Patient Copayments in Primary Medical Care

Thesis submitted in fulfilment
of the requirements of
Cardiff University
for the degree of Doctor of Philosophy

Christopher M. Penfold MSci ARCS

School of Dentistry
Cardiff University
Heath Park
Cardiff
CF4 4XY

ProQuest LLC
789 East Eisenhower Parkway
P.O. Box 1346
Ann Arbor, MI 48106-1346

Declaration

This work has not previously been accepted in substance for any degree and is not concurrently submitted in candidature for any degree.

Signed .....Chris Rengstl..... (candidate) Date 28/3/11

STATEMENT 1

This thesis is being submitted in partial fulfilment of the requirements for the degree of .....PhD.....(insert MCh, MD, MPhil, PhD etc, as appropriate)

Signed ...Chris Rengstl..... (candidate) Date 28/3/11

STATEMENT 2

This thesis is the result of my own independent work/investigation, except where otherwise stated.

Other sources are acknowledged by explicit references.

Signed ..Chris Rengstl..... (candidate) Date 28/3/11

STATEMENT 3

I hereby give consent for my thesis, if accepted, to be available for photocopying and for inter-library loan, and for the title and summary to be made available to outside organisations.

Signed ..Chris Rengstl..... (candidate) Date 28/3/11

Acknowledgements

In order to reach the end of this journey I have been extremely fortunate to have received input, support and guidance from many people.

I gratefully acknowledge the teaching and guidance of Professor Nick Buck, Deputy Director of the Institute for Social and Economic Research; Dr Christina Silver (Research Fellow) and Ms Ann Lewins (Research Fellow), University of Surrey Department of Sociology; Dr Sara Delamont, Cardiff University School of Social Sciences and Dr Stephen Hutchinson, Hutchinson Training and Development Ltd. For their advice and assistance in the development and undertaking of the quantitative aspects of this study I am extremely grateful to Professor Kent Matthews (Sir Julian Hodge Professor of Banking and Finance) and Professor Gerald Makepeace (Professor of Economics), Cardiff Business School; and also to Professor Robert Newcombe (Professor of Primary Care and Public Health), for his advice about my statistical strategies. The development and undertaking of the qualitative aspect of this study was the result of the input, support and guidance of many people. I gratefully acknowledge the support and advice of Dr Jacqui Jones (Office for National Statistics Methodology Directorate), Dr Michael Shepherd (AWARD Senior Research Fellow, Cardiff Institute of Society, Health and Ethics), Dr Susanne Langer (Cardiff University School of Social Sciences) and Professor Patricia Price (Department of Wound Healing, Cardiff University School of Medicine).

Dr Robert Wilson (Victoria Surgery, Rhymney) and Dr Kamila Hawthorne (Clinical Senior Lecturer, Cardiff University Department of Primary Care and Public Health and Four Elms Medical Centres, Cardiff) kindly gave me the opportunity to experience the day-to-day realities of primary medical care and offered me their views as general medical practitioners of the issue of copayments in primary medical care. Access to patients and precious space in clinics was kindly provided by the managers of the participating GP practices (Peter Robertson, Juliet Bodman and Steve Hartnell) and their staff.

With regards to the supervision of my PhD - for the support, encouragement, motivation and knowledge Professor Jonathan Shepherd and Dr Vaseekaran Sivrajasingham have given to me over these five years I will be eternally grateful. As a main supervisor I could not have asked for more from Professor Shepherd. Whilst working and studying under Professor Shepherd I have learnt a great deal about undertaking research and what is required to deliver relevant and high-quality research, and it has been one of the greatest and most rewarding opportunities that I have had.

I am grateful for the financial support of the Brickley Research Foundation.

I am also grateful to my friends and family, who have been a great source of support and distraction. I save my final thanks for Siân. Without you I would surely not have come close to completing this marathon – thank-you.

Abstract

This research was carried out to assess the feasibility of studying the effects of introducing copayments in primary medical care via studying the effects of copayments in primary dental care. Quantitative methods were used to investigate the impact of primary dental care copayments on patients and to compare predictors of primary medical and dental care uptake. Qualitative methods were used to investigate attitudes towards copayments for NHS primary health services and their extension to include primary medical consultations.

Regression models, chi-square analyses and ANOVA were applied to the England and Wales sub-sample of nationally representative self-report data from the 1998 Adult Dental Health Survey (ADHS) (n=3628) to investigate the impact of copayments on primary dental care uptake. Regression models and chi-square analyses were applied to the England and Wales sub-sample of nationally representative self-report data from the 1997/98 British Household Panel Survey (BHPS) (n=8526) and the 1998 ADHS (n=3641) to compare predictors of primary medical and dental consultations. Semi-structured interviews were undertaken in Bristol and Somerset with purposively sampled frequent and infrequent primary medical care users (n=19).

Predictors of primary medical and dental care utilisation differed across predisposing, enabling and illness level factors. Private and NHS dental copayments were perceived to be expensive and this perception was associated with lower preventive-led dental

consultation rates, but not with treatment-led consultation rates. Copayments for services affected the nature of the patient-practitioner relationship. Findings were inconclusive regarding the effect of copayment exemption status on people's decisions to consult a dentist and on dental treatments received. It was not feasible to study the effects of introducing copayments in primary medical care via studying the effects of copayments in primary dental care.

Table of contents

Index of tables

Index of figures

Chapter 1 Introduction

1.1 Structure of this thesis

This thesis comprises 10 chapters. Chapter 10 is an introduction to the thesis. Chapters two and three introduce and review the literature and concepts relevant to this thesis. Chapter 1 contains an overview of the application of cost-sharing in healthcare from international and national perspectives, and a review of research undertaken into the effects of cost-sharing in healthcare on patients. The review of the literature relating to the effects of cost-sharing on patients is considered firstly with regard to how patients were affected and secondly with regard to the methodologies employed. Chapter 3 is a review of people's patterns of use of healthcare resources and incorporates a review of how 'use of healthcare resources' can be measured and how the theoretical models of health utilisation, including the main model applied subsequently in this thesis, were developed.

Chapter 4 lists the specific aims and objectives of the studies which comprise this thesis, as well as the hypotheses which were tested. Chapter 5 details the methodologies used in the studies, including justification of their selection. Chapters 6, 7 and 8 contain the results of each of the studies undertaken, a discussion of the findings within the boundaries of each study and the limitations of each of the studies. Chapter 9 is a general discussion which puts the findings of each study in context with the other studies undertaken and draws out the main findings of this research. This chapter also details the implications of this research for public health policy and the general limitations of this research. Chapter 10 lists the conclusions of the studies undertaken.

1.2 Rationale for this research

Charges for healthcare payable at the point of delivery have long been a major feature of debates about the NHS. In his resignation speech in 1951 Aneurin Bevan said that the Government's compromise on patient charges for dentures and spectacles was 'the pebble...that is how the avalanche started':

> *'What will [the Chancellor of the Exchequer] do next year...prescriptions? Hospital charges? Where do you stop?... The Health Service will be like Lavinia - all the limbs cut off and eventually her tongue cut out, too.'*

Copayments (user fees at the point of service) in UK healthcare have been most strongly linked with primary care. Copayments were first introduced for dental care in 1952 and have long been used to support dentistry, sight tests and prescriptions. Primary medical care has, however, remained charge free at the point of service, although introduction of copayments for General Practitioner (GP) consultations features periodically in reviews of NHS funding and in opinion surveys of practitioners and the general public. A 1997 report by Bosanquet (1997) concluded that '70% [of Social Market Foundation survey respondents] would consult a doctor no less if they were charged £5 a visit', and the British Medical Association (BMA) was lobbied by GPs in 1999 to introduce patient charges in primary medical care. The BMA, however, maintained its policy of care free at the point of delivery. The Department of Health in England (2004b) published a consultation paper on the withdrawal of charge free primary care for non-UK residents to bring this policy into line with policy regarding secondary care for this group.

The introduction or subsequent extension of copayment schemes has been based on one or more of the following objectives (Eversley and Sheppard 2000):

- To protect government spending on other specific health or social policy objectives.
- To form part of a broader strategy to control public expenditure as a whole, as well as NHS spending.
- To act as a deterrent, preventing excessive and unnecessary use of services.

An assessment of the effectiveness of copayments as a constituent of public spending controls would necessitate an analysis of the national economy and social policy objectives involved in each change in the application of copayments. However, the role of copayments as a measure to reduce unnecessary use of services can be analysed in terms of:

- How the use of healthcare services has been modified.
- Whether modifications to patients' use of health service resources are equitable across socio-economic groups and promote utilisation based on need.

The desire to generate income for or to control spending on primary care means that the concept of General Practitioner (GP) consultations free at the point of care requires periodic review. The question which is the core of the work undertaken in this thesis is:

> *'What is the potential impact on patients of the introduction of charges for patients at the point of delivery of primary medical care?'*

This question underpins the main aim of this thesis:

> *'To assess the feasability of studying the effects of introducing copayments in primary medical care via studying the effects of copayments in primary dental care'.*

Chapter 2 Cost-sharing in healthcare – literature review

This chapter introduces the main concepts and terminology which relate to cost-sharing and reviews cost-sharing arrangements for healthcare which are applied within the UK and internationally. The structure of the UK National Health Service is outlined and the applications of cost-sharing within the NHS are detailed. The provision of healthcare resources in the NHS is then considered at a national level, with regard to how financial resources are distributed throughout the NHS, and internationally. Healthcare resource provision and selected health outcomes are compared internationally in order to understand how the provision of healthcare in the UK compares with that in other countries and to provide context for the investigation which follows. A semi-systematic review of studies of the effects of cost-sharing on patients composes the final section in this chapter. The main findings from these studies which are relevant to the principal questions addressed in this thesis are identified and discussed. Consideration is also given to areas evidence is lacking, particularly in a UK context; these areas are identified and summarised in the summary section of this chapter.

2.1 Cost-sharing - definitions and terminology

Patient charges for healthcare normally form part of a cost-sharing scheme, a process by which health expenses are shared between the consumer and insurer. Cost-sharing schemes are based on one or more of the following (Solanki and Schauffler 1999):

- Deductibles
    - The patient pays for the cost of healthcare up to the deductible level, beyond which their insurer meets any further costs of care.
- Coinsurance
    - The patient pays a fixed percentage, usually 20% or 25%, of the costs of care.
- Copayments
    - The patient pays a small, fixed fee for care irrespective of the total cost of providing that care.

Where possible this terminology is used to describe cost-sharing schemes for the remainder of this thesis.

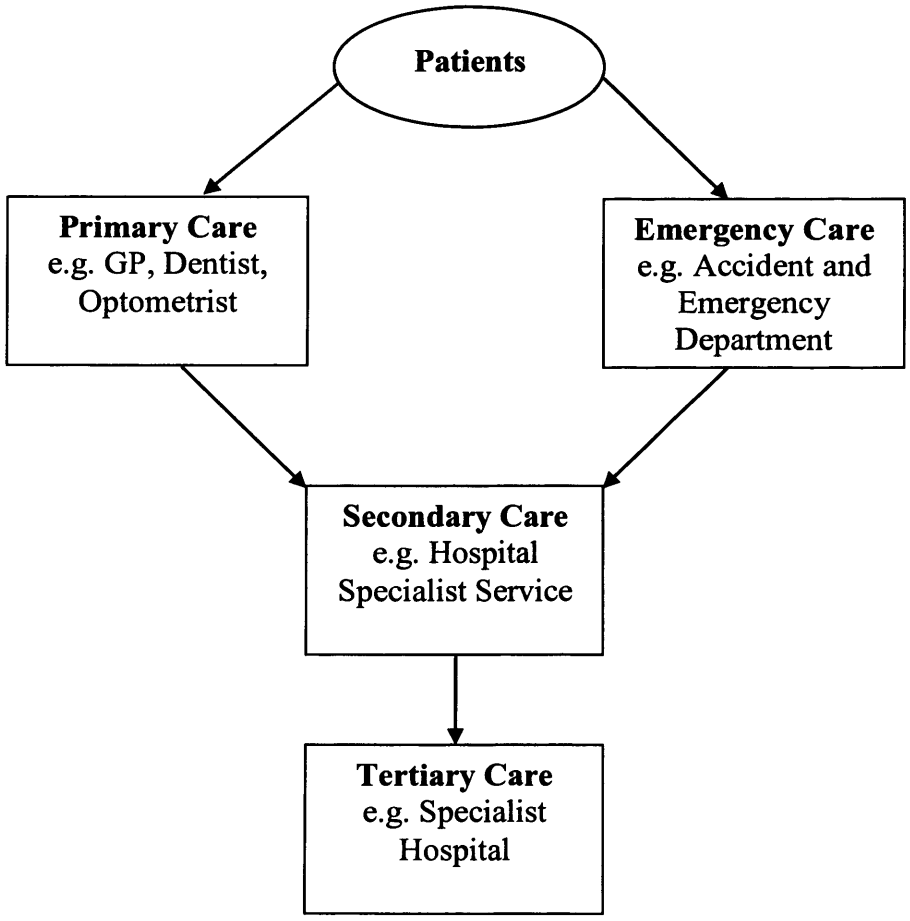
Some health insurance plans combine cost-sharing schemes, for example a deductible of $500 followed by a coinsurance rate of 20% for all costs above this. Coinsurance can also be applied with a cap on the maximum expense (e.g. a coinsurance rate of 20% up to a maximum expense of $500, beyond which the insurer meets all costs), effectively

making this a coinsurance/copayment combination. Worldwide there is a wide range of cost-sharing schemes, particularly through private health insurers.

2.2 The structure of the UK National Health Service

The United Kingdom National Health Service (NHS) consists of many levels of healthcare. Access to specialist healthcare (secondary and tertiary care) is normally via referral from a primary care practitioner or through an accident and emergency department, as illustrated in Figure 2-1.

Figure 2-1: An outline of the structure of healthcare in the UK NHS and the standard routes by which patients access different levels of care



Each level of care has been defined as follows:

- Primary Care

'The first level of contact with people taking action to improve health in a community including all initial (non-emergency) consultations with doctors, nurses or other health staff.' (Wanless 2003)

- Accident and Emergency Department

'A hospital department specialising in the initial assessment and treatment of people who develop a sudden illness or who sustain an accident.' (Department of Health. 2001)

- Secondary Care

'Specialised medical services and commonplace hospital care (outpatient and inpatient services). Access is often via referral from primary healthcare services.' (Wanless 2003)

- Tertiary Care

'Services... provided by specialised hospitals or departments... linked to medical schools or teaching hospitals. They treat patients with complex conditions who have usually been referred by other hospitals or specialist doctors.' (National Institute for Health and Clinical Excellence. 2005)

2.3 The application of cost-sharing in the UK NHS

The UK NHS is the main healthcare provider in the UK. Therefore, the main focus of this review of cost-sharing in the UK focuses on the NHS. Cost-sharing schemes administered privately and through the NHS are reviewed together for dental treatment and sight tests.

Table 2-1: Significant events in the history of NHS copayments

Year	Key change
1948	NHS launched with free prescriptions, spectacles and dental treatment
1949	Government draws up legislation for the introduction of prescription charges
1951	Government takes powers to introduce dental and ophthalmic charges
1952	First charges for prescriptions and dental treatment introduced
1956	Prescription charge doubled
1965	Prescription charges abolished
1968	Prescription charges reintroduced
1975-79	Prescription charges raised
1979	Prescription charge doubled
1988	Dental charges make up 75% of treatment costs
1990	Charges for dentistry are extended to include examinations and reports*
1997	Prescription charge now £5.65
1998	Ophthalmic charges abolished for those aged 60 and over

Source: 'Thinking the Unthinkable' (Eversley and Sheppard 2000)
*- (Lacey 2006)

2.3.1 Prescription items

As shown in Table 2-1, copayments were introduced for prescription items in 1952. Prescription cost-sharing is administered in two forms:

1 Over-the-counter (OTC) payment for individual prescription items

- This is a fixed fee copayment, regardless of the item being purchased
- The copayment applies to each item on a prescription script
- OTC payments account for the largest number of prescription items dispensed subject to a fee (Figure 2-3)

2 Pre-payment certificates (PPCs)

- PPCs are purchased to cover a set time period (three or 12 months). During this time period any number of prescription items may be obtained without any additional payment
- This scheme is designed to alleviate some of the additional financial burden associated with chronic ill health or illness requiring a large number of individual prescription items

Prescription copayments are applied subject to exclusion criteria for the medicines prescribed and the patient collecting the prescription.

Prescription items exempt from prescription copayments:

In 2004 the list of copayment-exempt prescription items consisted of (Department of Health. 2004a):

- Medication administered at a hospital or an NHS walk in centre
- Prescribed contraceptives
- Medication personally administered by a general medical practitioner (GP)
- Medication supplied at a hospital or Primary Care Trust (PCT) clinic for the treatment of a sexually transmissible infection (STI)

Individuals exempt from prescription copayments:

Individuals who meet the following criteria are exempt from paying the full prescription copayment (Department of Health. 2004a):

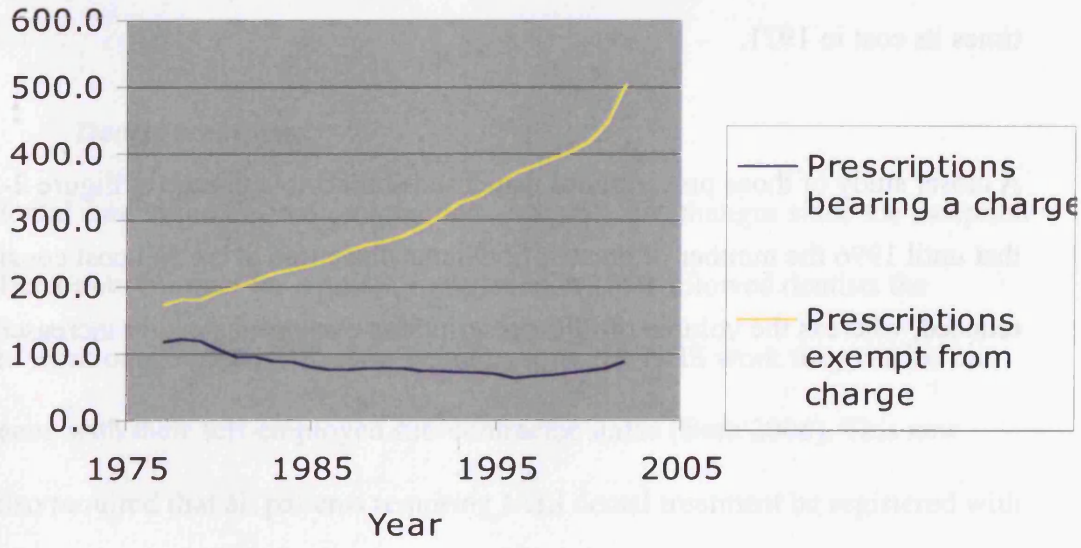
- Those aged 60 or over
- Those aged under 16, or aged 16 to 18 and still in full-time education
- Those who are pregnant, or who have had a baby in the previous 12 months and have a valid exemption certificate
- Those who have a listed medical condition and a valid exemption certificate
- Those holding an exemption certificate for a continuing physical disability necessitating help from another person to go out
- NHS in-patients
- Those receiving, or whose partner receives:
    - Income support
    - Income-based Jobseeker's Allowance

- Pension Credit Guarantee

- Those entitled to, or named on, a valid NHS tax credit exemption certificate
- Those named on a valid HC2 certificate
- War pensioners holding a war pension exemption certificate

Figure 2-2 highlights the difference in volume of prescription items dispensed with and without charge. It can be seen that of the 617 million prescription items dispensed in 2002, 505 million were dispensed to patients meeting the exemption criteria, 104 million were dispensed with a charge and eight million were prescription items bearing no charge. A rapid increase is seen in the number of prescriptions dispensed which were exempt from charges, whereas the number of prescriptions dispensed subject to a charge rose since 1996 following constant reduction from 1977 to 1996.

Figure 2-2: Distribution of prescription items between those bearing a charge and those dispensed for no charge, 1977 to 2002



Source: Department of Health for England

Table 2-2: Evolution of UK prescription charge, 1971 to 2004. Absolute charge and relative prescription charge (absolute charge/relative retail price index, 1971 = 1)

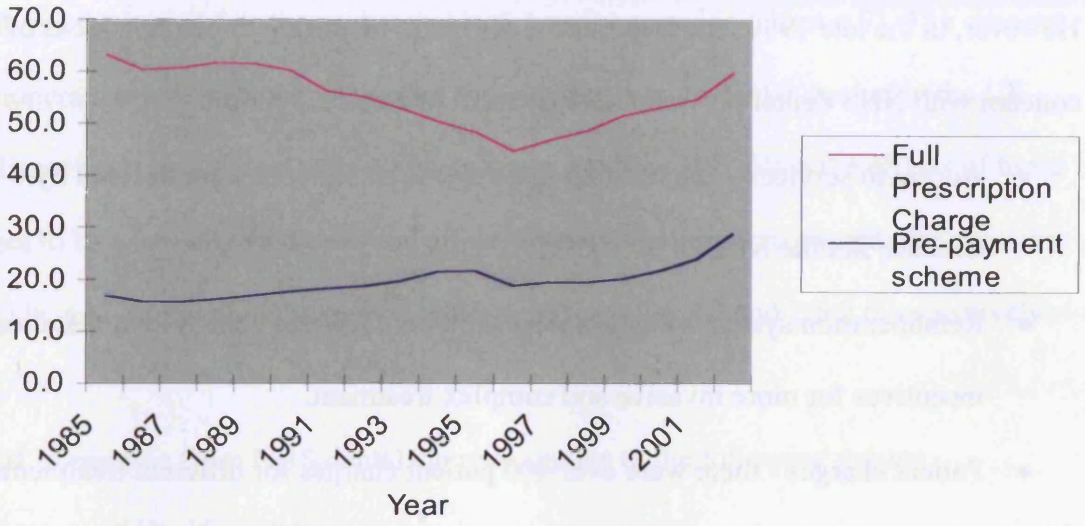
Year	Prescription charge (£)	Relative prescription charge
1971	0.20	1
1980	0.70	1.06
1985	2.00	2.27
1990	3.05	2.68
1995	5.25	3.69
2000	6.00	3.68
2004	6.40	3.58

Source: Royal Pharmaceutical Society

Table 2-2 shows how the prescription charge has changed both in its actual value each year and its relative value when the retail price index (RPI) is factored into the value. The relative prescription charge, by allowing individual years to be compared against each other, shows how in 2004 the cost of a prescription item, in real terms, is over 3.5 times its cost in 1971.

A closer study of those prescriptions dispensed subject to a charge in Figure 2-3 shows that until 1996 the number of prescription items dispensed at the full cost consistently reduced, whereas the volume of PPC prescriptions dispensed steadily increased.

Figure 2-3: Distribution of prescription items dispensed subject to a charge between over-the-counter (OTC) fee and the pre-payment scheme, 1985 to 2002.



The relationship between the price of prescriptions and the volume dispensed is frequently used in studies of the effects of cost-sharing, examples of studies of this relationship are discussed further in sections 2.5.2.5 and 2.5.2.7.

2.3.2 Dental treatment

Primary dental care in the UK has undergone two significant changes since the inception of the NHS. A new contract for dentists, introduced in 1990, allowed dentists the freedom to work outside the NHS while being paid for the NHS work they carried out, in accordance with their self-employed sub-contractor status (Bath 2006). This new contract also required that all patients requiring NHS dental treatment be registered with

an NHS dentist and maintain this registration through dental visits within a specified time frame.

However, in the late 1990s the Department of Health identified three main areas of concern with NHS dental provision (Department of Health. 2007b):

- Access to services – the location and volume of services were decided by dentists, not the NHS.
- Remuneration system - dentists were paid on a fee-per-item system that created incentives for more invasive and complex treatment.
- Patient charges - there were over 400 patient charges for different treatments, which caused confusion for patients and made it unclear what was NHS and what was private treatment.

The outcome of the subsequent working group, 'Options for Change', was the implementation of a new contract for NHS dentists which aimed to (Department of Health. 2007b):

1. 'Put local NHS in charge of commissioning local services.'
2. 'Provide dentists with an agreed annual income for an agreed level of patient care'
3. 'Simplify the charging system by introducing three charges.'

Cost-sharing in dentistry, in contrast to the relatively simple prescription copayments, is applied to a complex range of treatment options. However, due to the remuneration

arrangements in place for GDPs it is possible to disaggregate different treatment options from the overall range of treatments undertaken. As such, analyzing dental examinations and reports in isolation significantly simplifies the data available on dentistry in the UK (this forms the basis of analyses detailed in 5.3 and reported in Chapter 7). The changes in remuneration contracts for GDPs and the growing private dental market in the UK complicate analyzing dental attendance patterns, but they also allow the effects of these changes to be assessed. Studies of the effects of cost-sharing arrangements for dentistry in the UK and internationally are reviewed in sections 2.5.2.7 and 2.5.2.6 respectively.

In 2004 exemption from NHS dental charges applies to the following groups (Department of Health. 2004a):

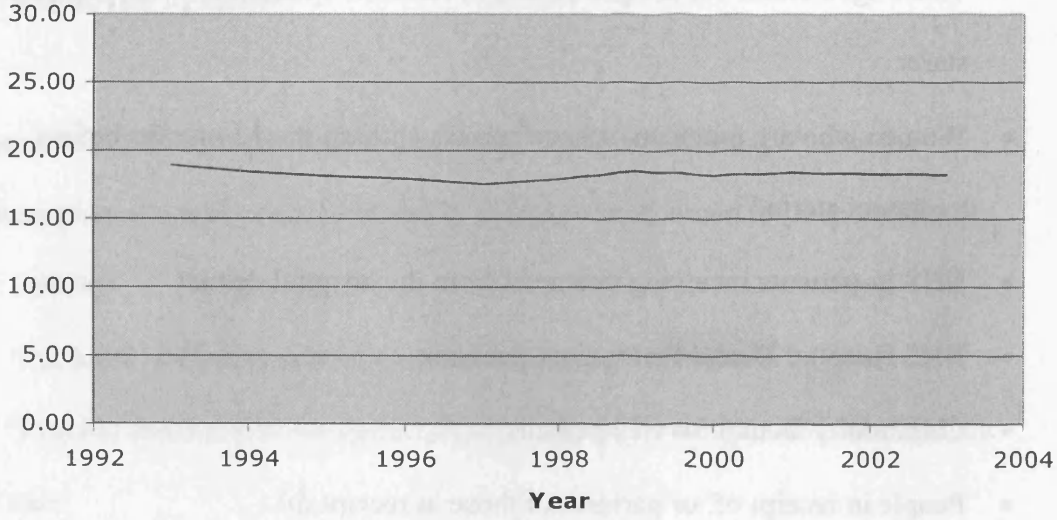
- Those aged under 18, or aged 18 and in full time education, when the treatment starts
- Women who are pregnant or have borne a child in the 12 months before treatment started
- NHS in-patients receiving treatment from the hospital dentist
- NHS Hospital Dental Service out-patients
- Community Dental Service patients
- People in receipt of, or partners of those in receipt of:
    - Income Support
    - Income-based Jobseeker's Allowance
    - Pension Credit Guarantee Credit
- People entitled to, or named on, a valid NHS tax credit exemption certificate

- People named on a valid HC2 certificate

In addition to the above, people aged under 25, or 60 or over, on the day of examination were entitled to free NHS dental examinations in Wales.

The focus of this review of NHS dental charges is the time period 1990 to 2006. In this period patient coinsurance rates constituted approximately 80% of the dentist's fee for treatment, up to a maximum of £384 per course of treatment in 2005 (Dental Services Division 2008).

Figure 2-4: The number of NHS dental examination and reports undertaken in England and Wales, 1993 to 2003



Source: Dental Practice Board

Table 2-3: Evolution of the patient charge and relative patient charge (absolute charge/relative retail price index, 1990 = 1) for an NHS clinical examination (0101)[1] in England and Wales between 1990 and 2004

Year	Patient Charge	Relative patient charge
1990	£3.45	1
1992	£3.45	0.86
1994	£3.92	0.93
1996	£4.16	0.93
1998	£4.64	0.98
2000	£4.92	0.99
2002	£5.32	1.02
2004	£5.64	1.04

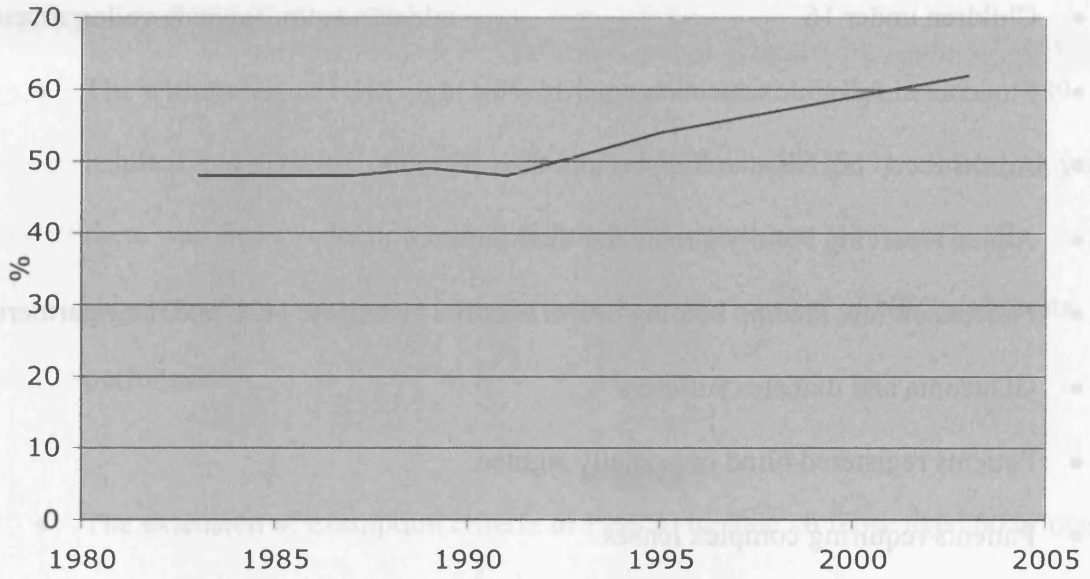
In contrast to the volume of prescription items dispensed Figure 2-4 shows how in the ten years from 1993 to 2003 the number of NHS dental examinations and reports has remained relatively stable. The relative patient charge for the basic NHS clinical examination and report has also remained stable (Table 2-3), unlike the prescription charge. Unlike GPs, GDPs have the option to work either for the NHS or as private practitioners. British Dental Association surveys have shown that in 1993, 75% of dentists treated at least 75% of their patients under the NHS. This figure has now dropped to approximately 60% of dentists. During this time there has also been an increase in the number of dentists with less than 25% of their patients being treated under the NHS (Buck and Newton 2001). Historically the decline of NHS dentistry can be linked back to funding cuts in 1992 (www.news.bbc.co.uk, 2004). However, changes

[1] During this time there were three levels of dental examination and reports available through the NHS: 0101 – Clinical examination, advice, charting and report; 0111 – Extensive clinical examination, advice, charting and report; and 0121 – Full case assessment, treatment planning and report.

in remuneration arrangements for NHS dentists and the lack of availability of some treatments under the NHS (Hancock, Calnan et al. 1999) have all contributed to the rise in private dentistry provision.

Results from the General Household Survey (GHS) show that there was growth between 1983 and 2003 in the number of respondents to the survey who reported receiving regular dental 'checkups' (Figure 2-5), whereas during the same period no increase was seen in the number of NHS dental examination and reports (Figure 2-4). These inconsistencies suggest a rising number of people are having dental treatment performed outside the NHS, although without a decline in NHS treatment. The rising number of people reporting to have regular dental 'checkups' may also be a result of improved oral hygiene leading to the GDP recommending a longer period between successive examination and reports or inaccuracies in the recalling of dental care by respondents to the survey.

Figure 2-5: Percentage of adult respondents who reported attending for regular dental examination and reports, 1983 to 2003.



Source: General Household Survey

2.3.3 Sight tests

An analysis of copayments in ophthalmic services is subject to similar constraints as this exercise in the dental services. Substantial changes to the eligibility criteria, anticipation of these changes and alterations to the data collection methodologies has reduced the amount of data available and the reliability of comparisons. However, changes in eligibility criteria for specific age groups allow investigations to be made into how out-of-pocket payments for this service alter utilisation of that service, potentially yielding additional information about the effects of copayments in healthcare.

In April 1989 NHS sight tests free at the point of delivery were restricted to the following eligible groups (Department of Health. 2004a):

- Children under 16
- Students in full time education aged 16-18
- Adults receiving Income Support and their partners
- Adults receiving Family Credit and their partners
- Patients on low income holding health benefits certificate HC2 and their partners
- Glaucoma and diabetes sufferers
- Patients registered blind or partially sighted
- Patients requiring complex lenses
- Close relatives aged 40+ of a glaucoma sufferer

Since April 1989 there have been the following significant policy changes in the general ophthalmic service (GOS):

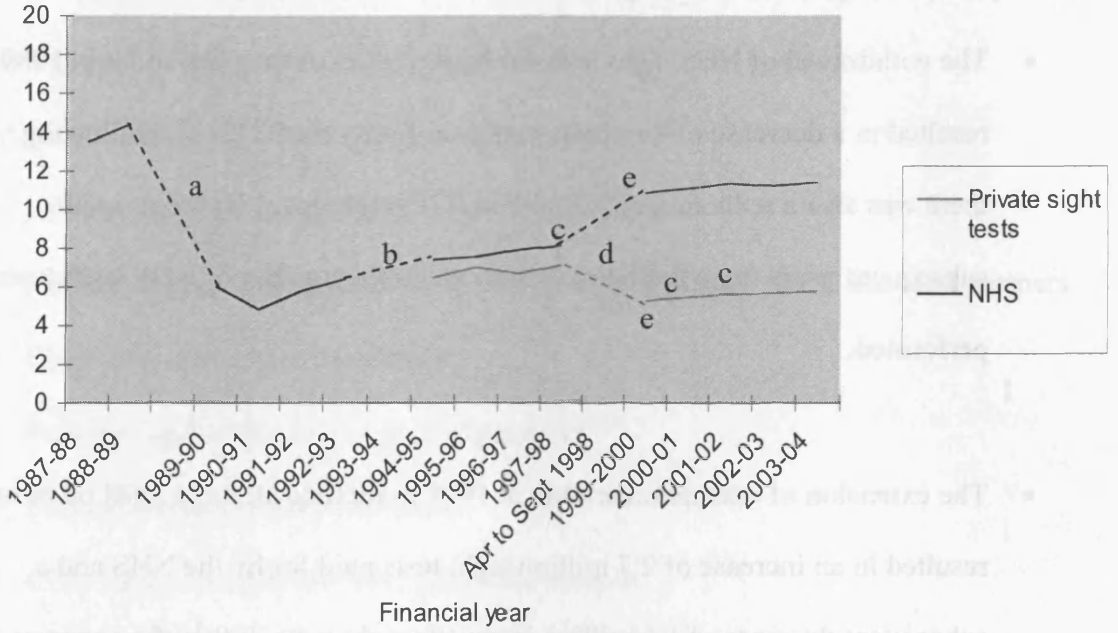
- Restriction of NHS sight tests free at the point of delivery in April 1989 to certain eligible sectors of the population
- Legislation permitting the sale of ready-made reading glasses by unregistered suppliers took effect from April 1989
- Extension of eligibility for NHS sight tests free at the point of delivery to all those aged 60 or over from April 1999

Figure 2-6 illustrates how numbers of sight tests have changed since 1987-88. The number of sight tests undertaken during this period has been strongly influenced by health policy changes, most notably:

- The withdrawal of NHS sight tests for a proportion of the population in 1989 resulted in a decrease of 8 million tests paid for by the NHS. The following year there was also a reduction of 1.2 million NHS sight tests. However in all subsequent years there has been an increase in the number of NHS sight tests performed.

- The extension of exemption criteria in 1999 to include all those aged 60 or over resulted in an increase of 2.7 million sight tests paid for by the NHS and a subsequent decrease of 1.6 million in private sight tests. It therefore appears that the re-introduction of free sight tests to everyone aged 60 or over resulted in more than one million additional sight tests being performed.

Figure 2-6: The number of NHS and private sight tests performed annually, 1987-88 to 2003-04



Source: General Ophthalmic Society (GOS)

a: From April 1 1989, GOS sight tests were restricted to certain eligible groups in the population. The GB figures for 1989/90 included 1.82 million sight tests paid for in 1989/90 but conducted in 1988/89 under the previous scheme. The remaining 4.2 million were conducted and paid for in 1989/90 but do not constitute a full twelve months of the new scheme. The figures for 1990/91 which do represent twelve months under the new scheme, are not therefore directly comparable with those for 1989/90.

b: Data unavailable

c: In 1997-98, 2000-01 and in 2002-03, OMPs (Ophthalmic Medical Practitioners) were not included in the survey sample and the number of private sight tests performed by OMPs was calculated on the basis of the percentage of private sight tests performed by Optometrists

d: In 1998-99, the survey period was not considered representative of the year as a whole because of the possible impact of anticipation of the extension of eligibility for NHS sight tests to all those aged 60 or over from 1 April 1999. Sight tests are therefore presented for the first six months only.

e: Patients aged 60 or over became eligible for NHS sight tests from 1 April 1999. Because of the lag of about a month between NHS sight tests performed and payment, not all NHS tests *performed* on patients aged 60 and over in 1999-2000 are included in the volume of NHS sight tests paid for by health authorities / SHBs because some were *paid for* after 31 March 2000. The ratio of private to NHS tests from the survey reflects tests performed, so the private total might also be understated by a few percent.

Using the example of sight tests it has been seen that substantial changes in the eligibility criteria for NHS treatment do significantly affect the usage patterns of the target population. In the case of reinstating their eligibility for NHS sight tests, those aged 60 or over had nearly one million additional sight tests in 1999-2000 as opposed to when they were ineligible and therefore had to pay privately. An approach such as this, utilising changes in policy for specific population groups, allows the relatively complex treatment options and eligibility criteria of ophthalmology and dentistry to be studied more simply.

The examples of cost-sharing for primary healthcare in the UK NHS which have been reviewed illustrate how widely it is applied. The criteria for exemption from these charges were found to be similarly wide-ranging and encompassed medical conditions, socioeconomic factors and specific medications. Studies of these cost-sharing arrangements, including changes to the criteria for exemption, and their effect on patients are reviewed in section 2.5.2.7.

2.4 Healthcare resources in the UK

The aims of this section are to provide specific details about how NHS primary care is funded as part of the overall healthcare system in the UK, and to put the provision of healthcare in the UK in context with international comparisons. The review of cost-sharing previously undertaken (section 2.3) showed that they are mainly applied in primary care. In this section the provision of funding for healthcare and its main primary

care recipients is reviewed. The provision of healthcare in the UK is also compared with selected other countries with regard to how healthcare is funded and selected outcome measures.

Table 2-4 details how government spending in England on family health services (FHS) has consistently increased over the 10 years from 1991-92 to 2001-02. In 2001-02 the largest expenditures in the FHS budget were £5,560m (46%) spent on drugs, £3,700m (31%) on general and personal medical services[2] and £1,600m (13%) on general dental services.

Figure 2-7 shows how the proportion of the FHS budget allocated to meet the drugs bill has increased consistently from 35% in 1991-92 to 46% in 2001-02. This has been countered by a reduction in the proportion of the FHS budget allocated to the other four main recipients. However the total budget for each of the five main recipients has increased annually above the rate of inflation.

[2] General Medical Services, GMS, are family doctor services provided by GPs in Primary Care practices. Personal Medical Services, PMS, is a scheme for GPs to enter into new contracts with a health authority to provide new or additional services for patients.

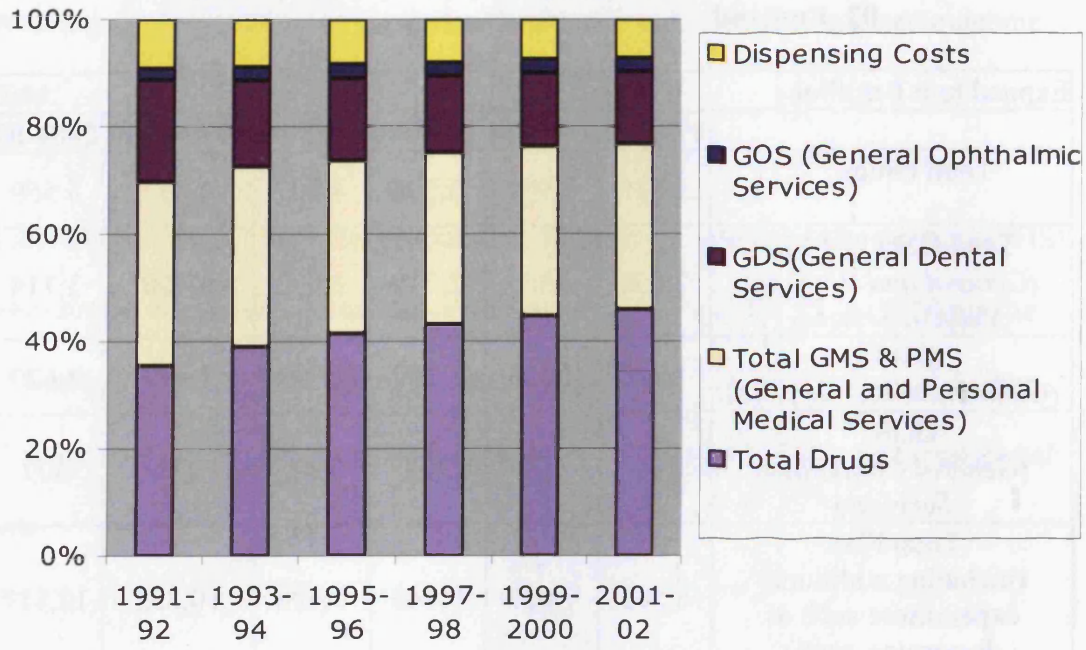
Table 2-4: Family Health Services (FHS) Gross Expenditure, 1991-92 to 2001-02, England

Expenditure £ million						
	1991-92	**1993-94**	**1995-96**	**1997-98**	**1999-2000**	**2001-02**
Total Drugs[1][2]	2,335	2,980	3,506	4,107	4,852	5,559
Total GMS & PMS *(General and Personal Medical Services)*	2,256	2,555	2,719	3,033	3,420	3,714
GDS[3] *(General Dental Services)*	1,248	1,223	1,292	1,349	1,479	1,629
GOS[4] *(General Ophthalmic Services)*	141	192	223	241	281	302
Total FHS (including additional expenditure such as dispensing costs)	6,583	7,627	8,446	9,498	10,852	12,117

Source: (Department of Health. 2003)

1. *Since 1999-2000 the Drugs budget has been part of the Unified Allocation. Figures reported are gross and do not include PPRS savings.*
2. *Drugs bill cash figures include amounts paid from April to March to contractors for drugs, medicines and appliances which have been prescribed by a GP/Nurse (relates to February to January prescriptions).*
3. *The Gross GDS costs include the cost of refunds to patients who incorrectly paid dental charges.*
4. *Expenditure on GOS increased in 1999-00 as a result of the Government's decision to extend eligibility for free NHS sight tests to everyone aged 60 and over from April 1999.*

Figure 2-7: The five main areas of expenditure of the FHS annual, 1991 to 2002.



Source: Department of Health 2003

International comparisons of healthcare systems can be useful for identifying similarities and differences. Findings from such studies can be considered in the context of the UK NHS so that health policy can be refined. Healthcare systems can be defined from many perspectives. Conceptually, they can be considered as three main groups – inputs, outputs and healthcare structures.

Examples of inputs:

- How healthcare is funded - e.g. spending per capita or as a percentage of gross domestic product (GDP)
- Sources of healthcare funding (private and public)

Examples of outputs:

- Population statistics, such as life expectancy and infant mortality rates

Examples of healthcare structures:

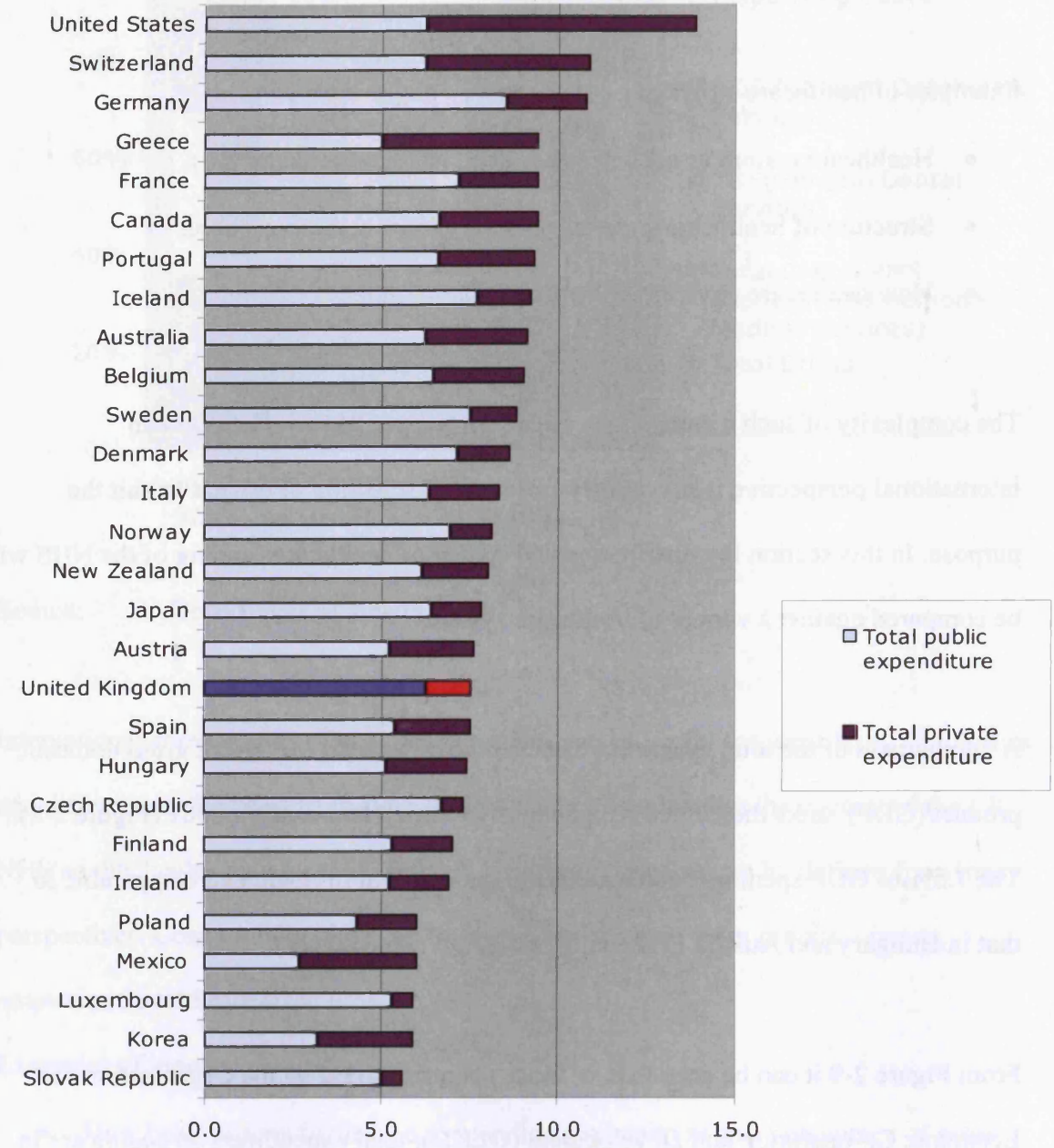
- Healthcare resources available (e.g. head of population per GP)
- Structure of healthcare and how patients access certain resources
- How healthcare coverage is distributed across the population

The complexity of such a comparison means that to put the UK NHS into an international perspective is necessarily a process of selection of criteria to suit the purpose. In this section the distribution and source of healthcare funding of the NHS will be compared against a variety of healthcare systems.

A comparison of the total expenditure on healthcare as a percentage of gross domestic product (GDP) ranks the United Kingdom as 18th of 28 countries in 2001 (Figure 2-8). The 7.5% of GDP spent on healthcare is the same as that in Spain and comparable to that in Hungary and Austria (7.4% and 7.6% GDP respectively).

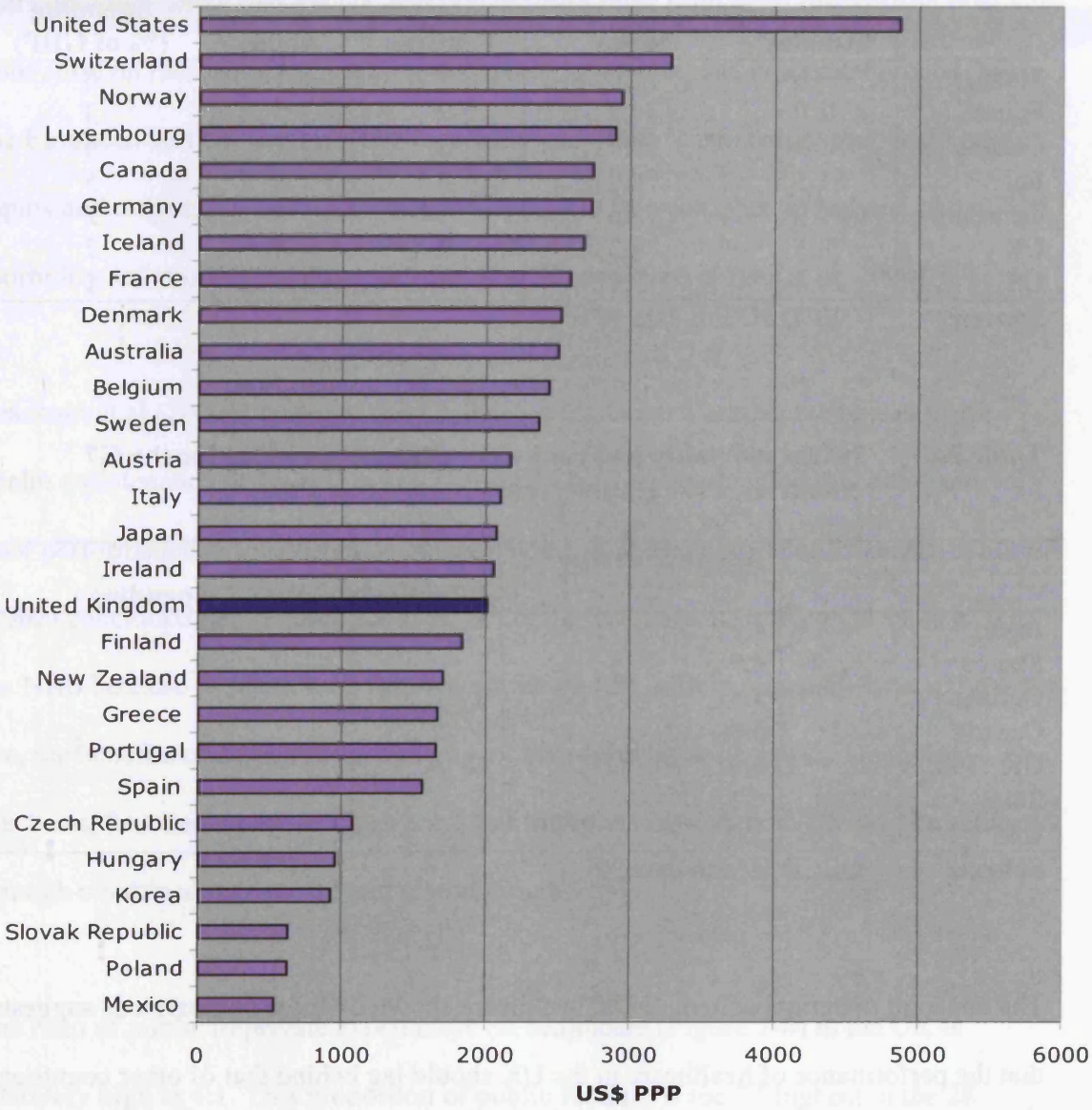
From Figure 2-9 it can be seen that, of those countries listed by the Organisation for Economic Co-operation and Development (OECD), total expenditure on healthcare in 2001 per capita ranks the United Kingdom as 17th of 28 countries. In the United Kingdom US$2012 per capita was spent on healthcare, which is similar to that spent by Ireland (US$2059) and Japan (US$2077).

Figure 2-8: Total expenditure on healthcare as a percentage of GDP



Source: OECD 2001

Figure 2-9: Total expenditure on health, per capita US$ purchasing power parity[3] (PPP)



[3] 'Purchasing power parities (PPPs) provide a means of comparing health spending between countries on a common base. PPPs are the rates of currency conversion that equalise the cost of a given 'basket' of goods and services in different countries.' (2006)

Table 2-5: Life expectancy and ranked healthcare spending for the G7 countries, 1996 (Emmerson, Frayne et al. 2000)

	Life expectancy at birth (years)		Rank Life expectancy		Rank Spending
	Females	Males	Females	Males	(% of GDP)
Japan	83.6	77.0	1	1	6
France	82.0	74.2	2	5	3
Canada	81.4	75.7	3	2	4
Italy	81.3	74.9	4	3	5
Germany	79.9	73.6	5	6	2
UK	79.5	74.3	6	4	7
US	79.4	72.7	7	7	1

Source: OECD Health data 99

Table 2-6: Infant mortality and ranked healthcare spending for the G7 countries, 1996 (Emmerson, Frayne et al. 2000)

	Infant mortality	Rank Infant mortality	Rank Spending
Japan	4.3	1	6
France	4.9	2	3
Germany	5.3	3	2
Canada	6.0	4=	4
UK	6.0	4=	7
Italy	6.2	6	5
US	8.0	7	1

Source: OECD Health data 99

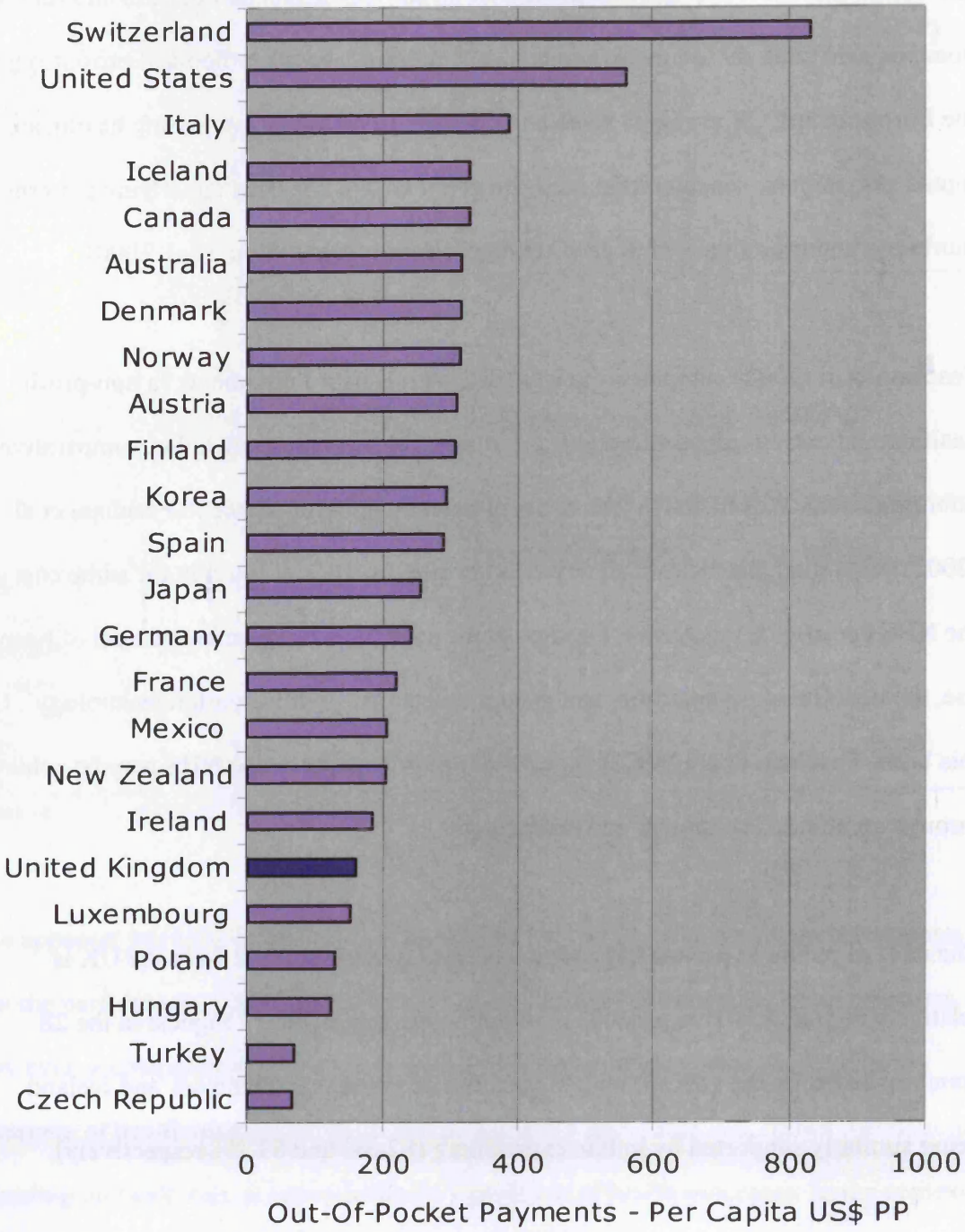
The apparent underinvestment in UK healthcare shown by these comparisons suggests that the performance of healthcare in the UK should lag behind that of other countries. However, a comparison of life expectancy and infant mortality rates (both common measures of health outcomes), as shown in Table 2-5 and Table 2-6, shows that national spending on healthcare is not necessarily a predictor of health outcomes. In the context of proportion of GDP spent on healthcare, in the UK infant mortality rates were lower

and life expectancy rates were higher than expected. In contrast, the US healthcare system performed badly according to these measures. Outcomes for specific illnesses and conditions show that the UK had higher death rates from heart disease and relatively poor survival rates for the most common cancers (lung, breast, colon and prostate) than the European and US averages between 1986 and 1990. When comparing healthcare inputs and outputs, consideration needs be given to 'the complex underlying patterns of morbidity and mortality within each country' (Emmerson, Frayne et al. 2000).

Feacham et al (2002) compared the UK NHS with Kaiser Permanente (a non-profit health maintenance organisation in California, USA) and concluded that comparatively poor performance in the NHS was not explained by underinvestment. Feacham et al (2002) concluded that 'Kaiser achieved better performance at roughly the same cost as the NHS because of integration throughout the system, efficient management of hospital use, the benefits of competition, and greater investment in information technology'. On this basis, Feacham et al (2002) suggest that improvements to the NHS may be achieved through combined investment and restructuring.

The ratio of public to private expenditure on healthcare (Figure 2-8) in the UK is relatively high at 4:1. This proportion of public funding is the 7th highest in the 28 countries listed by the OECD, with the healthcare systems of Denmark and Iceland being similarly supported by public expenditure (82.6% and 83.2% respectively).

Figure 2-10: Out-of-pocket payments for healthcare in selected countries – per capita US$ PPP, 1996



Source: **OECD**

Figure 2-10 demonstrates the comparatively low out-of-pocket payments for healthcare in the UK. Out-of-pocket payments as defined by the OECD constitute 'cost-sharing, self-medication and other expenditure paid directly by private households' (2001).

In this section it was seen that primary healthcare in the UK NHS received an increased level of financial provision in the late 1990s and early 2000s. This increase in financial resources was matched by plans outlined by the Department of Health to 'restore and modernise the health service around its founding principles' in its report 'The NHS Plan' (2001b). Central to this plan was primary healthcare, which the Department of Health stated would be characterised by:

> *'Universal, fast and convenient access by informed patients to an extended range of high quality services delivered in modern primary care settings by suitably trained and qualified primary care professionals'*

When compared with other countries in 2001 the UK spent a comparatively low percentage of its GDP on healthcare. A relatively high percentage of this expenditure was publicly funded and in 1996 'out-of-pocket' payments for healthcare were comparatively low in the UK. However, when health outcomes were considered the financial resource provision was not clearly related to performance. These comparisons demonstrate that there are a large number of contrasting healthcare systems operating worldwide, with different underlying financing structures. These differences will need to be taken into consideration when relating experiences of funding systems, such as copayments for primary medical care, to the UK.

2.5 The effects on patients of cost-sharing – literature review

In order to better understand how cost-sharing in healthcare affects patients a review of the literature in this area was undertaken. The main findings from the major studies retrieved using a semi-systematic search protocol (detailed below) are reviewed and areas of weakness in the current literature base relating to the main research question of this thesis are identified.

2.5.1 Search strategy

The following systematic strategy was adopted to search for relevant literature:

1. Medline (PubMed), PsycInfo, EconLit, Web of Science, EMBASE and Zetoc were searched using the following keywords/terms – 'copayment', 'co-payment', 'deductible', 'coinsurance' and 'co-insurance' ('cost sharing' was not used as a search term since it was too non-specific).
2. Manual searches of the references from key studies (particularly reviews of cost-sharing effects) were performed and cross-referenced with the database searches.
3. The results of these searches were manually checked to identify duplicate articles and articles not of relevance to the research topic, which were removed.
4. The remaining list of articles was further checked to eliminate those from developing countries and those not written in English.

Using this search strategy, 1611 articles were found. This collection of studies was categorised by the type of service being studied:

- 'primary care', 'primary healthcare', 'physician'
- 'dentist', 'dental care' or 'dentistry'
- 'prescription' or 'medication'

Studies were carried out in a range of European, North American, Asian and Australasian countries. The majority of studies were from North American countries and Europe.

These research articles were reviewed and the main themes relating to the effects of cost-sharing on patients were identified. Consideration was also given to the main methodologies used to calculate the effects of cost sharing, which are discussed in the context of the healthcare system studied.

2.5.2 Review of the literature

2.5.2.1 The RAND Health Insurance Experiment

The Health Insurance Experiment (HIE) conducted in the USA by the RAND Corporation between 1974 and 1982 is probably the most valuable resource when considering the effects of cost sharing in healthcare (Keeler 1992). The experiment aimed to answer two main questions:

1. How much more medical care will people use if it is provided free of charge?
2. What are the consequences for their health?

To answer these questions 5809 people were randomly assigned to health insurance plans that had either no cost-sharing (all medical fees met by the insurer), or 25, 50 or 95% copayment rates with a maximum annual family out-of-pocket payment of $1000 (in 1975-1981 US dollars).

Keeler (1992) identified significant conclusions from the RAND HIE, including:

- People given care free at the point of delivery (no cost-sharing) had better health at the end of the study in terms of blood pressure, corrected vision, and oral health. This was particularly evident for the poor and initially sick.
- Patients on the cost-sharing schemes chose to seek diagnosis and treatment for fewer illness episodes. The proposed reason was that patients relied more on time and home remedies.
- The proportion of inappropriate hospital admissions was almost identical for cost-sharing and free plans, as was inappropriate antibiotic use.
- Regular medical screening (Papanicolaou smears, breast and rectal examinations) was undertaken more for patients receiving care free at the point of delivery. However, other health habits such as exercise, diet and smoking (except for use of dental floss) were worse on the scheme which was free at the point of delivery than on the cost sharing schemes.
- Care free at the point of delivery led to more self-reported diseases and worry, especially among the initially well and rich.

The conclusion that the benefits of healthcare free at the point of delivery were most significant for those who were poor or initially sick is consistent with the belief that these population groups face disproportionate medical costs under cost-sharing schemes and that copayments for healthcare contribute to horizontal inequity. Rasell et al (1994) showed that the poorest 10% of Americans paid five times the average out-of-pocket healthcare expenses compared to the richest 10% of the population, and overall healthcare expenses (including insurance premiums and taxation) totalled 27% of the family income of the poorest 10% and 10% of the annual family income of the richest 10% of the population. Rasell et al (1994) suggested, however, that as well as reflecting the regressivity of out-of-pocket payments for healthcare, the increased out-of-pocket proportion of healthcare expenses for the poorest people may reflect their lack of comprehensive health insurance whereby they are more likely to face additional out-of-pocket healthcare costs than fully insured citizens.

Findings the RAND HIE indicate that cost-sharing schemes result in the following patient outcomes:

- People consult less frequently
    - This affects diagnosis and preventive screening
    - Consultations with medical practitioners are substituted for other treatment or diagnosis options
- Treatment rates are reduced
- The overall health status of the population is reduced

Reductions in consultation rates due to cost-sharing arrangements have been confirmed by other studies across emergency services, physician services, hospital admissions and pharmaceutical prescriptions.

2.5.2.2 Emergency Department visits

In their study of Emergency Department (ED) visits, O'Grady and Manning (1985) reported that patients enrolled on a co-insurance scheme for emergency care used emergency services 20 to 40 percent less than those without a co-insurance rate to pay. Findings from the HIE that the demand for medical services for minor ailments is more sensitive to price than for major ailments suggest that price sensitivity depends on the severity of the ailment (Newhouse 1993). Selby et al (1996) reported a slightly smaller reduction in ED visits (15%) following the introduction of copayments for ED visits, although, in agreement with findings from the HIE, they found that there was no reduction in consultations for the most serious conditions classified as 'always an emergency'. Furthermore, privately insured patients suffering from myocardial infarctions did not delay seeking emergency medical care due to modest ($25-$100), fixed copayments (Magid, Koepsell et al. 1997). When applied to emergency care cost-sharing schemes reduce the use of such services for minor conditions, whereas more serious conditions seem to be relatively unaffected.

2.5.2.3 Primary medical care/physician services

The effect of cost-sharing applied to primary medical care (or physician services) has been studied with regard to the frequency of consultations, the uptake of preventive care and the extent to which cost-sharing drives people to consult other practitioners. Cherkin and Grothaus (1989) found that a $5 copayment for physician office visits reduced primary care visits by 11% and physical examinations were reduced by 14% under the same scheme. However, as with ED consultations, the most serious care; in this case immunization rates for young children, cancer screening tests received by women, or medication use by persons with cardiovascular disease; was the least sensitive to price (Cherkin, Grothaus et al. 1990). Cost-sharing effects also differ according to the severity of symptoms, with minor symptoms being more price sensitive than serious symptoms (Shapiro, Ware et al. 1986). Lurie et al (1987) reported that levels of preventive care (infant immunisations, Pap smears and mammograms) were lower among people enrolled on a cost-sharing scheme, this was in agreement with Trivedi et al (2008), who found that 'relatively low copayment rates were associated with significantly lower mammography rates among women who should undergo screening mammography according to accepted clinical guidelines'. Solanki and Schauffler (1999) found that cost-sharing (both through copayments and coinsurance/deductibles) was associated with a reduced probability of receiving the recommended level of four preventive services - counselling, blood pressure, Pap smears and mammograms.

Chiappori et al (1998) studied the introduction of a 10% copayment rate for physician office and home visits for a subgroup of people in France. Their study focused on a

period in which a 10% copayment was introduced for certain enrolees rather than universally. Under these circumstances (a 'natural' experiment) it was found that rates of physician home visits reduced as a result of the copayment, however no change was observed in rates of physician office visits. A similar difference in the response of people to copayments for physician home and office visits was found in Belgium, although in this instance the rate of both decreased but the reduction was greater for home visits (Cockx 2003).

The effects of cost-sharing in primary care are felt not only by the patient, but also by the healthcare providers. Chandra et al (2007) reported that higher copayments for physician office visits and prescriptions can have a significant effect on the healthcare spending of elderly Americans. In their analysis of the impact of changes to cost-sharing arrangements for retired public employees in California, Chandra et al (2007) reported 'offset' effects resulting from increases in hospital utilization in response to the combination of higher copayments for prescriptions and physician consultations. The cost savings which were accrued by the supplemental insurer responsible for increasing the copayment rates were offset by the cost increases accrued by Medicare due to the increased rate of hospitalisations. A similar 'offsetting' effect was found in Belgium, and the effect was found to be larger in women than men (Cockx 2003). This effect was most pronounced among those who were most seriously ill or had chronic conditions.

Jung (1998) reported a study of the transition in Korea in 1986 to a healthcare system utilising copayments for each contact with a medical care provider (clinic or hospital).

Jung initially modelled the patient-physician interaction beginning with the physician categorising the intensity per visit, and subsequently permitted the patient to determine the number of visits to the physician based on this intensity. Using this technique Jung was able to test whether the introduction of a copayment will reduce the number of doctor visits within an illness episode and will increase the intensity per visit. Furthermore, Jung tested whether annual spending on medical care during the year will be reduced or whether the number of visits and intensity per visit will move in opposite directions, nullifying any change in total expenditure. The unifying finding was that 'when the copayment is raised, visits per illness episode will fall', which is consistent with the reduction in consultation rates found in the RAND HIE.

When applied to primary medical care cost-sharing has been found to result in reduced consultation rates, reduced preventive treatments and screening, and an increase in people consulting other practitioners services (mainly Emergency Departments). These findings are all in agreement with the RAND HIE. Cost-sharing has been found to disproportionately affect seriously ill people or those with chronic conditions, with regard both to offsetting effects (Chandra, Gruber et al. 2007) and health status (Keeler 1992).

2.5.2.4 Hospital admissions

Findings from the HIE relating to hospital admissions indicate that people on a 'full-coverage scheme' ($0 cost-sharing) used services at a higher rate (both ambulatory and hospital services) and used a wider range of services. However, once admitted to

hospital no difference in expenditure per admission was found between those on cost-sharing schemes and those who faced no charge at the point of delivery (Newhouse, Manning et al. 1981). Copayment effects have been found to prevail across healthcare services (inpatient, outpatient and dental services), although the magnitude of the price sensitivity differed by type of service, the patient's age (residential care was substituted for hospital care among elderly patients) and income (the greatest effect was on inpatient care among those with the lowest income) (Kupor, Liu et al. 1995).

2.5.2.5 Prescriptions

The effects of cost-sharing on prescription utilisation have been widely studied. The studies which are discussed in this section are from the USA and focus on the role of the cost-sharing arrangements of individual Health Maintenance Organisations (HMOs) or Medicaid (findings from studies conducted in the UK are discussed in 2.5.2.7). Adherence rates for people prescribed statins (a lipid lowering pharmaceutical therapy for the management of coronary heart disease) reduced by 2.2% for each additional $10 of copayment (Pedan, Varasteh et al. 2007). Tiered copayment schemes have been used by Health Maintenance Organizations in the USA to price cheaper but clinically-equivalent generic drugs more favourably than branded originator drugs (King and Kanavos 2002). This approach has been used to encourage patients to choose cheaper drugs, but to leave the final decision of which drug to choose to the patients.

Soumerai et al (1987) studied the effects of changes to Medicaid prescription policy on the number of prescriptions filled. Following a change which limited Medicaid enrolees

to three paid prescriptions per month, the number of prescriptions filled dropped by 30%. Reductions were largest for recipients of multiple prescriptions (predominantly females and elderly or chronic ill patients) who got 46% fewer prescriptions filled. The number of prescriptions for 'ineffective drugs' filled reduced by 58%, but 'essential drugs' were also filled less (insulin reduced by 28% and thiazides by 28%). When the three-prescription cap was replaced with a $1 copayment system the number of prescriptions for most medications returned to approximately pre-cap levels (Soumerai, Avorn et al. 1987). Among patients who regularly took three or more prescription drugs per month, the introduction of the three-prescription cap was associated with a relative risk of being admitted to a nursing home of 2.2 and the relative risk of hospitalisation was 1.2 (Soumerai, Ross-Degnan et al. 1991). Following discontinuation of the cap the relative risks returned to near pre-cap levels.

Cost-sharing applied to prescription items has been found to reduce the number of prescriptions filled. As with cost-sharing applied to other services, this effect was most significant for people who were chronically ill (Lexchin and Grootendorst 2004). The reduction in the number of prescriptions for 'ineffective' drugs filled contrasts with findings from the HIE that inappropriate antibiotic use did not differ between copayment plans. The increased risk of hospitalisation or being admitted to a nursing home for patients receiving a large number of prescriptions echoes findings from the HIE that people with access to care free at the point of delivery have a higher health status.

2.5.2.6 Dental care

A reduction in cost-sharing rates for dental treatment in the HIE was associated with an increase in demand for dental services and an increases in dental expenses (Manning, Bailit et al. 1985). Approximately two-thirds of the increase in dental expenses was attributable to increased demand (Manning, Bailit et al. 1985). Findings from Mueller and Monheit (1988), in their analysis of data from the National Medical Care Expenditure Survey (a panel survey undertaken in the USA which was begun in 1966), were consistent with those from the HIE regarding the effect of cost-sharing on the demand for dental care. They also found that insurance coverage affected the mix of care received, particularly affecting the use of more expensive treatments such as obtaining bridge work or receiving a crown, and also that insured patients received a more costly mix of care. In the HIE, participants who received their dental care delivered free at the point of delivery had better overall dental health than those on cost-sharing schemes (Bailit, Newhouse et al. 1985). In a study of dental provider choice in the mixed public-private dental provision in Finland, the price of publically funded and private dental treatment was significantly associated with reduced care seeking (Nguyen and Hakkinen 2006). The authors concluded that 'lowering copayments or user charges and increasing the public supply would increase dental service use evenly across both dental sectors, as a result of which inequality and inequity in the use of dental services may be reduced'.

2.5.2.7 Studies from the UK

In comparison to the range of studies into the effects of cost-sharing in healthcare which have been undertaken in other countries, there are relatively few studies which focus on

cost-sharing in the UK. The most widely studied application of cost-sharing in the UK is prescription charges, although studies have also been undertaken into cost-sharing for primary dental care and sight tests.

Prescriptions

Since non-exempt prescription items are dispensed subject to a fixed price copayment in the UK NHS they are the most accessible way of studying cost-sharing effects in the UK and consequently there are many studies. Those discussed here are a selection which represents the range of methodologies used as well as differing in their specific aims and populations of interest.

When analysing prescription drug utilisation between 1969 and 1986 O'Brien (1988) assessed the impact of changes to the prescription charge by calculating the own-price elasticity (the proportion by which the volume of prescription drugs dispensed changed following a change in their price). This was found to be -0.33 across this eight year period, rising to -0.6 at the end of this period. Ryan and Birch (1991), in their analysis of prescription utilisation data between 1979 and 1985, also found a negative but smaller short-run price elasticity of demand (the proportionate change in the volume of prescriptions dispensed in a month following a change in price in the same month) of -0.109, and long-run price elasticity (the proportionate change in volume after the 'lag' period, such as adjusting purchasing habits after the price change, have come into effect) of -0.09. Lavers (1989) found that the price elasticity of demand (equivalent to the own-price elasticity above) for prescription items between 1971 and 1982 was -0.22. These

calculations of the price elasticity of demand for prescription items are all consistent with regard to the direction of the effect, although the magnitude differed.

O'Brien (1988) found that the volume of over-the-counter (OTC) alternatives sold responded positively to increases in the prescription charge. This was calculated as a cross-price elasticity (the proportion by which the volume of OTC drugs sold would change following a change in the price of prescription drugs), which equalled +0.22, although the author was unable to establish whether this was due to the patient substituting prescription drugs for OTC alternatives or due to GPs recommending cheaper OTC alternatives. In contrast, Lavers (1989) found that the demand for prescriptions was not responsive to the cost of alternatives.

Schafheutle et al conducted focus groups (2002) and in-depth interviews (2008) with patients recruited from GP surgeries in the UK and who were suffering from chronic conditions. Their views and opinions about the prescription charge policy in the UK and the extent to which this policy affected their behaviour were sought. The application of such charges to people requiring medication for chronic conditions was raised as a concern, as was the appropriateness of criteria for medical exemption in place at the time (Schafheutle 2008). Results of the focus group discussions identified that the cost of prescriptions did affect how patients managed their conditions and also that discussing cost-related factors with their GP would alter the patient-doctor relationship (Schafheutle, Hassell et al. 2002).

Primary dental care

Few studies were found in this literature search which focuses solely on the effects of cost-sharing arrangements for primary dental care on patients in the UK. Two studies from Scotland focus on dental care demand and utilisation from 1962 to 1981 (Parkin and Yule 1988), and from 1982 to 1998 (Lacey 2006). Parkin and Yule (1988) used data from the Scottish Dental Estimates Board (a precursor to the Scottish Dental Practice Board) to calculate the price elasticity of total dental output (calculated from the fee per item of service), and to stratify this by charge exemption status and by whether courses of treatment included dental examinations and reports or dentures. Their findings included that the price elasticities of both 'output' and 'initial contacts' (courses of treatment which included a claim for an examination and report) were negative but that the price effect was greater for 'output', indicating that price has some disincentive effect on patients' first contact, but a greater effect on the treatment they receive having initiated contact. Lacey (2006) used data from the Dental Practice Board and the Scottish Dental Practice Board to study changes in the number of NHS dental examinations and reports following the introduction of charges for this service in 1990 (prior to this dental examinations and reports, unlike dental treatments, were not subject to a charge at the point of delivery). The main finding from this study was that the mean number of dental examinations and reports per dentist per month reduced by 7.6% following the introduction of the new charge, although the overall number of examinations and reports in Scotland increased over this time period. Changes to the provision of NHS dental services during this period, including the number of NHS dentists in Scotland, meant that evidence of price effects was reduced.

Birch (1989) studied NHS dental care utilisation by elderly patients and found that non-exempt patients were four times more likely to receive emergency care only, 340 times more likely to receive only a 'check-up' and, when receiving treatment, received 40% less treatment (the average cost per course of care by type of course) than exempt patients. However, Birch was unable to account for variations in dental health status since this was not recorded in the source data and the remuneration arrangements for dental treatment undertaken by dentists (which form the basis of the source data) may have contributed to an over-reporting of non-exempt 'check-up' rates.

Although there have been few quantitative studies of cost-sharing arrangements in UK primary dental care, they have been found to have a negative influence on dental examinations and reports, and additional treatment rates. Qualitative studies of dental attendance patterns support these findings, 'dental charges' have been cited frequently in as a barrier to accessing care (Finch, Keegan et al. 1988; Hill, White et al. 2003), particularly for older patients (Borreani, Wright et al. 2008; Borreani, Jones et al. 2009). Findings from these quantitative studies were limited due to the absence of patient-level or individual-level data describing dental attendance rates and utilisation. Furthermore, during the 1990s the provision of private dental care increased (as discussed in 2.3.2). Since the data used in these studies were collected through NHS dental boards they do not cover dental care provided privately.

Sight tests

In common with primary dental care, few studies were found in this literature search which focuses on the effect of fees at the point of delivery of sight tests on patients. The only study found which was subject to peer review reported that the removal of universally free sight testing in 1989, as discussed in 2.3.3, resulted in fewer true positive glaucoma referrals (Laidlaw, Bloom et al. 1994).

Acceptability of charges for primary medical care at the point of delivery

A survey of attitudes towards introducing charges for some NHS services was undertaken by Gooder et al (1993). Included in the proposed charges was a charge of £1 per GP consultation, which was supported by 51% of respondents. However, the findings were less conclusive when the additional comments provided by respondents during the interviews were also considered. These comments revealed the complex range of factors which influence people's attitudes towards paying, including that 'if you contribute to National Insurance you shouldn't have to pay for anything else' and that 'everyone should pay...for people on average incomes the odd few pounds will not hurt'. The complex array of factors which underlies support for, or opposition to, charges for healthcare services was further outlined by O'Reilly et al (2007). The authors analysed data from a survey of patients from primary medical practices in the Republic of Ireland (where cost-sharing is applied to primary medical consultations) and Northern Ireland (which does not have cost-sharing for primary medical care, in keeping with the rest of the UK). Findings from the study were that attitudes towards cost-sharing generally supported the status-quo, supporting the differences in the two

healthcare systems. Park et al found strong opposition to the proposal of charges for GP consultations and concluded that the NHS is 'a greatly-cherished national institution, whose role is perceived to be the universal provision of healthcare without favour'.

There are relatively few studies of the effects of cost-sharing for healthcare services on patients in the UK NHS. The studies which have been undertaken have found that cost-sharing is negatively associated with the volume of prescription items dispensed, dental treatments received and the number of true-positive glaucoma referrals. However, none of the studies which were reviewed used individual-level data, collected independent of the NHS to study the effects of cost-sharing from the patients' perspective. Surveys of attitudes towards the introduction of charges for NHS primary medical services have been supportive of their introduction, although there is also considerable support for a health service capable of 'the universal provision of healthcare without favour'.

2.5.2.8 An overview of quantitative methodologies

A range of methodologies have been employed in the literature reviewed, covering quantitative and qualitative approaches. Analyses have been cross-sectional and longitudinal in nature. The prospective, randomised approach adopted by the RAND Health Insurance Experiment represents the optimal way to study the effects of cost-sharing arrangements in healthcare (Manning, Newhouse et al. 1987). However, such a study is prohibitively expensive (Chiappori, Durand et al. 1998). Non-experimental data which describe periods of change in cost-sharing arrangements which are applied equally across a population (such as the increase in copayments for physician services in

Belgium (Cockx 2003)) or unequally (such as for ambulatory services (Schreyogg and Grabka 2009) or prescription drugs in Germany (Winkelmann 2004)) potentially allow the impact of these changes to be analysed. These are often referred to as 'natural experiments'. However, the only known instances of such changes in cost-sharing arrangements occurring in the UK relate to changes to the sight-test fee in 1989 and 1998 (Table 2-1).

Own-price and cross-price elasticities of demand are measures of the effect of changes to the price of a product or service on rates of purchase of the product (or utilisation of the service) or rates of purchase of alternative products (or utilisation of alternative services). In healthcare this approach is most widely applied to prescription items since price elasticity is relatively easy to calculate, although it has been applied in studies of physician office visits and dental treatments. Alongside the previously discussed RAND Health Insurance Experiment, there are several examples of 'natural experiments', in which changes to cost-sharing arrangements have been applied only to specific sub-populations (Chiappori, Durand et al. 1998; Cockx 2003; Winkelmann 2004). This approach offers a way of testing the effects of cost-sharing in a semi-controlled manner. However, this requires longitudinal data which describe a period of change to cost-sharing arrangements.

2.5.2.9 Qualitative studies of cost-sharing in healthcare

Qualitative approaches are much less widely used in studies of cost-sharing effects. Where they have been used greater insight has been gained into why and how people's health behaviours have changed.

In contrast to the evidence from previous studies which found that copayments influence people's use of healthcare resources, Reichmann and Sommersguter-Reichmann (2004), in their qualitative study of patients' views of copayments, found that copayments in the Austrian healthcare system had no discernible effect. The study focussed on three major fields of interest:

1. Patients' attitudes towards copayments
2. The effects of copayments on healthcare demand in general and the effects on patients' own behaviour in particular
3. Patients' actual behaviour

The authors concluded that 'these copayments are still too small to have a major guiding effect [on patients]'. Evidence of a guiding effect within certain population groups may have been masked by the low survey response rate (11%) and the unequal response rate between the two reported health insurance plans, 15% for GKK (an insurance plan for blue- and white-collar workers) and 7% for BVA (civil servants' health insurance scheme).

Public opinion surveys serve as an alternative method of eliciting the effects of cost-sharing on healthcare utilisation. Such studies can be used to understand how and why

copayments modify people's health related behaviour, as well as their perceived ranking of healthcare services. One such study undertaken by Gyrd-Hansen and Slothus (2002) focussed solely on the Danish citizens' preferences for financing public healthcare. Gyrd-Hansen and Slothus (2002) surveyed public opinion to determine whether the public would forego private healthcare and return to public healthcare if specified attributes of healthcare were improved. The attributes in this study included:

- All treatments being available to everyone regardless of cost
- More screening programs available
- A greater focus on preventive measures designed to reduce the incidence of lifestyle-related diseases

Alongside these healthcare provision attributes respondents were presented with methods by which the necessary extra funding might be generated:

- Additional out-of-pocket expense
- Additional tax payments

From the results of this survey Gyrd-Hansen and Slothus (2002) concluded that respondents would rather fund these changes through out-of-pocket payments, up to a maximum of 1500DKK. However, beyond this, respondents would prefer such changes to be funded through universally applied tax increases. This implies that respondents are willing to gamble on copayments, reasoning that they are not likely to incur the costs themselves, provided the potential loss is not too great. Beyond this relatively modest copayment limit respondents would rather have the security of funding through increased taxation and thereby avoid the copayments in the event of ill health.

Myllykangas et al (1997) report results of an opinion survey conducted in Finland designed to understand the health priorities of different population groups (general public, doctors, nurses and politicians). Their results show that all groups supported copayments of at least 50% of the cost for visits to physicians, occupational health services and dental services. However, 'primary healthcare and prevention of diseases for small children, mothers, the elderly and disabled people' were universally identified as services that should be funded entirely through general taxation.

The findings from the qualitative studies reviewed are generally in agreement with findings from previously discussed quantitative studies. However, the qualitative studies were able to probe hypothetical scenarios to understand how people might respond to changes to cost-sharing arrangements and their priorities for healthcare provision.

2.6 Summary

In this chapter the concept of cost-sharing has been introduced and defined. The application of cost-sharing in the UK NHS has been described, including significant changes to cost-sharing arrangements in each of the three main services in which they are applied and the criteria under which services or patients are eligible or have previously been eligible for exclusion from charges. A systematic search of the literature relating to cost-sharing in the UK and internationally was also undertaken.

Although the proportion of the cost of care met by charges at the point of delivery in the UK is low compared with other countries (see Figure 2-10), cost-sharing is applied in many areas of the UK NHS. Cost-sharing was found to be negatively associated with preventive interventions and therapeutic treatment, and to be negatively associated with the volume of prescription items dispensed. However, the UK studies identified relied on data collected for administrative purposes to describe the general effects of cost-sharing or cost-sharing effects at the practitioner-level. These studies did not control for individual-level factors. Furthermore, although dental treatment and sight tests in the UK are provided both on a publicly-funded NHS basis and on a private basis, no studies of privately-funded care were found.

The review of the literature relating to cost-sharing found that studies are generally in agreement regarding the effects of cost-sharing arrangements for healthcare on patients. The introduction or removal of cost-sharing arrangements resulted in reductions in the volume of consultations undertaken or prescriptions dispensed. These reductions were greater for services without immediate health benefits, such as preventive treatments, than for emergency treatments. A conclusion common to all studies is the importance of exclusion criteria to protect those for whom cost-sharing would be a financial burden, as shown most clearly by the results of the RAND HIE in which health status was most improved for those people who were poor or initially ill. The extent to which more specific findings from studies based in other countries can be applied to the UK may be

limited by differences in how healthcare systems are funded and the extent to which healthcare is universally provided[4].

Surveys of people's attitudes towards the introduction of charges for primary medical consultations in the NHS were also reviewed. Although findings from some studies indicated that attitudes were supportive of such charges, these were inconclusive and contradicted by results from qualitative interviews which indicated that strong support for the maintained provision of primary medical consultations free at the point of delivery.

The research undertaken in this thesis is intended to address three main areas of weakness identified in this review of the literature relating to cost-sharing. Firstly, there is a paucity of studies of the effects of cost-sharing arrangements already employed in the UK. Secondly, those studies which have been undertaken have been limited by their use of data which do not include information at the individual-level or patient-level. Thirdly, findings about people's attitudes towards charges at the point of delivery of NHS primary medical consultations are inconclusive.

[4] 17% of non-elderly Americans were uninsured in 2004 (Fronstin 2004).

Chapter 3 Patterns of use of healthcare resources – literature review

In Chapter 2 a paucity of studies of the effects of cost-sharing in the UK, particularly those making use of individual-level data, was identified as a current weakness in the evidence base. In order to address this it is necessary to understand what factors, potentially including cost-sharing arrangements, influence people's decision to consult with healthcare practitioners. Therefore, the focus of this chapter is to review the literature of relevance to understanding the factors which influence people's patterns of use of healthcare resources. This is intended to provide a framework in which the potential influence of copayments for primary medical care can be considered alongside established influencing factors. The question at the core of this thesis is concerned with the potential application of cost-sharing to NHS primary medical care, although such arrangements are not currently in place. Of the NHS services in which cost-sharing is currently applied, primary dental care, due to the similarly diverse range of services provided and clinical reasons for consulting, has been selected as the most comparable to primary medical care. Therefore, particular attention is given to the literature which describes factors which influence people's use of primary medical and dental services. Finally, an overview of the populations consulting a GP and regularly attending a GDP for an examination and report are presented and compared.

3.1 Access to and utilisation of healthcare

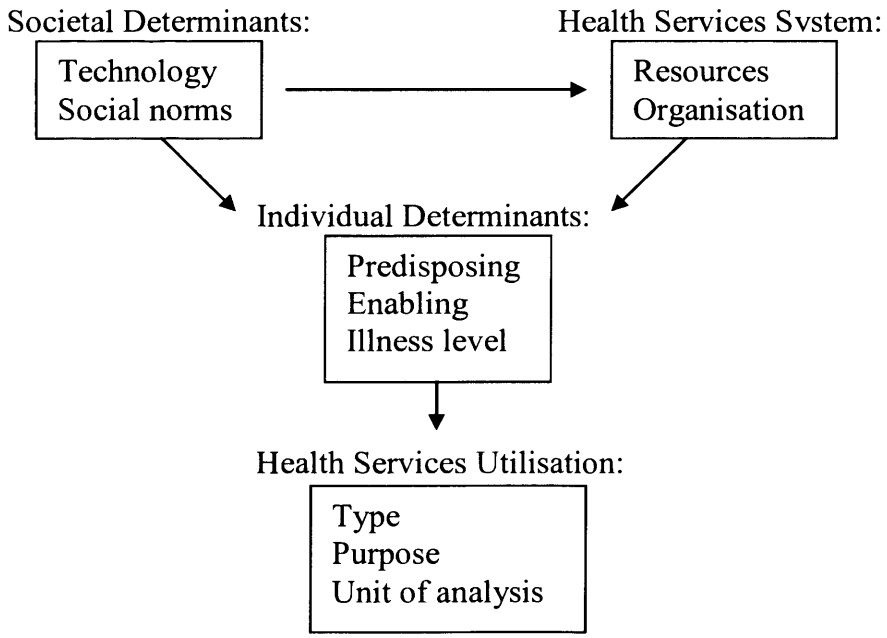
The outcome measures used in the quantitative studies of the effects of cost-sharing on patients reviewed in section 2.5 were mainly the number of consultations or prescriptions dispensed. Consultations or prescriptions dispensed are considered to be

measures of healthcare utilisation which are the result of 'potential access' being converted into 'realised access' (Aday and Andersen 1981; Goddard and Smith 2001). Mooney (1983) considered healthcare utilisation to be 'a function of both supply and demand' whereas access to healthcare is independent of whether the opportunity to access is exercised and is entirely dependent on supply-side arrangements (Goddard and Smith 2001). Penchansky and Thomas (1981) proposed that access was 'a concept representing the degree of "fit" between the clients and the system', which was comprised of five dimensions: availability, accessibility, accommodation, affordability and acceptability. This definition of the concept of 'access' shares much in common with the 'enabling factors' in the Behavioral Model of health service utilisation (discussed subsequently). For the purposes of this study, the definitions of utilisation by Mooney and access by Goddard and Smith will be used. Using this definition of access to healthcare it is difficult to measure access directly, but rather through indicators of access such as utilisation (Goddard and Smith 2001). Aday and Andersen (1974), in the early period of their development of frameworks for the study of access to and utilisation of healthcare, conceptualised 'utilisation of healthcare services' and 'consumer satisfaction' as the two outcomes resulting from access to healthcare. Access to healthcare was fundamentally determined by 'health policy' (which includes financing, education, manpower and organisation) and moderated by the 'characteristics of the health delivery system' (its resources and organisation) and the 'characteristics of the population-at-risk' (their predisposition to utilise healthcare, factors which enable their utilisation and measures of their need to utilise healthcare). This framework developed to study access to healthcare was complemented by the development of a

framework to study utilisation of healthcare (Figure 3-1). The Behavioral Model identified 'societal' and 'health services system' determinants of utilisation, which are mediated by 'individual' determinants (Andersen and Newman 1973). Utilisation of health services was defined by three characteristics:

- Type
    - Hospital, physician, drugs and medication, dentist, nursing home, other
- Purpose
    - Primary care, secondary care, tertiary care, custodial care
- Unit of analysis
    - Contact, volume, episodic care

Figure 3-1: Phase 2 of the 'Behavioral Model' for viewing health services utilisation



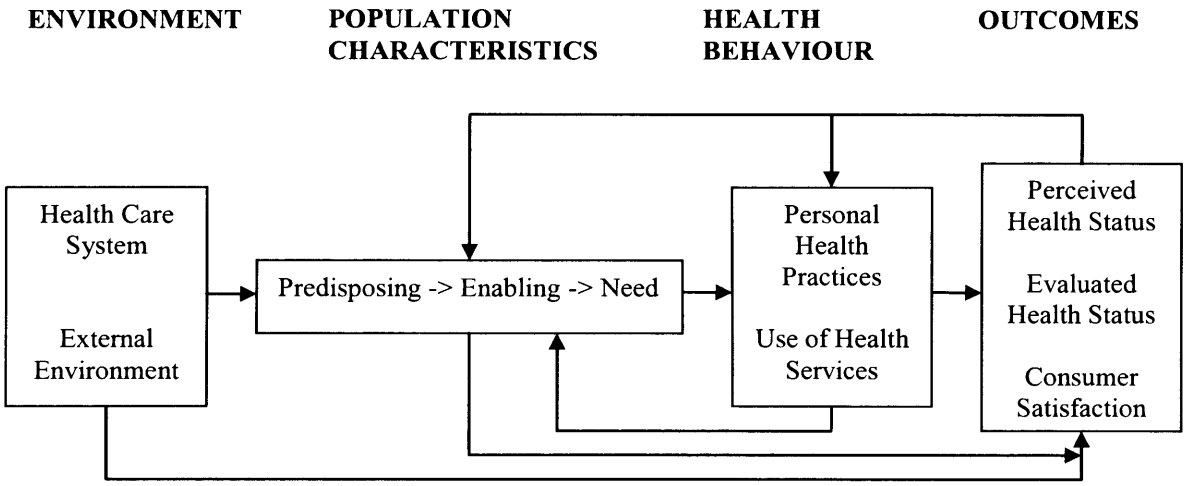
The individual determinants directly affect a person's health services utilisation and depend on:

- The predisposition of the individual to use services – predisposing factors
    - Demographic *(education, race, occupation, family size, ethnicity)*
    - Social structure *(age, sex, marital status, past illness)*
    - Beliefs *(values concerning health and illness, attitudes towards health services, knowledge about disease)*
- The individual's ability to secure services – enabling factors
    - Family *(income, health insurance, type of regular source, access to regular source)*
    - Community *(ratio of personnel and facilities to population, price of health services, region of country, urban-rural character)*
- The individual's illness level – illness factors
    - Perceived *(disability, symptoms, diagnoses, general states)*
    - Evaluated *(symptoms, diagnoses)*

Subsequent phases of the Behavioral Model extended the outcomes to the level of health status and consumer satisfaction, with health utilisation becoming an intermediate outcome or moderating factor between the individual-level determinants and health status or consumer satisfaction. Phase four of the model (Figure 3-2) represented a culmination of these modifications with the inclusion of feedback loops 'showing that outcome, in turn, affects subsequent predisposing factors and perceived need for services as well as health behavior' (Andersen 1995). The inclusion of feedback loops in this

phase of the model required that longitudinal data be used in order to properly implement the model, whereas previous phases did not have a temporal element and therefore are suitable for implementation using cross-sectional data. The latest developments of the Behavioral Model have focussed on customising the model for specific populations, including people receiving long-term care (Bradley, McGraw et al. 2002) and 'Vulnerable populations' (Gelberg, Andersen et al. 2000).

Figure 3-2: Phase Four of the Behavioral Model



The Behavioral Model has been widely applied in studies of healthcare utilisation. A major area in which the model has been applied is oral health, either focussing on dental service utilisation or oral health status as outcomes. Andersen et al (1997) defined a specific version of the Behavioral Model to study how variations in dental health delivery systems influence people's access to dental care and utilisation of dental

services. This model was subsequently used to study the relationship between having a usual source of dental care and access to dental services (Davidson, Cunningham et al. 1999). The Behavioral Model has also been applied in studies of racial differences in predictors of dental service use (Gilbert, Shah et al. 2002) and dental health attitudes (Gilbert, Duncan et al. 1997), as well as a study of predictors of preventive healthcare visits (Viera, Thorpe et al. 2006). There are few studies which have explored the full extent of the health status outcomes introduced in the later phases of the model. An example of such a study was undertaken by Baker (2009) in which the revised version of the Behavioral Model was used to study the contextual factors which shape perceived oral health. Applications of the Behavioral Model to primary medical care have included studies of frequent attendance (Vedsted and Olesen 2005) and infrequent attendance in general practice (Culica, Rohrer et al. 2002), and a study of the experiences of primary medical care by racial and ethnic groups in the USA (Shi 1999; Fiscella, Franks et al. 2002).

There are few studies which have incorporated people's ability to afford the cost of healthcare or the levels of individuals' levels of cost-sharing into studies which employ the Behavioral Model. Gilbert et al (1998) incorporated measures of people's ability to pay for dental treatment into a version of the Behavioral Model which they had modified in order to study associations between dental attitudes and other predisposing and enabling factors (Gilbert, Duncan et al. 1997). They found that alongside dental aesthetics, 'typical approach to care, dental attitudes, ability to pay for care, race, and sex' were associated with dental care use. Galbraith et al (2005) used the Behavioral

Model to identify independent variables that could affect health care use and expenditures. They used these variables to determine whether socioeconomic disparities exist in the financial burden of out-of-pocket healthcare expenditures for families. This is the only example in which healthcare expenditure has been the outcome measure and the Behavioral Model used to identify the independent variables.

There are several other established theoretical models of health-related behaviour. Of these, the Health Belief Model (HBM) is the most well known (Kapur, Hunt et al. 2004). The HBM was developed from definitions of health-related behaviours assigned by Kasl and Cobb (1966):

- *'[Preventive] health behaviours aimed to prevent disease (e.g. eating a healthy diet);*
- *Illness behaviours aimed to seek remedy (e.g. going to the doctor);*
- *Sick role behaviours are any activity aimed to get well (e.g. taking prescribed medication, resting)'*

Rosenstock (1966) extended the notion of health behaviour in order to understand why and how people use health services, and ultimately to understand 'how to persuade people to use health services'. It was this process which lead to the development of the HBM. As the HBM has been further developed so its application has expanded beyond the original areas of predicting preventive health behaviours and behavioural responses to treatment in acutely and chronically ill patients, and into predictions of many different types of health behaviours.

The HBM predicts that behaviour is a result of an individual's core beliefs. The core beliefs are the individual's perception of:

1. Susceptibility to illness
2. The severity of the illness
3. The costs involved in carrying out the behaviour
4. The benefits involved in carrying out the behaviour
5. Cues to action

The main applications of the HBM have been in studies of preventive health behaviour. However, its application in studies of primary medical and dental care utilisation are relatively limited. It has been used to study psychosocial and health belief variables associated with frequent attendance in primary care (Bellon, Delgado et al. 1999) and general determinants of factors associated with primary medical care consultations (van de Kar, Knottnerus et al. 1992).

3.2 Health Economics perspective

In health economics the influence of money on the patient–practitioner relationship is included from the perspective of both parties. The concept of 'moral hazard' is used to describe how money may influence the provision and uptake of healthcare resources; and how this can lead to an inefficient or inappropriate delivery of healthcare resources. Moral hazard exists in two forms:

1. Producer moral hazard (supplier induced demand)

   Supplier induced demand results from practitioners working under a fee-for-service (FFS) remuneration arrangement. Under such a scheme, practitioners receive a fee for individual services performed, such as a GDP performing a filling or a GP ordering blood tests. A financial incentive therefore exists for practitioners to provide services in excess of services necessary for optimum care.

2. Consumer moral hazard

   Consumer moral hazard arises when an individual, whose healthcare is provided under the aegis of a healthcare system free at the point of delivery, demands more medical resources than would be the case if paid for directly by the individual. Nicholson (1992) summarised consumer moral hazard as the 'effect of insurance coverage on individuals' decisions to undertake activities that may change the likelihood of incurring losses'.

Ehrlich and Becker (1972) made a distinction between two forms of consumer moral hazard:

- *Ex ante* moral hazard

  Ex ante moral hazard arises prior to sickness, in the healthy state. Provided an individual can reduce the probability of falling ill by adopting preventive measures, the presence of insurance coverage renders being ill a less undesirable state than if cost-sharing were used, thereby reducing an individual's incentive to avoid illness.

Examples of preventive measures are eating healthy meals and taking exercise.

- *Ex post* moral hazard.

  Ex post moral hazard occurs once the individual has become ill. Insurance coverage ensures a zero or subsidised price for medical services at the point of use, which gives rise to greater demand on the part of the patient than would be the case if the individual was to pay all costs (Donaldson and Gerard 1993).

Using the concept of moral hazard, the idea that copayments 'act as a deterrent, preventing excessive and unnecessary use of services' (Eversley and Sheppard 2000) can be reinterpreted as copayments being used to reduce 'consumer moral hazard'. The use of copayments as a deterrent can be reinterpreted as reducing '*ex ante* moral hazard' and their use to prevent 'excessive and unnecessary use of services' becomes an attempt to reduce '*ex post* moral hazard'.

By using models produced in health economics and health psychology, the potential impact of copayments in primary medical care can be seen in the larger context of health-related behaviour and the influence of insurance coverage on the use of healthcare. Why and when people seek help, as well as how they go about seeking healthcare advice, remains extremely complex but models of behaviour such as these outlined allow the many influencing factors to be combined and testable hypotheses to be generated. This forms the basis of the quantitative data analysis undertaken in this study.

3.3 A comparison of patient groups regularly visiting the GP or receiving a regular dental examination and report

The review of cost-sharing in the UK NHS (section 2.3) showed that the effect of cost-sharing varied according to the service it was applied to, the range of treatment options or services available and the criteria for exemption from charges. In order to be able to account more fully for these complexities this thesis will focus on the primary care service reviewed in section 2.3 that most closely relates to primary medical care. Primary dental care, compared with sight tests and prescription items, has a complex range of treatments (both preventive and curative) available to patients. Furthermore, courses of treatment may take several visits with further appointments being initiated by the GDP rather than the patient. For these reasons primary dental care shares most in common with primary medical care and is therefore the most appropriate choice to inform discussions about the potential impact of cost-sharing on primary medical care.

The main focus of the sections which follow is the influence of individual-level factors on the utilisation of primary medical and dental services. Prior to this, service-side factors, or 'Health Services Systems' as termed in the Behavioral Model (Figure 3-1), which can affect utilisation of these services are briefly reviewed. Access to healthcare services, as outlined in section 3.1, is considered in this thesis to be entirely dependent on supply-side arrangements. Variations in access can be the result of the availability of services (including the availability of information about services), the quality of services offered or the cost to patients of consulting with the service (Goddard and Smith 2001). The availability of services can include the impact of language barriers to accessing

services (O'Donnell, Higgins et al. 2007), the barrier imposed by the geographic distance to services (Turnbull, Martin et al. 2008) as well as which services are provided through the local primary medical centre. A review of the quality of primary medical care received by people from different social classes (measured as the length of consultation, number of questions asked and information received) found that people from the middle classes receive better quality care from their GPs than those from lower social groups, but the association between this and subsequent utilisation is inconclusive (Benzeval, Judge et al. 1995). The cost to the patient of accessing care can be financial (such as cost-sharing arrangements) and costs associated with time and travel (Goddard and Smith 2001). Cost to the patient can also influence utilisation through the patient's willingness-to-pay and their ability to afford the cost of care (Russell, Fox-Rushby et al. 1995).

3.3.1 The impact of demographic, socioeconomic and morbidity factors on GP consultation rates

GP consultation rates and the use of primary medical services in general have been found to be associated with a range of characteristics. The focus of this thesis is on the individual-level determinants of utilisation. At the individual-level ethnic origin, age, gender, education, income, vaccination status, distance from health services, smoking habits, marital status, self-appreciation of health status and past experience have been found to be associated with GP consultation rates (Temoshok, DiClemente et al. 1984; Thornhill, Fennelly et al. 1987; Samet, Hunt et al. 1988; Turner and Nido 1988; Kahan, Giveon et al. 2000). Results from the 2002 General Household Survey (GHS02) (2002) show a skewed U-shaped distribution with age (Figure 3-3). When averaged across all

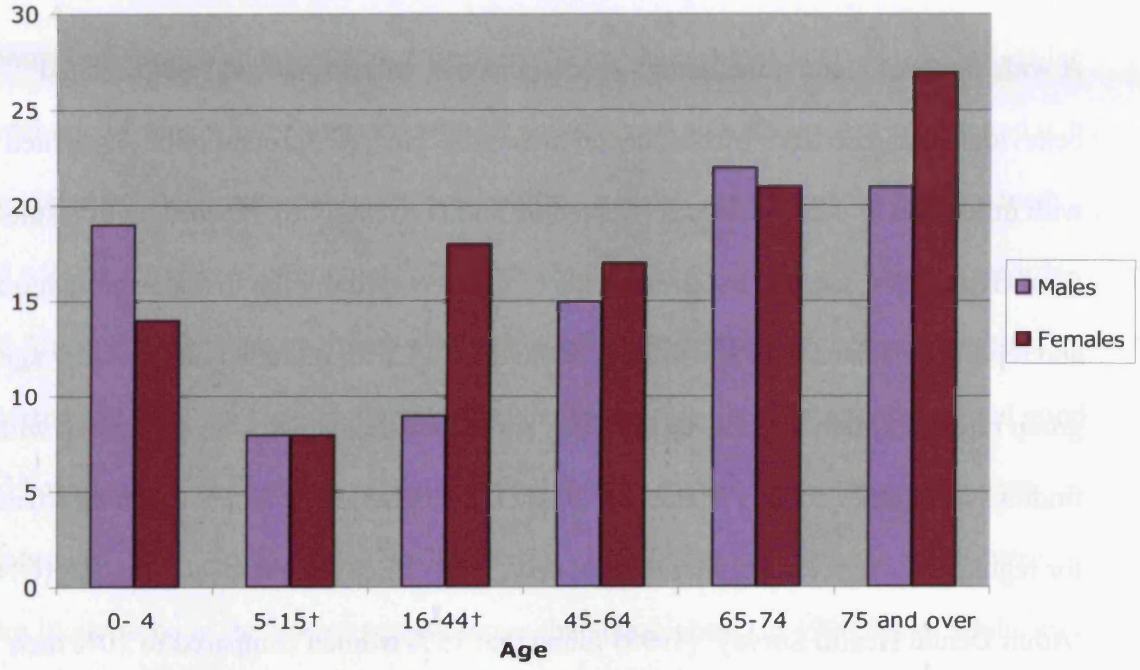
age groups a higher percentage of women reported consulting a GP in the 14 days prior to interview (17% women, 13% men). Results from the 'Morbidity Statistics from General Practice - Fourth national study 1991-1992' (MSGP4) (McCormick, Fleming et al. 1995) are consistent with this distribution of consultation rates, although a closer agreement between the datasets was obtained by comparing the GHS02 data for GPCs with the MSGP4 data for all consultations (including GP and practice nurse consultations). The higher use of primary medical care and health care services in general by women has been widely reported in studies in the UK (Macintyre 1993; Wyke, Hunt et al. 1998; McNiece and Majeed 1999; Banks 2001; Galdas, Cheater et al. 2005) and internationally (Banks 2001). The medical conditions for which the consultation rate difference between the sexes was most evident included 'genitourinary disease, mental disorders, diseases of the blood and blood-forming organs, symptoms, signs and ill-defined conditions, and for reasons in the supplementary classification' (McCormick, Fleming et al. 1995). The high rate of consultation for all young children may be as a result of health supervision and childhood immunisations, which were identified as major reasons for consultation by this age group as well as respiratory illnesses and otitis media (middle ear infection).

With regard to ethnic origin, people of Pakistani, Indian and West Indian origin have been found to have higher GP consultation rates than people of white origin (Balarajan, Yuen et al. 1989; Carr-Hill, Rice et al. 1996). However, in their study of inequalities in health due to ethnicity Davey Smith et al (2000) identified that findings from previous studies of ethnic variations in primary or secondary health service use were

compromised due to methodological limitations, for example some studies had not taken into account differences in morbidity or need between ethnic groups. There were also inconsistencies between conclusions from different studies, such as the conclusion that lower screening rates among ethnic minorities (particularly people from South Asia) is indicative of a lower uptake of preventive services by these groups (Rudat 1994), however, high immunisation rates were also found among the same groups (Baker, Bandaranayake et al. 1984).

The importance of including measures of morbidity or need in studies of use of primary medical care resources is further supported by studies of associations between socioeconomic status and GP consultation frequency. Findings from 'Living in Britain 2000' (Walker, Maher et al. 2001), as shown in Table 3-1, show that more respondents from lower socioeconomic classes across all age groups reported seeing a GP in the 14 days prior to interview than those from higher socioeconomic classes. However, when consideration is given to the health inequalities between the lowest and highest socioeconomic classes in the UK NHS 'GP utilisation seems to be distributed very much as expected on the basis of reported morbidity' (van Doorslaer, Koolman et al. 2002).

Figure 3-3: Trends in consultations with an NHS GP in the 14 days before interview by age



Source: (2002)

Table 3-1: Percentage of persons who consulted a doctor in the 14 days before interview, by sex, age, and socio-economic group of household reference person.

Socioeconomic Group of household reference person	Males %	Females %
Professional	8	15
Employers and Managers	11	14
Intermediate non-manual	12	15
Junior non-manual	11	16
Skilled manual and own account non-professional	13	17
Semi-skilled manual and personal service	12	16
Unskilled manual	15	20

Source: General Household Survey

3.3.2 The impact of demographic, socioeconomic and morbidity factors on dental examination and report rates

A wide range of factors, including 'gender, income, education, age, health-related behaviours and resources such as dental insurance' have been found to be associated with utilisation of dental services (Kosteniuk and D'Arcy 2006). According to results from GHS03 (Figure 3-4) the distribution of self-reported regular dental examination and report (DE) rates with age follows an inverted U, with more women in every age group reporting attending for regular DEs. An association which is in agreement with findings from other studies (Batchelor 2004). The higher percentage of women attending for regular DEs reflects a higher clinical need. The Office for National Statistics (ONS) 'Adult Dental Health Survey' (1998) found that 15% women compared to 10% men were edentate (having few if any teeth). However, men were found to have an average of 1.7 'decayed or unsound' teeth compared with 1.3 for women and women were found to have on average 7.3 'filled (or otherwise sound)' teeth compared with 6.6 for men. The age at which attendance for a DE peaks has been found to be between 45 and 70 years old (Richards and Ameen 2002; 2003b; Batchelor 2004).

In contrast to the GP usage pattern, findings from GHS03 (2003b) showed that 71% of 'large employers, higher managerial staff and higher professionals' reported having a regular DE, compared to 50% of routine workers and only 45% of respondents who had never worked or were long-term unemployed. This echoes previous findings that people from higher socioeconomic groups are more likely to register with a dentist (Eddie and Davies 1985). There is also evidence of this social gradient in oral health status. When

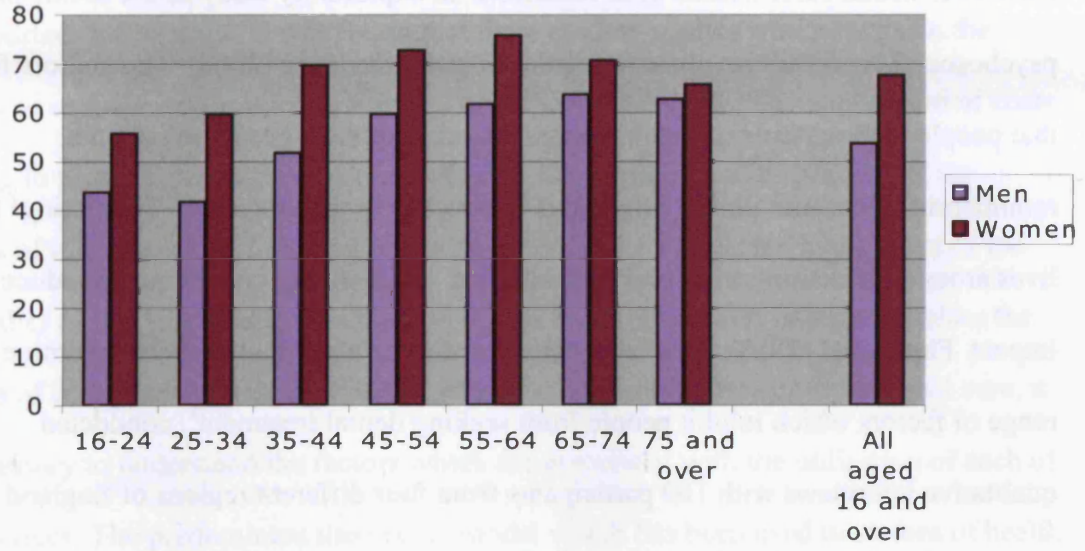
compared with non-manual workers, manual workers were more likely to have teeth extracted, whereas non-manual workers were more likely to have teeth filled (controlling for age and dental visit frequency) (Sheiham, Maizels et al. 1985). Regular dental attendance, when compared with irregular dental attendance, has been found to be associated with self-reported 'good oral health', a higher number of functioning teeth and a lower number of extractions (Sheiham, Maizels et al. 1985). However, Richards and Ameen (2002) were unable to establish whether the higher level of oral health reported was as a result of regular dental attendance or that regular attendance and good oral health are more likely to be found in people from higher socioeconomic classes. Analysis of ONS 'Adult Dental Health Survey' data found that edentate adults were more likely to be in the lowest social classes than the highest (in 1998 8% of adults in social classes I, II, IIINM were edentate, compared to 22% in social classes IV, V). The same survey also found that adults from lower social classes had a higher number of decayed or unsound teeth than those from higher social classes (1.9 decayed or unsound teeth on average per person compared to 1.2).

Additional demographic factors have been found to be associated with dental attendance patterns. In a study of family influences on dental attendance patterns among mothers McGrath et al (2002) found that mothers who were not living with their partner were more likely than those who were married and living with their spouse to classify themselves as 'irregular' dental attenders. Furthermore mothers with two or more children and those with children aged less than five years were also more likely to be 'irregular attenders'. These family structure factors, when included in regression models

alongside measures of household income, employment status and educational attainment were the only significant factors associated with mothers' self-reported attendance patterns.

Patterns of dental attendance can broadly be divided into two groups: problem-oriented dental attendance and regular dental attendance (Gilbert, Stoller et al. 2000). These two groups differ according to how people use dental services and their attitudes towards dentistry. Problem-oriented attenders use less dental care, are more likely to believe that 'nothing can be done' to prevent dental problems and their attitude towards dentistry is more negative than regular dental attenders (Gilbert, Stoller et al. 2000). These dental attendance behaviours have been described and used within the Behavioral Model to study the individual characteristics associated with receipt of dental radiographic procedures (Gilbert, Coke et al. 2004).

Figure 3-4: Percentage of adults who said they visited the dentist for a 'regular check-up' by sex and age, 2003



Source: (2003b)

Table 3-2: Dental attendance pattern: percentage of adults who said they went for a regular check-up by socio-economic classification of the household reference person, 2002

Socio-economic classification	Percentage who said they went for a regular check-up
Large employers and higher managerial	71
Higher professional	71
Lower managerial and professional	66
Intermediate	63
Small employers and own account	63
Lower supervisory and technical	58
Semi-routine	54
Routine	50
Never worked and long-term unemployed	45

Source: (2002)

Qualitative studies have also been undertaken into dental attendance and perceived barriers to dental care. Gibson et al conducted an exploratory study of the social and psychosocial processes involved in regular dental attendance (2000). The authors found that people with patterns of regular dental attendance 'have health behaviours reminiscent of chronic illness behaviours', particularly with regard to 'reordering' their lives around the disruption of oral ill health and 'normalizing' symptoms to reduce their impact. Finch et al (1988), in what is considered to be a seminal study to 'examine the range of factors which inhibit people from seeking dental treatment', conducted qualitative interviews with 109 participants from four different regions of England. The two main barriers to dental care identified were anxiety and cost. Dental care was considered by many respondents to be expensive and was openly acknowledged as the reason for non-attendance by some respondents. Resentment towards paying charges in addition to National Insurance payments was also expressed, as was 'confusion, suspicion and ignorance about the system of charging'. This highlights the difficulties of disentangling healthcare charges themselves from the overall structure and administration of the NHS. Quantitative studies of dental service utilisation are in agreement with the negative association between dental anxiety and rates of dental attendance among adults (Nicolas, Collado et al. 2007; Donaldson, Everitt et al. 2008) and young adults (Quteish Taani 2002). The cost of treatment and dental anxiety were also identified as barriers to dental utilisation by older adults, alongside concerns about the availability of dental care (Borreani, Wright et al. 2008).

3.4 Summary

As reported in Chapter 1, it was found that there are few studies which focus on the effects of cost-sharing applied to primary dental care in the UK. The application of cost-sharing to primary dental care was identified as a potentially suitable model of the effects of introducing cost-sharing for primary medical services. An assessment of the feasibility of this proposal is the core aim of this thesis. However, in order to relate the effects of cost-sharing in dentistry to its potential application in primary medical care, it is necessary to understand the factors which are associated with the utilisation of each of the services. The predominant theoretical model which has been used in studies of health service utilisation is the Behavioral Model, developed by Andersen. This model was constructed in order to understand better the factors which are associated with realised access to healthcare services, measured as health service utilisation, and has been widely applied in studies where consultation frequency is the measure of utilisation used as the outcome variable.

The review of factors associated with DEs and GPCs undertaken in this chapter revealed a wide range of factors which have been identified in previous studies. Overall findings indicate that rates of GPCs are generally associated with measures of morbidity, whereas DE rates are associated with factors beyond oral health. However, none of the studies reviewed compared factors associated with primary medical care with those associated with primary dental care directly. In order to address this, the Behavioral Model of health service utilisation forms the basis of a comparison of the factors associated with

utilisation of primary medical and dental services in the UK. The factors associated with the two main dental attendance behaviours, problem oriented attendance and regular dental attendance (henceforth termed treatment-led and preventive-led dental attendance respectively[5]), will be studied alongside overall dental attendance in order to better understand whether the factors associated with primary medical and dental service utilisation differ.

These two studies, a comparison of the factors associated with primary medical and dental service utilisation and an analysis of the effect of cost-sharing for primary dental care on patients, will be complemented by a study to compare people's attitudes towards current cost-sharing arrangements in the NHS and charges for primary medical care consultations.

[5] The terminology is changed from that used by Gilbert et al to acknowledge that the dental health behaviours studied in this thesis are informed by, but not strictly equal to, those used by Gilbert et al.

Chapter 4 Hypotheses, Aims and Objectives

4.1 Objectives

Out-of-pocket payments feature in many areas of primary healthcare. Such cost-sharing schemes receive political support based on the belief that either they reduce unnecessary use of healthcare resources or they generate additional healthcare income. Despite the imposition of such charges conflicting with the NHS founding principle of 'healthcare based on need, not ability to pay' there is evidence of support for additional charges at the point of service both in the medical profession and the general population (Gooder, Charny et al. 1993). Consultations with GPs remain the only significant area of NHS primary care free of charges for routine consultations. However, the desire to generate income for or to control spending on primary care necessitates a thorough understanding of the effects of charges on the utilisation of GP services.

The literature reviews undertaken have identified a number of findings of relevance to the core question in this thesis. Overall, studies reported positive and negative effects of cost-sharing. Under cost-sharing schemes people have been found to take greater individual responsibility for their health; however, such schemes also resulted in worse health status of those liable to meet cost-sharing expenses. The introduction of cost-sharing schemes resulted in reductions in the volume of consultations undertaken or prescriptions dispensed. Furthermore, these changes were greater for preventive health services and were dependent on financial wealth.

Despite the large number of studies into cost-sharing effects, only a small number were from the UK. Those studies identified were found to be limited due to lack of individual-level measures of socioeconomic status, demographics or illness level factors which have been widely used in other studies of patterns of health utilisation.

The Behavioral Model developed by Andersen has been widely applied in studies of health service utilisation and provides a framework in which factors which might influence utilisation can be identified and grouped together. This model has been applied in studies of the effects of cost-sharing for healthcare on patients, although not as widely as in more general studies of utilisation. It has been selected as a basis for the research described here since it offers a framework in which cost-sharing can be considered alongside other factors to study patterns of health service utilisation.

Although several studies have been undertaken into attitudes towards charges for NHS primary medical consultations, their findings have been contradictory. At the same time, these studies have indicated that there may be a prevalent, deeply ingrained belief that primary medical consultations which are free at the point of delivery must be an integral part of the NHS. It is therefore important to understand why charges are acceptable in some primary healthcare settings but not others.

The question which underpins this thesis is 'what is the potential impact on patients of the introduction of charges for patients at the point of delivery of primary medical care?'. The experience of cost-sharing applied to primary care dentistry was identified as

a potentially suitable model through which this underlying question may be studied. The main aim of this thesis is to assess the feasability of studying the effects of introducing copayments in primary medical care via studying the effects of copayments in primary dental care. This aim is the basis of the four sub-aims of the research undertaken in this thesis:

1. To use the Behavioral Model of health service utilisation to identify and compare predictors of attendance in primary medical and dental care in the UK
2. To investigate the impact of copayment arrangements in primary dental care in the UK on patients
3. To investigate the appropriateness of using primary dental care copayments as a basis for studying the possible effects of primary medical care copayments
4. To investigate the acceptability of primary medical and dental care copayments

These sub-aims[6] and their corresponding objectives are presented in the following sections, with hypotheses or expanded objectives as appropriate. Each objective corresponds to a study detailed in Chapters 6 to 8.

[6] Aim 3 and Aim 4 have been combined.

4.2 Aim 1 – To compare predictors of primary dental and primary medical service utilisation

Objectives:

- To identify variations across England and Wales in patterns of dental attendance for an examination and report by individual-level factors of the Behavioral Model of health service utilisation (predisposing, enabling and illness level indicators)
- To identify variations across England and Wales in patterns of dental attendance for treatment by individual-level factors of the Behavioral Model of health service utilisation (predisposing, enabling and illness level indicators)
- To identify variations across England and Wales in the uptake of general practitioner consultations by individual-level factors of the Behavioral Model of health service utilisation (predisposing, enabling and illness level indicators)
- To compare models of primary dental and medical service utilisation
- To determine the predictive power of the Behavioral Model of health service utilisation applied to primary dental and medical service utilisation.

4.2.1 Hypotheses

The following hypotheses will be tested in fulfilment of Aim 1 and its sub-aims:

- Preventive-led primary dental care utilisation is not associated with individual-level illness level factors

- Preventive-led primary dental care utilisation is associated with individual-level predisposing factors
- Preventive-led primary dental care utilisation is positively associated with individual-level enabling factors
- Treatment-led primary dental care utilisation is not associated with individual-level illness level factors
- Treatment -led primary dental care utilisation is associated with individual-level predisposing factors
- Treatment -led primary dental care utilisation is positively associated with individual-level enabling factors
- Primary medical care utilisation is positively with individual-level illness level factors
- Primary medical care utilisation is not associated with individual-level predisposing factors
- Primary medical care utilisation is not associated with individual-level enabling factors.

4.3 Aim 2 – To investigate the impact of charges for primary care dentistry on patients

Objectives:

- To compare the dental care received by private, NHS copayment -paying and NHS copayment -exempt patients
- To compare the cost to the patient at the point of delivery of the dental care received by private, NHS copayment -paying and NHS copayment -exempt patients
- To compare the cost to the health service of dental care received private, NHS copayment-paying and NHS copayment -exempt patients.

4.3.1 Hypotheses

The following hypotheses will be tested in fulfilment of Aim 2 and its sub-aims:

- Exemption from NHS dental copayments will be positively associated with primary dental care utilisation
- Patients who are exempt from NHS dental copayments will use more primary dental resources than non-exempt patients
- Patients who are exempt from NHS dental copayments will receive more diagnostic dental treatment items than non-exempt patients
- Patients who are exempt from NHS dental copayments will receive more preventive dental treatment items than non-exempt patients

- Patients who are exempt from NHS dental copayments will receive more therapeutic dental treatment items than non-exempt patients

4.4 Aim 3 – To investigate patients' views and opinions about primary healthcare and patient charges at the point of delivery of NHS services

Objectives:

- To investigate attitudes towards cost-sharing applied to NHS services, with a particular focus on cost-sharing in dentistry.
- To investigate whether people perceive cost-sharing for dental care, ophthalmic care or prescriptions difficult to manage
- To elicit how cost-sharing impacts on their use of dental, ophthalmic or prescription services
- To elicit views on the introduction of a £10 copayment for GP consultation
- To compare attitudes towards primary dental and medical services and practitioners, including with regard to cost-sharing

Chapter 5 Materials and Methods

5.1 Summary of methods

In fulfilment of the aims and objectives of this research, data collection and analysis protocols were designed and undertaken. A summary of the research methodologies used in this study is presented in this section, with full details of each stage given in the following sections.

1. A comparison of patterns of utilisation of primary dental and medical services.
    1. Key socio-economic and health related variables common to the 1997/98 BHPS and 1998 ADHS were compared to assess the complementarity of these two datasets.
    2. Variables identified by the Behavioral Model as predictors of primary medical and dental service use were selected from the 1997/98 BHPS and 1998 ADHS
    3. The predictor variables were processed and recoded for analysis.
    4. Binary dependent variables of having a DE and having three or more GPCs were recoded from the data.
    5. Ordinal dependent variables of five-year dental attendance (including whether for treatment or a routine appointment) and five-year grouped GPC frequency were recoded from the data.
    6. Contingency table valuations and chi-square analyses of BHPS and ADHS data, relating to GPCs and DEs respectively, were undertaken.

7. Forced entry maximum likelihood binary logistic regression models of primary medical and dental service use were constructed using the predictor variables identified from the Behavioral Model.

2. An assessment of the impact of copayments in primary dental care.
    1. Dental attendance rates and the provider of treatment by copayment status group (NHS charge-exempt, NHS charge-paying and private charge-paying), as identified in the 1998 ADHS, were analysed using contingency table valuations and Pearson chi-square analysis.
    2. Forced entry maximum likelihood binary logistic regression model of primary dental service use was constructed using the predictor variables identified from the Behavioral Model, with the addition of a criterion of exemption from copayments for NHS dentistry (income support status).
    3. The cost to the patient at the point of delivery of dental treatment undertaken by treatment provider was compared using one-way ANOVA.
    4. Dental treatment received by copayment status group (NHS charge-exempt, NHS charge-paying and private charge-paying), as identified in the 1998 ADHS, was compared using chi-square analysis.
    5. The value of dental treatment consumed (the cost of treatment if undertaken through the NHS, using NHS patient charge data) by copayment status group was compared using ANOVA; NHS-exempt patients were used as the control group.

6. A forced entry maximum likelihood multiple regression model of the value of dental treatment consumed was constructed using predictor variables identified from the Behavioral Model, and including the addition of copayment status groups.

3. Validation of the modelling of primary medical care copayments through primary dental care copayments.
    1. Frequent and infrequent primary medical service attenders were purposively sampled. Differing urban/rural locations and socioeconomic backgrounds were used as additional sampling criteria.
    2. Semi-structured interviews were undertaken.
    3. Verbatim transcripts of the interviews were prepared.
    4. Systematic interrogation of the interviews was undertaken of the views and opinions about the benefits of the service delivered by health practitioners and the acceptability of copayments in primary health services.

5.2 A comparison of predictors of primary dental and medical service use

The Behavioral Model (Andersen and Newman 1973), as discussed in section 3.1, is a framework within which health service utilisation can be modelled in terms of predisposing, enabling and perceived need factors. This was chosen as the main analytical framework for this study.

Since no single source of health utilisation data was suitable for analysing primary medical and dental service use (with the inclusion of relevant measures of clinical need), a combination of results from two or more data sources was needed. The most appropriate source of primary dental service use data is the ADHS; therefore compatibility of BHPS, HSE or GHS survey results with ADHS results was an important consideration. Batchelor (2004) noted that 'the results from [the ADHS and BHPS] are widely used and, as far as attendance for dental check-ups is concerned, they show similar trends during the 1990s'. Relevant BHPS data are also available from 1998, in common with the ADHS data. For these reasons the BHPS was selected for this study instead of HSE or GHS data.

Prior to generating common models of primary medical and dental service use an assessment of the compatibility of the ADHS and BHPS data was undertaken. Demographic, socioeconomic and health service utilisation variables common to the 1998 ADHS and h wave (1997/98) of the BHPS were identified. The distributions of survey respondents from England and Wales (appropriately weighted for population sampling differences) across measures of gender, age group, socio-economic group, social class, total household income quintiles, dental attendance in the 12 months prior to interview and provider of dental care from the two surveys were compared using chi-square analyses, a p-value < 0.05 was considered statistically significant.

These analyses demonstrate significant differences between sample populations according to measures of socio-economic group, household income and dental treatment

provider (Table 5-1). No significant differences were seen in the age, gender or social class distributions of the sampled populations. More ADHS than BHPS respondents were from the '30-39 years', '40-49 years' and '60-69 years' age groups, whereas the opposite was found for the "50-59 years', '70-79 years', '80-89 years' and '90+ years' age groups. No difference in age distribution was found in the '16-19 years' and '20-29 years' groups. Differences in socio-economic groups' distributions were generally small and the notable differences did not appear to follow a pattern. The income distribution of respondents to the ADHS was found to be approximately £1,500 to £2,000 lower at each quintile than the BHPS. The source of this discrepancy is unclear. However, differences in the definition of 'household' used in the two surveys may have affected the figure for total household income given by survey respondents.

A comparison of dental service utilisation reported in the two surveys shows consistency between rates of dental attendance in the previous 12 months. However, differences between the providers of treatment were seen. A higher proportion of ADHS respondents reported that their treatment was provided by the NHS compared with BHPS respondents (78.4% and 73.4% respectively). The reverse was seen for treatment provided privately (19.7% and 21.8% respectively) and treatment provided partly through the NHS and partly privately (1.8% and 4.7% respectively). 'Confusion about what is being charged for' (Finch, Keegan et al. 1988) and the fact that a 'dentist can provide both private and NHS dentistry using the same facilities and sometimes in the same session' (Hancock, Calnan et al. 1999) have been cited in the literature as blurring

the distinction between dentistry provided through the NHS and that provided privately, which may be the reason for this discrepancy.

The differences identified in the distributions of data from the ADHS and BHPS indicate that if any associations are found between age, income, socio-economic class or dental treatment provider and both primary medical and dental service utilisation then these associations must be treated cautiously.

Table 5-1: Comparison of common 1997/98 BHPS and 1998 ADHS variables

Predictor variable and categories	ADHS	BHPS	Prob. (Chi-square, df)
Sample Population	3641	8245	
	%	%	
Gender			
Male	48.8	47.3	
Female	51.2	52.7	
			0.136 (2.23, 1)
Age group			
16 to 19	6.4	6.2	
20 to 29	15.5	15.5	
30 to 39	20.8	18.6	
40 to 49	17.0	16.2	
50 to 59	14.5	16.2	
60 to 69	12.2	11.7	
70 to 79	9.6	10.3	
80 to 89	3.6	4.8	
90+	0.3	0.6	
			0.002^{+} (24.57, 8)
Socio-Economic Group		[7]	
Employer: large	0.1	0.0	
Manager: large	7.8	8.0	
Employer: small	1.5	2.1	
Manager: small	5.4	4.8	
Professional: self-employed	0.7	0.8	
Professional: employee	3.7	3.6	
Ancillary worker, artist	10.6	11.4	
Non-man. foremen, supervisor	3.4	3.7	
Junior non-manual	20.9	21.1	
Personal service	6.0	7.0	
Manual foremen, supervisor	4.8	4.4	
Skilled manual	10.2	9.6	
Semi-skilled manual	11.5	10.5	
Unskilled manual	6.4	6.3	
Own account (not professional)	5.8	5.5	
Farmers: employers, managers	0.1	0.3	
Farmers: own account	0.2	0.1	
Agricultural	0.4	0.7	
Armed forces	0.3	0.1	
			0.043^{+} (29.4, 18)

Continued overleaf...

[7] 'Socio-economic group, most recent job' was used in preference to 'Socio-economic group, present job' in order to maintain consistency with available socioeconomic group classifications from the ADHS

Table 5-1: Comparison of common 1997/98 BHPS and 1998 ADHS variables (continued)

Predictor variable and categories	ADHS	BHPS	Prob. (Chi-square, df)
Social Class	%	%	
Professional	4.4	4.5	
Managerial & Technical	25.5	26.7	
Skilled non-manual	24.9	25.0	
Skilled manual	21.0	19.6	
Partly skilled	16.9	17.3	
Unskilled	6.9	6.7	
Armed forces	0.3	0.1	
			0.180 (8.9, 6)
Total household income quintiles (aggregated to individual level)			
20%	£7826.79	£9911.83	
40%	£15653.60	£17454.90	
60%	£24523.90	£25910.00	
80%	£35220.50	£36636.40	
Dental attendance	%	%	
Visited dentist in the last 12 months?			
No	36.5	38.4	
Yes	63.5	61.6	
			0.053 (3.73, 1)
Dental treatment provider	%	%	
NHS	78.4	73.4	
Private	19.7	21.8	
Both	1.8	4.7	
			$<0.001^{+}$ (58.7, 2)

+ - *Denotes significant difference*

5.2.1 Data preparation

5.2.1.1 Predictor variables

Since two different data sources were used, the construction of the analytical framework differed depending on the variables available from each survey. A summary of the models developed is shown in Table 5-2. Table 5-3, Table 5-4 and Table 5-5 detail the 1998 ADHS and 1997/98 BHPS variables identified as corresponding to the 'enabling', 'predisposing' and 'illness level' factors of the Behavioral Model. Where possible, similar or identical ADHS and BHPS variables were used in the analytical frameworks in order to enable comparisons to be made more easily.

Table 5-2: Theoretical predictors of primary dental and medical care as identified by the Behavioral Model

Behavioral Model category	ADHS predictor variables	BHPS predictor variables
Predisposing	Education[10]	Education[10]
	Social class[10]	Social class[10]
	Sex[8]	Sex[8]
	Age group[8]	Age group[8]
	Household size[8]	
	Marital status	Marital status
		Race[8]
	'Don't see the point in going unless need to'[9]	
Enabling	Total household income[9]	Total household income[9]
	'Anxious about visiting dentist'[10]	Health insurance[8]
	'Nervous of some kinds of treatment'[10]	
	'Find NHS treatment expensive'[10]	
	'Costs less in long run if only go when in pain'[10]	
Illness level	Total oral health index profile (OHIP) score	General Health Questionnaire
	OHIP - physical pain	Health limits daily activities
		Number of health problems

Within the 'predisposing' factors, highest educational qualification and socio-economic group were available from the ADHS and BHPS. The BHPS records six levels of academic qualifications ('higher degree', '1st degree', 'HND, HNC, teaching', 'A level', 'O level', 'CSE' or 'none of these'). However, across the three related questions, the

[8] The categorisation of these predictors is taken from Swank et al (1986)
[9] The categorisation of these predictors is taken from Gilbert et al (2002)
[10] The categorisation of these predictors is taken from Baker (2009)

ADHS records only whether respondents have 'educational qualifications', 'professional, vocational or work-related qualifications' or whether their highest qualification is 'above or below degree level'. In the absence of specific occupation-related information in the ADHS, socio-economic group was used. Standard classification of socio-economic groups means that the ADHS and BHPS categories are the same. Unlike the BHPS, the ADHS does not record information related to race/ethnicity.

Age, gender and marital status categories are all consistent between the ADHS and BHPS. With regards to past illness, the BHPS does not have specific information available. Due to the longitudinal panel nature of the survey, illnesses reported in previous survey editions could conceivably be used. However, such data would be limited to respondents who have taken part in all years of the survey. The ADHS records a significant amount of oral health-related information. However, only 56% of respondents underwent a clinical examination compared with 92% of respondents who completed the interview section. Therefore, although significant additional oral health related information was available, poor response rates preclude its inclusion. The ADHS contains a question suitable for inclusion under the 'beliefs' component of the 'predisposing' factors. 'Reason for dental attendance' was taken as an indicator of dental attitude. However, the response rate was again poor and this question was therefore excluded from analyses (5268 from 6764). Other waves of the BHPS record information relating to 'values' and 'attitudes' to health and health services, particularly with

reference to income, health insurance and healthcare charges. However, the 1997/98 wave did not include these questions.

Income, having private health insurance and urban-rural characteristics of the region variables were included in both the ADHS and BHPS. Both the ADHS and BHPS recorded total annual household income. The usefulness of the private health insurance information recorded in the ADHS is limited due to it only being recorded for respondents who visited a dentist (i.e. it is recorded as a follow-on question asked only of respondents whose dental attendance frequency in the previous 20 years was non-zero). This does not allow the role of health insurance to be considered as a predictor of attendance, although it is suitable for inclusion in analyses of subsequent treatment received and its associated cost.

The recording of private health insurance information differs between the ADHS and BHPS. In the ADHS respondents are asked the multiple choice question 'Was your treatment under the NHS, was it private or was it something else?', with responses 'NHS', 'Private', 'NHS and private', 'School/Community dental service', 'Armed forces', 'Dental hospital', 'Dentist at your workplace', 'Through insurance', 'With a dental plan' or 'Something else?'. Of these responses the assumption was made that 'Dentist at your workplace', 'Through insurance' and 'With a dental plan' all referred to health insurance-based dental treatment, although funding of this insurance may be through the respondents' workplace. In the BHPS, information about possession of

private health insurance was sought, with possible responses being 'Yes, in own name', 'Yes, via other family member' or 'No, not insured'.

The price of treatment received is recorded in the ADHS as the cost of the last dental treatment received. Cost of treatment is not recorded in the BHPS. However, it was assumed that when considering GP consultations there is no associated charge[11]. The urban-rural character of the respondent's location is derivable from ADHS and BHPS data. In the ADHS, distance to the respondent's dentist is recorded, whereas in the BHPS population density of the respondent's location is taken as a measure of the urban-rural character. The incompatibility of these measures of urban-rural character means they were excluded from the analytical framework.

Within the 'perceived' component of the 'illness level' factors, the ADHS and BHPS both include a range of self-assessed measures of health. The oral health impact profile (OHIP), recorded in the ADHS, is a 'dental quality of life scale' (Nuttall, Steele et al. 2001) which provides information relating to oral health disabilities (physical, psychological and social disabilities and handicaps) and current symptoms of oral ill health in the form of current physical pain. The BHPS records whether respondents felt their health limited their daily activity, as well as the number of health problems they reported, both of which were used in the analysis of BHPS data relating to GP consultation frequency undertaken by Bago d'Uva (2005). The general health

[11] Although no copayment is associated with NHS GP consultations, services such as travel vaccinations and private GP consultations may be charged for. These comprise a small proportion of the total number of GP consultations undertaken annually and in the BHPS no distinction is made between NHS and private GP consultations.

questionnaire (GHQ), also used by Bago d'Uva, was used as a measure of the respondents' general state of health.

The clinical examination section of the ADHS contains data relating to illness levels. However, as previously mentioned, the response rate for the examinations was insufficient for this information to be included.

Table 5-3: Predisposing factors and their corresponding survey variables from a) the ADHS and b) the 1997/98 BHPS

Table 5-3a: ADHS variables corresponding to predisposing factors

Predisposing factors		**ADHS variables**	**Notes *(ADHS variable code)***
Demographic:	Education	√	highest educational qualification *(edattn3)*
	Race	N/A	
	Occupation	√	Socio-economic group *(seg)*
	Family size	√	Household size *(dvhsize)*
	Ethnicity	N/A	
Social Structure:	Age	√	*(age)*
	Sex	√	*(sex)*
	Marital Status	√	*(marstat)*
	Past illness	N/A	
Beliefs:	Values	N/A	
	Attitudes	√	Reasons for visiting dentist *(regular)*
	Knowledge	N/A	

Table 5-3b: 1997/98 BHPS variables corresponding to predisposing factors

Predisposing factors		**BHPS variables**	**Notes *(BHPS variable code)***
Demographic:	Education	√	Highest academic qualification *(hqfachi)*
	Race	√	Ethnic group membership *(hrace)*
	Occupation	√	Socio-economic group, present job *(hjbseg)*
	Family size	√	Household Identification Number + Person Number *(hhid + hpno)*
	Ethnicity	N/A	*Included in* 'Race' *above*
Social Structure:	Age	√	Age *(hage)*
	Sex	√	Gender *(hsex)*
	Marital Status	√	Legal marital status *(hmlstat)*
	Past illness	N/A	
Beliefs:	Values	N/A	
	Attitudes	N/A	
	Knowledge	N/A	

Table 5-4: Enabling factors and their corresponding survey variables from a) the ADHS and b) the 1997/98 BHPS

Table 5-4a: ADHS variables corresponding to enabling factors

Enabling		**ADHS variables**	**Notes *(ADHS variable code)***
Family:	Income	√	Household income *(gross)*
	Income source	N/A	
	Income access	N/A	
Community:	Facilities ratio	N/A	
	Price	√	price of previous treatment *(cost)*
	Region	N/A	
	Urban-rural	N/A	

Table 5-4b: BHPS variables corresponding to enabling factors

Enabling		**BHPS variables**	**Notes *(BHPS variable code)***
Family:	Income	√	Annual income *(hfiyr)*
	Health insurance	√	Covered by private medical insurance *(hhlcvr)*
	Income source	N/A	
	Income access	N/A	
Community:	Facilities ratio	N/A	
	Price	N/A	*NHS GP consultations are currently copayment-free*
	Region	N/A	
	Urban-rural	N/A	

Table 5-5: Illness level factors and their corresponding survey variables from a) the ADHS and b) the 1997/98 BHPS

Table 5-5a: ADHS variables corresponding to illness level factors

Illness Level		ADHS variables	Notes (ADHS variable code)
Perceived:	Disability	√	Oral health impact profile *(ohiptot)*
	Symptoms	√	OHIP – Physical pain *(ohippain)*
	Diagnoses	N/A	
	General states	N/A	
Evaluated:	Symptoms	N/A	
	Diagnoses	N/A	

Table 5-5b: BHPS variables corresponding to illness level factors

Illness Level		BHPS variables	Notes (BHPS variable code)
Perceived:	Disability	√	Does health limit daily activity *(hhllt)*
	Symptoms	√	Number of reported health problems
	Diagnoses	N/A	
	General states	√	General health questionnaire[12] *(hghqa-l)*
Evaluated:	Symptoms	N/A	
	Diagnoses	N/A	

[12] The GHQ is 'often used as an indicator of subjective well-being' (2006).

In preparation for data analysis, ADHS and BHPS predictor variables were recoded. In order to facilitate future comparisons, where possible common ADHS and BHPS analysis categories were developed during recoding. Of the 'predisposing' predictor variables, educational qualification, socio-economic group, household size, age, gender and legal marital status were recoded into the same analysis categories, as shown in Table 5-6 and Table 5-8. The race/ethnicity BHPS predictor variables were recoded into 'White', 'Black', 'Indian/Pakistani' and 'Other (mostly Chinese)' as used by Carr-Hill et al (1996). The ADHS private health insurance variable of the 'enabling' factors was recoded to give those who visited a dentist at their workplace, with insurance or with a dental plan a response of 'Dental health insurance'. All other categories were coded as 'No dental health insurance'. All other categories, as shown in Table 5-6 to Table 5-9, remained as coded in the surveys.

5.2.1.2 Dependent variables

Dependent variables of primary medical and dental service use in the 12 months prior to interview identified from the 1997/98 BHPS and 1998 ADHS were:

GP consultation frequency (from the BHPS):	0, 1-2, 3-5, 6-10, 10+
Dental visit (from the ADHS):	Yes, No

In order to ensure consistency between the binary data from the ADHS and the BHPS categories it was necessary to convert the five BHPS categories into two. Options for the binary cut-off were:

- 0 and > 0 GPCs

- These categories correspond to accessing GP services or not accessing GP services at all respectively

- < 3 and ≥ 3 GPCs
  - These categories correspond to less than or more than the average annual GPC frequency[13] respectively

- < 10 and ≥ 10 GPCs
  - The categories correspond to being a non-frequent attender or being a frequent GP attender[14] respectively

The specific areas of non-attendance and frequent attendance were not the focus of this study; therefore the cut-off used was < 3 and ≥ 3 GPCs.

[13] Neal et al found the average number of GPCs over a 41 month period was 0-9, which corresponds to approximately 0-3 GPCs over a 12 month period (1998).
[14] There is no universal definition of frequent GP attenders. However, 10+ annual GPCs is the highest GPC frequency category used in the BHPS and is therefore considered to be the frequent attender cut-off.

Table 5-6: Recoding of 'predisposing' predictor variables from the 1998 ADHS

Predictor variable	ADHS categories	Recoded categories
Predisposing		
Highest educational qualification	No academic qualifications, Below degree level, Above degree level	No academic qualifications, Below degree level, Above degree level
Socio-economic group		Higher Professional/ Managerial Lower Professional/ Managerial Intermediate Non-Manual Skilled Manual Semi-Skilled Manual Unskilled Manual
Household size	*Continuous*	*Continuous*
Age	*Continuous*	10-year age bands
Sex	Male, female	Male, female
Legal marital status	Single, never married Married Separated Divorced Widowed	Single, never married Married Separated Divorced Widowed
Reasons for visiting a dentist	Regular check-up Occasional check-up	Preventive attitude
	When having trouble	Treatment only attitude

Table 5-7: Recoding of 'enabling' and 'illness level' predictor variables from the 1998 ADHS

Predictor variable	Survey categories	Analysis categories
Enabling		
Household income	*continuous*	*continuous*
Household has car or van	Yes, No	Yes, No
Private health insurance (from 'Was your treatment under the NHS, private or something else?')	NHS Private NHS and private School/community dentist Armed forces Dental hospital Something else	No dental health insurance
	Dentist at workplace Through insurance With a dental plan	Dental health insurance
Price of previous treatment	*continuous*	*continuous*
Illness level		
Oral health impact profile (OHIP) – total score	Ordinal 0 to 14	Ordinal 0 to 14
OHIP – physical pain in the last 12 months	Never/hardly ever Occasional problem Problem fairly often Problem very often	No Occasionally Fairly often Very often

Table 5-8: Recoding of 'predisposing' predictor variables from the 1997/98 BHPS

Predictor variable	BHPS categories	Recoded categories
Predisposing		
Highest educational qualification	High degree 1st Degree	Above degree level
	HND, HNC, Teaching A level O level CSE	Below degree level
	None of these	No academic qualifications
Race/ethnicity	White	White
	Black – Caribbean Black – African Black – Other	Black
	Indian Pakistani	Indian/Pakistani
	Chinese Other	Other (mostly Chinese)
Socio-economic group		Higher Professional/ Managerial Lower Professional/ Managerial Intermediate Non-Manual Skilled Manual Semi-Skilled Manual Unskilled Manual
Household size	*Continuous*	*Continuous*
Age	*Continuous*	10-year age bands
Sex	Male, female	Male, female
Legal marital status	Single, never married Married Separated Divorced Widowed	Single, never married Married Separated Divorced Widowed

Table 5-9: Recoding of 'enabling' and 'illness level' predictor variables from the 1997/98 BHPS

Predictor variable	Survey categories	Analysis categories
Enabling		
Household income	*continuous*	*continuous*
Private health insurance	Yes, in own name Yes, via other family member	Dental health insurance
	No, not insured	No dental health insurance
Illness level		
Does health limit daily activity?	Yes, No	Yes, No
Number of reported health problems?	Integer	No health problems 1,2 health problems 3+ health problems
General health questionnaire	GHQ measure 0 - 36	0 - 36

5.2.2 Analysis

The first analysis stage was the comparison of predictors of GPC frequency and having a DE using BHPS and ADHS data respectively. The overall categorisation of the predictor variables of having a DE and GPC frequency is outlined in Table 5-2. The sub-categorisation of predictor variables of having a DE were those detailed in Table 5-6 and Table 5-7, and the predictor variables of GPC frequency were those from Table 5-8 and Table 5-9. Chi-square analyses of these contingency table valuations were undertaken and a p-value (probability) < 0.05 was considered to be statistically significant.

The second analysis stage was the generation of binary logistic regression models of GPC frequency and having a DE. The same dependent and predictor variables used in the previous analysis stage were used. This was undertaken in two steps. In the first step regression models including only those predictor variables common to both the BHPS and ADHS datasets, and in the second step all predictor variables were included in the regression models. To facilitate comparisons of the models generated, the forced-entry maximum likelihood method was used. In this approach all predictor variables are added to the regression model in one block. This is considered to 'give replicable results...appropriate for theory testing' (Field 2005b). The final model consists of all predictor variables which make a significant contribution to the predictive power of the model. Odds ratios and 95% confidence intervals were calculated for all variables. The relative influence of each predictor variable and the predictive powers of each model, calculated as the Cox & Snell R^2 and Nagelkerke R^2[15], were compared.

The final analysis stage was the generation of ordinal logistic regression models of GPC frequency, DE frequency in the period 1994-98 and dental attendance frequency 'for trouble' in the period 1994-98. The dependent variables used were annual GPC frequency[16] from the 1997/98 BHPS, categorised five-year DE frequency[17] from the

[15] Cox & Snell R^2 is a standard analogue to R^2 used in linear regression and is a measure of the amount of variability of the dependent variable which is explained by the regression model. Nagelkerke R^2 is a variation of this which includes a correction which permits it to be equal to 1.00 (Field 2005a). For the purposes of this study both values were calculated and given in the results but, unless the predictive powers of the models approached 1.00, Cox & Snell was considered to be the measure of predictive power.

[16] The categories used were the original BHPS GPC frequency categories - 'none', 'one or two', 'three to five', 'six to ten' and 'more than ten' GPCs in the last 12 months.

ADHS and categorised five-year frequency of dental visits 'for trouble'[17] from the ADHS. Five-year DE frequency was considered to be preventive-led attendance, five-year frequency of dental visits 'for trouble' was considered to be treatment-led attendance. The same predictor variables as used in the previous analysis stage were used. The estimated coefficients, which are measures of the magnitude and direction of change of the dependent variable if the predictor variable is in the specified category when compared with the reference category, associated with each predictor category were calculated and, as previously, a p-value < 0.05 was considered statistically significant.

All statistical analyses were undertaken using an Apple Macintosh G4 personal computer (OSX 10.4) running SPSS version 11.0 (SPSS Inc, Chicago, USA).

[17] Five-year continuous data from the ADHS was recoded into 'no attendance', 'up to once per year' (up to five appointments in five years) and 'more than once per year' (greater than five appointments in five years).

5.3 An investigation of the impact of patient charges on primary care dentistry

5.3.1 Data preparation

The datasets considered for inclusion in this study are reviewed in 0. Of those reviewed, the ADHS was found to be the most suitable for analysing the impact of copayments on primary dental care. The ADHS, unlike the other datasets reviewed, contains a range of information relating to the dental treatments received by survey respondents, the means by which dental services were provided (for example through the NHS, privately etc.) and any associated charge paid for treatment at the point of delivery. In addition, information indicating that respondents would qualify for exemption from charges at the point of delivery of NHS dentistry is included in the survey records. Due to variations in eligibility for exemption from NHS patient charges for dentistry and differences in funding arrangements in Scotland and Northern Ireland compared with England and Wales, the England and Wales sub-sample of the ADHS was used for analyses. Although the ADHS is the most appropriate source of data for this series of analyses, since it is a cross-sectional rather than longitudinal data source, cost evolution cannot be incorporated and therefore price elasticity of demand is incalculable.

The impact of copayments on primary care dentistry was analysed against two main measures:

1. Dental attendance rates

2. The consumption of treatment by respondents who attended.

For the purposes of this study a 12-month time-period for attendance was used. Since the ADHS does not record the frequency of attendance over the 12-month time-period prior to interview (rather the ADHS records the total attendance frequency in the previous five years), attendance was defined as a binary ('yes' or 'no') variable derived from the following three variables:

1. The time since the respondents' last visit to the dentist
2. The number of visits to a dentist in the previous five years for 'a check-up'
3. The number of visits to a dentist in the previous five years 'for trouble'.

A negative attendance response was recorded for respondents who either reported no visits for 'check-ups' or 'trouble', or whose most recent dental visit was more than 12 months prior to interview. Respondents who reported no visits for 'check-ups' or 'trouble' in the previous five years and who also reported having visited a dentist in the previous 12 months were excluded from analysis due to the inconsistency of their responses.

Ten categories of treatment provider are recorded in the ADHS. These were grouped as follows:

- NHS
    - National Health Service
    - N.H.S. and private

- School Community Dental Service
- Armed forces[18]
- Dental hospital (hospital)
- Something else?

- Private or with insurance
  - Private
  - Dentist at your workplace[19]
  - Through insurance
  - With a dental plan

With regards to information recorded in the ADHS which relates to the treatments received and the amount paid for those treatments, the following two ADHS questions (including multiple choice responses) were used:

1. *'(Can I just check) in the visit(s) you made to the dentist what did you have done?'*
   - *'A check-up (examination)'*
   - *'X-rays taken'*
   - *'Teeth taken out'*
   - *'Impressions taken'*
   - *'Dentures repaired'*
   - *'New dentures fitted'*

[18] Although dentistry provided to the armed forces is not delivered through the NHS it has been considered as NHS charge-exempt dentistry for this study.
[19] 'Dentist at your workplace' has been assumed to mean dentistry delivered privately and funded by employers.

- *'Treatment for an abscess'*
- *'Teeth filled'*
- *'Crowns (re)fitted'*
- *'Teeth scaled (scraped and cleaned) and polished'*
- *'Some other treatment:'*
  - *'Dentures removed and mouth checked'*
  - *'Gum treatment'*
  - *'Some other treatment'*

2. *'How much did the treatment cost you?'*

In the subsequent analyses undertaken using these variables it was necessary to make assumptions about what the variables refer to and the nature of the relationship between them. The treatments listed above were assumed to be those undertaken at the most recent dental appointment. The value given for the *'cost'* variable was assumed to refer to the amount paid by the respondent for the treatments indicated. This charge was assumed to be a single payment made following the completion of treatment at the point of delivery of treatment. Any treatments requiring multiple appointments were either assumed to have been completed, in which case any charge for these treatments was included in the value of *'cost'*; or incomplete and therefore not included in either the list of treatments received or in the value of *'cost'*.

Combining this *'cost'* variable with the treatment provider options, four treatment payment groups were generated as shown in Table 5-10. Within the 'copayment/charge

paid' category of the 'charge/copayment paying status' group the *'cost'* variable was assumed to be continuously distributed. NHS copayment-paying respondents were assumed to have paid, at the point of delivery of treatment, a charge according to the NHS scale of patient charges detailed in the NHS Statement of Dental Remuneration (SDR). Private charge-paying respondents were assumed to have paid 100% of the cost of treatments received at the point of delivery of treatment. Respondents from the 'no copayment/charge' category were considered to have different treatment payment arrangements than corresponding charge/copayment-paying respondents treated privately or through the NHS. In order for respondents to have been treated privately and paid no charge at the point of delivery of treatment the charges were assumed to have either been met through an insurance scheme which covered 100% of the cost of treatment or to have been met through a third party (for example a work-based dental scheme). In both of these cases insufficient information is recorded in the ADHS to know how the cost of treatment was met and therefore these respondents were excluded from analyses. NHS copayment-exempt respondents were assumed to have qualified for exemption from NHS dental charges as outlined by the Department of Health for England (Department of Health. 2004a).

Table 5-10: The definition of copayment status groups by charge/copayment status and treatment provider

		Charge/copayment paying status	
		No charge/copayment paid[20]	**Charge/copayment paid**
Treatment provider	**NHS**	NHS copayment-exempt	NHS copayment-paying
	Private	Private charge-free*	Private charge-paying

*- This copayment status group was excluded from all analyses

The identification of NHS copayment-exempt respondents based on the provider of treatment being 'NHS' and the amount paid for treatment being £0.00 identified only those eligible for exemption from NHS copayments that visited a dentist. Identification of respondents who meet the criteria for exemption from NHS copayments irrespective of whether they actually visited a dentist requires the criteria for exemption to be recorded in the ADHS. The only criterion for exemption from NHS copayments recorded in the ADHS is whether respondents were in receipt of income support and this was therefore used in analyses of attendance rates.

The same predisposing, enabling and illness level factors used in the analysis of DE rates detailed in 5.2.2 were used to provide additional information about differences between recipients of Income Support and the remaining survey respondents, and differences between copayment status groups. Respondents' pattern of dental attendance was used in analyses to determine their attitude towards regular dental visits and was

[20] This category included both NHS copayment exempt patients (n=856) and patients covered by insurance who paid £0.00 for treatment (n=81)

taken from information recorded by the ADHS question 'In general do you go to the dentist for...' with possible responses:

'a regular check-up'

'an occasional check-up'

'or only when you're having trouble'.

The components of care, used in subsequent analyses, comprised the range of treatments received and the 'value' of treatment consumed by respondents[21]. The possible responses to the question regarding treatments received by respondents at their last dental visit and the terminology used in this study to refer to these treatments are shown in Table 5-11. Respondents who received treatment which was categorised as 'Some other treatment – Some other treatment' were excluded from all analyses, other than descriptive analyses, since no details of treatment received were available.

[21] The 'value' of treatment consumed is a single measure of the amount of dental treatment received by individuals and is intended to permit direct comparisons of total treatment consumption by treatment payment groups.

Table 5-11: Analysis terminology used to define the ADHS treatment options

ADHS response		Analysis terminology
'A check-up (examination)'		Examination and report (ER)
'X-rays taken'		X-ray
'Teeth taken out'		Extraction(s)
'Impressions taken'		Impressions
'Dentures repaired'		Dentures repaired
'New dentures fitted'		New dentures
'Treatment for an abscess'		Abscess treatment
'Teeth filled'		Restorations
'Crowns (re)fitted'		Crowns fitted
'Teeth scaled (scraped and cleaned) and polished'		Scale and polish
'Some other treatment:'	*'Dentures removed and mouth checked'*	Dentures checked
	'Gum treatment'	Periodontal treatment
	'Some other treatment'	Other treatment

The scale of patient charges for NHS dental treatment from the 1998 Statement of Dental Remuneration (SDR) was used to generate approximations of the prices of the ADHS treatment options, using an adaption of the technique described by Chalkley and Tilley (2006). The wide-range of treatment items in the SDR were grouped using the ADHS treatment options as guidelines. The mean patient charge for each aggregated SDR item was calculated as the frequency-weighted mean cost of each treatment item

(see Appendix 3 for full details of how this was calculated). No analogue for the ADHS treatment option 'Dentures checked' was available in the SDR. The 'value' of the remaining treatment options is shown in Table 5-12.

Table 5-12: The 'value' of ADHS treatment items

ADHS treatment item	Value (£)
Examination and report (ER)	5.70
X-ray	4.66
Extraction(s)	5.64
Impressions	11.61
Dentures repaired	14.37
New dentures	51.42
Abscess treatment	5.31
Restorations	10.06
Crowns fitted	31.91
Scale and polish	8.59
Periodontal treatment	21.68
Dentures checked*	n/a*

*- No analogue for this ADHS treatment option was available in the SDR

The treatment items were categorised to supplement analysis of individual treatment items with grouped treatment items. These three treatment categories were defined as follows (Harris and Burnside 2004):

1. Diagnostic – Examinations and reports, and X-rays
2. Preventive – Scale and polish
3. Therapeutic – Extraction(s), abscess treatment, restorations, crown fitted and periodontal treatment[22]

The remaining treatment items refer to the fitting and maintenance of dentures (impressions, dentures repaired, new dentures and dentures checked). For the purposes of this study this category of treatment items was excluded from analyses.

5.3.2 Analysis

The analysis stage in this section was of the rates of attendance for dental treatment by treatment payment group. The proportions of dental treatment delivered through the NHS, privately or as a combination of NHS and private care were calculated. Contingency table valuations and Pearson chi-square analyses were then applied to the attendance rates of respondents in receipt of income support and therefore exempt from

[22] Periodontal treatment is a broad term which is assumed to include surgical and non-surgical periodontal treatments, which could be either therapeutic or preventive. In the absence of further information about what periodontal treatments were received, periodontal treatment was classified as a therapeutic treatment.

NHS charges compared with the attendance rates of the remaining respondents. Contingency table valuations and Pearson chi-square analyses were used to identify significant differences in the distribution of the predisposing, enabling and illness level factors used in section 5.2, between respondents receiving Income Support and the remaining survey population. The same analysis was used to compare copayment-exempt NHS, copayment-paying NHS and charge-paying private respondents. A forced-entry maximum likelihood binary logistic regression model of dental attendance was generated using the same predictor variables derived from the ADHS used in section 5.2 with the inclusions of income support status as a predictor variable. Ordinal logistic regression models of DE frequency and dental attendance frequency 'for trouble' in the period 1994-98 were generated using the same predictor variables as the binary logistic regression model above, and in the same manner as detailed in section 5.2. Odds ratios and 95% confidence intervals were calculated for all variables.

The comparison of copayment status groups was supplemented by contingency table valuations and Pearson chi-square analysis of respondents' classification of their attendance pattern. These analyses were used to supplement analyses of attendance rates and the components of care received undertaken in this section.

One-way analysis of variance (ANOVA) was applied to the mean cost to the patient[23] of treatment at the point of delivery by NHS copayment-paying and private charge-paying

[23] Values of *'cost'* equal to £0.00 were excluded from evaluations of the normality of distribution since a treatment cost of £0.00 is the result of charges for treatment being

respondents. Due to the large sample size of the ADHS survey no transformation of the ADHS '*cost*' variable was needed to account for a non-normal distribution.

A comparison of the uptake of the 12 treatment options included in the ADHS in the 12 months prior to interview by NHS copayment-exempt, NHS copayment-paying and private charge-paying patients was undertaken using contingency table valuations and Pearson chi-square analyses ($p<0.05$ was considered statistically significant). The categorised treatment items were analysed in the same way. The mean 'value' of treatment consumed by NHS copayment-exempt and copayment/charge-paying (both NHS and private) patients was compared using ANOVA. A comparison of the mean 'value' of treatment consumed by NHS copayment-paying and private charge-paying patients using ANOVA was also undertaken. A forced-entry maximum likelihood multiple regression model of the value of dental treatment consumed was generated. The same predictor variables derived from the ADHS used in section 5.2 were used in this model. Standardized βs (including their original unstandardized *b*-values and associated standard errors) were calculated for all variables. The predictive power of the model, calculated as the R^2, was calculated.

All statistical analyses were undertaken using an Apple Macintosh G4 personal computer (OSX 10.4) running SPSS version 11.0 (SPSS Inc, Chicago, USA).

---

paid by another means. All other values of 'cost' > £0.00 were included and the *'cost'* variable was considered continuous.

5.4 Patients' views and opinions about primary healthcare and copayments for NHS services

5.4.1 User consultation and pilot interviews

Prior to the design of the data collection stage relevant to this aspect of the research GPs, primary care managers, primary medical care service users and members of the general population were consulted about their views on the study topics and appropriate methods for collecting data. The outcomes of these consultations informed the development of the survey design. The main outcomes were:

- Frequent users of primary medical services comprise a large proportion of the workload in primary medical care. Therefore, recruitment for this study should focus disproportionately on frequent users of primary medical services (this is further discussed in 5.4.2).
- Interviews were felt to be a more appropriate form of collecting data from primary medical service users than a self-completion survey (this is further discussed in 5.4.2).

Pilot interviews were then undertaken with six randomly chosen participants. The pilot interviews were used to assess the semi-structured interview content, the recording equipment and the quality of interviews undertaken. Findings from the interviews were discussed with the participants and their feedback on the topics discussed was sought.

Participants in the pilot surveys expressed a range of views and opinions about the topics discussed which supported the use of interviews for data collection, which allows a 'deeper' understanding of social phenomenon. In these interviews participants raised specific queries about private dentistry, particularly regarding their dental insurance status. Additional background research was done to ensure that the interviewer was informed about the major private dental insurance plans available (Denplan and HSA). Participants were unsure as to the meaning of the term 'primary healthcare'. The interview content was modified to include a discussion of primary healthcare and what this meant to the participants.

5.4.2 Study design

The purpose of this aspect of study was to investigate how aware participants were of patient charges in primary care, whether they perceived General Medical and General Dental Practitioners differently with regard to their importance and role in their general and oral health and their feelings about extending patient copayments to primary medical care (a full overview of the hypotheses, aims and objective of this study can be found in Chapter 4). Rigorous qualitative research, more so than quantitative research, includes the researcher(s) as an integral part of the research process and therefore the views of the researcher formed an integral part of the development of the study (Charmaz 2006). An overview of the perspective of the lead researcher in this study is given in section 5.4.4.

Following the completion of the user consultations and pilot interviews (section 5.4.1) it was found that people had different experiences of primary healthcare. The different experiences of individuals informed the choice of method in this study to a qualitative rather than a quantitative approach based on self-completed surveys. Considering the complex nature of the research topics and the diverse nature of participants' experiences, the fact that qualitative methods allow a 'deeper' understanding of social phenomenon and an exploration of how people's 'lived experiences' have shaped their views and opinions (Charmaz 2006) rather than being confined by pre-determined questions, supported their selection for data collection in this study.

In common with the study detailed in section 5.2, it was assumed that participants' perceptions of GPs and GDPs would be influenced by a variety of factors, for example those identified in the Behavioral Model of health service utilisation (Andersen and Newman 1973). However, these were not expected to fully explain participants' health behaviour (Sutton 1998; Ogden 2003). The views and opinions expressed by participants relating to the research topics were not expected to be static, but rather developed as a result of their unique lived experiences and likely to change throughout their lifetime. However, within this study such changes were not expected to yield significant information relating to copayments in primary care. Therefore a longitudinal method was discounted. Although, as discussed in the sampling strategy in section 5.4.3.1, age effects were included to take account of the increasing use of primary medical care with age and the possibility of different childhood healthcare experiences as a result of generational changes in health policy and the structure of the healthcare system.

The research approach used in this qualitative study was based on thematic analysis. A variety of qualitative approaches were considered in terms of their relevance to the aims and objectives of the study. In this context thematic analysis and Grounded Theory (GT) were considered to be potentially suitable approaches. Thematic analysis has been widely applied in studies of attitudes towards and experiences of primary medical (Stenner, Courtenay et al. ; Shaw, Tansey et al. 2001) and dental care (Hill, White et al. 2003; Stokes, Ashcroft et al. 2006; Gregory, Thomson et al. 2010). Grounded Theory has formed the basis of a similarly wide range of studies of attitudes towards primary medical (Foster, Dale et al. 2001; Mercer, Cawston et al. 2007) and dental services (Gibson, Drennan et al. 2000; Gregory, Gibson et al. 2007). A GT design represents a systematic technique which generates a theory that 'explains, at a conceptual level, a process, an action, or interaction' about a topic (Creswell 1998). The goal of GT is to 'generate a plausible – and useful – theory of the phenomena that is grounded in the data' (McLeod 2001). However, GT also requires that theories generated from the data are 'grounded in the data' rather than being informed by or building on previously developed theories. Thematic analysis 'is a method for identifying, analysing and reporting patterns (themes) within data' (Braun and Clarke 2006). Thematic analysis can be applied according to two main epistemological positions, or as a combination of both, and allows greater flexibility with regards to these positions. Inductive thematic analysis means that 'the themes identified are strongly linked to the data themselves', whereas theoretical thematic analysis 'tends to be driven by the researcher's theoretical interest in the area, and is thus more explicitly analyst-driven' (Braun and Clarke 2006). The

choice between inductive or theoretical (deductive) thematic analysis also influences how the data are analysed. An inductive approach means that 'themes identified [from the data] are strongly linked to the data themselves' and coding of the data is undertaken 'without trying to fit into the researcher's preconceptions' (Patton 1990), whereas theoretical thematic analysis allows a 'more detailed analysis of some aspect of the data' and the data are coded 'for a quite specific research question' (Braun and Clarke 2006). Thematic analysis is often linked with content analysis (Braun and Clarke 2006). However, content analysis is a reductive methodology in which data are categorised according to preconceived coding schemes and the frequency of occurrence of each category is counted (Coast 1999). Content analysis ignores the context of individuals or categories, but is considered to be a qualitative methodology in which hypotheses can be tested rather than generated. This methodology has been widely applied in studies of primary health service utilisation, including the impact of economic hardship on managing the costs associated with chronic illness (Jeon, Essue et al. 2009) and people's perceptions of private and NHS dental service care (Hancock, Calnan et al. 1999). However, it was not the intention of this study to test hypotheses or to provide quantitative descriptions of patterns across qualitative data. It was therefore considered to be more appropriate to use thematic analysis and to preserve the power and subtlety of the data collected, which would be lost in content analysis. Considering the previous studies undertaken in the course of this research and their influence on the researcher's knowledge of the predictors of attendance in primary care deductive thematic analysis was considered to be the most appropriate research approach to explore people's experiences of and attitudes towards cost-sharing for health care. However, the final

objective of this qualitative investigation, to compare attitudes towards primary dental and medical services and practitioners, does not feature in the previous quantitative analyses and is not developed from a substantial literature base; therefore inductive thematic analysis is the most appropriate research approach for this objective. Studies which combine inductive and deductive thematic analysis are less common than those employing each method independently, but these two methods used together have been found to be 'complementary, rather than mutually exclusive, research tools' (Johnstone 2004) and that such a hybrid data categorisation model is 'more complete than either a deductive or an inductive method alone' (Brixey, Robinson et al. 2007).

Focus groups offer an opportunity to 'tackle abstract and conceptual subjects' and are 'useful for studies focusing on attitudes and views' (Ritchie, Lewis et al. 2004b) such as this study. However, 'understanding motivations and decisions' and 'the opportunity for clarification and detailed understanding' is best addressed by using individual in-depth interviews (Ritchie, Lewis et al. 2004b). Focus groups may have offered a better discussion of abstract concepts such as the possible consequences of copayments for GP appointments. However, the ethical concerns regarding the lack of confidentiality and the increased possibility that participants would feel inhibited by such a group setting outweighed the benefits of group interviewing.

Since copayments for Primary Medical consultations might be expected to reduce numbers of GP consultations, it was important to ensure that the views and opinions of those patients who visit the GP the most, as well as people from the general population,

were included. Neal et al (1998) reported that patients who visited their GP 12 times or more per year generated 15% of the practice workload yet accounted for only 3% of the people visiting the practice. The authors defined this group as 'frequent attenders', in common with several other studies (Heywood, Cameron Blackie et al. 1998; Jiwa 2000; Scaife, Gill et al. 2000). In the context of the general population, approximately 25% of respondents to the British Household Panel Surveys (1991 to 2004) had not visited the GP at all in the previous 12 months. Frequent attenders therefore comprise less than 3% of the general population but still account for 15% of all GP consultations. When designing the recruitment for this study, these factors were taken into account in addition to the outcomes of the user consultations (see 5.4.1 for details). Resulting from this, it was decided that randomised opportunistic sampling from the general population would not have been an effective inclusive strategy. The recruitment protocol is described in sections 5.4.3.1 and 5.4.3.3.

Due to the extensive body of literature concerning the factors which affect decision-making and patterns of attendance in healthcare, and that this study was guided by the Behavioral Model of health service utilisation (Andersen and Newman 1973), purposive sampling was chosen, rather than opportunistic or theoretical sampling. Purposive sampling ensures that 'the key constituencies of relevance to the subject matter are covered' and 'that, within each criteria, some diversity is included so that the impact of the characteristic concerned can be explored' (Ritchie, Lewis et al. 2004c). 'Extreme cases' (such as frequent attenders, people living in rural areas or people from more deprived areas) were sampled as well as 'typical cases' from the general population to

allow comparisons of subgroups[24] (Patton 2002; Robson 2002; Ritchie, Lewis et al. 2004c). The main sampling criteria used for the selection of participants were:

- Frequency of primary medical care attendance
- The level of deprivation of their area of residence

Gender, age and the rural/urban characteristics of participants' area of residence were also included as supplementary selection criteria (the full sampling criteria are detailed in 5.4.3.1).

The sample size of this study was not pre-determined since qualitative studies do not seek to produce generalisable findings based on statistical inference, as is the case with quantitative studies, but instead was determined by the 'point of diminishing return' or 'saturation point' where further interviews no longer result in the generation of new views or ideas of relevance to the research topic (Ritchie, Lewis et al. 2004c). However, since this study was subject to NHS ethical committee approval an approximate sample size in the region of 15 to 30 participants which ensured appropriate representation in the study by the target groups while restricting the sample to a number of interviews which could be undertaken was adopted.

The study undertaken by Finch et al (1988), in which the authors sought to examine 'the range of factors which inhibit people from seeking dental treatment', was the basis for

[24] This combination of 'extreme case' and 'typical case' sampling is similar to stratified purposive sampling, in which groups are selected 'that display variation on a particular phenomena but each of which is fairly homogenous'.

the survey design used in this study. Following completion of a pilot survey (5.4.1) a survey structure suitable for in-depth semi-structured interviewing and comprising direct open-ended questions was devised (see Appendix 6 for the interview schedule used).

The main data collection stage of this project involved semi-structured interviews with patients recruited from GP practices (13) and members of the general population (6). Participants were recruited from one rural electoral ward (Wessex) and two electoral wards in Bristol of contrasting deprivation index measures (Clifton and Easton). A full description of the participants is given in 5.4.3.2.

5.4.3 Data collection

5.4.3.1 Sampling strategy

The main criteria used for the purposive sampling strategy in this study were:

- Frequency of GP attendance
- The affluence of the local area
- The urban/rural characteristics of the area

Participants were also selected to ensure a mixture of genders and ages across the main sampling groups.

The following three locations were identified as suitable for recruitment and participants were recruited from GP Practices (frequent attenders) and the general population (regular attenders) from within these locations:

1. A rural electoral ward – (Wessex)
2. Two urban electoral wards
    a. A more affluent electoral ward of the City of Bristol – (Clifton)
    b. A more deprived electoral ward of the City of Bristol – (Easton)

Population statistics were not available aggregated to electoral ward level. Therefore a modification of the Index of Multiple Deprivation (IMD) was used to rank the electoral wards of the City of Bristol based on their composite Lower-level Super Output Areas (LSOAs).

The composite LSOAs of each electoral ward were multiplied by their population and summed. This was then averaged across the total population of the electoral ward to obtain the population weight index of multiple deprivation (Pop. Wt. IMD):

$$\text{Pop. Wt. IMD} = \frac{\sum_{1}(\text{IMD}_i * \text{pop}_i)}{\sum_{1} \text{pop}_i}$$

i = constituent LSOAs of the electoral ward

The resultant classification of the electoral wards in the City of Bristol is shown in Table 5-13.

Table 5-13: The population weighted index of multiple deprivation of the electoral wards in the City of Bristol

Electoral Ward	Population weighted IMD	Rank
Ashley	**44.5**	**3**
Avonmouth	29.9	14
Bedminster	23.7	22
Bishopston	**14.2**	**31**
Bishopsworth	31.4	12
Brislington East	22.5	24
Brislington West	21.5	26
Cabot	30.2	13
Cotham	16.0	29
Clifton	***15.2***	***30***
Clifton East	17.2	28
Easton[25]	***38.5***	***5***
Eastville	25.5	19
Filwood	**54.8**	**2**
Frome Vale	24.6	20
Hartcliffe	37.6	6
Henbury	32.7	11
Hengrove	23.9	21
Henleaze	**7.1**	**35**
Hillfields	26.4	18
Horfield	22.9	23
Kingsweston	34.2	10
Knowle	26.9	17
Lawrence Hill	**67.1**	**1**
Lockleaze	37.1	8
Redland	**14.1**	**32**
Southmead	**40.2**	**4**
Southville	29.1	15
St George East	20.3	27

Table continued overleaf.

[25] The practice indicated as being in the Easton ward relocated to Eastville. Since the practice had moved soon before data collection began the patient list, apart from patients registering after the relocation, was established prior to the relocation and was therefore considered to be Easton based.

Table 5-13: The population weighted index of multiple deprivation of the electoral wards in the City of Bristol (continued)

Electoral Ward	Population weighted IMD	Rank
St George West	28.5	16
Stockwood	21.7	25
Stoke Bishop	**8.2**	**34**
Westbury-on-Trym	**9.9**	**33**
Whitchurch Park	37.2	7
Windmill Hill	34.4	9

Practices within the electoral wards identified in bold were approached for participation in the study. Those practices indicated in italics agreed to participate in the study. Practice managers were approached to discuss the study and supplied with summary information about the study, and the practice managers or partners as appropriate gave approval.

Recruitment of both frequent and regular attenders was subject to the following exclusion criteria:

- Individuals who refused to participate
- Individuals under 18 or over 60[26] years of age at the time of recruitment
- Individuals who were unable to complete the interview due to a mental disability.

[26] This age group has been specified to include those people who currently face healthcare charges. Children (under 16 years old) are exempt from all healthcare charges. Approximately 70% of 16 year olds and 65% of 17 year olds in England and Wales are in full-time education and therefore qualify for charge-free prescriptions, NHS dental care and NHS sight tests. Adults aged 60 or over are entitled to charge-free prescriptions and NHS sight tests, although are not entitled to help with dental costs.

- Individuals who required an interpreter either due to language difficulties or a hearing impairment were excluded if they were unable to provide an interpreter
- Individuals who had no experience of healthcare within the United Kingdom

5.4.3.2 Participants

19 participants were recruited into this study of which 10 were male. Four participants were aged between 18 and 30 years, six between 30 and 50 years, and eight participants were aged between 50 and 65 years[27]. The distribution of participants according to the main sampling criteria is shown in Table 5-14.

Table 5-14: The recruitment of participants according to the main sampling criteria

		GP attendance frequency (n)	
		Regular	**Frequent**
Urban/rural characteristic and deprivation category of recruitment location (n)	**Urban – affluent**	2	4
	Urban – deprived	2	4
	Rural	2	5

This sampling protocol ensured that four groups of participants were recruited (regular attenders, frequent-urban-affluent, frequent-urban-deprived and frequent-rural) and that

[27] Age was not a main criterion for selection and was therefore approximated from initial meetings and comments made during interview. Age approximation was used solely to ensure that the final sample included a broad range of ages.

each group contained at least four participants, this follows the guidelines from Ritchie et al (Ritchie, Lewis et al. 2004c).

5.4.3.3 Recruitment and interview process

Frequent GP attenders[28] were recruited from a participating GP practice located in each of the wards identified in 5.4.3.1. Regular attenders were recruited from the general population and were normally resident in the same electoral wards.

Frequent GP attenders were identified and approached for participation by a GP or Practice Nurse and contact details taken, as approved by Taunton NHS ethics committee (see Appendices 3, 4, 5 and 6 for details of the information provided to participants, the consent form and flowcharts of the recruitment process). Participant recruitment was undertaken during the normal opening hours of the participating practices (between 8:30am and 6:00pm Monday to Friday). Suitable patients were identified from the practice's patient list by a member of the reception staff[29] as being within the desired age range and having attended the practice at least 12 times in the previous 12 months. The treating practitioner, at their discretion, introduced the topic of the study to the patient and invited them either to discuss it further with the researcher after their appointment or to leave their contact details. If convenient for the participant, informed consent was

[28] Defined as 12 or more GP consultations in the previous 12 months.
[29] Identifying suitable patients from the list of patients rather than approaching all patients individually ensured that only suitable patients were invited to participate and enabled the treating clinicians to exclude patients from being invited to participate if they did not feel it was appropriate.

attained immediately after their appointment and participants were interviewed at the practice. However, if this was not convenient participants were contacted within seven days of their initial meeting with the researcher and arrangements made to interview the participant at the practice or another location more convenient for the participant at a later date (in this case informed consent was attained immediately prior to interview).

The same informed consent and interview protocol was applied to the recruitment of regular attenders. However, regular attenders were identified and approached by the lead researcher and interviews were not undertaken at the GP surgeries. Household screening of targeted streets in the recruitment areas was undertaken which comprised a brief doorstep introduction to the study with people who were home. If no response was gained at the time of the initial round of recruitment a copy of the information sheet was left (Appendix 4) and a follow-up sweep of these houses was conducted later in the same week. Participant recruitment was undertaken during normal working hours and early evening (between 8:30am and 8:00pm Monday to Friday). Where necessary this recruitment protocol was supplemented with snowball sampling, whereby participants from the general population who had already been interviewed were invited to identify other people that they knew in the area who met the inclusion criteria and may have been interested in participating (Ritchie, Lewis et al. 2004c). If convenient for the participant, informed consent was attained after meeting with them. However, if this was not convenient participants were contacted within seven days of their initial meeting with the researcher and arrangements made to interview the participant at their home or another location more convenient for the participant at a later date (in this case informed

consent was attained immediately prior to interview). It was assumed that, having been recruited from the general population, respondents were likely to be regular attenders. Participants subsequently found to be frequent attenders were excluded from the study.

All interviews were recorded using an Aiwa MiniDisc recorder and Universal Microphone. Transcriptions were done manually by the author using an Apple Macintosh G4 laptop computer running Microsoft Word for Office X.

5.4.4 Researcher position

In their discussion of qualitative data analysis Taylor and Ussher (2001) argue that it is inappropriate to deny 'the active role the researcher always plays in identifying patterns/themes, selecting which are of interest, and reporting them'. Charmaz's social constructionist viewpoint of Grounded Theory recognises the role of the researcher in the 'co-construction with participants of reality and experience' and that the researcher should consider their interpretation of other people's experiences with their own in mind (Charmaz 2006). In qualitative research the researcher is considered integral to the development of the study, the data collection and how the analysis is undertaken. Therefore it is important to acknowledge the position from which the researcher has approached the study.

This study stemmed from the investigator's interest in what affects equitable access to healthcare. The investigator's own view at the outset was that copayments applied to

healthcare are an unnecessary barrier to people initialising contact with practitioners. The investigator's motivation to follow this qualitative data collection approach, influenced also by methodological factors already detailed, was his desire to go beyond the arms-length nature of secondary analyses of survey data and to consult people, especially those for whom copayments in primary medical care would be a disproportionately heavy financial burden, about their experiences of and views about copayments.

This qualitative study was undertaken concurrently with quantitative studies of attendance patterns in primary care and the impact of copayment in primary care dentistry. The Behavioral Model of health service utilisation (Andersen and Newman 1973) formed a core component of the study of attendance patterns (section 3.1). The analysis of these qualitative data was therefore done with these models as a background influence, particularly in the identification of themes.

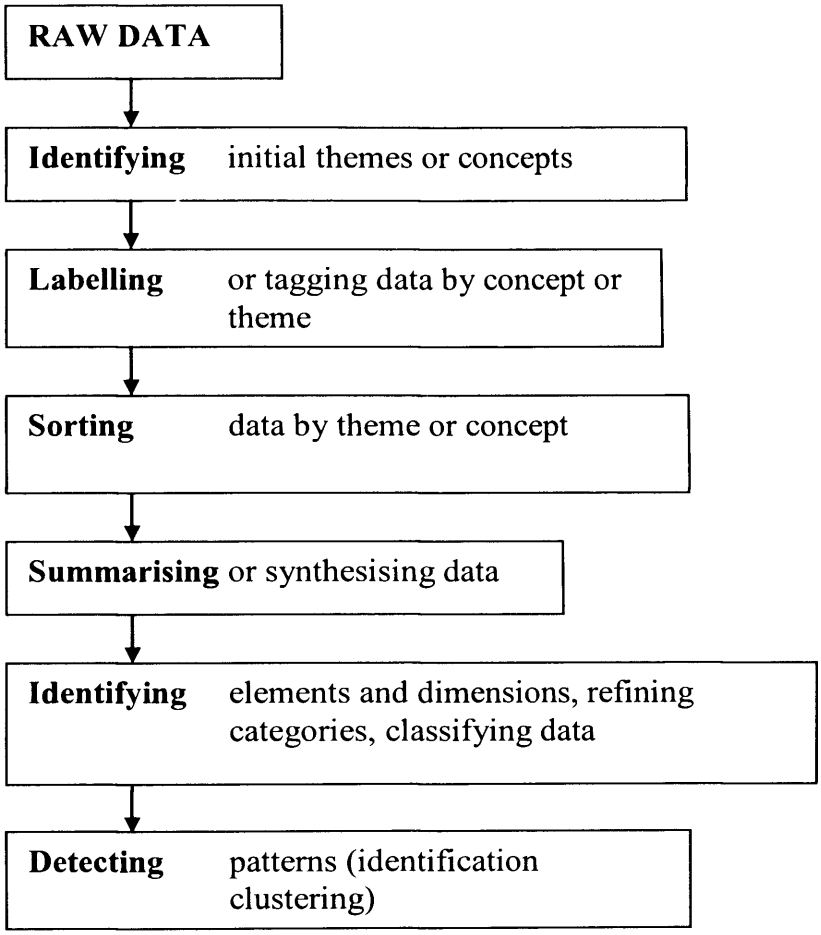
5.4.5 Data analysis

Data analysis was undertaken using content analysis within a thematic framework (Ritchie, Lewis et al. 2004a), as set out in Figure 5-1. Framework analysis was undertaken continuously while further data were collected. The steps outlined in the framework analysis were repeated several times when new data was added or to confirm previous iterations of the analysis process. Following transcription of the interviews, initial themes or concepts were identified and these were applied to the data by tagging

or 'coding' using NVivo 6 computer-assisted qualitative data analysis software (CAQDAS). The initial deductive coding was based on three themes: 'copayments for healthcare – views and opinions', 'cost – an influencing factor' and 'copayments for primary medical care'. Following this deductive coding, inductive coding was undertaken relating to attitudes towards primary dental and medical services and practitioners. Where appropriate, coded data were reviewed according to pre-determined categories (for example the criteria in the sampling strategy) and new categories were defined during the iterations of the analysis process. The data were then summarised ensuring that the original language used by the participants and the context of each extract was retained. Following a review of the categories and classifications, main themes were identified where appropriate. Finally, where possible, explanations of the patterns of association found in the data were generated and associations between the qualitative framework analysis and quantitative analyses were explored.

Reliability of the framework analysis was ensured by comparing the coding of the first five transcripts with analysis undertaken by two independent second raters (investigator triangulation) (Denzin 1989). Each second rater was provided with the original, un-coded transcripts from the interviews which they analysed independently. The coding structure and potential themes in the interviews were discussed and where agreement could not be reached the codes were rejected. The remaining analysis was undertaken by the lead researcher.

Figure 5-1: Thematic analysis framework (Ritchie, Lewis et al. 2004a)



Chapter 6 Results and Discussion - A comparison of predictors of primary dental and medical service use

6.1 Results

According to the 1998 ADHS (Table 6-1) the proportion of respondents reporting attendance for a dental examination and report (DE) in the 12 months prior to interview in England and Wales was 58.0% (2112 of 3641 respondents). Five-year longitudinal data relating to the total frequency of DEs (Figure 6-1) show that the majority of respondents (50.9%) reported attending up to once per year. However, there is a clear peak in attendance frequency of ten DEs in the previous five years, which corresponds to a DE every six months. Five-year longitudinal data relating to the total frequency of dental visits 'for trouble' (Figure 6-2) show that the majority of respondents (93.8%) reported attending up to five times in this five-year period, with 46.8% of respondents not visiting the dentist 'for trouble' at all in this period.

According to the BHPS (1994-1998) frequency of self-reported annual GP consultations in England and Wales show did not vary significantly in this period (Figure 6-3). However, cross-tabulation analyses, shown in Table 6-2, show considerable variation at the individual respondent level. For example, 53.5% of respondents who reported not having a GP consultation and 50.8% of respondents who reported having 'one or two' GP consultations in the 12 months prior to interview also reported 'none' or 'one or two' GP consultations respectively in the following year. In the 'three to five' and 'six to ten' categories only 38.0% and 28.7% respectively of respondents reported the same GP attendance frequency the following year. However, 45.3% of respondents who reported the highest GP consultation frequencies, 'more than ten', reported the same attendance

frequency the following year. The implication of this cross-tabulation is that GP consultation frequency data from the BHPS is not suitable, because of individual variation between successive waves of the survey, for aggregation over multiple waves of the survey. Therefore further analyses relating to GP consultations were undertaken using data from the 1998 wave of the BHPS only.

Pearson chi-square analyses of the predictor variables for DEs (Table 6-3) lead to a rejection of the null hypothesis of no correlation between the predictors and having a DE for all predictors (sig.<0.05) except for 'Oral Health Impact Profile – physical pain'. The null hypothesis of no correlation between the predictor variables and having three or more GP consultations (Table 6-4) was rejected for all predictors. Significant predictor variables were then used in further analyses.

Model 1 - Binary logistic regression modelling of DEs and GPCs using common ADHS and BHPS predictors (Table 6-5) identified contrasting associations between outcome variables and the predisposing and enabling factors. Educational attainment was positively associated with DEs but negatively associated with GPCs. Females were more likely than males to have a DE and to report higher than average GPC frequency (OR = 1.7 and 1.9 respectively). Marital status did not show clear associations either with DEs or GPCs. Respondents aged 16 to 19 were the most likely to have a DE and to report higher GPC frequency compared with the reference categories (80 to 89 years and 90+ years respectively). However, there were no other significant age groups associated with GPC frequency, whereas the likelihood of having a DE decreased steadily with age up to

80 to 89 years, which was the minimum. Members of the armed forces were significantly more likely than people from social classes IIIM, IV and V to have a DE (OR = 1.0, 0.04, 0.03 and 0.02 respectively) but there was no significant association between social class and GPC frequency. Total household income was positively associated with having a DE, whereas the people whose household income was classified as in the 'higher' quintile were the most likely to have more than three GPCs. The likelihood of having higher numbers of GPC decreased with for people on lower incomes, but those from the highest income quintile were the least likely to have higher numbers of GPCs.

Model 2 - Binary logistic regression modelling (Table 6-6) identified predisposing and enabling factors which were significantly associated with DEs. Of the predisposing factors analysed; sex, age group and 'not visiting a dentist unless in need' were significant predictors of DEs. Of the enabling factors analysed; feeling anxious about visiting a dentist, finding NHS treatment expensive and believing that it 'costs less in the long run if you only go [to the dentist] when in pain' were significant predictors of DEs.

Women were 1.7 times more likely (OR=1.72) than men to report having a DE. The peak age group for having a DE was 16 to 19 years. Respondents in this age group were 3.3 times more likely than those from the reference age group, 80 to 89 years, to have had a DE. Respondents aged 60 to 69 and 70 to 79 were also significantly more likely to have a DE (OR = 2.4 and 2.4 respectively) than those aged 80 to 89 years.

Respondents who disagreed with the statement that they did not 'see the point in visiting the dentist unless they needed to' were 6.7 times more likely than those who 'definitely' agreed with this statement to have a DE. Respondents who agreed with this statement 'to some extent' were twice as likely than those who 'definitely' agreed with it to have a DE.

Dental anxiety correlated significantly with lower DE rates. Respondents who reported not feeling anxious about visiting a dentist were nearly twice as likely to have had a DE than those who reported 'definitely' feeling anxious (OR = 1.9). Respondents who 'felt like that to a certain extent' (i.e. anxious about visiting a dentist) were 1.6 times more likely to have had a DE compared with those who were 'definitely anxious'. However, respondents' feelings about being 'nervous of some kinds of treatments' were not significantly associated with having a DE.

Respondents who did not report 'finding NHS treatment expensive' were twice as likely to report having had a DE than those who 'definitely felt like that'. Respondents who felt like that 'to some extent' were 1.5 times more likely to have a DE than those who 'definitely felt like that'. Respondents who agreed 'to some extent' with the statement that 'it costs less in the long run if I only go [to the dentist] when in trouble' were the least likely to report having had a DE. Respondents who 'definitely' agreed with this statement were 1.4 times more likely to have had a DE and respondents who 'didn't feel like that' were 1.9 times more likely to report having had a DE.

Model 3a - As with results from the binary logistic regression model, results from the ordinal logistic regression of attendance for a DE in the last five years (Table 6-7) show that women were more likely than men to have a DE. Respondents who agreed either 'definitely' or 'to some extent' with the statement 'I don't go [to the dentist] unless I need to' were less likely to have had a DE than those who disagreed. Feeling anxious about visiting the dentist was found to be negatively associated with having a DE. 'Finding NHS treatment expensive' was negatively associated with having a DE. Disagreeing with the statement that 'it costs less in the long run to visit only when in trouble' was positively associated with having a DE, however, the direction of the associations between the other responses were inconclusive.

In contrast to the binary logistic regression model, age group was not found to be significantly associated with five-year frequency of DEs. Also, respondents with a degree qualification or higher were significantly more likely than those with 'other kinds of qualifications' to have a DE. Total OHIP score was found to be negatively associated with having a DE.

Model 3b - Results from the ordinal logistic regression of dental attendance when in trouble (Table 6-8) found different predictors of attendance than those identified by the ordinal analysis of attendance for a DE. Respondents with an educational attainment of 'degree or higher' were significantly more likely than people with 'other' qualifications to have visited a dentist when in trouble, although there was no significant difference in attendance between people with a 'degree or higher' and people with 'no qualifications'.

In contrast to the ordinal model of DEs, total OHIP score was found to be positively associated with visiting when in trouble.

Model 4 - Binary logistic regression modelling of GP consultation frequency (Table 6-9) identified significant correlations between predisposing, illness level and enabling factors and having three or more GPCs. In summary, sex, marital status, age group and race were found to be significant predisposing factors. Whereas, of the enabling factors, total household income was a significant predictor, and GHQ score, number of health problems and whether health limits daily activities were significant illness level predictors.

Females were 1.7 times more likely than males to report higher numbers of GPCs. With regard to marital status, respondents who had never married were the least likely to report higher numbers of GPCs. Married respondents were 1.4 times more likely than those never married to have three or more GPCs. Widowed respondents were the most likely to report above average numbers of GPCs (OR=1.6).

Age was found to be negatively associated with number of GPCs. Peak likelihood of having above average numbers of GPCs was for respondents aged between 16 and 19 years, who were 7.9 times more likely than respondents aged over 90 years old to have three or more GPCs. Race was also found to be associated with number of GPCs. Respondents from the 'Other (mostly Chinese)' category were found to be 2.3 times more likely to have reported above average GPCs compared with 'white' respondents.

Total household income was found to be negatively associated with above average numbers of GPCs. Respondents from the lowest income quintile were found to be 1.3 times more likely to report above average numbers of GPCs than respondents from the highest income quintile. GPC frequency decreased with income, although there was no significant difference between the 'higher' and 'highest' income quintiles.

All measures of health status were negatively associated with numbers of GPCs. An incremental increase in GHQ score was significantly associated with a 1.06 times increase in above average numbers of GPCs. Respondents who said that their health limited their daily activities were 2.5 times more likely to report higher than average GPCs than those whose health did not limit their activities. Similarly, respondents with three or more health problems were 7.6 times more likely than those with no health problems to report above average numbers of GPCs, compared to respondents with one or two health problems, who were 3.2 times more likely to report higher numbers of GPCs.

Model 5 - In common with results from the binary logistic regression model, results from the ordinal regression model of GP consultation frequency (Table 6-10) found that women are more likely than men to visit their GP more frequently. Regarding marital status, being married was associated with higher numbers of GPCs than with never having been married. Otherwise marital status was not significantly associated with frequency of GPCs. Age was also found to be negatively associated with GPC

frequency. The same association between race and GPC frequency was found in the ordinal model. Respondents with the highest household income were the least likely to have higher levels of GPCs, with a marginal increase in GPC frequency from the 'higher' to 'lowest' income quintiles. In contrast to the binary model, higher educational qualification was significantly associated with lower GPC frequency.

Poor health status, as measured by GHQ score and number of health problems, were both associated with higher GPC frequency. However, having a health problem which limited daily activity was not significantly associated with higher GPCs in the ordinal model.

Collinearity diagnostics from the linear regression models of DEs and GPCs (Table 6-11 and Table 6-12) show that in both models the variance inflation factors (VIF) for all predictors are significantly less than ten and that the tolerances are greater than 0.1. Both of these measures indicate that collinearity between predictors was not a problem in either of the logistic regression models.

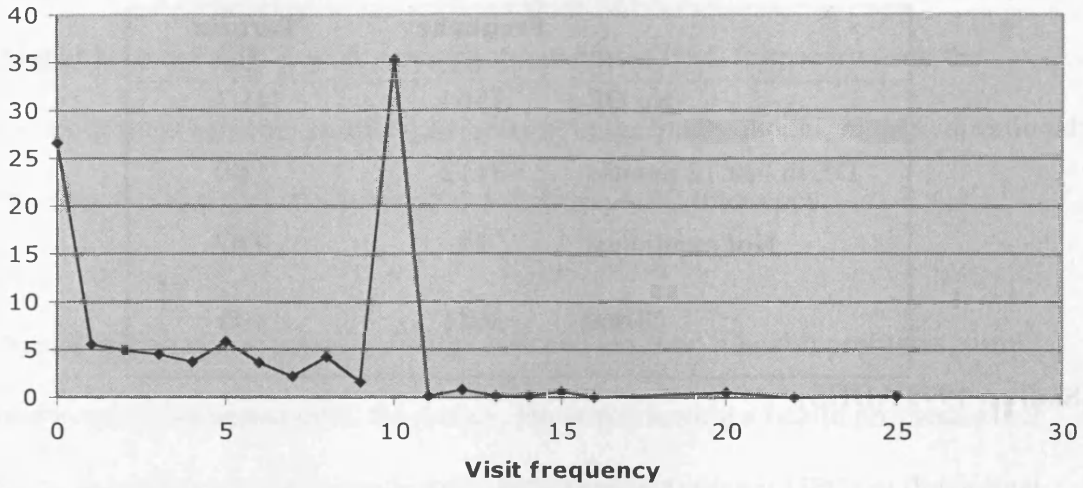
A comparison of the effectiveness of the models of attendance generated (Table 6-13) shows that the two models of attendance for a DE explained more of the variance in DEs than the proportion of variance in GPCs explained by the models generated for GP consultations, although the differences in effectiveness were small.

Table 6-1: Frequency of dental examination and reports (DEs) in England and Wales 1998

	Frequency n	Percent %
No DE	1504	41.3
DE in last 12 months	2112	58.0
Not mentioned	25	0.07
Total	3641	100

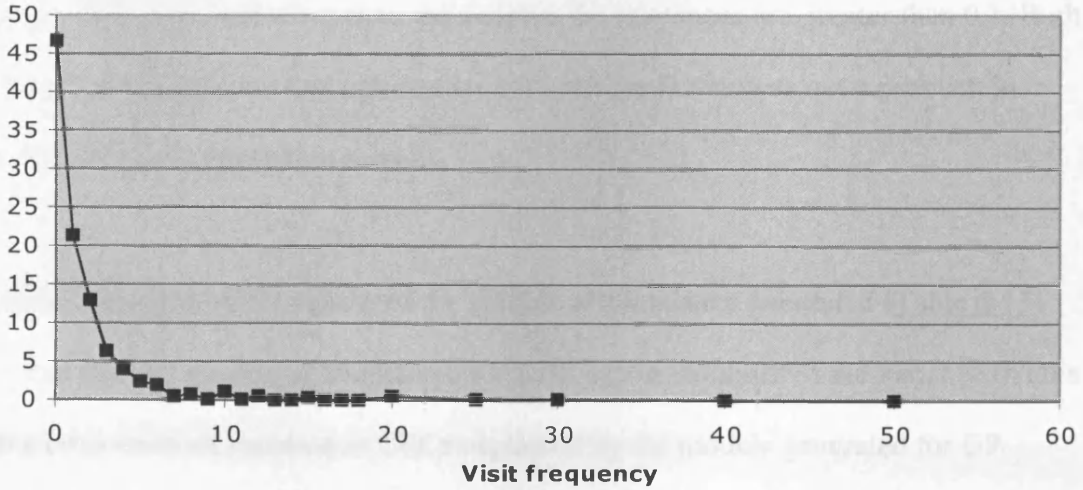
(**Source**: 1998 ADHS)

Figure 6-1: Frequency of DEs in England and Wales in the five years 1994 to 1998



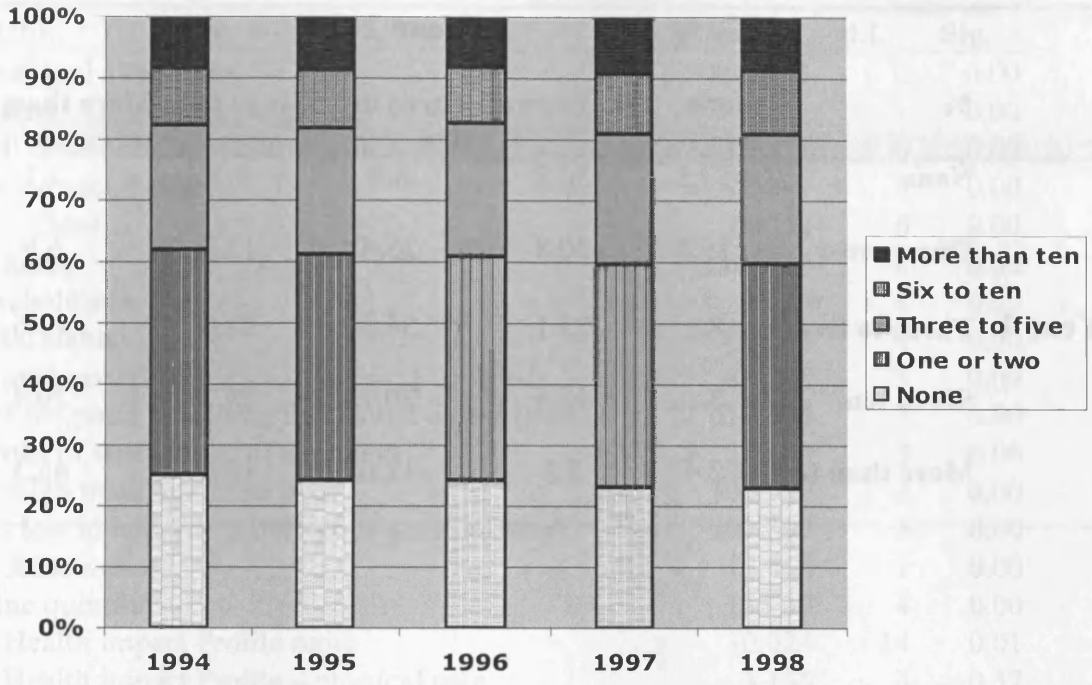
(**Source:** 1998 ADHS)

Figure 6-2: Frequency of dental visits 'for trouble' in England and Wales in the five years 1994 to 1998



(**Source:** 1998 ADHS)

Figure 6-3: Rate of annual GP consultations (GPCs) in England and Wales in the five years 1994 to 1998



(**Source:** 1994-1998 BHPS)

Table 6-2: Mean flux over five years (1994-1998) between GP attendance frequency groups

		Year 2				
	%	None	One or two	Three to five	Six to ten	More than ten
Year 1	None	53.5	30.2	8.8	3.1	2.1
	One or two	29.3	50.8	25.4	12.3	6.9
	Three to five	8.1	25.1	38.0	22.0	12.6
	Six to ten	3.3	11.6	20.7	28.7	20.4
	More than ten	2.4	7.3	12.0	19.8	45.3

Table 6-3: Summary of chi-square analyses of contingency table valuations of DEs by predisposing, enabling and illness level predictor variables

Variable	χ^2 value	d.f.	Sig.
Educational attainment	159.131	2	0.00
Gender	20.31	1	0.00
Social class of head of household	118.571	6	0.00
Grouped social class	70.897	3	0.00
Social Class	78.052	6	0.00
Age group	209.784	8	0.00
Household size	95.27	8	0.00
Marital status	80.191	4	0.00
Feel anxious	83.878	3	0.00
Don't see point in visiting the dentist unless need to	619.385	3	0.00
Nervous of some kinds of treatment	32.192	3	0.00
Find NHS treatment expensive	106.959	3	0.00
Costs less in long run if only go when in trouble	292.392	3	0.00
Health Insurance	13.464	1	0.00
Income quintile	145.35	4	0.00
Oral Health Impact Profile score	30.024	14	0.01
Oral Health Impact Profile – physical pain	3.155	3	0.37

Table 6-4: Summary of chi-square analyses of contingency table valuations of three or more GPCs by predisposing, enabling and illness level predictor variables

Variable	χ^2 value	d.f.	Sig.
Educational qualification	159.886	2	0.00
Social class	57.348	6	0.00
Gender	234.06	1	0.00
Age group	189.951	8	0.00
Race	9	3	0.03
Marital status	114.19	4	0.00
Health insurance	28.142	1	0.00
Income quintile	198.061	4	0.00
General Health Questionnaire	498.168	33	0.00
Number of health problems	1239.963	2	0.00
Health limits daily activity	773.49	1	0.00

Table 6-5: Model 1 - Binary logistic regression modelling of predictor variables for DEs and GPCs in 1998

Variable		DEs		GPCs	
		Sig.	OR	Sig.	OR
Educational attainment	No qualifications	0.00+	1.00	0.00+	1.00
	Other	0.00+	1.61	0.00+	0.77
	Degree or higher	0.00+	1.66	0.02+	0.79
Sex – Female		0.00+	1.71	0.00+	1.86
Legal marital status	Separated	0.01+	1.00	0.08	1.41
	Never married	0.96	0.99	0.05	1.00
	Married	0.16	1.45	0.01+	1.23
	Divorced	0.82	1.07	0.14	1.18
	Widowed	0.61	1.17	0.01+	1.06
Age group	16-19	0.00+	7.45	0.04+	2.04
	20-29	0.00+	3.99	0.17	1.57
	30-39	0.00+	4.90	0.48	1.26
	40-49	0.00+	5.17	0.77	1.10
	50-59	0.00+	4.61	0.16	1.57
	60-69	0.00+	3.51	0.07	1.78
	70-79	0.00+	2.53	0.05	1.87
	80-89	0.00+	1.00	0.14	1.62
	90+	0.86	1.18	0.00+	1.00
Social class	Armed Forces	0.02+	1.00	0.71	1.30
	I Professional	0.10	0.15	0.15	1.26
	II Management & Technical	0.05	0.10	0.39	1.10
	IIINM Skilled non-manual	0.05	0.10	0.11	1.19
	IIIM Skilled manual	0.04+	0.09	0.30	1.12
	IV Partly skilled	0.03+	0.08	0.19	1.15
	V Unskilled	0.02+	0.07	0.67	1.00
Household income	Lowest	0.01+	1.00	0.00+	1.26
	Lower	0.22	1.14	0.00+	1.32
	Middle	0.14	1.23	0.00+	1.54
	Higher	0.00+	1.65	0.00+	1.80
	Highest	0.02+	1.45	0.00+	1.00
Constant		0.78	0.71	0.00+	0.10

+ - *Denotes significant predictor*

Table 6-6: Model 2 - Binary logistic regression modelling of predictor variables for DEs in 1998

Variable		Sig.	OR
Educational attainment	No qualifications	0.98	1.00
	Other	0.90	0.98
	Degree or higher	0.97	1.01
Household size		0.24	1.06
Sex - Female		0.00+	1.72
Legal marital status	Separated	0.04+	1.00
	Never married	0.88	1.05
	Married	0.12	1.61
	Divorced	0.34	1.38
	Widowed	0.53	1.28
Age group	80-89	0.08	1.00
	16-19	0.02+	3.32
	20-29	0.21	1.78
	30-39	0.20	1.77
	40-49	0.14	1.94
	50-59	0.09	2.09
	60-69	0.04+	2.44
	70-79	0.04+	2.42
	90+	0.24	11.82
Social class	Armed Forces	0.37	1.00
	I Professional	0.18	0.21
	II Management & Technical	0.13	0.17
	IIINM Skilled non-manual	0.14	0.18
	IIIM Skilled manual	0.20	0.23
	IV Partly skilled	0.16	0.19
	V Unskilled	0.20	0.22
Don't go unless need to	Definitely	0.00+	1.00
	To some extent	0.00+	2.05
	Don't feel like that	0.00+	6.73
	Don't know	0.00+	4.28
Anxious about visiting	Definitely	0.00+	1.00
	To some extent	0.00+	1.59
	Don't feel like that	0.00+	1.85
	Don't know	0.08	2.10
Nervous	Definitely	0.15	1.77
	To some extent	0.09	1.96
	Don't feel like that	0.19	1.67
	Don't know	0.29	1.00
Find NHS expensive	Definitely	0.00+	1.00
	To some extent	0.00+	1.50
	Don't feel like that	0.00+	2.00
	Don't know	0.74	1.05

Continued overleaf...

Table 6-6: Model 2 - Binary logistic regression modelling of predictor variables for DEs in 1998 (continued)

Variable		Sig.	OR
Costs less if go when in pain only	Definitely	0.03+	1.39
	To some extent	0.00+	1.00
	Don't feel like that	0.00+	1.93
	Don't know	0.49	1.14
Annual household income quintile	Lowest	0.46	1.00
	Lower	0.17	1.25
	Middle	0.67	1.08
	Higher	0.22	1.24
	Highest	0.85	1.04
OHIP total		0.21	0.98
Constant		0.05	0.07

+ - *Denotes significant predictor*

Table 6-7: Model 3a - Ordinal logistic regression modelling of predictor variables for DE frequency in the five years 1994-1998

Variable		Estimate	Sig.
[NUM5CHCK = .00]		-3.38	0.00
[NUM5CHCK = 1.00]		-1.61	0.03
Educational attainment	No qualifications	-0.03	0.87
	Other	0.05	0.69
	Degree or higher	0.00 .	
Household size		0.04	0.29
Sex	Male	-0.67	0.00+
	Female	0.00 . +	
Legal marital status	Never married	-0.21	0.38
	Married	0.15	0.48
	Separated	-0.44	0.19
	Divorced	-0.03	0.90
	Widowed	0.00 .	
Age group		0.02	0.69
Social class	I Professional	-0.17	0.81
	II Management & Technical	-0.18	0.80
	IIINM Skilled non-manual	0.15	0.83
	IIIM Skilled manual	0.10	0.88
	IV Partly skilled	-0.09	0.90
	V Unskilled	-0.12	0.87
	Armed forces	0.00 .	
Don't go unless need to	Definitely	-2.17	0.00+
	To some extent	-1.39	0.00+
	Don't know	-0.39	0.14
	Don't feel like that	0.00 . +	
Anxious about visiting	Definitely	-0.76	0.00+
	To some extent	-0.20	0.09
	Don't know	-0.22	0.55
	Don't feel like that	0.00 . +	
Nervous	Definitely	-0.20	0.15
	To some extent	0.13	0.27
	Don't know	-0.86	0.01+
	Don't feel like that	0.00 . +	
Find NHS expensive	Definitely	-0.38	0.00+
	To some extent	0.08	0.50
	Don't know	-0.27	0.03+
	Don't feel like that	0.00 . +	
Costs less if go when in pain only	Definitely	-0.38	0.00+
	To some extent	-0.47	0.00+
	Don't know	-0.65	0.00+
	Don't feel like that	0.00 . +	

Continued overleaf...

Table 6-7: Model 3a - Ordinal logistic regression modelling of predictor variables for DE frequency in the five years 1994-1998 **(continued)**

Variable		Estimate	Sig.
Annual household income quintile	Lowest	0.07	0.66
	Lower	0.10	0.47
	Middle	-0.02	0.91
	Higher	0.25	0.06
	Highest	0.00 .	
OHIPTOT		-0.05	0.00+

+ - *Denotes significant predictor*

Table 6-8: Model 3b - Ordinal logistic regression modelling of predictor variables for dental attendance frequency 'for trouble' in the five years 1994-1998

Variable		Estimate	Sig.
[NUM5TRBL = .00]		0.34	0.63
[NUM5TRBL = 1.00]		3.63	0.00
Educational attainment	No qualifications	-0.31	0.06
	Other	-0.30	0.02[+]
	Degree or higher	0.00.	[+]
Household size		0.06	0.10
Sex	Male	-0.06	0.50
	Female	0.00.	
Legal marital status	Never married	0.06	0.78
	Married	0.15	0.45
	Separated	0.24	0.45
	Divorced	-0.06	0.81
	Widowed	0.00.	
Age group		0.02	0.61
Social class	I Professional	0.31	0.64
	II Management & Technical	0.32	0.61
	IIINM Skilled non-manual	0.11	0.86
	IIIM Skilled manual	0.25	0.69
	IV Partly skilled	0.15	0.81
	V Unskilled	0.13	0.84
	Armed forces	0.00.	
Don't go unless need to	Definitely	-0.26	0.31
	To some extent	0.08	0.51
	Don't know	0.36	0.17
	Don't feel like that	0.00.	
Anxious about visiting	Definitely	-0.18	0.18
	To some extent	0.10	0.36
	Don't know	-0.17	0.64
	Don't feel like that	0.00.	
Nervous	Definitely	-0.02	0.90
	To some extent	-0.15	0.18
	Don't know	-0.24	0.47
	Don't feel like that	0.00.	
Find NHS expensive	Definitely	0.11	0.33
	To some extent	0.15	0.19
	Don't know	-0.12	0.21
	Don't feel like that	0.00.	
Costs less if go when in pain only	Definitely	0.17	0.14
	To some extent	0.21	0.08
	Don't know	-0.31	0.05
	Don't feel like that	0.00.	

Continued overleaf...

Table 6-8: Model 3b - Ordinal logistic regression modelling of predictor variables for dental attendance frequency 'for trouble' in the five years 1994-1998 (continued)

Variable		Estimate	Sig.
Annual household income quintile	Lowest	0.16	0.29
	Lower	0.03	0.86
	Middle	0.05	0.71
	Higher	0.08	0.51
	Highest	0.00 .	
OHIPTOT		0.26	0.00+

+ - *Denotes significant predictor*

Table 6-9: Model 4 - Binary logistic regression modelling of predictor variables for three or more GPCs in the previous year

Variable		Sig.	OR
Educational qualification	No qualification	0.36	1.00
	Degree level or above	0.59	0.94
	Below degree	0.16	0.90
Social class	Unskilled	0.47	1.00
	Professional	0.17	1.28
	Managerial & Technical	0.45	1.10
	Skilled non-manual	0.08	1.23
	Skilled manual	0.51	1.09
	Partly skilled	0.46	1.09
	Armed Forces	0.92	1.08
Sex - female		0.00+	1.71
Age group	90+	0.00+	1.00
	16-19	0.00+	7.93
	20-29	0.00+	4.97
	30-39	0.00+	3.21
	40-49	0.03+	2.33
	50-59	0.00+	2.99
	60-69	0.00+	3.23
	70-79	0.00+	2.92
	80-89	0.13	1.80
Legal marital status	Never married	0.00+	1.00
	Married	0.00+	1.40
	Separated	0.14	1.39
	Divorced	0.19	1.18
	Widowed	0.00+	1.55
Race	White	0.01+	1.00
	Black	0.33	1.23
	Indian/Pakistani/Bangladeshi	0.22	1.31
	Other (mostly Chinese)	0.00+	2.33
Have private health insurance?		0.48	0.95
Household income quintiles	Highest	0.04+	1.00
	Lowest	0.01+	1.33
	Lower	0.02+	1.25
	Middle	0.01+	1.28
	Higher	0.05	1.19
General Health Questionnaire		0.00+	1.06
Number of health problems	None	0.00+	1.00
	1 or 2	0.00+	3.17
	3 or more	0.00+	7.62
Health limits daily activity		0.00+	2.48
Constant		0.00+	0.01

+ - *Denotes significant predictor*

Table 6-10: Model 5 - Ordinal logistic regression modelling of predictors variables for GPCs in the previous year

Variables		Estimate	Sig.
[HHL2GP2 = 1.00]		-4.38	0.00
[HHL2GP2 = 2.00]		-2.40	0.00
[HHL2GP2 = 3.00]		-1.07	0.11
[HHL2GP2 = 4.00]		0.09	0.89
Educational Qualification	Degree level or above	-0.20	0.03+
	Below degree	-0.13	0.02+
	No qualification	0.00	0.00+
Social class	Professional	-0.28	0.65
	Managerial & Technical	-0.38	0.54
	Skilled non-manual	-0.28	0.66
	Skilled manual	-0.37	0.55
	Partly skilled	-0.41	0.51
	Unskilled	-0.50	0.43
	Armed Forces	0.00.	
Sex	Male	-0.57	0.00+
	Female	0.00	0.00+
Age group		-0.09	0.00+
Legal marital status	Married	0.13	0.03+
	Separated	-0.01	0.95
	Divorced	0.14	0.14
	Widowed	0.17	0.12
	Never married	0.00	0.00+
Race	White	-0.57	0.01+
	Black	-0.38	0.16
	Indian/Pakistani/Bangladeshi	-0.24	0.38
	Other (mostly Chinese)	0.00	0.00+
Have private health insurance	Not insured	-0.04	0.53
	Insured personally or through family	0.00	
Household income quintiles	Lowest	0.17	0.04+
	Lower	0.15	0.05
	Middle	0.14	0.04+
	Higher	0.15	0.03+
	Highest	0.00	0.00+
General Health Questionnaire		0.05	0.00+
Number of health problems	None	-2.01	0.00+
	1 or 2	-0.99	0.00+
	3 or more	0.00	0.00+
Health limits daily activity	No	-0.99	0.07
	Yes	0.00	

+ - *Denotes significant predictor*

Table 6-11: Collinearity diagnostics of the binary logistic regression model predictors of DEs

Variables	Tolerance	VIF
Educational attainment	0.65	1.53
Household size	0.80	1.25
Sex	0.90	1.11
Legal marital status	0.73	1.37
Total OHIP score	0.95	1.05
Age group	0.63	1.58
Annual total household income quintile	0.69	1.44
Social Class	0.71	1.41
Always feel anxious about going	0.56	1.80
Don't see point in visiting the dentist unless need to	0.81	1.23
Nervous of some kinds of treatment	0.55	1.82
Find NHS treatment expensive	0.95	1.05
Costs less in long run if only go with trouble	0.84	1.19

Table 6-12: Collinearity diagnostics of the binary logistic regression model predictors of GPCs

Variables	Tolerance	VIF
Sex	0.96	1.04
Social class	0.75	1.33
Legal marital status	0.83	1.21
Age group	0.58	1.73
General Health Questionnaire	0.89	1.12
Number of health problems	0.70	1.42
Health limits daily activity	0.76	1.32
Have private health insurance	0.90	1.11
Race	0.99	1.01
Educational qualification	0.62	1.61
Household income quintiles	0.67	1.50

Table 6-13: Summary of the effectiveness of the models generated

Model type	Application	Measure of effectiveness		
		Cox & Snell R^2	*Nagelkerke R^2*	
Binary Logistic Regression	Having a DE	0.22	0.31	
	3 or more GPCs	0.20	0.28	
		Cox and Snell$^+$	*Nagelkerke*$^+$	*McFadden*$^+$
Ordinal Logistic Regression	5-year DE frequency	0.31	0.36	0.19
	Annual GPC frequency	0.25	0.27	0.10

+ - *Measures of pseudo R^2*

6.2 Discussion

Key findings

The comparison of patterns of utilisation of primary dental and medical services which is described in this section identifies similarities and differences in how people use these services. In summary, factors associated with DEs in the 12 months prior to interview were found to be from the predisposing and enabling groups. Factors associated with DEs in the previous five years were from the predisposing, enabling and illness level groups; whereas only illness level factors were associated with visits to the dentist in the previous five years 'when in trouble'. GPC frequency was associated with predisposing, enabling and illness level factors.

The hypothesis that primary dental care utilisation is not associated with individual-level illness level factors is partially accepted. The hypothesis was valid when considering dental care utilisation in the previous 12 months. However, the associations between utilisation and OHIP are significant in the separate models of preventive-led and treatment-led utilisation (although the direction of association differed); meaning that in these cases the hypothesis is rejected. The hypotheses that dental care utilisation is associated with predisposing factors and positively associated with enabling factors are both accepted[30]. Of the predisposing factors analysed; sex, education, age group and 'not visiting a dentist unless in need' were significant predictors of DEs, although the

[30] These questions were worded such that agreeing with the question was agreeing with a negative statement (for example agreeing with the statement that 'dental treatment costs less in the long-run if I go when in pain only'). Therefore, the negative associations found in the regression models are interpreted to be positive associations.

interpretation of associations with age and education are not clear. Of the enabling factors analysed; feeling anxious about visiting a dentist, finding NHS treatment expensive and believing that it 'costs less in the long run if you only go [to the dentist] when in pain' were significant predictors of DEs. However, there were no associations between enabling (except for education) or predisposing factors and treatment-led dental care utilisation, meaning that these hypotheses are rejected for this dental health behaviour.

In both models of primary medical care utilisation, significant positive associations were found with illness level factors, meaning that this hypothesis is accepted. However, the null hypotheses of no associations between primary medical care and either predisposing or enabling factors are rejected. GPC frequency was consistently negatively associated with age and income, and partially negatively associated with education. Furthermore sex, marital status and race were significant predictors of primary medical care utilisation.

The predictive power of both regression models of DEs was higher than that of GPCs across all measures. Although the difference between the predictive powers of the ordinal models was larger than that between the binary models, the maximum variation in the utilisation of primary medical or dental services explained by the models developed was 36%.

Strengths and Limitations

The strengths of this study are that it is developed from a well-established theoretical basis, that the datasets used have large sample sizes and record information at the individual level, and that the datasets include a range of social, economic and illness-level factors.

The weaknesses of this study include limitations which are common to most secondary analyses as well as those which are specific to this study. The likely effect (magnitude and direction) of each limitation on the findings is considered and, where appropriate, recommendations for future studies are outlined.

This study used the datasets from two surveys which recorded health service utilisation and a range of individual-level information. However, neither survey was designed specifically to record health service utilisation and the potential influencing factors. This meant that factors were not included in the regression models which might have been of interest either because they did not feature in the data collection protocols, such as the absence of information regarding reasons for visiting a GP in the BHPS, or the wording of questions was not appropriate for inclusion, such as the recording in the ADHS of health insurance status only for respondents who had visited a dentist. A potential outcome of this is that the observed associations may be attenuated by unknown confounders. There was also a limitation due to the requirement to maintain comparability between the factors in the regression models as much as possible. Comparisons of findings from this study with those from other studies must give

consideration both to the predictors which were included in analyses and those which were absent.

The use of datasets which recorded health service utilisation at the individual-level was a fundamental part of this study. Self-reported utilisation of health services has been found to be reliable in studies of primary medical (Roberts, Bergstralh et al. 1996) and dental service utilisation (Gilbert, Rose et al. 2002), although over-estimation using this method has also been reported (Sjostrom, Lind et al. 1998). An important consideration when using self-reported utilisation is the timeframe being recalled, with the reliability of recall longer than the previous six months found to be less reliable than shorter timeframes (Gilbert, Rose et al. 2002). Considering the recall timeframes which both the BHPS (12 months) and ADHS (up to five years) cover, reliability of this self-report method may have led to over estimations of utilisation. If self-reported utilisation has resulted in over estimation of actual utilisation non-significant associations may have been identified as significant in the regression models, which could have resulted in the null hypothesis being falsely rejected (type I error). A possible solution to this problem would be to link individual-level self-report data with more reliable centrally recorded data on utilisation of health services (such as individual primary medical care records), as is used in the USA-based Medical Expenditure Panel Survey.

Within the statistical analyses employed in this study there are two key assumptions which may have affected the findings. Firstly, the assumption of linear relationships between continuous predictor variables and utilisation may have missed non-linear

effects which could potentially be of interest. Secondly, in the ordinal logistic regression models it was assumed that the relationships between the independent variables and each level of the dependent variables were the same (for example it was assumed that the significant association between OHIP and DE frequency held true for each category of DE frequency)[31]. A potential consequence of this limitation is that associations which were only significant for some levels of the dependent variables may have been missed. Future studies which employ these analyses may benefit from considering non-linear relationships between the outcome and the individual predictor variables, and between the predictor variables and individual levels of the outcome variable.

Interpretations

To the author's knowledge this is the only study which has directly compared predictors of utilisation of primary medical and dental services, and that there is only one other study which has compared predictors of preventive-led and treatment-led utilisation of primary dental services (Gilbert, Stoller et al. 2000). However, there have been several studies of utilisation of each service independently with which the associations in this study are compared.

The increased GPC and DE probability for women is in agreement with literature showing that women use both primary medical (Field and Briggs 2001) and dental (Batchelor 2004) services more frequently than men. With regards to age, the peak

[31] The option to test this assumption is extremely sensitive to the sample size, meaning that this assumption is more likely to be found to be invalid for larger sample sizes, and it has therefore not been included in this study.

likelihood of DEs for people aged 16-19 years conflicts with studies undertaken by Batchelor (2004) and by Richards et al (2002). However, in these studies the youngest age group was defined as '25 or less' and '18 to 29' respectively, in contrast to the separate '16 to 19' and '20 to 29' years age groups used in this study. In the 16 to 19 years age group eligibility for exemption from NHS dental charges still applied to people in full-time education (Department of Health. 2004a) which may help to explain this peak attendance. Finch et al (1988) suggest that from this age group through those aged 20 to 30 years, a reduction in DE frequency might be expected due to a withdrawal of exemption from NHS dental charges and an increase in personal responsibility, rather than parental responsibility, for their health. However, the peak DE frequency found in this study suggests that attendance patterns may, at age 16 to 19 years, still be influenced by habitual attendance and parental guidance and that the reduction in DEs proposed by Finch et al (1988) may be delayed until age 20 to 30 years. Further analysis of the dental attendance patterns of this age group may offer an insight into the transition from NHS charge-exempt status to paying charges for NHS dental care. The reduction in DE likelihood for older respondents is in agreement with findings reported by Batchelor (2004) but conflicts with those from Richards et al (2002). Kelly et al (2000) reported findings from the 1998 ADHS which identified the greatest increase in dental attendance as being in the over 65 years age group. Batchelor (2004) proposed that increased attendance rates in this age group were the result of people retaining their teeth for longer. These findings indicate that the lower likelihood of DEs for older respondents is likely to change in the coming years.

Lower levels of DEs were found to be associated both with concerns about the expense of NHS treatment and with belief in the cost-saving benefits of visiting a dentist only when in pain. These associations continued when focussing on preventive-led dental attendance, whereas treatment-led dental attendance was not associated with such concerns. This would be in agreement with studies reviewed in section 2.5, in which the effects of cost-sharing were more pronounced for preventive services or those without immediate health benefits. These findings indicate that the perception of dental treatment as expensive is an important barrier to utilisation, which disproportionately affects preventive dental health behaviour. If this perception persists in the current NHS dental charging structure then this is likely to be undermining efforts to encourage dentists to spend more time on prevention than on complex and invasive procedures (Department of Health. 2007b).

Considering the associations between concerns about the cost of treatment and dental service utilisation it might be hypothesised that total household income would be positively associated with DEs. However, no such association was found. The lack of a significant association between income and DEs may be due to the use of total household income as an indicator of ability to afford dental treatments. An alternative method of evaluating household economic status, such as the modified OECD (Organisation for Economic Co-operation and Development) equivalence scale[32] (van Doorslaer and Koolman 2004), could be incorporated into future studies.

[32] The OECD equivalence scale combines information on household income and family size into a single income measure.

In contrast to dental examinations and reports, GP consultations were associated with a wide range of predisposing, illness level and enabling factors. The association between higher GPC frequency and both lower total household income and lower educational qualifications is consistent with results from Morris et al (2003). In common with these associations, social class would be expected to be associated with GPCs. However, Morris et al (2003) concluded that 'social class exerts little independent influence on use once account is taken of income, education, and economic activity' and the results from this study are in agreement with this conclusion. Involving alternative measures of socioeconomic status, such as the Registrar General's Socio-economic group as well as indices of deprivation such as the index of multiple deprivation (Hippisley-Cox, Fenty et al. 2007) in future analyses of GPCs and DEs could be undertaken[33]. However, the inclusion of a suitable measure of economic activity as previously discussed may be a more appropriate addition to the utilisation model.

The association which has been found in this research between poor health and higher levels of GPCs is indicative of a service accessed by people with the greatest needs and reflects the horizontal equity of access to NHS primary medical care as described by van Doorslaer and Koolman (van Doorslaer and Koolman 2004). In contrast, the association between the uptake of DEs and measures of oral health and hygiene does not seem to be as simple. The association between low oral health impact profile scores, an indicator of the 'adverse impact of oral conditions on quality of life' (Smith, Baysan et al. 2009), and higher preventive-led dental utilisation found in the ordinal model suggests that having a

[33] Currently the ADHS does not record all the information required to derive the Index of Multiple Deprivation (Noble, McLennan et al. 2008).

DE forms part of a commitment to a high 'dental quality of life' (Nuttall, Steele et al. 2001). However, the association between OHIP and treatment-led dental utilisation was positive, indicating that these dental health behaviours differ substantially. The association of preventive-led dental utilisation with enabling, predisposing and illness-level factors is in agreement with findings from Swank et al (1986) in their study of preventive dental behaviour. However, Swank et al found that poor self-evaluated condition of teeth was positively associated preventive dental behaviour. Whereas findings detailed in this study suggest either that people whose oral health impacts on their daily life are more likely to have a treatment-led pattern of utilisation rather than preventive, or that poor oral health results from a treatment-led pattern of dental utilisation[34]. Previous studies of regular dental attendance have found it to be associated with lower rates of tooth loss and dental decay (Sheiham, Maizels et al. 1985), and that problem-oriented dental attenders have more dental disease than regular dental attenders (Gilbert, Stoller et al. 2000). However, consideration also has to be given to potentially subtle differences across a range of oral-health related behaviours which may influence dental attendance behaviour, dental self-care and the likelihood of experiencing dental disease (Gilbert, Stoller et al. 2000).

Utilisation of primary medical care services shares more in common with preventive-led utilisation of primary dental care services than treatment-led utilisation. However, treatment-led dental utilisation is associated with oral health which impacts on daily life, which is similar to the association of general health and primary medical service

[34] The cross-sectional nature of the data and the regression models used in this study do not indicate the direction of causality between associated variables.

utilisation. Concerns about the expense of dental treatment were associated with preventive-led dental utilisation but not treatment-led utilisation. In the overall evaluation of the effectiveness of the logistic regression models generated to explain variation in utilisation patterns observed the models applied to primary dental care were consistently more effective. The proportion of the variance of the outcome measures explained by the regression models is favourable when compared with other studies of primary medical and dental service utilisation (Andersen, McCutcheon et al. 1983; Morris, Sutton et al. 2003). The wider relative range of clinical reasons for consulting a GP compared with visiting a dentist for an examination and report indicate that any model of attendance is likely to be more effective when applied to dentistry. However, the difference in effectiveness between the models, particularly the binary logistic regression models, was small and was not considered to be clinically significant.

Chapter 7 Results and Discussion – The impact of patient charges on primary care dentistry

7.1 Results

According to the 1998 ADHS the frequency of self-reported attendance for dental treatment in the 12 months prior to interview in England and Wales was 63.7% (2302 of 3628 respondents). The majority of those who had treatment in this period received it through the NHS (75.4%). Treatment delivered privately comprised 22.5% of all treatments, and combined NHS and private treatment comprised 2.0%. Respondents in receipt of Income Support (IS), and therefore eligible for exemption from NHS dental charges, comprised 6.1% (223 of 3641) of ADHS respondents in England and Wales. Of these, 55.5% (122 of 220) reported having dental treatment in the 12 months prior to interview. This was found to be significantly lower (χ^2=7.36, df=1, p=0.007) than the proportion of ADHS respondents not receiving IS who reported having dental treatment in the same period (64.0%, 2180 of 3406). A comparison of the providers of treatment found that almost all (95.1%, 116 of 122) of the IS recipients who visited a dentist in the 12 months prior to interview had NHS treatment, compared with 74.4% of ADHS respondents not receiving IS (Table 7-1).

Comparisons of ADHS respondents in receipt of IS (who were therefore eligible for exemption from NHS dental copayments) and those not receiving IS (who were assumed to be ineligible for exemption) using cross-tabulation and Pearson chi-square analyses (Table 7-2) show significant variations for all variables. Respondents not receiving IS were more likely to have a qualification and to be qualified to a higher level than IS recipients (χ^2=113.9, df=2, p=0.000). IS recipients were more likely to be female

(χ^2=20.7, df=1, p=0.000), less likely to be married (χ^2=166.7, df=4, p=0.000) and were older than non-recipients (χ^2=29.0, df=8, p=0.000). IS recipients were more likely to be from the lower three social classes than non-recipients (χ^2=79.6, df=6, p=0.000). IS recipients reported higher levels of anxiety about visiting a dentist and were more nervous of certain treatments than non-recipients (χ^2=17.2, df=3, p=0.001 and χ^2=19.2, df=3, p=0.000 respectively. Although a higher proportion of IS recipients reported that they did not visit a dentist unless they needed to (χ^2=13.4, df=3, p=0.004) and that it costs less to visit the dentist when in pain only (χ^2=20.3, df=3, p=0.000), they were less likely to report finding NHS dental treatment expensive (χ^2=25.4, df=3, p=0.000). Almost all IS recipients had a total household income in the 'lowest' or 'lower' quintiles, which differed significantly from non-recipients (χ^2=591.8, df=4, p=0.000). Significantly more non-recipients reported 'painful aching' in their mouths compared with IS recipients (χ^2=24.5, df=3, p=0.000).

A similar comparison of respondents who visited a dentist and either received NHS treatment and paid no copayment[35], received NHS treatment but paid a copayment and those who received private dental treatment and paid a charge at the point of delivery found significant differences between these groups for all variables except for gender (χ^2=4.9, df=2, p=0.087) (Table 7-3). Charge-paying private respondents were more likely than copayment-paying NHS and copayment-exempt NHS respondents to be

[35] This group includes income support recipients who received NHS dental treatment in the previous 12 months, as well as other ADHS respondents who received NHS dental treatment and paid no additional charge at the point of treatment.

educated to degree level or higher, whereas copayment-exempt NHS respondents were more likely to have no qualifications (χ^2=56.1, df=4, p=0.000). Copayment-exempt NHS respondents were more likely to have never married and less likely to be married than other respondents (χ^2=270.9, df=8, p=0.000) and were also significantly younger than other respondents (χ^2=483.0, df=16, p=0.000). NHS copayment-paying and private charge-paying respondents had a similar distribution across the social classes, however, a higher proportion of charge-exempt NHS respondents were in the lower classes than the other copayment status groups with the converse found in the higher classes (χ^2=121.6, df=12, p=0.000).

Anxiety about visiting a dentist and about specific dental treatments was higher among copayment-exempt NHS respondents than copayment-paying (χ^2=25.5, df=6, p=0.000). Copayment-exempt NHS respondents were more likely to 'only visit [a dentist] when they need to' than copayment-paying NHS and charge-paying private respondents (χ^2=89.8, df=6, p=0.000) and were the most likely to feel that treatment 'costs less if you go [to a dentist] when in pain only' (χ^2=113.8, df=6, p=0.000). Whereas copayment-paying NHS respondents were the most likely to find NHS dental treatment expensive (χ^2=317.0, df=6, p=0.000). 31.6% of copayment-exempt NHS respondents had a total household income in the lowest quintile, compared with 9.5% of copayment-paying NHS and 8.5% of private charge-paying respondents, whereas 31.7% of private charge-paying respondents had a total household income in the highest quintile compared with 17.5% and 25.2% of copayment-exempt and copayment-paying NHS respondents

respectively (χ^2=224.4, df=8, p=0.000). Copayment-exempt NHS respondents reported experiencing pain in their mouths more often than copayment-paying NHS and charge-paying private respondents (χ^2=14.7, df=6, p=0.022).

The binary logistic regression model of dental attendance found that educational attainment, household size, age, social class, being nervous of specific treatments and total annual household income were not significant predictors of attendance (Table 7-4). Being in receipt of income support was the only criteria for exemption from NHS dental copayments recorded in the ADHS. This was positively associated with dental attendance, however, the p-value of this association was 0.08 and therefore this association was not considered significant. Women were 1.9 times more likely to visit a dentist than men. Respondents who were married were 2.3 times more likely to visit a dentist than those who were separated.

Dental anxiety was correlated significantly with a lower likelihood of attendance. Respondents who did not report feeling anxious about visiting a dentist were two times more likely than those who were 'definitely' anxious. Those who felt anxious 'to some extent' about visiting a dentist were 1.7 times more likely than respondents who were 'definitely' anxious to attend. Respondents who disagreed with the statement that they did not 'see the point in visiting the dentist unless they needed to' were 9.0 times more likely than those who 'definitely' agreed with this statement to visit a dentist. Respondents who agreed with this statement 'to some extent' were twice as likely than those who 'definitely' agreed with it to visit a dentist. Respondents who did not report

'finding NHS treatment expensive' were twice as likely to report having visited a dentist than those who 'definitely felt like that'. Respondents who felt like that 'to some extent' were 1.5 times more likely to visit a dentist than those who 'definitely felt like that'. Also, respondents who definitely agreed with the statement that 'it costs less in the long run if I only go [to the dentist] when in trouble' were the least likely to report having visited a dentist. Respondents who agreed 'to some extent' with this statement were 1.4 times more likely to have visited a dentist and respondents who 'didn't feel like that' were 2.0 times more likely to report having visited a dentist.

The addition of income support status as a predictor variable to the ordinal logistic regression models described in Chapter 6 (Table 6-7 and Table 6-8) did not alter the regression coefficients of the original predictor variables and had no effect on the significant associations previously described (Table 7-5 and Table 7-6). Income support status was not significantly associated with attendance in the previous five years for a DE (Table 7-5) or when in trouble (Table 7-6). The mean charge paid by respondents at the point of delivery of NHS and private treatment was £34.20 (sd=80.16) (Table 7-7). 30.7% (856 of 2789 respondents) of respondents paid no additional charge for their treatment (Figure 7-1). 95% of all respondents who had treatment paid less than £150 at the point of delivery and the maximum reported amount paid at the point of delivery of treatment was £1,200 (Figure 7-3). Taking into consideration the provider of treatment, 37.9% of respondents treated through the NHS received their treatment without charge at the point of delivery compared with 13.2% of respondents who were treated privately (Figure 7-2). Respondents treated through the NHS comprised a higher proportion of

people whose additional costs were in the lower cost bands (13.8% paid less than £10 and 21.7% between £10 and £20, compared with 4.7% and 12.7% respectively for respondents treated privately). The proportion of respondents who paid more than £20 for their treatment was higher for those treated privately than for those treated through the NHS across all of the higher cost bands. The mean additional charge paid by respondents at the point of delivery for treatment provided through the NHS (excluding copayment/charge=£0.00) was £22.99 (sd=50.52), compared with £75.51 (sd=138.02) for treatment provided privately. A comparison, using one-way analysis of variance, of the mean copayment or charge paid at the point of delivery by respondents treated through the NHS (£37.03, sd=59.94) and privately (£87.10, sd=144.79) found that treatment provided through the NHS cost significantly less than private treatment (F=115.4, df=1, p=0.000) (Table 7-7).

The treatment most frequently received by respondents was an examination and report (92.3% of respondents who received treatment in the previous 12 months had an examination and report). Scale and polishing (61.0%), having teeth restored (29.1%) and having x-rays taken (29.1%) were also frequently undertaken (Figure 7-4). Pearson chi-square analyses found no difference in the uptake of treatment options by copayment status except with regard to scale and polishing (χ^2=58.06, df=2, p=0.000) (Table 7-8). 67.2% of respondents who were treated privately and incurred an additional charge for their treatment received a scale and polish. This was comparable to the 65.1% of NHS charge-paying respondents, whereas only 46.9% of NHS charge-exempt respondents received this treatment (Figure 7-5). Pearson chi-square analyses found no difference in

the uptake of therapeutic treatments (χ^2=1.65, df=2, p=0.44) or diagnostic treatment items (χ^2=6.11, df=2, p=0.05) (Figure 7-6). NHS charge-exempt respondents were significantly less likely to receive preventive treatment items than NHS charge-paying and private charge-paying respondents (χ^2=58.06, df=2, p=0.000).

Self-reported dental attendance patterns (Firgure 7-7) were found to vary by copayment status. 71.0% of NHS copayment-paying respondents reported attending regularly for a 'check-up', compared with 62.9% of private charge-paying respondents and 50.5% of NHS copayment-exempt respondents. The proportion of respondents who classified themselves as occasional attenders was not found to vary by copayment status (10.9%, 9.6% and 11.3% of NHS copayment-exempt, NHS copayment-paying and private charge-paying respondents respectively). NHS copayment-exempt respondents were most likely to classify themselves as attending 'only when having trouble' (38.6%) compared with only 19.3% of NHS copayment-paying respondents and 25.8% of private charge-paying respondents. Pearson chi-square analysis found these differences to be significant (χ^2=117.24, df=4, p=0.000).

According to the NHS scale of patient charges, the mean value of treatment consumed by copayment-exempt NHS respondents was £20.01 (sd=18.88), £22.80 (sd=19.82) by NHS copayment-paying respondents and £22.39 (18.63) by private charge-paying respondents. NHS charge-exempt respondents were the most likely to have received treatment with a value of '< £10' and charge-paying private respondents the least likely, whereas the converse applied to treatment with a value between £10 and £20 (Figure

7-8). There was no difference between the copayment status groups across the higher values of treatment. Results from one-way ANOVA identified significant differences between the value of treatment consumed by charge-exempt and non-exempt respondents (t=3.20, df=1641, P=0.001) but no difference between non-exempt NHS and private respondents (t=-0.42, df=1009, P=0.674). Excluding scale and polishing from the calculation of treatment value, the mean value of treatment consumed by copayment-exempt NHS respondents was £16.21 (sd=£18.25), £17.25 (£19.43) by NHS copayment-paying respondents and £16.75 (sd=£18.37) by private charge-paying respondents. Results from one-way ANOVA found no significant differences between the value of treatment consumed by charge-exempt and charge-paying respondents (t=1.01, df=1658, P=0.312) or between copayment-paying NHS and charge-paying private respondents (t=-0.529, df=1003, P=0.597).

Multiple regression analysis of the value of treatment consumed by ADHS respondents according to the NHS scale of patient charges for dentistry found that total OHIP score was found to be positively associated with the value of treatment consumed (B=1.63, SE=0.15, β=0.20) (Table 7-9). Qualifications and gender were not significantly associated with the value of treatment consumed. Single respondents consumed significantly less treatment than widowed respondents (B=4.23, SE=2.09, β=0.04); no other marital status categories were significantly associated with more or less treatment consumption. No significant difference was found between the value of treatment consumed by respondents aged 20-29 years and those aged 16-19 years. However, respondents aged 16-19 years consumed significantly less treatment than all other age

groups except for those aged over 90 years. Respondents aged 50-59 and 60-69 years consumed the most treatment (B=10.65, SE=2.07, β=0.19 and B=10.22, SE=2.23, β=0.16 respectively). Neither income nor social class were associated with treatment consumption value.

Respondents who 'definitely' visited the dentist when in need consumed significantly more treatment than those who 'didn't' (B=-4.87, SE=1.08, β=-0.12). 'Definitely' finding NHS dental treatment expensive was associated with significantly lower consumption than not finding it expensive (B=-2.75, SE=0.98, β=-0.06). Similarly, respondents who 'definitely' felt that it costs less to visit the dentist when in pain only consumed significantly more than those who did not (B=-2.30, SE=1.05, β=-0.05). No association was found between the value of treatment consumed and either dental anxiety or being nervous of certain treatments.

Copayment-paying NHS respondents consumed significantly more treatment than copayment-exempt NHS respondents (B=-2.55, SE=0.98, β=-0.06). However, no significant difference was found in the value of treatment consumed by copayment-paying NHS and private charge-paying respondents.

Table 7-1: The proportion of dental treatment undertaken through the NHS and privately in the previous 12 months in England and Wales (1998) by Income Support status

Dental treatment provider	% respondents not in receipt of IS	% respondents in receipt of IS
NHS	74.4	95.1
Private	23.7	1.6
Combined	1.9	3.3

Table 7-2: A comparison of ADHS respondents in receipt of Income Support and the general population by predisposing, enabling and illness level variables (including chi-square significance tests)

Variable		Not in receipt of IS (%)	In receipt of IS (%)	Overall (%)
Educational attainment++	No qualifications	26.3	58.3	28.3
	Other	58.9	39.9	57.8
	Degree or higher	14.7	1.8	13.9
Sex++	Male	49.8	34.1	48.8
	Female	50.2	65.9	51.2
Legal marital status++	Never married	27.5	30.5	27.6
	Married	56.7	22.0	54.6
	Separated	2.0	6.7	2.3
	Divorced	6.0	19.3	6.8
	Widowed	7.9	21.5	8.7
Age group++	16 to 19	6.8	1.3	6.5
	20 to 29	15.5	15.6	15.5
	30 to 39	20.9	19.2	20.8
	40 to 49	16.8	19.2	17.0
	50 to 59	14.6	12.9	14.5
	60 to 69	12.4	8.9	12.2
	70 to 79	9.2	16.1	9.6
	80 to 89	3.5	5.8	3.6
	90+	0.3	0.9	0.3
Social Class++	I Professional	4.7	0.5	4.4
	II Management & Technical	26.6	7.9	25.5
	IIINM Skilled non-manual	25.2	19.8	24.9
	IIIM Skilled manual	20.5	29.2	21.0
	IV Partly skilled	16.2	28.2	16.9
	V Unskilled	6.4	14.4	6.9
	Armed forces	0.3	0.0	0.3
Anxious about visiting+	Definitely	23.9	33.3	24.4
	To some extent	24.3	29.8	24.6
	Don't feel like that	49.9	33.9	49.0
	Don't know	2.0	2.9	2.0
Don't go unless need to+	Definitely	18.4	27.5	18.9
	To some extent	17.0	19.9	17.1
	Don't feel like that	61.8	48.5	61.1
	Don't know	2.8	4.1	2.9

\+ - denotes P(sig.) < 0.05

++ - denotes P(sig.) < 0.001

Table 7-2: A comparison of ADHS respondents in receipt of Income Support and the general population by predisposing, enabling and illness level variables (including chi-square significance tests) (continued)

Variable		Not in receipt of IS (%)	In receipt of IS (%)	Total (%)
Nervous++	Definitely	30.6	45.9	31.4
	To some extent	33.0	23.3	32.4
	Don't feel like that	34.2	27.9	33.9
	Don't know	2.2	2.9	2.2
Find NHS expensive++	Definitely	28.3	16.4	27.7
	To some extent	23.3	15.8	22.9
	Don't feel like that	26.6	35.1	27.1
	Don't know	21.7	32.7	22.3
Costs less if go when in pain only++	Definitely	19.4	22.1	19.5
	To some extent	15.4	12.2	15.3
	Don't feel like that	56.2	47.1	55.7
	Don't know	8.9	18.6	9.4
Annual household income quintile++	Lowest	15.8	83.9	20.5
	Lower	20.0	14.7	19.6
	Middle	21.3	0.5	19.8
	Higher	20.5	0.9	19.2
	Highest	22.4	0.0	20.9
OHIP - Physical pain+	Never/hardly ever	60.8	50.0	60.2
	Occasional problem	31.0	31.4	31.1
	Problem fairly often	5.1	12.8	5.5
	Problem very often	3.0	5.8	3.2

\+ - denotes P(sig.) < 0.05

++ - denotes P(sig.) < 0.001

Table 7-3: A comparison of copayment status groups by predisposing, enabling and illness level variables (including chi-square significance tests)

Variable		Copayment status group (%)			Total (%)
		Copayment-exempt NHS	Copayment-paying NHS	Charge-paying private	
Educational attainment++	No qualifications	25.2	21.6	17.6	22
	Other	65.3	61.9	59	62.5
	Degree or higher	9.5	16.6	23.4	15.5
Sex	Male	46.7	51.1	50.8	49.6
	Female	53.3	48.9	49.2	50.4
Legal marital status++	Never married	49.4	21.1	22.6	30.6
	Married	36.4	64.8	63.3	55.2
	Separated	2.9	1.5	4.1	2.4
	Divorced	7.5	6.9	6.2	7
	Widowed	3.8	5.8	3.8	4.8
Age group++	16 to 19	21.1	1.2	1.1	7.7
	20 to 29	24.5	14.5	15.2	17.9
	30 to 39	22.4	23.9	23.7	23.3
	40 to 49	13.3	20.2	23.9	18.6
	50 to 59	8.9	18	16.5	14.8
	60 to 69	4.9	12.9	13.2	10.3
	70 to 79	3.3	7.9	5.6	6
	80 to 89	1.6	1.3	0.6	1.3
	90+	0	0.1	0.2	0.1
Social Class++	I Professional	2.8	5	6.9	4.7
	II Management & Technical	18.1	31.4	35.2	28.1
	IIINM Skilled non-manual	25.5	25.9	24.7	25.5
	IIIM Skilled manual	22.6	19.3	17.6	19.9
	IV Partly skilled	21.6	13.8	12.8	15.9
	V Unskilled	8.3	4.7	2.9	5.4
	Armed forces	1.1	0.1	0	0.4
Anxious about visiting++	Definitely	26.4	21.5	23.4	23.4
	To some extent	22.2	27.3	23.7	25
	Don't feel like that	48	50.1	51.6	49.7
	Don't know	3.4	1.1	1.3	1.9
Don't go unless need to++	Definitely	23.9	14.1	15.1	17.5
	To some extent	20.1	14.4	16.4	16.6
	Don't feel like that	51.3	69.5	66.3	63
	Don't know	4.7	2	2.3	2.9

\+ - denotes P(sig.) < 0.05

++ - denotes P(sig.) < 0.001

Table 7-3: A comparison of copayment status groups by predisposing, enabling and illness level variables (including chi-square significance tests) (continued)

Variable		Copayment status group (%)			Total (%)
		Copayment-exempt NHS	Copayment-paying NHS	Charge-paying private	
Nervous++	Definitely	35	28.2	29.9	30.7
	To some extent	29.2	35.9	30.7	32.8
	Don't feel like that	32.7	34.3	37.5	34.4
	Don't know	3.1	1.6	1.9	2.1
Find NHS expensive++	Definitely	23.6	30.4	28.2	27.7
	To some extent	17	29.4	16.2	22.9
	Don't feel like that	22.3	31.6	22.8	26.9
	Don't know	37.2	8.6	32.8	22.5
Costs less if go when in pain only++	Definitely	22.5	16	19	18.7
	To some extent	15.8	14.1	16.2	15.1
	Don't feel like that	46.2	63.7	60.3	57.3
	Don't know	15.4	6.1	4.5	8.9
Annual household income quintile++	Lowest	31.6	9.5	8.5	16.6
	Lower	18.5	17.9	15.1	17.6
	Middle	15.7	23.7	21.4	20.7
	Higher	16.7	23.7	23.4	21.3
	Highest	17.5	25.2	31.7	23.9
OHIP - Physical pain+	Never/hardly ever	56.2	62.7	58.8	59.8
	Occasional problem	33	29.7	33.3	31.4
	Problem fairly often	6.4	4.9	5.1	5.4
	Problem very often	4.5	2.7	2.8	3.3

\+ - denotes P(sig.) < 0.05

++ - denotes P(sig.) < 0.001

Table 7-4: Binary logistic regression modelling of predictor variables of dental attendance in 1998 (including income support status)

Variable		Sig.	Odds Ratio	95% CI for OR Lower	Upper
Educational attainment	No qualifications	0.61	1.00		
	Other	0.45	1.12	0.84	1.48
	Degree or higher	0.33	1.23	0.81	1.87
Household size		0.19	1.07	0.97	1.18
Sex		0.00+	1.91	1.52	2.40
Legal marital status	Separated	0.00+	1.00		
	Never married	0.43	1.29	0.68	2.44
	Married	0.01+	2.32	1.24	4.34
	Divorced	0.11	1.75	0.88	3.48
	Widowed	0.20	1.69	0.76	3.77
Age group	80-89	0.01+	1.00		
	16-19	0.11	2.39	0.82	6.92
	20-29	0.62	1.26	0.50	3.18
	30-39	0.43	1.44	0.58	3.55
	40-49	0.39	1.49	0.60	3.69
	50-59	0.05	2.24	0.91	5.50
	60-69	0.05	2.40	0.99	5.86
	70-79	0.05	2.43	0.99	5.95
	90+	0.32	7.90	0.13	490.5
Social class	I Professional	0.84	1.00		
	II Management & Technical	0.30	0.74	0.42	1.31
	IIINM Skilled non-manual	0.56	0.84	0.46	1.53
	IIIM Skilled manual	0.84	0.94	0.52	1.71
	IV Partly skilled	0.58	0.84	0.45	1.56
	V Unskilled	0.76	0.90	0.44	1.83
	Armed Forces	0.99	1.00	0.00	-
Anxious about visiting	Definitely	0.00+	1.00		
	To some extent	0.00+	1.65	1.21	2.25
	Don't feel like that	0.00+	1.95	1.40	2.72
	Don't know	0.06	2.33	0.98	5.56
Don't go unless need to	Definitely	0.00+	1.00		
	To some extent	0.00+	2.20	1.63	2.97
	Don't feel like that	0.00+	9.03	6.82	11.98
	Don't know	0.00+	5.58	3.01	10.35
Nervous	Definitely	0.43	1.12	0.84	1.50
	To some extent	0.93	1.02	0.72	1.43
	Don't feel like that	0.02+	0.38	0.17	0.85
	Don't know	0.06	1.00		
Find NHS expensive	Definitely	0.00+	1.00		
	To some extent	0.00+	1.51	1.14	1.99
	Don't feel like that	0.00+	2.02	1.51	2.70
	Don't know	0.52	1.10	0.82	1.47

Continued overleaf...

Table 7-4: Binary logistic regression modelling of predictor variables of dental attendance in 1998 (including income support status) (continued)

Variable		Sig.	Odds Ratio	95% CI for OR Lower	95% CI for OR Upper
Costs less if go when in pain only	Definitely	0.05+	0.73	0.53	0.99
	To some extent	0.00+	1.00		
	Don't feel like that	0.02+	1.41	1.06	1.88
	Don't know	0.08	0.71	0.48	1.05
Annual household income quintile	Lowest	0.20	1.00		
	Lower	0.37	1.18	0.82	1.69
	Middle	0.87	0.97	0.66	1.42
	Higher	0.14	1.36	0.91	2.02
	Highest	0.99	1.01	0.67	1.53
Income Support status		0.08	1.54	0.95	2.49
OHIP total		0.02+	1.05	1.07	1.10
Constant		0.00	0.03		

+ - *Denotes significant predictor*

Table 7-5: Ordinal logistic regression modelling of predictor variables for DE frequency in the five years 1994-1998 (including income support status)

Variable		Sig.	Odds Ratio	95% CI Lower	95% CI Upper
[NUM5chck = .00]		0.00	0.33	0.06	1.86
[NUM5chck = 1.00]		0.03	1.93	0.34	10.91
			1.00		
Educational attainment	No qualifications	0.85	0.97	0.69	1.35
	Other	0.70	1.05	0.81	1.37
	Degree or higher		1.00		
Household size		0.32	1.04	0.96	1.12
Sex	Male	0.00+	0.51	0.43	0.62
	Female		1.00		
Legal marital status	Never married	0.37	0.80	0.50	1.30
	Married	0.50	1.16	0.76	1.78
	Separated	0.17	0.64	0.33	1.22
	Divorced	0.86	0.95	0.58	1.58
	Widowed		1.00		
Age group		0.67	1.02	0.94	1.09
Social class	I Professional	0.81	0.84	0.21	3.39
	II Management & Technical	0.80	0.84	0.22	3.22
	IIINM Skilled non-manual	0.83	1.16	0.30	4.48
	IIIM Skilled manual	0.89	1.10	0.29	4.25
	IV Partly skilled	0.90	0.92	0.24	3.55
	V Unskilled	0.87	0.89	0.22	3.55
	Armed forces		1.00		
Don't go unless need to	Definitely	0.00+	0.11	0.09	0.14
	To some extent	0.00+	0.25	0.20	0.31
	Don't know	0.14	0.68	0.41	1.13
	Don't feel like that		1.00		
Anxious about visiting	Definitely	0.00+	0.47	0.36	0.61
	To some extent	0.09	0.81	0.64	1.03
	Don't know	0.54	0.80	0.39	1.62
	Don't feel like that		1.00		
Nervous	Definitely	0.15	0.82	0.62	1.08
	To some extent	0.26	1.14	0.90	1.44
	Don't know	0.01+	0.42	0.22	0.82
	Don't feel like that		1.00		
Find NHS expensive	Definitely	0.00+	0.68	0.54	0.86
	To some extent	0.48	1.09	0.86	1.39
	Don't know	0.03+	0.76	0.60	0.98
	Don't feel like that		1.00		
Costs less if go when in pain only	Definitely	0.00+	0.69	0.54	0.87
	To some extent	0.00+	0.62	0.49	0.79
	Don't know	0.00+	0.52	0.38	0.71
	Don't feel like that		1.00		

Continued overleaf...

Table 7-5: Ordinal logistic regression modelling of predictor variables for DE frequency in the five years 1994-1998 (including income support status) (continued)

Variable		Sig.	Odds Ratio	95% CI	
				Lower	Upper
Annual household income quintile	Lowest	0.84	1.04	0.74	1.45
	Lower	0.50	1.10	0.83	1.47
	Middle	0.90	0.98	0.76	1.28
	Higher	0.06	1.28	0.99	1.65
	Highest		1.00		
OHIPTOT		0.00+	0.95	0.92	0.98
Receiving income support	No	0.57	0.89	0.60	1.32
	Yes		1.00		

+ - *Denotes significant predictor*

Table 7-6: Ordinal logistic regression modelling of predictors of dental attendance frequency 'for trouble' in the five years 1994-1998 (including income support status)

Variable		Sig.	Odds Ratio	95% CI Lower	95% CI Upper
[NUM5TRBL = .00]		0.92	1.08	0.26	4.54
[NUM5TRBL = 1.00]		0.00	29.08	6.84	123.35
			1.00		
Educational attainment	No qualifications	0.05	0.73	0.53	1.00
	Other	0.02*	0.74	0.58	0.94
	Degree or higher		1.00		
Household size		0.13	1.06	0.98	1.14
Sex	Male	0.52	0.94	0.79	1.13
	Female		1.00		
Legal marital status	Never married	0.82	1.05	0.67	1.65
	Married	0.48	1.16	0.78	1.72
	Separated	0.51	1.23	0.66	2.29
	Divorced	0.90	1.03	0.64	1.66
	Widowed		1.00		
Age group		0.58	1.02	0.95	1.09
Social class	I Professional	0.64	1.36	0.38	4.90
	II Management & Technical	0.61	1.38	0.40	4.75
	IIINM Skilled non-manual	0.86	1.12	0.32	3.88
	IIIM Skilled manual	0.70	1.28	0.37	4.42
	IV Partly skilled	0.82	1.16	0.33	4.04
	V Unskilled	0.84	0.88	0.24	3.16
	Armed forces		1.00		
Don't go unless need to	Definitely	0.03*	0.77	0.61	0.98
	To some extent	0.51	1.08	0.86	1.35
	Don't know	0.17	1.44	0.85	2.42
	Don't feel like that		1.00		
Anxious about visiting	Definitely	0.17	0.83	0.64	1.08
	To some extent	0.40	1.10	0.89	1.36
	Don't know	0.63	0.84	0.42	1.69
	Don't feel like that		1.00		
Nervous	Definitely	0.89	0.98	0.76	1.27
	To some extent	0.18	0.67	0.70	1.07
	Don't know	0.48	0.79	0.41	1.52
	Don't feel like that		1.00		
Find NHS expensive	Definitely	0.28	1.13	0.91	1.40
	To some extent	0.17	1.16	0.94	1.45
	Don't know	0.21	0.86	0.68	1.09
	Don't feel like that		1.00		
Costs less if go when in pain only	Definitely	0.14	1.19	0.94	1.49
	To some extent	0.07	1.24	0.98	1.57
	Don't know	0.05	0.73	0.53	1.00
	Don't feel like that		1.00		

Continued overleaf...

Table 7-6: Ordinal logistic regression modelling of predictors of dental attendance frequency 'for trouble' in the five years 1994-1998 (including income support status) (continued)

Variable		Sig.	Odds Ratio	95% CI	
				Lower	Upper
Annual household income quintile	Lowest	0.57	1.10	0.80	1.51
	Lower	0.94	1.01	0.77	1.33
	Middle	0.72	1.04	0.82	1.34
	Higher	0.51	1.08	0.86	1.37
	Highest		1.00		
OHIPTOT		0.00+	1.30	1.25	1.35
Receiving income support	No	0.22	0.79	0.54	1.15
	Yes		1.00		

+ - *Denotes significant predictor*

Figure 7-1: The additional amount paid for dental treatment in the previous 12 months in England and Wales in 1998

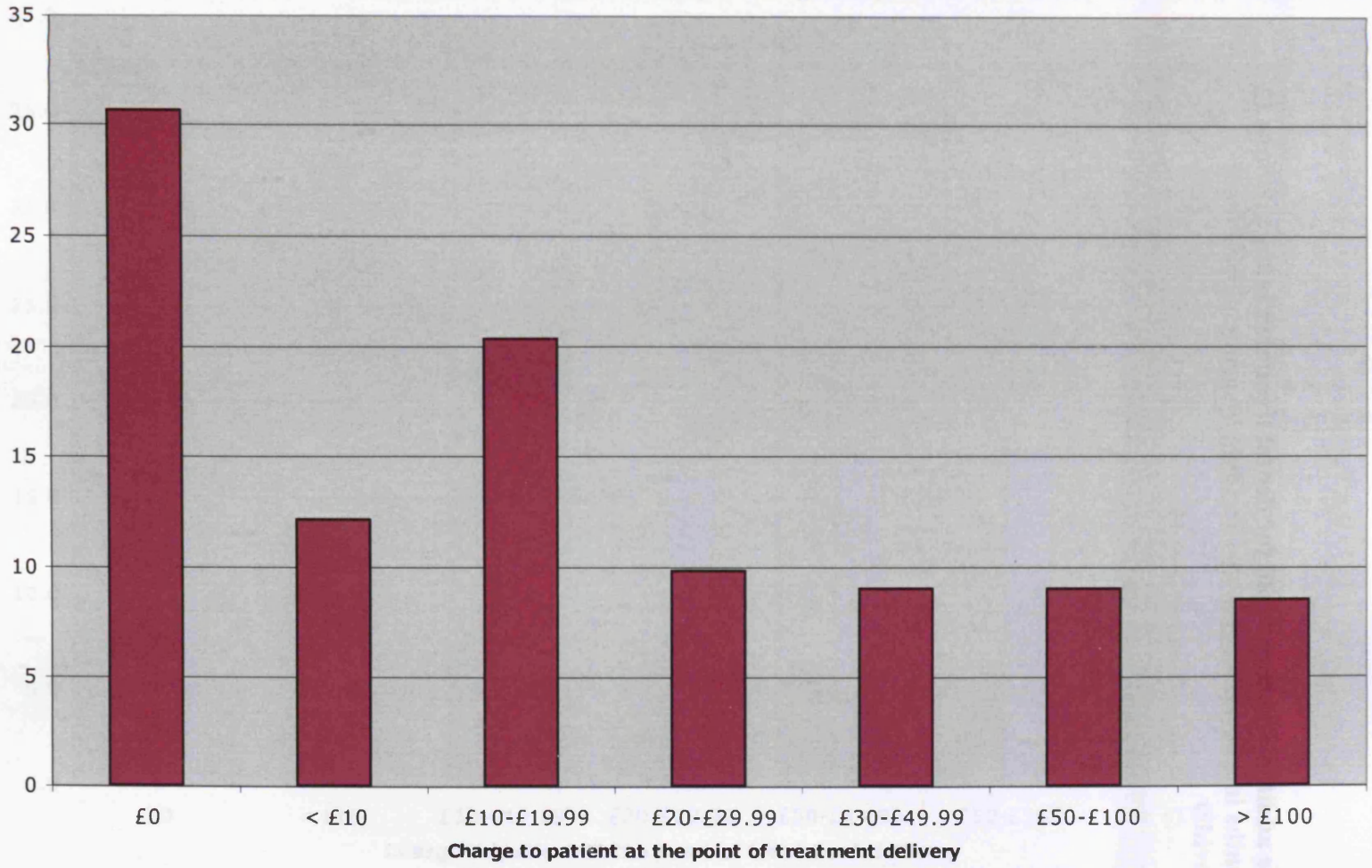

35
30
25
20
15
10
5
0
£0
< £10
£10-£19.99
£20-£29.99
£30-£49.99
£50-£100
> £100
Charge to patient at the point of treatment delivery

Figure 7-2: The additional amount paid for dental treatment in the previous 12 months in England and Wales in 1998, by grouped treatment provider

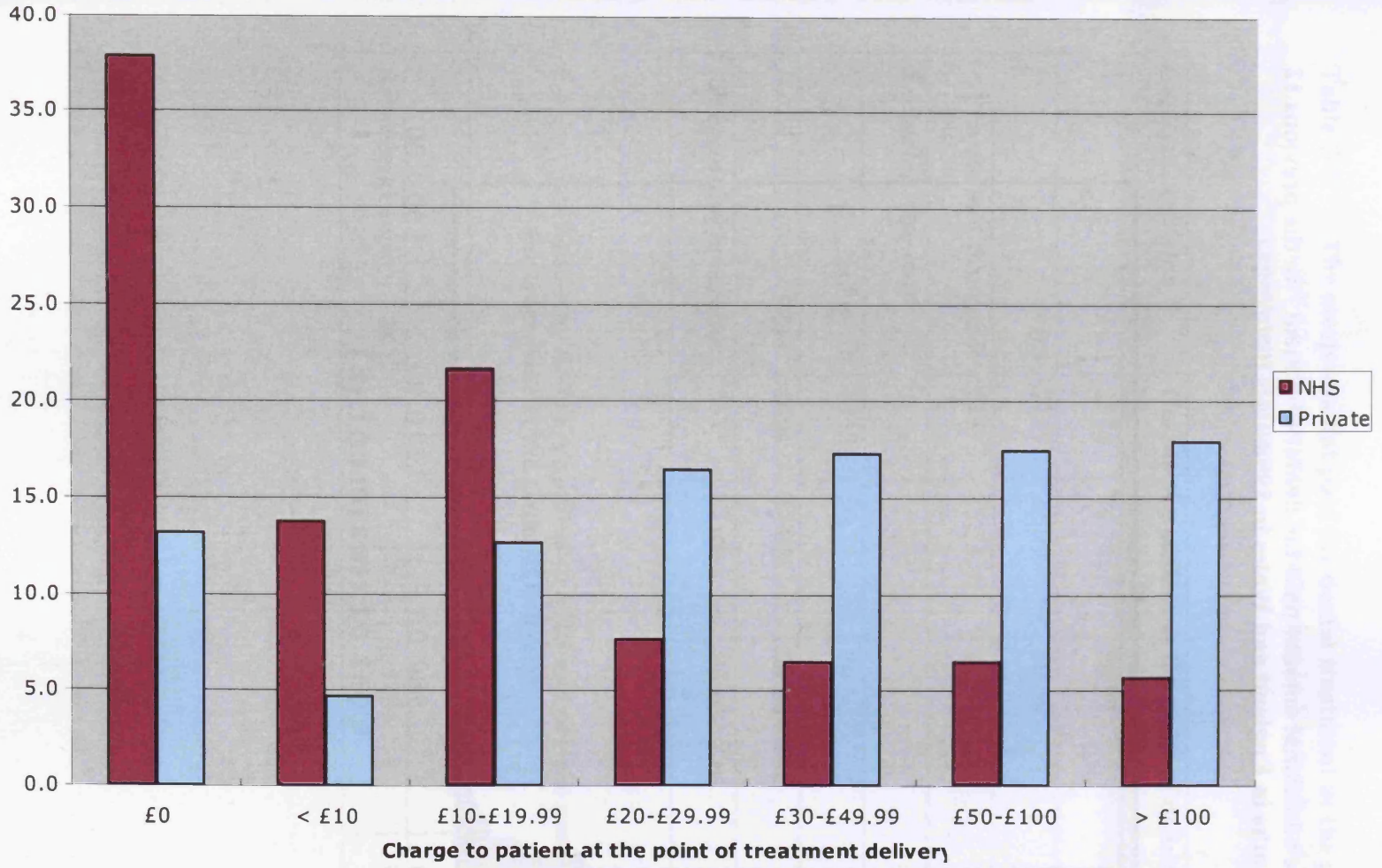
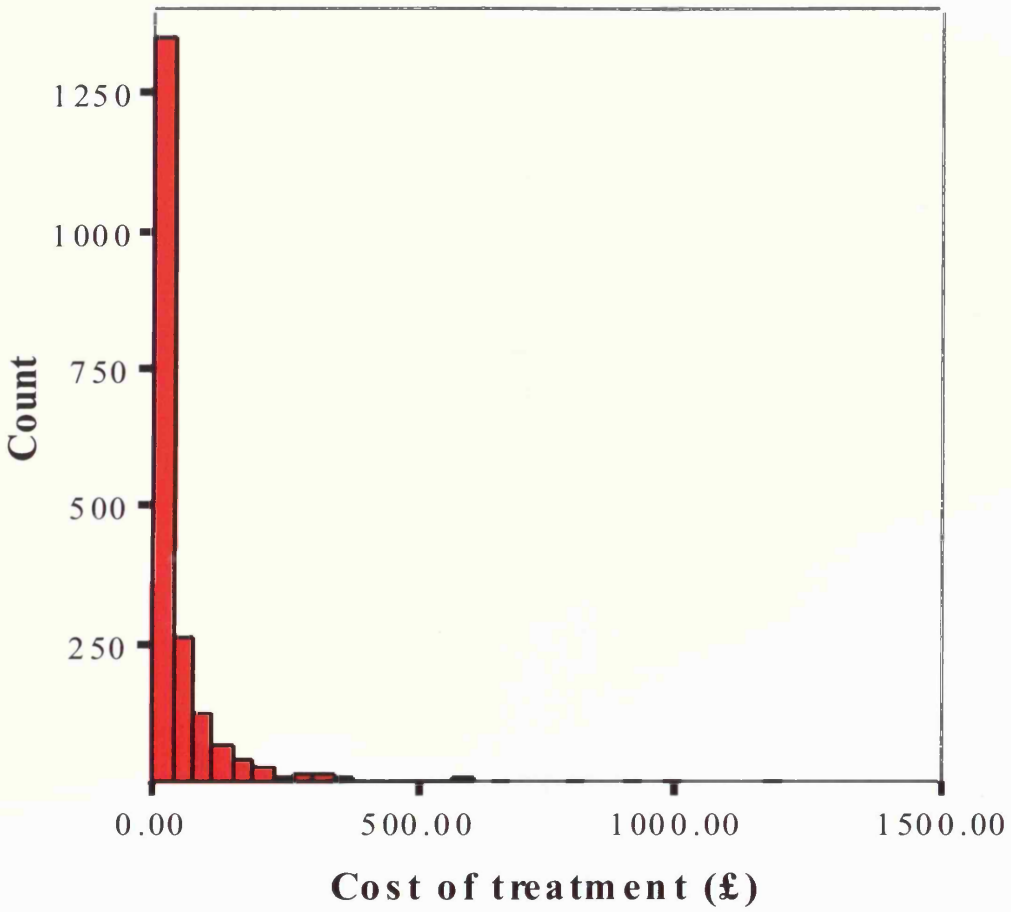

40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
£0
< £10
£10-£19.99
£20-£29.99
£30-£49.99
£50-£100
> £100
Charge to patient at the point of treatment delivery
NHS
Private

Figure 7-3: The additional amount paid for dental treatment[36] in the previous 12 months in England and Wales in 1998



[36] The value of the *'cost'* variable £0.00 is considered separate from the non-zero continuous values of *'cost'* and is therefore excluded from this graph

Table 7-7: The mean amount paid for dental treatment at the point of delivery in the 12 months prior to interview in England and Wales by copayment status

Copayment status	Cost to the patient at the point of delivery		
	N	Mean (£)	sd (£)
Overall	2870	34.20	80.82
NHS	2257	22.99	50.52
Private and insurance	613	75.51	138.02
Excluding zero cost:			
Overall	1932	50.79	94.12
NHS*	1401	37.03	59.94
Private and insurance*	531	87.10	94.12

*** - One-way ANOVA applied to NHS and private non-zero charges for treatment at the point of delivery**

	Sum of squares	df	Mean square	F	Sig.
Between groups	965284	1	965284	115.4	0.000

Figure 7-4: The uptake of dental treatments in the 12 months prior to interview in England and Wales in 1998

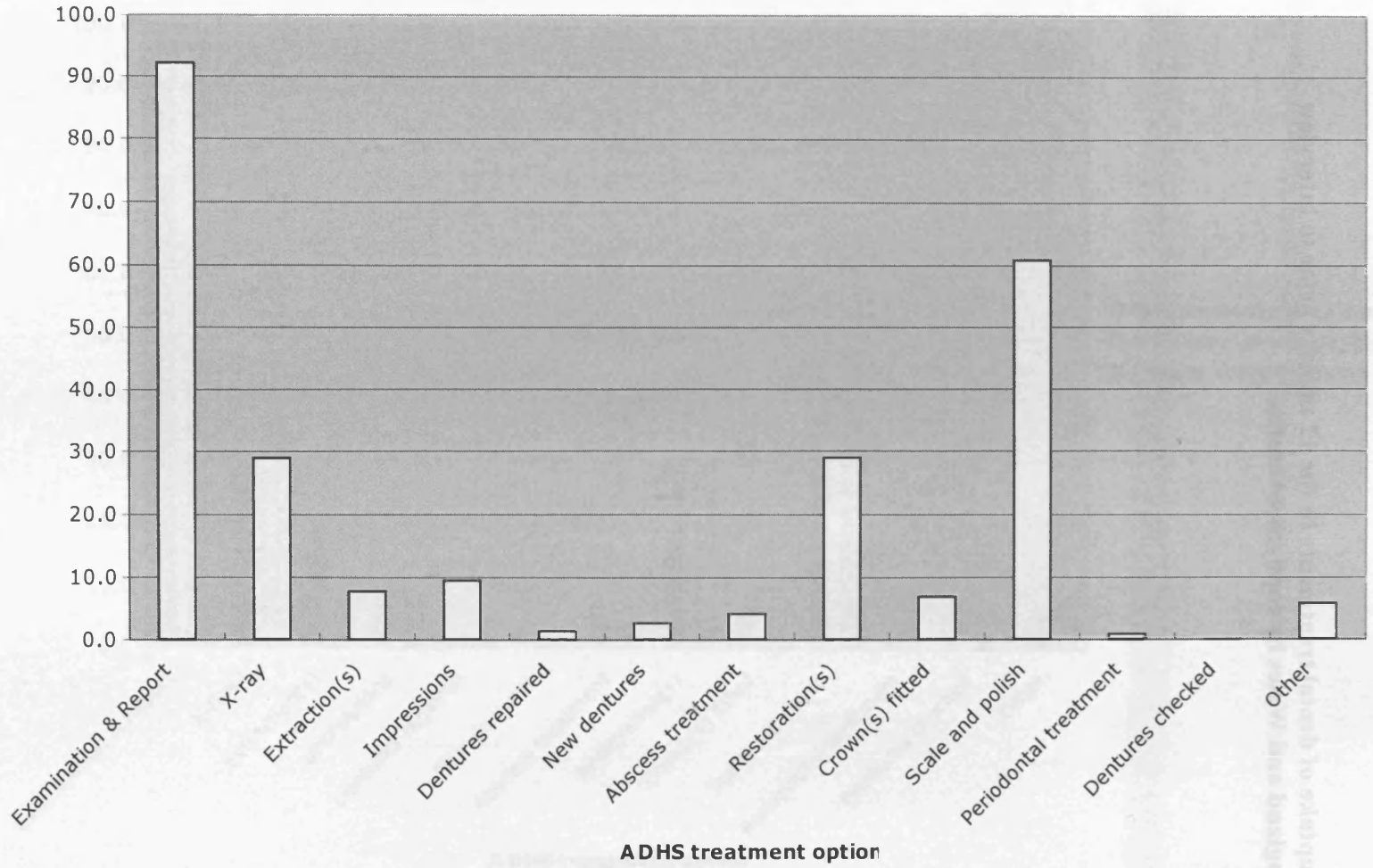

100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Examination & Report
X-ray
Extraction(s)
Impressions
Dentures repaired
New dentures
Abscess treatment
Restoration(s)
Crown(s) fitted
Scale and polish
Periodontal treatment
Dentures checked
Other
ADHS treatment option

Figure 7-5: The uptake of dental treatments in the 12 months prior to interview in England and Wales by copayment status

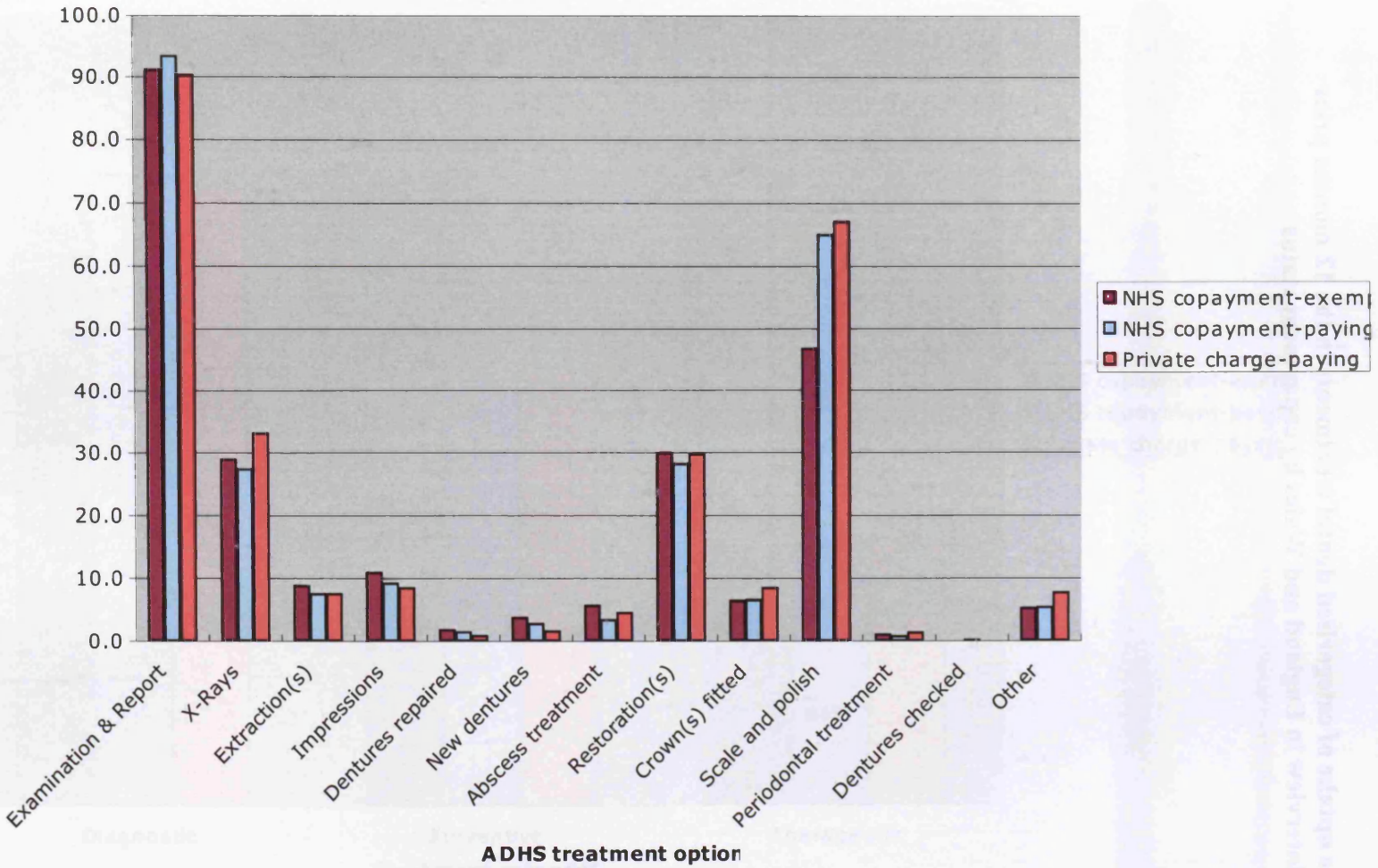

100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Examination & Report
X-Rays
Extraction(s)
Impressions
Dentures repaired
New dentures
Abscess treatment
Restoration(s)
Crown(s) fitted
Scale and polish
Periodontal treatment
Dentures checked
Other
ADHS treatment option
NHS copayment-exem
NHS copayment-paying
Private charge-paying

Figure 7-6: The uptake of categorised dental treatments in the 12 months prior to interview in England and Wales by copayment status

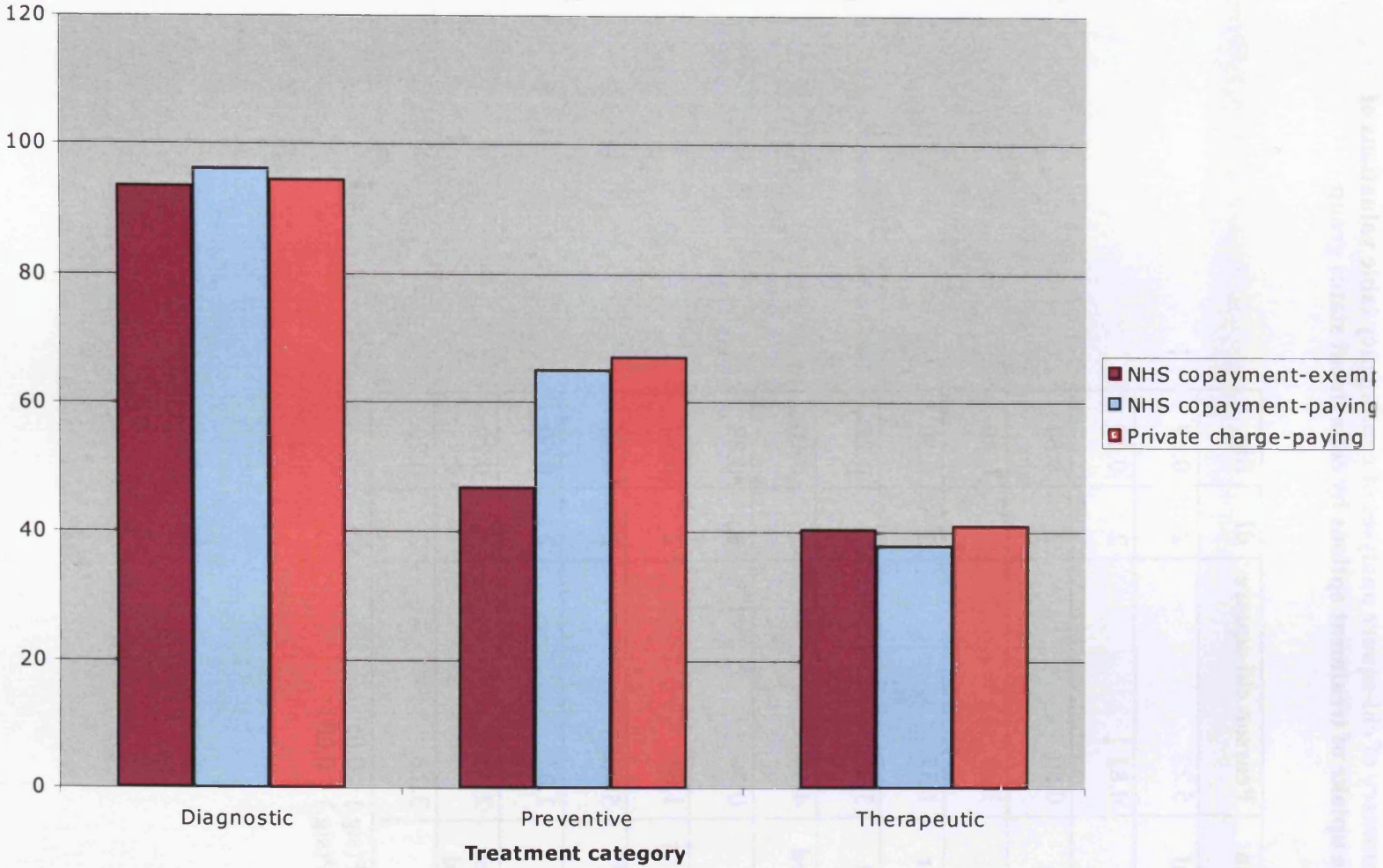

120
100
80
60
40
20
0
Diagnostic
Preventive
Therapeutic
Treatment category
NHS copayment-exem
NHS copayment-paying
Private charge-paying

Table 7-8: Summary of chi-square analyses of contingency table valuations of the uptake of treatment options by copayment status group

Treatment option	Pearson chi-square	df	Sig.
Examination and report	5.22	2	0.07
X-ray(s)	4.82	2	0.09
Extraction(s)	0.89	2	0.64
Impression(s)	1.83	2	0.40
Denture(s) repair	1.37	2	0.50
Denture(s) fitted	3.03	2	0.22
Abcess(es) treated	4.54	2	0.10
Teeth restored (filled)	0.74	2	0.69
Crown(s) fitted	1.83	2	0.40
Scale and polish^{++}	58.06	2	0.00
Periodontal treatment	1.03	2	0.60
Dentures removed & mouth checked	2.46	2	0.29
Other	3.22	2	0.20

\+ - denotes P(sig.) < 0.05
++ - denotes P(sig.) < 0.001

Figure 7-7: A comparison of ADHS self-assessed attendance patterns by copayment status group

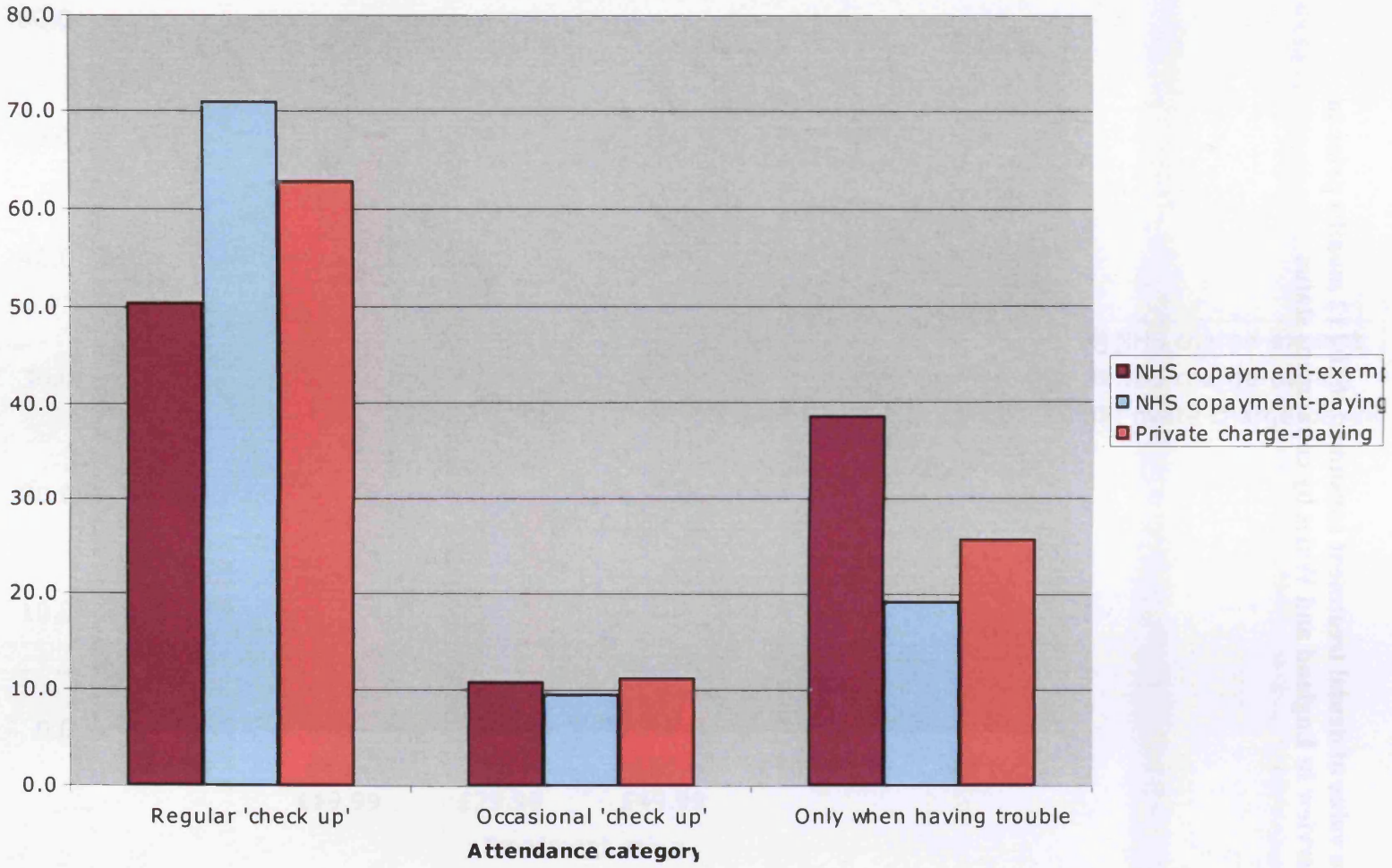

80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Regular 'check up'
Occasional 'check up'
Only when having trouble
Attendance category
NHS copayment-exem
NHS copayment-paying
Private charge-paying

Figure 7-8: The value of dental treatment consumed in the 12 months prior to interview in England and Wales by copayment status

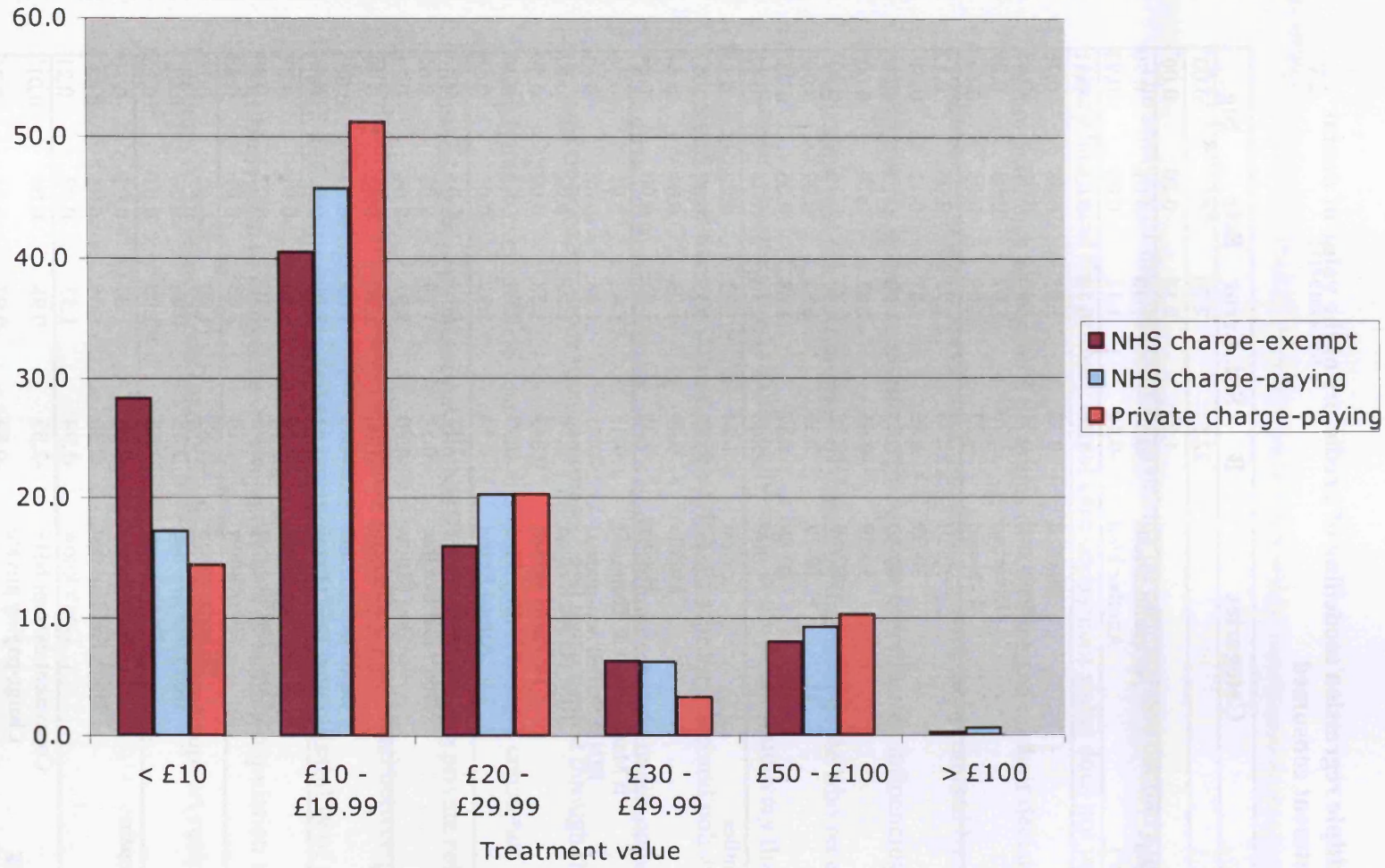

60.0
50.0
40.0
30.0
20.0
10.0
0.0
< £10
£10 - £19.99
£20 - £29.99
£30 - £49.99
£50 - £100
> £100
Treatment value
NHS charge-exempt
NHS charge-paying
Private charge-paying

Table 7-9: Multiple regression modelling of predictors of the value of dental treatment consumed

Variable	Categories	B	Std. Error	Beta	Sig.
Constant		22.51	2.70		0.00+
Total OHIP score		1.63	0.15	0.20	0.00+
Educational qualification (Ref. 'Degree or above')	No qualifications	-0.54	1.40	-0.01	0.70
	Another kind	-0.10	1.11	0.00	0.93
Sex (Ref. 'Male')		-1.26	0.78	-0.03	0.11
Legal marital status (Ref. 'Single')	Married	0.32	1.05	0.08	0.76
	Separated	-0.51	2.42	-0.01	0.83
	Divorced	1.78	1.62	0.03	0.27
	Widowed	4.23	2.09	0.05	0.04+
Age group (Ref. '16-19')	20-29	2.73	1.73	0.05	0.12
	30-39	4.80	1.87	0.11	0.01+
	40-49	6.45	1.98	0.13	0.00+
	50-59	10.65	2.07	0.19	0.00+
	60-69	10.22	2.23	0.16	0.00+
	70-79	7.39	2.52	0.09	0.00+
	80-89	8.37	3.88	0.05	0.03+
	90+	-5.68	11.36	-0.01	0.62
Household income quintiles (Ref. 'Highest')	Lowest	1.24	1.32	0.02	0.35
	Lower	0.49	1.15	0.01	0.67
	Middle	0.49	1.05	0.01	0.64
	Higher	0.21	1.03	0.00	0.84
Social Class (Ref. 'I Professional')	II Management & Technical	0.43	1.42	0.01	0.76
	IIINM Skilled non-manual	-0.71	1.46	-0.02	0.63
	IIIM Skilled manual	0.76	1.53	0.02	0.62
	IV Partly skilled	0.843	1.58	0.02	0.59
	V Unskilled	2.77	2.00	0.03	0.17
	Armed forces	1.54	5.91	0.01	0.80
Anxious about visiting (Ref. 'Definitely')	To some extent	-1.11	1.13	-0.03	0.33
	Don't feel like that	-0.54	1.19	-0.01	0.65
	Don't know	-4.90	3.07	-0.04	0.11
Don't go unless need to (Ref. 'Definitely')	To some extent	-1.06	1.24	-0.02	0.39
	Don't feel like that	-4.87	1.08	-0.12	0.00+
	Don't know	-0.41	2.40	-0.00	0.86
Nervous (Ref. 'Definitely')	To some extent	-0.30	1.02	-0.01	0.77
	Don't feel like that	-1.04	1.17	-0.02	0.38
	Don't know	2.14	2.83	0.01	0.45
Find NHS expensive (Ref. 'Definitely')	To some extent	-1.63	1.00	-0.03	0.10
	Don't feel like that	-2.75	0.98	-0.06	0.01+
	Don't know	-1.53	1.08	-0.03	0.16
Costs less if go when in pain only (Ref. 'Definitely')	To some extent	-1.28	1.24	-0.02	0.30
	Don't feel like that	-2.30	1.05	-0.05	0.03+
	Don't know	-1.94	1.53	-0.02	0.21
Copayment status (Ref. 'Copayment-paying NHS')	Copayment-exempt NHS	-2.55	0.98	-0.06	0.01+
	Charge-paying private	-0.89	0.97	-0.01	0.36

+ - *Denotes significant predictor*

7.2 Discussion

Key findings

The analysis of the impact of copayments on primary care dentistry undertaken in this study has found that primary dental care copayment status does not influence or is only a minor influence on people's decisions to seek care and on their decisions about the components of care. However, these findings were compromised by an inability to appropriately isolate copayment effects from other factors influencing dental service utilisation and the consumption of dental treatments. People who received their dental treatment privately paid significantly more at the point of delivery than those who received their treatment through the NHS. Except for scale and polishing, there was no significant difference in the uptake of dental treatments between copayment status groups or between those treated privately and those treated through the NHS. Copayment-exempt NHS respondents were found to have consumed significantly less treatment than copayment-paying NHS and charge-paying private respondents, although no difference in the value of treatment consumed was found between copayment-paying NHS and charge-paying private respondents. The generalisability of some findings in this study, due to differences between the survey sample population and copayment-exempt NHS respondents (and the sub-group of income support recipients), is limited.

Strengths and weaknesses

Many of the strengths and weaknesses of this study stem from the use of data from the Adult Dental Health Survey. Regarding the strengths of this study, the ADHS records information relating to the dental treatments received by individual respondents and the amount they paid for their treatment, irrespective of whether they were treated through the NHS or privately. The independence of this dataset from the providers of healthcare meant that the utilisation of primary dental services and the consumption of primary dental care were recorded from the patient's perspective. The inclusion of details about dental care delivered privately as well at that delivered through the NHS in the ADHS was reinforced by the use of a previously established scale of consumption which was independent of the type of treatment received or the treatment provider. This study is the first to apply this scale to both private and NHS dental treatments, which allowed consumption in both settings to be compared.

Regarding the limitations of this study, those relating more generally to secondary analysis have been discussed previously (section 6.2) and apply in this study. Specifically related to this study are two important limitations. Firstly, the only criterion for exemption from NHS dental copayments recorded in the ADHS is whether respondents were in receipt of income support. This limited the number of respondents who could be identified as qualifying for exemption irrespective of whether they actually visited a dentist. The remaining ADHS respondents were assumed to be ineligible for exemption from NHS dental copayments. However, respondents who qualified for exemption due to other reasons which were not recorded in the ADHS (for

example pregnant women) would have been wrongly classified as non-exempt. Findings from the univariate analyses do not indicate whether this misclassification led to an over- or under-estimation of the effect of qualifying for exemption on dental service utilisation. However, being in receipt of income support was marginally positively associated with dental service utilisation in the binary logistic regression model (although this association was not significant). This positive effect of exemption from NHS dental copayments on utilisation would be in agreement with the view that these charges act as a barrier to dental service utilisation (Finch, Keegan et al. 1988). Therefore, the misclassification of exempt respondents would be expected to have diluted the observed association between exemption due to being in receipt of income support and utilisation. This indicates that improving the classification of respondents' exemption status in future studies may yield significant findings regarding the effect of exemption from dental copayments on service utilisation.

The second limitation of this study relates to the accuracy of survey respondents' abilities to accurately recall the details of their previous dental visit, particularly the treatments received and the cost of treatment. Self-reported use of specific dental services has been found to vary according to the service type, with the recall of procedures with more impact on patients' daily lives being more reliable than that of less significant procedures (Gilbert, Rose et al. 2003).Concerns about the reliability of this self-report measure are supported by the absence of significant differences between most of the types of treatments received by copayment status groups. The implications of this limitation are discussed as part of the interpretation of the findings in this chapter. Future

studies which include a data collection phase (rather than secondary analysis of previously collected data) may benefit from the reliability of using direct observations of consultations, considered to be the 'gold-standard' method for recording the content of consultations (Callahan and Bertakis 1991; Stange, Zyzanski et al. 1998a; Stange, Zyzanski et al. 1998b), clinical records or patient exit questionnaires to record which treatments were received. However, the reliability of clinical records and patient exit questionnaires has been found to also depend on the type of health service being delivered (Harlow and Linet 1989; Stange, Zyzanski et al. 1998b). The potential value of recording the treatments received by respondents at their last appointment in surveys such as the ADHS could be enhanced by assessing the validity of the survey questions for recording such information and their reliability considering the time difference between consultation and survey completion.

Confounding between income support status and measures of socio-economic status was considered to be a potential problem in the regression models generated, particularly the binary logistic regression model in which income support status was marginally positively associated with dental attendance. Educational attainment, social class and total household income were identified as potential sources of confounding. However, the regression coefficients and significance values of these predictors were unaffected by the removal of income support status as a predictor in the regression models. Similarly, the regression coefficient and significance value associated with income support status changed minimally following the removal of each of these predictors in turn. Therefore, although confounding might be expected between income support status and some or all

of the predictors identified, this has not affected the findings from the regression models generated.

Interpretations

The lower rate of dental attendance by respondents in receipt of income support (and therefore eligible for exemption from NHS dental copayments) compared with the survey average found in this study seems to conflict with the reduction in dental attendance rates in Scotland following the introduction of patient charges for NHS dentistry in 1990 reported by Lacey (2006). Since participants in receipt of income support have always qualified for exemption from these charges (Lacey 2006), variations in the application of patient charges for NHS dentistry are unlikely to affect this population sub-sample. The finding that respondents receiving income support had a lower rate of dental attendance suggests that income support status is not a significant predictor of dental attendance. However, the marginal positive association between income support status and dental attendance in the multivariate binary logistic regression model of attendance, which support the findings reported by Parkin and Yule (1988) and Lacey (2006), suggests that exemption due to being in receipt of income support does influence the decision to seek care in this population sub-sample. Although, compared with other predictors of attendance, particularly those relating to dental anxiety and attitude towards regular dental attendance, this may only be a minor influence. Bazin et al (2005), in their study of non-utilisation of healthcare, concluded that since there are many other factors which affect healthcare utilisation 'health policies mainly promoting equal financial access to healthcare have little chance of abating health inequalities'. The

apparent failure of exemption from NHS dental copayments to increase attendance rates by income support recipients suggests that this conclusion remains valid in this population.

Income support recipients were much less likely to report finding NHS treatment expensive (which was previously found to be associated with lower DE rates section 0). However, the attendance rate, and subsequent DE rate, of this group was still lower than that of the general population. This indicates that, as would be expected for a group eligible to receive dental treatment free at the point of delivery, concerns about the cost of NHS dental treatment are not a major influence on the attendance rates of this group. This is in agreement with Parkin and Yule (1988), who found that price did not affect exempt patients and indicates that exemption from copayments is a relatively minor influence on the attendance rate of this population. The higher proportion of respondents in receipt of income support compared with the general population who reported that they visit a dentist when in trouble only (which was found to be a predictor of dental attendance in section 0) adds further support to the finding that attitude towards regular dental attendance is a predictor of attendance in this sub-population. This finding is not generalisable beyond this sub-population due to the significant differences found across all of the measures used in this study.

It was not an aim of this study to explore the validity of the assumption that the predictor variables in the logistic regression models are additive, rather than multiplicative, in how they combine to predict dental attendance. However, it was surprising to find non-

significant associations between the predictors total household income (also found in Chapter 6) and income support status, and dental attendance. These factors describe respectively the ability to afford dental copayments and exemption from such charges, and may moderate associations between concerns about the cost of dental treatment and dental attendance (for example concerns about the cost of dental treatment may be more strongly associated with dental attendance by people from low rather than high income households). In order to explore this the binary logistic regression model of dental attendance was expanded to include first-order interactions between these variables and variables which refer to the cost of dental treatment being a concern ('Costs less if go when in pain only', 'Don't go unless need to' and 'Find NHS expensive'). The results are detailed in appendix 8. In summary, the associations between these interactions and dental attendance were non-significant, therefore total household income and income support status are not considered to be moderators of associations between concerns about the cost of dental treatments and dental attendance. These findings further reinforce previous findings in Chapter 6 that perceptions of the cost of treatment are important predictors of attendance, but direct measures of the cost of treatment or ability to afford treatment are only a minor influence. Future studies of the impact of copayments on dental attendance would benefit from including other measures of exemption from copayments in order to confirm whether this finding relating to income support status is generalisable to exemption from dental copayments in general.

The finding in this study that dental treatments delivered privately cost people more at the point of delivery than treatments delivered through the NHS is in agreement with the

National Audit Office findings (2003a) and is consistent with the 1998 NHS dentistry cost-sharing arrangements, which meant that NHS patients paid a maximum of 80% of the cost of treatment (Dental Services Division 2008). Although private dental treatment was found to cost more at the point of delivery analysis of the components of care received and the value of care consumed by NHS copayment-paying and private charge-paying respondents found no significant differences. However, the components of care and value of care consumed were derived using the ADHS self-report measure of treatments received and therefore the previously discussed limitations of this data source affect the reliability of these findings. Assuming that these findings are reliable, this indicates that differences between dentistry delivered privately and that delivered through the NHS do not relate to the range of treatments received but rather to other aspects of the service. McGrath and Bedi (2003) found that differences in perceived oral health exist between patients treated through the NHS and those treated privately, but these were attributed to socio-demographic factors and use of services rather than the mode of payment for services. Hancock et al (1999) concluded from their general population survey that 'the benefits of private dental care were perceived mainly to be associated with easier access,...that dentists spent longer with patients and the surroundings were more pleasant'.

When respondents did visit a dentist, with the exception of scale and polishing, no difference in the proportion of treatment items undertaken was observed between copayment status groups. On the basis of these findings the hypotheses that exemption from NHS dental copayments will be associated with receipt of more diagnostic,

preventive and therapeutic dental treatments are rejected. The lower rate of scale and polishing in copayment-exempt NHS respondents compared with that in copayment-paying NHS and charge-paying private respondents found in this study is surprising. This finding and the absence of higher rates of other treatment options in copayment-exempt NHS respondents contradict findings from previous studies of copayment effects in general (see section 2.5.2), and studies of exemption from NHS dental copayments in particular (Birch 1989; Chalkley and Tilley 2006). With regard to the lower rate of scale and polishing, this finding could result from a lower uptake of preventive treatments by this copayment status group. Although scale and polishing is classified as a preventive treatment alongside oral hygiene instructions and fissure sealants (Harris and Burnside 2004)[37], it is the only preventive treatment detailed in the ADHS. The rates of other preventive treatments received by each copayment status group would need to be compared in order to verify this explanation. Another potential explanation, considering the comparable rates of the other treatments across copayment status groups, is that the self-report measure of treatment received used in the ADHS is not reliable. The variation between the rates of individual treatments (such as the high rate of DEs compared with other treatments) would be expected to be larger than the variation of individual treatments received between copayment status groups (such as differences in the rate of examinations and reports between copayment status groups). Therefore, if the self-report measure of treatments received is unreliable, this will mask the potentially subtle effect of copayment status on treatments received. The outcome of this concern regarding the reliability of the self-report measure of treatments received is that the hypotheses that

[37] Sub-gingival root debridement and topical fluoride application can also be considered to be preventive treatments (Jones, Evans et al. 2008).

exemption from NHS dental copayments will be associated with higher rates of preventive, therapeutic and diagnostic treatments may have been wrongly rejected.

The previously discussed potential limitation of the self-report measure of treatments received by ADHS respondents may have implications for the findings relating to treatment consumed by the copayment status groups. The significant difference found in the mean value of dental treatment consumed by copayment-exempt NHS respondents compared with the other copayment status groups was found to be the result of differences in the rate of scale and polishing between the groups. No other evidence has been found that exemption from NHS dental copayments encourages increased uptake of dental treatments, therefore the hypothesis that exemption from NHS dental copayments will be associated with individual use of more primary dental resources than non-exemption should be rejected. However, the underlying finding which informs the rejection of this hypothesis, that there was no significant difference in the treatment consumed by copayments status groups, conflicts with those of Chalkley and Tilley (2006), who found that charge-exempt patients received more intensive treatment[38] than non-exempt patients when treated by self-employed dentists. Considering the concerns about the reliability of the underlying method of recording treatments received, there is insufficient evidence to reject this hypothesis.

[38] 'Treatment intensity', as used by Chalkley and Tilley, is defined using the remuneration dentists received for delivering treatments and is therefore comparable to the definition of the 'value of treatment consumed' used in this study. The difference in terminology between these studies reflects the focus on practitioner remuneration arrangements by Chalkley and Tilley, compared with the focus on the charge incurred by patients in this study.

The usefulness of the value of treatment consumed as a collective measure of dental service utilisation used in this study was nullified to a certain extent by the similar rates of treatment received by each copayment status group, future studies may benefit from a common measure when comparing treatments received by people treated in different health sectors and whose treatment was funded differently. The differences across measures of enabling, predisposing and illness level factors found in this study between copayment status groups, and between income support recipients and the remaining ADHS sample from England and Wales limit the generalisability of some findings from this study.

In summary, primary dental care copayment status has been found to be a minor influence in comparison to attitudes towards dentistry on the decision to seek care, and of no influence on the components of care received. The NHS copayment exemption strategies in place in 1998 were not found to have resulted in increased consumption of dental services by copayment-exempt patients. The strength of associations between exemption due to being in receipt of income support and dental attendance may have been diluted by the misclassification of patients exempt from NHS dental copayments. There is also concern regarding the reliability of the survey methodologies employed in the 1998 ADHS to record dental treatments received by survey respondents. Rates of dental attendance and the uptake of dental treatments by low frequency users might be improved by supplementing NHS charge exemption strategies with programs designed to change negative attitudes to dentistry.

Chapter 8 Results and Discussion – Patients' views and opinions about primary healthcare and copayments for NHS services

8.1 Results

This section contains a review of the data collection process followed by a presentation of the themes that were identified during analysis, as well as participants' experiences of and views about copayments in healthcare. These are substantiated throughout using anonymous quotes from participant interviews.

8.1.1 Data collection process – review

The same basic recruitment strategy was applied to participants recruited from GP practices and the general population; however, there were differences in how recruitment operated in each location. Frequent GP attenders, who were recruited from GP practices, were easily identified and approached through the use of GPs and practice nurses as gate-keepers. Variations in the number of clinics running and the nature of these clinics (for example pre-booked appointments, specialist clinics for the management of conditions such as diabetes, and drop-in clinics, where patients attend without an appointment and wait in turn) meant that the process of recruiting from each practice was different. However, these differences were confined to how participants were identified (for example whether the lead researcher was presented with a list of suitable participants or whether he was involved in accepting or rejecting possible participants) and did not affect the informed consent or interview stages. The use of household screening supplemented by snowball sampling to recruit participants from the general population may have introduced biases into the sample population. Such biases

may have resulted from recruiting participants who were more inclined to participate in such a study due to their interest in the delivery of healthcare (for example people employed in the health-sector) or who were more likely to be at home during the recruitment process (for example people employed part-time or who were unemployed). However, by double sweeping the target households at different times of day (including outside normal working hours) and recruiting from three locations which differed by their index of deprivation and urban/rural characteristic such effects were reduced.

The mean interview time was 29 minutes. The shortest interview undertaken was 12 minutes and the longest was 55 minutes. Interviews with frequent primary medical care attenders which were undertaken immediately after their appointments were generally shorter than interviews undertaken separately from their appointments and interviews with regular attenders. Regular and frequent attenders who were interviewed separately from their primary medical care appointments tended to have allocated more time than the estimation of 30 to 40 minutes given to them during recruitment. Therefore, there was less time pressure than frequent attenders interviewed immediately after their appointments. In acknowledgement of the possible detrimental effects of time pressure on the quality of data collected, better provision was made during the data collection stage for undertaking interviews separately from primary medical care appointments (such as identifying several suitable two-hour interview windows for participants to choose from). These changes resulted in most of the subsequent interviews with frequent attenders being done at times other than immediately after their primary medical care appointment.

Although all participants were explicitly informed that they would not be asked to discuss any specific health conditions prior to commencing the interviews (this point was also mentioned in the participant consent form, which was signed by all participants), many participants volunteered this information. In order to address ethical concerns regarding reporting information which was beyond the requirements for this study, health conditions specified in the quotes used to support findings in this study have been changed. However, these revelations by participants may still have influenced the analysis of the interviews (for example a participant's direct reference to a particular condition may have drawn the researcher's attention more than if the condition had been indirectly referenced).

8.1.2 Results of the interview analysis

The results from the interview analysis are described in two main sections. This current section is concerned with the results directly related to the aims and objectives of this study from the deductive analysis. This is followed by a section containing findings from the inductive analysis.

8.1.2.1 Copayments for healthcare – views and opinions

One of the main topics discussed in the interviews was participants' experiences of copayments. People's views and opinions about copayments for NHS treatments or services were broadly grouped into two main areas; financial and political.

The views and opinions which were classified as 'financial' related either to concerns regarding the cost of treatments and services or whether services were good value for money. Concerns about being able to meet the cost of copayments were concentrated on prescriptions (although charges for NHS dentistry were also mentioned) and were linked either with financial constraints:

> *'There are periods where I get ill, I get chest infections and so I need more than one prescription. And the bottom-line is, if I don't have the money I can't get my medication, and there are times when I have not had the money to get my prescription' [Jan 1]*

Or with the unknown burden of long-term ill health/multiple prescriptions:

> *'In my family there is a couple of people with very bad disease and every week they have to have fifteen type of medicine, and the cost is crazy. You don't know how many medicines [your doctor] is going to give you. So, you are hoping it is just one. But you can't select which one you really need.' [Interview 16]*

Opinions were also expressed regarding whether copayments and charges for NHS and private services delivered value for money. There were opinions supporting the NHS in this respect (*'about £15 just for the checkup I think, which is fine because you are*

paying for the chap's expertise and his time and his equipment' [July 5]) as well as opinions that copayments for NHS services were not good value for money (*'about the dentist, from experience, you are in that seat less than 10 minutes. 50 quid - that is a lot of money per minute'* [Interview number 1]). These value-for-money judgements led participants to consider whether they felt the benefit of the services outweighed the cost (*'The last time I went for a checkup, I'm not sure the dentist even spoke to me. I was in and out in about 5 minutes and then they asked for £25, and that was a thoroughly disappointing experience that I haven't repeated'* [Interview number 3]).

The views and opinions relating to copayments that were classified as political encompassed sentiments regarding how healthcare should be provided in general and whether certain services should be free at the point of delivery. Dentistry was mentioned as a service which participants would have liked to be charge-free at the point of delivery (*'The dentist, I think it should be free'* [Interview number 6]). However, it was also considered to be non-essential, *'I mean, dentist, it's harder to see that. You could say that a model needs their teeth, to look nice and shiny with their teeth in the right place'* [Interview number 3], and therefore justifiably subject to a charge at the point of delivery.

Eligibility for exemption from copayments for NHS services was appreciated by those participants who benefited from it and was positively associated with use of the service. Participants qualified for exemption from charges for NHS treatments and services due to a variety of reasons, including:

Exemption from NHS prescription copayments due to their age:

> *'I don't pay now, because now I'm over 60, for my prescriptions which is a real bonus' [Interview 1]*

Charge-free NHS dentistry due to recent pregnancy:

> *'It's been a bit easy after having her, because my dentistry, you don't have to pay for your exams for a year after having a baby' [Interview 12]*

Exemption from charges for NHS prescription items due to being in receipt of benefits:

> *'The charges at the dentist, I don't pay because I am on benefits. So, no problem to me at all' [Interview 10]*

Charge-free NHS sight tests due to specific illness or treatments:

> *'I had to have my eyes tested when I was recovering from TB to see if the drugs had affected my eyesight' [Interview number 6]*

8.1.2.2 Cost – an influencing factor

The cost of charges at the point of delivery for NHS and private treatment was considered to be a barrier to dental treatment (*'the cost of it, I try to avoid as much as possible going to dentists in this country'* [Interview 16]) and was linked with value-for-money judgements about the service (*'going to the dentist and wasting your money, it's not a good idea'* [Interview 5]). Cost was also something which could become a barrier to accessing treatment due to changes in personal financial circumstances:

> *'I used to sort of kept my appointments diligently, all my checkups, had my dental treatment. I could afford that so it was much easier then. And then I sort of stopped studying in 2002, left with massive student debts, and I owed everybody. And so for a few years I couldn't even afford to go to the dentist' [Jan 1]*

Concerns about being able to meet the cost of charges for NHS treatments and services were occasionally in conflict with a desire to include dental visits as part of an oral health regime (*'unless there is something serious and you feel that...you need to give in'* [Interview 5]). However, in other instances, concerns about the cost of copayments were linked with views that dentists are unimportant to oral health which resulted in a reduced rate of attendance.

Changes in the provision of care from being funded through the NHS to private care were also a source for concerns about the financial cost of treatment (*'we were actually told that they were not going to continue doing NHS. And the alternative was Denplan...so now it costs me £16 a month'* [July 6]). Changes to the provision of care were linked with opinions which were personal rather than financial (*'I used to go to my friend, she was my dentist; but then, she went private. I stayed in the surgery, but there were other people that were in the NHS...I really was disappointed'* [Interview 14]). Opinions about the provision of private dental care were closely linked with the opinion that dentists providing care through the NHS are *'very difficult to find'* [Interview 12], this opinion resulted either from personal experience *('I have only just found an NHS dentist'* [Interview 12]) or from media coverage *('listen to the news, there are not many dentists currently in NHS'* [July 6], *'If you are new to Bristol, I think you might have trouble finding a dentist under the NHS'* [Interview 14]).

Aside from the direct financial cost of treatment, recommendations given by dentists to purchase additional products or book appointments for other chargeable services were frequently, although not exclusively, met with suspicion:

> *'I think sometimes some stuff are being pushed on to you for commercial reason' [Interview 16]*

> *'For a few years I went once every 9 months, and then they try and get you along every 6 months and I'm pretty sure I went to a hygienist... It was suggested by the dentist. I'm a bit cynical really, I wonder how much of that is creating jobs for people in the practice.' [Interview number 3]*

> *'About just under a year ago my dentist turned around and said 'have you thought about using the new Philips Sonicare toothbrushes? It's proven to be really a good piece of kit – and we just happen to have it on special offer'. So, if you like, he pushed that. And I think, on the whole, I've probably had less fillings now than I've had in the past and, probably, my teeth are in a condition now they probably weren't before'. [Interview 8]*

Similarly there were sceptical views expressed about the link between dentists' remuneration and the charges which patients pay for treatment, and that, as a result, patients exempt from charges for NHS dental treatments would receive a lower standard of care:

> *'they didn't seem particularly forthcoming on doing things that they don't have to do. Because, my [eligibility for exemption from NHS dental charges] is up in February, so I am sure then I will be called back and I will need lots of work' [Interview 12]*

These findings illustrate how the cost of treatment can influence people through their ability to afford treatment, their attitudes towards how treatment is delivered and the trust people have in practitioners when financial transactions are involved. Views and opinions about the cost of care, as well as associated concerns about the provision of NHS funded and private care, were exclusively related to primary dental care, rather than primary medical care.

8.1.2.3 Copayments for primary medical care

Participants' views and opinions relating to the possibility of introducing copayments for primary medical care were varied. Most opinions expressed were against the introduction of copayments for primary medical care, reasoning that such charges would adversely affect the delivery of healthcare to the general population or specific sub-populations.

> *'I think if we want to cure the problems that cost a vast amount of money then easy and hassle free contact with the gate keepers of your healthcare service is ideal.' [Interview number 3]*

> *'It's like you're being penalized for getting sick... It's like maintaining your health, not eating a lot and exercising so you don't become obese and you don't drain the NHS resources...to have to pay for it I think would be atrocious.' [Interview 12]*

Opposition to the introduction of copayments for primary medical care services also stemmed from the effect of such charges on the participants directly:

'I don't know if I would go to him so regular. I come here regular as clockwork, but like I come today, and I only want a change of prescription, I had my flu jab. So I wouldn't have been here today.' [Interview 11]

It was also argued that primary medical care delivered free at the point of service would increase the chance that people will get an early diagnosis:

'You could argue that going to the doctor and getting an early diagnosis for things like male cancer, they spend all this effort in raising awareness, in getting people who don't usually go to get checked out. If you bring the cost in then you set that entire process back a long way.' [Interview number 2]

'I think the doctor should be free at the point of service. If you had to pay £10 because you feel a bit under the weather, but you might actually have flu and be giving it to everybody around you, or in need of treatment because it's going to get far worse.' [Interview number 6]

The delivery of primary medical care free at the point of service was also viewed as an indicator of the country's wealth (*'That's the difference between the third world countries, basically you need money in your pocket for going to the doctor... If we started paying, it will take us to you know third world' [Interview 5]*) or a reflection of the social conscience of a country (*'In the States for example... You know, people that can't afford to go to the doctor, which I don't think is really right in a modern, prosperous country' [July 7]*).

There were, however, views in support of such charges. This support stemmed either from how they would benefit the delivery of primary medical care or reflected the extent

to which primary medical care was valued (*'What do you think will be the effect, if you have to pay £10? I would still go to him. Because I want a good way to live, a good standard of life.' [Interview 11], 'I don't think it's an outrageous thing to expect people to pay something towards the usage of the service' [July 7]*). Copayments for primary medical care were seen as a way of generating additional income to improve the delivery of services (*'I wouldn't object...if I am paying to see my GP, then I wouldn't have to come here and wait 2 1/2 hours' [Interview 10]*) and a way to discourage unnecessary use of services (*'There could be the argument, as far as the doctors are concerned is that that will whittle out all the time wasters.' [Interview 8], 'I think there is some merit in a [copayment-based] system... I have a friend and she is always running to the doctor with the cold with her children' [Interview 14]*). Copayments were also seen as a way of reducing the number of primary medical care appointments which are missed (*'I certainly think that people should pay for missed appointments, because the numbers are huge and amount of money for that wasted time is absolutely astronomical' [Interview number 1]*).

Comparisons of the relationship between attitudes towards copayments for primary medical care and copayments applied to other primary care services for each individual found that there was some consistency between these themes (*'To put an extra charge on... It's like you're being penalized for getting sick. It's like when you're penalized for looking after your teeth almost' – [Interview 12]*) but also revealed inconsistencies. For example in the following case primary medical care delivered free at the point of delivery was considered to support preventive health initiatives. Whereas charges

applied to primary dental care were considered to be reasonable considering the expense of such treatments:

> *'I think at the moment, because it's free, people will go – therefore it's preventative at the moment.' [Interview number 6]*

> *'Everything that is involved in dental surgery is hideously expensive... These things cost money, I'm not expecting something for nothing.' – [Interview number 6]*

In another case value-for-money judgements of charges applied to prescription items or dental treatments were associated with positive attitudes towards these charges.

> *'Prescription charges, yes I am aware of them and I don't mind paying, and of course I understand why I am doing it... it's generally quite fair really I think' – [Interview 7]*
> *'About £15 just for the checkup I think, which is fine because you are paying for the chap's expertise and his time and his equipment' – [Interview 7]*

Whereas opposition to copayments for primary medical consultations related not to the effect such charges would have on the individual but from the expectation that care would be delivered free to those who qualify for exemption. In contrast to the value-for-money judgements of copayments for prescription items and dental treatments, this negative attitude reflected a political judgement of their application to primary medical care:

> *'Presumably, I would have to pay that and if you are an unemployed chap, so once again I'm being penalized for a service that's free to others. I'm paying for it at source, from my taxes. So, I would feel aggrieved' – [Interview 7]*

The comparisons of attitudes towards current and proposed copayments for primary health services within cases did not have common themes to describe them. Financial concerns about their current application might have been expected to lead on to similar concerns about their proposed expansion, or politically motivated opposition might have been expected to govern judgements both of their current and potential future applications. However, in many instances attitudes towards current copayment arrangements were based on the individual's own experiences whereas attitudes towards the introduction of copayments for primary medical care were centred on the likely experiences of other people.

8.1.3 Patient-practitioner relationship

In the course of this study the relationship which people have with their GP or dentist was identified as a theme. This theme was identified as a result of the inductive analysis undertaken. The relationships which participants have with their practitioners were either 'personal' or 'impersonal'. Participants' ages and the characteristics which participants valued in their practitioners were strongly linked with these relationships. In addition the cost of treatment, history/'lived experiences' and service provision were also found to be minor influences on these relationships.

8.1.3.1 Personal and impersonal relationships

In some instances patient-practitioner relationships were developed over a long period of time (*'I have had the same GP [for] 25 years...So I feel I know him and I really respect his opinion'* [Interview 14]) and were founded on a strong feeling of trust (*'I want a good way to live, a good standard of life. And, I believe he is professional enough to give it to me'* [Interview 11]). However, for others, the relationship with their practitioners was less personal and more defined by factors such as convenience or cost (*'you don't really care how good the dentist is you're just so desperate to find [an NHS dentist]. Because if you go to the dentist privately it costs an absolute fortune'* [Interview 12]). These contrasting types of relationships between people and practitioners formed the basis of the relationship theme. Two types of relationships were identified from the data: personal and impersonal relationships. Personal relationships were characterised by factors which extended beyond the professional capabilities and included valuations of trust, understanding and compassion. In contrast, impersonal relationships were characterised by considerations of the professional capabilities of the practitioner, the delivery of services and the perceived importance of the services offered. The themes which were identified from the data as contributing to these relationships are outlined and discussed in the following sections.

8.1.3.2 The influence of cost on the patient-practitioner relationship

The financial cost associated with treatment influenced the nature of the patient-practitioner relationship. Value-for-money judgements predominated attitudes towards dental services (previously discussed in sections 8.1.2.1 and 8.1.2.2), which tipped the balance of some relationships with dentists away from personal and towards impersonal. When the previously discussed service-side effects, which included concerns about the cost of care limiting people's ability to use services and the shift from NHS to private care (section 8.1.2.2), were prevalent there was a lower level of trust between participants and their dentists than that between the same participants and their GPs. The result of this reduced level of trust, in common with the effect of value-for-money judgements, was that these relationships were impersonal.

8.1.3.3 Age/'Lived Experiences'

The effect of ageing was recognised by some participants as having affected their health, often resulting in increased rates of primary medical care attendance.

> *'As you get old it seems you are always doing things in life... Weight is probably the one thing that I am more conscious of than anything. Working on a theory that if you are fighting weight, the knock-on effect is things like blood pressure etc... When we were at the previous surgery, it was apparent my blood pressure was a bit high. So, that's when we started on trying to get the blood pressure down a bit. If it wasn't for that, I would not be coming to the surgery.' [Interview 8]*

'I come more often now...all of a sudden it comes along like you have blood pressure and things. It's quite common in somebody of my age, now I have to use the GP to have it checked'[Interview 13]

Previous or current episodes of general or oral ill health were associated by participants with changes in their attendance patterns, changes in their attitude towards their own health behaviour or changes in their perception of the role of the practitioner:

'I spent seven weeks in a hospital when my kidneys failed...and, I am never going back in there again. So, I take everything that doctors tell me' [Interview 11]

'Having had a considerable amount of dental work, it seems very sensible to me to maintain the work that they've done' [Interview number 2]

'You think of opticians almost as cosmetic rather than medical...But, in fact it's changing for me at the moment, because I've just been diagnosed as diabetic. I shall now have to go to places like opticians for medical reasons' [Interview 15]

These views, which are linked with 'lived experiences' or significant health-related events, relate to long-term personal relationships and were associated mostly with GPs, rather than dentists. Although these factors were linked with patient-practitioner relationships, it was not clear whether 'lived experiences' had caused the patient-practitioner relationship to change.

Impersonal relationships, in contrast with personal relationships, were characterised by the absence of any mention of long-term health problems or age-related health conditions. In these instances there were no established connections derived from long-

term ill health, instead these relationships were characterised by the other themes identified in this study. This lends support to the role of 'lived experiences' or significant health events being an important factor in the development of personal relationships with practitioners.

8.1.3.4 Service attributes

Some participants; irrespective of their age, the frequency of primary medical attendance or the area of recruitment; were not concerned at all about the attributes of the service or practitioner they consulted (*'I don't take any notice until they start to hurt, and then I phone the dentist, and I don't care which dentist it is'* [Interview6]). Whereas other participants valued, ahead of or in place of the attributes of the practitioners, such attributes as:

Access:

> *'this [surgery] is really frustrating to try and get to see a doctor on the day you want' [Interview 8]*

Service:

> *'I expect a certain service...that is why I am paying for BUPA' [Interview 10]*

Cost:

> *'I don't try to go [to the dentist] in advance at all...I would only go in an emergency...I feel constantly that they are trying to rip me off' [July10]*

Convenience:

'I've got a doctor's surgery 50 yards across from my flat...I get looked at before I go to work; it's a really minor inconvenience to my life' [Interview number2]

Values such as these indicate a consumer attitude towards practitioners and the services they provide. These consumer attitudes appear to align more closely with impersonal relationships rather than personal relationships. Considered alongside the previous findings relating to age/'lived experiences', this link between consumer attitudes and impersonal relationships may mirror the link between age/'lived experiences' and personal relationships.

8.1.3.5 Personal characteristics

In parallel with these consumer values, some participants valued the personal characteristics of their practitioners such as:

Compassion/understanding

'I feel that my GP understands me and my condition better than most people' [Interview Number6]

'If I go to a herbal practitioner they give me as long as I need. They interview me for 2 hours and they try to understand my life' [Interview number 3]

Bedside manner

'He has just got an excellent manner; and I think he has a lovely manner of relating to his patients' [Interview 14]

'[GP name] has been here ever since I have been here...I don't think it's necessary to see [GP name] every time. But he is always on the end of the phone. I find him very good.' [Interview 11]

A personal relationship also engendered feelings such as trust, respect and loyalty to be reciprocated by patients:

'I have had the same GP since I came to Bristol, 25 years; and I have stayed loyal to that GP. So I feel I know him, I feel I have a very good relationship with him, and I really respect his opinion' [Interview 15]

These data provided a range of examples of how people experience copayments for NHS services and the way in which these experiences interact with other factors to inform the types of relationships people have with their practitioners. The views and opinions relating to the proposed introduction of copayments for primary medical care consultations were varied, but could be classified as either financially or politically-based. It is possible to see how copayments for NHS dental treatments are an influencing factor on people's decision to utilise the service and the trust they have in practitioners to deliver treatment independent of financial influence. It is also apparent that such concerns do not relate to the delivery of NHS primary medical care. However, the complex range of other factors which can influence people's utilisation can also be seen in these data.

8.2 Discussion

Key Findings

These data highlight how cost-sharing for primary dental care is linked with judgements about the affordability of treatment and whether treatment provides value-for-money. These judgements can form part of people's decision to utilise primary dental services, although such decisions are influenced by a number of other factors. Cost-sharing for dental care can also affect people's attitudes towards dentists, most notably with regard to dentist's recommendations for subsequent appointments or additional chargeable treatments. The availability of dentists providing NHS treatment and the mixed provision of NHS and privately funded dental treatments were discussed alongside cost-sharing as barriers to accessing dental care. These concerns about how care is provided were expressed solely in relation to primary dental care as opposed to primary medical care. Attitudes towards the proposed introduction of copayments for primary medical care were varied both in their support and opposition. In contrast to attitudes towards current cost-sharing arrangements for NHS services, which were mainly derived from personal experiences, opinions about copayments for primary medical care were mainly based on how such charges would affect other people rather than the participants personally. Considering the different bases from which these attitudes were formed there was not an identifiable theme which linked these attitudes with experiences of current cost-sharing arrangements. An important theme in these data was the type of relationships people have with their practitioners. The relationships were considered to be either personal or impersonal and the cost of treatment, alongside other factors

including age/'lived experiences' and the characteristics of the practitioner or service, was a factor in determining the relationship type.

Strengths and Limitations

The use of thematic analysis applied to semi-structured interviews with purposively sampled participants generated data that exposed the breadth of primary care and people's experiences in this setting. Although people's views and opinions were found to be wide-ranging, an over-arching theme relating to the relationship people have with their practitioners was identified. This reflects the advantage of qualitative over quantitative methods in gaining a 'deeper' understanding of social phenomenon (Charmaz 2006).

The sample size used in this study (nineteen interviewees) was sufficient to incorporate the range of experiences in primary care while uncovering underlying themes which united many of the participants. The strategy adopted with regard to a sample size which reflected the point at which returns were low was found to be practical.

The selection of criteria for the purposive sampling were required to be sufficiently broad such that 'the key constituencies of relevance to the subject matter are covered' (Ritchie, Lewis et al. 2004c) yet did not include too many criteria which would have diluted the quality of data collected. This necessitated excluding predictors of attendance which were beyond the scope of the aims and objectives of this study, but may be of relevance within the broader context of the predictors of attendance in primary care. The

sampling criteria used in this study were sufficient to achieve the aims and objectives of this study as outlined in section 4.4. However, the connection between the relationship theme and studies of patient satisfaction with primary care (which is discussed subsequently) was not anticipated prior to this study and may have prompted the inclusion of other sampling criteria.

The identification of relationships as an important theme in this study was the result of the inductive analysis of the transcripts, which was undertaken after the deductive analysis. As discussed in section 5.4.5, this combined use of deductive and inductive analysis offers advantages over each approach individually. However, this combined approach may also reduce the opportunity to employ analytical techniques designed to maximise the effectiveness of each approach when used in isolation. In this study a commitment solely to deductive coding may have resulted in the link between copayments for health care and the relationship people have with their practitioner being missed. However, the identification of this theme was not used to inform the sampling of subsequent participants, as would have been the case if theoretical rather than purposive sampling had been employed (Boeije 2002). Furthermore, the application of the constant comparative method (CCM), which is a core component of Grounded Theory, in the inductive analysis may have improved both the internal and external validity of the findings (Boeije 2002).

Qualitative methodologies can be applied in studies which intend to investigate the cause of current attitudes and opinions. Although this was not the intention of this study,

this is one area which is potentially of interest, but which is beyond the scope of the data collected. Of particular interest would be the manner in which the relationship people have with their practitioner changes following changes to the themes which underpin it. In the context of this thesis comparing, for example, the way in which patient-practitioner relationships change following significant illness episodes with how they change as a result of changes to the provision of care (for example a dentist changing from providing care through the NHS to private care) could inform the extent to which copayments for primary medical consultations affect patient-practitioner relationships.

Interpretations

The finding that the cost of treatments subject to copayments influences decisions to use those services is consistent with studies of the effect of copayments on utilisation of primary dental care and their effect on the purchasing of prescription items (as discussed in sections 2.5.2.6 and 2.5.2.5 respectively). Previous qualitative studies of patients' views of dental care have identified the cost of treatment as a potential barrier to care (Finch, Keegan et al. 1988), a view which is reinforced by this study. Those people who qualified for exemption from charges for NHS services appreciated receiving their care free at the point of delivery and exemption was acknowledged by some participants as having encouraged them to use the service more regularly (particularly NHS dentistry). These findings further highlight the surprising absence of a significant association between exemption from dental copayments through being in receipt of income support and dental service utilisation in the quantitative analysis of ADHS data reported in Chapter 7. However, a wide range of reasons were given by interview respondents for

their qualification for exemption which suggests that the focus solely on income support status as an exemption criterion in Chapter 7 is too narrow to fully account for the influence of exemption from copayments on dental service utilisation.

Measures of the extent to which people considered dental treatment to provide value for money were strongly associated with preventive-led utilisation of dental services in Chapter 6. Similarly, such judgements were identified from the framework analysis of these qualitative interviews as important factors in decisions to use dental services. The cost both of dental treatment and prescription items also influenced decisions through concerns about the affordability of such charges. This finding contradicts with the lack of a significant association between total household income and dental service utilisation reported in Chapter 6 and Chapter 7. This lends further support that the total household income is not a reliable measure of people's ability to afford such costs, leading to the non-significant associations with dental service utilisation in the quantitative studies.

As well as influencing people's decision to use dental services, the cost of treatment influenced people's attitudes towards dentists. This was particularly evident when further treatment or additional, chargeable appointments were recommended by dentists. The assumption of a link between such recommendations and the dentist's income served to undermine the trust patients had in these recommendations. This echoes findings from Hill et al (2003) that patients were concerned that 'dentists are only motivated by potential earnings'. This concern was also prevalent when discussing the transition of dentists from providing care through the NHS to providing it privately.

The parallel provision of care provided privately and through the NHS in primary care dentistry was also found to cause confusion, which is consistent with findings reported by Finch et al (1988). The simplification of the charging structure applied to NHS dentistry following the introduction of the latest contract for NHS dentists (Department of Health. 2007b), as discussed in 2.3.2, does not address this confusion caused by the parallel provision of care. Therefore, from these findings patients are likely to remain confused and suspicious of the charges they are paying for services while dentistry is delivered in this way.

People's views and opinions about the proposed introduction of copayments for primary medical care consultations were mainly opposed to their introduction. Opposition to such charges was based on concerns about the impact of charges on the delivery of healthcare. The acceptability of the introduction of these charges was based on the belief that they would improve the delivery of healthcare, through the generation of additional income for the NHS or a reduction in unnecessary use of services. This range of views reflects the reasons given for the introduction of copayments for other NHS services and current concerns about their suitability (Eversley and Sheppard 2000). Attitudes towards current cost-sharing arrangements were drawn from people's own experiences. This contrasts with many people's attitudes towards the potential impact of cost-sharing applied to primary medical care, which were based on the how such charges would affect other people or specific sub-populations (such as older people or people on low incomes). Considering that people's attitudes towards current or proposed future cost-

sharing arrangements were found to be financially or politically motivated, it might be anticipated that these attitudes are related at the individual-level. It was not an aim of this study to explore this relationship. There may be a causal relationship between these themes which could be explored in future studies. It may also be beneficial for future studies to consider not only people's attitudes towards such charging arrangements, but also the source of these attitudes.

A finding in this study, which was incidental to the aims and objectives, was the identification of the relationship theme. The definitions of the personal and impersonal relationships, which were formulated during the course of analysis, were based on mutually exclusive criteria (for example whether people had thought and talked about the personal characteristics of their practitioner). However, some participants exhibited other characteristics that helped to explain their individual relationships. The finding that what people valued in their practitioners was an important aspect of the relationship with their practitioner is consistent with the finding that people's beliefs and attitudes about dentistry are a significant predictor of their rate of primary dental care attendance (Chapter 6). In a similar way, age was found to be a significant predictor of attendance in primary medical and dental care, and was also an important aspect of these relationships. The cost associated with treatment was identified a factor which contributed to these relationships, particularly cost associated with additional services or appointments. Other studies of attitudes towards copayments applied to NHS prescriptions found that people were reluctant to discuss the cost of prescriptions or decisions they make which are influenced by this cost because they felt this would

jeopardise the doctor-patient relationship (Schafheutle, Hassell et al. 2002). This suggests that the influence of cost on the patient-practitioner relationship pervades primary care services subject to cost-sharing.

The importance of people's age and their histories/'lived experiences' in the patient-practitioner relationship theme indicates that discussing the injuries or illnesses which people have experienced may contribute to this theme. Although participants were not asked about any illnesses or injuries they might have had, many volunteered this information in the course of the interviews. However, this line of investigation was not followed-up during the interviews and if such information was not volunteered then, due to the topic being excluded from the interview schedule for ethical reasons, the interviewer did not broach the subject. Information relating to people's previous illnesses or injuries was treated consistently across the interviews. Future studies following either a similar qualitative approach or with datasets in which patient satisfaction is recorded may gain further insight into people's relationships with their primary medical and dental practitioners by including their health histories.

The personal and impersonal relationships identified in this study echo findings from the development of a patient satisfaction questionnaire (Baker 2000). As well as patient satisfaction, studies of the relationship between patients and practitioners in primary care have encompassed a broad range of topics; including patient decision-making in dentistry (Zimmerman 1988) and reducing non-attendance rates in primary care (Martin, Perfect et al. 2005). In developing the patient satisfaction questionnaire Baker identified

three factors which described different dimensions of patients' satisfaction with general practice consultations: 'professional care', 'depth of relationship' and 'perceived time'. 'Professional care'[39] and 'depth of relationship'[40] were suggested to be a reflection of judgments of the patient-practitioner relationship being made on two levels. The first level (which concerned 'all the traditional behaviours expected of a doctor') and the second level (which described the 'personal and emotional level' of the relationship) share common concepts as those used to define the impersonal and personal relationships in this study. This suggests that patient-practitioner relationships are based on measures of patient satisfaction. Baker's third factor, 'perceived time'[41], was found to contrast with the findings of Zyzanski et al (1974), who found that in the USA 'concern about the financial cost of care' was a factor in determining patients' satisfaction with medical care. This framework analysis study did not find the length of appointments to be related to patient-practitioner relationships, although it was mentioned when discussing alternative and complementary practitioners in combination with the cost of copayments for primary care dentistry as a value for money judgement. Age has also been found to be strongly positively associated with patient satisfaction with primary medical care (Hall and Dornan 1990). This is in agreement with the finding from this framework analysis that personal relationships were linked with being older and adds

[39] 'Professional care' was defined as that which includes the patient's 'concerns about the examination, the provision of information about the illness and its treatment by the doctor, agreement with the doctor's advice and the doctor treating the patients as a person'.
[40] 'Depth of relationship' was concerned with 'the doctor's intimate knowledge of the patient within a relationship and the transmission of very personal information to the doctor'.
[41] 'Perceived time' was concerned with 'patients' perceptions of the length of consultations when related to their own requirements'.

further credence to the relationships defined in this study being closely linked to indicators of patient satisfaction.

Support for the introduction of copayments for primary medical care consultations was, for some people, based on the understanding that such charges would generate additional income which could be used to improve the quality of primary medical services. This association in respondents' minds between charges at the point of service and improved service delivery justifies the use of standardised patient satisfaction questionnaires in future studies of the similarities and differences between the roles of primary medical and dental practitioners, the impact of copayments on those roles and how practitioners are valued by patients.

Studies of patient satisfaction with primary dental care in the UK have generally focussed on the impact of significant changes to the delivery of care (for example the introduction of the PDS contract in 2006 (Milsom, Threlfall et al. 2008)), comparing care delivered privately and through the NHS (Hancock, Calnan et al. 1999) or patients' satisfaction with specific modes of treatment. The use of standardised patient satisfaction questionnaires in primary dental care, as well as in primary medical care, would allow further investigation of the main objectives of this study across primary dental and medical care. The inclusion of such questionnaires in future studies would also enable the more comprehensive fourth phase of the Behavioral Model of health service utilisation to be used. In the fourth phase 'consumer satisfaction', alongside 'perceived health status' and 'evaluated health status', formed a feedback loop 'showing

that outcome affects subsequent predisposing and perceived need' (1995). In this model 'consumer satisfaction' is also influenced by the 'health care system', which is comprised of, among other factors, the cost to the patient of utilising the service. Findings from this study indicate that cost-sharing for health services influences utilisation both directly, through consideration of its affordability, and indirectly, through subsequent value-for-money judgements having received treatment. Both of these mechanisms are included in the fourth phase of the Behavioral Model lending support for the use of this model to inform future studies of the influence of cost-sharing on health service utilisation. This final phase of the Behavioral Model of health service utilisation also offers an indication of how people's relationships with their practitioners contribute to the complex mix of factors which affect people's utilisation of health services.

With regard to the topic which is the core of this thesis, the potential impact on patients of introducing copayments for primary medical consultations, findings from this study indicate that such charges would be viewed negatively. Themes relating to current cost-sharing arrangements found that concerns about the cost of treatment and value-for-money judgements of dental treatments were an influencing factor in decisions about dental service utilisation. The cost of dental treatment was also a factor in the relationship between dentists and their patients. Taken together, these findings indicate that the introduction of copayments for primary medical consultations would present a barrier to utilisation for some people. The expected outcome of which would be a reduction in the consultation rates by people unable to afford the charges or who would

not consider these charges to represent good value for money. The introduction of such charges would also be expected to introduce a new dimension into the relationship people have with their GP. Concerns about whether GPs' judgements were influenced by financial considerations and a lack of trust in GPs' recommendations for other, chargeable appointments or treatments may alter the relationship people have with their GP.

Aside from the stated aims and objectives of this qualitative study, these interviews were also intended as an opportunity for the author to discuss with people directly how they have experienced the delivery of primary health services and what influence copayments for NHS services have on them. Analysis of the interviews undertaken highlighted the range of experiences people have in primary care and the diverse spectrum of influencing factors which determine whether people consult a practitioner. These interviews have allowed the interviewees the opportunity to recount their own experiences and to ensure that a personal perspective on a topic which is often viewed at arms-length was included.

Chapter 9 General Discussion

Key Findings and Interpretations

This study aimed to assess the feasability of studying the effects of introducing copayments in primary medical care via studying the effects of copayments in primary dental care. In order to explore this aim three sub-studies were undertaken. The first sub-study compared predictors of utilisation of primary medical and primary dental services. The second sub-study investigated the impact of copayments on primary care dentistry. The final sub-study explored people's views and experiences of cost-sharing for healthcare, with particular consideration of copayments for primary care dentistry and their proposed application to primary medical care. This discussion comprises a summary of the main findings from the sub-studies and how these contribute to the main aim of this study, a detailed consideration of the strengths and limitations of this study, proposed directions for future research and the public policy implications of the main findings in this study.

The comparison of patterns of utilisation of primary medical and dental services found differences across measures of people's predisposition to use these services (predisposing factors), their resources to enable them to access these services (enabling factors) and their clinical need to consult with these services (illness level factors). The perception of NHS dental treatment as expensive, the belief that 'dental treatment costs less [in the long-term] if you go when in pain only', feeling anxious about visiting the dentist and 'not visiting a dentist unless in need' were major predictors of dental service utilisation. Unlike primary dental service utilisation, primary medical service utilisation was associated with worse general health status. However, when preventive-led and

treatment-led dental service utilisation were considered separately, treatment-led utilisation was associated with worse oral health, whereas preventive-led utilisation was associated with better oral health. Furthermore, whereas preventive-led utilisation continued to be negatively associated with concerns about the cost of dental treatment, treatment-led utilisation was only associated with oral health.

The study of the impact of copayments on primary care dentistry found copayment status to be of either no influence or a minor of influence on people's decisions to utilise dental services or the components of care they received. Utilisation of primary dental services was found to be lower among people exempt from copayments for NHS dental services due to being in receipt of income support. This finding was surprising considering the disincentive effect of cost on patients' first contact with primary dental services reported by Parkin and Yule (1988) and with the reduction in dental attendance rates in Scotland following the introduction of patient charges for NHS dentistry in 1990 reported by Lacey (2006). Furthermore, Baker (2009) found that people with cost concerns delayed treatment because of these concerns, had poorer oral health and were less likely to brush every day. When income support status was compared with other factors associated with dental service utilisation, exemption from NHS dental copayments through being in receipt of income support was positively associated with utilisation, but this association was not significant. However, findings related to associations between exemption status and dental service utilisation were undermined by the misclassification of ADHS respondents who qualified for exemption for reasons other than being in receipt of income support. There were also concerns regarding the

reliability of self-reported dental treatments received, as recorded in the ADHS, and the misclassification of ADHS respondents who qualified for exemption for reasons other than being in receipt of income support. Due to these reliability concerns the findings relating to associations between copayment status and dental treatments received, and copayment status and the value of treatment consumed were inconclusive.

People's views and experiences of cost-sharing for healthcare were found to be varied. Common themes were identified which related to people's attitudes towards current cost-sharing arrangements, the manner in which cost influenced people's decisions about treatment and people's attitudes towards the introduction of copayments for primary medical care. Cost-sharing for primary dental care was an influence on participants' decisions to utilise the service due to concerns about the affordability of treatment and through judgements made about the value-for-money of dental treatments. Attitudes towards the proposed introduction of copayments for primary medical care were varied both in their support and opposition. Attitudes towards current cost-sharing arrangements for NHS services were mainly derived from personal experiences, whereas opinions about copayments for primary medical care were mainly based on how such charges would affect other people rather than the participants personally. The nature of participants' relationships with their practitioners was found to be a theme from these data too. Age/'lived experiences' and the characteristics of the practitioner or service were also important factors in determining these relationships. The cost associated with dental treatment was a factor which influenced these relationships through dentists'

recommendations for future chargeable appointments or treatments undermining the trust which participants had in their dentists.

There were contradictory findings regarding the effect of exemption from NHS dental copayments on utilisation and whether people's ability to afford charges for NHS dentistry affected utilisation. Exemption from dental copayments was acknowledged as a factor which stimulated attendance by those who were exempt, however, findings from quantitative analyses regarding the association between exemption from NHS dental copayments and service utilisation were inconclusive. The affordability of copayments for dental treatments was identified from the qualitative framework analysis as a factor which influenced people's decision to utilise dental services. However, total household income, which was considered to be an indicator of people's ability to afford such costs, was not associated with dental service utilisation in either of the quantitative studies. The source of discrepancies between findings from qualitative studies, in which organisational factors significantly affect utilisation, and those from quantitative studies, which find non-significant or only minor associations have been considered previously by Mechanic (1979). The author suggested that factors which account for these discrepancies include differences in the interpretation of "illness measures", data aggregation and cross-sectional quantitative versus processual qualitative analytical approaches. However, previously discussed limitations of the quantitative approaches adopted in this study (sections 6.2 and 7.2) may also have contributed to these discrepancies.

When considered together, findings from these studies indicate that patient charges applied at the point of delivery of dental care are perceived to be expensive and that this perception is negatively associated with utilisation of dental services. This negative association affects only preventive-led dental service utilisation, whereas associations between treatment-led utilisation and concerns about the cost of treatment were non-significant.

With regard to the main aim of this study, it was not possible to study the effects of introducing copayments in primary medical care via studying the effects of copayments in primary dental care. The feasibility of this aim depended on being able to disentangle the effects of dental copayments on service utilisation and the consumption of dental treatments from the potential effects of individual and service-level factors. Although there was evidence of some effect of copayment status on service utilisation, these findings were inconclusive and it was not possible to draw substantive conclusions. Considering that these findings were inconclusive or conflict with those from previous studies of copayment effects it was not appropriate to draw conclusions from this study about how copayments would influence primary medical care if they were introduced.

Strengths and limitations

The strengths and limitations of the sub-studies which comprise this thesis have been considered previously. In this general discussion the strengths and limitations of this study in its entirety are considered and discussed.

The major strength of this study is the use of a well-established theoretical model of health service utilisation. The Behavioral Model of health service utilisation both provided a framework to identify and relate potential factors associated with utilisation, and enabled comparisons of utilisation of primary medical and dental services. However, as discussed in greater detail subsequently, the fourth phase of the Behavioral Model offers several advantages over the second phase used in this study.

A further strength of this study, which integrates closely with the use of the Behavioral Model, is the use of nationally representative survey datasets which include a large number of potential confounders. The Behavioral Model offers a structure in which the potential effects of a large number of factors on health service utilisation can be considered. It was therefore important that the datasets which were used in the quantitative analyses were able to match this range of factors. Neither the ADHS nor the BHPS included all the factors proposed by the Behavioral Model. However, each dataset was still able to provide a large number of potential factors for inclusion in the generated models of utilisation. Furthermore, the large sample size of these surveys ensured that findings were generalisable, that comparatively small populations (for example income support recipients) could be studied without compromising statistical validity and that the study was adequately powered to be able to detect small associations that might be important at the population level.

The use of multiple methodologies is another strength of this study. With regard to the overall findings in this study, the combined quantitative and qualitative approach

enabled a greater understanding of how cost-sharing for healthcare impacts on patients' decision making; particularly regarding the complex range of factors associated with utilisation of primary dental services and the manner in which cost-sharing integrates with these factors. However, the complementarity of these different methodologies is discussed subsequently as a potential limitation of this study too.

The limitations discussed here relate to the two main aspects which form the basis of this thesis:

1. The use of the Behavioral Model as the underlying theoretical model of health service utilisation.
2. The complementarity of findings derived from different data sources and using different methodologies.

The validity of these aspects is discussed with reference to the outcomes of the sub-studies which comprise this thesis. Consideration is also given to how limitations in each of these aspects could be overcome in future studies.

The suitability of the Behavioral Model as a theoretical guide for the identification and conceptualisation of factors associated with health service utilisation has been discussed previously in section 3.1. The different phases of the model were discussed with particular consideration of their suitability for cross-sectional or longitudinal studies of utilisation. Considering the cross-sectional nature of the quantitative studies undertaken in this thesis the second phase of the model was selected in preference to the more recent

fourth phase, which includes feedback loops through which outcomes influence future utilisation. However, findings from the qualitative study indicate that when cost-sharing is applied to health services judgements about whether the cost of treatment was good value-for-money influenced participants' subsequent decision to utilise the service. This suggests that there is a specific feedback mechanism, perhaps more traditionally associated with consumers rather than patients, through which value-for-money judgements about copayments for treatments are important factors in decisions about future utilisation. This, in turn, lends support to the use of the fourth phase of the Behavioral Model in future studies of cost-sharing.

This phase of the model also incorporates health as a potential outcome of the predisposing, enabling and illness level factors alongside utilisation. This was exploited in a study of perceived oral health outcomes by Baker (2009) in which structural equation modelling was applied to Adult Dental Health Survey data. The application of this approach to studying the effects of copayment status on dental patients may lead to a better understanding of whether copayment status influences oral health status and whether this influence is direct or is mediated through utilisation. This would be of particular benefit when considering the impact of current NHS dental copayment arrangements on oral health and utilisation outcomes.

Closely related to the choice of the Behavioral Model as the theoretical framework, which has guided this study, are the choices of the conceptualisation of utilisation outlined by Mooney (1983) and access by Goddard and Smith (2001). As discussed in

section 3.1, Penchansky and Thomas (1981) proposed an alternative conceptualisation of access which centred around the "fit" between the patient's needs, the resources available to meet those needs and the demand for those resources (Ricketts and Goldsmith 2005). The "fit" concept and its basis on recursive relationships matches more closely the definition of access from the US Institute of Medicine as the 'timely use of personal health services to achieve the best possible outcome' (Millman 1993). Both of these concepts move towards a cyclical view of access and away from the more linear view of the Behavioral Model. Future studies of health service utilisation may benefit from considering access in this cyclical manner, particularly in longitudinal studies which incorporate the local provision of health services with individual-level utilisation data.

The complementarity of findings derived from different sources relates both to the use of data from the BHPS and ADHS to compare factors associated with utilisation of primary medical and dental services, and the use of quantitative and qualitative data to study the effects of cost-sharing on patients. The complementarity of ADHS and BHPS data was investigated as part of the development of the methodology employed in the first sub-study, and the findings were reported in section 5.2. The datasets were found to have similar distributions of participants across the socioeconomic and demographic measures common to both surveys, and were therefore considered to be suitable sources of data to compare predictors of utilisation. However, two limitations of this approach remain. Firstly, each survey sampled different participants. Although both surveys are considered to be nationally representative and there were only limited differences

between them according to the comparison of measures common to both datasets, utilisation of primary medical and dental services could be compared only at the population-level, rather than at the individual-level[42]. Secondly, data were collected differently in each survey. In many instances these differences were minor. However, the measures of health status and its impact on daily life, and the recording of frequency of attendance differed more significantly between surveys. A dataset in which both primary medical and dental service utilisation and general and oral health statuses are recorded on comparable scales would overcome these limitations. Furthermore, associations between utilisation of primary medical services and primary dental services could be studied.

The complementarity of the quantitative and qualitative methodologies was discussed in detail in section 8.2. It was not the intention of each sub-study to replicate findings using different methodological strategies (methodological triangulation), but instead to link together different aspects of the core proposal of this thesis (Miller and Glassner in Silverman 1997). However, the replication of some findings across sub-studies does support the validity of those findings. The downside of this approach is that opportunities to validate findings across methodologies, potentially applied to the same population, are reduced. Considering the greater understanding that was gained of the influence of cost-sharing for healthcare on patients through the qualitative interviews, future studies in this area may benefit from applying qualitative data collection as part of

[42] Although factors associated with utilisation of each service independently could be studied at the individual-level.

a mixed methodological approach, employing methodological triangulation where possible.

As discussed previously, it was not possible to study the effects of introducing copayments for primary medical services through the experience of the current application of copayments to primary dental services. Although, the finding from the first sub-study in this thesis, that preventive-led dental attendance was negatively associated with concerns about the cost of treatment, echoes similar findings from the RAND HIE, that rates of preventive medical services were disproportionately reduced on the schemes subject to cost-sharing (Keeler 1992). However, beyond this the agreement between findings from this study regarding the effects of exemption from dental copayments on utilisation and treatments received, and findings from other studies, including the RAND HIE, are limited.

Directions for future research

This study has identified a number of factors as being significantly associated with health service utilisation. However, the cross-sectional basis of the datasets used and the retrospective nature of this study have been identified as limitations. A prospectively designed cohort study would be of benefit to future studies either of utilisation of health services or of the effect of cost-sharing for healthcare on patients. A longitudinal cohort approach would enable causal relationships between these factors to be explored. Longitudinal studies of the effects of copayments on utilisation of healthcare services would add greater depth to findings from this study, for example those that relate to

private dentistry and its growth, and would allow changes in people's circumstances, such as qualifying for exemption from NHS dental charges, to be investigated. Variations in data collection methodologies between the ADHS and BHPS, and concerns about the reliability of the recording of treatments received in the ADHS indicate that a prospective study, in which methodologies are selected in order to optimise the power of the study to detect subtle associations, would be extremely valuable to future studies in this area. Considering the contradictory findings in this study regarding the effect of exemption from copayments for NHS dentistry on utilisation it may also be of interest to record a wider range of exemption criteria rather than solely being in receipt of income support. Recording a wider range of exemption criteria as part of a cohort study would allow the effect of moving to or from exemption on subsequent utilisation to be studied and would minimise the previously discussed misclassification error. Furthermore, as discussed previously, the effect of previous utilisation and patient satisfaction on subsequent utilisation, within the structure of the fourth phase of the Behavioral Model could also be studied using data collected in this manner. The British Household Panel Survey is the benchmark for longitudinal, cohort-based, nationally representative survey data. Data collected in a similar fashion for the purpose of investigating longitudinal effects of changes to the provision of health services, such as copayment arrangements, on individuals would be extremely valuable and would improve the reliability of inferences about the effect on patients of extending cost-sharing arrangements to new primary health services.

The recording of both treatment-led and preventive-led dental service utilisation in the ADHS enabled a deeper understanding of the role of oral health and concerns about the cost of dental treatments on utilisation to be studied. The extension of this differentiation to primary medical service utilisation may improve both our understanding of factors associated with primary medical service utilisation and inferences about the effect of introducing copayments to this service from their application to NHS primary dental services.

In the Behavioral Model the provision of healthcare is included as an organisational factor associated with utilisation. Future studies may benefit from datasets which combine measures of population characteristics with the local structure and availability of healthcare. Furthermore, with regard to the provision of healthcare, the lack of nationally representative information about the provision of private healthcare (including the volume of work undertaken and the associated cost to patients) was a limitation which future research could address. Considering the recent growth of the private healthcare market it may become increasingly important for this workload to be included in studies of service provision and utilisation.

Finally, the qualitative portion of this study could be expanded and integrated more fully with the quantitative portion. The use of different sampling criteria, for example ethnic origin or employment status, or through the use of focus groups, would provide an opportunity to test conclusions made in this study and explore the role of these other sampling criteria in people's views and opinions about primary healthcare and

copayments for NHS services. The integration of the quantitative and qualitative studies, for example through obtaining detailed qualitative data from a subsample of the previously discussed cohort study, would help to give a better understanding of the complex behavioural processes involved in health service utilisation and the extent to which cost-sharing affects utilisation.

Public policy implications

This study suggests that NHS dentistry is still perceived to be difficult to access. While this perception remains, people will continue to seek treatment in the private sector and any changes intended to improve access to NHS dental services will need to address this perception in order to be effective. In addition, dental treatment, whether provided privately or through the NHS, is perceived to be expensive and this perception is associated with lower utilisation of preventive dental services.

It was not possible to draw substantive conclusions about the impact of copayments for primary medical care based on findings from this study. However, two areas have been identified which indicate where such copayments may have an effect. Firstly, people who perceive copayments for primary medical care to be expensive may attend less frequently. This reduction is likely to affect preventive-led consultations more than treatment-led consultations. Secondly, the introduction of copayments in primary medical care may alter people's relationship with their GP, making their relationships more consumer-like and affecting the 'depth of the relationship' (Baker 2000). The outcome of which would be a negative impact on the delivery of targeted, preventive

health care through primary care services. These are core concepts of the strategy proposed in the 2004 report 'The NHS Plan' to reduce the demand placed on the NHS by 'creating a fully engaged population through individualised health promotion and disease prevention. It is assumed that much of this development will take place in primary care...if the health services are to move away from dealing predominantly with the sick' (Wanless 2004).

Chapter 10 Overall Conclusions

The overall conclusions from this study are:

- It was not feasible to study the effects of introducing copayments in primary medical care via studying the effects of copayments in primary dental care.
- In England and Wales in 1998 the uptake of primary dental care examinations and reports was associated with predisposing and enabling factors but not with illness level factors.
- Whereas, the uptake of primary medical care consultations was associated with predisposing, enabling and illness level factors.
    - Poor general health status was associated with a higher frequency of primary medical care consultations.
- Rates of preventive-led and treatment-led dental attendance were found to differ according to the individual-level factors of the Behavioral Model.
    - Preventive-led dental attendance was associated with predisposing, enabling and illness level factors; whereas treatment-led dental attendance was associated with illness level factors only.
    - Preventive-led dental attendance was associated with better oral health, whereas treatment-led attendance was associated with worse oral health.
- The application of the Behavioral Model in this study was equally effective in its description of the variation in uptake of primary dental care examinations and reports, and the variation in uptake of primary medical care consultations.
- Findings were inconclusive regarding the effect of exemption from NHS dental copayments through being in receipt of income support on primary dental service utilisation.

- Findings were inconclusive regarding the effect of exemption from NHS dental copayments on individual use of primary dental resources.
- Findings were inconclusive regarding the effect of exemption from NHS dental copayments on rates of dental procedures.
- Cost-sharing for primary healthcare services was considered by participants in decisions about utilising these services.
- The mechanisms through which cost-sharing influenced participants were:
    - Concerns about the affordability of such charges
    - Judgements about whether such charges represent value-for-money.
- Attitudes towards current and proposed future applications of cost-sharing varied according to the frame of reference.
    - Attitudes towards current cost-sharing arrangements were based on personal experiences, whereas attitudes towards proposed future cost-sharing arrangements were based either on their impact personally or on other populations.
- The main influences on participants' relationships with their practitioners were the characteristics which they valued in their practitioners and their age/'lived experiences'.
- Minor influences on participants' relationships with their practitioners were found to be their histories/'lived experiences', how health services were delivered and the cost of treatment.

Appendix 1 Abstracts of conference presentations derived from this study

Research from this thesis has been presented at several conferences, including:

1. British Society for Dental Research conference 2007, Durham, UK
2. Society for Academic Primary Care conference 2008, Galway, Ireland
3. Pan European Federation of the International Association for Dental Research, 2008, London, UK

The abstracts from theses presentations have been included in this appendix.

1. Abstract of the oral presentation given at the British Society for Dental Research conference 2007, Durham, UK:

Title: Predictors of primary dental and medical service use

Objectives:
To compare socioeconomic, demographic and health behaviour predictors of primary dental and medical service use.

Methods:
Nationally representative self-report data from the 2003-2004 and 2004-2005 (15,791 respondents included) British Household Panel Surveys (BHPS M and N waves), including information about dental examinations and reports (DEs) and General Medical Practitioner consultations (GPCs), were analysed using chi-square tests and logistic regression models.

Results:
64.5% of respondents in 2004-5 (9395 of 14559) reported having a DE compared to 38.0% (5,614 of 14,755) who reported three or more GPCs in the previous 12 months. Chi-square analyses showed that all socioeconomic (educational qualification, household income, social class), demographic (age, gender, marital status) and health factors (sight test in previous year, smoking, private health insurance status, service use in 2003-4) were all significantly correlated ($p<0.05$) with having a DE and three or more GPCs.
Logistic regression analyses confirmed that these socioeconomic factors were positively associated with DE, but only household income was a significant socioeconomic predictor of GPCs. All demographic and health factors remained significant predictors of DE, but marital status (except for those 'separated') and smoking ceased to be predictors of GPCs. Income was positively associated with DE but the relationship was non-linear for GPCs – middle income was associated with more GPCs than low or high income. Previous primary dental and medical service use was the strongest predictor of DE and GPCs.

Conclusions:
Predictors of primary dental and medical service use were different. High income was linked with high DEs but low GPCs. Low income was linked with low DEs and GPCs. Over the age of 40 DEs decreased but GPCs increased with age. Low social class was linked with low DEs but GPCs did not vary by social class.

Funded by the Brickley Research Foundation.

2. Abstract of the oral presentation given at the Society for Academic Primary Care conference 2008, Galway, Ireland:

Title: The impact of patient charges on primary care dentistry

Authors: CM Penfold, JP Shepherd

Introduction:
Provision of primary dental care in the UK is shared between the NHS and a growing private dental sector. Patient charges at the point of delivery of dental care range from the full cost of private treatment through NHS co-payments to free NHS care.
Objectives: To test hypotheses that the mean patient charge per course of treatment is inversely related to the rate of primary dental care uptake and the value of dental treatment consumed.

Methods:
Nationally representative self-report data from the 1998 Adult Dental Health Survey (ADHS), relating to dental attendance, treatment received and treatment costs were analysed.

Results:
64% of ADHS respondents (2302 of 3628) visited a dentist in the 12 months prior to interview. 74% received NHS care, 23% private care and 2% received combined private and NHS care. 55% of people who were receiving income support (122 of 222), and therefore entitled to treatment free at the point of delivery, visited a dentist in the previous 12 months. The mean patient charge for NHS dental treatment was £37.00 (s.d.=59.9) compared with £87.10 (s.d.=144.8) for private treatment. According to the NHS scale of patient charges, the mean value of dental treatment consumed by charge-exempt NHS (CexNHS) patients was £19.70 (95% C.I.=18.5-20.8), £22.80 (95% C.I.=21.8 – 23.8) by non-exempt NHS (NexNHS) patients and £22.40 (95% C.I.=20.8 – 24.0) by private patients. Analysis of variance (ANOVA) identified significant differences between the value of treatment consumed by CexNHS patients and by non-CexNHS patients (t=3.80, df=1838, P=0.000) but no difference between the value of treatment consumed by NexNHS and private patients (t=-0.42, df=1009, P=0.674).

Conclusions:
The rate of uptake of primary dental care and the value of treatment consumed were higher among charge-paying than charge-exempt patients. The mean patient charge for treatment was significantly higher for patients treated privately than for charge-paying patients treated in the NHS. There was no difference in the value of treatment consumed between groups. These findings suggest that patient charges for primary dental care are only a minor influence on decisions to seek care, and on decisions about the components of care as reflected in service costs.

3. Abstract of the oral presentation given at the Pan European Federation of the International Association for Dental Research, 2008, London, UK:

Title: The impact of patient charges on primary care dentistry

Authors: CM Penfold, JP Shepherd

Introduction:
Patient charges at the point of delivery of dental care in the UK range from the full cost of private treatment through NHS co-payments to free NHS care.

Objectives: To test hypotheses that the mean patient charge per course of treatment is inversely related to the rate of primary dental care uptake and the value of dental treatment consumed.

Methods:
Nationally representative data from the 1998 Adult Dental Health Survey (ADHS) were analysed.

Results:
64% of respondents (2302 of 3628) visited a dentist in the 12 months prior to interview. 74% received NHS care and 23% private care. 55% of people receiving income support (122 of 222), and therefore exempt from NHS patient charges, visited a dentist in the previous 12 months. The mean patient charge for NHS dental treatment was £37.00 (s.d.=59.9) compared with £87.10 (s.d.=144.8) for private treatment. According to the NHS scale of patient charges, the mean value of treatment consumed by charge-exempt NHS (CexNHS) patients was £19.70 (95% C.I.=18.5-20.8), £22.80 (95% C.I.=21.8 – 23.8) by non-exempt NHS (NexNHS) patients and £22.40 (95% C.I.=20.8 – 24.0) by private patients. Analysis of variance identified significant differences between the value of treatment consumed by CexNHS and non-CexNHS patients (t=3.80, df=1838, P=0.000) but no difference between NexNHS and private patients (t=-0.42, df=1009, P=0.674).

Conclusions:
The rate of primary dental care uptake and the value of treatment consumed were higher among charge-paying than charge-exempt patients. The mean patient charge for treatment was significantly higher for patients treated privately than for charge-paying NHS patients. There was no difference in the value of treatment consumed between groups. These findings suggest that patient charges for primary dental care are only a minor influence on decisions to seek care, and on decisions about the components of care as reflected in service costs.

Funding: Brickley Research Foundation

Appendix 2 Health utilisation data sources

A range of national and international datasets which include data relating to the use of primary healthcare resources are available. Relevant surveys including nationally representative surveys have been undertaken using individual patients, households and practitioners as the sampling unit. In addition, international surveys including a representative sample from the UK have been undertaken. Alongside these population surveys, there is a large amount of NHS data available with information relating to health service use.

In this study relevant sources of health utilisation data are reviewed and the following criteria are considered:

- The availability of relevant primary care utilisation information
- The availability of relevant health status information
- The time-frame
- The availability of data relating to respondents' social, economic and demographic status
- The availability of data relating to attitudes and beliefs about health and healthcare provision.

An overview of NHS data

The NHS records a range of information relating to service use and user satisfaction. The level of detail recorded differs between services and whether care is delivered in primary, secondary or tertiary settings.

Table 0-1: A summary of datasets compiled or maintained by the NHS

Primary care service	Co-ordinating body	Information available
Primary Medical care	The NHS Information Centre (The IC)[43]	GP workload survey
	Nottingham University/EMIS (QRESEARCH database)[44]	Annual number of GP consultations by patient, practitioner type, GP practice and location
Primary Dental care	Dental Practice Board (DPB)[43]	Quarterly and annual volume of NHS treatment options delivered and number of registered NHS patients
Primary Ophthalmic care	General Ophthalmic Services (GOS)[43]	Annual volume of sight tests and vouchers for glasses, including information on eligibility criteria
Pharmacists / Prescriptions	Royal Pharmaceutical Society (RPS) and Prescription Pricing Authority[43]	Monthly volume of prescriptions dispensed by type and patient charge status

As shown in Table 0-1, data collected by the NHS relating to health service use are available for all the main primary care services except for general medical care. The time frame covered by these datasets is continuous from the early 1990s onwards. The available data relate to detailed expenditure on NHS services and care undertaken by

[43] As of 2005 The NHS Information Centre has become the central point of access for all NHS related data

[44] The QRESEARCH database is maintained and managed by Nottingham University and EMIS on behalf of the Office for National Statistics and the Department of Health (2006)

services. The sources have been drawn from central records of patient contacts with practitioners, making them nationally representative. However, the usefulness of these datasets is limited since they do not contain any additional information relating to individual patients' social, economic, family or health status. Social and economic indicators are available based on geographic location; however, the smallest unit of measurement of each record is usually a Local Health Authority area or Primary Care Trust boundary and therefore the accuracy of the derived socio-economic indicators are limited.

The GP workload survey provides some information expected from central records of GP consultations. However, this survey was only undertaken in 1992/93 and 2006/07. The QRESEARCH database of GP practice records is a much more in-depth dataset and includes information relating to 'patient demographics (year of birth, sex, socio-economic data associated with postcode area), characteristics (height, weight, smoking status), symptoms, clinical diagnosis, consultations, referrals, prescribed medication and results of investigations' (Hippisley-Cox, Fenty et al. 2007). In 2006, the database held more than 30 million person years of observation from 525 practices in the UK. However, the usefulness of the QRESEARCH database is limited by the derivation of its data from patient records. Since it is a collection of data extracted from patient records the availability of data beyond that collected in standard clinical examinations is limited, for example there are no standardised objective measures of health status or data relating to attitudes and beliefs about health and healthcare provision recorded on the database.

An overview of nationally representative surveys

Nationally representative surveys which record primary healthcare related information include:

- The British Household Panel Survey (BHPS)
- The Adult Dental Health Survey (ADHS)
- The Health Survey for England (HSE)
- The General Household Survey (GHS)

Table 0-2 is a summary of these survey datasets, which of the main services they relate to and which editions of the survey are relevant.

Table 0-2: Nationally representative surveys which record primary healthcare utilisation data

Survey	GP	Dental	Optician	Prescription	Suitable editions
ADHS	-	✓	-	-	1988, 1998
BHPS	✓	✓	✓	-	1991 – 2005
HSE	✓	✓	-	✓	2001, 2002
GHS	✓	✓	✓	✓	2001, 2003

The 1998 Adult Dental Health Survey

The Adult Dental Health Survey (ADHS) is undertaken every ten years, the most recent of which was carried out in 1998. The 1998 ADHS covered 4,984 addresses at which all adults over 16 in residence were asked to take part. In total, 6,204 adults were

interviewed and those not edentate undertook a dental examination (Treasure, Kelly et al. 2001).

The specific aims of the survey were to (2001a):

- 'Establish the condition of the natural teeth and supporting tissues'
- 'Investigate dental experiences, attitudes and knowledge, dental care and oral hygiene'
- 'Establish the state and use made of dentures worn in conjunction with natural teeth'
- 'Identify those who have lost all of their natural teeth and investigate their use of dentures'
- 'Monitor the extent to which oral health targets set by government are being met'

Dental treatments received and treatment cost information is included in the survey results. Self-assessed as well as clinically measured oral health status, the physical, psychological and social impact of oral health, and opinions about dentists and dentistry in general are also recorded.

The British Household Panel Survey

The British Household Panel Survey (BHPS) comprises a nationally representative sample of around 5,500 households and more than 10,000 individuals who constitute a panel of interviewees re-interviewed every year. The attrition of the original panel of

respondents is supplemented annually by the recruitment of new households. Additional age group and region targeted sampling, such as the British Youth Panel, introduced in 1993 to include a representative sample of 11 to 15 year olds, also refresh the sample population. The BHPS was begun in 1990, with the first dataset available in 1991. Annual datasets are divided into waves, denoted alphabetically from 'a'. From 1994 to 2001 the BHPS data were also used in the European Community Household Panel Survey (ECHP) (see 0 for more details).

Many of the questions in the BHPS have remained consistent or subject to only minor changes, allowing longitudinal as well as cross-sectional analyses. One-off inclusions and themes repeated less often than annually are also available. The sampling methods and quality profile of the BHPS are reviewed fully in 'Quality Profile: British Household Panel Survey (v2.0)' (Buck, Burton et al. 2006).

The BHPS provides data for the following domains:

- Labour markets
- Income
- Savings and wealth
- Household and family organisation
- Housing
- Consumption
- Health
- Social and political values

- Education and training

The health domain includes questions relating to frequency of GP consultations in the previous 12 months; as well as whether the respondent had a dental 'check-up' or sight test and whether these were undertaken privately or through the NHS. These questions are supplemented by additional health status questions covering:

- Past accidents and illness
- How health effects daily life
- Personal health condition (including standardised measures of health status)
- Smoking
- Subjective well-being

The BHPS data are a suitable source for cross-sectional or longitudinal analyses of primary medical (Bago d'Uva 2005), dental (Batchelor 2004) or ophthalmic services (Propper 2000) uptake incorporating social, economic, demographic and health related predictors.

The European Community Household Panel

The European Community Household Panel (ECHP) dataset is a collection of longitudinal data from 12 European countries, including the BHPS data for the UK. The data provided by the participating countries was either from specific ECHP surveys or suitable data from national surveys were converted to the appropriate ECHP format.

Overall, approximately 130,000 adults from 60,000 households participated in the study (Gershunny, Taylor et al. 2004).

The ECHP dataset has individual and household level data on similar topics to the BHPS with the addition of a European-wide context.

The Health Survey for England

The Health Survey for England (HSE) comprises an annual survey covering the health of people in England. The population sample size differs for each year of the survey, but typically a fresh sample (unlike the BHPS, the sample population is not retained for future editions of the survey) of between 7,000 and 16,000 adults and 4,000 to 7,000 children are recruited annually. Each year the HSE focuses on different demographic groups and looks at indicators of health, including cardio-vascular disease, physical activity, eating habits, oral health, accidents and asthma (Department of Health. 2007a). The aims of the survey are:

- To provide annual data about the nation's health, including
    - Estimating the prevalence of specific health conditions
    - Estimating the prevalence of risk factors associated with those conditions
    - Examining differences between population sub-groups
- To monitor health targets

The core of the survey includes demographic and socio-economic indicators and questions about:

- General health and psycho-social indicators
- Smoking
- Alcohol consumption
- Use of health services and prescribed medicines

Measurements of height, weight and blood pressure, as well as blood samples, ECG (echo cardiogram) readings and lung function tests form the objective health measures of respondents.

All waves of the HSE include questions relating to GP consultation frequency and the 2001 and 2002 editions of the HSE include questions relating to dental attendance, how many teeth respondents have and recent dental ill health.

The General Household Survey

The General Household Survey (GHS) is an annual national survey of all adults aged 16 and over in approximately 13,000 households (Office for National Statistics. 2003). The aim of the survey is to collect data on a range of topics, including:

- Household and family
- Housing tenure and accommodation
- Consumer durables
- Employment
- Education
- Health and use of health services
- Smoking and drinking
- Family information
- Income
- Demographic information

The section, 'Health and use of health services' includes questions relating to:

- Self-reported health
- Use of health services
- NHS and private consultations
- Hospital visits

All editions of the GHS include questions about GP consultations in the previous two weeks, including whether these consultations were through the NHS or privately and whether respondents were given a prescription. The 2001-02 edition includes questions relating to dental visits in the previous month and three months. The 2003-04 edition includes questions relating to when respondents last visited a dentist and for what reason, and how many natural teeth they have.

Health utilisation datasets recorded on behalf of or by the NHS are extensive sources of information relating to healthcare utilisation patterns. However, these datasets are limited by their derivation from clinical records which do not record information regarding attitudes and beliefs about health and healthcare provision, and also do not include comparable records of people who have not used the associated service. Each survey dataset provides a standardised set of data for each respondent (dependent on the response rates for each question) and are not restricted to those having visited a healthcare practitioner only. However, these datasets can be limited by the time frame covered by the surveys or the compatibility of successive editions.

Appendix 3 Calculation of the 'value' of ADHS treatment items

The 1998 Statement of Dental Remuneration (SDR) catalogues 631 treatment items chargeable through the NHS. For each item the number of times it was claimed for and the total cost to the NHS of these claims, in absolute terms and as a percentage of the NHS budget for dentistry, is recorded. 171 of these items, accounting for 84.2% of the NHS dental budget in 1998, were grouped and matched with ADHS treatment options as shown in Table 0-2. The value of each ADHS treatment option was defined as the mean cost of its constituent SDR treatment items, as follows:

$$Value_k = \frac{\sum^i (C_i * n_i)}{\sum^i (n_i)}$$

i = SDR treatment item

k = ADHS treatment option/grouped SDR treatment items

C = Unit cost of item i

n = number of times item i was claimed

Using this definition and the frequency and cost data from the SDR the value of the ADHS treatment options is shown in Table 0-1.

Table 0-1: The 'value' of ADHS treatment items

ADHS treatment item	Value (£)
Examination and report (ER)	5.70
X-ray	4.66
Extraction(s)	5.64
Impressions	11.61
Dentures repaired	14.37
New dentures	51.42
Abscess treatment	5.31
Restorations	10.06
Crowns fitted	31.91
Scale and polish	8.59
Periodontal treatment	21.68
Dentures checked	n/a

Table 0-2: The number, cost, percentage and unit cost of SDR treatment items grouped into ADHS treatment option categories

ADHS option	Description	Number (10^3)	Cost (10^3 £)	%	Unit cost (£)
Examination and report	Clinical exam & report	17904.7	95023.5	10.94	5.31
	Extensive exam & report	2703.0	20501.6	2.36	7.58
	Full case assessment	170.9	2888.0	0.33	16.90
	Transfer report	1.7	4.6	0.00	2.70
	Total	20780.3	118417.8	13.64	5.70
X-ray	Small Film -1 film	1679.4	4533.7	0.52	2.70
	-2 films	3126.0	11687.6	1.35	3.74
	-3 films	643.2	2944.8	0.34	4.58
	-4 films	265.7	1541.8	0.18	5.80
	-5 films	100.9	708.9	0.08	7.02
	-6 films	50.4	415.6	0.05	8.24
	-7 films	19.2	181.2	0.02	9.46
	-8 films	11.7	125.1	0.01	10.65
	-9 films	6.1	72.8	0.01	11.83
	-10 films	3.6	47.5	0.01	13.04
	-11 films	2.0	28.1	0.00	14.28
	-12 films	4.4	68.2	0.01	15.43
	Medium Film -1 film	21.3	74.3	0.01	3.49
	-2 films	7.1	36.7	0.00	5.14
	-3 films	0.8	5.5	0.00	6.78
	Large Film -1 film	2.9	16.2	0.00	5.59
	-2 films	5.4	44.5	0.01	8.27
	-3 films	0.1	0.6	0.00	10.92
	Panoral Film	1417.2	11788.4	1.36	8.32
	Lateral headplate with ortho	0.8	9.9	0.00	12.29
	-others	0.1	0.5	0.00	9.79
	Total	7368.5	34331.8	3.96	4.66
Impressions	Study casts - per set	134.3	1595.2	0.18	11.88
	- per dup set	3.2	24.0	0.00	7.52
	- single cast	4.2	25.0	0.00	6.01
	Add fee - occl analysis	2.9	34.1	0.00	11.82
	Total	144.5	1678.2	0.18	11.61

ADHS option	Description	Number (10^3)	Cost (10^3 £)	%	Unit cost (£)
Restorations	Amalgam Filling -1 surface	2260.7	13087.6	1.51	5.79
	-2 or more surfaces	508.4	4356.1	0.50	8.57
	1 MO or DO filling	4489.0	50774.5	5.85	11.31
	1 MOD filling	1857.0	27756.2	3.20	14.95
	Tunnel restoration -per fill	9.6	108.9	0.01	11.32
	-maximum per tooth	0.4	5.4	0.00	14.91
	composite/synth -1 filling	3953.8	42966.2	4.95	10.87
	-2 or more	322.7	5493.4	0.63	17.02
	additional fees -1 angle	525.5	1837.3	0.21	3.50
	-incisal edge	117.3	76.0	0.01	0.65
	-2 angles	39.9	231.1	0.03	5.79
	-cusp tip	50.0	416.3	0.05	8.34
	Glass ionomer etc -1 filling	1916.2	19034.7	2.19	9.93
	-2 or more	75.5	1026.2	0.12	13.60
	Pin or screw retention	1002.2	4593.0	0.53	4.58
	Fissure seal - sealant only	277.3	1469.9	0.17	5.30
	- composite resin	61.7	468.0	0.05	7.59
	- glass ionomer	67.2	544.0	0.06	8.10
	-Both of above	162.0	1835.6	0.21	11.33
	Add fee for medical condition	0.0	3.8	0.00	222.12
	Surface with GI -1 filling	12.8	127.0	0.01	9.95
	maximum per tooth	1.5	22.1	0.00	14.78
	combination max 14A, B, C & E	114.5	2373.9	0.27	20.72
	Addl with 14C1 or 14D	58.1	1341.0	0.15	23.08
	Pre 90 proviso (2) combtions	0.0	0.0	0.00	0.00
	Total	17883.1	179948.3	20.72	10.06
Extractions	Extractions - 1 tooth	1191.1	6308.2	0.73	5.30
	- 2 teeth	199.9	1931.4	0.22	9.66
	- 3-4 teeth	92.0	1374.5	0.16	14.93
	- 5-9 teeth	44.6	873.7	0.10	19.59
	- 10-16 teeth	8.9	233.8	0.03	26.36
	- 17 + teeth	2.0	65.8	0.01	32.18
	Additional fee per visit	1682.3	7374.1	0.85	4.38
	Total	3220.8	18161.5	2.09	5.64
Scale & pol.	Scaling and polishing	13373.5	114927.8	13.23	8.59
Perio. treatment	Periodontal trt 2 visits	1469.0	30505.6	3.51	20.77
	Chronic perio trt-1-4teeth	3.1	80.8	0.01	26.21
	-5-9teeth	2.0	62.7	0.01	32.06
	-10-16teeth	4.9	183.7	0.02	37.63
	17 or more	59.9	2533.3	0.29	42.32
	Total	1538.8	33366.0	3.84	21.68

ADHS option	Description	Number (10^3)	Cost (10^3 £)	%	Unit cost (£)
Crowns fitted	Inlay or Pinlay -1 surface cav	1.7	78.5	0.01	44.88
	-2 surface cav	11.7	744.5	0.09	63.48
	-2 surface with incisal edge	0.4	25.1	0.00	57.74
	-3 or more surface cavity	68.0	5728.7	0.66	84.19
	Crowns Full or 3/4 prec. metal	196.1	13799.0	1.59	70.38
	Jacket - non-prec metal alloy	28.0	1615.8	0.19	57.61
	Porcelain jacket	31.7	1787.6	0.21	56.38
	Bonded FJC - gold	926.5	74414.7	8.57	80.32
	Bonded FJC - non precious	13.7	1057.6	0.12	77.10
	Bonded FJC -platinum	2.4	158.5	0.02	65.72
	Jacket -synthetic resin	1.7	77.3	0.01	46.07
	Additional fee per arch	1013.4	5348.1	0.62	5.28
	Core/post - metal alloy	221.7	4928.2	0.57	22.23
	- prefabricated	70.3	874.5	0.10	12.44
	Pin or screw retention	294.4	1764.3	0.20	5.99
	Silicate etc facing - Inlay	0.3	2.2	0.00	6.90
	- Crowns	5.0	48.7	0.01	9.67
	Dovetail or slot	1.5	17.0	0.00	11.59
	Parallel metallic surface	2.9	31.4	0.00	10.75
	Temporary crown-non post ret	40.4	399.3	0.05	9.89
	Temporary crown-post retained	25.5	357.2	0.04	14.01
	Removal of fractured post	3.2	34.7	0.00	10.79
	Other forms of crown	0.4	47.0	0.01	106.11
	Renewal of facing -inlays	0.3	1.8	0.00	6.93
	- crowns	1.3	10.8	0.00	8.10
	Other repair of a crown	4.2	96.3	0.01	23.07
	Refix or recement -Inlays	47.8	344.0	0.04	7.20
	- crowns	588.2	4234.0	0.49	7.20
	Pre 92 C+dia/post/backing	0.0	0.0	0.00	0.00
	Pre Dec96 Crowns 3/4 or basket	0.5	37.5	0.00	81.86
	Pre Dec96 Full/Jacket - molar	15.2	1314.5	0.15	86.45
	Pre Dec96 Full/Jacket - premolar	1.2	97.1	0.01	81.90
	Pre Dec96 Core/post-precious	27.7	622.1	0.07	22.42
	Pre Dec96 Composite facing	0.1	1.3	0.00	17.92
	Palladium supplement for 1711	22.9	32.8	0.00	1.43
	Palladium supplement for 1721	77.1	126.5	0.01	1.64
	Palladium supplement for 1732	20.9	9.6	0.00	0.46
	Total	3768.6	120268.0	13.85	31.91

ADHS option	Description	Number (10^3)	Cost (10^3 £)	%	Unit cost (£)
New dentures	Synthetic res add per course	1.3	15.2	0.00	11.72
	Temp base -per application - upp	10.3	161.5	0.02	15.70
	-max per dent -upp	1.5	45.3	0.01	31.08
	-per application -low	9.1	142.8	0.02	15.72
	-max per dent -low	1.2	38.0	0.00	31.06
	Other treatment	0.0	0.0	0.00	0.00
	Dentures - synth resin full U+L	230.5	25535.9	2.94	110.79
	Full upper (only)	77.2	5337.8	0.61	69.13
	Full lower (only)	38.9	2691.9	0.31	69.20
	Partial - 1-3 teeth	120.6	5556.5	0.64	46.09
	- 4-8 teeth	167.1	10197.3	1.17	61.02
	- 9 or more teeth	79.0	5738.7	0.66	72.60
	Full width 1-3 teeth partial	1.2	133.6	0.02	114.12
	Other combinations	43.4	4946.9	0.57	113.94
	- 1-3 with 1-3 teeth	3.0	274.9	0.03	92.03
	-1-3 with 4-8 teeth	8.9	948.6	0.11	106.88
	- 1-3 with 9-12 teeth	1.7	191.7	0.02	113.58
	- other combinations	64.0	7287.7	0.84	113.88
	add fee-lingual/palatal bar	8.7	83.5	0.01	9.65
	Metal ss/cc full denture Upp	11.1	1156.9	0.13	103.82
	Metal ss/cc full denture Low	2.1	221.7	0.03	103.92
	Plate - 1-3 teeth	5.5	582.9	0.07	105.81
	- 4-9 teeth	19.2	2222.5	0.26	115.88
	- 9-12 teeth	8.2	985.5	0.11	120.78
	Single bar - 1-3 teeth	8.5	947.8	0.11	111.27
	- 4 or more teeth	26.9	3268.1	0.38	121.65
	Multi bar - 1-3 teeth	6.6	760.2	0.09	115.92
	- 4 or more teeth	27.2	3531.9	0.41	129.71
	Additional fee - teeth backed	7.9	58.3	0.01	7.36
	Maximum per denture	0.5	22.9	0.00	43.75
	Dentures in any other metal	0.2	25.2	0.00	117.14
	Add fee Soft lining - upper	3.9	95.2	0.01	24.23
	Add fee Soft lining - Lower	24.4	592.0	0.07	24.25
	Add fee Special trays-Upper	417.0	4897.9	0.56	11.74
	Add fee Special trays-Lower	318.2	3737.7	0.43	11.75
	Add fee perm ID marker-Upper	24.3	90.9	0.01	3.73
	Add fee perm ID marker-Lower	21.7	81.0	0.01	3.73
	Total	1801.0	92606.2	10.66	51.42

ADHS option	Description	Number (10^3)	Cost (10^3 £)	%	Unit cost (£)
Dentures repaired	Repairs - crack/fracture single	448.5	5003.2	0.58	11.15
	each additional repair	35.0	138.0	0.02	3.95
	Maximum for add repairs	0.1	1.6	0.00	14.38
	Refixing clasp - first repair	16.0	259.1	0.03	16.19
	- addl repairs	2.1	16.2	0.00	7.85
	Maximum for addl repairs	0.0	0.3	0.00	9.31
	Other repairs	1.7	57.6	0.01	33.61
	Add fee Impression technique	101.3	517.4	0.06	5.11
	Adjusting denture	220.9	1734.6	0.20	7.85
	Other adjustments	0.6	6.7	0.00	10.97
	Reline excl repair/addition	91.6	2431.8	0.28	26.54
	Addition of flange	7.6	229.0	0.03	30.04
	Soft lining existing denture	16.9	686.3	0.08	40.55
	Addition - clasp	10.8	237.7	0.03	21.97
	- tooth	202.6	3743.9	0.43	18.48
	- new gum	2.7	49.1	0.01	18.46
	- Other	3.9	140.4	0.02	36.24
	Proviso -additional repairs	1.9	7.5	0.00	3.95
	Proviso -maximum	0.1	2.3	0.00	25.64
	Combinations of 28a&28d	87.0	2714.0	0.31	31.19
	Total	1251.3	17976.8	2.07	14.37
Abscess treatment	Incising an abscess	2.8	14.7	0.00	5.31

Appendix 4 Participant information sheet

Information Sheet - **(Version 2.3)**

February 2007

User Fees in Primary Health Care

You are being invited to take part in a research study which forms part of my doctoral studies in health services research at Cardiff University. I greatly appreciate you taking the time to consider, and possibly participate in, this study. Before you decide whether you would like to participate it is important that you understand why the research is being done and what it will involve. Please take time to read the following information carefully. Talk to others about the study if you wish, and ask if there is anything that is not clear or if you would like more information.

Please note: ***This is a student study and not linked to any commercial companies.*** *Your participation will be* ***entirely confidential****, thank-you.*

Introduction:

In the National Health Service healthcare is often free for patients when they need it. There are, however, some services such as dental checkups and eye tests which patients have to pay for. In this study I am looking at GP appointments and dental healthcare and how charges for these services might affect patients. There are conflicting views about paying for healthcare, with some people believing that charges would be a good thing, and others believe they are unfair. By doing this study I hope to be able to add to the knowledge about healthcare charges and possibly influence government policy on healthcare charges.

Why have I been chosen?
A range of people have been invited to take part in this study. People have been invited from 2 different areas of Bristol (Clifton and Easton) as well as people living in the more rural area of Somerton, in Somerset. In each location 2 main groups of roughly 5 people each will be invited to take part:

1. Members of the general public
2. People who visit their GP quite frequently

The purpose of this study is to find out how people feel about paying for healthcare and how they would feel if they had to pay to visit their GP. By interviewing these groups I hope to get the views and opinions of people from the general public, who may not have to pay much more than currently; and people who visit their GP quite frequently, who would be likely to have to pay more.

Do I have to take part?
No – you are entirely free to choose.
Whether you choose to take part or not will not affect any of your healthcare rights.

What will I be doing?
You will take part in a recorded interview which should last no longer than 45 minutes and will be done in the Practice, at your home or another location (e.g. local café) - whichever you prefer.

What will I be asked?

You may be asked for some information about yourself on one or more of the following topics:

- How often you visit your GP, dentist or optician.
- How you pay for healthcare and how you feel about this.
- Your general and dental health (**an overview only**)
- How important you feel GPs and dentists are in keeping you healthy.

The interview will be focused on how you use local healthcare services. Any questions asked about your health will be general, you will not be asked about any specific illnesses you have or may have had in the past.

Will my taking part be confidential?
Yes – you will not be named in the study.
Agreeing to take part in the study means that comments you make during the interview may be used in publications that result from this study, but you will not be named.

What will happen to the recording?
The recording of your interview will be stored for 7 years. These recordings will be entirely anonymous and will only be used by Cardiff University, the NHS or another researcher with permission from me, the lead researcher.

Who will be able to access the results?
The results from this study will be used for academic submissions to Cardiff University and may also be published in medical journals.

If you have any questions or concerns:
I can be contacted from 9am until 5pm Monday to Friday on 07949408989 (if I do not answer, please leave a message and I will call you back as soon as possible).

If you have concerns that you would rather discuss with someone else:
The NHS Patient Advice and Liaison Service (PALS) can be contacted on:
Somerset (01278 432013)
Bristol (0117 9003433).

Please note that PALS cannot answer specific queries about this study.

If you would like a copy of the results please discuss this at the time of your interview.

Please use the contact details below if you have any further questions about this project.

Thank-you for your time,

Chris Penfold

Cardiff University

Tel: *07949408989*
Email: chrispenfold@yeovilsmile.plus.com

Appendix 5a Participant consent form

Patient consent (version 1.1)
Patient Identification Number:.....

CONSENT FORM

Title of Project:

User Fees in Primary Healthcare

Name of Researcher: Chris Penfold **Please initial**

1. I confirm that I have read and understand the information sheet dated ..... (version 2.2) for the above study. ☐
2. I confirm that I have been able to ask questions about this study, and I have received satisfactory responses. ☐
3. I understand that taking part is entirely voluntary. I am free to with draw at any time, without giving any reason, without my healthcare or legal rights being affected. ☐
4. I understand that the interview will be recorded and that this recording may be used anonymously in any publications generated by this study or re-analysed by another researcher at the discretion of C Penfold. ☐
5. I agree to take part in the above study ☐

Name.....Signed ..... **Date** .....

Name...C Penfold.....Signed..... **Date**..... (researcher)

1 for patient, 1 for researcher

If you have any queries please contact me on:

07949408989 – Monday to Friday, 9am to 5pm (if there is no answer, please leave a message and I will respond asap)
chrispenfold@yeovilsmile.plus.com

Appendix 5b Participant contact form

Patient contact (version 1.1)

CONTACT FORM

User Fees in Primary Healthcare

Name of Researcher: Chris Penfold

'Thank-you for your interest in taking part in this study. Please read the information and then complete the details below.'

Thanks, Chris Penfold

By completing the information below you are agreeing to be contacted by the lead researcher. **Completing this form does not mean you have agreed to take part in the study. The details on this form will be kept entirely confidential.**

Name:.....

Contact telephone number:.....

(email address if convenient:.....)

When is the best time to call (please circle as appropriate)?

Morning / Afternoon / Evening

Appendix 5c Clinician crib sheet

Patient Copayments in Primary Medical Care

(User Fees in Primary Health Care)

- Please stress – **Taking part in this study is entirely voluntary**
  - **Anything discussed will be entirely confidential**
  - **The study is being run by Cardiff University – not commercial**
- Give them a Patient Information Sheet

Suggested Introduction:
'We are inviting some patients from this Practice to take part in a study run by Cardiff University. We are particularly interested in talking to patients who come here quite frequently – Would it be OK to tell you about the study, and then you can consider whether you would like to take part?'

What is it about?

The study is about healthcare and how patient charges for things such as prescriptions, dental treatment and eye tests affect patients.

What does taking part involve?

You will take part in a recorded interview which should last no longer than 45 minutes and will be done in the Practice or at your home, whichever is most convenient.

If they are interested in taking part...
What next?
Either:

- Discuss the study further with the researcher now

Or,

- Leave your contact details for the researcher to contact you at a later date

Appendix 6 Survey outline

The following interview schedule formed the basis of each interview. Where appropriate additional topics for probing have been included, however each interview was guided by the participant and topics were probed as appropriate.

Introduction

What is the study about?

- A discussion about healthcare and how you use it.
    - Discussing GPs, dentists, opticians and prescriptions
- We will not be discussing medical details.
- Interview will be recorded.

Primary care usage

Discuss the use of GPs, Dentists and Opticians, and prescription items.

Experience of user fees in primary care

Discuss patient charges associated with:
Dentistry
Optician
Prescriptions

Avoiding charges

- Have you ever found the charges (as answered above) difficult to manage?
    - Do you do anything to keep costs down?
        - Probe further

General health overview and role of practitioners

'*Now I would like to discuss your general health...*'

General Health:

- How would you describe your general health?
- Do you think about your health?
- How important is your general health to you?

- Overall do you think there are things that it is important for people to do to be healthy?
    - What role do you feel a GP plays in keeping you healthy?
    - What role do you feel that you play in staying healthy?

'Moving more specifically to your dental health...'

Dental Health:

- How would you describe your dental health?
- Do you think about your dental health?
- How important is your dental health to you?
- Do you think there are things that it is important for people to do to keep their teeth and gums healthy?
    - What role do you feel a dentist plays in keeping your teeth and gums healthy?
    - What role do you feel that you play in your oral health?

Possible impact of copayments for GP visits

'Previously we discussed some NHS healthcare services that you have to pay for...'

- Why do you think the NHS charges some people for NHS dental check-ups?
- Similarly, why do you think there are charges for sight tests?
- Why do you think people do not currently pay for NHS GP visits?
    - How would you feel if charges were introduced?
        - Probe further

Appendix 7 Flowcharts for the recruitment of participants

Figure 0-1: Flowchart for the recruitment of 'regular attender' participants

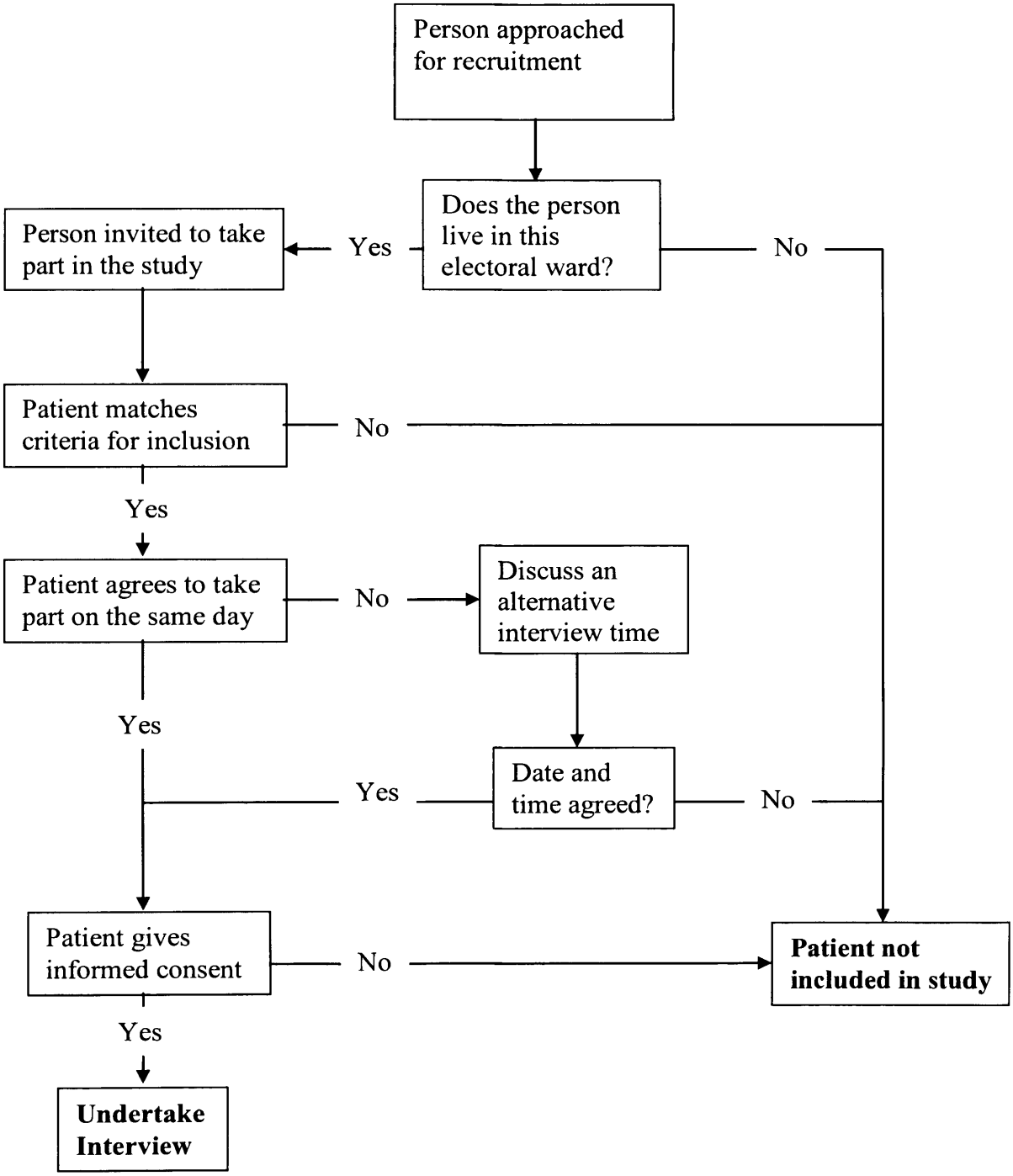
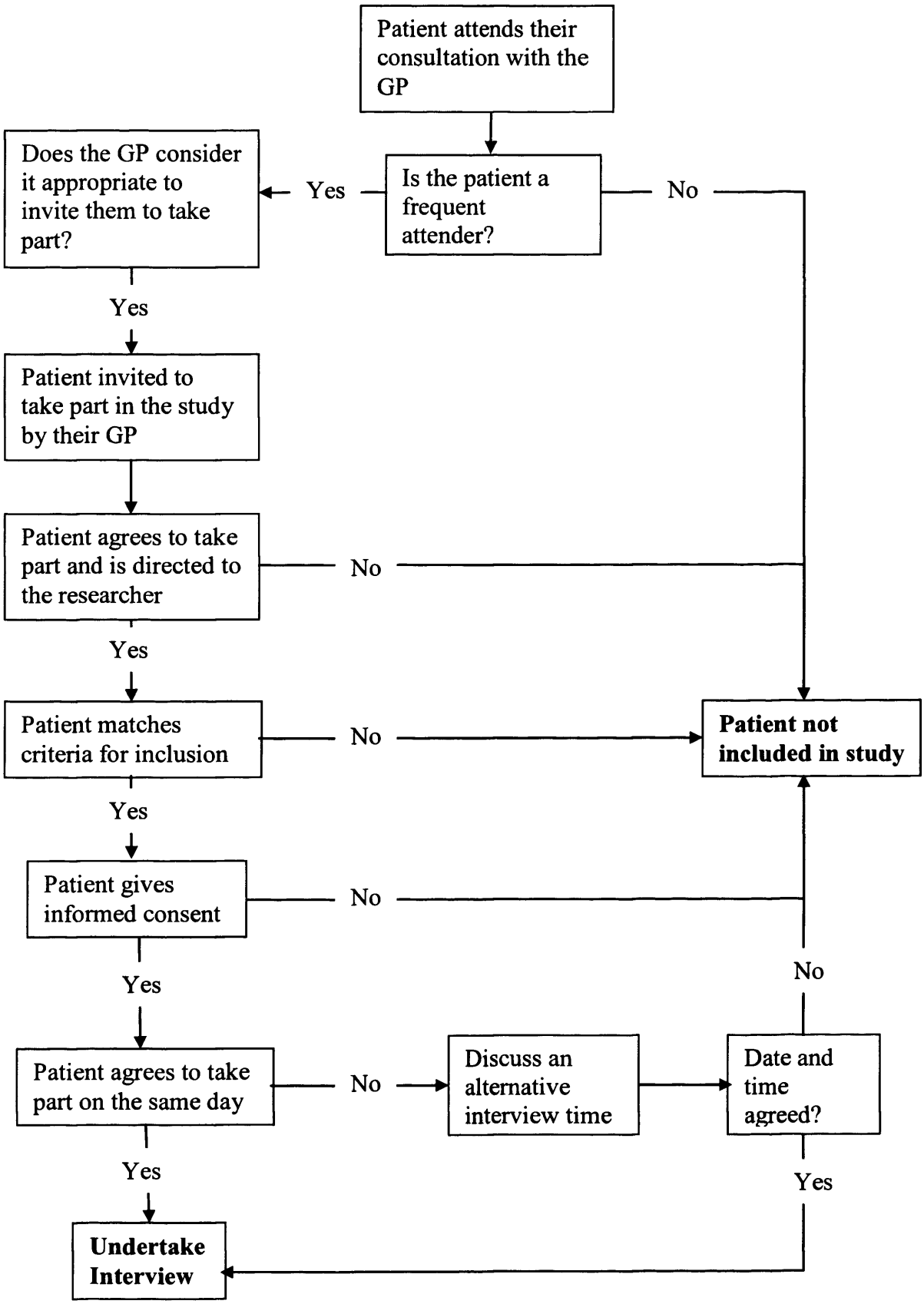


Figure 0-2: Flowchart for the recruitment of 'frequent attender' participants



Appendix 8 Binary logistic regression model of predictors of dental attendance in 1998 including interaction terms

Table 0-1: Binary logistic regression modelling of predictors of dental attendance in 1998 including income support status and interaction terms

Variable		Exp(B)	Sig.
Educational attainment	No qualifications		.367
	Other	1.180	.267
	Degree or higher	1.358	.168
Sex	Female	2.013	.000
Legal marital status	Separated		.001
	Never married	1.356	.355
	Married	2.447	.006
	Divorced	2.049	.046
	Widowed	1.975	.104
OHIP total		1.046	.045
Household size		1.074	.166
Age group	80-89		.002
	16-19	2.648	.083
	20-29	1.344	.543
	30-39	1.549	.358
	40-49	1.585	.334
	50-59	2.465	.056
	60-69	2.812	.028
	70-79	2.729	.033
	90+	6.687	.371
Annual household income quintile	Lowest		.643
	Lower	1.221	.632
	Middle	.651	.338
	Higher	1.069	.892
	Highest	.884	.808

Social class	I Professional		.618
	II Management & Technical	.718	.257
	IIINM Skilled non-manual	.804	.489
	IIIM Skilled manual	.983	.957
	IV Partly skilled	.805	.504
	V Unskilled	.917	.815
	Armed Forces	7.476E8	.999
Anxious about visiting	Definitely		.003
	To some extent	1.581	.005
	Don't feel like that	1.866	.000
	Don't know	2.033	.128
Don't go unless need to	Definitely		.000
	To some extent	2.311	.052
	Don't feel like that	7.070	.000
	Don't know	3.167	.146
Nervous	Definitely		.086
	To some extent	1.127	.432
	Don't feel like that	1.030	.866
	Don't know	.397	.027
Find NHS expensive	Definitely		.015
	To some extent	1.929	.104
	Don't feel like that	2.912	.007
	Don't know	.908	.794
Costs less if go when in pain only	Definitely		.051
	To some extent	.398	.040
	Don't feel like that	1.279	.514
	Don't know	.969	.948
Income Support status		2.573	.148
Household income *	'Don't go unless need to'		.792
Lower *	To some extent	1.058	.914
	Don't feel like that	1.579	.319
	Don't know	2.538	.340
Middle *	To some extent	1.097	.866
	Don't feel like that	1.491	.397
	Don't know	3.787	.233

Higher *	To some extent	.600	.354
	Don't feel like that	1.027	.955
	Don't know	19.643	.236
Highest *	To some extent	1.160	.795
	Don't feel like that	1.601	.348
	Don't know	.921	.937
Household income *	'Find NHS expensive'		.034
Lower *	To some extent	.725	.523
	Don't feel like that	.386	.070
	Don't know	.599	.296
Middle *	To some extent	.716	.513
	Don't feel like that	.497	.168
	Don't know	2.086	.149
Higher *	To some extent	1.067	.901
	Don't feel like that	.571	.273
	Don't know	1.903	.204
Highest *	To some extent	.733	.538
	Don't feel like that	1.284	.627
	Don't know	1.220	.676
Household income *	'Costs less if go when in pain only'		.060
Lower *	To some extent	1.849	.283
	Don't feel like that	1.026	.958
	Don't know	.720	.599
Middle *	To some extent	1.709	.338
	Don't feel like that	1.987	.166
	Don't know	.400	.175
Higher *	To some extent	3.053	.052
	Don't feel like that	1.479	.429
	Don't know	.552	.398
Highest *	To some extent	2.222	.178
	Don't feel like that	.677	.444
	Don't know	.695	.607
Income support status *	'Don't go unless need to'		.918
	To some extent	1.378	.648

	Don't feel like that	1.440	.555
	Don't know	1.869	.636
Income support status *	'Find NHS expensive'		.737
	To some extent	.432	.335
	Don't feel like that	.591	.499
	Don't know	.465	.316
Income support status *	'Costs less if go when in pain only'		.225
	To some extent	.327	.198
	Don't feel like that	.598	.443
	Don't know	2.225	.325
	Constant	.022	.000

References

(1998). Adult Dental Health Survey: Oral Health in the United Kingdom 1998. O. f. N. Statistics. London.

(2001a, 2001). "Adult Dental Health Survey." Retrieved 2007, from http://www.statistics.gov.uk/ssd/surveys/adult_dental_health_survey.asp.

(2001b). Primary care, general practice and the NHS plan. The NHS plan. D. o. Health, Department of Health: 1-14.

(2002). General Household Survey. O. f. N. Statistics, Office for National Statistics.

(2003a). Dentistry Research - Patient Survey. London, National Audit Office.

(2003b). General Household Survey. O. f. N. Statistics, Office for National Statistics.

(2004). "30% Copayment Rate Affecting Medical Visits: Korosho Survey." Pharma Japan.(1898): 16.

(2006). Volume A: Introduction, technical report and appendices. British Household Panel Survey User Manual. M. Taylor, J. Brice, N. Buck and E. Prentice-Lane. Colchester, University of Essex.

Aday, L. A. and R. Andersen (1974). "A framework for the study of access to medical care." Health Serv Res **9**(3): 208-220.

Aday, L. A. and R. M. Andersen (1981). "Equity of access to medical care: a conceptual and empirical overview." Med Care **19**(12 Suppl): 4-27.

Andersen, R. M. (1995). "Revisiting the Behavioural Model and Access to Medical Care: Does it Matter." Journal of Health and Social Behaviour **36**(March): 1-10.

Andersen, R. M. and P. L. Davidson (1997). "Ethnicity, Aging, and Oral Health Outcomes: A Conceptual Framework." Advances in Dental Research **11**(2): 203-209.

Andersen, R. M., A. McCutcheon, L. A. Aday, G. Y. Chiu and R. Bell (1983). "Exploring dimensions of access to medical care." Health Serv Res **18**(1): 49-74.

Andersen, R. M. and J. F. Newman (1973). "Societal and individual determinants of medical care utilization in the United States." Milbank Memorial Fund Quarterly, Health and Society **51**(1): 95-124.

Bago d'Uva, T. (2005). "Latent class models for use of primary care: evidence from a British panel." Health Economics **14**: 873-892.

Bailit, H., J. Newhouse, R. Brook, N. Duan, G. Goldberg, J. Hanley, C. Kamberg, V. Spolsky, A. Black and K. Lohr (1985). "Does more generous dental insurance coverage improve oral health?" J Am Dent Assoc **110**(5): 701-707.

Baker, M. R., R. Bandaranayake and M. S. Schweiger (1984). "Differences in rate of uptake of immunisation among ethnic groups." Br Med J (Clin Res Ed) **288**(6423): 1075-1078.

Baker, R. (2000). "Development of a questionnaire to assess patients' satisfaction with consultations in general practice." British Journal of General Practice **40**: 487-490.

Baker, S. R. (2009). "Applying Andersen's behavioural model to oral health: what are the contextual factors shaping perceived oral health outcomes?" Community Dentistry And Oral Epidemiology **37**(6): 485-494.

Balarajan, R., P. Yuen and V. Soni Raleigh (1989). "Ethnic differences in general practitioner consultations." British Medical Journal **299**(6705): 958-960.

Banks, I. (2001). "No man's land: men, illness, and the NHS." British Medical Journal **323**(7320): 1058-1060.

Batchelor, P. A. (2004). "Changes in Self-Reported Attendance of British Adults for Dental Check-Ups Between 1991 and 2000." Primary Dental Care **11**(4): 125-130.

Bath, L. (2006). Dental Health in Somerset, Somerset County Council health Scrutiny Sub-Committee.

Bazin, F., I. Parizot and P. Chauvin (2005). "Original approach to the individual characteristics associated with forgone healthcare: a study in underprivileged areas, Paris region, France, 2001-2003." European Journal of Public Health **15**(4): 361-367.

Bellon, J. A., A. Delgado, J. D. Luna and P. Lardelli (1999). "Psychosocial and health belief variables associated with frequent attendance in primary care." Psychol Med **29**(6): 1347-1357.

Benzeval, M., K. Judge and M. Whitehead (1995). The role of the NHS. Tackling inequalities in health: An agenda for action. M. Benzeval, K. Judge and M. Whitehead. London, Kings Fund.

Birch, S. (1989). "Hypothesis: Charges to Patients Impair the Quality of Dental Care for Elderly People." Age and Ageing **18**(1): 136-140.

Boeije, H. (2002). "A Purposeful Approach to the Constant Comparative Method in the Analysis of Qualitative Interviews." Quality and Quantity **36**(4): 391-409.

Borreani, E., K. Jones, S. Scambler and J. E. Gallagher (2009). "Informing the debate on oral health care for older people: a qualitative study of older people's views on oral health and oral health care." Gerodontology.

Borreani, E., D. Wright, S. Scambler and J. E. Gallagher (2008). "Minimising barriers to dental care in older people." BMC Oral Health **8**: 7.

Bosanquet, N. (1997). "The NHS at Fifty: The Public's View." Pfizerforum.com: Britain's National Health Service, 2004.

Bradley, E. H., S. A. McGraw, L. Curry, A. Buckser, K. L. King, S. V. Kasl and R. Andersen (2002). "Expanding the Andersen model: the role of psychosocial factors in long-term care use." Health Serv Res **37**(5): 1221-1242.

Braun, V. and V. Clarke (2006). "Using thematic analysis in psychology." Qualitative Research in Psychology **3**: 77-101.

Brixey, J. J., D. J. Robinson, C. W. Johnson, T. R. Johnson, J. P. Turley, V. L. Patel and J. Zhang (2007). "Towards a hybrid method to categorize interruptions and activities in healthcare." International Journal of Medical Informatics **76**(11-12): 812-820.

Buck, D. and J. T. Newton (2001). "The privatisation of NHS dentistry? A national snapshot of general practitioners." British Dental Journal **190**(3): 115-118.

Buck, N., J. Burton, H. Laurie, P. Lynn and S. C. Noah Uhrig (2006). Quality Profile: British Household Panel Survey. P. Lynn, Institute for Social and Economic Research, University of Essex.

Callahan, E. J. and K. D. Bertakis (1991). Development and validation of the Davis Observation Code.

Carr-Hill, R. A., N. Rice and M. Roland (1996). "Socioeconomic determinants of rates of consultation in general practice based on fourth national morbidity survey of general practices." British Medical Journal **312**: 1008-1012.

Chalkley, M. and C. Tilley (2006). "Treatment intensity and provider remuneration: dentists in the British National Health Service." Health Economics **15**: 933-946.

Chandra, A., J. Gruber and R. McKnight (2007). Patient Cost-Sharing, Hospitalization Offsets, and the Design of Optimal Health Insurance for the Elderly, National Bureau of Economic Research, Inc, NBER Working Papers: 12972.

Charmaz, K. (2006). Constructing grounded theory: a practical guide through qualitative analysis. London, Sage.

Cherkin, D. C., L. Grothaus and E. H. Wagner (1989). "The effect of office visit copayments on utilization in a health maintenance organization." Med Care **27**(11): 1036-1045.

Cherkin, D. C., L. Grothaus and E. H. Wagner (1990). "The effect of office visit copayments on preventive care services in an HMO." Inquiry **27**(1): 24-38.

Chiappori, P. A., F. Durand and P. Y. Geoffard (1998). "Moral hazard and the demand for physician services: First lessons from a French natural experiment." European Economic Review **42**(3-5): 499-511.

Coast, J. (1999). "The appropriate uses of qualitative methods in health economics." Health Economics **8**: 345-353.

Cockx (2003). "The Demand for Physician Services Evidence from a Natural Experiment." Journal of Health Economics **22**(6): 881-913.

Creswell, J. W. (1998). Qualitative inquiry and research design: choosing among five traditions. Thousand Oaks; CA., Sage.

Culica, D., J. Rohrer, M. Ward, P. Hilsenrath and P. Pomrehn (2002). "Medical Checkups: Who Does Not Get Them?" Am J Public Health **92**(1): 88-91.

Davey Smith, G., N. Chaturvedi, S. Harding, J. Nazroo and R. Williams (2000). "Ethnic inequalities in health: a review of UK - epidemiological evidence." Critical Public Health **10**(4): 375-375.

Davidson, P. L., W. E. Cunningham, T. T. Nakazono and R. M. Andersen (1999). "Evaluating the Effect of Usual Source of Dental Care on Access to Dental Services: Comparisons among Diverse Populations." Med Care Res Rev **56**(1): 74-93.

Dental Services Division (2008). NHS exemption data. Penfold CM., NHS Business Services Authority: Email.

Denzin, N. (1989). The Research Act. Englewood Cliffs, NJ, Prentice-Hall.

Department of Health. (2001). NSF Diabetes, Department of Health.

Department of Health. (2003). Breakdown of spending programme. Departmental report 2003, Department of Health.

Department of Health. (2004a). Help with health costs. London.

Department of Health. (2004b). Proposals to Exclude Overseas Visitors from Eligibility to Free NHS Primary Medical Services. D. o. Health, Department of Health.

Department of Health. (2007a, 9 February 2007). "Health Survey for England - Introduction." Health Survey for England Retrieved 8th May, 2008, from http://www.dh.gov.uk/en/Publicationsandstatistics/PublishedSurvey/HealthSurveyForEngland/Healthsurveybackground/DH_4000522.

Department of Health. (2007b). NHS dental reforms: one year on, Department of Health.

Donaldson, A. N., B. Everitt, T. Newton, J. Steele, M. Sherriff and E. Bower (2008). "The effects of social class and dental attendance on oral health." Journal of Dental Research **87**(1): 60-64.

Donaldson, C. and K. Gerard (1993). The economics of health care financing: the visible hand. Basingstoke, Macmillan.

Eddie, S. and J. A. Davies (1985). "The effect of social class on attendance frequency and dental treatment received in the General Dental Service in Scotland." Br Dent J **159**(11): 370-372.

Ehrlich, I. and G. S. Becker (1972). "Market Insurance, Self-Insurance, and Self-Protection." The Journal of Political Economy **80**(4): 623-648.

Emmerson, C., C. Frayne and A. Goodman (2000). Pressures in UK Healthcare: Challenges for the NHS. P. J. London, The Institue for Fiscal Studies.

Eversley, J. and C. Sheppard (2000). Thinking the Unthinkable - The case against charges in primary health care, Health Rights**:** 0-60.

Feacham, R. G. A., N. K. Sekhri and K. L. White (2002). "Getting more for their dollar: a comparison of the NHS with California's Kaiser Permanente." British Medical Journal **324**: 135-143.

Field, A. (2005a). Logistic Regression. Discovering Statistics Using SPSS. Wright DB. London, Sage Publications Ltd.

Field, A. (2005b). Regression. Discovering Statistics Using SPSS. Wright DB. London, Sage Publications Ltd.

Field, K. and D. Briggs (2001). "Socio-economic and locational determinants of accessibility and utilization of primary health-care." Health and Social Care in the Community **9**(5): 294-308.

Finch, H., J. Keegan, K. Ward and B. Sanyal Sen (1988). Barriers to the receipt of dental care: A qualitative research study. London, Social and Community Planning Research.

Fiscella, K., P. Franks, M. P. Doescher and B. G. Saver (2002). "Disparities in Health Care by Race, Ethnicity, and Language among the Insured: Findings from a National Sample." Medical Care **40**(1): 52-59.

Foster, J., J. Dale and L. Jessopp (2001). "A qualitative study of older people's views of out-of-hours services." Br J Gen Pract **51**(470): 719-723.

Fronstin, P. (2004). Sources of Health Insurance and Characteristics of the Uninsured: Analysis of the March 2004 Current Population Survey. Issue Brief, Employee Benefit Research Institute.

Galbraith, A. A., S. T. Wong, S. E. Kim and P. W. Newacheck (2005). "Out-of-pocket financial burden for low-income families with children: socioeconomic disparities and effects of insurance." Health Serv Res **40**(6 Pt 1): 1722-1736.

Galdas, P. M., F. Cheater and P. Marshall (2005). "Men and health help-seeking behaviour: literature review." J Adv Nurs **49**(6): 616-623.

Gelberg, L., R. M. Andersen and B. D. Leake (2000). "The Behavioral Model for Vulnerable Populations: application to medical care use and outcomes for homeless people." Health Serv Res **34**(6): 1273-1302.

Gershunny, J., M. F. Taylor, J. Frick, O. Juergens, D. Watson, E. Marlier, P. J. Pedersen, R. Muffels and A. Schizzerotto (2004). ECHP User Guide, EPUNet: 1-39.

Gibson, B. J., J. Drennan, S. Hanna and R. Freeman (2000). "An exploratory qualitative study examining the social and psychosocial processes involved in regular dental attendance." Journal of Public Health Dentistry **60**(1): 5-11.

Gilbert, G. H., J. M. Coke, R. A. Weems and B. J. Shelton (2004). "Patient characteristics associated with receipt of dental radiographic procedures during a 48-month population-based study of dentate adults." Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology & Endodontics **97**(5): 642-651.

Gilbert, G. H., P. Duncan, M. W. Heft and R. T. Coward (1997). "Dental Health Attitudes among Dentate Black and White Adults." Medical Care **35**(3): 255-271.

Gilbert, G. H., R. P. Duncan and W. B. Vogel (1998). "Determinants of dental care use in dentate adults: Six-monthly use during a 24-month period in the Florida dental care study." Social science & medicine **47**(6): 727-737.

Gilbert, G. H., J. S. Rose and B. J. Shelton (2002). "A prospective study of the validity of data on self-reported dental visits." Community Dentistry And Oral Epidemiology **30**(5): 352-362.

Gilbert, G. H., J. S. Rose and B. J. Shelton (2003). "A prospective study of the validity of self-reported use of specific types of dental services." Public Health Rep **118**(1): 18-26.

Gilbert, G. H., G. R. Shah, B. J. Shelton, M. W. Heft, E. H. Bradford, Jr. and L. S. Chavers (2002). "Racial differences in predictors of dental care use." Health Serv Res **37**(6): 1487-1507.

Gilbert, G. H., E. P. Stoller, R. P. Duncan, J. L. Earls and A. M. Campbell (2000). "Dental self-care among dentate adults: contrasting problem-oriented dental attenders and regular dental attenders." Special Care in Dentistry **20**(4): 155-163.

Goddard, M. and P. Smith (2001). "Equity of access to health care services: Theory and evidence from the UK." Social Science and Medicine **53**: 1149-1162.

Gooder, P., M. Charny and S. Farrow (1993). "Public attitudes to charging for some National Health Service services." Social Science and Medicine **36**(4): 565-568.

Gregory, J., B. Gibson and P. G. Robinson (2007). "The relevance of oral health for attenders and non-attenders: a qualitative study." Br Dent J **202**(7): E18-E18.

Gregory, J., W. M. Thomson, J. R. Broughton, M. P. Cullinan, G. J. Seymour, J. A. Kieser, M.-A. Donaghy and D. M. Shearer (2010). "Experiences and perceptions of oral health and oral health care among a sample of older New Zealanders." Gerodontology **9999**(9999).

Gyrd Hansen, D. and U. Slothus (2002). "The citizen's preferences for financing public health care: a Danish survey." International Journal of Health Care Finance and Economics **2**(1): 25-36.

Hall, J. A. and M. C. Dornan (1990). "Patient sociodemographic characteristics as predictors of satisfaction with medical care: a meta-analysis." Social Science and Medicine **30**(7): 811-818.

Hancock, M., M. Calnan and G. Manley (1999). "Private or NHS General Dental Service care in the United Kingdom? A study of public perceptions and experiences." Journal of Public Health Medicine **21**(4): 415-420.

Harlow, S. D. and M. S. Linet (1989). "Agreement between questionnaire data and medical records. The evidence for accuracy of recall." Am J Epidemiol **129**(2): 233-248.

Harris, R. and G. Burnside (2004). "The role of dental therapists working in four personal dental service pilots: type of patients seen, work undertaken and cost-effectiveness within the context of the dental practice." British Dental Journal **197**(8): 491-496.

Heywood, P. L., G. Cameron Blackie, I. H. Cameron and A. C. Dowell (1998). "An assessment of the attributes of frequent attenders to general practice." Family Practice **15**(3): 198-204.

Hill, K. B., D. A. White, A. J. Morris, N. Goodwin and F. J. T. Burke (2003). "Verifiable CPD paper: National evaluation of personal dental services: a qualitative investigation into patients' perceptions of dental services." Br Dent J **195**(11): 654-656.

Hippisley-Cox, J., J. Fenty and M. Heaps (2007). Trends in Consultation Rates in General Practice 1995 to 2006: Analysis of the QRESEARCH database, The Information Centre for health and social care: 1-29.

Jeon, Y. H., B. Essue, S. Jan, R. Wells and J. A. Whitworth (2009). "Economic hardship associated with managing chronic illness: a qualitative inquiry." BMC Health Serv Res **9**: 182.

Jiwa, M. (2000). "Frequent attenders in general practice: an attempt to reduce attendance." Journal of Family Practice **17**(3): 248-251.

Johnstone, P. L. (2004). "Mixed methods, mixed methodology health services research in practice." Qual Health Res **14**(2): 259-271.

Jones, G., C. Evans and L. Hunter (2008). "A survey of the workload of dental therapists/hygienist-therapists employed in primary care settings." British Dental Journal **204**(3): E5.

Jung, K.-T. (1998). "Influence of the Introduction of a Per-Visit Copayment on Health Care Use and Expenditures: The Korean Experience." The Journal of Risk and Insurance **65**(1): 35-58.

Kahan, E., S. M. Giveon, S. Zalevsky, Z. Imber-Shachar and E. Kitai (2000). "Behaviour of Patients with Flu-like Symptoms: Consultation with Physician versus Self-Treatment." Israeli Medical Association Journal **2**: 421-425.

Kapur, N., I. Hunt, M. Lunt, J. McBeth, F. Creed and G. MacFarlane (2004). "Psychosocial and illness related predictors of consultation rates in primary care - a cohort study." Psychological Medicine **34**: 719-728.

Kasl, S. V. and S. Cobb (1966). Health behaviour, illness behaviour, and sick role behaviour: II. Sick role behaviour. Archives of Environmental Health. Buckingham, Open University Press. **2000:** 396.

Keeler, E. B. (1992). "Effects of Cost Sharing on Use of Medical Services and Health." Medical Practice Management: 317-321.

Kelly, M., J. G. Steele, N. Nuttall, G. Bradnock, J. Morris and J. Nunn (2000). Adult Dental Health Survey: Oral Health in the United Kingdom 1998. London: The Stationery Office.

King, D. R. and P. Kanavos (2002). "Encouraging the use of generic medicines: Implications for transition economies." Croatian Medical Journal **43**(4): 462-469.

Kosteniuk, J. and C. D'Arcy (2006). "Dental Service Use and its Correlates in a Dentate Population: An Analysis of the Saskatchewan Population Health and Dynamics Survey, 1999-2000." Journal of the Canadian Dental Association **72**(8): 731a-h.

Kupor, S. A., Y. C. Liu, J. Lee and A. Yoshikawa (1995). "The effect of copayments and income on the utilization of medical care by subscribers to Japan's National Health Insurance System." Int J Health Serv **25**(2): 295-312.

Lacey, S. (2006). "The relationship between NHS patient charges and the uptake of dental examinations by Scottish adults 1982-1998." British Dental Journal **201**(6): 361-364.

Laidlaw, D. A., P. A. Bloom, A. O. Hughes, J. M. Sparrow and V. J. Marmion (1994). "The sight test fee: effect on ophthalmology referrals and rate of glaucoma detection." British Medical Journal **309**(6955): 634-636.

Lavers, R. (1989). "Prescription charges, the demand for prescriptions and morbidity." Applied Economics **21**: 1043-1052.

Lecomte, P., I. Romon, S. Fosse, D. Simon and A. Fagot-Campagna (2008). "Self-monitoring of blood glucose in people with type 1 and type 2 diabetes living in France: the Entred study 2001." Diabetes Metab **34**(3): 219-226.

Lexchin, J. and P. Grootendorst (2004). "Effects of prescription drug user fees on drug and health services use and on health status in vulnerable populations: a systematic review of the evidence." Int J Health Serv **34**(1): 101-122.

Lurie, N., W. G. Manning, C. Peterson, G. A. Goldberg, C. A. Phelps and L. Lillard (1987). "Preventive care: do we practice what we preach?" Am J Public Health **77**(7): 801-804.

Macintyre, S. (1993). "Gender differences in the perceptions of common cold symptoms." Soc Sci Med **36**(1): 15-20.

Magid, D. J., T. D. Koepsell, N. R. Every, J. S. Martin, D. S. Siscovick, E. H. Wagner and W. D. Weaver (1997). "Absence of association between insurance copayments and delays in seeking emergency care among patients with myocardial infarction." N Engl J Med **336**(24): 1722-1729.

Manning, W. G., H. L. Bailit, B. Benjamin and J. P. Newhouse (1985). "The demand for dental care: evidence from a randomized trial in health insurance." J Am Dent Assoc **110**(6): 895-902.

Manning, W. G., J. P. Newhouse, N. Duan, E. B. Keeler, A. Leibowitz and M. S. Marquis (1987). "Health insurance and the demand for medical care: evidence from a randomized experiment." Am Econ Rev **77**(3): 251-277.

Martin, C., T. Perfect and G. Mantle (2005). "Non-attendance in primary care: the views of patients and practices on its causes, impact and solutions." Family Practice **22**(6): 638-643.

McCormick, A., D. Fleming and J. Charlton (1995). Fourth national study 1991-1992. Morbidity Statistics from General Practice. HMSO. London, OPCS.

McGrath, C. and R. Bedi (2003). "Dental services and perceived oral health: are patient better off going private?" Journal of Dentistry **31**: 217-221.

McGrath, C., C. Y. Y. J. Yeung and R. Bedi (2002). "Are single mothers in Britain failing to monitor their oral health?" Postgraduate Medical Journal **78**(918): 229-232.

McLeod, J. (2001). Qualitative research in counselling and psychotherapy. London, Sage.

McNiece, R. and A. Majeed (1999). "Socioeconomic differences in general practice consultation rates in patients aged 65 and over: prospective cohort study." British Medical Journal **319**(3): 26-28.

Mechanic, D. (1979). "Correlates of Physician Utilization: Why Do Major Multivariate Studies of Physician Utilization Find Trivial Psychosocial and Organizational Effects?" Journal of Health and Social Behavior **20**(4): 387-396.

Mercer, S. W., P. G. Cawston and A. P. Bikker (2007). "Quality in general practice consultations; a qualitative study of the views of patients living in an area of high socio-economic deprivation in Scotland." BMC Fam Pract **8**: 22.

Millman, M. (1993). Access to Health Care in America. Washington, DC, National Academy Press, Institue of Medicine.

Milsom, K. M., A. Threlfall, K. Pine, M. Tickle, A. S. Blinkhorn and P. Kearney-Mitchell (2008). "The introduction of the new dental contract in England - a baseline qualitative assessment." British Dental Journal **204**(2): 59-62.

Mooney, G. H. (1983). "Equity in health care: confronting the confusion." Eff Health Care **1**(4): 179-185.

Morris, S., M. Sutton and H. Gravelle (2003). Inequity and inequality in the use of health care in England: an empirical investigation. Centre for Health Economics technical Paper, University of York.

Mueller, C. D. and A. C. Monheit (1988). "Insurance coverage and the demand for dental care. Results for non-aged white adults." J Health Econ **7**(1): 59-72.

Myllykangas, M., O.-P. Ryynanen, J. Kinnunen and J. Takala (1997). "Attitudes to cuts in expenditure and increased fees in health care." Public Health **111**(2): 71-75.

National Institute for Health and Clinical Excellence. (2005). "Glossary."

Neal, R. D., P. L. Heywood, S. Morley, D. Clayden and A. C. Dowell (1998). "Frequency of patients' consulting in general practice and workload generated by frequent attenders: comparisons between practices." British Journal of General Practice **48**: 895-898.

Newhouse, J. (1993). Free for all? Cambridge, Mass., Harvard University Press.

Newhouse, J. P., W. G. Manning, C. N. Morris, L. L. Orr, N. Duan, E. B. Keeler, A. Leibowitz, K. H. Marquis, M. S. Marquis, C. E. Phelps and R. H. Brook (1981). "Some interim results from a controlled trial of cost sharing in health insurance." N Engl J Med **305**(25): 1501-1507.

Nguyen, L. and U. Hakkinen (2006). "Choices and Utilization in Dental Care: Public vs. Private Dental Sectors, and the Impact of a Two-Channel Financed Health Care System." European Journal of Health Economics **7**(2): 99-106.

Nicholson, W. (1992). Microeconomic theory: Basic principles and extensions. Fort Worth, TX, Dryden Press.

Nicolas, E., V. Collado, D. Faulks, B. Bullier and M. Hennequin (2007). "A national cross-sectional survey of dental anxiety in the French adult population." BMC Oral Health **7**: 12.

Noble, M., D. McLennan, K. Wilkinson, A. Whitworth, H. Barnes and C. Dibben (2008). The English Indices of Deprivation 2007. London, Department for Communities and Local Government.

Nuttall, N. M., J. G. Steele, C. M. Pine, D. White and N. B. Pitts (2001). "The impact of oral health on people in the UK in 1998." British Dental Journal **190**: 121-126.

O'Brien, B. (1988). "The effect of patient charges on the utilisation of prescription medicines." Journal of Health Economics **8**: 109-132.

O'Donnell, C., M. Higgins, R. Chauhan and K. Mullen (2007). ""They think we're OK and we know we're not". A qualitative study of asylum seekers' access, knowledge and views to health care in the UK." BMC Health Services Research **7**(1): 75.

O'Grady, K. F., W. G. Manning, J. P. Newhouse and R. H. Brook (1985). "The impact of cost sharing on emergency department use." N Engl J Med **313**(8): 484-490.

O'Reilly, D., C. O'Neill, T. O'Dowd, K. Galway, A. Gilliland, A. Kelly, A. Murphy, E. Shryane, K. Steele and G. Bury (2007). "Patients' attitudes to co-payments for general practitioner services: do they reflect the prevailing system?" J Health Serv Res Policy **12**(4): 197-201.

OECD (2001). A comparative analysis of 30 countries. OECD Health Data 2001. Paris, OECD.

Office for National Statistics. (2003, 30 May 2003). "General household survey." Social survey - general household survey Retrieved May 9, 2008, from http://www.statistics.gov.uk/ssd/surveys/general_household_survey.asp.

Ogden, J. (2003). Health psychology: a textbook. Buckingham, Open University Press.

Park, A., R. Jowell and S. McPherson The future of the National Health Service: Results from a Deliberative Poll, The Kings Fund.

Parkin, D. and B. Yule (1988). "Patient charges and demand for dental care in Scotland, 1962-81." Applied Economics **20**(2): 229-242.

Patton, M. (1990). Qualitative evaluation and research methods, Sage.

Patton, M. (2002). Qualitative Research and Evaluation Methods. Thousand Oaks, Sage.

Pedan, A., L. Varasteh and S. Schneeweiss (2007). "Analysis of factors associated with statin adherence in a hierarchical model considering physician, pharmacy, patient, and prescription characteristics." J Manag Care Pharm **13**(6): 487-496.

Penchansky, R. and J. W. Thomas (1981). "The Concept of Access: Definition and Relationship to Consumer Satisfaction." Medical Care **19**(2): 127-140.

Propper, C. (2000). "The demand for private health care in the UK." Journal of Health Economics **19**: 855-876.

Quteish Taani, D. S. (2002). "Dental anxiety and regularity of dental attendance in younger adults." J Oral Rehabil **29**(6): 604-608.

Rasell, E., J. Bernstein and K. Tang (1994). "The Impact of Health Care Financing on Family Budgets." International journal of health services: planning, administration, evaluation **24**(4): 691-714.

Reichmann, G. and M. Sommersguter-Reichmann (2004). "Co-payments in the Austrian social health insurance system - Analysing patient behaviour and patients' views on the effects of co-payments." Health Policy **67**: 75-91.

Richards, W. and J. Ameen (2002). "The impact of attendance patterns on oral health in a general dental practice." British Dental Journal **193**(12): 697-670.

Ricketts, T. C. and L. J. Goldsmith (2005). "Access in health services research: The battle of the frameworks." Nursing Outlook **53**(6): 274-280.

Ritchie, J., J. Lewis and G. Elam (2004a). Analysis: Practices, Principles and Processes. Qualitative Research Practice. Ritchie J and Lewis J. London, SAGE Publications Ltd.: 199-218.

Ritchie, J., J. Lewis and G. Elam (2004b). Design Issues. Qualitative Research Practice. Ritchie J and Lewis J. London, SAGE Publications Ltd.: 47-76.

Ritchie, J., J. Lewis and G. Elam (2004c). Designing and Selecting Samples. Qualitative Research Practice. Ritchie J and Lewis J. London, SAGE Publications Ltd.: 77-108.

Roberts, R. O., E. J. Bergstralh, L. Schmidt and S. J. Jacobsen (1996). "Comparison of self-reported and medical record health care utilization measures." J Clin Epidemiol **49**(9): 989-995.

Robson, C. (2002). Real World Research. Oxford, Blackwell.

Rosenstock, I. (1966). "Why People Use Health Services." Milbank Memorial Fund Quarterly **44**(3): 94-124.

Rudat, K. (1994). Black and minority ethnic groups in England. London, Health Education Authority.

Russell, S., J. Fox-Rushby and D. Arhin (1995). "Willingness and ability to pay for health care: a selection of methods and issues." Health Policy and Planning **10**(1): 94-101.

Ryan, M. and S. Birch (1991). "Charging for Health Care: Evidence on the Utilisation of NHS Prescribed Drugs." Social Science and Medicine **33**(6): 681-687.

Samet, J. M., W. C. Hunt, M. L. Lerchen and J. S. Goodwin (1988). "Delay in seeking care for cancer symptoms: a population-based study of elderly New Mexicans." J Natl Cancer Inst **80**(6): 432-438.

Scaife, B., P. S. Gill, P. L. Heywood and R. D. Neal (2000). "Socio-economic characteristics of adult frequent attenders in general practice: secondary analysis of data." Family Practice **17**(4): 298-304.

Schafheutle, E. I. (2008). "Patients' views on the UK policy of prescription charges-Insights from qualitative interviews." Res Social Adm Pharm **4**(4): 343-354.

Schafheutle, E. I., K. Hassell, P. R. Noyce and M. C. Weiss (2002). "Access to medicines: cost as an influence on the views and behaviour of patients." Health & Social Care in the Community **10**(3): 187-195.

Schreyogg, J. and M. M. Grabka (2009). "Copayments for ambulatory care in Germany: a natural experiment using a difference-in-difference approach." Eur J Health Econ.

Selby, J. V., B. H. Fireman and B. E. Swain (1996). "Effect of a copayment on use of the emergency department in a health maintenance organization." N Engl J Med **334**(10): 635-641.

Shapiro, M. F., J. E. Ware, Jr. and C. D. Sherbourne (1986). "Effects of cost sharing on seeking care for serious and minor symptoms. Results of a randomized controlled trial." Ann Intern Med **104**(2): 246-251.

Shaw, C., R. Tansey, C. Jackson, C. Hyde and R. Allan (2001). "Barriers to help seeking in people with urinary symptoms." Fam Pract **18**(1): 48-52.

Sheiham, A., J. Maizels, A. Cushing and J. Holmes (1985). "Dental attendance and dental status." Community Dent Oral Epidemiol **13**(6): 304-309.

Shi, L. (1999). "Experience of Primary Care by Racial and Ethnic Groups in the United States." Medical Care **37**(10): 1068-1077.

Silverman, D. (1997). Qualitative research: theory, method and practice. London, Sage.

Sjostrom, O., S. O. Lind and D. Holst (1998). "Pattern of attendance to dentists and hygienists in the County of Goteborgs and Bohus lan during 1990-1992." Community Dent Health **15**(2): 77-81.

Smith, B., A. Baysan and M. Fenlon (2009). "Association between Oral Health Impact Profile and general Health scores for patients seeking implants." Journal of Dentistry **37**: 357-359.

Solanki, G. and H. H. Schauffler (1999). "Cost-sharing and the utilization of clinical preventive services." Am J Prev Med **17**(2): 127-133.

Soumerai, S. B., J. Avorn, D. Ross-Degnan and S. Gortmaker (1987). "Payment restrictions for prescription drugs under Medicaid. Effects on therapy, cost, and equity." N Engl J Med **317**(9): 550-556.

Soumerai, S. B., D. Ross-Degnan, J. Avorn, T. McLaughlin and I. Choodnovskiy (1991). "Effects of Medicaid drug-payment limits on admission to hospitals and nursing homes." N Engl J Med **325**(15): 1072-1077.

Stange, K. C., S. J. Zyzanski, C. R. Jaen, E. J. Callahan, R. B. Kelly, W. R. Gillanders, J. C. Shank, J. Chao, J. H. Medalie, W. L. Miller, B. F. Crabtree, S. A. Flocke, V. J. Gilchrist, D. M. Langa and M. A. Goodwin (1998a). "Illuminating the 'black box'. A description of 4454 patient visits to 138 family physicians." J Fam Pract **46**(5): 377-389.

Stange, K. C., S. J. Zyzanski, T. F. Smith, R. Kelly, D. M. Langa, S. A. Flocke and C. R. Jaén (1998b). "How Valid Are Medical Records and Patient Questionnaires for Physician Profiling and Health Services Research?: A Comparison with Direct Observation of Patient Visits." Medical Care **36**(6): 851-867.

Stenner, K. L., M. Courtenay and N. Carey "Consultations between nurse prescribers and patients with diabetes in primary care: A qualitative study of patient views." International Journal of Nursing Studies **In Press, Corrected Proof.**

Stokes, E., A. Ashcroft and M. J. Platt (2006). "Determining Liverpool adolescents' beliefs and attitudes in relation to oral health." Health Educ Res **21**(2): 192-205.

Sutton, S. (1998). "Predicting and explaining intentions and behaviour: How well are we doing?" Journal of Applied Social Psychology(28): 1317-1338.

Swank, M. E., S. W. Vernon and D. R. Lairson (1986). "Patterns of preventive dental behavior." Public Health Rep **101**(2): 175-184.

Taylor, G. W. and J. M. Ussher (2001). "Making Sense of S&M: A Discourse Analytic Account." Sexualities **4**(3): 293-314.

Temoshok, L., R. J. DiClemente, D. M. Sweet, M. S. Blois and R. W. Sagebiel (1984). "Factors related to patient delay in seeking medical attention for cutaneous malignant melanoma." Cancer **54**(12): 3048-3053.

Thornhill, J. A., J. J. Fennelly, D. G. Kelly, A. Walsh and J. M. Fitzpatrick (1987). "Patients' delay in the presentation of testis cancer in Ireland." Br J Urol **59**(5): 447-451.

Treasure, E., M. Kelly, N. Nuttall, J. Nunn, G. Bradnock and D. White (2001). "Factors associated with oral health: a multivariate analysis of results from the 1998 Adult Dental Health survey." British Dental Journal **190**(2): 60-68.

Trivedi, A. N., W. Rakowski and J. Z. Ayanian (2008). "Effect of cost sharing on screening mammography in Medicare health plans." N Engl J Med **358**(4): 375-383.

Turnbull, J., D. Martin, V. Lattimer, C. Pope and D. Culliford (2008). "Does distance matter? Geographical variation in GP out-of-hours service use: an observational study." British Journal of General Practice **58**(552): 471-477.

Turner, B. J. and R. M. Nido (1988). "Urgency in seeking medical care for specific symptoms: perceptions of physicians and patients." J Gen Intern Med **3**(3): 245-249.

van de Kar, A., A. Knottnerus, R. Meertens, V. Dubois and G. Kok (1992). "Why do patients consult the general practitioner? Determinants of their decision." Br J Gen Pract **42**(361): 313-316.

van Doorslaer, E. and X. Koolman (2004). "Explaining the differences in income-related health inequalities across European countries." Health Economics **13**(7): 609-628.

van Doorslaer, E., X. Koolman and F. Puffer (2002). Equity in the use of physician visits in OECD countries: Has equal treatment for equal need been achieved?

Measuring Up: Improving the Performance of Health Systems in OECD Countries: 225-248.

Vedsted, P. and F. Olesen (2005). "Social environment and frequent attendance in Danish general practice." Br J Gen Pract **55**(516): 510-515.

Viera, A., J. Thorpe and J. Garrett (2006). "Effects of sex, age, and visits on receipt of preventive healthcare services: a secondary analysis of national data." BMC Health Services Research **6**(1): 15.

Walker, A., J. Maher, M. Coulthard, M. Goddard, E. Goddard and M. Thomas (2001). Living in Britain. General Household Survey. London, Office for National Statistics.

Wanless, D. (2003). Population Health Trends. Securing Good Health for the Whole Population. London, Department of Health.

Wanless, D. (2004). Securing Good Health for the Whole Population. Securing Good Health for the Whole Population, Department of Health.

Winkelmann, R. (2004). "Co-payments for prescription drugs and the demand for doctor visits - Evidence from a natural experiment." Health Economics **13**(11): 1081-1089.

Wyke, S., K. Hunt and G. Ford (1998). "Gender differences in consulting a general practitioner for common symptoms of minor illness." Social science & medicine **46**(7): 901-906.

Zimmerman, R. S. (1988). "The Dental Appointment and Patient Behaviour." Medical Care **26**(4): 403-414.

Zyzanski, S. J., B. S. Hulka and M. D. Cassel (1974). "Scale for the measurement of 'satisfaction' with medical care: modifications in content, format and scoring." Medical Care **12**(7): 611-620.