

Access to Primary Health Care in England: Policy, Theory, and Evidence

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Doctor of Philosophy
2016

ABSTRACT

Background: The U.K. Government plans to improve access to general practice services in England, partly by extending the opening hours of these services. The Government expects this to enhance patient experience and reduce use of emergency hospital services. The thesis aims to provide empirical evidence relevant to these policy expectations.

Methods: Three observational studies of a cross-sectional questionnaire-based survey—the GP Patient Survey—from 2011-12 to 2013-14 (2,912,535 respondents aged ≥ 18 years old and registered to 8,289 general practices in England). Respondent-level data were deterministically linked at the practice level to Hospital Episode Statistics Accident and Emergency (A&E) and Inpatient data and to routine data on practice characteristics. Multivariable regression estimated associations between: (1) participation in the Extended Hours Access Scheme and patient experience; (2) several patient experience measures; and (3) patient experience and rates of A&E visits and emergency hospital admissions.

Results: Most patients were very (40.0%) or fairly (42.3%) satisfied with the opening hours of their practices; results were similar for experience of making an appointment and overall experience. Practices that participated in the Extended Hours Access Scheme had greater adjusted mean values of these measures than non-participants, but the mean differences were small (≤ 1.25 on 0-100 scales). Overall experience was most strongly associated with doctor interpersonal quality of care (standardised coefficient=0.38; 95% CI: 0.38 to 0.38). A standard deviation increase in the practice-level mean experience of making an appointment predicted a 2.7% decrease (rate ratio=0.973; 95% CI: 0.966 to 0.979) in A&E visit rates and a 1.7% decrease (rate ratio=0.983; 95% CI: 0.978 to 0.988) in emergency admission rates.

Conclusions: Changes to opening hours under existing policies are unlikely to improve patient experience of general practice substantially. Realistic short-term improvements in experience would likely have modest effects on use of emergency hospital services.

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ACKNOWLEDGEMENTS

Thank you first of all to Matt Harris and Azeem Majeed for supervising my PhD and, more generally, for starting my research career and supporting my subsequent work. I am also grateful for the statistical advice of Hilary Watt and general support of Chris Millett and Sonia Saxena. I have also enjoyed working with Emma Richards, Ellie Gunning, Lizzie Cecil, Michael Soljak, and Alex Bottle on papers related to this thesis.

Thank you to Imperial College for my BSc, MPH, and now PhD studies; it has been a great second home. I thank the National Institute for Health Research for funding my PhD and time in Cambridge, through a Doctoral Research Fellowship (DRF-2013-06-142) and the Doctoral Training Exchange Scheme. Views expressed in this thesis are not necessarily those of the NHS, the National Institute for Health Research, or the Department of Health.

Thank you most of all to Mum, Dad, Ben, and the wider family
—I could write a thesis on why!

INTRODUCTION

Access to primary health care has been widely debated in England in recent years. The U.K. House of Commons Public Accounts Committee and the National Audit Office have both written reports on this topic in the past year.^{1 2,a} The House of Commons Health Committee also conducted an inquiry into primary care, with some focus on access, during this period.³ These investigations concentrated on general practice services—the core of English primary care. This thesis also focuses on these services, in line with Government plans for improving primary care. I approach the topic mainly from a health services research perspective, while noting political influences on health policy. This approach undoubtedly leads to different conclusions than if I had used political science, for example, as the guiding discipline of the thesis; I am interested in solutions to health service problems rather than political ones.

The thesis is structured as follows:

- *Chapter 1* describes the policy context of the thesis. It introduces past and current policies implemented by the Government to improve access to general practice in England. I place current plans within wider developments in the National Health Service (NHS), including new organisational models and improvements to weekend services. I also provide examples of similar policies in other countries.
- *Chapter 2* discusses the most relevant existing literature. It first describes patient experience of general practice in England. It then reviews existing literature on the relationship between patient experience of general practice and use of emergency hospital services. I also assess evaluations of interventions where general practices opened in the evenings and at weekends. The final section summarises the key limitations of existing literature and how to address them.
- *Chapter 3* discusses how to measure patient experience of general practice using a national patient survey. I use these methods in each original study presented in later chapters of the thesis, where patient experience measures are outcome variables,

^a I am writing in July 2016.

explanatory variables, or both. I present the aims and objectives for these studies and also clarify my use of the terms ‘access’, ‘opening hours’, and ‘patient experience’.

- *Chapter 4* reports the first original study of the thesis. It examines whether practices that participate in a national scheme to extend opening hours provide a systematically different patient experience to other practices. I also test whether associations vary by patients’ abilities to take time off work to visit their general practices. The results suggest a modest association between scheme participation and better experiences.
- *Chapter 5* investigates relationships between several patient experience measures. I try to explain variation in patients’ satisfaction with opening hours, experiences of making appointments, and overall experiences. The main explanatory variables and explanatory power of models differ across these outcome measures. The effects of different interventions are therefore also likely to vary across outcomes.
- *Chapter 6* presents associations between the experience measures above and rates of Accident and Emergency (A&E) visits and emergency hospital admissions at the practice level. I use these associations to estimate the absolute reductions in numbers of A&E visits and emergency admissions with specified changes in patient experience. I also convert the reductions into costs. The results suggest that any net savings from policies that improve access to general practice are likely to be small.
- *Chapter 7* reviews the thesis and discusses its policy implications. I describe some general limitations of the thesis, including that its political context may reduce its policy relevance. I revisit this context before stating my conclusions.

Each chapter has several sections that I refer forward and back to throughout the thesis to link different parts.^b For example, I relate *chapter 4* back to *section 1.1* where I explain that the Government expects extended opening hours to improve patient experience. In general, the empirical methods and studies presented in *chapters 3* to *6* aim to address and inform national policy described in *chapter 1*. I therefore anchor the thesis in the policy context.

^b These sections are numbered sequentially with the chapter number as the first digit; for example, *1.1* is the first section in *chapter 1*.

1

Policy Context

Everyone in England will have access to a general practice that is open between 8 a.m. and 8 p.m., seven days a week, the U.K. Prime Minister has said.⁴ The Government's aim to achieve this by the end of the current Parliament, in 2020, has been highly debated since its announcement in September 2014. At this time, around 1,000 general practices in England had been trialling interventions to improve access to their services, supported by the 'Prime Minister's GP Access Fund'. Appointments in the evenings and at weekends, outside normal opening times, were the most common intervention trialled. However, the commitment to extend opening hours nationally has been controversial, due partly to pressures faced by general practices in maintaining existing services.

This first chapter provides the policy context of the thesis. Its purpose is to describe the main national policies related to access to general practice and to examine the Government's rationales for them. The publicly stated rationales may not be the only ones, so I also examine the political context and wider NHS context of policies. I discuss policy actors, events, and rhetoric in addition to policy content. To do this, I rely on numerous grey literature sources, such as Government press releases, NHS strategy documents, and policy guidance, to characterise the policy process and the underlying narratives.

Section 1.1 describes the development of the GP Access Fund from its announcement in 2013 to the present day. It also explores the Government's rationales for trying to improve access to general practice. *Section 1.2* highlights a political interest in related policy, as shown by the manifesto pledges of the major political parties for the 2015 general election. *Section 1.3* examines the wider health service context, in terms of the resourcing of general practice, organisational changes to out-of-hospital care, and plans to improve weekend services. *Section 1.4* describes past policies on access to general practice, from 2000 onwards, that could be seen as precursors to the GP Access Fund. *Section 1.5* provides some examples of policies in other countries that are similar to those in England.

1.1 GP ACCESS FUND

The Prime Minister's GP Access Fund^a has been the focus of U.K. Government^b efforts to improve access to primary health care in England since 2013. It provides much of the context to current policy debate and research on this topic, with a particular focus on access to general practice services. The GP Access Fund has led Government plans to extend the opening hours^c of general practices nationally. Although commonly referred to in the singular, the Fund can be divided into two 'waves', based on the timing of funding.

1.1.1 Wave One

The Prime Minister announced the first wave of the GP Access Fund in October 2013, during the Conservative Party^d annual conference.⁵ The Government's press release for the announcement was titled 'Seven day, 8am - 8pm, GP access for hard working people'.⁶ A

^a The Prime Minister's GP Access Fund (originally called the Prime Minister's Challenge Fund) is commonly referred to throughout the thesis as the 'GP Access Fund'.

^b The term 'Government' is used throughout this thesis to refer to the two governments of the United Kingdom that have been led by David Cameron, from 2010 to the present day, unless indicated otherwise. Policies relevant to this thesis have remained similar between these two governments. The term 'Prime Minister' refers to David Cameron, unless indicated otherwise.

^c The core hours specified in the contracts of most general practices in England are 8 a.m. to 6.30 p.m. from Monday to Friday (excluding public holidays). Any mention of an extension of opening hours or times in this thesis refers to additional opening times outside these core hours, unless indicated otherwise.

^d The Prime Minister is the leader of the Conservative Party.

£50 million fund was available to support general practices in England to improve patients' access to care. The press release read 'The move will make it easier for people to see their family doctor from 8am to 8pm, seven days a week' and 'help thousands who struggle to find GP appointments that fit in with their family and work life'.⁶ Extending general practice opening hours was the main focus of the announcement, but other interventions that could be supported by the Fund were also given. These included providing consultations by telephone, email, or the internet, and online booking of appointments.⁶

In April 2014, the U.K. Department of Health announced that 20 schemes, consisting of 1,147 general practices with around 7.5 million registered patients,^e would be supported by the first wave of the Fund.⁷ NHS England selected these schemes through a competitive bidding process that assessed applicants on the proposed intervention, its sustainability, and the timescale of implementation, for example.⁸ Schemes received varying amounts of financial support depending on factors including population size and the designs of interventions.⁸ Three key national objectives were subsequently established: to provide more hours of general practitioner (GP) appointments, to improve patient and staff satisfaction with access, and to increase the range of contact modes for general practice consultations.⁹

Each of the 20 pilot schemes reportedly provided additional general practice appointments in the evenings and at weekends.⁹ However, it was uncommon for each individual practice to extend their opening hours. Schemes instead set up a small number of 'hubs' or 'centres' that opened outside routine hours and provided care to a wider population than a single practice would do normally. Therefore, more appointments in the evenings and at weekends were available, but these would not necessarily have been at a patient's registered practice. Most pilot schemes (15 of 20) provided telephone, internet-based, or video consultations or online registration and appointment booking systems.⁹ Several schemes also employed additional nurses or established closer relationships between general practice and pharmacy.⁹

Schemes generally piloted several interventions simultaneously, reducing the potential to determine interventions' independent effects. *Chapter 2* discusses the national evaluation of wave one of the GP Access Fund (*section 2.3.2*). This wave ended in September 2015.⁸

^e In April 2014, there were 8,002 general practices recorded in national population data with 56 million registered patients. The first wave of the GP Access Fund therefore supported around 14% of practices.

1.1.2 Wave Two

In September 2014, again at the Conservative Party annual conference, the Prime Minister revealed that a second wave of pilot schemes would be supported by the GP Access Fund.¹⁰ He stated that an extra £100 million would be added to the Fund to enable this.¹⁰ The Prime Minister also announced his aim for everyone in England to have access to a general practice that is open between 8 a.m. and 8 p.m., seven days a week, by 2020.⁴ This goal was suggested in the press release for wave one of the Fund, a year earlier, which read ‘Ministers want to use the pilots as the first step to rolling the scheme out across the country’.⁶ Wave two of the Fund could be considered the second step, as part of £400 million outlined for national implementation by 2020.¹⁰

The 37 pilot schemes supported by wave two, reported to cover 1,417 general practices with 10.6 million registered patients, were announced in March 2015.¹¹ This was in the last week before Parliament dissolved and political parties officially began their campaigns ahead of the U.K. general election in May 2015. The Government’s press release for the announcement, entitled ‘GP evening and weekend appointments to increase’, emphasised that around 18 million patients would benefit from the Fund across both of its waves.¹²

The interventions trialled by wave two pilot schemes were often similar to those in wave one. However, a minimum condition of funding for wave two schemes was that patients should ‘be able to access general practice services from 8am-8pm on weekdays (or equivalent) and [have] improved access at weekends’.¹³ Although some wave one schemes did meet this condition, it was not mandatory for them to do so. This suggests an enhanced focus on extended opening hours in wave two, perhaps to quicken progress towards the Prime Minister’s commitment. Still, few schemes in this wave set out to provide additional appointments from 8 a.m. to 8 p.m. at the weekends (in addition to on weekdays).⁸ Some schemes also reduced the number of extended hours they provided, or reverted to previous opening hours entirely, due to a lack of patient demand.⁹

Wave two of the GP Access Fund ended in March 2016. In total, £175 million was reported to have been spent on the Fund: £50 million initially outlined for wave one, £100 million initially outlined for wave two, and a further £25 million later revealed.¹⁴ NHS England has committed to further funding of all wave one and two pilot schemes. In April 2016, it

announced that over £500 million of recurrent funding would be available by 2020-21 to ensure adequate access to general practice in the evenings and at weekends nationally.¹⁵

1.1.3 New GP Contract

In October 2015, for the third consecutive year, the Prime Minister made an announcement at the Conservative Party annual conference on general practices opening seven days a week.¹⁶ Plans for a ‘new, voluntary contract for GPs to deliver 7-day care for all patients by 2020’ were revealed.¹⁶ The Government’s press release explained that the contract would be for federations or practices with at least 30,000 registered patients, and that it would be offered by April 2017 on a phased basis.¹⁶ The contract is expected to help general practices work more collaboratively with other community services, partly by integrating budgets for the contracted services. The full details of the contract are still being developed.¹⁵

1.1.4 Government Rationales

The Government has given several reasons for the policies described above. *Table 1.1* (see next page) shows that some rationales relate to improving patient experience of accessing services. The Secretary of State for Health^f has stated that the number of people unable to get appointments has been increasing and public satisfaction with access is worsening.¹⁷ This is the result of an increase in demand that exceeds any increases in capacity, he has said, with trends in demand caused by an increasingly comorbid and ageing population with greater expectations of health services.¹⁷ These expectations are thought to include being able to access general practice seven days a week using a range of technologies. Policy rhetoric often focuses on benefits for working people who cannot or would prefer not to take time off work to see a GP. An implicit rationale could be that satisfaction with access is important to patients’ overall experiences of their general practices and of the NHS generally.

Table 1.1 also shows that some rationales focus on benefits to NHS services, rather than to patients. These benefits include reduced demand for emergency hospital services and cost

^f The Secretary of State for Health refers to the Conservative Member of Parliament Jeremy Hunt throughout the thesis, unless indicated otherwise.

savings. With the population changes described above, the Secretary of State^g expects that without intervention “our hospitals will be overwhelmed – which is why we need effective, strong, and expanding general practice more than ever before”.¹⁷ I discuss the causal mechanisms that may explain such hypotheses in *chapter 2*, in the context of relevant existing literature. Several studies¹⁸⁻³⁰ have examined national associations between access to general practice and use of emergency hospital services. Other studies^{31 32} have estimated the effects of extended opening hours on this outcome. It is a focus of this thesis to review and produce empirical research that addresses key Government expectations, particularly regarding patient experience and use of emergency hospital services.

I discuss the policy goal to enable general practices to form new working relationships with other organisations in *section 1.3.2*; current policy to improve access can be framed in terms of wider plans to expand out-of-hospital care.

Table 1.1 Government Rationales for the GP Access Fund and Related Policies

Rationales	Quoted statements
To improve patients’ abilities to get general practice appointments and the convenience of these appointments	• ‘It will help thousands who struggle to find GP appointments that fit in with their family and work life’⁶ • ‘...to offer extra services for those who struggle to find appointments that fit in with their family and work life’⁷ • “There are a lot of working people who do not want to have to take time off work to see their GP”³³
To modernise general practice services so that patients can access care as suited to their lifestyles	• “This is about responding to the fact that the public now expect a seven-day NHS”³³ • ‘...a variety of forward-thinking services to suit modern lifestyles, including greater use of Skype, email, and phone consultations’⁶ • ‘Flexible access including email, Skype, and phone consultations for those who might prefer it to face-to-face’⁶
To reduce use of emergency hospital services by managing patients better in community settings	• ‘By improving access to primary care, we will be able to relieve pressure on A&E and other emergency services within the NHS’¹⁶ • “The role and purpose of 7 day primary care is about much more than convenience – it is about making sure precious hospital capacity is kept clear for those who really need it”¹⁷ • ‘These plans represent the start of a fundamental shift...to better manage conditions in the community rather than being admitted to hospital’⁷

^g This refers to the Secretary of State for Health throughout the thesis, unless indicated otherwise.

To help achieve efficiency savings outlined for the NHS	• “The real point...is that potentially around 20% of the £22 billion of savings that we need to find in the NHS in England will come through new models of care, where we catch illnesses earlier and stop people needing to go into hospital”³³
To enable general practices to collaborate and work with other types of organisation to deliver primary care at a larger scale	• ‘GPs will now be able to join forces with neighbouring GPs to form these federations and networks of practices’¹⁶ • ‘This first wave of pioneers will...make it easier for practices to join up with each other, as well as other services provided in the community’⁶ • “...it is part of a much bigger strategy, which is a dramatic increase in the capacity of general practice and the capacity of primary care”³³

A&E: accident and emergency; GP: general practitioner; NHS: National Health Service

1.2 POLITICAL INTEREST

The previous section introduced the Prime Minister’s announcements about extended opening hours at the past three Conservative Party annual conferences, from 2013 to 2015.^{6 10 16} This may highlight a political interest that was also apparent ahead of the 2015 general election.

1.2.1 Political Events

Government press notices issued for the Prime Minister’s announcements at the Conservative Party conferences generated national media coverage.^{4 34 35} These notices must be planned and likely intended to publicise a policy that the public should view positively. Party annual conferences attract much media interest, so announcements here are likely to reach a wide public audience. This ‘stage’ could also give the impression that the policy is important to the Conservative Party; the public may recognise the policy’s prominence and associate it with a high level of Party commitment. The Prime Minister’s role in the announcements and the policy title ‘Prime Minister’s GP Access Fund’ could reinforce this message.

These announcements are particularly relevant in the context of a general election. The Prime Minister’s pledge given at the start of the chapter—that everyone in England will have access to a general practice that is open between 8 a.m. and 8 p.m., seven days a week, by 2020—was made six months before Parliament dissolved ahead of the 2015 general election.⁴ The

first commitment made in the Conservative Party election manifesto read ‘we will continue to increase spending on the NHS, provide 7-day a week access to your GP and deliver a truly 7-day NHS’.³⁶ The manifesto later stated ‘Already millions more people can see a GP 7 days a week, from 8am-8pm, but by 2020 we want this for everyone.’^{36,h}

The Labour Party, traditionally the other major political party in the U.K.,ⁱ also made election pledges relevant to access to general practice. Its manifesto stated ‘We will guarantee people a GP appointment within 48 hours, and on the same day for those who need it.’³⁷ This was similar to a promise made by a Labour-led government in 2000, which I discuss later in the chapter (*section 1.4*).³⁸ The Labour Party tried to discredit the Conservative Party’s plans, by claiming that it had become more difficult to get a GP appointment under the Conservative-led coalition^j government.¹⁰ Access to general practice therefore became a highly debated topic before the general election. In his first major speech after being re-elected, the Prime Minister renewed his commitment to extended opening hours.³⁹

1.2.2 Policy Rhetoric

The Prime Minister called the Conservative Party the “party of working people” when he launched its election manifesto.⁴⁰ At the Party’s annual conference in 2015, he described it as “The party of working people, the party for working people—today, tomorrow, always”.⁴¹ This rhetoric was also in the Prime Minister’s first post-election speech, which focused solely on the NHS; he said “there is nothing that embodies the spirit of one nation coming together – nothing that working people depend on more – than the NHS.”³⁹ Press releases on extended opening hours also refer to particular socioeconomic groups. These releases have read, for example, ‘Hard working people will be able to see their GP seven days a week’,⁶ ‘easier for millions of hardworking people and their families to fit seeing a GP around their busy lives’,⁷ and ‘offer hardworking taxpayers and families the security of the care they need’.¹⁶

The influence of wider political strategy on the decision to extend opening hours is unclear. The Government may expect working people to perceive clear benefits to this policy, such that it can act as a source of government support. It may also be seen as a ‘distributive’ policy

^h The manifesto also pledged to guarantee same-day appointments for people aged over 75 years old.

ⁱ The Labour Party won 232 of 650 seats in the 2015 U.K. general election; the Conservative Party won 331.

^j The government was led by a coalition between the Conservative Party and the Liberal Democrats, in order to form a majority in Parliament, from 2010 to 2015.

in that it particularly benefits certain groups without reducing benefits to others. The public may therefore be less likely to see the issue as controversial, so public acceptability should not be an issue for the Government. The public may instead see improvements in access to general practice as a very legitimate focus of Government policy, because of its relevance to the whole population and the role of the NHS in the national cultural identity. Opening hours can be easily quantified and communicated to the public. These factors may partly explain the political interest in access to general practice in the 2015 general election.

1.2.3 Pledge on Opening Hours

The policy agenda may have also been influenced by the feasibility of extending opening hours which partly depends on the planned changes. These changes can differ between sources. The Government auditor understands the Government's pledge to mean access to general practice services from 8 a.m. to 8 p.m. on each day of the week (84 hours in total).² This is a common interpretation and fits with wording in the Conservative Party election manifesto (see *section 1.2.1*). It is also consistent with the Prime Minister's statement that "the aim is clear across the next Parliament to make sure everyone has access to a GP surgery that is open between eight in the morning and eight in the evening seven days a week."⁴

Other sources are more ambiguous. Wave two of the GP Access Fund did not set specific opening times for weekends; it required that pilot schemes provided 'improved access' at weekends, in addition to appointments from 8 a.m. to 8 p.m. on weekdays (*section 1.1.2*).¹³ This might be a step towards providing appointments between these times at weekends too, by 2020. However, the Government's mandate to NHS England does not specify opening times; the relevant goal for 2020 reads '100% of population has access to weekend/evening routine GP appointments'.⁴² NHS England's strategy plan for general practice, published in April 2016, stated that the distribution of appointments across the week would be determined locally, with some minimum requirements not yet published.¹⁵

The Government's plans for extended opening hours can therefore appear unclear. The ambiguity may be partly due to different communication sources. It could also reflect incremental changes to uncertain and evolving policy.

1.2.4 Policy Process

It may be unrealistic to expect the Government's pledge to be fixed through time. The incrementalist model of policy-making suggests that policies continually adjust as a result of negotiation and challenge between different interest groups.⁴³ These groups could include patients, NHS providers, and medical professionals. It may be partly because of this pluralism in the policy process that the Government has given different rationales, which appeal to different interests, for current policy. *Table 1.1* provided several rationales, and it can be unclear which rationale, if any, is the primary one. Policy makers may be vague about this to avoid conflict and propose several in case one is not achieved.⁴⁴ Some analysts observe that policy is often associated with strong promises but vague goals that may not be specified in advance and for which there is no clear consensus.⁴⁴

Incrementalists argue that policy implementation continually reshapes objectives, and vice versa.⁴⁴ With this view, objectives for current policy to improve access are likely to be partly determined by practices and commissioners who design and implement interventions locally, as in the GP Access Fund. These organisations ultimately decide opening hours, for example, and therefore what reasonable expectations for related policy are. Central policy makers have set the vision, issued guidance, and allocated funds to facilitate extended opening hours. However, the Secretary of State has acknowledged significant human and financial resource constraints in general practice and how this wider context may affect the ability of general practice to deliver the Government's plans.³³

1.3 WIDER NHS CONTEXT

In addition to the resource constraints in general practice, plans for practices to open seven days a week are contextualised by two broader agendas in NHS policy. One of these agendas is to improve and expand the capacity of care provided outside of hospitals. The second agenda is to make weekend NHS services more similar to services provided on weekdays.

1.3.1 Funding, Workload, and Staffing

The percentage of total Government spending on health invested in general practice decreased year-on-year from 2005-06 to 2013-14, from 10.6% to 8.2%.⁴⁵ In absolute terms, investment in general practice reduced by 6% (with adjustment for inflation) over the same period, which is equivalent to a decrease in funding of almost £560 million.⁴⁶

Data on the number of general practice consultations provided nationally each year are not routinely collected. However, several studies⁴⁷⁻⁴⁹ have estimated that the annual number of consultations per patient has increased in recent years. For example, one analysis of 398 practices estimated that the annual consultation rate increased by 10.5%, from 4.7 to 5.2 per patient, between 2007-08 and 2013-14.⁴⁷ These studies used routine consultation records from relatively small, non-representative samples (<5%) of practices, so generalisability is unclear. An earlier analysis, using a different dataset and sample of 496 practices, estimated that the annual consultation rate increased by 28.4%, from 4.4 to 5.6 per patient, between 2000-01 and 2008-09.⁵⁰ Changes in population demographics and health could partly explain these trends and may further add to clinical workload by increasing the complexity of consultations. General practice could also face an increased non-clinical workload, from increased commissioning responsibilities, for example.

In a national survey of 1,172 GPs in 2015, reported stress was the highest since the survey started in 1998 and ‘increasing workloads’ was the greatest stressor.⁵¹ This is an important cause of GPs leaving, or planning to leave, practice.^{52 53} The number of full-time equivalent GPs^k per 100,000 population is estimated to have remained fairly constant in recent years, changing from 61.0 in 2006 to 60.6 in 2014.⁵⁴ Trends for other practice staff are unclear due to several changes in data collection methods and data completeness.⁵⁴

Table 1.2 lists some reasons why the Royal College of General Practitioners opposes the Government’s plans for seven-day opening.^{55 56} It cites inadequate investment in general practice, increasing workloads, and difficulties in recruiting and retaining GPs.

^k The number of GPs was 30,931 in 2006 and 32,628 in 2014. These figures exclude GP registrars and retainers due to changes in data collection for these GPs during the data period. Another limitation is that the figures do not include locum GPs.

Table 1.2 Views of the Royal College of General Practitioners on Government Plans^{55 56}

Quoted statements
• ‘It is unrealistic to talk about providing seven day access to routine services at the current time because general practice is hugely overstretched and under-resourced’ • ‘There is not sufficient evidence to suggest that seven day access is consistently being called for by patients across the country, or that it provides an effective use of NHS resources’ • ‘Promising to extend services to seven days could fuel further increases in patient expectation and demand at a time when general practice is unable to absorb any more pressure’ • ‘Forcing all areas to provide seven day access to routine care could have a catastrophic impact on efforts to recruit and retain more GPs’ • ‘We are concerned that the proposal to provide seven day GP access to routine care could jeopardise continuity of care’ • ‘Extending access to routine care, without a commensurate increase in investment and workforce, will place major pressures on GPs and practice staff, forcing them to work unsustainable hours, which would be a threat to patient safety’

GP: general practitioner. Each statement is quoted from the given references.

NHS England’s strategy plan for general practice¹⁵ addresses some of these issues. It includes the target of having 5,000 more GPs by 2020, as given in the Government’s mandate to NHS England.⁴² The headcount number of GPs¹ increased by 1,175 from 2010 to 2014,⁵⁴ so the target is ambitious. Another goal is for at least 5,000 extra other staff, including nurses, pharmacists, and mental health therapists, by 2020-21.¹⁵ NHS England’s plan also outlines ways to reduce workload, including programmes to support self-care, changes to the interface between GPs and hospitals, and fewer regulatory inspections.¹⁵

The Government announced as part of its 2015 spending review that the NHS would receive an £8.4 billion increase in real terms annual funding by 2020-21.^{57 58} It referred to £750 million of investment to ensure everyone can access general practice in the evenings and at weekends and to have an extra 5,000 GPs.⁵⁷ NHS England intends to increase investment in general practice by 4% or more per year through to 2020-21.⁵⁸ This amounts to an increase of at least £2.4 billion per year by the end of this period.¹⁵ As stated in *section 1.1.2*, NHS England currently plans to use over £500 million of this funding to ensure adequate access to general practice in the evenings and at weekends nationally.¹⁵

This increase in funding for primary care accords with NHS England’s five-year strategy—the NHS Five Year Forward View—which asserts that ‘Out-of-hospital care needs to become

¹ The full-time equivalent number of GPs increased by 1,677. These figures include GP registrars and retainers but not GP locums.

a much larger part of what the NHS does'.⁵⁹ This statement was framed in terms of providing coordinated care for patients with long-term conditions.⁵⁹

1.3.2 Out-of-Hospital Care

The Five Year Forward View describes new service models that will be promoted by NHS England in the coming years.⁵⁹ One of these models, termed 'Multispecialty Community Providers', involves extended groups of general practices forming 'networks', 'federations', or larger single organisations.⁵⁹ These organisations could incorporate community nurses, social workers, and mental health services. The groups are expected to eventually employ specialist doctors, such as paediatricians and psychiatrists, and take over most outpatient activity from hospitals.⁵⁹ The new voluntary contract for GPs introduced in *section 1.1.3* is intended to support this new service model.

The Five Year Forward View also detailed 'vertically' integrated 'Primary and Acute Care Systems'.⁵⁹ This refers to single organisations providing both general practice and hospital services, together with other community services, for large populations; Multispecialty Community Providers could expand to start running local hospital services.⁵⁹ With Clinical Commissioning Groups' greater role in commissioning general practice services,⁶⁰ there is a trend for a single organisation to be responsible for commissioning NHS services locally too.^m Ultimately, a local area could have just one organisation responsible for providing all NHS services under a capitated budget delegated from NHS England.ⁿ

With this frame, Government plans for access to general practice are just one part of wider organisational changes to the NHS. *Table 1.1* suggested that one rationale for the GP Access Fund was to help practices build new relationships outside traditional working boundaries and to form new organisations covering larger populations.

^m Clinical Commissioning Groups are GP-led organisations responsible for commissioning urgent and emergency care, elective hospital care, and community and mental health services on behalf of local populations. There are currently 209 of these organisations in England.

ⁿ This concept underlies the 'Accountable Care Organisations' in the United States which typically include several primary care practices and at least one hospital.

1.3.3 Seven-Day Services

The Conservative Party's election pledge to 'deliver a truly 7-day NHS' (*section 1.2.1*) related to hospitals as well as general practice, with the Prime Minister stating that "this 7-day NHS will be just as vital in our hospitals too."^{36 39} The Government has often referred to evidence suggesting an increased risk of death for hospital admissions made at the weekend compared to on weekdays, when explaining its focus on seven-day hospital services.^{33 39 61} It has adopted a set of key clinical standards to monitor the provision of hospital services across the week. These standards include, for example, that all inpatients on a general ward should be reviewed during a consultant-delivered ward round at least daily, seven days a week.¹⁶

The Government's plans also include changes to doctors' contracts. It intends to remove a clause from consultants' contracts that allows them to opt-out of non-emergency care in the evenings and at weekends, by April 2017.⁶² Proposed revisions to the junior doctors' contract, which altered pay for weekend work among other changes, led to strikes organised by the British Medical Association. This highlights the potential power of national bodies of doctors to affect policy through influencing members and possibly withdrawing labour. The British Medical Association, like the Royal College of General Practitioners, opposes Government policy for general practices to offer services seven days a week.⁶³

1.4 FURTHER POLICY ON ACCESS

Improving access to general practice is not a new goal of health policy in England. The Labour governments of 1997 to 2010 also introduced policies on this topic. In 2000, the 'NHS Plan' asserted that 'patients will be able to see a primary care professional within 24 hours and a GP within 48 hours' by 2004.³⁸ Since this target, and before the GP Access Fund was created, several initiatives have aimed to improve access to general practice.

1.4.1 Advanced Access

After the NHS Plan, general practices were encouraged to adopt a particular model for their appointment systems known as Advanced Access. Its central principle was that patients should be offered an appointment on the same day as their requests were made.⁶⁴ Practices were supposed to achieve this by collecting data on demand for appointments and matching supply accordingly.⁶⁴ By 2004, approximately 31% of practices in England claimed to be implementing the Advanced Access model ‘completely’, and a further 36% reported ‘mostly’ following its principles.⁶⁵ These two groups of practices offered more same-day appointments and fewer pre-bookable appointments than control practices.⁶⁵ They were also more likely to offer telephone consultations and redirect workload from GPs to healthcare assistants.⁶⁵

The targets given in the NHS Plan were not achieved; 88% of offered appointments were estimated to be within two working days of the request in Advanced Access practices, and 74% in control practices.⁶⁶ This may be partly because the model was poorly implemented and informally adapted by practices.⁶⁵ Advanced Access no longer features explicitly in current policy debate, though some of the associated interventions do.

1.4.2 Financial Incentives

In 2002-03, while Advanced Access was being promoted, general practices received incentive payments for implementing plans to improve access and for sustained achievement of the NHS Plan target.⁶⁷ The payment amount was agreed locally, but the Department of Health suggested payments of £1 per registered patient or an average payment of £5,000 per practice.⁶⁷ From 2003 to 2006, this incentive continued under a Directed Enhanced Service^o scheme with similar requirements and payments.⁶⁸

In 2006, a new Directed Enhanced Service with a maximum investment of £108 million replaced existing incentives; practices could earn up to £2.06 per patient.⁶⁹ Two thirds of each practice’s payment was determined by scores across four areas in a new patient experience

^o Directed Enhanced Services are schemes linked to national priorities that practices can choose whether to participate in or not (in addition to the essential services specified in their core contracts).

survey^p: ability to consult a GP within two working days, to book appointments more than 48 hours in advance, and to see a preferred GP, and the ease of telephone contact.⁶⁹ The first two of these indicators were included in the Quality and Outcomes Framework^q from 2008 to 2011, with an average practice able to earn up to £7,289.^{70 71}

The one access-related incentive from this period that remains in operation is a Directed Enhanced Service, introduced in 2008, known as the Extended Hours Access Scheme.⁷² The extension of opening hours incentivised by this scheme is consistent with the aims of the GP Access Fund, which may partly explain the scheme's continuation.

1.4.3 Extended Hours Access Scheme

The original Extended Hours Access Scheme planned to improve patient 'access to primary medical services, through face to face appointments with a GP at times outside practices' current core contracted hours,^r in line with patients' expressed needs'.⁷² Additional appointments had to be face-to-face with a GP; other consultation types were not permitted.⁷² During core contracted hours, existing services and standards of access had to be maintained. The scheme required practices to open outside of core hours for at least 30 minutes per 1,000 registered patients each week.⁷² Additional sessions were supposed to last for at least 90 continuous minutes and provide six or seven appointments per 90 minutes. Practices participating in the scheme received £2.95 per registered patient per year.⁷²

Table 1.3 summarises revisions to the Extended Hours Access Scheme in 2010, 2011, and 2014.⁷³⁻⁷⁵ Practices are still required to open outside of core times for at least 30 minutes per 1,000 patients each week, but many other details have changed.⁷⁶ For example, appointments no longer have to be for face-to-face GP consultations; other practice staff and modes of consultation can be used. Extra sessions can now be provided concurrently to meet the total time requirement. Practices can also offer appointments at neighbouring practices working as part of a group; the total number of extended hours provided collectively by the group should

^p This was the GP Patient Survey. The other third of payments depended on practices agreeing written plans for improving access and participating in a survey designed to monitor access (the Primary Care Access Survey).

^q The Quality and Outcomes Framework, introduced in 2004, is a national pay for performance scheme that rewards general practices according to their achievement against a set of indicators.

^r The core hours specified in the contracts of most general practices in England are 8 a.m. to 6.30 p.m. from Monday to Friday (excluding public holidays).

equal the number required had each practice been participating independently.⁷⁵ The payment has also reduced to £1.90 per patient per year.

Table 1.3 Details of the Extended Hours Access Scheme and GP Access Fund

	Extended Hours Access Scheme				GP Access Fund
Period of operation	Sept. 2008 to March 2010	April 2010 to March 2011	April 2011 to March 2014	April 2014 onwards	April 2014 onwards*
Extended opening hours requirement	At least 30 minutes per 1,000 patients each week outside of core opening times [†]				8 a.m.-8 p.m. on weekdays and open at weekends (in wave two)
	Requirement was for number of opening hours, not clinical time; sessions had to last for at least 90 minutes		Requirement was/is for clinical time, not number of opening hours; sessions must last for at least 30 minutes		
Consultation mode(s)	Face to face	Face to face	Face to face	Face to face, telephone, or other modes	Face to face, telephone, or other modes
Consultation providers	GPs	GPs	GPs, nurses, and others [‡]	GPs, nurses, and others [‡]	GPs, nurses, and others
Extended opening hours providers	Individual practices	Individual practices	Individual practices	Individual or groups of practices	Groups of practices
Percentage of practices that participated [§]	77% (6,384/8,279) (July 2009)	-	71% (5,751/8,060) (2013-14)	74% (5,877/7,959) (2014-15)	32% (2,564/7,959) (2014-2016)
Annual payment per registered patient (£)	2.95	3.00	1.90	1.90	N/A
Investment (£ millions)**	-	161	70 (2013-14)	84 (2014-15)	175

GP: general practitioner; N/A: not applicable

The core opening times specified in the standard General Medical Services and Personal Medical Services contracts are 8 a.m. to 6.30 p.m. on any day other than Saturday, Sunday, and public holidays.

*April 2014 was when the first 20 pilot schemes of the GP Access Fund were announced (*section 1.1*).

[†]This number is converted to the nearest quarter hour to set the minimum requirement. Practices are expected to offer, on average, at least two appointments per 30 minutes. Existing standards must be maintained within core opening hours. The GP Patient Survey is supposed to inform choices regarding extended opening hours.

[‡]Health care assistants became eligible under scheme requirements to provide appointments from April 2014.

[§]Data in 2009 were from a different collection to those in 2013-14 and 2014-15, so the percentages are not necessarily comparable. Figures for the GP Access Fund are approximate.

**£161 million was available for investment in the Extended Hours Access Scheme in 2010-11. Figures for 2013-14 and 2014-15 are based on the sum value of scheme payments to (and deductions from) practices.

The GP Access Fund could be seen as an incremental development of past policy on access to general practice, including the Extended Hours Access Scheme most immediately. For

example, the 2010 guidance for the Extended Hours Access Scheme suggested that patients could visit practices other than their own to access services outside core hours,⁷³ as in the GP Access Fund. A fund with a similar name and value—the ‘Primary Care Access Fund’ of £168 million—existed in 2002-03 to support progress towards the NHS Plan target.⁶⁷

1.4.4 Other Services

Several new healthcare services were established from 2000 onwards to improve access to sources of care besides traditional general practice.⁷⁷ These services typically have longer opening hours than general practices and do not require patients to book appointments or be registered with the service. ‘Walk-in centres’ provide nurse-led treatment of minor injuries and illnesses.⁷⁸ Similar services led by GPs were established from 2008 to 2010 and were intended to open from 8 a.m. to 8 p.m., seven days a week.⁷⁸ ‘GP-led urgent care centres’ often co-located with hospital emergency departments have emerged since 2009.⁷⁹ The distinction between these services can be unclear. In general, they provide alternative sources of first point-of-contact care to general practices and hospital emergency departments.

Out-of-hours primary care services^s are often accessed via NHS 111, a telephone advice and navigation service introduced from 2010.⁸⁰ This includes telephone consultations, home visits, and out-of-hours clinics. Clinical Commissioning Groups are responsible for planning out-of-hours care in most local areas, after general practices were able to opt out of providing these services from 2004.⁸⁰ Out-of-hours services can therefore be clearly distinguished from core general practice services. This thesis focuses on the latter.

1.5 INTERNATIONAL CONTEXT

I have so far discussed the policy context of access to general practice in England only. Several policies similar to those in England can be found internationally. The Secretary of State has cited networks of primary care providers in Alberta, Canada and in New Zealand as

^s Out-of-hours general practice services provide a source of urgent care when practices are typically closed, from 6.30 p.m. to 8.00 a.m. on weekdays and all day at weekends and on public holidays.

examples English general practices could use to provide care seven days a week.¹⁷ In Alberta, 42 networks of around 3,300 GPs and at least 1,100 other health professionals aim to provide care 24 hours a day, seven days a week through multi-disciplinary teams.⁸¹

In 2012, Italy passed a law that also intended for primary care professionals to work in groups to provide care 24 hours a day, seven days a week.⁸² Paediatricians and other specialists were supposed to work alongside GPs, to help co-ordinate care for patients with chronic illnesses.⁸² The plans departed from the traditional model of GPs working in single, independent practices. This also applies to the GP Access Fund and the Multispecialty Community Provider model outlined earlier (*section 1.3.2*).

The Australian Department of Health introduced a scheme in 2015 to encourage general practices to open ‘after-hours’.⁸³ The Practice Incentives Programme After-Hours Incentive has five payment levels for different extents of after-hours provision. For example, the third level payment of A\$5.50 per patient (£3.16) is for practices that provide after-hours care through the practice from 6 p.m. to 11 p.m. on weeknights and ensure formal arrangements are in place at other times.⁸³ This policy, as a financial incentive to provide care in the evenings and at weekends, is similar to the Extended Hours Access Scheme (*section 1.4.3*).

Primary care reform in the United States has recently focused on the ‘Patient-Centred Medical Home’ which is a collection of principles for providing primary care services.⁸⁴ A central idea is that care should be easily accessed and existing operational standards require practices to provide appointments in the evenings and at weekends.⁸⁴ They also require practices to provide same-day appointments for patients who require them⁸⁴; the Advanced Access model (*section 1.4.1*), centred on this principle, originated in the United States.⁶⁴

Primary care is often viewed as an essential part of a well-developed health system. The World Health Organization described a widespread and growing demand for improved primary care internationally in its 2008 World Health Report entitled ‘Primary Health Care – Now More Than Ever’.⁸⁵ It explained that the health systems of most Organisation for Economic Co-operation and Development^t countries continued to rely too much on hospitals, despite many trying to decrease this reliance in favour of primary care since the 1980s. The

^t The Organisation for Economic Co-operation and Development is a collective of 34 member countries, mostly with high-incomes and including the U.K., that meets to discuss common policy issues.

report included increased health equity, reduced hospitalisation and mortality rates, and improved satisfaction with health services as expected benefits of better primary care.⁸⁵

The U.K. Government states similar expectations for improvements in access to primary care in England (*table 1.1*). The next chapter discusses existing literature relevant to these goals.

SUMMARY

This chapter has described the policy context of the thesis. Central to this context is the Prime Minister's GP Access Fund which, so far, has supported approximately 2,500 general practices in trialling interventions to improve access to care. Extended opening hours have been the focus of these interventions. The Fund provided the earliest indication of the Government's commitment for all patients in England to have access to general practice services seven days a week by 2020. Political interest in the subject became clear around the 2015 general election, consistent with wider Government rhetoric on improving the lives of working people. Recent policies have continued long-standing attention to access to general practice in England, with the Extended Hours Access Scheme ongoing. Changes to primary care in several other countries are similar to in England, reflecting the attempts of health systems to better meet patient expectations while managing increased healthcare costs.

2

Existing Literature

The first chapter discussed the policy context of the thesis. It outlined several national policies designed to improve access to general practice, including the GP Access Fund and the Extended Hours Access Scheme. The Government has stated several rationales for this focus, including that it will improve patients' experiences of accessing general practice, reduce use of emergency hospital services, and provide cost savings to the NHS (*table 1.1*). The Secretary of State has referred to increasing numbers of patients unable to get appointments and decreasing public satisfaction with access (*section 1.1.4*). Government rhetoric focuses on working people (*section 1.2.2*) which may imply that this group is expected to benefit most from extended opening hours, for example. These expectations and rationales can all be tested empirically, and several past studies provide relevant evidence. *Chapter 1* noted that the Royal College of General Practitioners considers existing evidence as insufficient to support Government plans for practices to offer appointments seven days a week (*table 1.2*).

The current chapter discusses the existing literature that is most relevant to the thesis. Its main purpose is to review empirical studies relevant to the Government's policy rationales. I highlight important limitations of the existing literature that restrict its ability to inform

policy and that I address in later chapters of the thesis. *Section 2.1* describes trends in several patient experience measures using a national patient survey, known as the GP Patient Survey. I also discuss inequalities in experiences between patient groups and predictors of overall satisfaction, using the same survey. *Section 2.2* reviews existing literature on the relationship between patients' experiences of accessing general practice and use of emergency hospital services, including both A&E visits and emergency admissions. *Section 2.3* describes evaluations of local initiatives to extend opening hours as well as the national evaluation of the GP Access Fund's first wave. *Section 2.4* summarises the main limitations of existing literature and suggests how to address them.

I used four search strings, shown in *appendix 1*, to help identify relevant literature. One string focused on characteristics of general practices and use of emergency hospital services, while a second string focused on patient attitudes and behaviours regarding access to general practice. Two further search strings identified studies using the GP Patient Survey and articles written by one or more of 25 researchers (from eight U.K. universities) whose previous work was relevant. The searches therefore attempted to identify relevant literature by topic, method, and author. I received weekly automated email alerts, through Ovid, for new publications meeting the criteria of one or more of the search strings. These alerts acted as repeated systematic searches of the literature and supplemented more informal methods of identifying relevant work, such as reference tracking.^a

2.1 PATIENT EXPERIENCE

The GP Patient Survey is a quantitative postal survey that measures patient experience of general practice in England. It is conducted annually on behalf of NHS England and receives around 900,000 responses each year^b from adults registered with a general practice. The

^a I first created and ran the search strings before my PhD studies so did not conduct a new systematic search as part of the work presented in this thesis. In addition to using Ovid alerts, I received notifications from Google Scholar about any new articles that cited or were similar to my published work.

^b The number of responses was 903,357 in 2013-14 and 858,381 in 2014-15.

sampling frame includes all practices with eligible patients^c in England. I provide more detail on the survey's methods in *chapter 3 (section 3.2.1)*. Questionnaires include a range of items on satisfaction with opening hours, experience of making appointments, and overall experience, for example. I have previously reported trends in related measures from 2011-12 to 2013-14⁸⁶; the discussion below incorporates 2014-15 as an extra data year.^d

2.1.1 GP Patient Survey Results

Table 2.1 describes weighted results for selected GP Patient Survey measures.^e In 2014-15, 88.6% of respondents reported being able to get an appointment on their last attempt, while 81.4% were able to get a convenient appointment. Similar percentages were satisfied with opening hours (78.5%) and had good overall experiences of making appointments (73.3%).

Table 2.1 Results from the GP Patient Survey, 2011-12 to 2014-15, as Percentages of Respondents

	2011-12	2012-13	2013-14	2014-15	Change
On last attempt, wanted an appointment:					
On the same day	42.4	42.7	42.9	41.8	-0.6
On the next working day	13.0	12.4	12.0	10.5	-2.5
A few days later	25.0	24.9	24.7	24.2	-0.8
A week or more later	5.7	6.0	6.4	7.5	1.9
Without a specific day in mind	13.9	14.0	14.1	16.0	2.0
Able to get an appointment to see or speak to someone	90.8	89.5	88.8	88.6	-2.2
Had an appointment:					
On the same day	37.5	37.6	38.1	38.6	1.1
On the next working day	14.7	13.5	12.6	11.5	-3.2
A few days later	34.5	33.8	32.9	31.4	-3.1
A week or more later	13.3	15.1	16.5	18.5	5.3
Available appointment was convenient*	93.3	92.5	91.9	91.8	-1.5
Able to get a convenient appointment to see or speak to someone†	84.7	82.7	81.7	81.4	-3.3
Good overall experience of making an appointment	79.1	76.3	74.6	73.3	-5.9
Satisfied with the hours that GP surgery is open	84.1	82.7	79.9	78.5	-5.5
GP surgery is open at convenient times	83.2	82.2	79.9	79.8	-3.4

^c Patients are eligible if they are at least 18 years old, have a valid NHS number, and have been registered with a general practice continuously for the last six months.

^d 2014-15 is the most recent financial year for which complete data are available at the time of writing. Survey methods and question wording changed in 2011, so data from before 2011-12 are incomparable to later data.

^e *Appendix 2* explains how these measures were calculated. Results are weighted to account for survey design and non-response (see *section 3.2.4*).

Additional opening times that would make it easier to see or speak to someone: [‡]					
Before 8 a.m.	33.2	34.1	34.4	33.4	0.3
At lunchtime	12.9	12.4	12.3	11.5	-1.4
After 6.30 p.m.	69.1	69.8	71.1	70.3	1.2
On Saturdays	71.2	72.2	74.3	73.4	2.3
On Sundays	31.7	33.7	36.8	39.6	7.9
None of these	3.5	3.1	2.9	3.7	0.2
See or speak to a preferred GP always, almost always, or a lot of the time [§]	65.7	63.2	61.0	60.0	-5.7
Easy to get through to someone at GP surgery by phone	80.9	77.7	75.5	73.3	-7.6
Good experience of GP surgery overall	88.3	86.7	85.7	84.8	-3.5

Part of this table has been published in *The BMJ*.⁸⁶ Measures are defined in *appendix 2*.

Measures on appointments are for patients' last attempts to see or speak to a GP or nurse from their GP surgery. Changes calculated between 2011-12 and 2014-15. Minimum annual number of survey respondents: 858,381 (2014-15). Changes to survey methods in 2011 preclude direct comparison with results for earlier years.

*Percentages apply to patients who were able to get an appointment.

†Calculated as the proportion 'Able to get an appointment to see or speak to someone' multiplied by the proportion for whom 'Available appointment was convenient'.

‡Percentages apply to patients who felt their GP surgery was not open at convenient times or didn't know; multiple responses allowed.

§Percentages apply to patients who have a GP they usually prefer to see or speak to (in surgeries with >1 GP; 57.4%, 2011-12; 56.8%, 2012-13; 55.8%, 2013-14; 52.7%, 2014-15).

Each of these measures decreased slightly year-on-year from 2011-12 to 2014-15 (*table 2.1*). Decreases also occurred for the percentages of respondents: able to consult their preferred GP often if they had one (65.7% to 60.0%); able to get through to their general practice easily by telephone (80.9% to 73.3%); and having a good overall experience (88.3% to 84.8%).

These figures may be interpreted differently depending on how they are framed. Most responses to each item were positive which suggests that general practice provides good experiences, on average, across several areas. A minority of patients, 14.8% in 2014-15, responded both that current opening times were not convenient and additional opening times on Saturdays would be helpful, while the equivalent figure was 8.0% for Sundays.^f This suggests that most patients would be content if general practices did not open at weekends. However, these patients may still benefit if practices did open seven days a week. Moreover, from 2011-12 to 2014-15, the percentages of respondents that found opening times inconvenient and that thought opening on Sundays would be helpful both increased (*table 2.1*). This reflects a trend of worsening patient experience across several measures, consistent with the Secretary of State's claim that public satisfaction is falling (*section 1.1.4*).¹⁷ Whether

^f These figures are calculated as $100 \times (1 - 0.798) \times 0.734$ for Saturdays and $100 \times (1 - 0.798) \times 0.396$ for Sundays.

these changes reflect differences in the service provided or increased patient expectations, or both, the direction of the trend could be seen as a problem.

2.1.2 Inequalities in Experiences

Table 2.2 shows that GP Patient Survey respondents who are employed are much less likely to find current opening times convenient, particularly if they cannot take time off work to see a GP. This pattern also applies to several other experience measures, before and after adjusting for respondent characteristics, including ability to get an appointment and satisfaction with the ease of contacting practices by telephone.⁸⁷

Table 2.2 Responses to the Question ‘Is Your GP Surgery Currently Open at Times That Are Convenient for You?’ in the GP Patient Survey 2013-14, by Work Category

Work category	Question response		Total
	No (inconvenient)	Yes (convenient)	
Not working*	28,936 (8.6%)	308,818 (91.4%)	337,753
Can take time off work to see GP	66,213 (22.3%)	231,050 (77.7%)	297,263
Cannot take time off work to see GP	62,911 (44.2%)	79,504 (55.8%)	142,415
Total	158,059 (20.3%)	619,371 (79.7%)	777,430

This table is to be published in *British Journal of General Practice*.⁸⁸

Responses are weighted to account for survey design and non-response (by age, gender, geographical location, general practice, and other variables) to increase national representativeness.⁸⁹ Data were missing for 7.9% of responses; responses of ‘Don’t know’ are excluded from the table (6.6% of weighted responses). *Full-time education, unemployed, sick or disabled, retired, looking after home, other.

Numerous patient experience measures also show consistent patterns across several other patient characteristics.⁹⁰ A study of the 2009 survey demonstrated that respondents in younger age groups, of south Asian ethnicities, and with worse self-reported health responded more negatively for all 11 measures examined⁹⁰; this finding remained when only using variation within practices to estimate associations.^g

Whether these inequalities, which exist even within practices, are seen as problems for policy to solve could depend on what the inequalities represent. They may result from observable differences in care, possibly because of cultural or language differences between staff and certain patient groups.⁹⁰ Alternatively, different groups may perceive the same care differently, perhaps due to varied expectations or social norms. Inequalities may also reflect use of the GP Patient Survey as the research instrument; some groups may be systematically

^g Therefore, the findings are not wholly explained by the concentration of certain patient groups in practices with worse average patient experiences.

more negative in surveys generally, possibly due to life circumstances, the contexts in which questionnaires are completed, or different interpretations of language used.

Several studies⁹¹⁻⁹³ have examined why south Asian patients respond more negatively about GP interpersonal quality of care.^{90 94} This does not apply in all practices in England,⁹⁰ and the national associations can be explained by the languages patients speak at home⁹¹ and those spoken by GPs.⁹² These findings suggest that inequalities by ethnicity are not just a survey artefact. It is unclear how this relates to inequalities across other patient characteristics, but various causal mechanisms that relate to true differences in experience are plausible. For example, patients with worse self-reported health may have comorbidities that cannot be treated adequately within a standard consultation.⁹⁵ Patients who cannot take time off work to see a GP may be unable to visit their practices within normal opening hours.

Inequalities in reported experiences therefore probably reflect actual experiences, at least partly. These differences could be suitable targets for policy. The Government has focused on inequalities by working status, in addition to trends of worsening experiences, when justifying its plans to improve access to general practice (*section 1.1.4*).

2.1.3 Determinants of Experiences

Paddison *et al.*⁹⁶ examined relationships between overall satisfaction with general practice and other patient experience measures in the GP Patient Survey 2009-10; *table 2.3* shows the associations estimated. Overall satisfaction was most strongly associated with patients' views of the interpersonal quality of care provided by GPs. Patients' abilities to see a GP within two weekdays and to book a GP appointment more than two weekdays ahead on their last attempts were more weakly associated with overall satisfaction.

Table 2.3 Adjusted Associations of Overall Satisfaction with Several Patient Experience Measures in the GP Patient Survey 2009-10, as Reported by Paddison *et al.*⁹⁶

Experience measure	Standardised regression coefficient (95% CI)
GP interpersonal quality of care	0.48 (0.48 to 0.48)
Helpfulness of receptionists	0.22 (0.22 to 0.22)
Ability to see a GP within two weekdays	0.11 (0.11 to 0.12)
Ease of contacting the practice by telephone	0.09 (0.09 to 0.10)
Nurse interpersonal quality of care	0.09 (0.09 to 0.10)
Ability to get a GP appointment more than two weekdays ahead	0.06 (0.05 to 0.06)

CI: confidence interval; GP: general practitioner

Standardised regression coefficients equal changes in the measure of overall satisfaction, in terms of the standard deviation of this measure, for a one standard deviation increase in the relevant tabulated measure.

Associations adjusted for patient age, gender, ethnicity, deprivation, self-reported health, self-reported mental health condition, other experience measures, and a random intercept for general practice using linear regression.

These findings suggest that policy to improve access to general practice, such as extended opening hours, could have a relatively weak effect on overall satisfaction. However, Paddison *et al.*⁹⁶ did not include several relevant measures from *table 2.1* as explanatory variables, partly because relevant questions were not added until later versions of the GP Patient Survey. Satisfaction with opening hours, appointment convenience, and experiences of making appointments could be more strongly associated with overall satisfaction than the ability to get an appointment for the time period wanted. I highlight this limitation of the analysis because of the results' policy relevance; if overall satisfaction is primarily determined by GP interpersonal quality of care, policy may benefit patients more if this factor was prioritised over or alongside improving access.^h

Given the policy focus on working people (*section 1.2.2*), it may also be relevant to examine whether associations between patient experience measures differ by the work categories given in *table 2.2*. Discrete choice experiments that asked participants to choose between hypothetical appointments suggest that working people more strongly prefer appointments at a convenient time of the day than people not in work.^{97 98} Appointment convenience may have the greatest effects on other experience measures for working people.

^h The associations presented in *table 2.3* were largely consistent for different patient groups. GP interpersonal quality of care was the factor most strongly associated with overall satisfaction in all subgroup analyses.

2.1.4 Absolute Numbers

Table 2.1 presented GP Patient Survey results as percentages. Some of these results can be converted into absolute numbers of appointments using estimates for the annual number of general practice consultations in England.^{25 86} The last estimate of the national number of consultations was 303.9 million for 2008-09, based on data for a sample of 496 practices.⁵⁰ This figure may be imprecise and could be an underestimate given trends in workload since 2008-09 (*section 1.3.1*),ⁱ but this does not affect my overall propositions below.

I have previously estimated using 2012-13 results from the GP Patient Survey that 94.0% of respondents' last attempts to get appointments resulted in consultations.²⁵ If there are 303.9 million consultations in a given year, this suggests that approximately 19.5 million^j attempts each year do not result in a consultation (or 47 per practice per week^k). This estimate makes several assumptions,^l but it demonstrates a large unmet demand for general practice.

Using the same results, 1.6% of appointment attempts resulted in patients visiting A&E departments after being unable to get suitable appointments; the ratio of these A&E visits to consultations was 0.017.²⁵ This suggests that approximately 5.1 million A&E visits followed unsuccessful attempts to get suitable general practice appointments in 2012-13 (23% of 21.7 million A&E visits in this year⁹⁹). I reiterate that this is an estimate, but it seems likely that unmet demand for general practice increases demand for A&E services considerably.

Despite only a small percentage of appointment attempts leading to A&E visits, the absolute number of such instances is large because of the substantial number of attempts to get general practice appointments. Moreover, as the total number of A&E visits (21.7 million in 2012-13⁹⁹) is much smaller than the number of general practice consultations (303.9 million in 2008-09⁵⁰), any shift in demand to A&E providers may have a larger impact on emergency hospital services than on general practice.

ⁱ More recent consultation data were given in *section 1.3.1*, but the corresponding studies did not try to translate their findings (from non-representative samples of practices) into nationally representative estimates.

^j $(303,900,000 \div 0.9398) - 303,900,000 = 19,500,000$ (to 3 significant figures)

^k $(19,500,000 \div 52) \div 7,928 = 47$ (to 2 significant figures)

^l These assumptions include, for example, that all booked appointments resulted in a consultation, that a patient's last attempt to get an appointment is representative of other attempts, and that the relevant GP Patient Survey responses are not biased.

2.2 EMERGENCY HOSPITAL SERVICES

The annual number of visits to A&E departments in England increased by 19.2% between 2005-06 and 2014-15, from 18.8 million to 22.4 million.⁹⁹ The annual number of emergency hospital admissions increased by 20.5%, from 4.7 million to 5.6 million, over the same period.¹⁰⁰ I have previously reported that the percentage of emergency admissions that are via an A&E department^m increased from 53.8% in 2001-02 to 68.6% in 2010-11.^{101,n} These trends indicate increased use of emergency hospital services.

2.2.1 Reducing Use

These trends could be undesirable for several reasons. Increased use could reflect greater levels of illness and disease in the population. In addition to the harm associated with worse health, patients could be at greater risk of iatrogenic harm from requiring hospital treatment. Some changes in use may reflect substitution of A&E services for general practice; patients may have benefited more from seeing a GP because of the continuity of care it can provide, for example. The trends may also represent problems for providers of emergency hospital services. These providers may find it difficult to meet extra demand which could reduce the quality of service provided; an opportunity cost of treating additional patients with possibly minor complaints is being unable to focus on severely ill patients. Emergency hospital care, particularly for admitted patients, is also expensive to the NHS.

The Government expects that its plans for access to general practice will reduce use of emergency hospital services (*table 1.1*). Several causal mechanisms could help to explain this relationship. *Section 2.1.4* suggested that a large number of A&E visits follow unsuccessful attempts to get suitable general practice appointments.²⁵ Patients may also visit A&E departments without contacting their general practices first because they do not expect suitable appointments to be available. Many of these patients may have been treatable solely

^m Other recorded emergency admission routes are: via a GP, via a Bed Bureau, via a consultant outpatient clinic, and via other means.

ⁿ This trend is driven by a 72% increase in the annual number of emergency admissions via A&E departments (2.1 to 3.6 million) and a 17% decrease in admissions via a GP (1.1 to 0.9 million) from 2001-02 to 2010-11.

within general practice. Some of the corresponding A&E visits might result in admission to hospital and therefore increase numbers of emergency admissions too.^o

If patients cannot, or do not expect to, get convenient general practice appointments, they may prefer to see how their conditions develop before seeking further care. The conditions of some patients may deteriorate without treatment in general practice, to the point that they then require emergency treatment in hospital. This might occur with an acute infection or an acute exacerbation of a long-term condition, for example. Patients with improved access to general practice may seek care more often, thereby providing GPs with more opportunities to review patients' long-term conditions and promote healthy behaviours. This could also help to reduce patients' risks of emergency admission.

These mechanisms lead to the hypothesis that patients with better access to general practice should use emergency hospital services less, all else held constant. Numerous studies have examined this association at the practice-level using cross-sectional study designs and measures of access derived from the GP Patient Survey.

2.2.2 Associations with Access

Three studies^{23 27 30} have examined rates of A&E visits in the whole population. In my study of the 2010-11 financial year, the outcome measure only included emergency department^p visits where patients had referred themselves and were discharged home without hospital admission.²³ One study³⁰ examined both this outcome measure and visits to minor A&E departments in 2012-13, while another study focused on all A&E visits in 2011-12.²⁷ The analyses also differ in the variables adjusted for, the statistical methods used, and the presentation of results, which makes it difficult to compare the magnitudes of estimated associations across studies. However, all three studies suggest that practices with greater scores on measures related to access have lower adjusted rates of A&E visits. For example, my analysis estimated that the fifth of practices with the greatest percentages of patients able

^o The assumption is that some patients admitted to hospital via A&E departments would not have been admitted if they had visited their general practice first. A&E doctors may be more likely to admit patients than GPs because the former are less likely to know patients' medical histories, for example.

^p Three categories of A&E department can be clearly distinguished: emergency departments are consultant-led 24 hour services with full resuscitation facilities; single specialty A&E services are consultant-led services focusing on a specific discipline; other A&E services are led by nurses or GPs and primarily treat minor injuries or illnesses (such as walk-in centres, minor injuries units, and urgent care centres).

to see a GP within two weekdays had a 10.2% (95% CI: 5.5% to 14.7%) lower adjusted rate of A&E visits than the fifth with the lowest values of the access measure.²³

The findings of a further study¹⁰² that included A&E visits for patients aged less than 15 years old only are consistent with the above studies of the whole population. Respondents in the GP Patient Survey 2011-12 who were unable to get a general practice appointment on their last attempt were more likely to report calling an out-of-hours primary care service in the past six months.¹⁰³ Two additional studies^{104 105} have examined associations between GP Patient Survey measures of access and rates of A&E visits in local areas^q; these studies did not find evidence of a relationship, which could reflect a lack of statistical power, variation in results by English region, or different model specifications to the national studies.

I have previously investigated whether patients registered to more accessible practices are more likely to be admitted directly via a GP versus via an A&E department.²⁴ Using GP Patient Survey data linked to administrative hospital records for 2011-12, I estimated that the adjusted odds of GP admission increased by 21% (95% CI: 21% to 22%) for a five point increase in the practice percentage of patients able to get an appointment.²⁴ This provides evidence that A&E services and general practices substitute for one another in the context of more severe illness, as well as for minor conditions. *Section 2.2.1* also hypothesised that better access to general practice may reduce numbers of emergency admissions.

Several studies^{19-22 26 28 29} have examined national associations between GP Patient Survey measures related to access and practice-level rates of emergency admissions for specific conditions.^r These studies focused on two measures relating to patients' abilities to see a GP within two weekdays and to get an appointment more than two days ahead; at least one of these measures was negatively associated with admission rates in all but one of these studies. A further study suggests that first-time admissions for cancer are more likely to be emergency admissions (versus elective) when practice percentages of patients able to see a GP within two weekdays are lower.¹⁸ One local analysis^s did not find evidence of associations between practice-level rates of emergency admissions and measures related to access.¹⁰⁶

^q These areas covered 145 practices in Leicestershire and 68 practices in northwest London.

^r These conditions include asthma, chronic obstructive pulmonary disease, dementia, diabetes complications, epilepsy, heart failure, and stroke.

^s This covered 145 practices in Leicestershire.

The body of literature cited above has the three main limitations shown in *table 2.4*. The effects of specified changes in access to general practice on absolute total numbers of A&E visits and emergency admissions, in the whole population, have not been previously reported.

Table 2.4 Three Main Limitations of Existing Research into the Relationship between Patient Experience and Use of Emergency Hospital Services

Limitation	Why this is a limitation
1. Past studies typically restrict the study population or outcome variable so that it no longer reflects the whole population or total emergency hospital service use.	Policy makers will likely need to consider effects across total use of emergency hospital services when assessing the cost-effectiveness of interventions. Exploring effects only within certain populations or subsets of A&E visits or emergency admissions may underestimate the total impact of interventions.
2. Only variation in patient experience and use of emergency hospital services <i>between</i> general practices has typically been used to estimate associations.	Associations based solely on variation <i>between</i> practices can be confounded by unobserved factors that vary between practices and are constant for each practice over time. By using variation <i>within</i> practices over several time periods, these confounding factors can be accounted for, making findings more robust.
3. Findings are commonly left in an abstract mathematical form, such as relative differences in rates of A&E visits or emergency admissions, so it is difficult to understand the implications for national policy.	Small relative differences could equate to large absolute changes, so different conclusions may be reached if relative differences are relied on alone. The expected absolute changes in total use of emergency hospital services with different changes in patient experience are unknown. Consequently, it is unclear whether related interventions are worthwhile to explore.

2.3 EXTENDED OPENING HOURS

Two quasi-experimental studies^{31 32} have examined the effects of local programmes to extend opening hours in parts of Greater Manchester and London. These programmes had similar aims to, but were not supported by, the GP Access Fund. A national evaluation of the GP Access Fund's first wave has also been conducted.⁹

2.3.1 Local Evaluations

In central London, four general practices that started opening seven days a week in 2013-14 were estimated to experience a 9.9% decrease in A&E visits within a year relative to 30 other

practices in the local area.³² This effect was largely driven by fewer A&E visits at the weekend and by patients who were discharged with follow-up required from a GP or another healthcare provider.³² Emergency admissions via A&E departments for elderly patients also decreased at the weekend.³² The four pilot practices collectively opened for an extra 62 hours at the weekend, or 2 hours and 49 minutes per 1,000 registered patients.³² This is quite a large change to opening hours for these practices. However, it only equates to around 20 minutes per 1,000 patients per week for the area as a whole, across 34 practices. A&E visits for practices neighbouring the pilot practices did not decrease, despite all patients being able to use the weekend GP services. Total effects on A&E visits across the whole area will have likely been much smaller than the 9.9% reduction reported for the study.

In Greater Manchester, four pilot areas started to provide appointments seven days a week alongside numerous other interventions in 2014.³¹ Across all areas, practices implementing the changes were estimated to have 2.7% fewer A&E visits within a year compared to other practices in Greater Manchester.³¹ All pilot areas had fewer self-referred A&E visits in the post-intervention period, and this finding remained with different model specifications. However, results for total numbers of A&E visits were inconsistent across pilot areas and some models suggested no effects in any of the areas. Moreover, the analysis suggests that the interventions had no effect on several patient experience measures in the GP Patient Survey.³¹ These results could be partly explained by the modest percentages of extra appointments that were booked (55.3% to 83.7% across areas).³¹ It is difficult to compare the changes in opening hours to the central London practices above, as the Greater Manchester pilot practices revised their interventions during the study period. Comparisons are also limited by differences in the outcome measures examined.

A limitation of these two studies is their generalisability; the effects of the interventions in London and Manchester are unlikely to be the same as in other parts of England. National evaluations of GP Access Fund pilot schemes may be more useful to central policy makers.

2.3.2 GP Access Fund Evaluation

NHS England commissioned a consultancy firm to conduct the national evaluation of the GP Access Fund's first wave (*section 1.1.1*). This evaluation focused on three key programme

objectives: to provide additional hours of GP appointment time, to improve patient and staff satisfaction with access to general practice, and to increase the range of contact modes.⁹ Other focuses were effects on A&E visits and emergency admissions, value for money, and changes to organisational models of primary care.⁹ These areas are consistent with the Government rationales given in *table 1.1*. The evaluation report describes several issues with the quality of evaluation data, including missing data, non-standardised definitions, and manual collection in some practices.⁹ Results should therefore be treated with caution.

All 20 pilot schemes provided new appointments outside core opening hours, in addition to numerous other interventions.^t The evaluation estimated that medium-sized pilot schemes extended hours for 41 minutes per 1,000 patients each week, on average.⁹ An estimated 75% of appointments in these hours were used by patients, so the evaluation suggested that an extra 31 minutes per 1,000 patients could maximise utilisation for medium-sized schemes. This almost equals the Extended Hours Access Scheme requirement for practices to provide additional appointments for at least 30 minutes per 1,000 patients each week (*section 1.4.3*).

Low utilisation outside core hours, particularly on Sundays, led many schemes to reduce the number of extended hours provided or revert to previous hours entirely.⁹ This accords with the GP Patient Survey results shown in *table 2.1* which suggest that most patients already found opening times convenient. Utilisation could increase as patient awareness changes or patient behaviour adapts. This was seen in the Greater Manchester schemes described above (*section 2.3.1*), but the utilisation rates for Sunday appointments, in particular, remained low (ranging from 12.4% to 64.4% across pilot areas; 22.4% to 83.9% for Saturdays).³¹

As pilot schemes trialled several interventions simultaneously, the evaluation could not separate the individual effects of different interventions. Instead, it estimated the combined effects across all interventions and schemes. The report⁹ does not provide much detail on the methods used to do this or on the results, so their validity is unclear. For example, the report states that ‘at a programme level, there has been little change in patients’ levels of satisfaction and experience’, but the estimated changes in GP Patient Survey measures are not given.⁹

^t These interventions included GP appointment triage, telephone and internet-based consultations, online registration and appointment booking, increased use of nurses and pharmacists in general practice, and closer working with care homes.

Patients registered to pilot scheme practices were estimated to have made 15% fewer A&E visits in the year after schemes started compared to the year before; this only includes visits with no investigation and no significant treatment.^{9,u} These visits decreased nationally by 7% over the same period.⁹ Interventions introduced by pilot schemes may have caused the extra reduction, but alternative explanations are that pilot scheme areas simultaneously made other changes that affected A&E visits and that trends differed before schemes started.^v Moreover, pilot scheme practices are self-selected and are possibly those expecting a greater benefit from participation; any effects estimated for the schemes may not equal the effects of introducing interventions nationally. Rates of emergency admissions appeared to be greater in the post-intervention period,⁹ but this was not quantified or compared to national changes.

The true effects of the GP Access Fund's first wave on patient experience and use of emergency hospital services are unclear. An evaluation of the second wave of pilot schemes was commissioned in January 2016, but the report is yet to be published. Even if the data quality used in the evaluation improves, the independent effects of extended opening hours cannot be determined because of the simultaneous introduction of other interventions. This also applies to the local evaluation in Greater Manchester (*section 2.3.1*). Pilot practices in central London did not test other interventions alongside extended opening hours, but the generalisability of results to other parts of England is questionable. In summary, the likely national effects of policies to extend opening hours are largely unknown.

2.4 RESEARCH SUMMARY

Sections 2.1 to 2.3 highlighted three limitations of existing literature relevant to this thesis. *Table 2.5* summarises these limitations and how to address them.

^u These were identified using the 'VB11Z' category of the payment tariff for A&E departments. This category accounts for approximately 22% of A&E visits each year (2012-13 figure).

^v For example, the number of A&E visits in pilot scheme areas may have been decreasing at a greater rate than the national trend before the GP Access Fund started.

Table 2.5 Three Important Limitations of Relevant Existing Literature

Limitation	How to address this limitation
1. Previous analysis examining variation in overall satisfaction in the GP Patient Survey omitted or was unable to include some policy-relevant survey measures as explanatory variables	Conduct analysis to include omitted patient experience measures, such as satisfaction with opening hours, and use more recent GP Patient Survey data to examine newly available measures, such as appointment convenience and overall experience of making appointments
2. The absolute effect of improving patient experience by a specified amount on all A&E visits and emergency admissions in the whole population has not been previously estimated	Redefine the study population and outcome variables from those used in previous research and translate model results into absolute effect sizes
3. The effects of variation in opening hours, and policies designed to extend opening hours, on outcomes such as patient experience are largely unknown	Examine differences in outcomes between practices that do and practices that do not participate in the Extended Hours Access Scheme; scheme participation acts as a source of variation in opening hours

2.4.1 Existing Limitations

The limitations in *table 2.5* exist partly because relevant data are unavailable or have been unavailable until recently. For example, I expect more studies would have examined the effects of extended opening hours if an accurate national dataset of practices' opening times existed. Practices do report their opening times on an NHS patient information website, but these times were systematically different to those given in a telephone survey of a nationally representative sample of 320 practices.¹⁰⁷ No other routine source of practice opening times has been tested for validity. In general, the data routinely collected on the characteristics of practices in England are quite limited. For example, no data are available on numbers of consultations provided by each practice nationally or on appointment systems used; data on general practice staffing has been largely restricted to GPs (*section 1.3.1*).

Section 2.3.2 highlighted that the individual effects of different interventions trialled in GP Access Fund pilot schemes cannot be separated, partly because several interventions were often introduced simultaneously. Interventions may also have changed over time or been phased in, so the time of introduction may also be difficult to define. I could not examine the combined effects of the GP Access Fund across all interventions and schemes for this thesis because the post-intervention data required is not currently available.^w In the absence of well-

^w The first pilot schemes of the GP Access Fund were announced in April 2014, but many schemes did not begin until later that year or until 2015, and most wave two pilot schemes should have started in 2015. Outcome data for the 2015-16 and 2016-17 years are therefore required but not yet available.

designed experiments to improve access to general practice, most relevant research has relied on observational methods incorporating the GP Patient Survey (*sections 2.1 and 2.2*). This may increase the risk of confounding, but the research benefits from studying national samples of practices; findings are directly generalisable to the whole of England.

Research using the GP Patient Survey can be extended to address the limitations numbered one and two in *table 2.5*, by examining additional variables, adjusting the study population, and using different statistical methods. To address the third limitation, an accurate measure of variation in opening hours is needed which, as explained above, is not available from existing national datasets of opening times. Another approach is to examine differences between practices that do and do not participate in the Extended Hours Access Scheme (*section 1.4.3*); data on scheme participation became newly available in February 2015 and covered the 2013-14 financial year.¹⁰⁸ The findings could also be relevant to the GP Access Fund because the extensions to opening hours in pilot schemes are similar to the requirements of the Extended Hours Access Scheme (*section 2.3.2*).

2.4.2 Research in Other Countries

Chapter 1 gave examples of relevant policies from other countries that are similar to those in England, such as primary care providers working in groups to deliver services seven days a week in Canada, New Zealand, and Italy (*section 1.5*). I have not discussed literature reporting relevant data or studies from countries other than England so far in this chapter. This literature includes a study estimating that GPs in one Italian region who extended their opening hours to between ten and 12 hours a day had fewer A&E visits than GPs who did not.¹⁰⁹ Other examples are studies in the United States¹¹⁰⁻¹¹² that examined associations between A&E visits and characteristics of primary care providers including opening hours,¹¹⁰ patient-reported barriers to receiving care,¹¹¹ and patient-reported difficulties in accessing care in the evenings and at weekends.¹¹² I do not provide more detail on research from other countries because the generalisability of results to the English NHS is questionable. This research does not affect the conclusions of my thesis.

The remainder of the thesis focuses on research and policy in England only. The next chapter introduces the methods of my original research studies presented in the thesis.

SUMMARY

Most respondents to the GP Patient Survey report positive experiences of their general practices across several measures. These measures generally decreased in value from 2011-12 to 2014-15, indicating worsening experiences. Working people, particularly if they cannot take time off work to see a GP, report worse experiences than those not in work. Overall satisfaction was most strongly associated with the interpersonal quality of care provided by GPs in previous research, but the relevant study did not examine some relevant variables such as satisfaction with opening hours and experiences of making appointments. Many A&E visits in England each year follow failed attempts to get suitable general practice appointments. This may help to explain why more accessible practices have lower rates of A&E visits and emergency admissions in several national studies. Absolute reductions in numbers of A&E visits and emergency admissions with specified changes in patient experience have not been previously reported. The generalisability of evaluations of extended opening hours in London and Manchester are questionable. Evaluations of the GP Access Fund cannot separate the individual effects of different interventions.

3

Methods

Previous chapters described the policy and research contexts of the thesis. *Chapter 1* highlighted a particular policy interest in the opening hours of general practices as part of wider organisational changes to primary care. Government rationales for this focus include improving appointment convenience, better meeting patient expectations, and reducing use of emergency hospital services (*section 1.1.4*). *Chapter 2* introduced measures of patient experience of general practice from the GP Patient Survey; I explained that most respondents report positive experiences, though measures typically worsened from 2011-12 to 2014-15 (*section 2.1.1*). I noted three policy-relevant gaps in existing literature: the effects of policies that extend opening hours are largely unknown; the relevance of satisfaction with opening hours to overall experience is unclear; and no studies have estimated associations between patient experience, A&E visits, and emergency admissions in the whole population (*sections 2.1 to 2.3*). The rest of the thesis addresses these knowledge gaps.

The current chapter focuses on study methods relevant to each of the three original research chapters that follow it. *Section 3.1* discusses my use of the terms ‘access’, ‘opening hours’, and ‘patient experience’ so that it is clear what I consider to be measures of each. *Section 3.2*, the main part of the chapter, focuses on the GP Patient Survey; survey measures of patient

experience are used as explanatory or outcome variables, or both, in each research chapter. I describe the design of the GP Patient Survey and the patient experience measures that I focus on. I also discuss adjusting survey results for respondent characteristics and possible biases in the survey, including from non-response and missing data. I reserve details of methods specific to a chapter, including statistical methods, until that respective chapter. *Section 3.3* presents the aims and objectives for the rest of the thesis. The chapter marks the transition of the thesis from discussing its context to focusing on its original contributions.

3.1 USE OF TERMS

I use many words in this thesis without defining them. Readers interpret and form their own meanings of phrases within the subject context. These meanings should be similar to mine for common and non-technical words, despite the ambiguity inherent in language. Some terms are particularly prominent in the thesis, such as ‘access’, ‘opening hours’, and ‘patient experience’. I discuss my use of these terms below. My aim is not to prescribe what should be meant by these terms but only to clarify what I mean when I use them.

The empirical research reported in later chapters depends, by definition, on observation. Logical positivists^a associated with the traditional account of definitions in philosophy¹¹³ argue that empirical observation is key to analysing the meanings of words and propositions; if the observations needed to determine whether a proposition is true or false are known, then the proposition’s meaning is also known.^{114,b,c} If an observation does not verify a proposition as true or false, then it is irrelevant to the proposition’s meaning. One proposition relevant to this thesis is ‘*P* was able to access general practice services’, where *P* denotes a person.

^a Logical positivism is a set of ideas associated mainly with 19th and 20th century philosophers that is concerned with, for example, the relation of science and experience, the ability and need to verify propositions, and probability theory.

^b Propositions, rather than individual terms, are key because many words take on different meanings in different contexts; for example, ‘feet’ in ‘stand on two feet’ and ‘ten feet tall’ are interpreted differently. This principle is central to the traditional account of definitions which maintains that terms must be defined within specific contexts; propositions can provide this context.

^c For example, the phrase ‘Cowling was the author of this thesis’ is said to be understood if the reader knows the observation(s) that reveals whether it is true or false. This observation could relate to seeing the thesis being written and by whom.

Existing conceptualisations of access often disaggregate it into several ‘types’, ‘dimensions’, or ‘sub-components’.¹¹⁵⁻¹²² The constituent parts differ between authors. For example, in one prominent conceptualisation,¹²² ‘access’ has five dimensions: availability (volumes and types of services), accessibility (geographical locations of services and users), accommodation (organisation of services to accept clients), affordability, and acceptability (relations of user attitudes and personal/practice characteristics). Another framework¹¹⁸ posits four dimensions of ‘access’, termed ‘service availability’, ‘utilisation of services and barriers to access’, ‘relevance, effectiveness, and access’, and ‘equity and access’. Other conceptualisations include patient choice and continuity as dimensions.^{115 120} The opening hours of general practices could be seen as a measure of service availability or of how accommodating services are to patients’ expectations in these frameworks. Similarly, numbers of doctors per patient and travel times to services have been proposed as measures of access.^{115 118 121}

However, I cannot consider the above ‘dimensions’ as collectively constituting the meaning of access, for two reasons. First, I do not make inferences about all of them from propositions such as ‘*P* was able to access general practice services’. For example, from this proposition, I do not infer the opening hours or number of doctors a practice has. Second, even if these and other variables were specified, I would not be able to say whether *P* was or was not able to access general practice services on a given attempt. There are numerous variables that may affect the probability of a patient being able to access care, but I see these variables as distinct from the meaning of access itself. Their true relationships must be determined through empirical research, which implies that access can be measured as a distinct entity.

When a patient receives care in general practice, I consider it necessarily true to state that the patient had access to general practice services. Access does not necessarily result in the receipt of care, however; a patient may try to get an appointment, be offered one, but decide not to take up the offer. I would still state that this patient was able to access services, because there was an opportunity to receive care in the offered consultation.

It could be argued that everyone registered with a general practice has the opportunity to receive care from these services and, therefore, has access to them. I do not adopt this view as it implies that access is constant within GP-registered populations and would therefore be

irrelevant to research investigating relationships in these populations.^d Moreover, a registered patient may be unable to receive care on a specific attempt to do so, perhaps because appointments can only be booked on the same day and all were taken when the attempt was made. Patients' abilities to access services may differ between appointment attempts; these attempts are a more appropriate unit of analysis for measuring access.

A patient may be offered an appointment on a given attempt but not accept it because the 'conditions' of access are unsuitable. These conditions could include the timing of the appointment and the health professional able to be consulted. Both of these factors can be objectively observed, but their suitability to the patient is subjective.^e Two patients could access general practice under the same conditions but perceive their experiences very differently. I use the term 'patient experience' to refer to both the objective and subjective parts of patients' interactions with their practices.^f

Subjective parts of patient experiences can only be measured by eliciting them from patients, by definition. This could be done via surveys or in-depth interviews, for example. Objective parts of experiences such as outcomes of patients' appointment attempts could be routinely recorded in general practice information systems, though this is not common. Alternatively, patients could report these aspects of their experiences too, as in the GP Patient Survey which measures both objective and subjective experiences of general practice.

3.2 GP PATIENT SURVEY

3.2.1 Survey Design

The GP Patient Survey is a quantitative postal survey conducted annually by Ipsos MORI on behalf of NHS England. Adults with valid NHS numbers who have been registered with a

^d This is because the access measure would not vary, so it could not explain variation in other measures or be explained by other measures.

^e The suitability of an appointment as perceived by a patient cannot exist independently of that patient.

^f For brevity, I include patient satisfaction when I refer to 'patient experience'.

general practice in England continuously for the last six months are eligible to participate.^g The sampling frame includes all practices with eligible patients. Ipsos MORI receives a dataset on all eligible patients from the Health and Social Care Information Centre.^h Using this dataset, Ipsos MORI aims to sample around 2.64 million patients annually¹²³ and sets the sample size for each practice intending for confidence intervals to be of equal magnitudes across practices.ⁱ Patients from practices with small registered populations or low response rates in the previous year are therefore oversampled. Within practices, patients are stratified by age band and gender and sampled on a ‘1 in n’ basis.¹²³ The Health and Social Care Information Centre then provides Ipsos MORI with contact details for sampled patients.

Questionnaires are sent in two waves each financial year, from July to September (wave one) and January to March (wave two). Respondents submit responses by return post, telephone, or online. *Table 3.1* describes survey participation over three years. As stated in *chapter 2*, GP Patient Survey methods have substantially changed since its introduction in 2007, with large changes in 2011.¹²⁴ Data from 2011-12 onwards are incomparable with earlier data, particularly because numerous questions have been removed, reworded, or added. The most recent data I could obtain from NHS England was for 2013-14. I therefore focus on data from 2011-12 to 2013-14 below. Survey methods were consistent over this period.

Table 3.1 Descriptive Statistics for Participation in the GP Patient Survey 2011-14, by Survey Year

	2011-12 ¹²⁴	2012-13 ¹²⁵	2013-14 ⁸⁹
Number of questionnaires sent	2,742,373	2,761,123	2,631,209
Number of questionnaires returned	1,037,946	971,232	903,357
Response rate	37.8%	35.2%	34.3%
Number of practices with respondents	8,258	8,129	8,005
Mean (SD) number of respondents per practice	126 (27.3)	119 (20.6)	113 (18.5)

SD: standard deviation

Number of practices with questionnaires sent to patients: 2011-12, 8,271; 2012-13, 8,169; 2013-14, 8,017.

I obtained respondent-level GP Patient Survey data for the 2011-12, 2012-13, and 2013-14 years under a data sharing agreement with NHS England; each observation in these data corresponds to one respondent. Ipsos MORI provided encrypted datasets via an online file exchange system. Each respondent has a unique barcode number; the identifiable data used

^g ‘Adults’ refers to people aged at least 18 years old. Patients cannot receive more than one questionnaire in any 12 month period.

^h This dataset contains a unique reference number, patient age, gender, and postcode, and the practice code.

ⁱ The target sample size for each practice is calculated to provide a 95% confidence interval of around ± 9 for a question where 50% of respondents select one answer and 50% the other answer.

by Ipsos MORI when contacting sampled patients^j is not available in the data. In addition to survey responses, the datasets provide details of each respondent's registered practice. This includes practices' Organisation Data Service codes, thereby permitting deterministic linkages to other datasets at the practice level. Ipsos MORI checks responses for completion error and edits them where appropriate before providing data^{89 124 125}; for example, 'Answered in error' is recorded when an answer is precluded based on responses to earlier questions.

Survey design receives input from the Royal College of General Practitioners, British Medical Association, Department of Health, and NHS England.¹²³ The NHS Outcomes Framework, a primary means by which the Department of Health holds NHS England to account, includes two survey measures of patient experience of general practice.¹²⁶ These measures relate to overall experience and overall experience of making appointments, which are both subjective measures. This highlights the importance of subjective measures which account for patient expectations, values, and preferences, as well as objective experiences.

3.2.2 Patient Experience Measures

Patients' overall experiences of making appointments are likely to be explained by their abilities to get appointments, appointment convenience, and other 'conditions' of any appointments obtained.^k Questions on these topics are included in the same section of the GP Patient Survey and ask each respondent about their last attempt to get an appointment. Both objective and subjective factors that affect experiences of making appointments could influence a patient's use of general practice and, in turn, use of emergency hospital services. This variable is therefore particularly relevant to examine to extend the existing literature on the relationship between patient experience of general practice and rates of A&E visits and emergency admissions. I outlined the main limitations of this literature in *section 2.2.2*.

Chapter 2 also stated that I would extend previous research to examine the association between experience of making an appointment and overall experience. I highlighted satisfaction with opening hours as another variable that could affect overall experience and had not been previously examined in this regard. This measure is also highly relevant in examining the effects of extended opening hours on patient experience, as it directly

^j Name, address, birth month and year, gender, and NHS number

^k These conditions include appointment timing and the consulting health professional.

addresses opening hours. Experience of making an appointment and overall experience are more general and could be affected by a wider range of factors.

These three patient experience variables provide a complementary and parsimonious set to focus on when addressing the main limitations of relevant existing literature given in *chapter 2* and summarised in *table 2.5*. I used three survey questions to measure these variables; *table 3.2* shows that each question had five informative response options.

Table 3.2 GP Patient Survey Questions and Responses Used to Define Patient Experience Measures

GP Patient Survey question	Answer value [*]
How satisfied are you with the hours that your GP surgery is open? [†]	
Very satisfied	100
Fairly satisfied	75
Neither satisfied nor dissatisfied	50
Fairly dissatisfied	25
Very dissatisfied	0
Overall, how would you describe your experience of making an appointment?	
Very good	100
Fairly good	75
Neither good nor poor	50
Fairly poor	25
Very poor	0
Overall, how would you describe your experience of your GP surgery?	
Very good	100
Fairly good	75
Neither good nor poor	50
Fairly poor	25
Very poor	0

GP: general practitioner. Question numbers in GP Patient Survey 2013-14 were 25 (satisfaction with opening hours), 18 (experience of making an appointment) and 28 (overall experience). All respondents were asked to complete each of the tabulated questions.

^{*}Values were those assigned after linearly rescaling each outcome measure (see below).

[†]Responses of 'I'm not sure when my GP surgery is open' were excluded from analysis.

Previous research has used two approaches when analysing GP Patient Survey questions with several categorical response options. One approach is to create a dichotomous variable,^{87 95} such as whether a respondent was satisfied with opening hours (fairly or very satisfied) or not. This has the strength that the variable has a simple interpretation when aggregated to higher levels; the NHS Outcomes Framework uses this approach to monitor the national percentage of respondents that have good (fairly or very good) overall experiences and experiences of making appointments.¹²⁶ A limitation of this approach is that it does not take account of the full response distribution; using the example of satisfaction with opening

hours, if respondents became very satisfied from fairly satisfied, the value of the variable would not change despite an improvement in satisfaction. Very dissatisfied respondents would be in the same category as people who are ‘neither satisfied nor dissatisfied’, even though these people may feel very differently.

A different approach is more common using respondent-level data. This approach treats response options as lying on interval scales, with options assumed to have a linear order that can be analysed as a numerical variable.^{90 96 127-130} A relative limitation is that the interpretation of summary measures of this variable at higher levels is not as simple as a percentage of respondents; the same mean value, for example, can result from many different combinations of underlying responses. However, the full response distribution is taken account of so changes in responses from fairly to very satisfied, for example, are measured as improvements in satisfaction. For this reason, and to be consistent with existing literature, I use this approach in the rest of the thesis. This choice should not affect the conclusions drawn in the thesis substantially, as mean values derived from interval scales should be highly correlated with those based on dichotomous variables. For example, the practice-level mean values of the measures given in *table 3.2* were very highly correlated with the means when the corresponding variables were coded as dichotomous ($r>0.94$).¹

The interval scales assume that differences in, for example, satisfaction between very dissatisfied and fairly dissatisfied and between very satisfied and fairly satisfied are equal. This linearity assumption is supported by use of the same quantifiers (very and fairly) for positive and negative responses.^m The range of the scale is arbitrary; it does not affect the correct interpretation of results which should always account for scale. The analysis used a range from 0 to 100, consistent with previous research,^{90 130} which is intuitive to interpret results on. The values assigned to each response are shown in *table 3.2*.

¹ Satisfaction with opening hours was coded as very or fairly satisfied vs. other. Experience of making an appointment and overall experience were coded as very or fairly good vs. other. The Pearson correlation coefficients were calculated using 2013-14 GP Patient Survey data.

^m I could instead have assumed that the response options are ordered but do not lie on interval scales. Analysis in subsequent chapters could then have been based on ordered logistic regression. However, this makes the proportional odds assumption which could be violated and the interpretation of coefficients is less straightforward than in linear regression. Further alternatives such as multinomial logistic regression are also difficult to readily interpret and summarise, as numerous coefficients are estimated for each explanatory variable. On the whole, I considered the assumption of interval scales reasonable and it confers significant advantages relating to the presentation and interpretation of results.

3.2.3 Adjustment for Patient Characteristics

Respondent-level Analysis

A confounding variable for the association between an explanatory variable X and outcome variable Y is a variable that explains variation in Y independently of X , is associated with X , and does not lie on the ‘causal path’ from X to Y . *Chapter 2* cited several studies that demonstrate differences in patient experience outcomes based on patient characteristics (*section 2.1.2*). These characteristics are therefore likely to meet the first criterion of confounding variables given above; they are also unlikely to lie on the causal paths of the predictor variables examined in this thesis, as, for example, demographic factors such as age, gender, and ethnicity are not determined by health services. It is therefore reasonable to treat patient characteristics as candidate confounding variables and to adjust analyses for them.

Table 3.3 shows the characteristics I adjust for in the respondent-level analyses reported in subsequent chapters. Age group, gender, ethnicity, Index of Multiple Deprivation¹³¹ fifth, and self-reported healthⁿ are the standard control variables in GP Patient Survey analyses using respondent-level data.^{90 94-96 127 132} I also adjusted for patient ability to take time off work to see a GP which was modelled in recent work¹³⁰ and is highly relevant to Government policy (*section 1.2.2*); it could moderate associations between interventions and patient experience measures.

Table 3.3 Patient Characteristics Adjusted For in Respondent-level Analyses of the GP Patient Survey

Variable	Categories	Coding
Age group	18 to 24, 25 to 34, 35 to 44, 45 to 54, 55 to 64, 65 to 74, 75 to 84, 85 or over	Categories given in survey questionnaires
Gender	Male, female	Categories given in survey questionnaires
Ethnicity	White, mixed, Asian, black, other	Derived from 18 survey categories using Office for National Statistics methods ¹³³
Index of Multiple Deprivation 2010 fifth	Fifths of national ranking of areas of residence*	Derived from national ranking available in survey datasets
Can take time off work to see a GP [†]	Not working, yes, no	Combination of two questions relating to employment status and ability to take time off work

ⁿ Questionnaires in recent years ask about confidence in managing health instead of self-reported health status.

Confident in managing health [‡]	Very, fairly, not very, not at all	Categories given in survey questionnaires
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*Areas of residence were lower layer super output areas (small geographical units with a mean population of 1,500 people).

†Respondents in full-time or part-time paid work were asked 'If you need to see a GP at your GP surgery during your typical working hours, can you take time away from your work to do this?' 'Not working' respondents were in full-time education, unemployed, sick or disabled, retired, looking after their home, or something else.

‡Question was 'How confident are you that you can manage your own health?'

Practice-level Analysis

Previous research¹²⁷ has examined the effect of respondent case-mix adjustment (using age group, gender, ethnicity, deprivation fifth, and self-reported health) on practice-level values for patient experience measures. This adjustment accounted for little of the variance in practice-level means and most practices did not change rank by ten percentile points or more; for example, 5.9% of the practice-level variance in mean satisfaction with opening hours was due to differences in respondent characteristics and 15.6% of practices changed rank by ten percentile points or more for this measure.¹²⁷ The effect of case-mix adjustment is therefore modest for most practices but, since there is some effect, adjustment may still be advisable depending on what the differences in experience across patient characteristics represent.

Chapter 2 discussed how reported patient experience varies across patient groups within the same practice⁹⁰; this may be solely because different groups have different interactions with practices or because interactions are similar but perceived differently across groups (*section 2.1.2*). Either way, some groups truly have worse experiences of their practices. In this case, analyses that aim to characterise true experiences by practice do not need to adjust for respondent case-mix. Alternatively, the differences may relate to variation in how patient groups interpret survey questions and the contexts in which they complete questionnaires, for example; variation in reported experiences could be an artefact of factors besides true differences in experience between groups. In this instance, case-mix adjustment is necessary. Both sets of explanations are plausible and both may contribute. I return to this discussion in *chapter 6* where analysis is conducted at the practice level.

3.2.4 Possible Biases

Non-response Bias

Table 3.1 showed that 35.8% of questionnaires sent in the 2011-14 surveys were completed and returned. If non-respondents have systematically different experiences to respondents, summary results at the practice or national levels, for example, will be biased. A previous study¹³⁴ examined response rates across variables available in the data used to sample patients; response rates were lower in younger age groups, men, and in more deprived areas.¹³⁴ Younger patients report more negative experiences than older patients across several measures, while associations for gender and deprivation are often small and inconsistent.⁹⁰ Based on these variables only, survey results are likely to be biased upwards because younger age groups are under-represented. The effects of unobserved characteristics associated with non-response may be different, however. At the practice level, response rates explained less than 0.2% of the variance in two measures^o examined once respondent characteristics were adjusted for.¹³⁴ This suggests little differential non-response bias at the practice level.

The GP Patient Survey respondent-level datasets include a variable recording a weight given to each respondent by Ipsos MORI. This weight incorporates a non-response weight equal to the reciprocal of the predicted probability of response.¹²³ This probability is estimated using logistic regression with patient age, gender, region of England, and several area-based measures^p as explanatory variables.¹²³ Based on these variables, the non-response weight gives more weight to respondents who are less likely to respond, removing any non-response bias associated with the variables modelled. This does not necessarily account for all non-response bias, however. In addition to incorporating a non-response weight, the overall weight accounts for oversampling from some practices (*section 3.2.1*) and ensures the weighted population resembles the eligible population for each practice.¹²³

Measurement Error

A second source of error in practice-level values is the sampling of patients within practices. As the number of respondents per practice increases, the influence of within-practice variation in patient experience on practice-level means decreases.¹³⁵ Therefore, variation in practice-level values increasingly reflects true differences in patient experience between

^o Ability to see a GP within two weekdays and ability to book appointments more than two weekdays ahead.

^p Data linked to postcodes on ethnicity, deprivation, employment and marital status, and other socioeconomic indicators.

practices; the reliability of practice-level measures increases.^q One strength of the GP Patient Survey is its size; *table 3.1* showed that the 2013-14 survey collected a mean of 113 responses per practice (standard deviation=18.5). Previous research suggests that practice-level measures of satisfaction with opening hours and overall satisfaction have good (reliability>0.8) and excellent (reliability>0.9) reliabilities at this sample size, respectively.¹³⁵ However, since the reliability is not perfect (equal to one), there is some measurement error. This will bias regression estimates where patient experience at the practice level is an explanatory variable towards the null; associations for patient experience are attenuated. I expand on this in *chapter 6* where the analysis is conducted at the practice level.

Previous work assessing GP Patient Survey methods has also examined the construct validity of measures relevant to access. A study of 41 practices in southwest England found strong correlations between measures of appointment availability within two days from simulated telephone calls and the GP Patient Survey.¹³⁶ Satisfaction with opening hours, experience of making appointments, and overall experience cannot be validated in the same way, as these subjective constructs cannot be observed independently of the respondent (*section 3.1*).

Missing Data

Missing data is another possible source of bias. Complete case analysis, which excludes observations with missing data for any variables included in an analysis, is unbiased if there are no systematic differences between the missing and observed values. *Table 3.4* shows that descriptive statistics for key variables are similar between complete cases and all GP Patient Survey respondents, and most respondents (81.4%) are complete cases for the variables tabulated. Results from complete case analysis should therefore be similar to results had there been no missing data. I use this approach in the subsequent research chapters.

Table 3.4 Comparison of All Respondents and Complete Cases (With No Missing Data) for Key Variables in the GP Patient Survey, 2011-14

	Number of respondents	Percentage of respondents (%)	Number of complete cases	Percentage of complete cases (%)
Age (years):				
18 to 24	120,263	4.2	99,217	4.2
25 to 34	275,565	9.6	235,372	9.9
35 to 44	376,214	13.1	320,443	13.5
45 to 54	496,900	17.4	421,174	17.8

^q Reliability equals: practice-level variance ÷ (practice-level variance + respondent-level variance/n), where n is the mean number of respondents per practice.

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55 to 64	575,908	20.1	486,424	20.5
65 to 74	561,814	19.6	464,948	19.6
75 to 84	346,370	12.1	268,025	11.3
85 or over	111,737	3.9	76,592	3.2
Total	2,864,771		2,372,195	
Gender:				
Male	1,237,230	43.2	1,040,772	43.9
Female	1,627,054	56.8	1,331,423	56.1
Total	2,864,284		2,372,195	
Ethnicity:				
White	2,511,254	87.9	2,094,930	88.3
Mixed	21,459	0.8	17,404	0.7
Asian	169,559	5.9	141,032	6.0
Black	76,699	2.7	59,810	2.5
Other	78,193	2.7	59,019	2.5
Total	2,857,164		2,372,195	
Deprivation fifth:*				
1 (most deprived)	596,503	20.5	472,261	19.9
2	577,155	19.8	466,336	19.7
3	597,355	20.5	489,025	20.6
4	588,258	20.2	485,479	20.5
5 (least deprived)	550,900	18.9	459,094	19.4
Total	2,910,171		2,372,195	
Can take time off work to see GP:				
Not working†	1,460,780	53.5	1,258,060	53.0
Yes	883,318	32.4	779,570	32.9
No	384,779	14.1	334,565	14.1
Total	2,728,877		2,372,195	
Confident in managing health:				
Very	1,185,895	42.5	1,021,511	43.1
Fairly	1,392,810	49.9	1,184,691	49.9
Not very	172,691	6.2	138,932	5.9
Not at all	37,596	1.4	27,061	1.1
Total	2,788,992		2,372,195	
	Mean (SD) in respondents		Mean (SD) in complete cases	
Satisfaction with opening hours‡	80.3 (23.2)		80.0 (23.2)	
Experience of making an appointment‡	78.3 (24.6)		78.5 (24.4)	
Overall experience‡	84.1 (19.8)		84.3 (19.6)	

GP: general practitioner; SD: standard deviation

2,912,535 survey respondents from 8,289 general practices. Data presented where available for each variable for all respondents in the first and second results columns. Data presented for complete cases only (n=2,372,195) in the third and fourth results columns.

*Fifths of the national Index of Multiple Deprivation rank for lower layer super output areas of residence.

†Full-time education, unemployed, sick or disabled, retired, looking after home, other.

‡Measured on five-level interval scales from 0 (most negative response option) to 100 (most positive option).

I further discuss possible biases, within the context of individual analyses, in the original research chapters that follow. The aims and objectives of these chapters are given below.

3.3 AIMS AND OBJECTIVES

Aims

- To make an original and valid contribution to health services research by examining access to general practice in England, particularly in its relation to patient experience, general practice opening hours, and use of emergency hospital services
- To provide timely evidence relevant to current national policy discourse on access to general practice in England such that policy makers and health service managers with an interest in empirical evidence can be better informed

Objectives

- To determine whether patients registered to general practices participating in the Extended Hours Access Scheme report a systematically different patient experience in the GP Patient Survey, compared to patients from non-participating practices
- To investigate the determinants of patient satisfaction with opening hours, experience of making appointments, and overall experience, by analysing associations between relevant measures from the GP Patient Survey
- To estimate changes in use of emergency hospital services with specified changes in patient experience of general practice, through linking GP Patient Survey and Hospital Episode Statistics data over several years
- To suggest implications of the original research presented in this thesis for policy makers and health service managers, while acknowledging that the policy process is influenced by several factors beyond empirical findings

Each of these objectives is addressed separately in the four remaining chapters of the thesis. The three original research chapters are next (*chapters 4, 5, and 6*), followed by the concluding discussion chapter (*chapter 7*). Research chapters are reported using the guidance of the STROBE¹³⁷ and RECORD¹³⁸ statements.

SUMMARY

Existing conceptualisations of ‘access’ often disaggregate it into several dimensions. Opening hours could be seen as a relevant measure of some of these dimensions, but I consider it as a possible determinant of access rather than as a measure of access. Access is necessary to receive care and can be objectively observed, as can several ‘conditions’ under which care is accessed such as the timing of a consultation. Other conditions, such as the suitability of an appointment to a patient, are inherently subjective. Both objective and subjective aspects of access to general practice can be measured using patient surveys. The GP Patient Survey is a national questionnaire-based survey of adults registered with general practices in England. I focus on measures of satisfaction with opening hours, experience of making an appointment, and overall experience in original research presented in subsequent chapters. I adjust analyses for the characteristics of survey respondents in these studies. The following chapters aim to make an original and valid contribution to health services research and provide timely evidence relevant to current national policy discourse.

4

Extended Opening Hours

Abstract

Background: Previous chapters described how changes to opening hours are prominent in Government plans to improve access to general practice. The effects of policies to extend opening hours are largely unknown, including the effects of the Extended Hours Access Scheme. This chapter reports associations between participation in this scheme and patient experience measures from the GP Patient Survey.

Methods: Cross-sectional analysis of the GP Patient Survey 2013-14 linked with routine data on scheme participation and other practice characteristics; 903,357 survey respondents registered with 8,005 practices formed the eligible study population. Outcome measures related to satisfaction with opening hours, experience of making an appointment, and overall experience (measured on five-level interval scales from 0 to 100). Mean differences in these measures between scheme participation groups were estimated using multilevel random-effects regression, adjusting for several patient and practice characteristics.

Results: Most patients were very (37.2%) or fairly satisfied (42.7%) with the opening hours of their practices; results were similar for experience of making appointments and overall experience. Most practices participated in the Extended Hours Access Scheme (73.9%). Scheme participants had greater adjusted mean values of all three outcome measures than non-participants, but the mean differences were small; they ranged from 1.25 (95% CI: 0.96 to 1.55) for satisfaction with opening hours to 0.32 (95% CI: 0.04 to 0.60) for overall experience. Associations varied by patient ability to take time off work to see a GP for satisfaction with opening hours only ($P<0.001$); the greatest mean difference was when patients could not take time off (2.08; 95% CI: 1.53 to 2.63).

Conclusions: Participation in the Extended Hours Access Scheme has a limited association with three patient experience measures. This questions expected impacts of current plans to extend hours on patient experience.

Previous chapters described how changes to opening hours are prominent in Government plans to improve access to general practice. The GP Access Fund has been the main policy used to support these plans, with one objective being to improve patients' experiences of accessing services. *Chapter 2* outlined difficulties in evaluating the GP Access Fund, which include being unable to separate the effects of extended opening hours from other new initiatives (*section 2.3.2*). Other empirical settings must be used to examine the independent effects of extended opening hours.

Chapter 1 explained that elements of the GP Access Fund incrementally progress the aim of the Extended Hours Access Scheme to extend opening hours (*section 1.4.3*). The effects of this policy also remain largely unknown. While research on the Extended Hours Access Scheme is valuable in its own right, it may also provide insights into the likely effects of extended opening hours in the GP Access Fund pilot schemes. I earlier described how the medium-sized schemes provided 41 minutes of additional hours per 1,000 patients each week in the first wave of the GP Access Fund, which is only slightly more than the minimum requirement of the Extended Hours Access Scheme alone (*section 2.3.2*). Other similarities, and differences, are given in *table 1.3* (reproduced from *chapter 1*) below.

Table 1.3 Details of the Extended Hours Access Scheme and GP Access Fund

	Extended Hours Access Scheme				GP Access Fund
Period of operation	Sept. 2008 to March 2010	April 2010 to March 2011	April 2011 to March 2014	April 2014 onwards	April 2014 onwards*
Extended opening hours requirement	At least 30 minutes per 1,000 patients each week outside of core opening times [†]				8 a.m.-8 p.m. on weekdays and open at weekends (in wave two)
	Requirement was for number of opening hours, not clinical time; sessions had to last for at least 90 minutes		Requirement was/is for clinical time, not number of opening hours; sessions must last for at least 30 minutes		
Consultation mode(s)	Face to face	Face to face	Face to face	Face to face, telephone or other modes	Face to face, telephone or other modes
Consultation providers	GPs	GPs	GPs, nurses and others [‡]	GPs, nurses and others [‡]	GPs, nurses and others
Extended opening hours providers	Individual practices	Individual practices	Individual practices	Individual or groups of practices	Groups of practices

EXTENDED OPENING HOURS

Percentage of practices that participated [§]	77% (6,384/8,279) (July 2009)	-	71% (5,751/8,060) (2013-14)	74% (5,877/7,959) (2014-15)	32% (2,564/7,959) (2014-2016)
Annual payment per registered patient (£)	2.95	3.00	1.90	1.90	N/A
Investment (£ millions) ^{**}	-	161	70 (2013-14)	84 (2014-15)	175

GP: general practitioner; N/A: not applicable

The core opening times specified in the standard General Medical Services and Personal Medical Services contracts are 8 a.m. to 6.30 p.m. on any day other than Saturday, Sunday, and public holidays.

*April 2014 was when the first 20 pilot schemes of the GP Access Fund were announced (*section 1.1*).

†This number is converted to the nearest quarter hour to set the minimum requirement. Practices are expected to offer, on average, at least two appointments per 30 minutes. Existing standards must be maintained within core opening hours. The GP Patient Survey is supposed to inform choices regarding extended opening hours.

‡Health care assistants became eligible under scheme requirements to provide appointments from April 2014.

§Data in 2009 were from a different collection to those in 2013-14 and 2014-15, so the percentages are not necessarily comparable. Figures for the GP Access Fund are approximate.

**£161 million was available for investment in the Extended Hours Access Scheme in 2010-11. Figures for 2013-14 and 2014-15 are based on the sum value of scheme payments to (and deductions from) practices.

It is possible to identify practices participating in the Extended Hours Access Scheme from 2013-14 onwards using an annual data publication made newly available in 2015.^{108 139} This publication details payments made to each general practice in England by financial year. Payments are broken down by revenue stream, one of which is the Extended Hours Access Scheme. According to these data, 71% of practices received a payment under the scheme in 2013-14; the total payment across all practices was £70 million.¹⁰⁸ The Extended Hours Access Scheme was the only national intervention designed to extend general practice opening hours in this year. The first pilot schemes of the GP Access Fund started in the 2014-15 financial year.⁹ Payment data for 2013-14 therefore present the opportunity to examine the effects of scheme participation without possible confounding by GP Access Fund schemes.

I earlier described how one rationale for the Government's changes to opening hours relates to patients' expectations and preferences (*table 1.1*). *Chapter 2* presented statistics from the GP Patient Survey on changes in patient experience measures from 2011-12 to 2014-15 (*table 2.1*), and *chapter 3* more fully discussed the details of this survey. This included that measures derived from the GP Patient Survey are often used in monitoring the performance of the NHS, such as measures of experiences making appointments and of experiences overall in the NHS Outcomes Framework (*section 3.2.1*). Both of these measures suggest a worsening of patient experience over recent years, as do measures of satisfaction with opening hours (*table 2.1*). Most GP Patient Survey respondents still report good experiences,

though some groups such as those unable to take time off work to see a GP respond much more negatively. Government rhetoric has focused on working people (*section 1.2.2*).

Improving patient experience is a key goal of Government plans for general practice. It was given as one of three main objectives for the GP Access Fund in its evaluation, for example.⁹ One question is whether existing changes to opening hours, through the GP Access Fund and the Extended Hours Access Scheme, will help to achieve this goal.

The current chapter addresses this question. The relevant thesis objective is: To determine whether patients registered to general practices participating in the Extended Hours Access Scheme report a systematically different patient experience in the GP Patient Survey compared to patients from non-participating practices. I also examine how associations differ by patient ability to take time off work to see a GP and by English region. The work presented in this chapter has been previously published.¹⁴⁰

4.1 METHODS

The study design was a cross-sectional regression analysis of a large multilevel dataset. This dataset consisted of respondent-level data from the GP Patient Survey 2013-14 linked to general practice-level data on the Extended Hours Access Scheme and other practice characteristics. The GP Patient Survey 2013-14 sent questionnaires to 2,631,209 eligible patients registered to 8,017 practices in England; 903,357 respondents, from 8,005 practices, returned completed questionnaires, providing a response rate of 34.3% (*table 3.1*).⁸⁹ The mean number of responses per practice was 113 (SD=18.5; minimum=1; maximum=166). *Section 3.2* provided further survey details, including eligibility criteria and sampling methods. The practice-level data sources are outlined below.

Patient Experience

I used the three measures of patient experience defined in *section 3.2.2* as outcome measures. These related to satisfaction with opening hours, experience of making an appointment, and

overall experience. *Table 3.2* presented the question wordings, responses, and values used to derive these measures from the GP Patient Survey.^a Each measure had a five-level interval scale with a range from 0 to 100.

Extended Hours Access Scheme

The Health and Social Care Information Centre provided data on payments to general practices in the 2013-14 financial year (1st April 2013 to 31st March 2014).¹⁰⁸ These data were extracted from general practice computer systems^b and validated at the end of each financial quarter.¹⁰⁸ Data record the cash payments made to each general practice; they do not include accruals or other accounting adjustments and they do not account for the expenditure of each practice.¹⁰⁸ Payment data for the Extended Hours Access Scheme were available for 99.7% of practices (7,981 of 8,005) in the GP Patient Survey data.^c

Participating practices receive £1.90 per registered patient per year; a practice with 7,426 patients (the mean number in October 2015¹⁴¹) receives £14,109 for providing at least 3 hours and 45 minutes of additional appointments outside core hours per week, for the whole financial year. The analysis distinguished practices that received a payment under the Extended Hours Access Scheme ('scheme participants') from those that did not ('non-participants'). It was not possible to measure the number of extended hours provided over the minimum requirement (30 minutes per 1,000 patients per week) because payments are based solely on the registered population of each practice.

The core hours of most general practices in England are from 8 a.m. to 6.30 p.m. on all days other than Saturdays, Sundays, and public holidays.^{142 143} These are the core hours specified in the standard General Medical Services and Personal Medical Services contracts.^{142 143} In 2013-14, 95% of practices^d had one of these contract types.¹⁴⁴ Such practices that participate in the Extended Hours Access Scheme are paid for providing appointments outside of these

^a The questions were 'How satisfied are you with the hours that your GP surgery is open?', 'Overall, how would you describe your experience of making an appointment?', and 'Overall, how would you describe your experience of your GP surgery?'

^b Health and Social Care Information Centre GP Payments system, National Health Applications and Infrastructure Services. Some payments to general practices are not paid through this system and are therefore excluded from the data. These payments include those for premises costs, centrally procured information technology services, and Local Authority Public Health Grants, for example.

^c The GP Payments data can include services other than general practices, such as walk-in centres.

^d General Medical Services, 55%; Personal Medical Services, 40%.

times. Practices with other contract types often open for longer as part of their main contracts,¹⁴⁵ so non-participation does not imply shorter opening hours. Therefore, the analysis only included practices with General or Personal Medical Services contracts.¹⁴⁴ In these practices, participants should have longer contracted hours than non-participants.

Patient and Practice Characteristics

I treated 12 variables as possible confounders of associations between scheme participation and the patient experience measures. These variables included the six patient characteristics given in *table 3.3*: age group, gender, ethnicity, deprivation fifth, ability to take time off work to see a GP, and confidence in managing health, as reported in the GP Patient Survey. The other six variables were practice characteristics.

The Health and Social Care Information Centre provided data for several of these characteristics. These data recorded the number of registered patients,¹⁴⁴ the full-time equivalent number of GPs,¹⁴⁴ and performance in the Quality and Outcomes Framework 2013-14.¹⁴⁶ Data extracts for the numbers of registered patients and GPs correspond to 30th September 2013. Previous research has examined associations between performance in the Quality and Outcomes Framework and patient experience measures from the GP Patient Survey.¹²⁸ This research suggests that the intermediate outcome measures of performance are those most highly correlated with patient experience, though the correlations are relatively weak (Spearman rank correlations < 0.18).¹²⁸ The same analysis defined a composite measure of performance on intermediate outcome measures as the sum of achievement weighted by the relative number of points available for each measure.^{128 147} I follow this approach.^e

Two further characteristics of practices included in the analysis were the region of England and the national Index of Multiple Deprivation rank for each practice's registered population. Ten regions of England, based on Strategic Health Authorities,^f were distinguished using postcode data supplied by the Office for National Statistics.¹⁴⁸ The Index of Multiple

^e Achievement was calculated as the percentage of a practice's population, p , that attained outcome i in a given year, t , as $N_{pti} / (D_{pti} + E_{pti})$ where N is the number of patients attaining the outcome, D is the number of patients deemed eligible for outcome i and E is the number exception reported. There were 13 individual outcome measures, relating to blood pressure, cholesterol, blood glucose, and epileptic seizures (see *appendix 3*).

^f Strategic Health Authorities were regional NHS organisations responsible for strategic oversight.

Deprivation rank for each practice^g was calculated as the weighted sum of the ranks in 2010 for each lower layer super output area (LSOA) in which a practice had registered patients.¹³¹

¹⁴⁹ The weights were the proportions of each practice's population living in each LSOA.¹⁵⁰ The sixth practice characteristic was whether it was located in an urban or rural area; an area is classified as urban by the Office for National Statistics if it has a population of at least 10,000 people.¹⁵¹ This variable was present in the GP Patient Survey datasets.

I linked GP Patient Survey data with practice-level data deterministically using the unique Organisation Data Service codes assigned to practices by the Health and Social Care Information Centre. All practices included in the GP Patient Survey data were also present in the practice-level dataset that contained each of the practice characteristics.

Statistical Methods

All statistical analysis was conducted using Stata (version 13.1).¹⁵² Descriptive statistics for survey responses included all respondents, both unweighted and weighted for survey design and non-response. Other statistics only included general practices (and associated respondents) that had a General or Personal Medical Services contract, at least 1,000 registered patients and 50 survey responses, and were open for the whole financial year; this was to exclude small practices likely to be atypical or in organisational transition. These inclusion criteria were met by 7,428 general practices (92.8% of original sample) with 854,206 survey respondents (94.6% of original sample).

I used multilevel linear regression to estimate associations between the patient experience measures and participation in the Extended Hours Access Scheme. Models adjusted for the 12 patient and practice characteristics given above, which were considered as potential confounders. These models also included a random intercept specified at the general practice level to account for the clustering of respondents within practices. I report standard errors made robust to possible heteroskedasticity.

In addition to estimating the overall association between scheme participation and patient experience, I also tested whether the association varied by respondents' abilities to take time

^g There was no evidence of multicollinearity problems from including Index of Multiple Deprivation measures at both the respondent and practice levels.

off work to see a GP and by region of England. Separate models added interaction terms between scheme participation and one of these moderating variables to examine this. Policy rhetoric on extended opening hours often focuses on benefits to working people in particular and plans for national implementation (*sections 1.1 and 1.2*).

The estimation procedure for the regression models excluded respondents who had missing data for one or more of the included variables. Across the three outcome measures, this excluded between 12% (overall experience) and 15% (experience of making an appointment) of respondents and 0.4% of practices. Complete case analysis is unlikely to bias associations between scheme participation and patient experience, as argued in *section 3.2.4*.

4.2 RESULTS

Table 4.1 describes the characteristics of the 903,357 respondents to the GP Patient Survey 2013-14. The first results column reports the overall number and column percentages of respondents in each category of each patient characteristic. For example, 18.7% of weighted respondents could not take time off work to see a GP, whereas 38.4% could take such time off, and 42.9% were not in paid work. The second and third results columns present these statistics by whether the respondent's registered practice participated in the Extended Hours Access Scheme or not. Most of the included general practices did participate (73.9%; 5,492/7,428). Respondents were similar between scheme participation groups.

Table 4.1 Characteristics of Respondents to the GP Patient Survey 2013-14, by Participation in the Extended Hours Access Scheme. Figures are Number (Unweighted; Weighted Percentages) of Respondents.

Characteristic	Overall (n=903,357)	In scheme (n=633,164*)	Not in scheme (n=221,042*)
Age (years):			
18 to 24	34,815 (3.9; 9.7)	23,645 (3.8; 9.4)	8,393 (3.9; 9.5)
25 to 34	80,767 (9.1; 17.1)	54,597 (8.8; 16.9)	19,091 (8.8; 16.5)
35 to 44	111,298 (12.5; 17.3)	76,497 (12.3; 17.2)	27,036 (12.4; 17.5)
45 to 54	153,641 (17.3; 18.6)	107,323 (17.2; 18.7)	38,014 (17.5; 18.9)
55 to 64	177,966 (20.0; 14.8)	125,843 (20.2; 15.0)	43,684 (20.1; 14.9)
65 to 74	183,908 (20.7; 12.3)	130,941 (21.0; 12.5)	45,307 (20.8; 12.4)
75 to 84	111,332 (12.5; 7.3)	79,246 (12.7; 7.5)	27,368 (12.6; 7.3)
85 or over	35,492 (4.0; 2.9)	25,287 (4.1; 3.0)	8,694 (4.0; 2.9)
Total	889,219	623,379	217,587
Gender:			
Male	385,485 (43.3; 49.0)	269,842 (43.3; 49.0)	94,307 (43.3; 49.0)
Female	503,834 (56.7; 51.0)	353,627 (56.7; 51.0)	123,275 (56.7; 51.0)
Total	889,319	623,469	217,582
Ethnicity:			
White	777,904 (87.8; 87.1)	548,164 (88.3; 87.8)	192,408 (88.7; 87.6)
Mixed	6,729 (0.8; 1.0)	4,492 (0.7; 0.9)	1,631 (0.8; 1.0)
Asian	51,629 (5.8; 6.3)	35,929 (5.8; 6.1)	11,236 (5.2; 5.9)
Black	23,581 (2.7; 2.6)	15,246 (2.5; 2.4)	5,303 (2.5; 2.5)
Other	26,215 (3.0; 3.1)	17,323 (2.8; 2.9)	6,265 (2.9; 3.0)
Total	886,058	621,154	216,843
Deprivation fifth: [†]			
1 (most deprived)	186,046 (20.6; 20.6)	123,151 (19.5; 19.8)	43,912 (19.9; 19.7)
2	179,379 (19.9; 20.0)	127,955 (20.2; 20.5)	39,606 (17.9; 17.9)
3	185,234 (20.5; 20.0)	133,545 (21.1; 20.5)	43,869 (19.9; 19.0)
4	181,712 (20.1; 19.7)	130,436 (20.6; 20.1)	45,041 (20.4; 19.7)
5 (least deprived)	170,498 (18.9; 19.8)	117,818 (18.6; 19.1)	48,392 (21.9; 23.7)
Total	902,869	632,905	220,820
Can take time off work to see GP:			
Not working [‡]	460,614 (54.0; 42.9)	323,953 (54.2; 42.9)	112,226 (53.8; 42.4)
Yes	269,493 (31.6; 38.4)	188,354 (31.5; 38.3)	67,086 (32.1; 39.1)
No	122,589 (14.4; 18.7)	85,597 (14.3; 18.8)	29,475 (14.1; 18.5)
Total	852,696	597,904	208,787
Confident in managing health:			
Very	365,679 (42.1; 42.8)	257,346 (42.3; 43.1)	88,939 (41.8; 42.2)
Fairly	436,179 (50.2; 49.7)	305,644 (50.2; 49.5)	107,696 (50.6; 50.3)
Not very	54,953 (6.3; 6.2)	37,729 (6.2; 6.0)	13,260 (6.2; 6.2)
Not at all	11,818 (1.4; 1.3)	8,151 (1.3; 1.3)	2,836 (1.3; 1.3)
Total	868,629	608,870	212,731

Part of this table has been published in *BMJ Quality & Safety*.¹⁴⁰

GP: general practitioner

903,357 survey respondents from 8,005 general practices; data presented where available for each variable.

Weighted percentages account for survey design and non-response.

*Numbers and totals include only the respondents whose general practices were included in the analysis.

†Fifths of the national Index of Multiple Deprivation rank for lower layer super output areas of residence.

‡Full-time education, unemployed, sick or disabled, retired, looking after home, other.

Table 4.2 describes respondent satisfaction with opening hours, experience of making an appointment, and overall experience. Most respondents gave positive responses to the relevant questions. For example, 79.9% of weighted respondents were either very (37.2%) or fairly (42.7%) satisfied with the opening hours of their general practices.

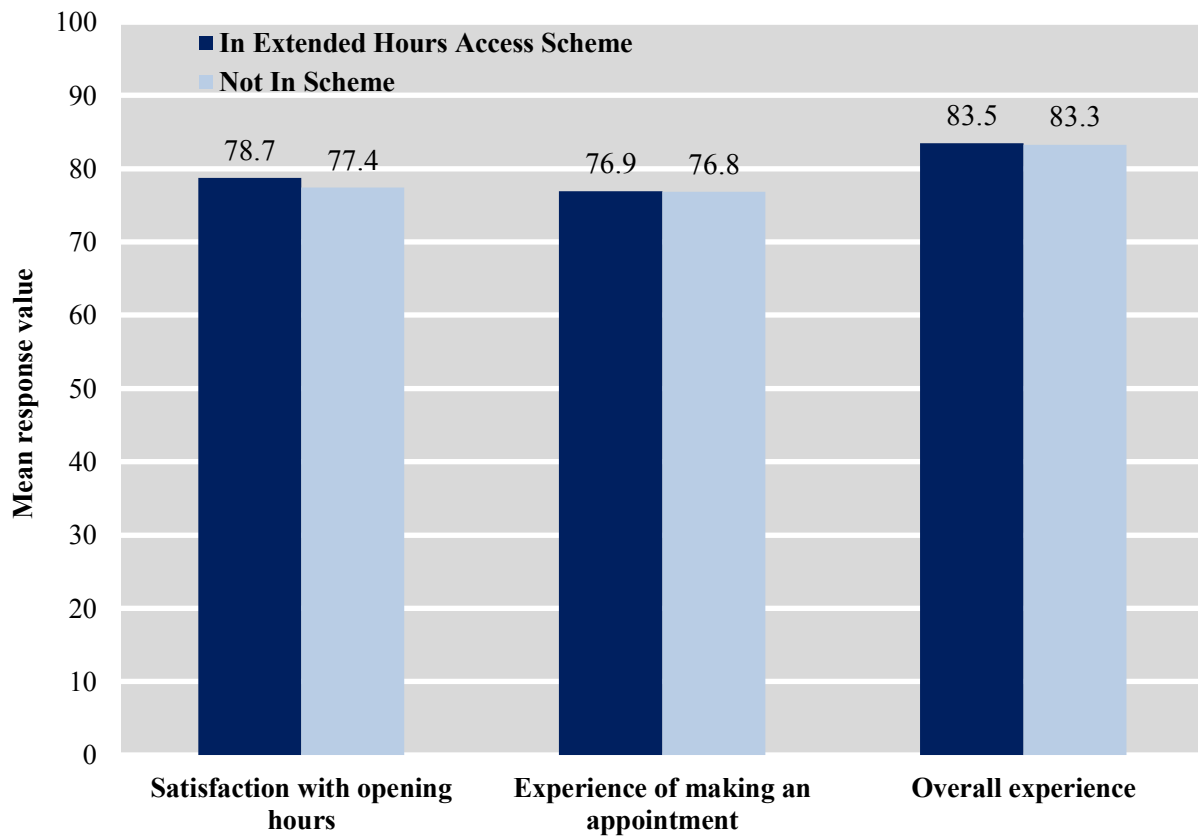
Table 4.2 Satisfaction with Opening Hours, Experience of Making an Appointment, and Overall Experience in the GP Patient Survey 2013-14

Question	Number (unweighted; weighted percentages) of respondents
How satisfied are you with the hours that your GP surgery is open?*	
Very satisfied	358,987 (41.8; 37.2)
Fairly satisfied	352,262 (41.1; 42.7)
Neither satisfied nor dissatisfied	77,306 (9.0; 10.2)
Fairly dissatisfied	48,015 (5.6; 6.8)
Very dissatisfied	21,305 (2.5; 3.1)
Total	857,875
Overall, how would you describe your experience of making an appointment?	
Very good	346,279 (40.3; 33.8)
Fairly good	334,833 (39.0; 40.9)
Neither good nor poor	99,458 (11.6; 13.9)
Fairly poor	50,875 (5.9; 7.4)
Very poor	26,881 (3.1; 4.1)
Total	858,326
Overall, how would you describe your experience of your GP surgery?	
Very good	437,868 (49.6; 43.1)
Fairly good	342,015 (38.7; 42.6)
Neither good nor poor	69,618 (7.9; 9.5)
Fairly poor	25,043 (2.8; 3.6)
Very poor	8,146 (0.9; 1.2)
Total	882,690

A version of this table has been published in *BMJ Quality & Safety*.¹⁴⁰

GP: general practitioner. 903,357 survey respondents from 8005 general practices; data presented where available for each variable. Weighted percentages account for survey design and non-response. *Responses of "I'm not sure when my GP surgery is open" were excluded (n=25,271).

Figure 4.1 compares mean values of the patient experience measures between scheme participation groups; the unadjusted mean differences were small. For example, the mean satisfaction with opening hours for respondents whose practices participated in the Extended Hours Access Scheme was 1.3 points greater than in non-participating practices.

Figure 4.1 Mean Satisfaction with Opening Hours, Experience of Making an Appointment, and Overall Experience, by Scheme Participation

A version of this figure has been published in *BMJ Quality & Safety*.¹⁴⁰

Table 4.3 indicates that the measured characteristics of included general practices were relatively similar between participation groups. The greatest standardised bias was 23.3% for the percentage of practices located in the East Midlands. Most measures varied modestly between participation groups, however, as for the patient characteristics (table 4.1). These findings suggest that the adjusted mean differences in patient experience by scheme participation should not differ greatly from the unadjusted results.

Table 4.3 Characteristics of Practices Included in the Analysis, by Participation in the Extended Hours Access Scheme. Figures are Means for Continuous Variables and Percentages for Categorical Variables.

	Overall (n=7,428)	In Scheme (n=5,492)	Not in Scheme (n=1,936)	Standard. bias (%)
Registered population size	7216.8	7418.9	6643.3	18.3
Number of GP FTEs per 10,000 patients	6.3	6.3	6.3	1.6
National Index of Multiple Deprivation rank	4119.2	4084.2	4218.6	-5.8
Quality and Outcomes Framework achievement	75.5	75.7	75.0	13.0
Urban location (vs. rural)	83.8	84.9	80.6	11.3

Region of England:				
East Midlands	7.9	6.1	12.9	-23.3
East of England	9.8	10.2	8.6	5.3
London	16.8	17.8	14.0	10.4
North East	5.0	5.9	2.4	17.6
North West	15.3	14.3	18.1	-10.2
South Central	6.4	6.4	6.3	0.8
South East Coast	7.9	6.8	10.8	-14.1
South West	9.2	10.4	6.0	15.8
West Midlands	11.9	11.9	11.7	0.8
Yorkshire and the Humber	9.9	10.2	9.3	3.1

FTE: full-time equivalent; GP: general practitioner

The standardised percentage bias is the difference of the means in the participant and non-participant groups as a percentage of the square root of the average of the variances in both groups.

Table 4.4 presents associations estimated in the multilevel linear regression models. Patient experience, across all three measures, was slightly greater on average in practices that participated in the Extended Hours Access Scheme. The differences were small, however, with the greatest being 1.25 (95% confidence interval [CI]: 0.96 to 1.55) for satisfaction with opening hours. This corresponds to 0.28 standard deviations in this outcome measure at the practice level once adjusted for patient characteristics, indicating a modest association. The mean differences of 0.48 (95% CI: 0.07 to 0.90) for experience of making an appointment and 0.32 (95% CI: 0.04 to 0.60) for overall experience represent negligible associations (equivalent to a 0.07 standardised mean difference).^h

Greater differences in patient experience existed between categories of patient characteristics. For example, respondents aged 85 years or more had an adjusted mean value of satisfaction with opening hours that was 10.1 (95% CI: 9.7 to 10.5) greater than that for respondents aged 18 to 24 years old (*table 4.4*). Similar mean differences existed between respondents who were not very or not at all confident in managing their own health and respondents who were very confident. Respondents who could not take time off work to see a GP were much less satisfied with opening hours than those not working (mean difference: -14.6; 95% CI: -14.8 to -14.4) and reported worse experiences for the other two measures also. Patients who could take such time off work gave more comparable responses to, but still more negative than, those not working.

^h Between-practice standard deviations of measures after adjustment for respondent characteristics were 4.5 for satisfaction with opening hours, 7.0 for experience of making an appointment, and 4.3 for overall experience.

Table 4.4 Associations of Patient Experience with Characteristics of Patients and General Practices, Estimated Using Multilevel Linear Random-effects Regression. Figures Are Adjusted Mean Differences (95% Confidence Intervals).

	Satisfaction with opening hours	Experience of making an appointment	Overall experience
In Extended Hours Access Scheme	1.25 (0.96 to 1.55)	0.48 (0.07 to 0.90)	0.32 (0.04 to 0.60)
Age (years; vs. 18 to 24):			
25 to 34	2.65 (2.29 to 3.02)	2.87 (2.52 to 3.23)	2.12 (1.81 to 2.42)
35 to 44	4.28 (3.94 to 4.63)	4.81 (4.46 to 5.15)	5.16 (4.87 to 5.44)
45 to 54	4.86 (4.52 to 5.20)	5.36 (5.03 to 5.69)	7.11 (6.83 to 7.38)
55 to 64	6.18 (5.85 to 6.52)	6.87 (6.55 to 7.20)	8.45 (8.18 to 8.72)
65 to 74	8.46 (8.13 to 8.80)	9.57 (9.24 to 9.90)	10.66 (10.39 to 10.94)
75 to 84	10.30 (9.95 to 10.64)	12.51 (12.17 to 12.85)	13.32 (13.03 to 13.60)
85 or over	10.12 (9.72 to 10.52)	14.04 (13.64 to 14.45)	14.14 (13.81 to 14.47)
Female (vs. male)	1.15 (1.05 to 1.26)	-0.61 (-0.72 to -0.50)	-0.15 (-0.24 to -0.07)
Ethnicity (vs. white):			
Mixed	0.20 (-0.47 to 0.87)	0.06 (-0.63 to 0.75)	0.19 (-0.37 to 0.75)
Asian	-1.59 (-1.89 to -1.29)	-3.69 (-4.01 to -3.36)	-2.31 (-2.56 to -2.05)
Black	3.02 (2.64 to 3.41)	2.51 (2.11 to 2.91)	2.65 (2.32 to 2.98)
Other	3.14 (2.77 to 3.50)	1.25 (0.86 to 1.65)	1.34 (1.03 to 1.66)
Deprivation fifth:*			
1 (most deprived)	(ref.)	(ref.)	(ref.)
2	-1.32 (-1.51 to -1.13)	-0.55 (-0.75 to -0.35)	-0.58 (-0.74 to -0.42)
3	-2.27 (-2.47 to -2.07)	-0.81 (-1.02 to -0.59)	-1.05 (-1.22 to -0.88)
4	-2.93 (-3.14 to -2.71)	-0.94 (-1.17 to -0.72)	-1.36 (-1.54 to -1.19)
5 (least deprived)	-3.65 (-3.89 to -3.42)	-1.26 (-1.50 to -1.02)	-1.70 (-1.89 to -1.51)
Can take time off work to see GP (vs. not working):			
Yes	-3.68 (-3.82 to -3.53)	-1.89 (-2.04 to -1.74)	-1.56 (-1.68 to -1.44)
No	-14.62 (-14.83 to -14.40)	-11.04 (-11.25 to -10.83)	-7.96 (-8.13 to -7.80)
Confident in managing health (vs. very):			
Fairly	-7.26 (-7.37 to -7.15)	-7.58 (-7.70 to -7.47)	-7.23 (-7.32 to -7.14)
Not very	-11.55 (-11.81 to -11.29)	-13.84 (-14.11 to -13.56)	-13.18 (-13.41 to -12.94)
Not at all	-10.14 (-10.73 to -9.55)	-12.25 (-12.86 to -11.63)	-12.64 (-13.19 to -12.09)
Registered population size†	-0.79 (-0.93 to -0.66)	-3.31 (-3.55 to -3.07)	-1.12 (-1.26 to -0.99)
Number of GP FTEs per 10,000 patients†	0.61 (0.45 to 0.77)	0.90 (0.70 to 1.09)	0.81 (0.66 to 0.95)
National Index of Multiple Deprivation rank of practice†	0.02 (-0.14 to 0.17)	1.29 (1.07 to 1.52)	1.27 (1.12 to 1.42)
Quality and Outcomes Framework achievement†	0.49 (0.36 to 0.63)	0.97 (0.77 to 1.16)	0.65 (0.52 to 0.78)
Rural (vs. urban) location	-0.50 (-0.87 to -0.14)	1.85 (1.35 to 2.35)	0.73 (0.38 to 1.07)
Region of England:			
East Midlands	(ref.)	(ref.)	(ref.)
East of England	-0.95 (-1.52 to -0.38)	1.29 (0.44 to 2.14)	0.06 (-0.51 to 0.63)
London	-3.12 (-3.65 to -2.58)	-1.32 (-2.11 to -0.54)	-1.82 (-2.36 to -1.29)
North East	1.37 (0.73 to 2.02)	2.43 (1.45 to 3.42)	2.08 (1.44 to 2.72)
North West	0.30 (-0.21 to 0.82)	0.94 (0.15 to 1.73)	1.55 (1.04 to 2.06)
South Central	-0.91 (-1.51 to -0.30)	1.16 (0.20 to 2.11)	0.18 (-0.44 to 0.80)
South East Coast	-2.68 (-3.29 to -2.07)	0.10 (-0.80 to 1.00)	-0.41 (-1.03 to 0.21)
South West	0.36 (-0.18 to 0.90)	3.37 (2.56 to 4.18)	2.06 (1.52 to 2.59)
West Midlands	-1.50 (-2.06 to -0.93)	0.36 (-0.45 to 1.17)	0.17 (-0.38 to 0.71)
Yorkshire and the Humber	-0.39 (-0.95 to 0.17)	0.76 (-0.09 to 1.61)	1.09 (0.55 to 1.63)

A version of this table has been published in *BMJ Quality & Safety*.¹⁴⁰ FTE: full time equivalent; GP: general practitioner; ref.: reference. *Fifths of the national Index of Multiple Deprivation rank for lower layer super output areas of residence. †Estimates are for a standard deviation increase at the practice level.

Table 4.5 reports associations between scheme participation and the patient experience measures by ability to take time off work to see a GP. This association did not vary by employment category for experience of making an appointment and overall experience (joint tests of interaction terms equal to zero: $P=0.315$ and $P=0.788$, respectively). It did vary for satisfaction with opening hours, however ($P<0.001$); the greatest mean difference was observed for respondents who could not take time off work to see a GP (2.08; 95% CI: 1.53 to 2.63). This mean difference was equal to 0.47 standard deviations in satisfaction with opening hours at the practice level once adjusted for patient characteristics, indicating a moderate association.

Table 4.5 Associations of the Extended Hours Access Scheme with Patient Experience by Ability to Take Time Off Work to See a GP, Estimated Using Multilevel Linear Random-effects Regression

	Satisfaction with opening hours	Experience of making an appointment	Overall experience
Cannot take time off:			
Mean difference (95% CI)	2.08 (1.53 to 2.63)	0.65 (0.04 to 1.26)	0.27 (-0.18 to 0.71)
<i>P</i> value	<0.001	0.035	0.237
Standardised mean difference	0.47	0.09	0.06
Can take time off:			
Mean difference (95% CI)	1.52 (1.16 to 1.89)	0.57 (0.10 to 1.03)	0.37 (0.04 to 0.69)
<i>P</i> value	<0.001	0.017	0.028
Standardised mean difference	0.34	0.08	0.09
Not working:*			
Mean difference (95% CI)	0.87 (0.60 to 1.15)	0.39 (-0.01 to 0.79)	0.30 (0.03 to 0.57)
<i>P</i> value	<0.001	0.057	0.028
Standardised mean difference	0.20	0.06	0.07

A version of this table has been published in *BMJ Quality & Safety*.¹⁴⁰

CI: confidence interval. Categories based on responses to 'If you need to see a GP at your GP surgery during your typical working hours, can you take time away from your work to do this?' which is only asked of respondents in full-time or part-time work. Model specification is the same as for random-effects regression model in table 4.4 with interaction terms added between participation in the Extended Hours Access Scheme and ability to take time off work to see a GP. *P* values for joint tests of interaction terms were <0.001 (opening hours), 0.315 (appointment), and 0.788 (overall).

*Full-time education, unemployed, sick or disabled, retired, looking after home, other.

Table 4.6 reports associations between scheme participation and the patient experience measures by region of England. Mean differences across all experience measures were generally small in each region; the largest was 3.58 (95% CI: 2.66 to 4.49) for satisfaction with opening hours in East of England. There was no evidence that the association with overall experience varied by region (joint test of interaction terms equal to zero: $P=0.139$).

Table 4.6 Associations of the Extended Hours Access Scheme with Patient Experience by Region of England, Estimated Using Multilevel Linear Random-effects Regression. Figures Are Adjusted Mean Differences (95% Confidence Intervals).

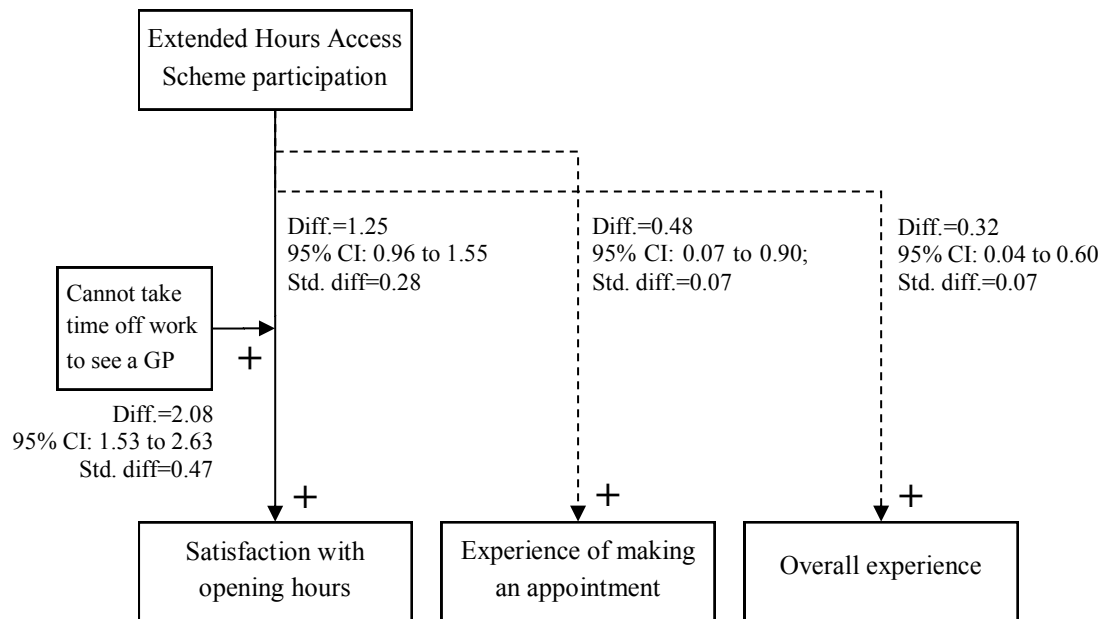
Region	Satisfaction with opening hours	Experience of making an appointment	Overall experience
East Midlands	1.10 (0.26 to 1.95)	-0.29 (-1.58 to 1.00)	0.16 (-0.68 to 1.01)
East of England	3.58 (2.66 to 4.49)	1.97 (0.64 to 3.30)	1.27 (0.37 to 2.16)
London	-0.27 (-1.12 to 0.58)	-0.59 (-1.65 to 0.47)	-0.49 (-1.25 to 0.28)
North East	1.92 (0.13 to 3.71)	1.34 (-0.98 to 3.65)	1.11 (-0.47 to 2.68)
North West	1.90 (1.25 to 2.55)	0.87 (-0.15 to 1.88)	0.33 (-0.32 to 0.97)
South Central	1.08 (0.04 to 2.13)	2.21 (0.46 to 3.96)	1.31 (0.22 to 2.41)
South East Coast	1.57 (0.61 to 2.53)	0.87 (-0.49 to 2.23)	0.42 (-0.55 to 1.40)
South West	0.67 (-0.17 to 1.51)	0.21 (-1.03 to 1.46)	0.31 (-0.57 to 1.20)
West Midlands	1.23 (0.31 to 2.15)	0.07 (-1.06 to 1.20)	0.13 (-0.67 to 0.93)
Yorkshire and the Humber	0.43 (-0.52 to 1.37)	-0.20 (-1.57 to 1.16)	0.02 (-0.82 to 0.86)

Model specification is the same as in *table 4.4* with interaction terms added between participation in the Extended Hours Access Scheme and region of England. *P* values for joint tests of interaction terms were <0.001 (opening hours), 0.049 (appointment), and 0.139 (overall).

4.3 DISCUSSION

Most respondents to the GP Patient Survey 2013-14 were satisfied with their general practices' opening hours, had good experiences of making appointments, and had good experiences of their practices overall. Most general practices participated in the Extended Hours Access Scheme. The characteristics of respondents and practices were generally similar between scheme participation groups. Mean values of the patient experience measures were greater in the participating group than for non-participants, in both unadjusted and adjusted analyses, but the magnitudes of the differences were small. Limited associations generally existed in each region of England. The association between scheme participation and satisfaction with opening hours varied by patient ability to take time off work to see a GP; the greatest mean difference was for those unable to take time off, but this association remained moderate. Several respondent characteristics, such as a younger age, having low confidence in managing health, and being unable to take time off work to see a GP, were associated with substantially more negative responses across patient experience measures. *Figure 4.2* summarises the adjusted associations between scheme participation and the patient experience measures.

Figure 4.2 Summary Diagram of Adjusted Associations between Scheme Participation and Satisfaction with Opening Hours, Experience of Making an Appointment, and Overall Experience



The '+' symbol indicates a positive association (or positive interaction) between two variables. The box at the arrowhead is the outcome variable. The box at the foot of the arrow is the explanatory variable. A dashed arrow indicates a negligible (but statistically significant) association with no interaction by ability to take time off work to see a GP. CI: confidence interval; Diff.: mean difference; Std. diff.: standardised mean difference.

Limitations

I was unable to examine the times of the week practices were offering additional appointments under the Extended Hours Access Scheme. This was because scheme payments are calculated from numbers of registered patients, not from appointment details. There are no other national datasets that accurately record the opening times of practices.¹⁰⁷ Other appointment characteristics, such as the type of consultation and health professional consulted, could also not be examined due to data availability. Patient experience may be affected by several of these characteristics which could moderate the effects of scheme participation. The analysis was limited to estimating the overall association between scheme participation and patient experience, without examining practice characteristics that could be moderating variables.

Cross-sectional studies are, in general, particularly susceptible to residual confounding. I attempted to reduce confounding bias by controlling for 12 characteristics of patients and

practices. There may be other characteristics associated with both scheme participation and patient experience that were not accounted for and therefore biased the associations estimated. The 12 measured characteristics were generally similar between participation groups, however, such that the adjusted results were comparable to the unadjusted results. If this pattern is typical of important determinants of patient experience, the potential for residual confounding to bias the results is limited. The relatively low response rate of the GP Patient Survey, and the non-response bias that could result, is unlikely to affect the estimated associations for scheme participation, as the response rates were similar between participation groups (36.9% and 37.2%).

A repeated cross-sectional analysis over several years was not possible because the general practice payment data were only available for 2013-14 at the time of the study. Adequate data, on both scheme participation and patient experience, were also unavailable to examine the introduction of the Extended Hours Access Scheme in 2008.ⁱ The analysis therefore relied on one data year to estimate the ‘effect’ of scheme participation. Specifically, it used patient experience in the non-participant group as the counterfactual of patient experience in practices that did participate had they not participated. If this counterfactual is inaccurate, the estimated associations between scheme participation and patient experience will not reflect the causal effect of participation among participating practices. This could be the case if, for example, non-participating practices tended to implement other interventions that improved patient experience more than participating practices. This specific example would result in underestimates of the effects of scheme participation. Using only one data year, the analysis was unable to examine the temporal dynamics of the scheme’s effects. For example, participation may have greater short-term effects on patient experience, but weaker long-term effects as extended opening hours become normalised in patients’ expectations.

It might be suggested that patient ability to take time off work to see a GP lies on the causal path from scheme participation to patient experience. For example, someone working shifts may find it easier to take time off in the evening and see a GP in a participating practice then, which could improve their experience. In this case, it could be unsuitable to adjust for patient ability to take time off work to see a GP because some of the ‘effect’ of scheme participation acts through this variable. However, whatever the true dynamics between scheme

ⁱ Participation in the Extended Hours Access Scheme was recorded monthly, at an area level, until 2009. The corresponding data releases then stopped and have not resumed.

participation and ability to take time off work, *table 4.1* showed that the distribution of the latter variable was very similar between participation groups. Consequently, whether you adjust for patient ability to take time off work to see a GP or not, the results are largely unchanged as shown by the similarity of the unadjusted and adjusted results. Moreover, it was necessary to include this variable in the regression equation to examine how it moderated associations between scheme participation and patient experience.

Possible Explanations

If the limited associations observed do reflect the causal effect of scheme participation, several factors could contribute to the explanation. An increase in the mean value of patient experience measures depends on a more positive response being selected in the GP Patient Survey; for example, ‘very satisfied’ could be selected instead of ‘fairly satisfied’ regarding satisfaction with opening hours. ‘Very satisfied’ is the most positive response and respondents who would have selected it regardless of scheme participation cannot reflect any improvements in patient experience in their answers. It could be that these respondents, possibly more elderly patients not in work, are also the greatest users of the additional appointments offered. Other respondents, who could have reported improved experiences in the GP Patient Survey, may not have used the additional appointments. This might include younger respondents who cannot take time off work to see a GP, a group that may generally have a low need for healthcare.

Alternatively, the respondents with potential to report improved experiences may have used the additional appointments greatly but did not reflect this in survey responses. Responses for satisfaction with opening hours may partly depend on respondents being able to recall their practices’ opening times. If they are often unable to do this, this may inhibit extended opening hours from translating into improved satisfaction with opening hours in the GP Patient Survey. However, the association between scheme participation and patient experience varied by employment category, with respondents unable to take time off work to see a GP having the greatest mean difference. The mechanism presumed by policy that would account for this association is that these respondents do use the additional appointments provided outside working hours, this does improve their satisfaction with opening hours, and they do then reflect this in the GP Patient Survey.

The association between scheme participation and patient experience is still relatively modest for respondents unable to take time off work to see a GP. The small size of associations could be partly explained by the limited size of the intervention. The minimum requirement of the Extended Hours Access Scheme to provide at least 30 minutes of additional appointments per 1,000 registered patients each week does not represent a large change to opening hours. For the average practice, it equates to an extra 3 hours and 45 minutes of appointments per week. A practice may structure these appointments to extend opening hours by 3 hours and 45 minutes; if previously open from 8 a.m. to 6.30 p.m., Monday to Friday, this would extend the practice's opening hours by 7% (56 hours and 15 minutes versus 52 hours and 15 minutes). The relative change in the number of consultations is likely to be less than this, however, because several consultations are typically provided at the same time during core hours. Moreover, opening hours may not be extended by 3 hours and 45 minutes as scheme requirements allow additional appointments to be provided concurrently (with minimum session lengths of 30 minutes).

The scheme also allows practices to meet the appointment requirement through any type of consultation and health professional. Patients are not necessarily more likely to be able to see their preferred GP in a face-to-face consultation, which may limit the effects of scheme participation on patient experience. Some participating practices may violate scheme guidelines by redistributing appointments from within core hours to other times, such that the overall number of appointments does not change but income is received via the Extended Hours Access Scheme. Practices' decisions about how to meet scheme requirements could therefore also limit the effect size.

Relation to Existing Literature

I have previously reported that propensity score matching and instrumental variable analysis produce similar results to the regression analysis presented above.¹⁴⁰ A previous analysis aimed to determine the effect of the Extended Hours Access Scheme's introduction in 2008 for 639 general practices.¹⁵³ However, the validity of this analysis is compromised by the methods used to identify scheme participants; it used an internet search engine to find regions distributing a leaflet related to the scheme and an unreliable online data source¹⁰⁷ to determine when participating practices were extending their opening hours.¹⁵³

A telephone survey of a nationally representative sample of 320 general practices in England suggests that 62% of practices provided face-to-face appointments with a GP outside of core times in 2013-14.¹⁰⁷ This is less than the 74% of practices that received Extended Hours Access Scheme payments in the same period. The difference could be explained by practices using other appointment types to meet scheme requirements. It may be that some practices do not provide information about extended opening hours on the telephone or did not participate in the scheme for the whole financial year. Of the practices that did report providing face-to-face GP appointments outside core hours in the telephone survey, the mean number of extended opening hours was 2.6 hours (1.4 hours of which were provided in the evenings and 0.9 hours at weekends).¹⁰⁷ This suggests that practices do typically provide some additional appointments concurrently when participating in the Extended Hours Access Scheme.

Chapter 2 highlighted a cross-sectional analysis⁹⁶ of the GP Patient Survey 2009-10 that examined variation in overall satisfaction; *table 2.3* showed that GP interpersonal quality of care was the measure most strongly associated with satisfaction, of six measures studied.⁹⁶ Measures related to access were also positively associated with satisfaction, but the associations had smaller magnitudes.⁹⁶ If the main determinants of overall experience do relate to GPs' interpersonal skills, this might help to explain the lack of an association between participation in the Extended Hours Access Scheme and overall experience. Several discrete choice experiments that asked participants to choose between consultation scenarios suggest that patients are willing to trade between appointment characteristics, such as waiting a few extra days to see a preferred GP.^{97 98 154 155} Some patients may be willing to trade the timing of an appointment in the evening or at a weekend for another characteristic without an effect on patient experience. This could also help to explain the limited associations between participation in the Extended Hours Access Scheme and patient experience.

Patients who cannot take time off work to see a GP have long reported worse experiences in the GP Patient Survey, in line with the results of this chapter. In 2007-08, this group reported finding it more difficult to get an appointment for the desired time frame (within or more than two weekdays ahead) and with a particular GP and they were less satisfied with their ability to get through on the telephone and with opening hours.⁸⁷ In the 2013-14 GP Patient Survey, 55.8% of respondents who could not take time off work to see a GP felt that current opening times were convenient; this was in contrast to 77.7% of respondents who could take time off work to see a GP and 91.4% of those who were not working (*table 2.2*).⁸⁸ The Extended

Hours Access Scheme may reduce these inequalities, but large differences remain. The chapter's results are also consistent with other analyses of the GP Patient Survey that examined associations between patient characteristics and experience. For example, associations of younger age groups with worse experiences are well known.^{87 90}

Relation to GP Access Fund

The evaluation of the first wave of the GP Access Fund reported that medium-sized pilot schemes provided 41 minutes of extended opening hours per 1,000 registered patients each week.⁹ It states that the analysis represents the 'totality of extended hours provision and not simply the additional capacity being provided'.⁹ Therefore, some of these extended opening hours are likely supported by the Extended Hours Access Scheme; the difference between the minimum requirement of this scheme and the extension of opening hours in the GP Access Fund is 11 minutes per 1,000 registered patients each week (a 37% relative difference). This may not be a sufficiently large increase in hours to improve patient experience much more than was estimated for the Extended Hours Access Scheme alone in the current chapter. Other interventions, some of which may improve patient experience, are being trialled alongside extended opening hours under the GP Access Fund, however.

Table 1.3 described some differences between the GP Access Fund and the 2013-14 Extended Hours Access Scheme. In this version of the scheme, participating practices had to meet the minimum requirement individually. In the GP Access Fund, practices have worked in groups to provide extended opening hours, sometimes with a dedicated centre that opens for longer than typical practices. Under these arrangements, a patient within a pilot scheme area may be offered an appointment at a service other than their registered practice. If this appointment is not wanted by the patient or it is seen to be inferior to an appointment at their own practice, the effects on patient experience may be limited. Revisions to the Extended Hours Access Scheme in 2014 allow participating practices to now work in groups, as in the GP Access Fund, to meet the minimum requirement. It is unknown what effect this has had on the provision of appointments outside core opening times.

The GP Access Fund evaluation⁹ also estimated the utilisation of appointments outside core times. It reported that 75% of such appointments were used as of May 2015, when all wave

one pilot schemes were operational.⁹ It therefore cautiously suggested that around 30 minutes of extended opening hours per 1,000 registered patients per week could maximise utilisation in medium-sized pilot schemes. This is the minimum requirement of the Extended Hours Access Scheme. This scheme alone may suffice as an intervention to extend opening hours. Several of the wave one pilot schemes experienced low demand for appointments at the weekend, particularly on Sundays.⁹ Demand for appointments outside core times may increase in time, however, perhaps as patient awareness of additional appointments improves or behaviour adapts. The evaluation of the second wave of pilot schemes, which may have had different experiences, has not yet been published. The average extension of opening hours per patient may have been greater in the second wave than the first, because of the second wave's minimum requirement that patients could access services at weekends and from 8 a.m. to 8 p.m. on weekdays.

Future Research

Improving patient experience is just one of several rationales that the Government has used to explain policy to extend opening hours. Other rationales, related to reducing use of A&E departments or reducing NHS spending, could be examined. It is feasible to estimate the association between participation in the Extended Hours Access Scheme and practice-level rates of visits to A&E departments, for example. Rates of emergency admissions to hospital and the associated costs are other possible outcome measures. I will examine associations between patient experience and use of emergency hospital services in *chapter 6*. The Royal College of General Practitioners expects that extending opening hours may reduce relational continuity of care (*table 1.2*), which could also be examined in future research.

With data on scheme participation for several years, it may be possible to examine how changes in participation status affect changes in outcome measures between years. Any changes in scheme requirements, such as in 2014, would need to be accounted for. An alternative dataset for examining extended opening hours could soon be available. The 2016-17 General Medical Services contract includes a requirement for practices to record data every six months on appointments provided in the evenings and at weekends until 2020-21.¹⁵⁶

Time-series analysis has the relative advantage over cross-sectional analysis that time-invariant characteristics of practices associated with both scheme participation and the outcome measures can be accounted for, thereby reducing confounding. However, there are some methodological difficulties with time-series analysis in the current policy context. For example, practices extending their opening hours in the coming years may simultaneously introduce other interventions. Without data on what these interventions are and when they are introduced for each practice, it would be difficult to estimate the independent effects of extending opening hours. Moreover, practice-level changes in patient experience measures derived from the GP Patient Survey typically have much sampling variation; analysis of these changes as outcomes would likely need to utilise both between-practice and within-practice variation when estimating associations with scheme participation. The disadvantage of this is that practice-level time-invariant confounding factors could not be fully accounted for.

The discussion earlier referred to uncertainty regarding how important opening hours and the conditions under which care is accessed are to patients' overall experiences of their practices. This is the focus of the next chapter.

SUMMARY

The Extended Hours Access Scheme and the GP Access Fund are the two main national policies intended to extend general practice opening hours in England. Most practices participate in the Extended Hours Access Scheme. Patient satisfaction with opening hours is slightly greater in participating practices than non-participating practices; this difference increases modestly when comparing patients who cannot take time off work to see a GP only. Patient experience of making appointments and of practices overall are similar between participating and non-participating practices; the corresponding differences do not vary by patients' abilities to take time off work to see a GP. In summary, the results suggest a limited association between participation in the Extended Hours Access Scheme and patient experience. Since the actual extension of opening hours under this scheme and the GP Access Fund have some similarities, the findings question whether extended opening hours under the GP Access Fund will have a large impact on patient experience.

5

Determinants of Experiences

Abstract

Background: Previous research suggests that patients' overall satisfaction with general practice is most strongly associated with the interpersonal quality of care provided by GPs. This work did not examine policy-relevant measures such as satisfaction with opening hours and experience of making appointments. The current chapter examines associations between these and other patient experience measures from the GP Patient Survey.

Methods: Cross-sectional analysis of the GP Patient Survey 2011-12, 2012-13, and 2013-14; 2,912,535 survey respondents registered with 8,289 practices formed the eligible study population. Outcome measures related to satisfaction with opening hours, experience of making an appointment, and overall experience (measured on five-level interval scales). Nine other experience measures, including interpersonal quality of care and appointment convenience, were explanatory variables. Associations were estimated as standardised coefficients from multilevel fixed-effects linear regression models, adjusting for several patient characteristics and year.

Results: Most responses for each outcome measure were positive; for example, 76.9% of patients had a very good (35.7%) or fairly good (41.2%) experience of making an appointment. The models explained almost all variation in experience of making an appointment and overall experience between practices ($R^2=0.93$ and $R^2=0.91$, respectively). Experience of making an appointment was most strongly associated with appointment convenience ($\beta=0.29$). Overall experience was most strongly associated with GP interpersonal quality of care ($\beta=0.38$). The models explained much less variation in satisfaction with opening hours (between-practice $R^2=0.53$) which was most strongly associated with appointment convenience ($\beta=0.17$).

Conclusions: Satisfaction with opening hours, experience of making an appointment, and overall experience have different main determinants. Effects of interventions will likely differ across these measures.

The Government has partly explained its rationale for extending general practice opening hours in terms of improving the convenience of appointments (*table 1.1*). The national evaluation of the GP Access Fund's first wave considered patient satisfaction to be a key outcome measure (*section 2.3.2*).⁹ More convenient appointments could help to enhance patients' overall experiences of their general practices. Patients could also become more satisfied with their opening hours and this, in turn, may improve overall experience. The magnitudes of these effects are unknown, however; other factors may be more influential. *Chapter 4* showed that the association between satisfaction with opening hours and participation in the Extended Hours Access Scheme was greater for working people than those not working. Patient experience of making appointments and overall experience were more similar between participation groups, and there was no evidence that the relevant associations varied by work status. These variations in results suggest that the three experience measures have different determinants and that satisfaction with opening hours may not be particularly important to overall experience.

Paddison *et al.*⁹⁶ examined associations between overall satisfaction^a and several experience measures using the 2009-10 GP Patient Survey (*table 2.3*, reproduced from *chapter 2*); GP interpersonal quality of care was most strongly associated with overall satisfaction.

Table 2.3 Adjusted Associations of Overall Satisfaction with Several Patient Experience Measures in the GP Patient Survey 2009-10, as Reported by Paddison *et al.*⁹⁶

Experience measure	Standardised regression coefficient (95% CI)
GP interpersonal quality of care	0.48 (0.48 to 0.48)
Helpfulness of receptionists	0.22 (0.22 to 0.22)
Ability to see a GP within two weekdays	0.11 (0.11 to 0.12)
Ease of contacting the practice by telephone	0.09 (0.09 to 0.10)
Nurse interpersonal quality of care	0.09 (0.09 to 0.10)
Ability to get an appointment more than two weekdays in advance	0.06 (0.05 to 0.06)

CI: confidence interval; GP: general practitioner

Standardised regression coefficients equal changes in the measure of overall satisfaction, in terms of the standard deviation of this measure, for a one standard deviation increase in the relevant tabulated measure.

Associations adjusted for patient age, gender, ethnicity, deprivation, self-reported health, self-reported mental health condition, other experience measures, and a random intercept for general practice using linear regression.

If the main determinants of overall satisfaction relate to GP interpersonal quality of care, interventions to extend opening hours may have little effect on this outcome. The analysis of

^a The measure was derived from the question 'In general, how satisfied are you with the care you get at your GP surgery or health centre?'

Paddison *et al.*⁹⁶ did not examine satisfaction with opening hours, however, so the relevance of this measure to overall satisfaction remains unknown. This is also true of the experience of making an appointment measure. More recent versions of the GP Patient Survey than that used by Paddison *et al.*⁹⁶ also allow characteristics of patients' appointments to be examined, such as their type, timing, and convenience. There is scope to extend previous work by using these additional measures to explain variation in overall experience. In addition, no previous research has attempted to explain variation in satisfaction with opening hours and experience of making an appointment in the GP Patient Survey.

Understanding associations between experience measures could help to set expectations for policy to extend opening hours. A measurable effect on satisfaction with opening hours may not translate into an effect on overall experience. Policy makers may then want to assess whether an effect on satisfaction with opening hours alone is sufficient to justify the intervention. This chapter will quantify relationships between policy-relevant measures of patient experience from the GP Patient Survey.

The corresponding thesis objective is: To investigate the determinants of patient satisfaction with opening hours, experience of making appointments, and overall experience, by analysing associations between relevant measures from the GP Patient Survey. I also examined whether these associations vary by patient ability to take time off work to see a GP.

5.1 METHODS

The study design was a cross-sectional regression analysis of the GP Patient Survey, using respondent-level data from the 2011-12, 2012-13, and 2013-14 survey years. Across these three years, the GP Patient Survey sent questionnaires to 8,134,705 eligible patients registered with 8,289 general practices; respondents returned 2,912,535 completed questionnaires, providing an overall response rate of 35.8% (*table 3.1*). The mean number of responses per practice over the three year period was 351 (SD=72; minimum=1; maximum=519). Further details of the GP Patient Survey, including on numbers of responses

in each survey year, were provided in chapter three (*section 3.2.1*); data from survey years before 2011-12 were not used due to methodological changes to the survey in 2011.

Patient Experience Measures

The analysis coded measures of satisfaction with opening hours, experience of making an appointment, and overall experience as interval scales with five levels, using the same survey questions and responses as in the previous chapter (see *table 3.2*).^b

The analysis included further patient experience measures based on the findings of previous research. Paddison *et al.*⁹⁶ suggest that the measures shown in *table 2.3* explained 92% of practice-level variation in overall satisfaction with general practice in 2009-10, after accounting for differences in patient characteristics between practices.⁹⁶ These six measures related to the interpersonal quality of care provided by GPs and by nurses, helpfulness of receptionists, ease of contacting practices by telephone, ability to see a GP within two weekdays, and ability to get a GP appointment more than two weekdays in advance.⁹⁶ The first four of these measures can be derived in more recent versions of the GP Patient Survey using the questions shown in *table 5.1*.

Table 5.1 GP Patient Survey Questions Used to Derive Patient Experience Measures Related to GP and Nurse Interpersonal Quality of Care, Ease of Contacting the Practice by Telephone, and Helpfulness of Receptionists

GP Patient Survey question
Last time you saw or spoke to a GP from your GP surgery, how good was that GP at each of the following? ^{**†}
Very good
Good
Neither good nor poor
Poor
Very poor
Last time you saw or spoke to a nurse from your GP surgery, how good was that nurse at each of the following? ^{**†}
Very good
Good
Neither good nor poor
Poor
Very poor

^b These questions were ‘How satisfied are you with the hours that your GP surgery is open?’, ‘Overall, how would you describe your experience of making an appointment?’ and ‘Overall, how would you describe your experience of your GP surgery?’

Generally, how easy is it to get through to someone at your GP surgery on the phone? [‡]
Very easy
Fairly easy
Not very easy
Not at all easy
How helpful do you find the receptionists at your GP surgery? [§]
Very helpful
Fairly helpful
Not very helpful
Not at all helpful

GP: general practitioner

The relevant question numbers in the GP Patient Survey 2013-14 were 21 (GP interpersonal quality of care), 23 (nurse interpersonal quality of care), 3 (ease of telephone contact), and 4 (helpfulness of receptionists). All respondents were asked to complete each of the tabulated questions.

*Question asked for five items: giving you enough time, listening to you, explaining tests and treatments, involving you in decisions about your care, and treating you with care and concern.

Responses of †‘Doesn’t apply’ (≤18.5%), ‡‘Haven’t tried’ (2.8%) and §‘Don’t know’ (1.4%) were excluded from analysis.

The analysis treats the responses to these questions as lying on interval scales, consistent with previous research.⁹⁶ The two questions relating to interpersonal quality of care are each asked for five items, labelled ‘giving you enough time’, ‘listening to you’, ‘explaining tests and treatments’, ‘involving you in decisions about your care’, and ‘treating you with care and concern’. For each question, I calculated a summary measure of these items as the mean value of responses from respondents who answered three or more items.^c This is again consistent with previous research using these measures from the GP Patient Survey.⁹⁴⁻⁹⁶ Factor analyses of the five items suggest that they measure one construct, for each of GP and nurse interpersonal quality of care.^{93 157}

Two measures used by Paddison *et al.*⁹⁶, relating to being able to see a GP within two weekdays and getting an appointment more than two weekdays in advance, are based on questions no longer included in the GP Patient Survey. These questions were replaced in 2011 by a larger set of questions that ask respondents about the ‘last time you wanted to see or speak to a GP or nurse from your GP surgery’ (*table 5.2*). Respondents state, in sequence, the type and timing of appointment they wanted, whether they were able to get an appointment, and, if so, the type, timing, and convenience of the appointment obtained.

^c A mean response value for interpersonal quality of doctor care was calculated if three or more items under question 21 were answered. A mean response value for interpersonal quality of nurse care was calculated if three or more items under question 23 were answered. If less than three items were answered, the value of the corresponding variable was set to missing.

Table 5.2 GP Patient Survey Questions Used to Derive Measures Relating to the Last Time Respondents Wanted to See or Speak to a GP or Nurse from their General Practices

GP Patient Survey question	Question number
Question asked of all respondents	
What did you want to do? [‡]	10
See a GP at the surgery	
See a nurse at the surgery	
Speak to a GP on the phone	
Speak to a nurse on the phone	
Have someone visit me at my home	
And when did you want to see or speak to them? [†]	11
On the same day	
On the next working day	
A few days later	
A week or more later	
I didn't have a specific day in mind	
Were you able to get an appointment to see or speak to someone? [†]	12
Yes	
Yes, but I had to call back closer to or on the day I wanted the appointment	
No	
Question asked only of respondents able to get an appointment[‡]	
What type of appointment did you get? I got an appointment:	13
To see a GP at the surgery	
To see a nurse at the surgery	
To speak to a GP on the phone	
To speak to a nurse on the phone	
For someone to visit me at my home	
How long after initially contacting the surgery did you actually see or speak to them? [†]	14
On the same day	
On the next working day	
A few days later	
A week or more later	
How convenient was the appointment you were able to get?	15
Very convenient	
Fairly convenient	
Not very convenient	
Not at all convenient	

GP: general practitioner. Responses of *'I didn't mind/wasn't sure what I wanted' (1.8%) and †'Can't remember' (2.6%) were excluded from analysis.

‡Respondents who answered 'Yes' or 'Yes, but I had to call back...' to the preceding question.

The analysis included whether a respondent was able to get an appointment to see or speak to someone (based on question 12) as a dichotomous explanatory variable; responses of 'Yes' and 'Yes, but I had to call back...' formed one category and responses of 'No' formed the other category. Some questions are only asked of respondents who report that they were able to get an appointment to see or speak to someone (*table 5.2*). For this group of respondents, the analysis included a further three measures as explanatory variables. These were whether the type of appointment was what the respondent wanted (based on questions ten and 13),

whether the timing of the appointment was that wanted (questions 11 and 14), and how convenient the appointment was (question 15). The first two of these measures were dichotomous, distinguishing respondents who selected concordant answers for the appointment wanted and obtained from respondents who did not.^d The measure of appointment convenience was treated as lying on an interval scale with four levels corresponding to the four response options.

Patient Characteristics

I treated the six patient characteristics given in *table 3.3* as potential confounders, as in *chapter 4*. These were age group, gender, ethnicity, deprivation fifth, ability to take time off work to see a GP, and confidence in managing health, as reported in the GP Patient Survey. These variables are consistent with those included by Paddison *et al.*⁹⁶ with the addition of the ability to take time off work to see a GP as an extra variable. This variable could reduce confounding given its strong association with patient experience (*chapter 4*) and could also moderate associations between patient experience measures.

Statistical Methods

All statistical analysis was conducted using Stata (version 13.1).¹⁵² Descriptive statistics included all respondents, both unweighted and weighted for survey design and non-response. When estimating associations, each model included all respondents without missing data for any of the variables included in that model; *section 3.2.4* justified complete case analysis.

Linear regression was used to estimate associations between patient experience measures. The models adjusted for the six patient characteristics given above, by including them as categorical variables in the regression equations. Models also included a fixed effect specified at the general practice level to account for the clustering of respondents within practices. The models therefore control for possible confounding by unobserved variables

^d Examples of concordant answers are responses of ‘See a GP at the surgery’ for Q10 and ‘To see a GP at the surgery’ for Q13; responses of ‘On the same day’ for Q11 and ‘On the same day’ for Q14. Examples of discordant answers are responses of ‘See a GP at the surgery’ for Q10 and ‘To see a nurse at the surgery’ for Q13; responses of ‘On the same day’ for Q11 and ‘On the next working day’ for Q14. Respondents who didn’t have a specific day in mind for their appointment were treated as giving concordant answers for the measure relating to appointment timing.

that do not differ within practices; associations can be interpreted in terms of the relationships between variables within practices. I included indicator variables for the year of the GP Patient Survey response in the regression equation, to control for any time-varying factors that affected all respondents equally. Standard errors were robust to heteroskedasticity.

Before estimating associations, I standardised all patient experience measures to have means of zero and standard deviations of one. This allowed the strength of associations to be compared across experience measures used as explanatory variables in a given model and across models with different outcome measures. With this formulation, the regression models returned standardised regression coefficients. These coefficients are interpreted as the estimated absolute change in an outcome measure, in terms of standard deviations of this measure, for a one standard deviation increase in an explanatory variable.

A series of model sets, denoted models A-D, estimated the relationships between the different experience measures. The model sets differ in terms of the variables and respondents included (since certain variables only apply to some respondents). In each set, experience of making an appointment, satisfaction with opening hours, and overall experience were the outcome measures. The other patient experience measures were explanatory variables.

Model set A estimated the associations between the outcome measures and each of the explanatory experience measures in turn, adjusting only for patient characteristics and survey year. Model set B extended set A by simultaneously including each of the explanatory experience measures; associations were therefore adjusted for the correlations between experience measures. Model set C only included respondents who reported being able to get appointments and additionally examined the type, timing, and convenience of these appointments as explanatory variables. Model set D included interaction terms between each explanatory experience measure in set C and the variable recording respondent ability to take time off work to see a GP. This was to test whether associations differed across categories of this variable. A fifth model, denoted model E, was estimated with overall experience as the outcome measure only. It extended model C by including satisfaction with opening hours and experience of making an appointment as explanatory variables.

A sensitivity analysis added a measure of relational continuity of care^e to model set B. This measure was restricted to a sensitivity analysis because it only applied to the 59% of respondents who stated that they had a preferred GP. In further sensitivity analyses, I re-estimated model B for each outcome measure with the addition of quadratic terms for each patient experience measure used as an explanatory variable; I then compared the overall R^2 values for these models with those originally obtained assuming linear relationships. This was to test whether it was reasonable to model relationships as linear in the main analysis. I also assessed collinearity among explanatory variables by calculating the variance inflation factors after estimating model C with overall experience as the outcome measure^f, using linear regression.

The limits of the 95% confidence intervals estimated for the standardised regression coefficients often equalled the coefficients themselves when rounded to two decimal places. This is partly due to the large number of survey respondents. The main text reports 95% confidence intervals for coefficients, but tables report the coefficients only (which often equal the interval limits) to increase clarity.

5.2 RESULTS

Table 5.3 describes characteristics of the 2,912,535 respondents to the GP Patient Survey in 2011-12, 2012-13, and 2013-14. The unweighted and weighted percentages of respondents are given alongside the absolute numbers of respondents in each category. For example, 18.0% of weighted respondents could not take time off work to see a GP, whereas 38.8% could take such time off, and 43.2% were not in paid work.

^e The relevant GP Patient Survey question is ‘How often do you see or speak to the GP you prefer?’ There are four informative response options: ‘Always or almost always’, ‘A lot of the time’, ‘Some of the time’ and ‘Never or almost never’. The analysis treated these responses as lying on an interval scale with four levels.

^f The variance inflation factors will be similar across outcome measures. I used model C as it contained more explanatory variables than model B, so collinearity is likely to be greater.

Table 5.3 Characteristics of Respondents to the GP Patient Survey 2011-14

	Number of respondents	Unweighted percentage of respondents (%)	Weighted percentage of respondents (%)
Age (years):			
18 to 24	120,263	4.2	9.7
25 to 34	275,565	9.6	17.1
35 to 44	376,214	13.1	17.8
45 to 54	496,900	17.4	18.5
55 to 64	575,908	20.1	15.0
65 to 74	561,814	19.6	11.9
75 to 84	346,370	12.1	7.2
85 or over	111,737	3.9	2.9
Total	2,864,771		
Gender:			
Male	1,237,230	43.2	49.0
Female	1,627,054	56.8	51.0
Total	2,864,284		
Ethnicity:			
White	2,511,254	87.9	87.2
Mixed	21,459	0.8	1.0
Asian	169,559	5.9	6.4
Black	76,699	2.7	2.6
Other	78,193	2.7	2.8
Total	2,857,164		
Deprivation fifth:*			
1 (most deprived)	596,503	20.5	20.5
2	577,155	19.8	20.1
3	597,355	20.5	20.0
4	588,258	20.2	19.7
5 (least deprived)	550,900	18.9	19.7
Total	2,910,171		
Can take time off work to see GP:			
Not working†	1,460,780	53.5	43.2
Yes	883,318	32.4	38.8
No	384,779	14.1	18.0
Total	2,728,877		
Confident in managing health:			
Very	1,185,895	42.5	43.2
Fairly	1,392,810	49.9	49.5
Not very	172,691	6.2	6.0
Not at all	37,596	1.4	1.3
Total	2,788,992		

GP: general practitioner

2,912,535 survey respondents from 8,289 general practices; data presented where available for each variable.

Weighted percentages account for survey design and non-response.

*Fifths of the national Index of Multiple Deprivation rank for lower layer super output areas of residence.

†Full-time education, unemployed, sick or disabled, retired, looking after home, other.

Table 5.4 shows that most respondents were positive about their satisfaction with opening hours, experience of making an appointment, and overall experience. For example, 82.3% of weighted respondents were very (40.0%) or fairly (42.3%) satisfied with opening hours.

Table 5.4 Satisfaction with Opening Hours, Experience of Making an Appointment, and Overall Experience in the GP Patient Survey 2011-14

	Number of responses	Unweighted percentage of respondents (%)	Weighted percentage of respondents (%)
Satisfaction with opening hours*			
Very satisfied	1,235,576	44.8	40.0
Fairly satisfied	1,109,522	40.2	42.3
Neither satisfied nor dissatisfied	224,494	8.1	9.3
Fairly dissatisfied	132,747	4.8	5.9
Very dissatisfied	55,309	2.0	2.5
Total	2,757,648		
Experience of making an appointment			
Very good	1,176,083	42.4	35.7
Fairly good	1,080,176	38.9	41.2
Neither good nor poor	301,154	10.9	13.2
Fairly poor	145,114	5.2	6.6
Very poor	74,139	2.7	3.5
Total	2,776,666		
Overall experience			
Very good	1,452,265	51.2	44.8
Fairly good	1,080,961	38.1	42.2
Neither good nor poor	208,637	7.4	8.8
Fairly poor	71,511	2.5	3.2
Very poor	23,300	0.8	1.0
Total	2,836,674		

2,912,535 survey respondents from 8,289 general practices; data presented where available for each variable. Weighted percentages account for survey design and non-response.

*Responses of 'I'm not sure when my GP surgery is open' were excluded (n=80,636; 2.8%).

Table 5.5 describes frequency distributions of the other patient experience measures. Most respondents (89.7%) were able to get an appointment the last time they tried; for them, these appointments were commonly of the type and time interval wanted and were convenient. The pattern of generally positive responses also applied to the ease of contacting practices by telephone, helpfulness of receptionists, frequency of consulting a preferred GP, and GP and nurse interpersonal quality of care.

Table 5.5 Ease of Contacting Practices by Telephone, Helpfulness of Receptionists, Appointment Characteristics, Frequency of Consulting a Preferred GP, and Interpersonal Quality of Care in the GP Patient Survey 2011-14

	Number of responses	Unweighted percentage of respondents (%)	Weighted percentage of respondents (%)
Ease of contact by telephone*			
Very easy	1,020,288	36.3	29.6
Fairly easy	1,293,282	46.0	48.5
Not very easy	355,258	12.6	15.2
Not at all easy	144,488	5.1	6.7
Total	2,813,316		
Helpfulness of receptionists†			
Very helpful	1,561,893	54.8	47.3
Fairly helpful	1,070,939	37.6	42.8
Not very helpful	165,141	5.8	7.5
Not at all helpful	53,161	1.9	2.6
Total	2,851,134		
Able to get an appointment‡			
Yes	2,486,136	91.5	89.7
No	230,237	8.5	10.3
Total	2,716,373		
Got the type of appointment wanted§			
Yes	2,333,194	94.1	93.7
No	145,954	5.9	6.3
Total	2,479,148		
Got the timing of appointment wanted§**			
Yes	1,818,058	77.8	77.5
No	520,132	22.3	22.5
Total	2,338,190		
Convenience of appointment§			
Very convenient	1,282,530	52.4	47.0
Fairly convenient	1,024,922	41.9	45.7
Not very convenient	123,640	5.1	6.5
Not at all convenient	17,145	0.7	0.9
Total	2,448,237		
Frequency of consulting preferred GP††			
Always or almost always	744,438	46.4	40.0
A lot of the time	364,934	22.8	23.4
Some of the time	412,203	25.7	29.7
Never or almost never	82,214	5.1	6.9
Total	1,603,789		
	Number of responses	Unweighted mean (SD)	Weighted mean (SD)
GP interpersonal quality of care‡‡	2,778,536	1.6 (0.7)	1.7 (0.8)
Nurse interpersonal quality of care‡‡	2,487,778	1.6 (0.7)	1.6 (0.7)

2,912,535 survey respondents from 8,289 general practices; data presented where available for each variable. Weighted percentages account for survey design and non-response.

Responses excluded from analysis: *‘Haven’t tried’ (n=79,574), †‘Don’t know’ (n=40,588), ‡‘Can’t remember’ (n=77,477), **‘Can’t remember’ (n=124,602).

§Measure only applicable to respondents who were able to get an appointment (n=2,486,136).

††Measure only applicable to respondents who had a preferred GP (n=1,677,868).

‡‡Measures range from 1 (all items ‘Very good’) to 5 (all items ‘Very poor’).

Associations between Patient Experience Measures

Table 5.6 reports standardised regression coefficients (β) for the associations between experience of making an appointment and the explanatory experience measures. In model A, when these measures were individually present in the regression model (not adjusting for others), the ease of telephone contact ($\beta=0.57$; 95% CI: 0.57 to 0.57) and helpfulness of receptionists ($\beta=0.54$; 95% CI: 0.54 to 0.55) were most strongly associated with experience of making an appointment. This was also true in model B, when measures were jointly included in the model, but the coefficients were smaller ($\beta=0.31$ and $\beta=0.28$, respectively). In model C, including only respondents who were able to get an appointment on their last attempt, the convenience of this appointment had the strongest association with the experience of making the appointment ($\beta=0.29$; 95% CI: 0.29 to 0.29). This measure was followed by the ease of telephone contact and helpfulness of receptionists, while other measures had weaker associations ($\beta \leq 0.07$). This order was consistent for respondents who were not in paid work, those who could take time off work to see a GP, and those who could not take such time off; the magnitudes of associations differed across groups only slightly.

Table 5.6 Standardised Regression Coefficients (β) for the Associations between Experience of Making an Appointment and Other Patient Experience Measures, Estimated Using Multilevel Fixed-effects Linear Regression

	GP interpersonal quality of care	Nurse interpersonal quality of care	Ease of telephone contact	Helpfulness of receptionists	Able to get an appointment	Type of appointment wanted	Timing of appointment wanted	Convenience of appointment
Model A*	0.37	0.31	0.57	0.54	0.38	0.05	0.15	0.48
Model B†	0.13	0.06	0.31	0.28	0.23	-	-	-
Model C‡	0.07	0.04	0.24	0.22	-	0.01	0.06	0.29
Model D§:								
Not in paid work	0.08	0.04	0.23	0.22	-	0.01	0.05	0.28
Can take time off work to see GP	0.07	0.04	0.25	0.22	-	0.02	0.06	0.29
Cannot take time off work to see GP	0.07	0.03	0.27	0.23	-	0.02	0.07	0.32

GP: general practitioner

All models included a fixed effect at the general practice level.

*Model A adjusted for patient characteristics and survey year (2,059,929 $\leq n \leq$ 2,425,123).

†Model B adjusted for patient characteristics, survey year, and other explanatory experience measures (n=2,029,130).

‡Model C adjusted for patient characteristics, survey year, and other explanatory experience measures among respondents who were able to get an appointment (n=1,736,757).

§Model D added interaction terms between each explanatory experience measure in model C and respondent ability to take time off work to see a GP (n=1,736,757).

When satisfaction with opening hours was added as an explanatory variable to model C, its association with experience of making an appointment was relatively weak ($\beta=0.10$; 95% CI: 0.10 to 0.10) and the coefficients for other measures remained almost unchanged.

Table 5.7 shows associations between the same explanatory experience measures as above and satisfaction with opening hours. As for experience of making an appointment, the ease of telephone contact ($\beta=0.36$; 95% CI: 0.36 to 0.37) and helpfulness of receptionists ($\beta=0.37$; 95% CI: 0.37 to 0.37) were most strongly associated with satisfaction with opening hours in model A. Once other experience measures were simultaneously adjusted for in models B and C, these two measures had smaller standardised regression coefficients than that for interpersonal quality of care provided by GPs ($\beta=0.16$; 95% CI: 0.15 to 0.16). This was marginally smaller than the coefficient for the convenience of appointments ($\beta=0.17$; 95% CI: 0.17 to 0.17) which was the measure most strongly associated with satisfaction with opening hours among respondents able to get an appointment. The strength of this association varied moderately by patient group, increasing from $\beta=0.13$ for respondents not in paid work to $\beta=0.24$ for those unable to take time off work to see a GP. Associations for other measures remained relatively similar across patient groups.

Table 5.7 Standardised Regression Coefficients (β) for the Associations between Satisfaction with Opening Hours and Other Patient Experience Measures, Estimated Using Multilevel Fixed-effects Linear Regression

	GP interpersonal quality of care	Nurse interpersonal quality of care	Ease of telephone contact	Helpfulness of receptionists	Able to get an appointment	Type of appointment wanted	Timing of appointment wanted	Convenience of appointment
Model A*	0.35	0.28	0.36	0.37	0.18	0.03	0.08	0.33
Model B†	0.19	0.09	0.18	0.18	0.07	-	-	-
Model C‡	0.16	0.07	0.14	0.14	-	0.00	0.01	0.17
Model D§:								
Not in paid work	0.17	0.08	0.13	0.13	-	0.01	0.01	0.13
Can take time off work to see GP	0.15	0.07	0.16	0.14	-	0.00	0.01	0.20
Cannot take time off work to see GP	0.15	0.06	0.17	0.16	-	0.00	0.01	0.24

GP: general practitioner. All models included a fixed effect at the general practice level.

*Model A adjusted for patient characteristics and survey year (2,034,190 $\leq$ n $\leq$ 2,445,500).

†Model B adjusted for patient characteristics, survey year, and other explanatory experience measures (n=2,015,397).

‡Model C adjusted for patient characteristics, survey year, and other explanatory experience measures among respondents who were able to get an appointment (n=1,724,802).

§Model D added interaction terms between each explanatory experience measure in model C and respondent ability to take time off work to see a GP (n=1,724,802).

When experience of making an appointment was added as an explanatory variable to model C, its coefficient of 0.20 (95% CI: 0.19 to 0.20) was the largest of all experience measures. Coefficients for measures in *table 5.7* reduced by 0.06 (convenience of appointment) or less.

Table 5.8 presents associations between overall patient experience and each of the other experience measures, including satisfaction with opening hours and experience of making an appointment. The interpersonal quality of care provided by GPs was the explanatory experience measure most strongly associated with overall experience in models A, B, and C ($0.38 \leq \beta \leq 0.60$). The helpfulness of receptionists had a fairly weaker relationship among all respondents ($\beta=0.26$; 95% CI: 0.26 to 0.26) and among those able to get an appointment ($\beta=0.23$; 95% CI: 0.23 to 0.23), while other explanatory measures had smaller standardised regression coefficients ($\beta \leq 0.15$ overall and across patient groups). In model E, an extra model with satisfaction with opening hours and experience of making an appointment added as explanatory variables, GP interpersonal quality remained the most strongly associated with overall experience ($\beta=0.34$; 95% CI: 0.34 to 0.34). Experience of making an appointment followed this ($\beta=0.23$; 95% CI: 0.22 to 0.23); associations for satisfaction with opening hours ($\beta=0.15$; 95% CI: 0.15 to 0.15) and helpfulness of receptionists ($\beta=0.16$; 95% CI: 0.16 to 0.16) were of similar magnitudes.

Table 5.8 Standardised Regression Coefficients (β) for the Associations between Overall Experience and Other Patient Experience Measures, Estimated Using Multilevel Fixed-effects Linear Regression

	GP interpersonal quality of care	Nurse interpersonal quality of care	Ease of telephone contact	Helpfulness of receptionists	Able to get an appointment	Type of appointment wanted	Timing of appointment wanted	Convenience of appointment	Satisfaction with opening hours	Experience of making appointments
Model A*	0.60	0.39	0.45	0.52	0.24	0.04	0.09	0.36	0.48	0.61
Model B†	0.41	0.09	0.15	0.26	0.08	-	-	-	-	-
Model C‡	0.38	0.08	0.12	0.23	-	0.00	0.01	0.11	-	-
Model D§:										
Not in paid work	0.38	0.08	0.10	0.23	-	0.00	0.01	0.10	-	-
Can take time off work to see GP	0.37	0.08	0.14	0.22	-	0.01	0.02	0.12	-	-
Cannot take time off to see GP	0.39	0.08	0.15	0.24	-	0.01	0.02	0.13	-	-
Model E**	0.34	0.06	0.04	0.16	-	0.00	0.00	0.02	0.15	0.23

GP: general practitioner

All models included a fixed effect at the general practice level.

*Model A adjusted for patient characteristics and survey year (2,080,925 ≤ n ≤ 2,503,720).

†Model B adjusted for patient characteristics, survey year, and other explanatory experience measures (n=2,049,187).

‡Model C adjusted for patient characteristics, survey year, and other explanatory experience measures among respondents who were able to get an appointment (n=1,751,053).

§Model D added interaction terms between each explanatory experience measure in model C and respondent ability to take time off work to see a GP (n=1,751,053).

**Model E added satisfaction with opening hours and experience of making an appointment to model C (n=1,698,043).

Table 5.9 shows how the ability of the regression models to explain variation in experience of making an appointment, satisfaction with opening hours, and overall experience differed across these measures. The ‘reference models’ included only patient characteristics and survey year as explanatory variables, whereas model B also included the explanatory experience measures applicable to all respondents. The R^2 values from estimation of model B were typically much greater than from estimation of the reference models. For example, model B explained 93% and 91% of between-practice variation in experience of making an appointment and overall experience, respectively.^g This model explained substantially less variation, 53%, in satisfaction with opening hours between practices.

Table 5.9 Ability of Model B to Explain Variation in Experience of Making an Appointment, Satisfaction with Opening Hours, and Overall Experience, Compared to Reference Models

	Overall R^2	R^2 within practices	R^2 between practices
Experience of making an appointment:			
Reference model	0.10	0.09	0.21
Model B	0.59	0.55	0.93
Satisfaction with opening hours:			
Reference model	0.10	0.10	0.14
Model B	0.32	0.31	0.53
Overall experience:			
Reference model	0.12	0.11	0.30
Model B	0.60	0.58	0.91

Reference models adjusted for patient characteristics and survey year.

Model B adjusted for patient characteristics, survey year, and explanatory experience measures applicable to all respondents.

In the sensitivity analysis that examined associations among respondents who had a preferred GP, the frequency of seeing a preferred GP was weakly associated with experience of making an appointment ($\beta=0.09$), satisfaction with opening hours ($\beta=0.07$), and overall experience ($\beta=0.08$). The standardised regression coefficients for other variables included in the models remained similar to those estimated for model set B (results not shown).

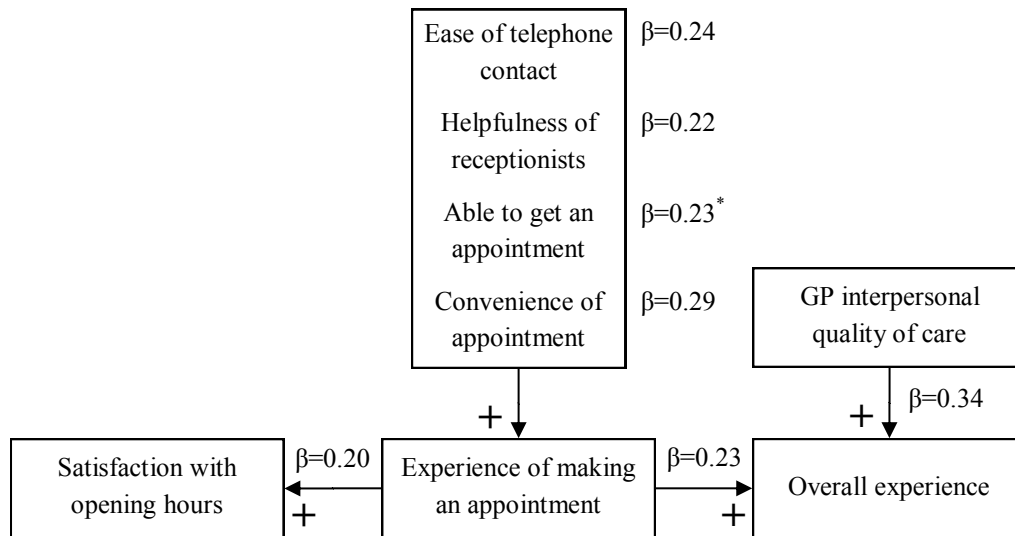
^g R^2 values were similar between models B, C, and D (results not shown).

When including quadratic terms for the experience measures used as explanatory variables in model set B, the overall R^2 values were 0.60 for experience of making an appointment, 0.32 for satisfaction with opening hours, and 0.61 for overall experience. These values are almost identical to those shown in *table 5.9*, when relationships were assumed to be linear. This suggests that modelling relationships between experience measures as linear was sufficient to explain variation in the outcome measures. *Appendix 4* shows that the variance inflation factors for patient experience measures were small (<1.6), so collinearity among explanatory variables is not a concern.

5.3 DISCUSSION

For all experience measures examined, most GP Patient Survey respondents gave positive responses about their general practices. Patients' experiences of the last time they tried making an appointment were most strongly associated with the ease of contacting practices by telephone, the helpfulness of receptionists, whether they were able to get an appointment and, if so, the convenience of that appointment. The models explained almost all variation in experience of making an appointment between practices and most variation overall (between and within practices). In contrast, the same models explained approximately one half of variation in satisfaction with opening hours between practices and approximately one third of variation overall. For respondents able to get an appointment on their last attempt, the convenience of that appointment was again the measure most strongly associated with satisfaction with opening hours, but the association was weaker than with experience of making an appointment. Patients' overall experiences were most strongly associated with the interpersonal quality of care provided by GPs, followed by patients' experiences of making appointments, their satisfaction with opening hours, and the perceived helpfulness of receptionists. The models explained almost all variation in overall experience between practices and most variation overall. Several measures (interpersonal quality of care provided by nurses, appointment type and timing, and relational continuity of care) were unimportant in explaining variation in the outcome measures. *Figure 5.1* summarises associations for the main explanatory variables of each outcome measure.

Figure 5.1 Summary Diagram of Main Explanatory Variables for Satisfaction with Opening Hours, Experience of Making an Appointment, and Overall Experience



β is the standardised regression coefficient, interpreted as the estimated absolute change in an outcome measure, in terms of standard deviations of this measure, for a one standard deviation increase in an explanatory variable. Only associations where $\beta \geq 0.20$ are shown (arbitrarily, for clarity), based on results from model C or, for overall experience, from model E. *Coefficient is from model B as variable included in this multivariable model only. The '+' symbol indicates a positive association between two variables. The box at the arrowhead is the outcome variable. The box at the foot of the arrow presents explanatory variables.

Limitations

The analysis estimated sets of cross-sectional associations between patient experience measures. It adjusted for six characteristics of respondents, factors that do not vary within practices, and factors that varied between years affecting all respondents equally. Residual confounding of an association between two experience measures could result from, for example, an unobserved third experience measure. Associations estimated when only adjusting for patient characteristics (model A) attenuated when experience measures were modelled simultaneously. These associations might weaken further still if other measures are included. Alternatively, it might be that an unobserved patient characteristic explains some associations in part; this particular limitation could be addressed through analysing a cohort of survey respondents who complete a questionnaire in each survey wave, but such a cohort does not currently exist. Unobserved characteristics of practices cannot confound the results of this analysis, as all regression models included fixed effects at the practice level which account for any variables that vary between practices but are constant within them.

The results could be influenced by the design of the survey. For example, the ordering of questions and their position in the questionnaire could affect responses. Adjacent questions may be answered more similarly than if they were further apart, and respondent fatigue could result in responses being more consistent in latter parts of questionnaires. The ordering effect may not be too large, as shown by modest associations between satisfaction with opening hours and overall experience despite the relevant questions (questions 25 and 28) being in adjacent sections; the strongest associations were sometimes between measures based on questions distant from one another.^h Still, other aspects of survey design, or even the use of a survey to examine the relative importance of different factors, could affect the conclusions drawn. Research on decision making has well established, in other contexts, that people's preferences between two options can be inconsistent across elicitation modes; preferences can be influenced by the context and framing of questions or decision problems.^{158 159}

Respondents' stated experiences may not be the same as their 'true' or averaged perceptions; stated perceptions could be subject to much random variation (as well as systematic variation caused by contextual factors). The resulting measurement error would attenuate associations estimated in the regression models. If this error is similar across experience measures, the ordering of measures in terms of association strength would be maintained. If the error varies across measures, the ordering could be affected. Measures relating to respondents' last attempts to get appointments could be particularly susceptible to error from inaccurate recall. This would make patient experience appear less sensitive to these measures than is true. Associations for 'ability to get an appointment' could also be attenuated if, for example, some respondents stating that they were unable to get an appointment could actually have got an appointment, but perhaps it was not the appointment wanted.

Possible Explanations

Experience of making an appointment was most strongly associated with ease of telephone contact, helpfulness of receptionists, and appointment convenience. As most patients normally book appointments by phone (89% in the GP Patient Survey 2013-14) and will likely speak to a receptionist, related measures could affect experiences of making an appointment, in addition to characteristics of the appointment itself. The perceived

^h An example is the associations of experience of making an appointment (Q18) with ease of telephone contact (Q3) and helpfulness of receptionists (Q4).

helpfulness of receptionists may also depend on whether patients were able to get a satisfactory appointment. Satisfaction with opening hours was partly explained by these measures independently, and also by respondents' overall experiences of making appointments. However, only 53% of variation in satisfaction with opening hours between practices was explained, which was much less than the corresponding figures for experience of making an appointment (93%) and overall experience (91%). It might be that satisfaction with opening hours is more sensitive to the opening hours themselves (which were not modelled) than the individual experiences possibly affected by them.

The interpersonal quality of care provided by GPs had the strongest association with overall experience, but much weaker associations with experience of making an appointment and satisfaction with opening hours. This might be because the latter two measures are more specific, relating to factors outside of the consultation, whereas overall experience is a more holistic construct. GP interpersonal quality of care is likely an important determinant of patient experience because the GP-patient interaction is a fundamental component of general practice as a service. Patients consult nurses less often than GPs,⁵⁰ which may help explain why nurse interpersonal quality of care had weaker associations with outcome measures than GP interpersonal quality.

Questions in the GP Patient Survey about making an appointment ask specifically about 'last time you wanted to see or speak to a GP or nurse from your GP surgery'. If a patient was unable to get an appointment, or a convenient one, on this attempt, it is likely that they could get one on their preceding or next attempt.ⁱ Consequently, the impact on satisfaction with opening hours or overall experience may not be too adverse. This may help to explain the modest associations between these two measures and those relating to appointment attempts. The type and timing of appointments were minimally associated with all outcome measures; this might be because patients are very willing to make trade-offs between appointment characteristics when booking them.^{97 98 154 155} The measure for appointment timing may also have a lot of measurement error due to inaccurate respondent recall.

The question relevant to relational continuity of care asks 'How often do you see or speak to the GP you prefer?' While this question is ambiguous, it is also not restricted to attempts when patients wanted to see their preferred GP. Patients may be very willing to consult other

ⁱ Since most patients report being able to get a convenient appointment on their last attempt.

GPs or nurses in certain contexts without adverse effects on experiences. This could help to explain the modest associations observed for the continuity measure.

Relation to Existing Literature

The findings are largely consistent with those of Paddison *et al.*⁹⁶ Both analyses suggest that GP interpersonal quality of care is the measure most strongly associated with overall experience, followed by the helpfulness of receptionists. The standardised regression coefficients for these measures were also similar (0.41 and 0.26, respectively, in model B and 0.48 and 0.22, respectively, in the analysis of Paddison *et al.*⁹⁶). The differences in these coefficients could be due to changes in the wording of the outcome measure^j or the fewer patient characteristics modelled by Paddison *et al.*⁹⁶, for example. Both analyses were consistent in explaining almost all between-practice variation in overall experience and in estimating that associations did not vary greatly across different patient groups.

My analysis adds to that of Paddison *et al.*⁹⁶ by showing that experience of making an appointment and satisfaction with opening hours are also associated with overall experience, but not as strongly as GP interpersonal quality of care. It also provides evidence on which variables explain variation in experience of making an appointment and satisfaction with opening hours. For example, the results suggest appointment convenience, ease of telephone contact, and helpfulness of receptionists to be most strongly associated with experience of making an appointment. The analysis extends what was previously known through a more comprehensive assessment of patient experience.

Several studies have used discrete choice experiments to try and elicit the most important factors to patients when booking appointments in England.^{97 98 154 155} These experiments simulate appointment decisions but choice options are necessarily simplified, restricted to a few characteristics, and largely ignore the decision context. Stated preferences may also be different from patients' actions. The studies imply that patients are able to make trade-offs between characteristics in appointment decisions and that the magnitudes of these trade-offs

^j Paddison *et al.* used a slightly different question, that is not included in more recent versions of the GP Patient Survey, to assess overall experience. This question was 'In general, how satisfied are you with the care you get at your GP surgery or health centre?', which explicitly refers to satisfaction and 'the care'. In contrast, the question used here refers to 'your experience': 'Overall, how would you describe your experience of your GP surgery?'

differ by scenario (such as an urgent versus a minor illness). For example, a patient may select a less convenient appointment to see a preferred GP, or wait a few extra days to have a more convenient appointment time. Therefore, patients' experiences of making appointments may reflect an overall impression of an appointment rather than any specific characteristic.

Relation to Earlier Chapters

The previous chapter estimated that the association between satisfaction with opening hours and participation in the Extended Hours Access Scheme varied by respondent ability to take time off work to see a GP; the magnitude of the association was greatest for respondents who could not take time off work to see a GP and lowest for those not in paid work. The analysis presented above estimated that the association between satisfaction with opening hours and appointment convenience also followed this pattern. These observations may be related if participation in the Extended Hours Access Scheme is associated with increased appointment convenience.

To test this, I conducted a post-hoc analysis using the same model specification as in *chapter 4* with appointment convenience as the outcome measure (as defined in this chapter). Scheme participation was associated with a 0.30 (95% CI: 0.07 to 0.53) increase in appointment convenience on a 0-100 scale, indicating a minimal association. This suggests that if the Extended Hours Access Scheme does have a causal effect on satisfaction with opening hours it is not through improving appointment convenience. It may act through the hours themselves instead. If the Extended Hours Access Scheme has little effect on appointment characteristics and, in turn, the experience of making an appointment, its minimal association with overall experience is expected. I would not expect the Extended Hours Access Scheme to improve GP interpersonal quality of care.

Future Research

Given that overall experience was most strongly associated with a composite measure of GP interpersonal quality of care, future research could investigate individual aspects of this composite measure. It could also further examine how discordance between the timing of appointments wanted and obtained affects patient experience; for example, an appointment in

a week's time could be acceptable if an appointment was wanted a few days later but unacceptable if it was wanted for the same day. Future work could also try to account for the unexplained between-practice variation in satisfaction with opening hours, which may rely on the development of accurate opening hours data. The GP Patient Survey could benefit from establishing a cohort of respondents that complete a questionnaire in each wave, so that additional unobserved variables can be controlled for when estimating associations.

In earlier chapters of the thesis, I explained that the Government sometimes gives its rationale for improving access to general practice in terms of benefits for the NHS, in addition to benefits for patients. One expectation is that it will reduce use of emergency hospital services. This hypothesis is the subject of the next chapter.

SUMMARY

This chapter suggests that overall experience of general practice is most strongly associated with the interpersonal quality of care provided by GPs. Experience of making an appointment is most strongly associated with the convenience of appointments, ease of telephone contact, and helpfulness of receptionists. These measures explained almost all variation in overall experience and experience of making an appointment between general practices. In contrast, much variation in satisfaction with opening hours between practices could not be explained by other experience measures. In summary, the results suggest that overall experience, experience of making an appointment, and satisfaction with opening hours as measured in the GP Patient Survey represent three distinct constructs with different determinants. The effects of interventions are likely to differ across these measures.

6

Emergency Hospital Services

Abstract

Background: The Government expects that improving access to general practice will reduce demand for emergency hospital services. Previous studies addressing this hypothesis focused on a particular population or type of demand; the national absolute effects of improving patient experience on total use of emergency hospital services had not been previously estimated. This chapter addresses this gap in the existing literature.

Methods: Repeated cross-sectional time series analysis of the GP Patient Survey linked with Hospital Episode Statistics A&E and Inpatient data and routine data on practice characteristics for the 2011-12 to 2013-14 financial years. The eligible study population consisted of 8,124 practices (23,875 practice-years) with more than 50 survey responses and 1,000 patients in a year. Outcome measures were numbers of A&E visits and emergency hospital admissions per patient by practice-year. Predictor variables were practice means of satisfaction with opening hours, experience of making an appointment, and overall experience; associations were estimated using random-effects Poisson regression, adjusting for several practice characteristics.

Results: Mean practice rates of A&E visits and emergency admissions increased from 2011-12 to 2013-14 (310.3 to 324.4 and 98.8 to 102.9 per 1,000 patients, respectively). Each predictor variable decreased; for example, the practice mean of satisfaction with opening hours was 79.4 in 2011-12 and 76.6 in 2013-14. A standard deviation increase in experience of making an appointment predicted a 2.7% decrease (RR=0.973; 95% CI: 0.966 to 0.979) in A&E visit rates and a 1.7% decrease (RR=0.983; 95% CI: 0.978 to 0.988) in admission rates. This corresponds to 455,090 fewer A&E visits and 91,443 fewer admissions nationally per year. Satisfaction with opening hours and overall experience were not consistently associated with outcomes.

Conclusions: Practices providing better experiences of making appointments had lower rates of A&E visits and emergency admissions. This association was modest and is unlikely to equate to large cost savings.

The previous two chapters focused on explaining variation in patient experience of general practice. This is one outcome that the Government intends to improve through current policy (*table 1.1*). Another stated goal is to reduce demand for A&E departments and other emergency hospital services.^a *Chapter 2* described that the evaluation of the GP Access Fund's first wave estimated programme-level effects on A&E visits, but the evaluation could not examine the independent effects of individual interventions such as extended opening hours (*section 2.3.2*). Consequently, research on the GP Access Fund cannot explore the causal mechanisms and relationships that lie behind any programme-level effects observed. An alternative research strategy is to examine 'natural' variation^b in factors that are hypothesised to affect demand for emergency hospital services, such as patient experience of general practice. This is the approach used in the current chapter to explain variation in rates^c of visits to A&E departments and emergency admissions.

Chapter 2 cited several studies that investigated the associations between measures of patient experience from the GP Patient Survey and A&E visits^{23 27 30 102 105} or emergency admissions (*section 2.2.2*).^{18-22 26 28 29 106} These studies typically use similar study designs and the same data sources but differ in the population studied, the variables modelled, and the statistical methods used to estimate associations, for example. These idiosyncratic differences make it difficult to compare results; for example, conflicting findings from two studies could be due to the exclusion of an important confounding variable in one of them or true differences between populations. In addition to this difficulty comparing studies, the body of work has three important limitations, as *table 2.4* summarised (reproduced on next page).

The current chapter addresses these limitations. It characterises the relationship between patient experience and use of emergency hospital services nationally in England, incorporating all use of emergency hospital services, and translates the findings into absolute amounts that can be readily interpreted by policy makers. These amounts include numbers of A&E visits and emergency admissions and associated costs to hospital providers. *Table 1.1* highlighted that the Government hopes to achieve substantial savings, as well as reduce use of emergency services, through new models of primary care.

^a I refer to A&E departments as 'emergency hospital services' for conciseness only while acknowledging that A&E departments exist in both hospital and non-hospital settings.

^b I use 'natural variation' to refer to variation not solely attributable to a specific intervention or experiment such as the GP Access Fund.

^c I use 'rates' to refer to numbers of A&E visits or emergency admissions per patient per financial year.

Table 2.4 Three Main Limitations of Existing Research into the Relationship between Patient Experience and Use of Emergency Hospital Services

Limitation	Why this is a limitation
1. Past studies typically restrict the study population or outcome variable so that it no longer reflects the whole population or total hospital service use.	Policy makers will likely need to consider effects across total use of emergency hospital services when assessing the cost-effectiveness of interventions. Exploring effects only within certain populations or subsets of A&E visits or emergency admissions may underestimate the total impact of interventions.
2. Only variation in patient experience and use of emergency hospital services <i>between</i> general practices has typically been used to estimate associations.	Associations based solely on variation <i>between</i> practices can be confounded by unobserved factors that vary between practices and are constant for each practice over time. By using variation <i>within</i> practices over several time periods, these confounding factors can be accounted for, making findings more robust.
3. Findings are commonly left in an abstract mathematical form, such as relative differences in rates of A&E visits or emergency admissions, so it is difficult to understand the implications for national policy.	Small relative differences could equate to large absolute changes, so different conclusions may be reached if relative differences are relied on alone. The expected absolute changes in total use of emergency hospital services with different changes in patient experience are unknown. Consequently, it is unclear whether related interventions are worthwhile to explore.

The corresponding thesis objective is: To estimate changes in use of emergency hospital services with specified changes in patient experience of general practice, through linking GP Patient Survey and Hospital Episode Statistics data over several years.

6.1 METHODS

The study used a repeated cross-sectional time series design, with general practices as the units of analysis. The time series included the 2011-12, 2012-13, and 2013-14 financial years. There were 24,392 practice-years for 8,289 practices in the GP Patient Survey over this period. The analysis excluded practice-years where the registered population did not exceed 1,000 or the number of GP Patient Survey responses did not exceed 50.^d This left 23,875 practice-years (97.9% of initial sample) for 8,124 practices; 96.0% of these practices (n=7,802) were present in the dataset in each year of the study period.

^d This was to remove atypical practices likely serving specialised populations with unreliable practice-level survey measures and outcome data.

A&E Visits and Emergency Admissions

Hospital Episode Statistics is a routine administrative dataset recording hospital outpatient, inpatient, and A&E activity in NHS-funded providers in England.¹⁶⁰ This study used the A&E and inpatient datasets for 2011-12, 2012-13, and 2013-14, as provided by the Health and Social Care Information Centre. Patients' registered practices are identified in these datasets by their unique Organisation Data Service codes.

Each record in Hospital Episode Statistics A&E data corresponds to a single visit to an A&E department. The main outcome variable for A&E visits included all records in this dataset where the arrival date was within the study period.^e It recorded the number of A&E visits by general practice population by financial year. In a sensitivity analysis, a second outcome variable included visits to emergency departments ('type 1' A&E departments) only^f; these are defined as A&E departments providing consultant-led 24-hour services with full resuscitation facilities.¹⁶¹

Each record in Hospital Episode Statistics Inpatient data corresponds to a continuous period of care under the same consultant doctor ('finished consultant episode').¹⁶² Some hospital stays generate several records when patients are transferred between consultants within the same hospital or between hospitals. To avoid counting several admissions in these instances, the analysis was based on 'superspells' which are continuous periods of care from initial admission to final discharge after any hospital transfers.¹⁶² The outcome variable for emergency admissions included all superspells where the method of admission indicated an emergency admission^g; this includes emergency admissions via GPs and hospital outpatient clinics, as well as via A&E departments. The outcome variable recorded the number of emergency admissions by general practice population by financial year.

^e A small percentage of records were excluded to prevent duplication (approximately 0.02%). Duplicate records were defined as those with the same patient identifier, arrival date, and arrival time.

^f Records where department type equalled 1.

^g Records where method of admission equalled 21 (Emergency: via A&E services, including the casualty department of the provider), 22 (Emergency: via general practitioner), 23 (Emergency: via Bed Bureau, including the Central Bureau), 24 (Emergency: via consultant outpatient clinic), or 28 (Emergency: other means, including patients who arrive via the A&E department of another healthcare provider).

Patient Experience Measures

The analysis focused on the three measures of patient experience, derived from the GP Patient Survey, that were included in each of the previous two chapters: satisfaction with opening hours, experience of making an appointment, and overall experience.^h I argued in *chapter 3* that these measures are particularly relevant to current policy (*section 3.2*). They also form a parsimonious set that represents three distinct constructs, as shown in *chapter 5*. Overall experience was most strongly associated with GP interpersonal quality of care. Appointment convenience, ease of telephone contact, and helpfulness of receptionists explained almost all variation in experience of making an appointment between practices. Much variation in satisfaction with opening hours was unrelated to experience measures. Associations between use of emergency hospital services and satisfaction with opening hours, experience of making an appointment, and overall experience will reflect any effects of the observed determinants of these patient experience measures (examined in *chapter 5*) as well as their unobserved determinants.

The three patient experience measures were coded as in the previous two chapters (see *table 3.2*), using respondent-level data from the GP Patient Survey 2011-12, 2012-13, and 2013-14. The analysis calculated general practice-level values of these measures as the means of respondent-level values by practice by survey year. In calculation of these means, responses were weighted to account for survey design and non-response, using the weights given in the GP Patient Survey datasets (*section 3.2.4*). The resulting continuous variables had hypothetical ranges from 0, when all respondents selected the most negative response option, to 100, when all selected the most positive option. I used these continuous variables as well as categorical fifths of the weighted practice-level means (in separate models) when estimating associations with rates of A&E visits and emergency admissions. Use of categorical variables allowed non-linear relationships to be observed (if any) and helped with the interpretation of the magnitudes of associations.

^h An alternative modelling approach was to include each of the 12 patient experience measures from *chapter 5* as separate predictor variables. Limitations of this approach include potential problems with multicollinearity and difficulties in translating results into absolute changes in A&E visits and emergency admissions in ways that make practical sense. For example, policy is unlikely to focus on the helpfulness of receptionists independently of trying to improve experiences of making appointments generally. In contrast, I have focused on three broad, important, and empirically distinct variables that can focus policy and allow results to be interpreted easily.

Practice Characteristics

The Health and Social Care Information Centre provided data on the number and age-gender distribution of patients registered to each general practice; I received data for 2011 and 2012 by email and downloaded the 2013 data¹⁴⁴ online. Data extracts were for 30th September in each year. I coded the age-gender distribution of each practice's population as percentages for 14 age-gender bands¹⁶³ (male and female; 0 to 4 years, 5 to 14 years, 15 to 44 years, 45 to 64 years, 65 to 74 years, 75 to 84 years, 85 years or more), as determined by the Health and Social Care Information Centre's categorisation of data.ⁱ

The 2011 Census provided data on the ethnicity profiles of each LSOA in England.¹⁶⁴ I calculated the percentages of a practice's registered population of various ethnicities (white, mixed, Asian, black, and other) as the weighted sums of the percentages for each LSOA in which a practice had registered patients.^j The weights were the proportions of each practice's population living in each LSOA.^{150 164} The analysis assumed that the ethnicity profile of each practice was constant over the study period (time invariant), because of data availability.

The Index of Multiple Deprivation 2010 domain scores for each practice were calculated as the weighted sum of the scores for each LSOA in which a practice had registered patients.¹⁴⁹ The weights were the proportions of each practice's population living in each LSOA.¹⁵⁰ The seven Index domains were: income deprivation; employment deprivation; health deprivation and disability^k; education, skills, and training deprivation; barriers to housing and services; crime; and living environment deprivation. These measures were time invariant.

Quality and Outcomes Framework data on the intermediate clinical outcomes of patients registered to each general practice were obtained from the Health and Social Care Information Centre, for each year of the study period.^{146 165 166} *Chapter 4* stated that the intermediate outcome measures are those most highly correlated with patient experience, though the correlations are weak (Spearman rank correlations < 0.18).¹²⁸ Moreover,

ⁱ I used the male 15 to 44 category as the reference variable as it had the greatest mean value; I excluded it when estimating associations to prevent perfect multicollinearity among the age-gender variables. The residual multicollinearity that existed among the rest of the age-gender variables was not a problem in this analysis as they only acted as control variables; coefficients for the patient experience measures are unaffected.

^j The white ethnicity category was the reference variable (using the same logic as for the age-gender variables).

^k This domain is partly based on rates of emergency admissions (one of the outcome measures). The weight given to these rates in this domain is relatively small (0.19 out of a total weight of 1) however, and the results do not change significantly if this domain is omitted from the models.

intermediate outcome measures have shown associations with rates of emergency admissions in previous research, whereas process measures tend not to.^{21 22 28 163} I used a composite measure of performance calculated as the weighted sum of achievement^l on intermediate outcome measures, using the relative number of points for each measure as the weights.^{128 147}

I obtained data on the contract type of each practice as of September in each study year. Data for 2011 and 2013 were available online;^{144 167} 2012 data were received by email from the Health and Social Care Information Centre. I also analysed the urban-rural classification¹⁵¹ and Clinical Commissioning Group of each practice, based on postcodes.¹⁴⁸

I deterministically linked Hospital Episode Statistics data, patient experience measures, and practice characteristics using practice Organisation Data Service codes. Few practice-years present in the GP Patient Survey data were not present in the other datasets (0.2%).

Statistical Methods

All statistical analysis was conducted using Stata (version 13.1).¹⁵² Descriptive statistics included all eligible practice-years (23,875 for 8,124 practices). When estimating associations between variables, estimation of a given model used only practice-years without missing data for any of the variables included in that model; the numbers of practice-years used to estimate models are given in the footnotes of results tables.

I estimated associations between the patient experience measures and rates of A&E visits and emergency admissions in Poisson regression models.^m The outcome variable in these models was either the number of A&E visits or the number of emergency admissions by the registered population of a practice in a given year. Each model was estimated, in turn, for A&E visits and emergency admissions. Models included the natural logarithm of the number of patients registered to each practice as an offset term, with its coefficient constrained to 1, so that the estimated coefficients represented associations with rates of the outcomes (rather

^l Achievement was calculated as the percentage of a practice's population, p , that attained outcome i in a given year, t , as $N_{pit}/(D_{pit}+E_{pit})$ where N is the number of patients attaining the outcome, D is the number of patients deemed eligible for outcome i and E is the number exception reported. There were 13 individual outcome measures, relating to blood pressure, cholesterol, blood glucose, and epileptic seizures (see *appendix 3*).

^m Previous studies have often used negative binomial regression in this context to account for overdispersion in the outcome variable. Poisson regression is still consistent under this scenario, but the standard errors may be biased; I accounted for this by calculating robust standard errors (rather than model-based ones).

than numbers).^{23 163} I present exponentiated coefficients, referred to as rate ratios (RRs), with $100*(RR-1)$ equalling the percentage change in the rate of A&E visits or emergency admissions resulting from a specified change in an explanatory variable.

Models included a random intercept at the general practice level to account for repeated observations on the same practices. Coefficients were therefore estimated using both variation in measures between practices and variation in measures within practices (between years) over the study period. Consequently, associations are partly adjusted for potential confounders that are unobserved and are constant within practices over time. I present 95% confidence intervals derived from standard errors that are robust to heteroskedasticity.

In multivariable analyses, I entered patient experience measures into models as explanatory variables simultaneously, along with the practice characteristics detailed above. Each model was estimated four times: once with all experience measures coded as continuous variables and three times each with only one of these measures coded as categorical fifths. The measures were treated as categorical variables in turn, rather than simultaneously, to minimise confounding. All observed practice characteristics were adjusted for as their purpose was to reduce confounding, despite increasing model complexity.

The variables for a practice's contract type and urban/rural location were categorical, and models included 210 dummy variables for the Clinical Commissioning Group area of a practice's location (with one reference group). Models also included either the mean A&E visit rate or mean emergency admission rate for each practiceⁿ in the three financial years preceding the study period (2008-09, 2009-10, and 2010-11).^{163 168} These pre-sample mean rates are intended to control for unobserved characteristics of practices that do not vary over time and affect use of emergency hospital services. I standardised all continuous variables to have a mean equal to zero and a standard deviation equal to one, so that the estimated coefficients could be interpreted in terms of a standard deviation change in these variables. This allowed strengths of associations to be compared across patient experience measures.

I used the coefficients estimated for the regression models to calculate absolute differences in numbers of A&E visits and emergency admissions with specified changes in patient

ⁿ The mean A&E visit rate was included when A&E visits were the outcome variable, and the mean emergency admission rate was included when emergency admissions were the outcome variable.

experience^o; these changes were half and one standard deviation increases in experience measures consistently associated with the outcome variables. I converted differences in numbers of visits and admissions into provider costs using NHS reference costs.¹⁶⁹

Sensitivity Analysis

Five sensitivity analyses explored how results changed with different model specifications. The first analysis included visits to emergency departments only in the outcome variable, in line with previous research.²³ The second sensitivity analysis included all types of A&E department in the outcome variable, but only A&E visits and emergency admissions for patients aged 18 years old or over were included, in line with the GP Patient Survey sample.

Chapter 3 discussed adjusting practice-level patient experience measures for the case-mix of survey respondents (*section 3.2.3*). Such adjustment is necessary if inequalities in experiences between patient groups are an artefact of the GP Patient Survey. If inequalities solely reflect true differences in experiences, case-mix adjustment is unnecessary. The correct explanation is likely to lie between these two extremes. A third sensitivity analysis therefore used a different method to create the practice-level experience measures which accounted for respondent case-mix. These measures were predictions of practice-level random effects after estimating random-effects linear regression models with patient experience measures as the outcome variables and patient characteristics as control variables.^{128,p} *Section 3.2.3* explained that case-mix adjusted values are not too different from unadjusted ones for most practices,¹²⁷ so the results of this sensitivity analysis should be similar to the main results.

The fourth sensitivity analysis adjusted for additional variables; these were the practice prevalence of 21 conditions recorded via the Quality and Outcomes Framework,^{146 165 166} the weighted percentage of GP Patient Survey respondents who knew how to contact an out-of-hours GP service, the measure of relational continuity of care examined in *chapter 5*, and the

^o For example, the estimated change in the number of A&E visits when all practices improved their mean experience of making appointments by one standard deviation was calculated as $\sum_{p=1}^P (e^{\beta} - 1) \times x_p$, where P denotes the number of general practices, β is the estimated coefficient for experience of making an appointment, and x_p is the predicted number of A&E visits for practice p .

^p The six patient characteristics used as control variables were the same as in previous chapters: age group, gender, ethnic group, Index of Multiple Deprivation fifth, ability to take time off work to see a GP, and confidence in managing own health.

number of full-time equivalent GPs per 1,000 registered patients.^{144 170 171} These variables have been associated with use of emergency hospital services in some previous studies.

The fifth sensitivity analysis used only within-practice variation in variables to estimate associations in Poisson regression models; these models also included indicator variables for survey year. This analysis removed the possibility of confounding by practice characteristics that do not vary between the three years of the study period, in addition to the national time trend in rates of A&E visits and emergency admissions.^q

6.2 RESULTS

Table 6.1 describes outcome and patient experience measures in the 23,875 practice-years eligible for analysis. The mean rate of A&E visits increased from 310.3 to 324.4 per 1,000 registered patients from 2011-12 to 2013-14. The mean rate of emergency admissions increased from 98.8 to 102.9 per 1,000 registered patients. Total numbers of A&E visits and emergency admissions increased from 16,413,581 to 17,352,774 and from 5,353,777 to 5,647,655, respectively, in the sample.^r Trends in patient experience were in the opposite direction: the means for experience of making an appointment, satisfaction with opening hours, and overall experience decreased in successive years (*table 6.1*).

^q I chose not to estimate associations using within-practice variation only in the main analysis because large percentages of changes in practice-level patient experience between years are random variation. This has the effect of attenuating associations estimated in regression models.

^r Total numbers of A&E visits and emergency admissions recorded in Hospital Episode Statistics increased from 17,619,708 to 18,517,381 and from 5,631,572 to 5,819,106, respectively, from 2011-12 to 2013-14.

Table 6.1 Descriptive Statistics for Rates of A&E Visits and Emergency Admissions and for Patient Experience Measures for General Practices in England, 2011-14

	Mean	SD	Minimum	Maximum
2011-12 (n=8,075)				
Rate of A&E visits	310.3	107.2	26.6	1194.3
Rate of emergency admissions	98.8	27.5	15.0	413.2
Experience of making an appointment	77.8	8.5	40.2	98.2
Satisfaction with opening hours	79.4	6.1	46.8	98.7
Overall experience	82.8	6.1	55.5	98.3
2012-13 (n=7,950)				
Rate of A&E visits	324.4	115.0	36.3	1318.2
Rate of emergency admissions	100.3	26.9	3.0	405.9
Experience of making an appointment	76.0	9.2	34.4	99.2
Satisfaction with opening hours	78.5	6.3	47.1	98.5
Overall experience	81.7	6.5	49.1	99.1
2013-14 (n=7,850)				
Rate of A&E visits	324.4	109.7	19.4	1157.0
Rate of emergency admissions	102.9	26.8	3.8	339.5
Experience of making an appointment	74.8	9.5	30.3	99.0
Satisfaction with opening hours	76.6	6.6	46.0	98.5
Overall experience	81.1	6.7	46.9	98.7

A&E: accident and emergency; SD: standard deviation

Total number of practices across period is 8,124.

Rates of A&E visits and emergency admissions are numbers per 1,000 registered patients.

Table 6.2 describes continuous variables used to control for confounding. Mean rates of A&E visits and emergency admissions from 2008-09 to 2010-11 (the pre-sample period) were less than in the study period. Most practices were in urban areas (85.7% of practice-years) and had a General (55.3%) or Personal (40.6%) Medical Services contract.^s

Table 6.2 Descriptive Statistics for Continuous Characteristics of General Practices in England, 2011-14, and Pre-Sample Rates of A&E Visits and Emergency Admissions

	Mean	SD	Minimum	Maximum
Rate of A&E visits, 2008-11	275.6	107.1	15.9	3,769.2
Rate of emergency admissions, 2008-11	98.6	30.3	21.5	846.2
Number of registered patients	6,940.3	4,219.9	1,001	52,609
Percentages of patients by age-gender (%):				
Male, 0 to 4	3.1	0.9	0.2	9.2
5 to 14	5.8	1.2	0.2	14.4
15 to 44*	20.9	4.7	8.8	60.5
45 to 64	13.0	2.2	1.7	25.4
65 to 74	4.2	1.6	0.1	11.7
75 to 84	2.4	1.0	0.0	8.5
85 or over	0.7	0.4	0.0	3.7
Female, 0 to 4	3.0	0.9	0.1	8.7

^s Other contract types were Alternative Provider Medical Services (2.9%) and Primary Care Trust Medical Services (1.2%).

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5 to 14	5.5	1.2	0.2	14.8
15 to 44	20.1	4.1	8.9	54.6
45 to 64	12.4	2.5	1.2	19.2
65 to 74	4.4	1.6	0.1	13.2
75 to 84	3.0	1.2	0.0	9.8
85 or over	1.4	0.7	0.0	8.2
Percentages of patients by ethnicity (%):				
White*	83.3	19.7	9.7	99.6
Mixed	2.4	1.8	0.2	11.3
Asian	9.1	13.3	0.1	76.3
Black	4.0	6.7	0.0	46.1
Other	1.2	1.8	0.0	18.8
QOF achievement	74.6	5.1	39.8	97.2

Data are for 23,875 practice-years and 8,124 practices.

A&E: accident and emergency; QOF: Quality and Outcomes Framework; SD: standard deviation

Other variables adjusted for in regression models were Index of Multiple Deprivation domain scores, practice contract type, urban/rural location, and Clinical Commissioning Group.

Statistics for Index of Multiple Deprivation domains have no natural interpretation (mean, SD): Income (0.16, 0.09); Employment (0.11, 0.05); Health and Disability (0.09, 0.72); Education, Skills and Training (23.08, 13.79); Barriers to Housing and Services (22.33, 8.73); Crime (0.08, 0.62); Living Environment (23.77, 13.36).

*Variables used as reference categories in regression models and therefore omitted in model estimation.

Table 6.3 shows that increases in each patient experience measure were associated with lower rates of A&E visits before adjusting for other variables. In the multivariable analysis, the rate of A&E visits was associated with mean practice experiences of making an appointment only, independently of the variables controlled for. A standard deviation increase in the experience of making an appointment measure predicted a 2.7% decrease (RR=0.973; 95% CI: 0.966 to 0.979) in the rate of A&E visits. There was no evidence of an association for satisfaction with opening hours (RR=1.001; 95% CI: 0.996 to 1.005; $P=0.788$) or overall experience (RR=1.003; 95% CI: 0.997 to 1.010; $P=0.260$). *Table 6.3* shows the corresponding associations when patient experience measures were coded as categorical fifths; the adjusted rate in the fifth of practices providing the best mean experiences of making an appointment was, on average, 3.5% lower (RR=0.965; 95% CI: 0.952 to 0.979) than in the fifth providing the worst mean experiences.

Table 6.3 Associations between Rates of A&E Visits and Fifths of Experience of Making an Appointment, Satisfaction with Opening Hours, and Overall Experience for General Practices in England, 2011-14

	Mean A&E visit rate	Unadjusted RR (95% CI)	Adjusted RR (95% CI)
Experience of making an appointment			
30.3 to 68.8	343.2	1 (ref.)	1 (ref.)
68.8 to 74.5	324.7	0.980 (0.972 to 0.987)***	0.991 (0.983 to 0.999)*
74.5 to 79.2	319.7	0.965 (0.957 to 0.974)***	0.983 (0.973 to 0.993)***
79.2 to 84.1	313.1	0.948 (0.939 to 0.957)***	0.974 (0.962 to 0.985)***
84.1 to 99.2	296.7	0.933 (0.922 to 0.943)***	0.965 (0.952 to 0.979)***
Satisfaction with opening hours			
46.0 to 73.0	320.1	1 (ref.)	1 (ref.)
73.0 to 77.0	314.9	0.984 (0.978 to 0.990)***	0.999 (0.993 to 1.005)
77.0 to 80.1	315.8	0.972 (0.966 to 0.978)***	0.998 (0.992 to 1.005)
80.1 to 83.6	315.2	0.966 (0.959 to 0.973)***	1.001 (0.993 to 1.009)
83.6 to 98.7	332.5	0.954 (0.944 to 0.963)***	0.999 (0.989 to 1.009)
Overall experience			
46.9 to 76.7	345.5	1 (ref.)	1 (ref.)
76.7 to 80.9	330.0	0.984 (0.977 to 0.992)***	1.003 (0.995 to 1.011)
80.9 to 84.1	320.6	0.974 (0.966 to 0.982)***	1.006 (0.997 to 1.014)
84.1 to 87.4	309.3	0.962 (0.953 to 0.971)***	1.005 (0.995 to 1.016)
87.4 to 99.1	292.6	0.951 (0.941 to 0.961)***	1.006 (0.994 to 1.019)

A&E: accident and emergency; CI: confidence interval; ref.: reference; RR: rate ratio

Mean A&E visit rates expressed as numbers per 1,000 patients.

Unadjusted rate ratios estimated using random-effects Poisson regression with no other explanatory variables.

Adjusted rate ratios estimated using random-effects Poisson regression with all explanatory variables included.

In adjusted analyses, the number of included practice-years was 23,334 (97.7% of eligible practice-years).

* $P < 0.05$; *** $P < 0.001$

Table 6.4 shows that, like for A&E visits, increases in each patient experience measure were associated with lower rates of emergency admissions before adjusting for other variables. In the multivariable analysis, experience of making an appointment was associated with the rate of emergency admissions, independently of the variables controlled for. A standard deviation increase in practices' mean experiences of making an appointment predicted a 1.7% decrease (RR=0.983; 95% CI: 0.978 to 0.988) in the rate of emergency admissions. Satisfaction with opening hours was also associated with the outcome, with an estimated 0.9% decrease (RR=0.991; 95% CI: 0.988 to 0.995) in the rate of emergency admissions for a standard deviation increase in satisfaction with opening hours. In contrast, increased overall experience was associated with slightly greater rates of emergency admissions (RR=1.007; 95% CI: 1.002 to 1.012), but this association did not remain when patient experience measures were coded as categorical fifths (table 6.4).

Table 6.4 Associations between Rates of Emergency Admissions and Fifths of Experience of Making an Appointment, Satisfaction with Opening Hours, and Overall Experience for General Practices in England, 2011-14

	Mean admission rate	Unadjusted RR (95% CI)	Adjusted RR (95% CI)
Experience of making an appointment			
30.3 to 68.8	103.1	1 (ref.)	1 (ref.)
68.8 to 74.5	100.5	0.978 (0.973 to 0.983)***	0.986 (0.981 to 0.992)***
74.5 to 79.2	100.4	0.970 (0.964 to 0.977)***	0.981 (0.975 to 0.988)***
79.2 to 84.1	100.6	0.955 (0.948 to 0.963)***	0.972 (0.964 to 0.980)***
84.1 to 99.2	98.7	0.939 (0.929 to 0.948)***	0.958 (0.948 to 0.968)***
Satisfaction with opening hours			
46.0 to 73.0	94.7	1 (ref.)	1 (ref.)
73.0 to 77.0	97.7	0.983 (0.978 to 0.988)***	0.993 (0.988 to 0.998)**
77.0 to 80.1	100.0	0.974 (0.969 to 0.979)***	0.989 (0.984 to 0.995)***
80.1 to 83.6	103.1	0.965 (0.959 to 0.971)***	0.985 (0.978 to 0.991)***
83.6 to 98.7	107.9	0.953 (0.946 to 0.960)***	0.979 (0.971 to 0.987)***
Overall experience			
46.9 to 76.7	97.8	1 (ref.)	1 (ref.)
76.7 to 80.9	100.8	0.987 (0.982 to 0.993)***	1.002 (0.997 to 1.008)
80.9 to 84.1	102.1	0.983 (0.977 to 0.990)***	1.008 (1.001 to 1.015)*
84.1 to 87.4	102.2	0.973 (0.965 to 0.980)***	1.007 (0.998 to 1.015)
87.4 to 99.1	100.4	0.963 (0.955 to 0.972)***	1.007 (0.996 to 1.017)

CI: confidence interval; RR: rate ratio

Mean emergency admission rates expressed as numbers per 1,000 patients.

Unadjusted rate ratios estimated using random-effects Poisson regression with no other explanatory variables.

Adjusted rate ratios estimated using random-effects Poisson regression with all explanatory variables included.

In adjusted analyses, the number of included practice-years was 23,334 (97.7% of eligible practice-years).

* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$

Table 6.5 presents the results of the sensitivity analysis. It shows the adjusted rate ratios for A&E visits and emergency admissions comparing the fifth of practices with the best patient experience scores to the fifth of practices with the worst scores. These results generally accord with those of the main analysis; improved experiences of making an appointment were consistently associated with reduced rates of A&E visits and emergency admissions in all analyses. The association between satisfaction with opening hours and rates of emergency admissions was attenuated when additional practice characteristics were controlled for (RR comparing highest and lowest performing fifths=0.991; 95% CI: 0.983 to 0.999) and no longer statistically significant when the model was estimated using within-practice variation only (RR=0.993; 95% CI: 0.985 to 1.002; $P=0.139$).

Table 6.5 Sensitivity Analysis: Adjusted Rate Ratios for A&E Visits and Emergency Admissions Comparing English General Practices in the Highest and Lowest Performing Fifths of Patient Experience Measures, 2011-14

	A&E visits			Emergency admissions		
	RR	95% CI		RR	95% CI	
Sensitivity analysis 1[*]						
Experience of making appointment	0.971	0.950	0.991	-	-	-
Satisfaction with opening hours	0.993	0.978	1.009	-	-	-
Overall experience	1.028	1.005	1.052	-	-	-
Sensitivity analysis 2[†]						
Experience of making appointment	0.961	0.948	0.974	0.955	0.945	0.966
Satisfaction with opening hours	0.999	0.989	1.009	0.978	0.969	0.986
Overall experience	1.004	0.991	1.016	1.011	1.000	1.022
Sensitivity analysis 3[‡]						
Experience of making appointment	0.965	0.953	0.978	0.961	0.951	0.971
Satisfaction with opening hours	0.996	0.986	1.006	0.979	0.971	0.987
Overall experience	1.002	0.990	1.013	1.003	0.993	1.013
Sensitivity analysis 4[§]						
Experience of making appointment	0.974	0.961	0.988	0.962	0.952	0.972
Satisfaction with opening hours	1.003	0.993	1.013	0.991	0.983	0.999
Overall experience	1.006	0.994	1.019	1.007	0.997	1.017
Sensitivity analysis 5^{**}						
Experience of making appointment	0.981	0.968	0.995	0.967	0.956	0.978
Satisfaction with opening hours	1.002	0.991	1.013	0.993	0.985	1.002
Overall experience	1.010	0.997	1.022	1.006	0.995	1.017

CI: confidence interval; RR: rate ratio

*Includes only visits to emergency departments (type 1 A&E departments) in the outcome variable.

†Includes only A&E visits and emergency admissions for patients aged 18 years old or over.

‡Used case-mix adjusted patient experience measures as explanatory variables.

§Adjusted for additional practice characteristics.

**Estimated using variation within practices between financial years only.

The main analysis predicted 16,686,133 A&E visits for the 7,821 included general practices in a single year. *Table 6.6* shows that when the A&E visit rate decreased by 1.4% in each practice, as estimated for a half standard deviation increase in experience of making an appointment, the national number of A&E visits decreased by 229,118 (95% CI: -283,044 to -175,015). When the A&E visit rate decreased by 2.7%, as estimated for a standard deviation increase in experience of making an appointment, the number of A&E visits decreased by 455,090 (95% CI: -561,286 to -348,195). The average cost of an A&E visit to A&E providers is approximately £132¹⁶⁹; 229,118 and 455,090 visits correspond to £30,243,576 and £60,071,880, respectively.

Table 6.6 also shows that the models predicted decreases in the national number of emergency admissions of 45,915 (95% CI: -58,942 to -32,857) and 91,443 (95% CI: -117,244 to -65,516) with half and whole standard deviation increases in experience of making an

appointment, respectively. The average cost of an emergency admission is £2,233¹⁶⁹; 45,915 and 91,443 fewer emergency admissions correspond to savings of £102,528,195 and £204,192,219, respectively.[†] The total estimated annual cost saving, for both A&E visits and emergency admissions, from a one standard deviation increase in experience of making an appointment is therefore £264,264,099.

Table 6.6 Estimated Changes in Numbers of A&E Visits and Emergency Admissions, and Associated Costs, with Half and Whole Standard Deviation Increases in Practice Mean Experiences of Making an Appointment

	Number of A&E visits	Difference in number of A&E visits (95% CI)	Difference in cost (£) (95% CI)
No change	16,686,133	-	-
0.5 SD increase	16,457,015	-229,118 (-283,044 to -175,015)	-30,243,576 (-37,361,808 to -23,101,980)
1 SD increase	16,231,043	-455,090 (-561,286 to -348,195)	-60,071,880 (-74,089,752 to -45,961,740)
	Number of emergency admissions	Difference in number of emergency admissions (95% CI)	Difference in cost (£) (95% CI)
No change	5,434,809	-	-
0.5 SD increase	5,388,893	-45,915 (-58,942 to -32,857)	-102,528,195 (-131,617,486 to -73,369,681)
1 SD increase	5,343,366	-91,443 (-117,244 to -65,516)	-204,192,219 (-261,805,852 to -146,297,228)

A&E: accident and emergency; CI: confidence interval; SD: standard deviation

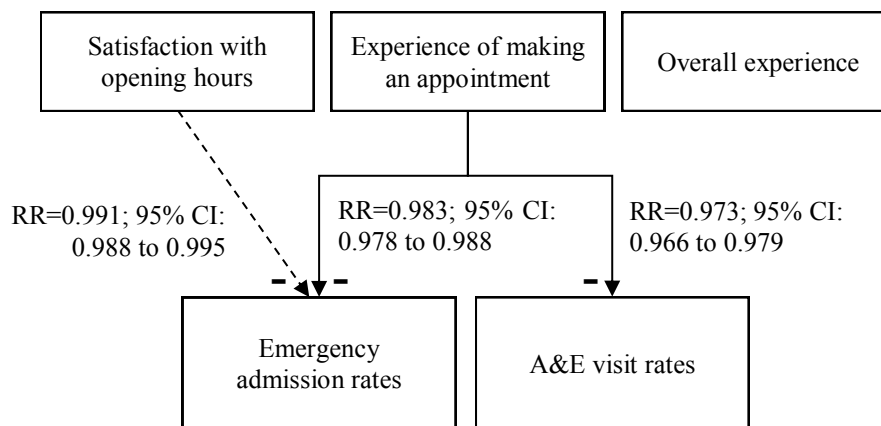
6.3 DISCUSSION

The results suggest that practices providing better experiences of making an appointment, on average, have lower rates of A&E visits and emergency admissions. This association existed before and after adjusting for several practice characteristics and remained in all sensitivity analyses. A one standard deviation increase in experience of making an appointment was associated with 455,090 fewer A&E visits and 91,443 fewer emergency admissions annually. These figures correspond to a total annual cost saving of approximately £264.3 million. Satisfaction with opening hours was not independently associated with A&E visit rates; this

[†] The cost given is for an average admission spell (within the same hospital provider); superspells (incorporating transfers between hospitals) on which the analysis is based will cost more, so the method used may underestimate the cost savings.

measure was associated with reduced admission rates, though not in the most conservative sensitivity analysis performed. Practices providing better overall experiences did not have lower rates of A&E visits or emergency admissions once experience of making an appointment, satisfaction with opening hours, and practice characteristics were adjusted for. *Figure 6.1* summarises the adjusted associations.

Figure 6.1 Summary Diagram of Adjusted Associations between Patient Experience Measures and Use of Emergency Hospital Services



A&E: accident and emergency; CI: confidence interval; RR: rate ratio. The RRs presented correspond to a standard deviation increase in an explanatory variable. The ‘-’ symbol indicates a negative association between two variables. The box at the arrowhead is the outcome variable. The box at the foot of the arrow is the explanatory variable. The arrow for the association between satisfaction with opening hours and emergency admission rates is dashed because it attenuated substantially with additional control variables (sensitivity analysis 4) and was not statistically significant using within-practice variation only (sensitivity analysis 5).

Limitations

Respondent-level data from the GP Patient Survey cannot be linked to Hospital Episode Statistics data, since patient identifiers are inconsistent between the two datasets. The analysis was therefore necessarily conducted at the practice level. The associations estimated at this level may not reflect those existing at the patient level if, for example, there are important effects of unobserved practice characteristics on the use of emergency hospital services (resulting in ecological bias).¹⁷² Variation in practice-level values of patient experience measures is not entirely due to true variation between practices and within practices across years; measurement error results from the sampling of respondents within practices (*section 3.2.4*). This will have attenuated associations in the regression models.

I controlled for possible confounding from practice-level factors by including several characteristics of practices and their populations, in addition to indicator variables for Clinical Commissioning Group and the pre-sample mean rates of A&E visits and emergency admissions. The main analysis used both between-practice and within-practice variation to estimate associations, thereby reducing the possible confounding effects of practice characteristics that do not change over time. Furthermore, the sensitivity analysis using only within-practice variation eliminates the possibility of confounding by such variables and the main finding remained—better experiences of making appointments were associated with lower rates of A&E visits and emergency admissions.

This association could still be explained by unobserved characteristics of practices that vary between years and are correlated with both experience of making an appointment and use of emergency hospital services; the analysis does not account for this form of confounding except to the extent that the unobserved confounders are associated with variables controlled for in the models. The direction and magnitude of resulting bias is unknown.

The analysis did not examine the costs of A&E visits and emergency admissions as outcome variables in the regression models; I estimated changes in costs from predicted differences in numbers of A&E visits and emergency admissions. This method is reasonable given that previous research suggests reduced hospital expenditure associated with improvements in primary care is mainly due to fewer admissions, rather than reduced costs for patients still admitted.¹⁷³ I have not addressed long-term cost differences from changes in patient experience, which may contrast with short-term differences; for example, disease prevention strategies may generate short-term cost savings that are offset by increased healthcare costs associated with longer lives and old age.¹⁷⁴

Hospital Episode Statistics records fewer A&E visits than the Weekly A&E Situation Report data collection which has complete coverage of all A&E visits across all organisations. For example, the number recorded in Hospital Episode Statistics was 83.6% of that recorded in the A&E Situation Report data in 2013-14 (18,197,530 versus 21,778,657).¹⁷⁵ If data completeness is not associated with the patient experience measures, independently of control variables such as Clinical Commissioning Group and pre-sample A&E visit averages, the association will not be biased but the 95% confidence intervals will be too wide. This is not a major concern given the large sample size; confidence intervals remained relatively narrow.

If A&E data completeness is independently associated with the patient experience measures, the estimated relationships with A&E visit rates will be biased. To assess this possibility, one of the sensitivity analyses included emergency department visits only; Hospital Episode Statistics records a similar number of these visits to the A&E Situation Report data.^{175,u} The association with experience of making an appointment remained.

Relation to Earlier Chapters

Chapter 5 suggested that variation in experience of making an appointment was primarily explained by the convenience of appointments, ease of telephone contact, and helpfulness of receptionists. Each of these measures is relevant to the conditions under which patients access their general practices. The results of the current chapter therefore highlight experiences of access as possible determinants of use of emergency hospital services. *Chapter 5* suggested that the main determinant of overall experience was the interpersonal quality of care provided by GPs; this variable is therefore unlikely to explain variation in use of emergency hospital services based on the lack of associations observed for overall experience in the current chapter. *Chapter 5* described that much variation in satisfaction with opening hours could not be explained by the patient experience measures examined (47% of between-practice variation). It is therefore more difficult to interpret the relevant findings of the current chapter in terms of experience constructs underlying satisfaction with opening hours.

Chapter 4 estimated that participation in the Extended Hours Access Scheme was minimally associated with experience of making an appointment. It is therefore unlikely that scheme participation is related to the use of emergency hospital services through the same mechanism as experience of making an appointment. While *chapter 4* did suggest a slightly larger association between scheme participation and satisfaction with opening hours, the current chapter found mixed evidence for a relationship between satisfaction with opening hours and use of emergency hospital services; this relationship was restricted to emergency admissions only and did not exist in the most conservative model tested. Overall, the results question whether the Extended Hours Access Scheme would be associated with rates of A&E visits or emergency admissions. It is plausible that scheme participation could affect these outcomes independently of changes in patient experience, however. I was unable to examine direct

^u In 2013-14, Hospital Episode Statistics recorded 14,310,440 emergency department visits, while Weekly A&E Situation Report data recorded 14,213,148 emergency department visits.

associations between scheme participation and use of emergency hospital services within the course of my PhD studies due to delays in accessing Hospital Episode Statistics data; these associations are a potential topic for future research.

Possible Explanations

Chapter 2 introduced several ways that access to general practice, and the circumstances under which it may be accessed, could affect use of emergency hospital services. These included that: some patients who are unable to get a suitable general practice appointment could then visit an A&E department; some patients may visit an A&E department straight away if they have had negative experiences of trying to get an appointment previously or expect that they would not be able to get a suitable appointment this time; and some patients' conditions might worsen without ready or convenient access to general practice such that their risk of requiring emergency hospital care increases. Each of these mechanisms could contribute to the associations observed between experience of making an appointment and rates of A&E visits and emergency admissions.

Overall experience, mainly explained by GP interpersonal quality of care, was not associated with the outcome measures. A plausible hypothesis is that high interpersonal quality could act as an incentive for patients to see a GP rather than visit their A&E department, such that it could affect use of emergency hospital services. It might also be that a better doctor-patient relationship facilitates improved technical quality of care which could then reduce patients' need for emergency care. The results provide no support for these hypotheses, however. Patients may choose which setting to seek care in based primarily on the broad characteristics of that setting, rather than expectations about the care likely to be received.

Satisfaction with opening hours was associated with rates of emergency admissions in the main analysis and in all sensitivity analyses apart from the most conservative model specification. In this model, the possibility of confounding by time-invariant practice-level factors and the national time trend was removed. Therefore, it might be that the associations between satisfaction with opening hours and emergency admissions are due to residual confounding. There was no evidence of an association between satisfaction with opening hours and rates of A&E visits; if there was a true association with emergency admissions, the

results suggest this is due to changes in the percentage of A&E visits that result in admission or the number of admissions via other methods, such as direct admission via a GP.

Relation to Existing Literature

The results are consistent with three observational studies^{23 27 30} that have previously investigated associations between patient experience measures from the GP Patient Survey and rates of A&E visits in the national adult population. The specific measures used differ between the three studies, and to those used in the above analysis, but they each suggest an association between lower rates of A&E visits and higher scores on measures relating to access.^v A further national study¹⁰² investigated this association while only including A&E visits for patients aged less than 15 years old in the outcome; this study also estimated a negative relationship between the measure of access examined^w and A&E visit rates. These studies used similar designs based on variation between practices nationally in a given year. Two regional studies,^{104 105} again using a similar design, did not produce results consistent with the national analyses; this could reflect variation in results by region, a lack of statistical power, and variation in model specification.

A series of studies^{19-22 26 28 29} has investigated associations between access-related measures from the GP Patient Survey and rates of emergency admissions for specific conditions.^x The study designs were similar to the analyses of A&E visits and the analysis presented in this chapter. The studies focused on two measures, relating to patients' abilities to get appointments within two weekdays and more than two days ahead; at least one of these measures was negatively associated with admission rates in each of the studies. Other national analyses suggest that for patients registered to more accessible general practices: the probability of having an emergency admission, versus elective admission, for cancer is lower¹⁸; and the probability of having an emergency admission via an A&E department, versus directly via a GP, is lower.²⁴ The results of a regional analysis¹⁰⁶ were inconsistent with the national analyses, as for the corresponding analysis of A&E visits,¹⁰⁵ suggesting no association between rates of emergency admissions and access-related measures.

^v These measures include the percentage of a practice's population able to see a GP within two weekdays and the percentage that was able to get an appointment to see or speak to someone on their last attempt.

^w The percentage that was able to get an appointment to see or speak to someone on their last attempt.

^x Chronic obstructive pulmonary disease, asthma, heart failure, diabetes complications, epilepsy, dementia, and stroke.

Future Research

The study suggests an association between patients' experiences of making appointments and the use of emergency hospital services. It is plausible that this reflects a causal relationship. Attempts to reduce use of emergency hospital services could therefore consider interventions that improve experiences of making appointments. Future research might investigate which interventions achieve these improvements in different contexts. The results of *chapter 5* suggest that ensuring practices can be contacted easily, receptionists are helpful, and patients are provided with convenient appointments would be important components of these interventions. The national evaluation of the GP Access Fund could estimate programme-level effects on experiences of making appointments.

Improvements in patient experience of general practice may affect the pattern of emergency hospital service use, as well as the total amount; the percentage of admissions where patients are referred directly by their GP (rather than via A&E) may increase.²⁴ Future research could test whether rates of admissions via a GP actually increase with improved experiences of making appointments and are offset by reduced rates of admissions via A&E departments. Future work might also examine how increased use of emergency hospital services affects service performance. Relevant outcomes include process measures, such as waiting times, and measures of in-hospital patient experience. Services operating above their intended capacities may be unable to maintain normal care quality, so clinical outcomes could worsen.

Alternative codings of the patient experience measures could be explored. For example, the percentage of a practice's population that selects the most negative response category could better predict use of emergency hospital services than the averaged responses. Further studies may also seek to understand what 'types' of A&E visits and emergency admissions are associated with patients' experiences of making appointments. Current lists of so-called 'ambulatory care sensitive conditions'¹⁷⁶ are based mainly on expert consensus, rather than empirical investigation. Analyses could be stratified by condition to explore whether associations exist for a much larger range of conditions than previously thought relevant. Policy makers are likely to still consider the impact of interventions in terms of all emergency service use, however. It is the implications of the thesis for policy that the next and final chapter discusses.

SUMMARY

This chapter provides evidence that practices with better mean experiences of making appointments have lower rates of A&E visits and emergency admissions. The estimated magnitudes of the associations were quite small, meaning that the relative reductions in rates appear modest. These relative differences correspond to non-trivial absolute reductions, under the modelled scenarios, in costs of A&E visits and emergency admissions, however. It is likely that the associations are explained by variation in whether patients are able to get convenient appointments, easily contact their practice, and speak with helpful receptionists. The results provide mixed evidence of a relationship between satisfaction with opening hours and use of emergency hospital services. There was no evidence that patients' overall experiences were associated with rates of A&E visits or emergency admissions independently of other experience measures.

7

Discussion

I reviewed the policy and research contexts of the thesis, detailed the methods of the GP Patient Survey, and reported three original studies in previous chapters. The discussion sections of *chapters 4, 5, and 6* considered these studies' limitations and relations to existing literature; I also suggested possible explanations for results and suitable areas for future research. The current chapter provides a more general discussion of the thesis as a whole, particularly in its relation to policy. This chapter also concludes the thesis.

Section 7.1 reviews the main points of the thesis by chapter. *Section 7.2* discusses the implications for policy, while assuming that research is a legitimate input to policy decisions. I suggest caution towards the Government's expectations that existing plans will significantly improve patient experience, reduce use of emergency hospital services, and reduce net NHS costs. *Section 7.3* highlights limitations of the thesis in being able to inform policy. One of these limitations is that the policy and political context described in *chapter 1* may reduce the role of evidence in policy-making. *Section 7.4* revisits this policy context to acknowledge the multiple forces influencing policy. *Section 7.5* outlines directions for future research drawing on suggestions from previous chapters. I state my final conclusions in *section 7.6*.

7.1 REVIEW OF THESIS

Chapter 1 described the policy context of the thesis. It introduced Government plans to improve access to general practice, including the commitment that everyone will be able to see a GP between 8 a.m. and 8 p.m., seven days a week, by 2020. *Section 1.1* reviewed the development of the GP Access Fund as the main policy used to support extended opening hours, in addition to other changes like greater use of GP triage systems. Pilot schemes were designed and managed locally, with funding decided centrally. Government aims for these schemes included improvements in patient experience, reduced use of emergency hospital services, and new working arrangements between practices. A voluntary contract to support GPs in providing care seven days a week is intended to be available by April 2017. *Section 1.2* highlighted a political interest in related policy, as shown by pledges at political party conferences and in election manifestos. The Government's exact plans for opening hours are now relatively unclear, since several policy documents phrase related targets differently. Policy rhetoric has focused on working people.

Section 1.3 explained that these plans are part of wider attempts to make NHS services more consistent throughout the week, including in hospitals. The Government also sees the GP Access Fund as part of a broader strategy to increase the capacity of out-of-hospital care. New models of primary care organisations are central to this strategy. The Royal College of General Practitioners opposes plans for general practice to offer services seven days a week. *Section 1.4* suggested that policy to extend opening hours could be seen as an incremental progression of several initiatives to improve access to general practice from 2000 onwards. The Extended Hours Access Scheme, introduced in 2008, remains in operation with adjustments that reflect more general policy direction, such as practices working in groups. *Section 1.5* gave examples of other countries that have implemented primary care policies that are similar to those in England.

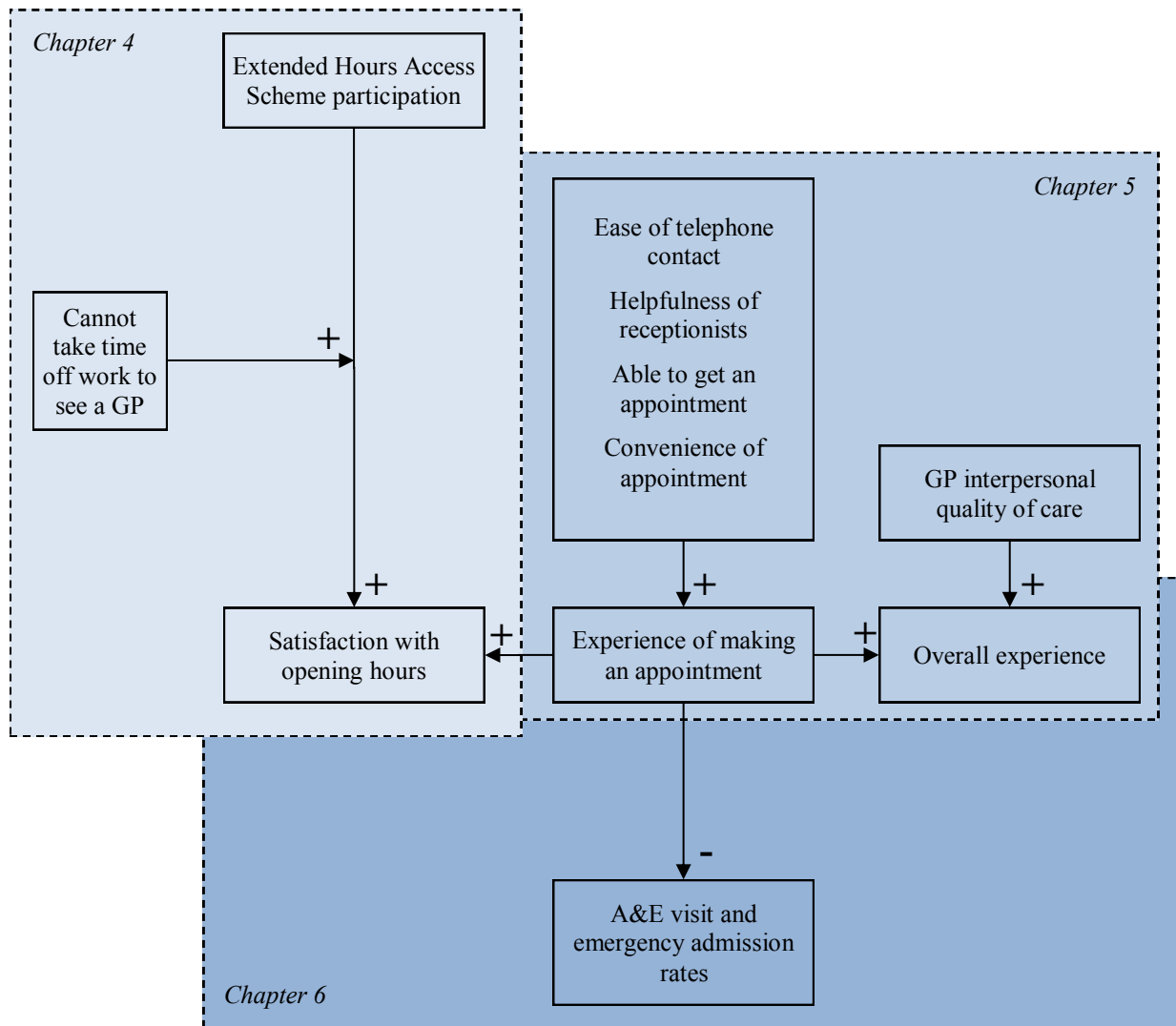
Chapter 2 reviewed the existing literature most relevant to the thesis. It first introduced the GP Patient Survey as a method of examining patient experience of general practice in England. *Section 2.1* described that most survey respondents report positive experiences of their general practices, but numerous measures of patient experience have worsened from 2011-12 to 2014-15. For example, 84.1% of weighted respondents were very or fairly

satisfied with opening hours in 2011-12, but this figure decreased to 78.5% in 2014-15. Some respondent groups, including those unable to take time off work to see a GP, report substantially worse experiences across several measures. Previous analysis of the GP Patient Survey suggests that overall satisfaction is most strongly associated with GP interpersonal quality of care, but this analysis did not examine policy-relevant factors such as satisfaction with opening hours and experiences of making appointments. This is the first gap in existing literature addressed by the original studies presented in this thesis.

Section 2.2 described studies linking GP Patient Survey and administrative hospital data to investigate associations between patient experience and use of emergency hospital services. Measures related to access are often negatively associated with rates of A&E visits or emergency admissions in these studies; a limitation is that the total absolute effects across all use of emergency hospital services had not been estimated. This is the second gap in existing literature addressed by my original studies. *Section 2.3* explained that the national evaluation of the GP Access Fund's first wave had several limitations that question the validity of estimated effects at the programme level. Moreover, it was unable to assess the independent effects of individual interventions, such as extended opening hours, because pilot schemes often introduced several interventions simultaneously. Two studies have examined separate policies to extend opening hours in London and Manchester, but the generalisability of results is unclear. The effects of extended hours policies nationally are largely unknown, including effects on patient experience. I highlighted this as a third gap in existing literature that a later research chapter aimed to address.

Chapter 3 focused on study methods relevant to each of the three original research chapters, particularly the GP Patient Survey. *Section 3.1* discussed my use of the terms 'access', 'opening hours', and 'patient experience'. *Section 3.2* described the design of the GP Patient Survey and highlighted satisfaction with opening hours, experience of making an appointment, and overall experience as policy-relevant measures. I discussed adjusting for respondent characteristics in respondent-level and practice-level analyses and explained how possible sources of bias may affect results. *Section 3.3* stated aims and objectives for the thesis as a whole.

Chapters 4, 5, and 6 presented original research. *Figure 7.1* summarises the directions of the main associations reported in these chapters.

Figure 7.1 Schematic Diagram of the Main Associations from *Chapters 4, 5, and 6*

The '+' symbol indicates a positive association (or positive interaction) between two variables, and the '-' symbol indicates a negative association. The box at the arrowhead is the outcome variable. The box at the foot of the arrow is the explanatory variable.

Chapter 4 examined associations between participation in the Extended Hours Access Scheme and patient experience. The study design was a cross-sectional, multilevel analysis of respondent-level data from the GP Patient Survey linked to practice-level data on scheme participation and other characteristics. The study year was 2013-14. Most practices (71%) participated in the Extended Hours Access Scheme in this year, and measured characteristics of respondents and practices were generally similar between participation groups. Random-effects linear regression estimated that participating practices had a slightly greater mean satisfaction with opening hours and marginally greater means of experience of making an appointment and overall experience, independently of the respondent and practice characteristics adjusted for.

The association varied by work status for satisfaction with opening hours only; the greatest mean differences were for patients who were unable to take time off work to see a GP, while patients not working had the smallest differences. All associations were typically modest in each region of England. Several respondent characteristics, such as younger age and inability to take time off work to see a GP, were associated with substantially worse experiences, consistent with previous research. The findings provide the first national evidence on the effects of a policy to extend opening hours on patient experience.

Chapter 5 examined associations between patient experience measures in the GP Patient Survey. The study design was a cross-sectional, multilevel analysis of respondent-level data from the GP Patient Survey 2011-14. Fixed-effects linear regression models estimated that overall experience was most strongly associated with GP interpersonal quality of care, which agrees with past research. I extended previous work by analysing satisfaction with opening hours and experience of making an appointment; these measures were also associated with overall experience but less strongly than GP interpersonal quality of care. Models explained almost all variation between practices in overall experience; this also applied to experience of making an appointment which was most strongly associated with being able to get an appointment, appointment convenience, receptionist helpfulness, and ease of telephone contact. Models explained much less variation in satisfaction with opening hours.

I suggested that satisfaction with opening hours, experience of making an appointment, and overall experience are three distinct constructs with different main determinants. The effects of interventions are therefore likely to differ across these GP Patient Survey measures, as was the case for participation in the Extended Hours Access Scheme in *chapter 4*.

Chapter 6 investigated associations between patient experience and rates of A&E visits and emergency admissions. The study design was a repeated cross-sectional time series analysis of the GP Patient Survey linked with Hospital Episode Statistics data and routine data on practice characteristics for 2011-12 to 2013-14. The units of analysis were practice-years. Random-effects Poisson regression estimated that practices providing better experiences of making an appointment on average had lower rates of A&E visits and emergency admissions, across all model specifications. Greater satisfaction with opening hours was associated with lower rates of emergency admissions (but not A&E visits) in certain models, though this

relationship did not exist in the most conservative sensitivity analysis. Overall experience was not associated with either outcome in multivariable analyses.

The main analysis predicted 455,090 fewer A&E visits and 91,443 fewer emergency admissions annually if all practices had mean experiences of making appointments that were one standard deviation greater than those observed. This would reduce associated costs to service providers by approximately £264 million per year. The study provides the first estimates of total absolute changes in numbers of A&E visits and emergency admissions with specified changes in patient experience. *Chapter 5* showed that variation in experience of making an appointment between practices is almost entirely explained by the ease of telephone contact, helpfulness of receptionists, and ability to get a convenient appointment. These variables may affect use of emergency hospital services.

7.2 POLICY IMPLICATIONS

Worsening patient experience of general practice, whether due to changing patient expectations or differences in general practice, could be seen as a problem by policy makers (*section 2.1.1*). The inclusion of measures of overall experience and experience of making appointments in the NHS Outcomes Framework¹²⁶ implies that decreases in these measures are important to the NHS. The Secretary of State has further justified plans in terms of particular benefits to working people (*table 1.1*). The worse experiences that this group reports (*section 2.1.2*) conflicts with egalitarian NHS principles. Moreover, *section 2.2.1* gave several reasons why increasing use of emergency hospital services might be problematic and how changes in access to general practice may moderate this trend. Problems can therefore be defined, supporting policy action to some extent. How to resolve these problems is less clear.

7.2.1 Extended Opening Hours

Associations between Extended Hours Access Scheme participation and patient experience measures had small magnitudes. *Chapter 4* discussed several possible explanations for this,

including that the study design may have been unable to detect the true causal effects of scheme participation. However, the results suggested that associations for satisfaction with opening hours varied by employment category, and a plausible causal mechanism exists for this finding.^a A causal interpretation is also supported by the specificity of this effect moderation to satisfaction with opening hours; this variable directly addresses opening hours whereas experience of making an appointment and overall experience are likely affected by several factors that do not change with extended opening hours. It is therefore reasonable to discuss the associations in terms of causal effects when discussing their policy implications.

One explanation for the modest associations relates to the design of the Extended Hours Access Scheme; scheme requirements may not result in changes that substantially improve patient experience. Participating practices have to provide consultations for at least 30 minutes per 1,000 patients each week outside of core times. For an average practice, this equates to an extra 3 hours and 45 minutes of consultation time. As discussed in *chapter 4*, a participating practice could extend its opening hours by the same amount, with just one clinic running; opening hours would extend by 7% over core times (56 hours and 15 minutes versus 52 hours and 30 minutes). The relative change in consultation time is likely to be less than this, however, as several consultations typically run simultaneously within core times. As the scheme's minimum requirement now relates to consultation time (rather than a number of extended hours), the relative change in opening hours could also be less if extra appointments are provided concurrently rather than successively.

Several other revisions to the scheme have relaxed its requirements, such as allowing staff other than GPs to provide the additional appointments and, since 2014-15, allowing different modes of consultations and practices to work in groups to meet the time requirements. Investment has also reduced from £3.00 to £1.90 per registered patient (*table 1.3*). It may be that strengthening the requirements of the Extended Hours Access Scheme would increase its effects on patient experience. This could include increasing the minimum time commitment above 30 minutes per 1,000 registered patients per week. It is unclear how large any changes to the scheme would need to be to produce the desired improvements in patient experience, and at what effect the scheme could be considered cost-effective.

^a Patients not in work may benefit little from extended opening hours as they likely find it relatively easy to visit their general practices during core hours. Working people should benefit more because of the inconvenience or financial loss of arranging time off work to receive care. Those who cannot take time off work should benefit the most, as it increases the level of service provided during the only times in which they can use it.

The findings are relevant to the GP Access Fund. As discussed in *chapter 4*, the evaluation of the first wave suggested that medium-sized pilot schemes provided, on average, 41 minutes of extended opening hours per 1,000 registered patients each week. It also advised that, since only 75% of related appointments were utilised, around 30 minutes of extended hours per 1,000 patients could maximise utilisation. This is the minimum requirement of the Extended Hours Access Scheme alone. These figures question whether extended opening hours in the GP Access Fund will have substantial effects on patient experience; the effects may be more similar to those of the Extended Hours Access Scheme. Other interventions trialled in GP Access Fund schemes could have greater effects on patient experience, however, and other rationales for this policy exist. Policy makers should not be surprised if planned changes to opening hours do not substantially improve patient experience.

Even with greater changes to opening hours, results for the Extended Hours Access Scheme suggest that any benefits may be restricted to satisfaction with opening hours, with possibly little effect on overall experience. Policy makers will need to consider whether this would be sufficient to justify the policy. The NHS Outcomes Framework does not include satisfaction with opening hours; overall experience and experience of making an appointment are the two measures used to assess patient experience of general practice. Benefits may also be largely limited to working people (57.1% of weighted GP Patient Survey respondents), particularly the minority group unable to take time off work to see a GP (18.7%).

7.2.2 Determinants of Experiences

Policy makers should consider interventions besides those designed to improve access if they aim to increase overall experience. One factor that is unlikely to be affected by interventions focused on access is GP interpersonal quality of care. This variable was the most strongly associated with overall experience in *chapter 5*. It was a composite of five items relating to GPs giving patients enough time, listening to them, explaining treatments, involving them in decisions, and treating them with concern. Policy that aims to improve overall experience could focus on these aspects of the GP-patient relationship. The contexts of GP work may be relevant; for example, a high workload could prevent GPs from spending enough time with patients. The characteristics of individual GPs may be more important though, as the variance

in interpersonal quality of care between doctors (within practices) is greater than the variance due to differences between practices.¹²⁹

If policy aims to improve experiences of making appointments, suitable interventions might ensure that patients can contact their practices easily by phone, speak with helpful receptionists, and book convenient appointments. These factors are likely to be interdependent and all have a role in patients' attempts to access care. Several interventions trialled in the GP Access Fund schemes are relevant, such as non-traditional modes of consultation, GP telephone triage, and online appointment booking systems. Experience of making an appointment had the second strongest association with overall experience in *chapter 5*; under a causal interpretation, the same interventions may be able to improve overall experience through enhancing experiences of making appointments. However, some interventions, such as telephone consultations, substantially change the GP-patient interaction and could reduce GP interpersonal quality of care and, in turn, overall experience. This is an example of an unintended consequence that policy makers should consider.

I expect that satisfaction with opening hours is largely influenced by the hours themselves (or their recall by patients), in addition to the experiences affected by them. This could explain why several patient experience measures explained much less variation in satisfaction with opening hours than in experience of making an appointment and overall experience. Satisfaction with opening hours may be the measure most sensitive to policy that extends opening hours, as shown for the Extended Hours Access Scheme. Policy makers could therefore adopt it as the primary outcome variable to monitor plans that extend hours. Given the prominence of these plans in NHS policy, the variable could also be suitably added to the NHS Outcomes Framework to complement experience of making an appointment and overall experience. Interventions are likely to differ in effect across these three variables.

7.2.3 Emergency Hospital Services

Practices' mean experiences of making appointments were consistently associated with rates of A&E visits and emergency admissions in all analyses. Previous research suggests that many A&E visits are preceded by unsuccessful attempts to get convenient general practice appointments each year, which is a plausible causal mechanism underlying the association for

A&E visits. *Chapter 5* showed that the ability to get an appointment and appointment convenience are important explanatory variables for experience of making an appointment. Associations with rates of A&E visits and emergency admissions were graded across fifths of this experience measure, but the relative differences were modest. It is unlikely that the results severely underestimated the true effects of improving experiences of making appointments; adjustment for possible confounders attenuated associations so any residual confounding may be more likely to bias associations away from the null.

The estimated reductions in provider costs from fewer A&E visits and emergency admissions are small compared to the annual Department of Health budget (£116 billion in 2015-16¹⁷⁷) or hospital trust deficits (£2.4 billion in 2015-16¹⁷⁸). The reductions could recover some of the spending associated with interventions that improve experiences of making appointments, however. Total funding for the GP Access Fund was £175 million across its two waves,¹⁴ which covered approximately one third of practices in England (*section 1.1*). NHS England's strategic plan for general practice suggests that over £500 million per year will be available by 2020-21 to ensure that 'everyone has access to GP services, including sufficient routine appointments at evenings and weekends'.¹⁵ This exceeds the estimated cost reduction from improving experience of making an appointment by one standard deviation (£264 million). The GP Access Fund's effect on experiences of making appointments is unknown.

Increasing experience of making an appointment by one standard deviation could be an ambitious policy goal; assuming a normal distribution,^b it is equivalent to 84% of practices having greater values of this measure than the mean value before the improvements occurred. Increases of a half standard deviation are likely more feasible in the short-term; this would result in 69% of practices having greater values than the pre-intervention mean. Policy makers should consider how likely interventions are to achieve these improvements when estimating possible benefits from reduced spending on A&E visits and emergency admissions. Mean experience of making an appointment decreased by 3.0 points, equivalent to 0.3 standard deviations, between 2011-12 and 2014-15 (*chapter 6*), so increases of this magnitude may be feasible in the short-term with suitable policies.

The Extended Hours Access Scheme is unlikely to achieve these increases, as it only had a minimal association with experience of making an appointment in *chapter 4*. Given the

^b Practice-level mean experiences of making appointments approximate a normal distribution.

similar extension of opening hours in the first wave of the GP Access Fund, I do not expect this element of pilot schemes to achieve large increases in experience of making an appointment either. Other elements of pilot schemes may contribute though and opening hours may be extended further in other waves. The results suggest caution towards the Government's expectation that planned changes to improve access to general practice will substantially relieve pressure on emergency hospital services and reduce NHS costs. *Table 7.1* summarises the main implications of the thesis for policy.

Table 7.1 Summary of Main Policy Implications

Policy implication	Summary
1. Consider revising the Extended Hours Access Scheme to increase its effects on patient experience	Satisfaction with opening hours, experience of making an appointment, and overall experience were only slightly better in practices that participated in the Extended Hours Access Scheme. A possible explanation is that the requirements of the scheme are insufficient to create large improvements in experiences.
2. Give due consideration to the interpersonal quality of care provided by GPs as a strong predictor of overall experience	If the estimated associations reflect the main determinants of overall experience, improvements in GP interpersonal quality of care may be more beneficial to patients' overall experiences than interventions that aim to improve access. A possible unintended consequence of some of these interventions, such as new consultation modes, is that the interpersonal quality of care reduces.
3. Assess satisfaction with opening hours, experience of making appointments, and overall experience using the GP Patient Survey when evaluating policy to improve access to general practice	The main explanatory variables, and amount of variation explained, differed across these measures. Interventions are therefore also likely to have varying effects on these three measures, as shown for the Extended Hours Access Scheme. Policy makers may want to consider whether improvements in one measure but not in overall experience are sufficient to support a policy.
4. Do not expect that realistic short-term improvements in access to general practice will substantially reduce use of emergency hospital services or produce net cost savings to the NHS	While practices that provide better experiences of making appointments on average have lower rates of A&E visits and emergency admissions, the magnitudes of these associations are modest. The cost reduction associated with a one standard deviation improvement in experience of making an appointment, which is an ambitious increase, is less than the £500 million per year that NHS England plan to spend on extra primary care capacity by 2020.

A&E: accident and emergency; GP: general practitioner; NHS: National Health Service

7.3 LIMITATIONS

The policy implications proposed above are based on causal interpretations of associations presented in *chapters 4, 5, and 6*. Since these associations were estimated using observational study designs, the findings are particularly susceptible to residual confounding and may be biased estimates of the true associations. I cannot be certain of the extent of bias. Policy makers should acknowledge this uncertainty and the limitations and alternative explanations of results given in previous chapters. They should also appreciate that the findings are predominantly national estimates^c and relationships are likely to differ between local areas. The research is limited by being unable to identify the contexts in which different interventions are likely to be more beneficial. The national estimates are perhaps most relevant to central policy makers in setting overall strategic direction.

Many other policy-relevant questions exist that the research cannot address. For example, it cannot suggest which interventions in the GP Access Fund are most promising or predict the effects of changes to the Extended Hours Access Scheme. *Chapter 2* explained that accurate, national data recording consultation details and opening times for each general practice do not exist, so these variables cannot be examined currently. There may be benefits to improving access to general practice that are inherently difficult to measure. For example, it may reduce patients' anxieties about their conditions if they know they can access care suitably when required. Other arguments for improved access include better coordination of care, improved health equity, and reduced mortality.¹⁷⁹ The Royal College of General Practitioners argues that Government plans could jeopardise relational continuity of care (*table 1.2*), which is an unintended policy outcome that I have not examined.

The nature of available data limited analysis to cross-sectional study designs, either with one data year or a time series. This did not allow the full dynamics of associations to be estimated. For example, I suggested in *chapter 4* that any short-term effect of participation in the Extended Hours Access Scheme on patient experience may reduce over time as it becomes normal to expect extended opening hours. It may also be more difficult to improve patient experience in practices with initially very good experiences than in those with worse

^c I also estimated associations between participation in the Extended Hours Access Scheme and patient experience by region of England (*chapter 4*).

experiences.^d This sensitivity to initial conditions is characteristic of ‘complex adaptive systems’ which healthcare has been considered an example of.^{180 181} Other properties of such systems include inherent unpredictability, high dispersion of control throughout the system, and adaptation of ‘agents’ within the system to changing conditions.^{180 181} These agents could include patients who increase their demand for services when the capacity of general practice increases (supply-induced demand). I could not examine such changes.

The points above highlight that my analyses address a limited set of questions under uncertain assumptions that simplify reality. The findings may still be valid, but a potential limitation is that they are not as policy-relevant as the thesis assumes them to be. My analysis of the policy context in *chapter 1* depends on public communication from Government and NHS bodies. If this communication does not reflect the real rationales, expectations, and intentions for improving access to general practice, then the policy relevance of the thesis could be reduced.^e The main motivations for current policy may be political rather than related to health services; key policy makers may not be interested in research findings.

7.4 POLICY CONTEXT

Chapter 1 highlighted a political interest in policy to improve access to general practice. This interest is underlined by the Government’s manifesto commitment that everyone will have access to these services from 8 a.m. to 8 p.m., seven days a week, by 2020 (*section 1.2*). Such policy is likely to be supported, or at least not opposed, by patients, as it intuitively seems like a service improvement. The commitment is therefore a possible source of Government support and may help to keep the current Government in power. Marxist theorists would frame this as a concession to an economically subordinate class that experiences worse health as a result of capitalism, possibly reducing social unrest.^{182,f} The Government is likely to act

^d This hypothesis is implied by the law of diminishing marginal returns which suggests that the marginal effect of an increase in one variable on another variable decreases as the value of the first variable increases.

^e My analysis of the policy context is likely to be affected by my research discipline of health services research. Political scientists, for example, may see the context in a different way, with effects on thesis relevance.

^f Public support for plans to improve access to general practice, or the NHS generally, could also be explained along class lines under Marxist theories.

in its own political and class interests rather than act solely as a ‘disinterested wielder of the public good’.⁴⁴ This political frame questions the relevance of research to policy decisions.

Chapter 1 explained how Government plans for extended opening hours may have changed since the manifesto commitment (*section 1.2.3*). The Secretary of State has acknowledged this commitment, however, stating that “Increasing convenience for the general public in terms of being able to make routine evening and weekend appointments is a manifesto commitment that this Government made so we have to honour that”.³³ The experiences of GP Access Fund pilot schemes, with low demand on Sundays in particular, may have contributed to any changes in plans. Alternatively, the manifesto pledge may have always been symbolic, used just to communicate that the issue is being addressed, rather than precisely how.

This notion of policy as ‘symbolic action’¹⁸³ may also apply to policy on extended opening hours and access to general practice more widely. *Section 7.2.1* argued that the Extended Hours Access Scheme and the first wave of the GP Access Fund have extended opening hours only modestly. It is questionable whether these policies can truly resolve the issues that the Government has referred to (*table 1.1*), but the policies allow the Government to be seen as trying to address certain problems while the actual focus may lie elsewhere. This focus could be the structural changes to out-of-hospital care described in *section 1.3.2*. The national evaluation of the GP Access Fund concluded that a key legacy was the new collaborations set up between general practices and other organisations to provide a wider range of services to larger populations. These technical changes are unlikely to generate public support, in contrast to the intuitive benefits of extended opening hours. There is a clear advantage of symbolising changes to general practice in terms of extended hours instead.

General practices ultimately decide the changes that are implemented (*section 1.2.4*). The GP Access Fund received 410 applications across both waves,^{8 9} with 57 pilot schemes selected, suggesting an appetite for change with additional funding. However, the experiences of schemes that reduced their hours due to low demand (*section 2.3.2*) question whether practices can feasibly open seven days a week nationally. Practices may also be influenced by large medical interest groups, such as the Royal College of General Practitioners and British Medical Association, that oppose Government plans (*section 1.3*). Under a corporatist lens, these organisations are powerful provider groups that bargain with the Government and other

central policy bodies to serve the interests of members; NHS England's strategic plan for general practice was developed 'in partnership with' the Royal College.¹⁵

These sectoral influences on policy, in addition to the systemic political influences on Government, question the possibility of rational policy-making.⁴⁴ Incrementalists would see medical corporatism and decentralised control of implementation (as above) as reasons why policy develops by trial and error, and not by scientific investigation (*section 1.2.4*). There is evidence of the remedial adjustments characteristic of incrementalism within GP Access Fund pilot schemes and in the extended opening hours commitment. The evaluation methods for the GP Access Fund's first wave were not robust (*section 2.3.2*), but this is expected under an incrementalism with little focus on evidence. Still, the evaluation may have served to help legitimise the policy process. Policy has also developed incrementally in the longer term, with marginal changes to financial incentive schemes from 2000 onwards (*section 1.4*).

In the previous section of this chapter, I emphasised some limitations in my research's ability to inform policy (*section 7.3*). Problems with patient experience of general practice can be clearly defined (*section 2.1*), but research cannot remove all uncertainty over the effects of different policies on these problems. Policy has to proceed by trial and error to some extent and, therefore, be incremental rather than super-rational in at least one sense. The possible results of inaction, including further declines in patient experience, may be worse than those of reasonable intervention. The small adjustments described by incrementalism may also reduce the risks^g of introducing new policies with uncertain effects.

I do not want to overstate the relevance of the policy implications listed in *table 7.1*, given the complexity of policy-making and the multiple forces that act on it. Research alone cannot decide what direction policy should take. However, my findings do help to set expectations for the effects of different policies, such as the Extended Hours Access Scheme and the GP Access Fund. Specifically, the findings question whether current policies that extend opening hours and aim to improve access affect patient experience and use of emergency hospital services substantially. Policy expectations may be too optimistic.

^g These risks include the opportunity costs of introducing these policies over other ones.

7.5 FUTURE RESEARCH

The true effects of the GP Access Fund may remain unclear if an independent academic evaluation is not conducted. *Section 2.3.2* highlighted limitations in the evaluation⁹ of the first wave conducted by a consultancy firm; the same firm has been commissioned by NHS England to evaluate the second wave of pilot schemes. When sufficient post-intervention data are available, future research could use routine sources, such as the GP Patient Survey and Hospital Episode Statistics, to compare changes in practices that were part of a scheme with practices that were not; local or regional control groups would improve the validity of estimated effects. This research would be unable to separate the effects of different interventions (*section 2.3.2*), but it could estimate policy-level impacts on important outcomes such as patient experience and use of emergency hospital services.

Future research could also aim to identify local experiments, outside of GP Access Fund schemes, that focus on single interventions such as extended opening hours. Evaluations of such experiments would add to evidence from central London and Greater Manchester on changes to opening hours (*section 2.3.1*). Other relevant interventions such as telephone triage are being evaluated in several localities.^{184 185} Future research could also continue to analyse natural variation in characteristics of general practices and patient experience. This could include data resulting from practices' new contractual requirement to record evening and weekend appointments.¹⁵⁶ Future work might also examine associations between participation in the Extended Hours Access Scheme and use of emergency hospital services. Establishing a longitudinal cohort of GP Patient Survey respondents whose answers could be linked at the patient level to general practice and hospital records would also be a useful research development.

7.6 CONCLUSIONS

The Government has implemented several policies relevant to access to general practice in England in recent years. Patient experience of general practice decreased across several GP

Patient Survey measures from 2011-12 to 2014-15. Some patient groups report much worse experiences than others, even within the same practice. This includes people who cannot take time off work to see a GP. Overall experience is most strongly associated with GP interpersonal quality of care. Experience of making an appointment is most strongly associated with appointment convenience when an appointment is obtained. Less variation in satisfaction with opening hours, than in overall experience and experience of making an appointment, is explained by other patient experience measures. These three outcomes were slightly greater in practices that participated in the Extended Hours Access Scheme than in non-participating practices in 2013-14; the difference was greatest for satisfaction with opening hours, particularly among people who could not take time off work to see a GP. Practices with better mean experiences of making appointments have slightly lower rates of A&E visits and emergency admissions, but these reductions are unlikely to result in large net cost savings for the NHS. These conclusions suggest that the Government's existing plans to improve access to general practice may not meet some expectations.

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APPENDICES

Appendix 1 Search Strings Used to Identify Relevant Literature

Searches are automatically run weekly in Ovid (<http://ovidsp.ovid.com/>) using the EMBASE, MEDLINE, and Health Management Information Consortium databases.

Characteristics of General Practices and Use of Emergency Hospital Services

1. *(access\$ adj3 primary).ab,ti.*
2. *(access\$ adj3 "general practi\$").ab,ti.*
3. *(access\$ adj3 GP\$).ab,ti.*
4. *(character\$ adj3 "general practi\$").ab,ti.*
5. *(character\$ adj3 GP\$).ab,ti.*
6. *(emergency adj3 attend\$).ab,ti.*
7. *("A&E" adj3 attend\$).ab,ti.*
8. *(emergency adj3 utili\$).ab,ti.*
9. *hospital admission?.ab,ti.*
10. *hospitali#ation.ab,ti.*
11. *(emergency adj3 visit\$).ab,ti.*
12. *("A&E" adj3 visit\$).ab,ti.*
13. *1 or 2 or 3 or 4 or 5*
14. *6 or 7 or 8 or 9 or 10 or 11 or 12*
15. *13 and 14*

Patient Attitudes and Behaviours Regarding Access to General Practice

1. *GP.ab,ti.*
2. *general practi\$.ab,ti.*
3. *family medicine.ab,ti.*
4. *family practi\$.ab,ti.*
5. *family physician?.ab,ti.*
6. *primary care.ab,ti.*
7. *appointment?.ab,ti.*
8. *access\$.ab,ti.*
9. *availab\$.ab,ti.*
10. *consultation?.ab,ti.*
11. *continuity.ab,ti.*
12. *schedul\$.ab,ti.*
13. *(patient? adj3 choice?).ab,ti.*
14. *(patient? adj3 satisf\$).ab,ti.*
15. *(patient? adj3 behavio?r?).ab,ti.*
16. *(choice? adj3 behavio?r?).ab,ti.*
17. *(patient? adj3 attitude?).ab,ti.*
18. *(patient? adj3 prefer\$).ab,ti.*
19. *(patient? adj3 decision?).ab,ti.*
20. *1 or 2 or 3 or 4 or 5 or 6*

21. 7 or 8 or 9 or 10 or 11 or 12
22. 13 or 14 or 15 or 16 or 17 or 18 or 19
23. 20 and 21 and 22

Research Using the GP Patient Survey

1. GP Patient Survey.ab,ti.
2. General Practice Patient Survey.ab,ti.
3. 1 or 2

Researchers Whose Previous Work is Relevant

1. cambridge\$.in. and ("roland m\$" or "abel g\$" or "burt j\$" or "lyratzopolous g\$").au.
2. manchester\$.in. and ("kontopantelis e\$" or "whittaker w\$" or "bower p\$" or "checkland k\$" or "hodgson d\$").au.
3. york\$.in. and ("doran t\$" or "dusheiko m\$" or "gravelle h\$" or "street a\$" or "mason a\$" or "goddard m\$" or "jacobs r\$" or "cookson r\$").au.
4. bristol\$.in. and ("purdy s\$" or "salisbury c\$" or "morris r\$").au.
5. london\$.in. and "ashworth m\$".au.
6. leicester\$.in. and "baker r\$".au.
7. oxford\$.in. and "lasserson d\$".au.
8. exeter\$.in. and ("campbell j\$" or "warren f\$").au.
9. 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8

Appendix 2 Definitions of Measures in *Table 2.1*

No.*	Measure	Responses in numerator and denominator	Responses in denominator only
3	Easy to get through to someone at GP surgery by phone	Very easy; Fairly easy	Not very easy; Not at all easy
8	Have a preferred GP to see or speak to	Yes	No
9	See or speak to a preferred GP always, almost always, or a lot of the time	Always or almost always; A lot of the time	Some of the time; Never or almost never
11	Wanted an appointment on the same day [†]	On the same day	On the next working day; A few days later; A week or more later; I didn't have a specific day in mind
12	Able to get an appointment to see or speak to someone	Yes; Yes, but I had to call back closer to or on the day I wanted the appointment	No
14	Had an appointment on the same day [†]	On the same day	On the next working day; A few days later; A week or more later
15	Available appointment was convenient	Very convenient; Fairly convenient	Not very convenient; Not at all convenient
18	Good overall experience of making an appointment	Very good; Fairly good	Neither good nor poor; Fairly poor; Very poor
25	Satisfied with the hours that GP surgery is open	Very satisfied; Fairly satisfied	Neither satisfied nor dissatisfied; Fairly dissatisfied; Very dissatisfied
26	GP surgery is open at convenient times	Yes	No
28	Good experience of GP surgery overall	Very good; Fairly good	Neither good nor poor; Fairly poor; Very poor

Measures relating to 'Additional opening times that would make it easier to see or speak to someone' (Q27) were calculated as the number of responses for a given opening time category ÷ total number of responses; multiple responses allowed.

All measures are expressed as percentages in the main text.

Measures on appointments are for patients' last attempts to see or speak to a GP or nurse from their GP surgery.

*Question number in the GP Patient Survey. [†]Equivalent definitions were used for other time categories.

Appendix 3 Quality and Outcomes Framework Measures Used as Control Variables in *Chapters 4* and *6*

	2011-12	2012-13	2013-14	Points
Coronary heart disease				
The percentage of patients with coronary heart disease in whom the last blood pressure reading is 150/90 mmHg or less*	CHD06	CHD06	CHD002	17
The percentage of patients with coronary heart disease whose last measured total cholesterol is 5 mmol/l or less*	CHD08	CHD08	CHD003	17
Stroke and transient ischaemic attack (TIA)				
The percentage of patients with a history of stroke or TIA in whom the last blood pressure reading is 150/90 mmHg or less*	STROKE06	STROKE06	STIA003	5
The percentage of patients with stroke or TIA whose last measured total cholesterol is 5 mmol/l or less*†	STROKE08	STROKE08	STIA005	5
Hypertension				
The percentage of patients with hypertension in whom the last blood pressure reading is 150/90 mmHg or less	BP05	BP05	HYP002	10
Diabetes				
The percentage of patients with diabetes whose last measured total cholesterol is 5mmol/l or less*	DM17	DM17	DM004	6
The percentage of patients with diabetes in whom the last IFCC-HbA1c reading is 59 mmol/mol or less*	DM26	DM26	DM007	17
The percentage of patients with diabetes in whom the last IFCC-HbA1c reading is 64 mmol/mol or less*	DM27	DM27	DM008	8
The percentage of patients with diabetes in whom the last IFCC-HbA1c reading is 75 mmol/mol or less*	DM28	DM28	DM009	10
The percentage of patients with diabetes in whom the last blood pressure reading is 150/90 mmHg or less*	DM30	DM30	DM002	8
The percentage of patients with diabetes in whom the last blood pressure reading is 140/80 mmHg or less*	DM31	DM31	DM003	10
Epilepsy				
The percentage of patients aged 18 years or over on drug treatment for epilepsy who have been seizure free for the last 12 months*	EPILEPSY 08	EPILEPSY 08	EP002	6
Chronic kidney disease				
The percentage of patients on the CKD register in whom the last blood pressure reading is 140/85 mmHg or less*	CKD03	CKD03	CKD002	11

Intermediate outcome measures for peripheral arterial disease (PAD002 and PAD003) were introduced to the QOF in 2012-13, and an additional measure for hypertension (HYP003) was introduced in 2013-14 (not used in analysis). An intermediate outcome measure for mental health (MH18/MH010) was not included, as it applied to few patients in each practice.

Points are those available in QOF 2013-14; 57 and 55 points were available for BP05 in 2011-12 and 2012-13 respectively.

*Last reading recorded in the preceding 15 months in QOF 2011-12 and 2012-13 and in the preceding 12 months in QOF 2013-14.

†Measure changed for QOF 2013-14 to apply only to patients with a non-haemorrhagic stroke or a history of TIA.

Appendix 4 Variance Inflation Factors for Explanatory Variables in Chapter 5

	VIF
GP interpersonal quality of care	1.46
Nurse interpersonal quality of care	1.39
Ease of telephone contact	1.44
Helpfulness of receptionists	1.58
Type of appointment wanted	1.01
Timing of appointment wanted	1.06
Convenience of appointment	1.43
Age (years):	
18 to 24	-
25 to 34	3.36
35 to 44	4.28
45 to 54	5.28
55 to 64	5.96
65 to 74	6.23
75 to 84	4.39
85 or over	2.04
Gender:	
Male	-
Female	1.04
Ethnicity:	
White	-
Mixed	1.01
Asian	1.05
Black	1.04
Other	1.02
Deprivation fifth:	
1 (most deprived)	-
2	1.66
3	1.74
4	1.77
5 (least deprived)	1.76
Can take time off work to see GP:	
Not relevant	-
Yes	1.63
No	1.41
Confident in managing health:	
Very	-
Fairly	1.15
Not very	1.12
Not at all	1.03
Year:	
2011-12	-
2012-13	1.31
2013-14	1.31

VIF: variance inflation factor. A common rule of thumb is that VIFs greater than 10 indicate collinearity issues.

Appendix 5 List of Articles Published During PhD Studies*Articles Related to PhD*

Cowling TE, Gunning EJ. Access to general practice in England: political, theoretical and empirical considerations. *Br J Gen Pract.* 2016;66:e680-2. doi: 10.3399/bjgp16X686977.

Cowling TE, Harris MJ, Majeed A. Extended opening hours and patient experience of general practice in England: multilevel regression analysis of a national patient survey. *BMJ Qual Saf.* 2016. Available from: doi: 10.1136/bmjqs-2016-005233.

Richards EC, Cowling TE, Gunning EJ, et al. Online data on opening hours of general practices in England: a comparison with telephone survey data. *Br J Gen Pract.* 2015;65(641): e806-12. Available from: doi: 10.3399/bjgp15X687841.

Cowling TE, Harris M, Watt H, et al. Access to primary care and the route of emergency admission to hospital: retrospective analysis of national hospital administrative data. *BMJ Qual Saf.* 2015. Available from: doi: 10.1136/bmjqs-2015-004338.

Cowling TE, Harris MJ, Majeed A. Evidence and rhetoric about access to UK primary care. *BMJ.* 2015;350: h1513. Available from: doi: 10.1136/bmj.h1513.

Cowling TE, Soljak MA, Bell D, et al. Emergency hospital admissions via accident and emergency departments in England: time trend, conceptual framework and policy implications. *J R Soc Med.* 2014;107(11): 432-8.

Cowling TE, Harris MJ, Watt HC, et al. Access to general practice and visits to accident and emergency (A&E) departments in England: cross-sectional analysis of a national patient survey. *Br J Gen Pract.* 2014. Available from: doi: 10.3399/bjgp14X680533.

Other Articles

Cecil E, Bottle A, Cowling TE, et al. Primary Care Access, Emergency Department Visits, and Unplanned Short Hospitalizations in the UK. *Pediatrics.* 2016. Available from: doi: 10.1542/peds.2015-1492.

Cowling TE, Ramzan F, Ladbrooke T, et al. Referral outcomes of attendances at general practitioner-led urgent care centres in London, England: retrospective analysis of hospital administrative data. *Emerg Med J.* 2015. Available from: doi: 10.1136/emered-2014-204603.

Ismail TF, Jabbour A, Gulati A, et al. Role of late gadolinium enhancement cardiovascular magnetic resonance in the risk stratification of hypertrophic cardiomyopathy. *Heart.* 2014. Available from: doi: 10.1136/heartjnl-2013-305471.

Calderón-Larrañaga A, Soljak M, Cowling TE, et al. Association of primary care factors with hospital admissions for epilepsy in England, 2004-10: national observational study. *Seizure.* 2014;23(8): 657-61.