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The funding pressures facing the NHS from 2010/11 to 2021/22

# A decade of austerity?

*Research report*

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## About this work programme

This report discusses the main conclusions and implications of the first phase of a Nuffield Trust research programme called **Buying Time: What is the scale of the financial challenge facing the NHS and how can it be met?** The report draws on work undertaken for the Nuffield Trust by the Institute for Fiscal Studies and the London School of Economics.

The Buying Time programme is examining how the NHS and social care system in England can meet the key challenge of improving patient care within a severely constrained budget. It brings together research and evidence on the efficiency and effectiveness of health and social care to answer these key questions:

- What is the scale of the financial challenge facing the NHS and social care system over the next ten years?
- Can the NHS in England meet the challenge by delivering more efficient and effective health and social care systems?

The programme is empirically based and consists of two phases:

- Phase 1 (2011 to 2012): Assessing the scale of the financial challenge
- Phase 2 (2013 to 2014): Rising to the challenge: the scope for productivity gains.

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| | |
|---|---|
| A&E | Accident & Emergency |
| BCBV | Better Care, Better Value [indicators] |
| CCG | clinical commissioning group |
| CHD | coronary heart disease |
| COPD | chronic obstructive pulmonary disease |
| GDP | Gross Domestic Product |
| GDS | general dental services |
| GP | general practitioner |
| HES | hospital episode statistics |
| IFS | Institute for Fiscal Studies |
| MHMDS | Mental Health Minimum Dataset |
| NHS | National Health Service |
| OBR | Office for Budget Responsibility |
| OECD | Organisation for Economic Co-operation and Development |
| ONS | Office for National Statistics |
| PbR | Payment by Results |
| PCT | primary care trust |
| PDS | personal dental services |
| PSSRU | Personal Social Services Research Unit |
| QIPP | Quality, Innovation, Productivity and Prevention |
| UK | United Kingdom |

# Executive summary

Spending on the UK NHS as a share of national income has more than doubled since its introduction in 1948, rising by an average of four per cent a year in real terms. This period of rapid growth has now come to a halt, but funding pressures on the NHS continue to rise. The NHS in England is targeting efficiency savings of £15 to £20 billion by 2014/15 to meet this challenge, and it is likely that austerity will be required beyond this period. But where are the pressures likely to come from and how can the shortfall in funding be met? This report aims to address these questions by quantifying the financial pressures facing the NHS in England over the next decade to 2021/22. It forms part of a Nuffield Trust research programme that is exploring the potential funding gap facing the NHS in England over the next decade and how this can be addressed.

## Key points

- After 2014/15, to avoid cuts to the service or a fall in the quality of care patients receive, the NHS in England must either achieve unprecedented sustained increases in productivity, or funding will need to increase in real terms.
- Pressures on the NHS are projected to grow at around four per cent a year up to 2021/22. These arise from growing demand for health care to meet the needs of a population which is ageing, growing in size, and experiencing more chronic disease. They also result from increases in the cost of providing health care – of which the largest item is workforce pay.
- If NHS funding is held flat in real terms beyond this spending review period, the NHS in England could experience a funding gap worth between £44 and £54 billion in 2021/22, unless offsetting productivity gains can be delivered.
- The NHS is committed to improving productivity (the 'QIPP (Quality, Innovation, Productivity and Prevention) Challenge') by around four per cent a year to 2014/15. If this is achieved, the funding gap of £44 to £54 billion would be reduced to a potential shortfall of £28 to £34 billion by 2021/22. This, however, would require continued efficiency savings of around four per cent a year if funding is kept flat in real terms (as it is now) beyond 2014/15.
- If NHS funding is increased in line with the historic average (four per cent a year) after 2014/15, this would be sufficient to meet the projected demands on the service. However, the outlook for public finances makes this highly unlikely, as such a settlement for the NHS would have significant implications for other public services and welfare spending, or would require major increases in taxation.
- If spending grew more modestly, in line with the forecast growth in GDP (2.4 per cent a year), the NHS would need to make further efficiency savings of around two per cent a year if the current QIPP challenge is achieved. This represents a profound challenge for the NHS.
- Managing demand, particularly among people with long-term chronic conditions, will be critical – pressure on costs from this group is at least equal, if not more than, that from the expanding and ageing population.

- Pay restraint is likely to contribute around 40 per cent of the required QIPP savings by 2014/15. The scale of the productivity challenge facing the NHS after 2015 is increased by the very different outlook for pay across the NHS workforce. If NHS earnings start to increase in line with the historic increase of two per cent a year above inflation, greater savings will need to be made in other areas.
- Our projections are based on analysis of recent trends in the use and cost of health care, but the past is not always a reliable guide to the future. Therefore, more can and should be done to understand the impact of a wide range of policy changes and service redesign initiatives on productivity. There should be more transparent analysis of research evidence and assumptions in future. Such analysis can only help to put the NHS on a more sustainable footing over the next decade.

## About this research

This research attempts to quantify the funding pressures facing the NHS in England over the decade to 2021/22. It is based on new modelling by researchers at the Nuffield Trust. It also draws on research that the Nuffield Trust commissioned from the Institute for Fiscal Studies (IFS) to examine the amount of funding which might be available to the NHS in England beyond 2014/15 (Crawford and Emmerson, 2012).

The research also examines funding pressures on social care services. To inform this analysis, the Nuffield Trust commissioned a new research report from the London School of Economics (Wittenberg and others, 2012). These reports form part of a wider Nuffield Trust research programme exploring the potential funding gap facing the NHS and social care system in England over the next decade and how it can be met.

## Research findings

This research sets out to quantify the funding pressures facing the NHS in England over the next decade, and estimates the impact of three key factors in reducing this pressure: pay restraint; improving care for people with long-term chronic conditions; and increasing acute sector productivity. It examines two time periods: the current spending review period to 2014/15, and the period from 2015/16 to 2021/22.

## The overall scale of the potential funding gap facing the NHS

If future governments decide to extend the real-terms funding freeze in this spending review period to 2021/22 as part of the programme to reduce both the cyclical and structural fiscal deficit, the NHS would need to increase productivity by four per cent a year in real terms for a decade, thus extending the QIPP challenge by a further seven years. By 2021/22 this would be equivalent to a shortfall of between £44 and £54 billion. Part of this funding gap arises from the well-known impact of population change. The population of England is expected to grow by four million people between 2010 and 2021. Our population is also ageing and health care use increases in old age.

The research also examines the potential impact of:

- rising rates of hospital utilisation by people with chronic conditions
- the rising cost of providing health care – as health care workers' pay has previously risen by around two per cent a year in real terms.

If the recent trends in pay and use of health services to treat chronic conditions continue, these factors would put greater pressure on the NHS than population change.

## The financial challenge to 2014/15

In 2009 the NHS Chief Executive Sir David Nicholson alerted the NHS to the potential scale of the funding gap and therefore the productivity challenge facing the NHS during the current spending review period. This was estimated at between £15 and £20 billion by 2014/15. This Nuffield Trust research estimates that the potential funding gap for primary care trust (PCT) commissioned NHS services in England, which make up 80 per cent of the total budget for the English NHS, would be £13 billion in 2014/15. This equates to £16 billion over the whole English health revenue budget. Closing this gap will require efficiency savings of four per cent a year – the QIPP challenge.

We have explored various ways in which the QIPP challenge may be met:

- the impact of pay restraint
- management of long-term chronic conditions
- increasing acute sector productivity.

## The financial challenge between 2015/16 and 2021/22

After examining how the gap in NHS funding in 2014/15 could be met, this research focuses on the potential funding gap over the next decade to 2021/22, assuming that the NHS meets the QIPP challenge, and that the potential funding gap has been closed (to within half a billion pounds) by end of the 2014/15 financial year.

The funding allocation for the NHS in England thereafter is uncertain. Economic forecasts, including those from the Office for Budget Responsibility (OBR), anticipate that there will be an outstanding structural budget deficit after additional planned cuts of around 1.9 per cent of Gross Domestic Product (GDP) (Office for Budget Responsibility, 2012). This research projects that funding pressures on the English NHS will continue to rise at a rate of four per cent a year between 2015/16 and 2021/22. If the NHS achieves the QIPP savings in this spending review period, our research estimates that the additional funding pressures on the NHS will amount to a further £28 billion in 2021/22 for PCT-commissioned health services. This would be equivalent to £34 billion across the English health revenue budget as a whole.

We have compared our estimated funding pressure with three potential government funding scenarios for the NHS in England. These scenarios were previously developed by the IFS as part of this Nuffield Trust research programme (Crawford and Emmerson, 2012).[1] Alongside assumptions for population growth and health care activity (detailed in the main report), we assume that pre-2010/11 trends in inflation of pay (of around two per cent per year), prices and activity resume following the savings of the period 2010/11 to 2014/15.

- **Scenario 1: Spending is frozen in real terms**
  If austerity continues at the current level and spending on the NHS remains broadly flat in real terms, the funding gap in England will equate to a rise in funding pressures of around £28 to £34 billion in 2021/22.
- **Scenario 2: Spending grows in line with national income**
  If the government increases funding for the NHS in England in line with economic growth (GDP), based on OBR forecasts, the funding gap would be

1. The figures we use here are lower than those used in the IFS report as we take only the portion of the health budget that is spent on PCT-commissioned services, which accounts for around £8 in every £10 spent on the NHS in England.

around £12 to £14 billion in 2021/22. This would require savings of around two per cent a year.

- **Scenario 3: Spending grows in line with historic average**
  If funding for the NHS in England grows in line with the historic average for the UK NHS of four per cent a year, funding would match our estimate of pressure, leaving no shortfall in funding. However, this is highly unlikely to be a realistic scenario, with further cuts to total public spending already announced for the period to 2016/17.

## What is the outlook for social care up to 2021/22?

For social care, the challenge is potentially even greater, particularly given recent cuts in funding. Similarly to health care, social care services in England are also experiencing rising pressure from the ageing population and increases in the prevalence of chronic conditions. There have been real-terms cuts to social care funding, with a recent survey of directors of adult social services indicating that almost £1 billion had been cut from budgets in 2012/13 (equivalent to 6.8 per cent), following a 7.7 per cent cut in the previous year (Smulian, 2012). This has resulted in services being restricted and a rising level of unmet need for care (Age UK, 2011). Shortfalls in social care funding are impacting on NHS services through: increased demand for NHS community services; increased emergency and unplanned care admissions to hospital; and delayed transfers of care (NHS Confederation, 2012).

The next decade could see funding pressures rise between three and four per cent a year in real terms. According to Nuffield Trust calculations building on findings from the Personal Social Services Research Unit (PSSRU), there would be a funding gap of between £7 and £9 billion by 2021/22 if funding were held constant in real terms. These funding pressures would rise to between five and six per cent a year if the recommendations of the Commission on Funding of Care and Support were implemented, resulting in a total funding gap of £10 to £12 billion by 2021/22.

## Conclusion

This analysis suggests that without unprecedented, sustained increases in health service productivity, funding for the NHS in England will need to increase in real terms between 2015/16 and 2021/22 to avoid cuts to the service or a fall in the quality of care patients receive. This could be avoided if the government were to return the NHS in England to funding growth at the historic (pre-2010/11) average rate of four per cent a year in real terms. However, this is highly unlikely, with further cuts to total public spending already planned until 2017.

### Suggestions for further research

This work is a beginning, and clearly there are many more factors that might help to reduce funding pressure. These could be modelled in line with emerging evidence from research findings, for example the impact of: service reconfiguration; integrated care; workforce skill mix; changes to social care funding; and greater use of telehealth and telecare. It is clear that there is a role for much more comprehensive, independent and transparent analysis of research evidence and assumptions in future, given the present funding squeeze. This might help identify the policies and local initiatives that might make the most impact on quality and costs. This can only help to put the NHS on a more sustainable footing over the next decade.

# 1. Introduction

Spending in the United Kingdom (UK) on the National Health Service (NHS) has risen by an average of four per cent a year in real terms since it was formed in 1948. The English NHS accounted for over 80 per cent of this figure in 2010/11. This rise in spending on health has outpaced economic growth (measured as the increase in Gross Domestic Product (GDP)), meaning that NHS spending as a share of UK national income has more than doubled – from 3.5 per cent in 1949/50 to 7.9 per cent in 2007/08.[1] The growth rate has also accelerated in recent years, with the period between 1996/97 and 2009/10 seeing average annual funding increases of 6.4 per cent (Crawford and Emmerson, 2012).

Total spending on health includes both public and private expenditure. In 2007/08, total spending on health was almost one percentage point higher than spending on the NHS, at 8.8 per cent of GDP. This is close to the average of 8.9 per cent for countries across the Organisation for Economic Co-operation and Development (OECD) in the same year. The increase in the proportion of GDP spent on health in the UK has also been broadly similar to the average for OECD countries, having risen from 3.9 per cent in the UK in 1960, and from an average of 3.8 per cent across other OECD countries (OECD, 2012a).

Public spending on health accounts for over 80 per cent of all health spending in England, and is funded through taxation (OECD, 2012a). Taxation funds a range of public services, welfare payments and debt interest. As health spending has risen, the share of public spending devoted to health has also increased. The government spent almost £450 billion on public services in 2010/11: 27 per cent of this was on health; compared to 17 per cent three decades before (Institute for Fiscal Studies, 2012).

> Planned public spending will be reduced by £81 billion, in real terms, from 2011/12 to 2014/15

This period of rapid funding growth for the NHS has now come to a halt. With the current economic crisis leading to fiscal consolidation in the UK, resuming the historical growth rate in NHS funding looks unrealistic in the short to medium term. Planned public spending will be reduced by £81 billion, in real terms, over the four-year period from 2011/12 to 2014/15, as set out in the 2010 Spending Review (HM Treasury, 2010). This equates to an average fall in total public spending of 2.1 per cent a year over this period. Against this backdrop, the English NHS has received relatively generous treatment, with funding set to increase by an average of 0.1 per cent a year in real terms. In contrast, other public services will have their funding reduced by an average of 2.9 per cent a year in real terms (Crawford and Emmerson, 2012).

1. 2007/08 figures are used to avoid the one-off impact of the global financial crisis.

This austerity comes at a time of continuing pressures on the NHS. While it might appear that health has fared relatively well, increases in funding would have been required to keep pace with current trends in demand for, and the costs of, health care. With funding essentially frozen in real terms, productivity savings are needed to maintain the availability and quality of services provided to the population. The NHS has faced periods of low growth or cuts in the past, but these have not been sustained for a period of longer than three years. Given the historic growth rate of the NHS, this represents the tightest period in the past 50 years (Crawford and Emmerson, 2012).

As the NHS in England is largely publicly funded from taxation, with some funding from user charges (such as prescription charges), the amount of activity undertaken is largely determined by the available capacity (which is related to the amount of funding). The NHS is required to spend within a budget set by the government, and if the rising demand for health care is not met through a combination of additional funding and productivity gains, this will result in unmet need for care.

The challenge to the NHS of continuing to meet growing demands while maintaining quality in the face of cost pressures was foreseen by Sir David Nicholson, Chief Executive of the English NHS. In his annual report for 2008/09, he wrote:

> *[W]e must be prepared for a range of scenarios, including the possibility that investment will be frozen for a time. We should also plan on the assumption that we will need to release unprecedented levels of efficiency savings between 2011 and 2014 – between £15 and £20 billion across the service over the three years. (Nicholson, 2009, p. 47; see also UK Parliament, 2010)*

In response to this 'Nicholson Challenge', the NHS Quality, Innovation, Productivity and Prevention (QIPP) programme was established in 2010 to deliver efficiency savings of £20 billion by 2014/15, for reinvestment in frontline services, with the aim of meeting rising demand and improving quality without increased real funding (Department of Health, 2012).

The increasing cost of the NHS is being driven both by rising demand for health care and by the increasing availability and cost of delivering care. The primary driver of increased demand is often stated as being the ageing population in England. However, increases in activity cannot be explained by this alone, and demographic change represents a greater cost pressure for social care than for health care (Blunt and others, 2010; Wanless, 2002). Additional pressures on health care come from the rising prevalence of people with long-term chronic conditions in the population, over and above that related to the ageing of the population. In addition, changing expectations and underlying societal norms about health, illness and health care influence health-seeking behaviour and the way people use health care services, although these influences are not well understood (OECD, 2012b). Supply-side factors that are important determinants of cost include (OECD, 2012b; Wanless, 2002):

- treatment practices
- technological progress (including availability of treatments)
- the level of productivity
- workforce structure
- input prices

- regulatory factors
- incentives inherent in payment mechanisms.

The presence of multiple and inter-related factors driving cost makes predicting future health care expenditure highly complex, with increasing uncertainty in the projections as the time period increases. Previous projections have varied in methodology and the factors considered, making comparison between different projections difficult. However, common to all projections is the rising cost (OECD, 2012b).

Local authority funding did not receive the relative protection afforded to the NHS in England over the period 2010/11 to 2014/15. Funding for social care services is therefore likely to be cut throughout this period. As with health care, the demands placed on the social care system are growing due to similar pressures (Wittenberg and others, 2012).

Spending on health care in England beyond March 2015 will not be determined until the next spending review. However, it looks very likely that continued austerity will be necessary, and two further years of real cuts to spending on public services are already planned for 2015/16 and 2016/17 to help reduce the public sector deficit (HM Treasury, 2011). This may be further extended to 2017/18 in the 2012 Autumn Statement. It is highly unlikely that growth in NHS funding at rates experienced prior to 2010 will resume, particularly as other areas of public spending have already been cut much more than health.

As part of this ongoing programme to explore the potential funding gap facing the NHS in England over the next decade, a previous report by researchers at the Institute for Fiscal Studies (IFS), published by the Nuffield Trust (Crawford and Emmerson, 2012), estimated the amount of funding which might be available to the NHS in England beyond 2014/15.

In this report, we explore funding pressures facing the NHS over the decade to 2021/22. We then analyse the outlook in two different periods. Firstly, pressures in the current spending review period to 2014/15. The funding envelope for this period has already been fixed by the government, and we examine the contribution of different approaches within the QIPP programme to bridge the funding gap. We then look at the scale and source of funding pressures from 2014/15 to 2021/22, estimating the size of the potential funding gap under three scenarios which the government might consider in the next spending review:

- a continued real-terms freeze in NHS funding
- growth in line with the economy
- a return to the historical rate of increase of four per cent a year.

## Notes

In this report, we use the terms *funding allocation* to refer to the amount of money available, as determined by government; and *funding pressure* to refer to the amount of money that would be required if scenarios occur as specified. The *funding gap* is the difference between the allocation and the pressures resulting from projected activity.

We predominantly focus on the portion of the total NHS budget that is currently spent by primary care trusts (PCTs) on commissioning services for the population of England. We refer to 'PCT-commissioned NHS services' as this is the current legal status, and have assumed that these will be similar to the clinical commissioning groups (CCG)-commissioned services after April 2013.

All estimates for funding and spending are given in real terms at 2010/11 prices.

# 2. Understanding the factors which influence spending on health care in England

Four types of approaches are commonly used to estimate future funding pressures on health services (Astolfi and others, 2012):

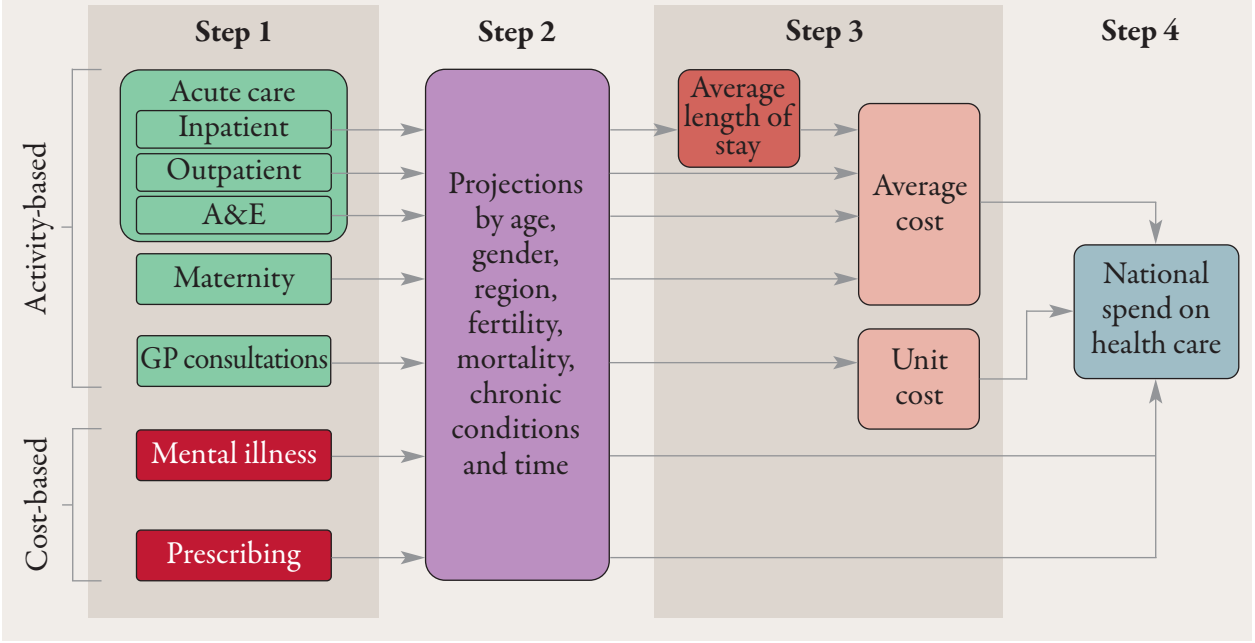
- micro-simulation models (detailed models exploring the direct effect on individuals of policy changes)
- component-based models (a variety of forecasting models based on groups of individuals)
- macro-level models (analyses of aggregate health expenditures)
- combined models (combining different methods to make use of all available data).

Due to the wide range of data available, this study opted to develop a 'combined model', using component-based methods where rich data sources were available, and macro-level models where only aggregated data were available.

The approach can be split into four steps, as show in Figure 2.1. These steps are:

- **Step 1:** Identifying which factors are associated with current health service use or cost using the most recent data available, and estimating the contribution of the different factors to current patterns of use or cost.
- **Step 2:** Estimating future health service activity based on forward projections of those key factors – population growth (by age, sex and geographical region), fertility, mortality and prevalence of selected chronic conditions. Extrapolating recent trends in

Figure 2.1: The four steps used to project funding pressures



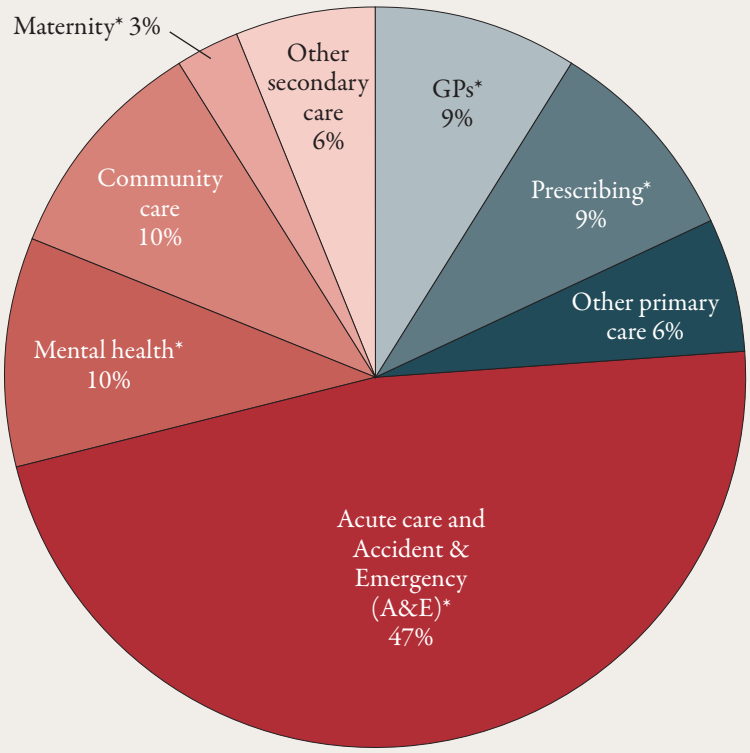
the rates of use of services within age and sex groups, and for people with chronic conditions.

- **Step 3:** Applying 2010/11 average unit costs to the projected activity, then increasing unit costs to reflect the potential real-terms growth in health service pay rates.
- **Step 4:** Combining each service-specific projection into an estimate of the total English spending pressures on health care, adjusting this to take account of services for which data were not available.

## 2.1 Step 1: Analysing current activity or cost

The NHS includes a wide range of different services. Most of these are commissioned by local health organisations on behalf of their population (PCTs until March 2013 and then new bodies called CCGs and a national strategic body, the NHS Commissioning Board). A total of £87 billion was spent by PCT commissioners on

### Figure 2.2: Breakdown of spending on NHS services in 2010/11




Note: 'Other primary care' includes: contractor-led general dental services (GDS) and personal dental services (PDS); salaried trust-led GDS and PDS; general ophthalmic services; Department of Health initiative funding; pharmaceutical services; local pharmaceutical services; services pilots; new pharmacy contract; and non-general medical services from general practitioners (GPs). 'Other secondary care' includes: learning difficulties; and other contractual services.

Source: data from the Department of Health (2010/11 financial monitoring and account forms for PCTs).

**£87 billion**

was spent by PCT commissioners on health care services in 2010/11

health care services in 2010/11. Just under a quarter of this (£21 billion) was spent on primary care, and the remaining 76 per cent (£66 billion) was spent on secondary care, as illustrated in Figure 2.2.

PCTs commission services under a range of different contractual arrangements. For some services, such as community care and mental health, PCTs set local providers a fixed annual budget, and it is the provider (for example the local mental health trust) which manages the demand for services from patients. In other cases, such as the majority of acute services, providers (NHS hospitals) receive a payment for each patient and the commissioner is responsible for managing the financial risk of additional demands on the service.

We examined each service type separately to reflect the diversity of activity and organisation of health care. We focused on services for which we had accessible national data over time, and to which we could apply nationally recognised costs.[1] We used a component-based approach for GP consultations, acute care and A&E, mental health and maternity activity, and used a macro-level approach for prescribing. Due to a lack of available data, we were unable to undertake detailed analysis of other primary care services, community care and other secondary care activity.

Acute and A&E activity is split into four types of activity, each of which we assessed separately. The four types of activity are:

- emergency inpatient care
- non-emergency inpatient care
- outpatient care
- A&E.

**Table 2.1: Description of the sample used for the acute care model**

| Age | Sex | Number of people | Proportion in their last year of life | Proportion with at least one inpatient admission linked to a chronic condition |
|---|---|---|---|---|
| 0 | Male<br>Female | 32,961<br>32,960 | 0.3%<br>0.2% | 0.3%<br>0.2% |
| 1–19 | Male<br>Female | 601,162<br>570,496 | <0.1%<br><0.1% | 1.0%<br>0.8% |
| 20–49 | Male<br>Female | 1,090,419<br>1,081,212 | 0.1%<br>0.1% | 1.6%<br>2.2% |
| 50–84 | Male<br>Female | 789,849<br>866,433 | 1.9%<br>1.4% | 10.1%<br>8.5% |
| 85+ | Male<br>Female | 37,528<br>78,659 | 18.9%<br>16.7% | 33.0%<br>27.5% |

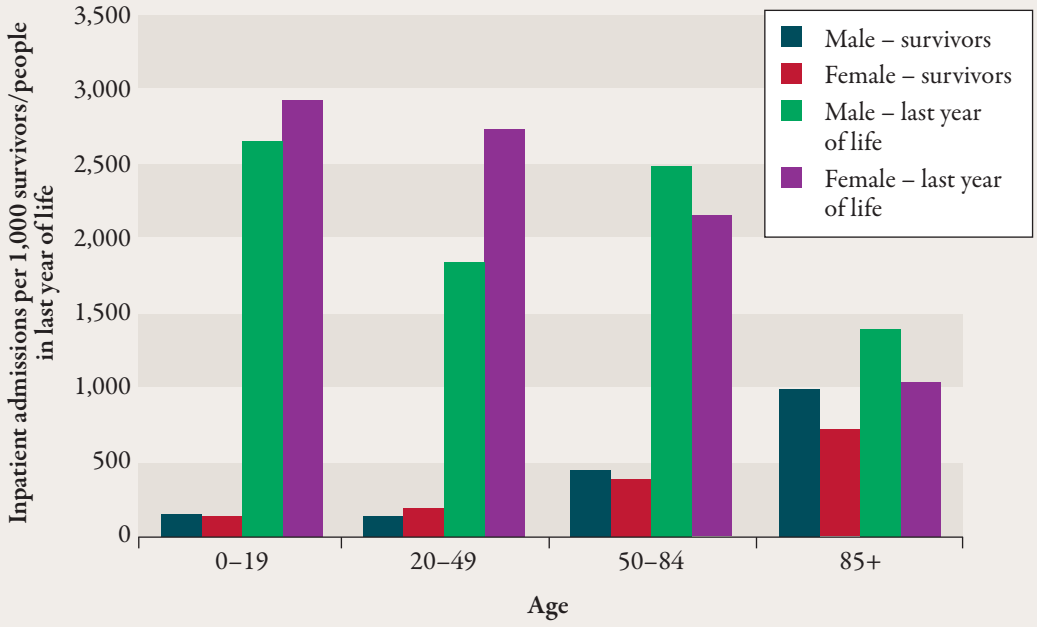
1. Signified by * in Figure 2.2.

These acute sector services account for almost half of all spending by PCTs. We examined the factors which are associated with use of acute health care by undertaking a regression analysis using linked person-level activity data from the hospital episode statistics (HES) for 2009/10, the most recent data available at the time of modelling (Department of Health, 2010). We used a 10 per cent sample of the population of England (based on Office for National Statistics (ONS) estimates) to provide detailed data on 5.2 million individuals' use of the acute sector. This sample was representative of the geographical distribution of the total population across the nine Government Office Regions in England. Table 2.1 (on previous page) provides a descriptive summary of the sample used for the acute care model.

The regression analysis examined how the rate of use of health services (number of hospital admissions, outpatient visits or A&E attendances) varied in 2009/10 with a number of the key drivers of demand, namely age, sex, geographical region,[1] whether it was their last year of life and whether they had received inpatient care for a chronic condition.

Figure 2.3 shows how the average number of inpatient admissions per person varied by age for men and for women in 2009/10, separated for those in the last year of their life.

## Figure 2.3: Number of inpatient admissions per 1,000 people in 2009/10, based on a 10 per cent sample of the population of England




Note: The actual number of inpatient appointments for 0- to 19-year-olds is much lower than the number for those aged 85+, as much fewer are in their last year of life.

While health service utilisation tends to increase with age, there is additional use of health services as people approach the end of their life at every age. This increase is less pronounced for people aged over 85 years, but is still evident. Use of health services is thus dependent not just on ageing, but also on the number of people who are expected to die at any particular time.

1. We used Government Office Regions.

To determine the effect of treatment for major chronic conditions, we identified people with specific chronic conditions using diagnosis data recorded in inpatient records for 2009/10. We selected conditions that were included in the Department of Health chronic disease management compendium of information (Department of Health, 2004), with additions based on expert guidance from our steering group. The chronic conditions included were:

- arthritis
- cancer[1]
- chronic obstructive pulmonary disease (COPD) or asthma
- coronary heart disease (CHD) or heart failure
- dementia
- diabetes
- epilepsy
- mental ill-health
- renal disease
- stroke.

Together, these conditions account for a significant proportion of the overall burden of disease in the UK, contributing more than half of the total number of years of life lost due to ill-health, disability or early death in the UK in 2004 (World Health Organization, 2008).

We specifically examined the effect of having more than one of these conditions (co-morbidity) in individuals, using the most common combinations of chronic conditions observed. These were:

- diabetes with COPD or asthma
- diabetes with CHD or heart failure
- COPD or asthma with CHD or heart failure
- cancer with COPD or asthma.

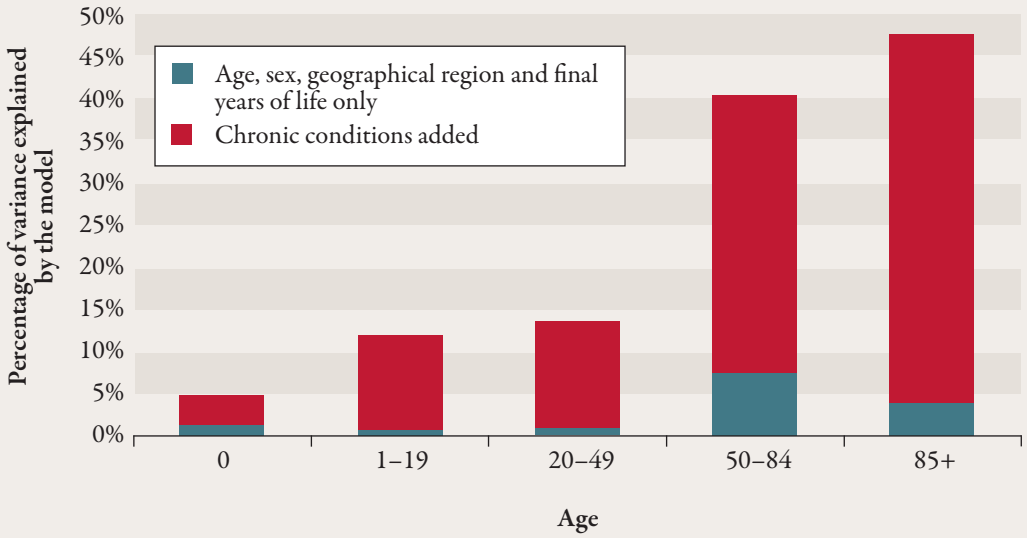
Other combinations were grouped to estimate an overall effect.

The regression models explored the impact of chronic conditions on the use of health services. Our results show that in 2009/10, age, sex, geographical region and final year of life were statistically significant factors associated with the rates of acute sector utilisation. As an example of this, Figure 2.4 shows the amount of variation in emergency inpatient activity that was explained by these factors, for different age groups, illustrating that inclusion of data on diagnosed chronic conditions substantially increases the amount of variation in the use of NHS services explained by the regression model.

The regression models explain between one per cent (for outpatient appointments for newborns) and 44 per cent (for emergency inpatients for people aged 85 and older) of the

1. Specifically, lung cancer, colorectal cancer, breast cancer, prostate cancer, cervical cancer and melanoma.

Figure 2.4: The proportion of observed variation in emergency inpatient care explained by factors included in the regression model (adjusted $R^2$)




observed variation in acute sector utilisation. The over-50s account for around 70 per cent of spending on emergency inpatient care. This is consistent with previous research examining the variation at the individual level for a given year's hospital treatment, due to the high level of uncertainty around an individual's care (Dixon and others, in press). The regression models explain more of the variation in an individual's use of acute care for those age groups that account for the majority of health spending. When we apply the regression models to the whole population of England for 2010/11, they predict between 93 per cent (for emergency inpatient admission) and 99 per cent (for outpatient appointments) of actual activity.

Beyond acute services, to estimate maternity activity, we used annual fertility estimates from the ONS to predict the number of births per year, rising from 660,000 births in 2010 to 690,000 in 2021.

For primary care, we examined trends in the number of times a year individuals visit their GP. The number of consultations at a GP practice per person per year rose from 3.9 in 1995/96 to 5.5 in 2008/09. Over the same period, the proportion of these consultations occurring with a GP, rather than a practice nurse, fell from 75 per cent in 1995/96 to 62 per cent in 2008/09. We have assumed that both of these trends will continue over the period 2010/11 to 2021/22, so that by 2021/22 there will be 7.8 consultations per person per year; 55 per cent of which will be with a GP.

Person-based mental health data are available for England using the Mental Health Minimum Dataset (MHMDS). These data include information on the use of dedicated mental health services (such as community psychiatric nursing teams and mental health hospitals). Around three per cent of the population in 2010/11 received care from NHS dedicated mental health services. The estimates for mental health services do not include the large volume of care provided for mental health problems by GPs, or treatment of physical conditions where the person also has a mental health problem (for example asthma care for a person with schizophrenia). These form part of our analysis of primary

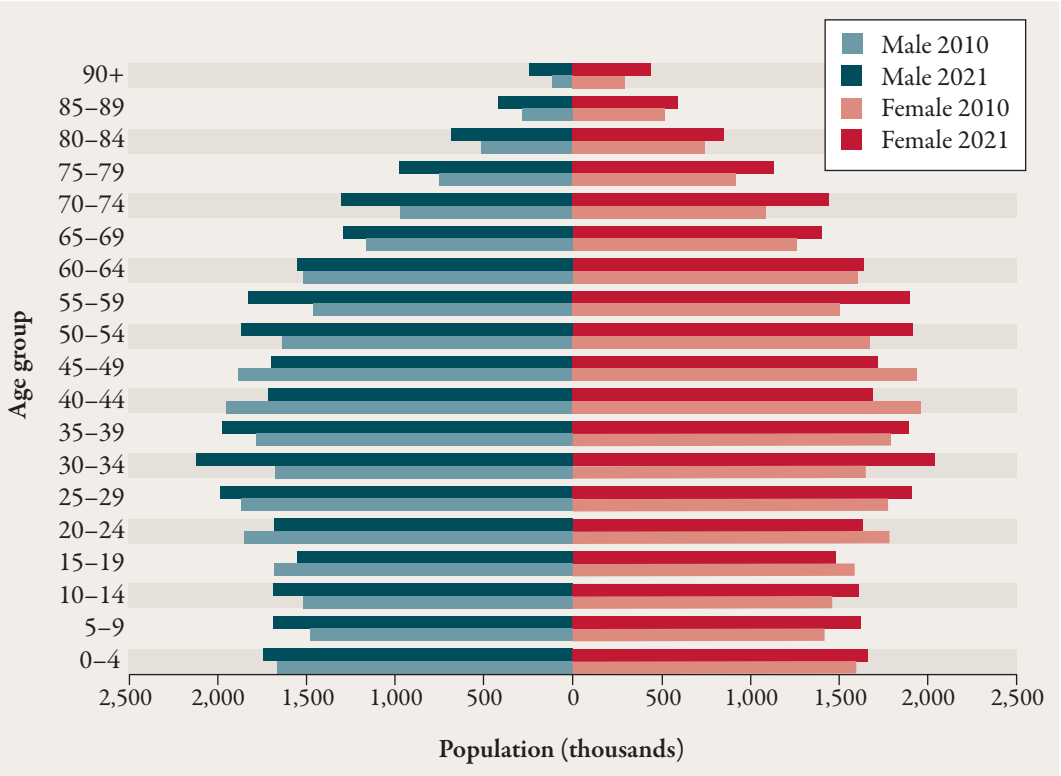
care and acute care services. We calculated the average cost per mental health service user[1] per year in 2010/11 based on age, sex, geographical region and the intensity[2] of inpatient care required.

We used a macro-level approach to estimate prescribing spending over time, extrapolating the total prescribing budget from quarterly spending data between 2008/09 and 2011/12.

## 2.2 Step 2: Projections

Population growth and demographic change are fundamental drivers of future health care activity. Clearly, as a population grows, the need for health care will rise. Additionally, a population with a greater proportion of older people will have a greater need for health care (Yali and Revenson, 2004). We used the principal ONS projections from 2008 for population, mortality and fertility to create a projection to 2021/22.[3] Figure 2.5 shows the change by age and sex between the population estimates for 2010 and 2021. The population is projected to grow for all age groups of 50 years and above, for both males

**Figure 2.5: Population change in England between 2010 and 2021, by age and sex, based on the 2008 ONS principal projections**




1. Cost estimates are based on 2010 unit cost figures from the Personal Social Services Research Unit (PSSRU), with an adjustment to bring total spending in line with NHS national reference costs. The model for mental health predicts annual cost per person, hence these costs are actually applied prior to Step 1.

2. This was grouped into those who had received high-intensive, medium-intensive, low-intensive or no inpatient care. Where a person had received more than one type of care, the most intensive type was used.

3. Although more recent estimates are now available, we required the growth to be split by Government Office Region, and data on this were not available at the time.

and females. The overall population for England is projected to grow by over four million people, from 52.1 million (49.3 per cent male) in 2010 to 56.4 million (49.6 per cent male) in 2021. This increase is greater than the current total population of Wales (StatsWales, 2011).

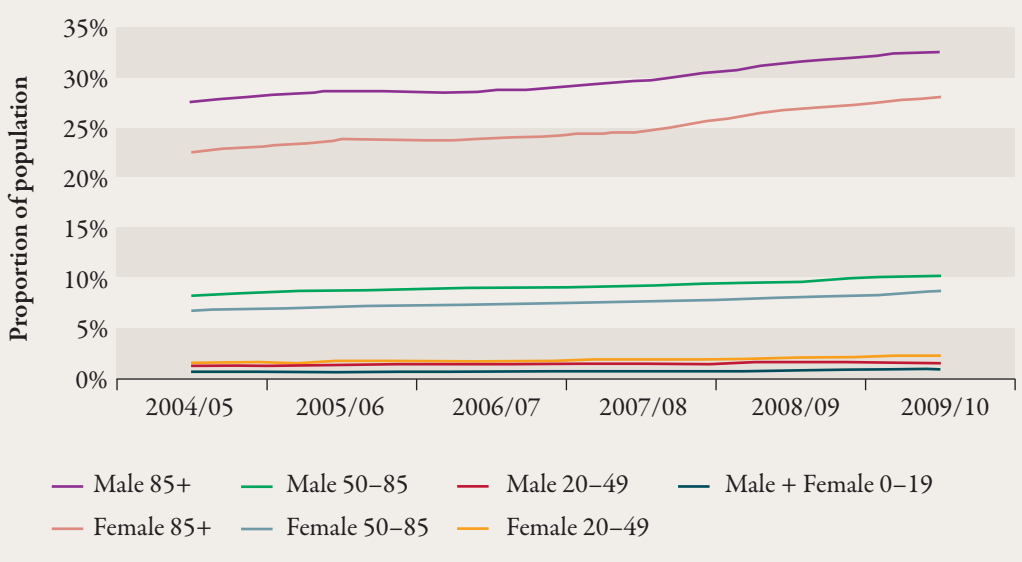
If we define 'working age' as those aged between 20 and 64 years, the proportion of people of working age would fall from 60 per cent in 2010 (24 per cent under working age, 16 per cent older people) to 58 per cent in 2021 (23 per cent under working age, 19 per cent older people).

For acute and A&E activity, we used additional information about the number of people being treated in hospital for each of the specified chronic conditions. The probability of having an inpatient admission related to a chronic condition is higher for older age groups than younger age groups. Admissions linked to chronic conditions are therefore likely to rise as the population ages. However, recent trends suggest that this probability is also rising within age bands, as shown in Figure 2.6. If this trend continues, the impact on the NHS due to chronic conditions will amplify the effect of population growth alone.

> Admissions linked to chronic conditions are likely to rise as the population ages... recent trends suggest that this probability is also rising within age bands.

For each of the selected chronic conditions, we produced projections of the probability of having at least one inpatient admission in a year, broken down by sex and five-year age bands. Although this probability is falling in some age/sex groupings, for some conditions, the overall proportion for all conditions increased from four per cent of the population in 2004/05 to five per cent in 2009/10.

Figure 2.6: Proportion of people in age/sex groupings with at least one inpatient admission linked to a chronic condition between 2004/05 and 2009/10



This measure of activity encompasses a combination of inter-related factors, which we were unable to distinguish due to limitations of the data. These factors would be complex to model individually, due to the need to make assumptions about their inter-relationships, and, in some cases, are difficult to measure accurately. These factors include:

- the rising prevalence of chronic conditions within the population linked to increases in risk factors such as obesity and alcohol consumption
- additional detection and treatment of chronic conditions
- more intensive models of treatment, possibly as a result of new technologies and higher-quality standards
- limitations in out-of-hospital care for people with chronic conditions.

We applied a similar technique to the mental health model to predict how many people would require mental health services each year, based on the number of people using services between 2008/09 and 2010/11. This projection would see the proportion of people aged over 65 years using mental health services growing by just over 50 per cent by 2021/22, as shown in Table 2.2.

### Table 2.2: Proportion of the population likely to require mental health services in a year, based on current trends observed in the MHMDS between 2008/09 and 2010/11

| Year | Age | Male | Female | Population |
|---|---|---|---|---|
| 2010/11 | 16–64 | 2% | 3% | 3% |
| | 65+ | 4% | 5% | 5% |
| 2021/22 | 16–64 | 3% | 3% | 3% |
| | 65+ | 6% | 8% | 7% |

We estimated the proportion of people likely to require high-intensive, medium-intensive, low-intensive or no inpatient care for a mental health problem, by age and sex (see Table 2.3).

### Table 2.3: Proportion of people using mental health services who require high-intensive, medium-intensive, low-intensive or no inpatient care in 2010/11

| Age | Sex | High-intensive inpatient care | Medium-intensive inpatient care | Low-intensive inpatient care | No inpatient care | Total |
|---|---|---|---|---|---|---|
| 16–64 | Male | 0.9% | 0.4% | 9.0% | 89.6% | 100% |
| | Female | 0.3% | 0.1% | 7.2% | 92.4% | 100% |
| 65+ | Male | 0.1% | 0.0% | 7.5% | 92.4% | 100% |
| | Female | 0.0% | 0.0% | 6.0% | 94.0% | 100% |

Annual cost data for prescribing were available at the national level from 2008/09 to 2011/12. We projected this forward over time to complement the other models, with total spending rising from £8 billion in 2010/11 to £10 billion in 2021/22 (two per cent a year).

## 2.3 Step 3: Costs

To translate the health service utilisation projections into projections of total spending, we applied unit costs to the estimated activity.

Acute and A&E activity in England is costed according to the 2010/11 national 'Payment by Results' (PbR) tariff. Where activity is not covered by this tariff, we used an estimate derived from national NHS reference costs (Department of Health, 2011c).[1]

For inpatient activity, we estimated an average cost per day and applied this to the average number of bed-days. This allowed us to explore the impact on total spending of reducing the average length of stay of inpatient spells. Outpatient costs were estimated based on cost per attendance and A&E costs were based on cost per visit.

Maternity spells are costed in the same way as acute and A&E activity. By identifying inpatient spells for antenatal treatment or birth, we calculated the average annual costs for someone giving birth (£2,156). This cost was applied to the fertility estimates from the ONS.

The cost for a consultation at a GP practice was based on the PSSRU costs for 2010 (Curtis, 2010): £32 for a GP consultation and £12 for a consultation with a practice nurse.

Mental health accounts for £1 in every £10 of spending on NHS services in England. For the reasons explained above, we estimated cost per person per year for mental health, rather than attempting to estimate activity.

All costs were estimated on full average cost in 2010/11. To explore future funding pressures, we looked at the impact of rising real wage costs on the unit cost of health care. Data from the Department of Health provider economics impact assessment model show that the workforce accounts for 64 per cent of hospital costs (Department of Health and NHS Confederation, 2010). For the 36 per cent of hospital costs that are non-pay, we assume that unit costs will increase in line with inflation. Similarly, prescribing costs in the community were increased in line with inflation.

## 2.4 Step 4: NHS spending

The final step was to combine the projections for each of the service types (acute care and A&E; maternity; mental health; prescribing; and GP consultations) to create an estimate of total NHS spending on PCT-commissioned services in England.

We first applied an adjustment for the results of each service type. We were not able to account for the total cost for some service types due to a lack of data, such as critical care for inpatients and community care in the mental health sector. We accounted for this by applying an aggregation factor so that the value estimated in 2010/11 matched the amount spent by PCTs on the service type in the same year.

1. Activity not covered by the tariff accounts for 12 per cent of inpatient admissions and 22 per cent of outpatient appointments. All A&E activity was costed using the tariff.

We then made a final adjustment to account for the service types that we did not model (other primary care; community care; and other secondary care), assuming that these sectors grow in line with those modelled. The resulting final figure therefore relates to aggregate NHS spending on activity by commissioners in 2010/11 (£87 billion) from the NHS accounts. This excludes funding for strategic health authorities and the Department of Health.

The total Departmental Expenditure Limit for health in 2010/11 was £107 billion (HM Treasury, 2012). When estimating the funding gap for 2021/22, we have focused on the proportion of this that PCTs spend on commissioning services – roughly 80 per cent. To give a range, we inflate our figures proportionally to the total health spend under the assumption that the maximum saving achievable on the non-PCT spend will be the same as that made on the PCT portion.

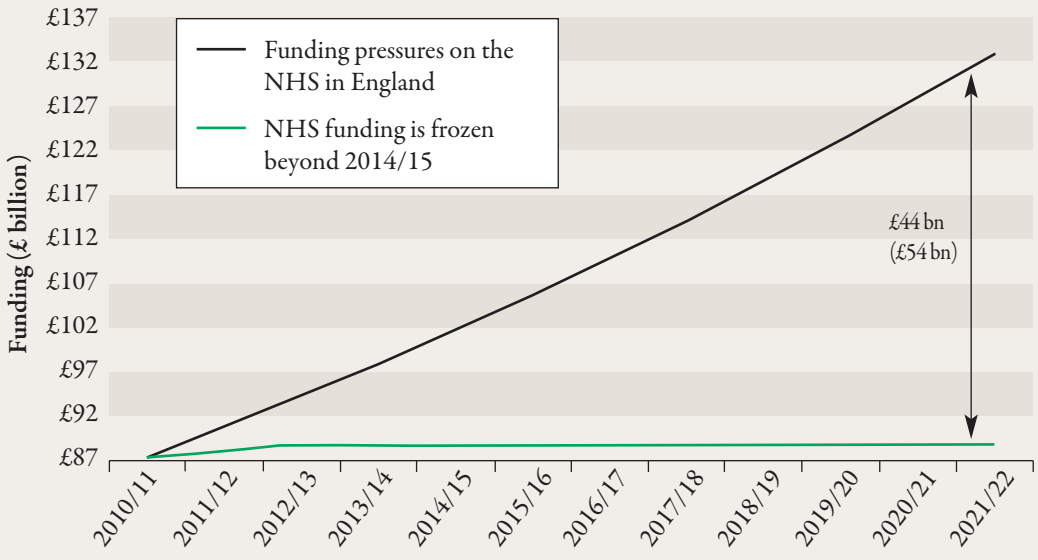
# 3. The financial challenge over the next decade

The 'Nicholson Challenge' and the following QIPP programme set out the financial challenge for the NHS to achieve by 2014/15. However, it is unlikely that the current economic climate will have improved by this time, and the period of tight funding for the NHS may be much longer than originally envisaged.

A 2012 survey of member organisations of the NHS Confederation revealed that many chief executives and chairs were concerned that some savings currently being made could not be sustained over a three-year period, let alone a 10-year period (Farrar, 2012). It is therefore vital that NHS organisations plan beyond the current QIPP objectives, and consider the challenge faced over a longer time period.

If no savings are made through QIPP plans, and recent trends in pressures continue, the funding gap would be between £44 and £54 billion in 2021/22, if the real-terms freeze in funding continues beyond 2014/15 (see Figure 3.1). This assumes that no savings have been made to meet the Nicholson Challenge.

Figure 3.1: The funding gap by 2021/22, assuming English NHS funding rises as set out in the 2010 Spending Review to 2014/15 and is frozen in real terms after, and without the effect of QIPP savings




Note: The funding gap for PCT-commissioned NHS services in England is displayed together with the estimate for the departmental expenditure limit, in brackets.

We break this decade period into two phases. Firstly, we explore how the NHS might meet the challenge of closing the potential funding gap during the current spending review period to 2014/15. Then, we ask what the extent of the challenge might be over the remaining period to 2021/22 under three potential funding scenarios.

# 4. The financial challenge to 2014/15

## 4.1 The potential funding gap facing the NHS in England by 2014/15

The funding allocation for PCT-commissioned NHS services in England would need to rise in real terms from £87 billion in 2010/11 to £102 billion in 2014/15, if pressures continue to rise in line with patterns observed prior to 2010/11, and policy-makers and managers had taken no action to improve efficiency and reduce costs. This is illustrated by the black line in Figure 4.1 on the following page. This estimate is based on rising pressures on the NHS from three sources – the population, the likelihood of receiving care and the cost of providing care – as described in the box below.

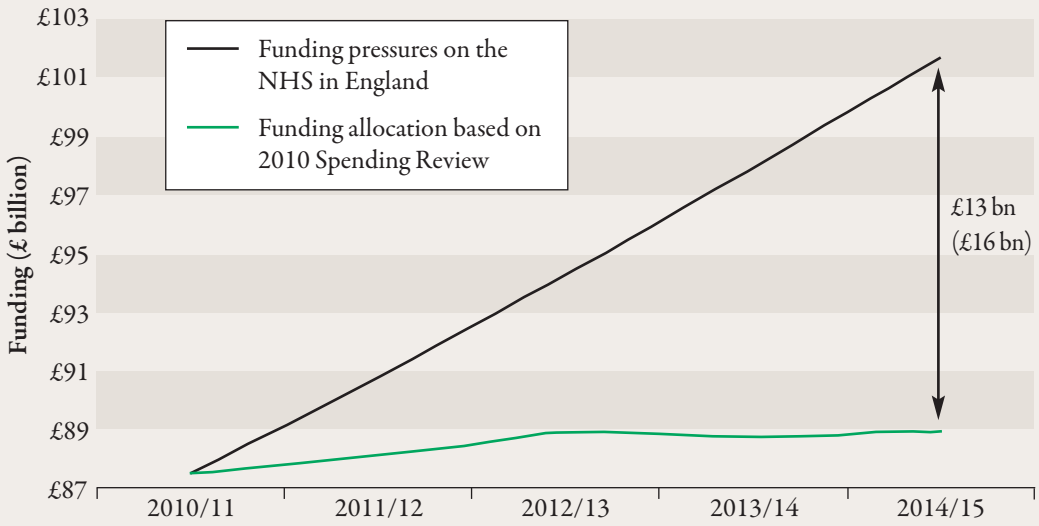
### Rising pressures on the NHS

- **Demography.** The projections examine the impact of the population growing and ageing in line with the central projection from the ONS, known as the 'principal population projection'.
- **Health care activity.** The projections estimate the impact of rates of hospital utilisation associated with chronic conditions continuing in line with trends observed between 2004/05 and 2009/10. The proportion of the population using mental health services is assumed to grow in line with trends observed between 2008/09 and 2010/11. Growing pressures on primary care services are assumed to follow trends between 1995/96 and 2008/09 for GP consultations; and the prescribing budget to follow trends between 2008/09 and 2011/12.
- **Health care costs.** The projections assess the impact of health care workers' pay rising in line with the historical trend for hospital and community health service staff: two per cent a year above inflation (authors' calculations, based on Department of Health, 2011a). The unit costs of drugs and other consumables are assumed to increase in line with whole economy inflation. Additional activity is costed at the current average rate of existing activity.

Without off-setting productivity savings, funding would need to rise by four per cent a year above inflation to meet pressures on PCT-commissioned NHS services in England. However, under plans set out in the 2010 Spending Review, NHS funding is increasing by less than one per cent a year in real terms between 2010/11 and 2012/13, with effectively a real-terms freeze for the following two years. In light of this, the potential funding gap for PCT-commissioned NHS services in England would be £13 billion in 2014/15, or £16 billion over the whole health revenue budget (Figure 4.1). Closing this gap would require efficiency savings of four per cent a year.

Our estimate of the financial challenge to the NHS over this period is close to the original figure set out by the Department of Health in its QIPP challenge to the NHS; to make £15 to £20 billion of savings by 2014/15 (Department of Health, 2012). More

## Figure 4.1: Projected funding gap for PCT-commissioned NHS services in England, with 2010 Spending Review allocations between 2010/11 and 2014/15




Note: The funding gap for PCT-commissioned NHS services in England is displayed, together with the estimate for the departmental expenditure limit, in brackets.

detailed comparison of our estimate with that of the Department of Health is not possible as the assumptions behind these figures have not been published.

In 2010, the Department of Health published a study undertaken by McKinsey & Co. (2010) exploring the productivity potential in the NHS (over a different time period to our study, of 2011/12 to 2013/14). This work found that, with NHS funding held constant in real terms from 2011/12, there would be a potential funding gap of between £10 and £15 billion by 2013/14. The King's Fund (Appleby and others, 2010) also sought to quantify the size of the financial challenge, drawing on the methodology used by Sir Derek Wanless (2002) in his report *Securing our Future Health*. This analysis estimated a potential funding gap of £21 billion by 2013/14, assuming no real-terms increase in NHS funding between 2011/12 and 2013/14. This figure was based on resource and capital spending, whereas we look at resource spending only.

Our projection of the potential funding gap to 2014/15 is based on the 2008 principal estimates of population growth from the ONS (Office for National Statistics, 2008). The impact of the alternative ONS assumptions of population growth is relatively small (the potential funding gap would be £12 to £15 billion using the ONS's low population growth projection, and £14 to £17 billion with the high population growth projection).

## 4.2 Closing the NHS funding gap: 2010/11 to 2014/15

### The impact of pay restraint

Pay for hospital and community health service staff (including doctors, nurses, support staff and managers) rose by an average of around two per cent a year in real terms over the 35 years to 2009/10 (authors' calculations, based on Department of Health, 2011a). If this rate of increase had continued beyond 2010/11 it would have been a major

contributor to the funding gap. However, the Department of Health intended that pay restraint would contribute a significant proportion of the necessary QIPP savings (Department of Health, 2011b). The government has frozen pay awards for all public sector workers, including NHS staff, earning basic salaries of more than £21,000 a year for 2011/12 and 2012/13; staff earning less than £21,000 were awarded £250 a year cash uplifts in April 2011 and 2012 (NHS Employers, 2012a). For each of the two years following this pay freeze (2013/14 and 2014/15), the government has set public sector pay awards at an average of one per cent a year in cash terms, although the detail of NHS pay awards is not yet known (HM Treasury, 2011).

Despite the two-year pay freeze, overall earnings and pay costs in the NHS have increased in cash terms due to staff moving up through incremental pay steps. Incremental progression resulted in around 60 per cent of non-medical staff receiving average basic pay increases of 3.4 per cent in cash terms in 2011/12 (NHS Employers, 2012a). These incremental pay increases, plus the £250 uplift, added around 2.4 per cent in cash terms to the pay bill for non-medical staff (NHS Employers, 2012b). Table 4.1 shows our assumptions of average pay changes across all NHS staff (doctors, nurses and administrative staff), taking account of the pay policy and incremental progression. While pay rises on average in cash terms, in real terms this represents a pay cut in 2011/12 and 2012/13, followed by flat pay in 2013/14 and 2014/15.

Table 4.1: The expected effect of the government's pay policy and progression on pay-per-whole-time equivalent worker in the NHS, 2011/12 to 2014/15

| Workforce pay change assumption (%) | 2011/12 | 2012/13 | 2013/14 | 2014/15 |
|---|---|---|---|---|
| Average (cash terms) | 1.67 | 1.67 | 2.54 | 2.54 |
| GDP deflator | 2.38 | 2.70 | 2.50 | 2.50 |
| Real terms | -0.7 | -1.0 | 0.0 | 0.0 |

**3%**

Projected increase in funding pressures on acute services due to population change and rising admissions for chronic conditions between 2010/11 and 2021/22

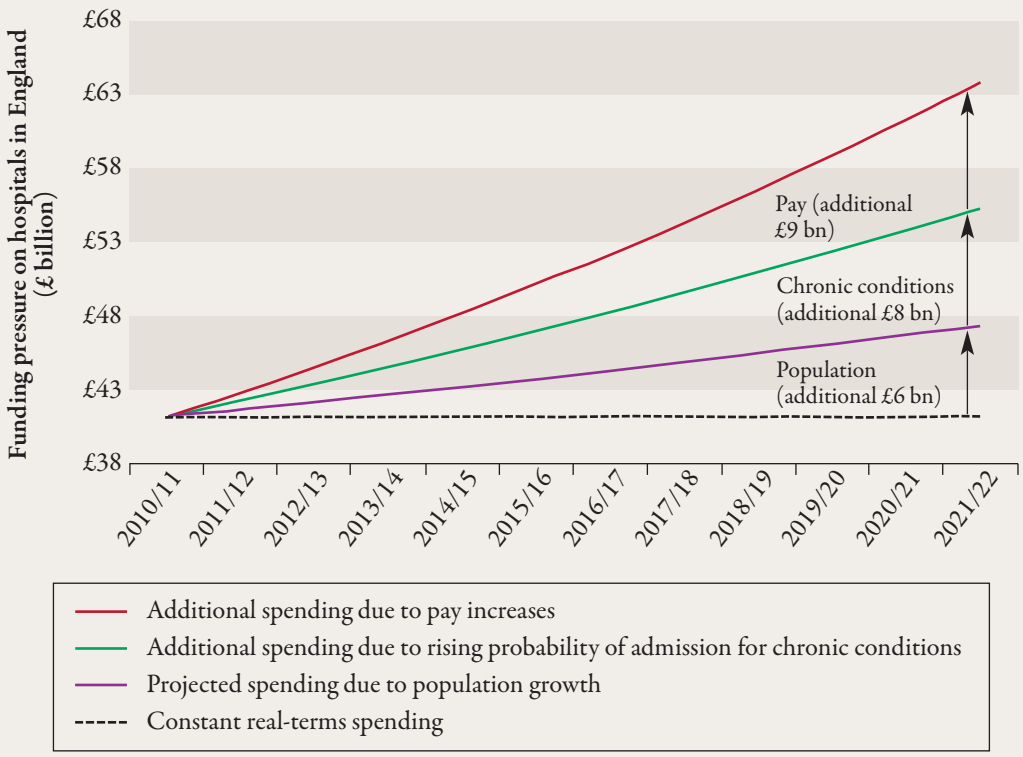
With the pay policy in place for 2011/12 and 2012/13, and the assumption of a one per cent cap on pay awards for 2013/14 and 2014/15 on top of incremental progression, the potential funding gap in 2014/15 will be reduced by £5 billion in real terms (42 per cent of the total gap; see Figures 4.3 and 4.4 later in this chapter). This will leave a potential funding gap of two per cent a year.

### Better management of chronic conditions

Growth and ageing of the population, alongside trends in hospital admissions for patients with chronic conditions, are creating pressure on NHS services in England. We explored the direct effect of each of these factors on acute care pressure (see Figure 4.2). Funding pressures on acute services will rise by just over one per cent a year between 2010/11 and 2021/22 as a result of population change in line with the ONS projection alone. The increase in hospital admissions for patients with chronic conditions, without the population growth effect, will result in increased funding pressure on acute services of over one per cent a year across the same period. The combined effect

of population change and rising admissions for chronic conditions will result in total pressure on acute services in England rising by three per cent a year in real terms.[1] On top of this, if pay pressures continue in line with previous trends of two per cent a year above inflation, the total funding pressure on the acute sector would increase by four per cent a year.

## Figure 4.2: Funding pressures on acute services in England attributable to population change and to the rising probability of admission for chronic conditions




In our projection, we have assumed that an individual's age- and sex-specific probability of receiving inpatient care for a chronic condition continues to change in line with trends observed between 2004/05 and 2009/10.

Health care activity is largely determined by the level of NHS funding. It may therefore be the case that the rising (on average) probability of receiving health care for chronic conditions observed between 2004/05 and 2009/10 was driven by the increases in funding over this period. Under this assumption, it would be reasonable to suppose that if funding does not increase, growth in activity may not continue at the historic rate. If the age- and sex-specific probability of receiving inpatient care for chronic conditions remains at the level observed in 2009/10, the estimated funding gap in 2014/15 will be reduced by a further £3 billion, leaving a remaining gap of £4 billion (see Figures 4.3 and 4.4).

We do not imply that this activity level is the 'correct' level or that it precludes the possibility of unmet need (due to either lack of detection or rationing through eligibility criteria and treatment guidelines). Nor do we state that unnecessary activity is occurring.

1. These figures hold all other drivers of costs, such as pay, static to highlight the specific effects from population and chronic conditions.

## Increasing acute sector productivity

After implementing pay restraint and significant changes to the management of chronic conditions, a funding gap of £4 billion remains in 2014/15; this would require savings of one per cent a year. Increases in NHS productivity are needed if this challenge is to be met. These productivity gains are intended to be achieved through delivery of local QIPP plans to improve performance and increase the quality and productivity of services.

We have explored the potential savings achievable from reducing the variation in acute sector productivity using the national *Better Care, Better Value* (BCBV) indicators (NHS Institute, 2012).[1] Reductions in hospital activity are a key focus of local plans as the acute sector accounts for almost half of the spending on NHS services (see Figure 2.2 on page 14). We have selected hospital activity BCBV indicators that reflect the major cost areas in the acute sector. Using these we have estimated the potential savings that would result if all hospitals in England converged at the performance of the top 50 per cent (or at the level of the top 25 per cent for the length of stay indicator, for which the 50 per cent of data were not available). If this were to happen, further savings of almost £4 billion in real terms could be achieved in 2014/15. The projected activity reductions are summarised in Table 4.2.[2] Savings are calculated at a regional level, and so are not applied uniformly across England.

### Table 4.2: Possible reductions in hospital activity based on Nuffield Trust calculations using Better Care, Better Value indicator data

| Result of QIPP actions | | Annual reduction | Activity in 2010/11 | Projected activity in 2014/15 without QIPP savings | Projected activity in 2014/15 with QIPP savings | Reduction in 2014/15 from QIPP savings |
|---|---|---|---|---|---|---|
| Reduction in outpatient appointments (first and follow-up) | | 6.7% | 65.6 million | 68.3 million | 51.8 million | 24% |
| Reduction in emergency spells and readmissions | | 2.3% | 5.5 million | 5.8 million | 5.3 million | 9% |
| Reduction in hospital length of stay: | Emergency | 3.5% | 37.3 million | 39.7 million | 31.3 million | 21% |
| | Non-emergency | | 15.9 million | 16.8 million | 14.6 million | 13% |

Source: Author calculations based on data from: www.productivity.nhs.uk/Dashboard/For/Q33/And/50th/Percentile/2010-11-Q2

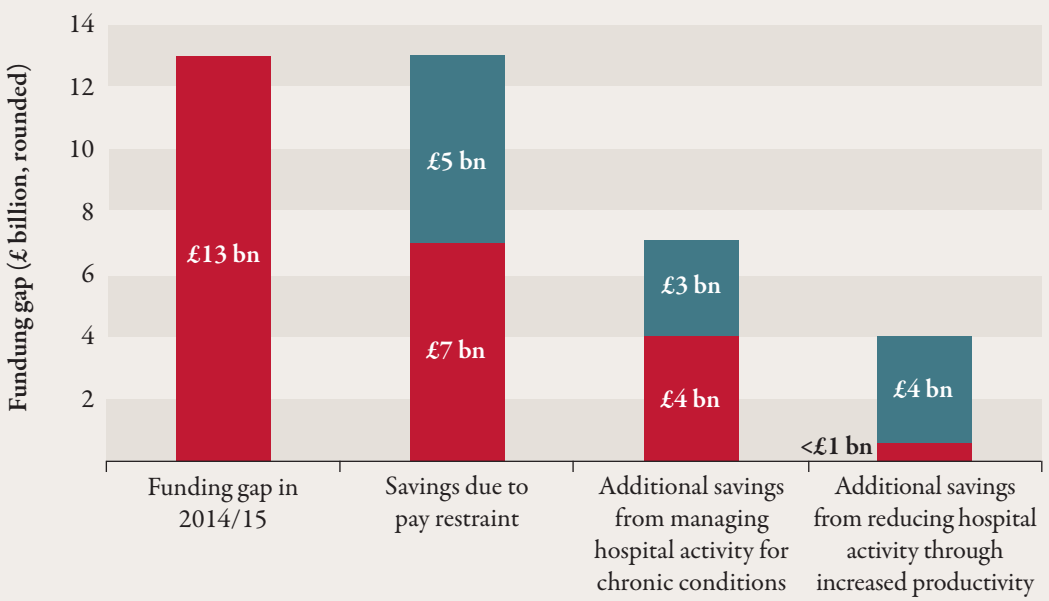
1. The data provided by BCBV indicators use specific subsets of data in their calculations. We adapted these to create our own estimates based on whole hospital episode statistics activity. We accept full responsibility for these calculations, and any mistakes are our own.
2. Reductions are made alongside increasing pressures from a growing population and increasing admissions for chronic conditions. Therefore the total reduction appears lower than might be expected.

We have not directly modelled productivity gains in the mental health, community[1] and primary care sectors. We assume that productivity in these sectors will improve in line with the acute sector, but that this will be offset by additional pressure placed on community and primary care to enable the reductions in acute sector activity to be made without resulting in extra unmet need. Overall productivity of the health system will therefore be improved by seeing the right patients, in the right setting, at the right time.

Maximising savings from these productivity gains will be dependent on translating the reductions in activity into cashable savings. In reality, it will not be possible to save all costs associated with the reduced activity, as hospital costs include variable (13 per cent), semi-fixed (64 per cent) and fixed (23 per cent) components (Department of Health and NHS Confederation, 2010). The variable costs, such as consumables that are directly related to the unit of activity, can be saved in full over the time period to 2014/15. The fixed costs, associated with the use of buildings and so on, will be very difficult to release over this time period, as they would require cessation of all activity associated with the source of the cost. The semi-fixed costs consist largely of staff costs. While these cannot be released in direct proportion to the activity reductions, they can be released in a more gradual manner over the longer term. We have assumed that one third of the semi-fixed costs related to the activity reductions can be released by the end of this period.

The potential additive impact on the funding gap of pay restraint, management of health care activity for chronic conditions, plus these acute sector productivity improvements, is illustrated in Figures 4.3 and 4.4.

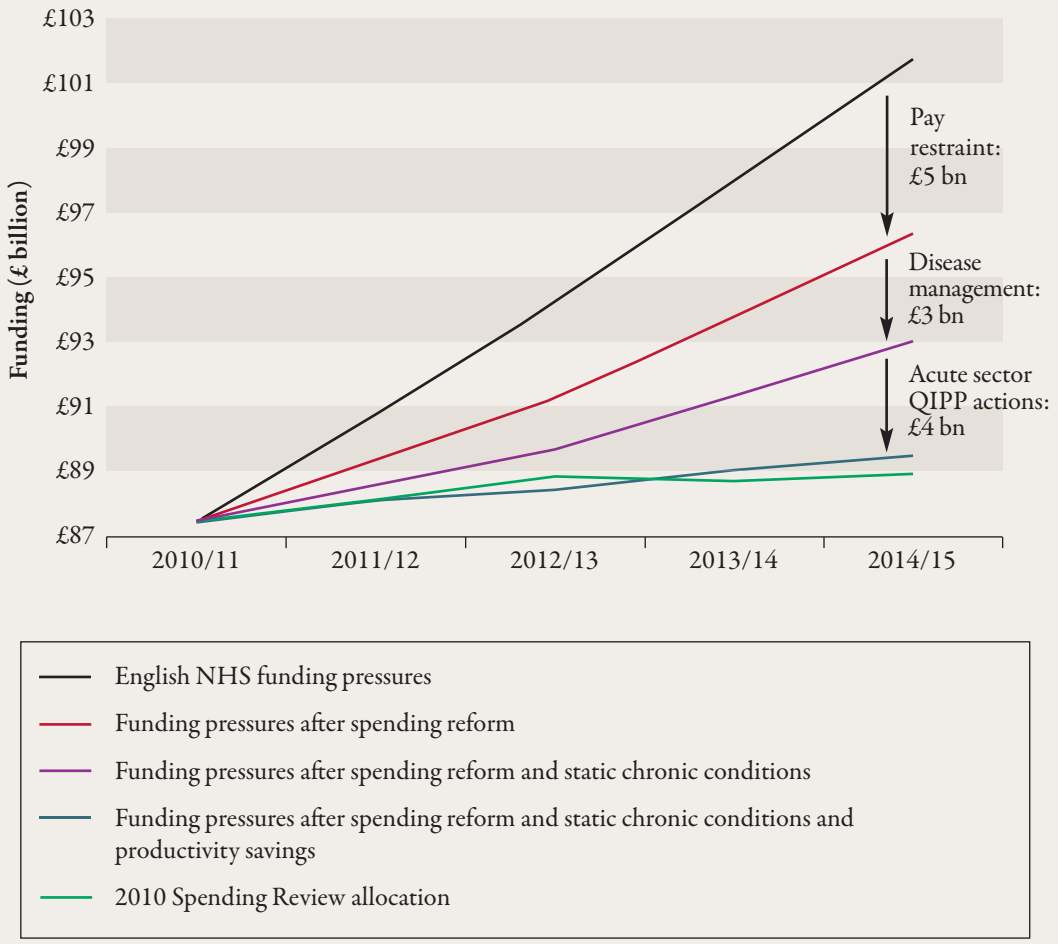
## Figure 4.3: Additive reduction in the funding gap achieved by pay restraint in the NHS, reduction in hospital activity through management of chronic conditions, and acute sector productivity savings




Note: Numbers in bars may not correspond to overall bar height, due to rounding.

1. We do not specifically model community activity. Total spend on PCT-commissioned services is calculated as a proportional adjustment to the results from other models. Therefore, in our model a decrease in the cost of acute services results in a slight decrease in services, including community services, although not modelled independently.

Figure 4.4: Additive reduction in the funding gap per year between 2010/11 and 2014/15, due to pay restraint in the NHS, reduction in hospital activity through management of chronic conditions, and acute sector productivity savings




**40%**

of the potential funding gap in 2014/15 could be met through pay restraint

Around 40 per cent of the potential funding gap in 2014/15 could be met through pay restraint (the current pay policy in place in England). By managing hospital activity for chronic conditions, a further quarter of the total gap could be closed. An additional quarter could be realised from acute sector productivity savings. This would leave a deficit of less than £1 billion (less than half of one per cent) in 2014/15, thus effectively meeting the financial challenge posed by the NHS allocation over this period.

# 5. The financial challenge between 2015/16 and 2021/22

In the previous section, we explored possible scenarios by which the funding gap in 2014/15 could be met. For the remainder of this report we have assumed that the QIPP challenge has been met as discussed, and the potential funding gap has been closed (to within half a billion pounds) by March 2015.

The funding allocation for the NHS in England after 2014/15 is uncertain, although the government has signalled its intention to implement further reductions in total public spending for at least a further two years. Moreover, economic forecasts, including those from the government's Office for Budget Responsibility (OBR), anticipate that there will be an outstanding structural budget deficit after these additional cuts of around 1.9 per cent of GDP (Office for Budget Responsibility, 2012). Against this somewhat bleak economic and fiscal outlook, we examine how funding pressures on NHS services in England compare with three possible funding scenarios previously developed as part of this programme of work (Crawford and Emmerson, 2012).

## 5.1 What level of NHS spending will be required from 2015/16 to 2021/22?

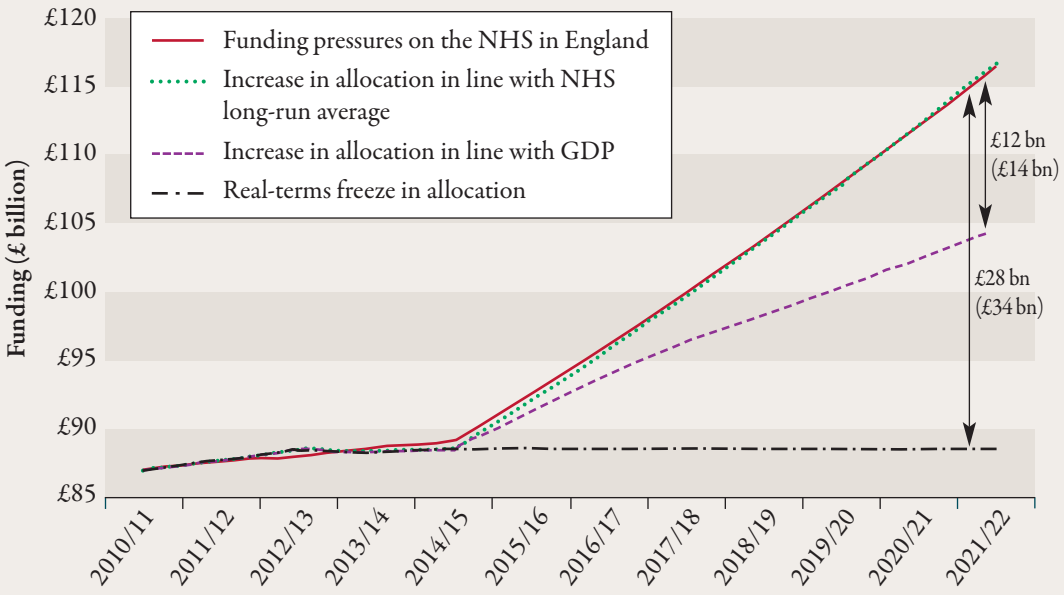
Following savings worth £12 billion made by the end of 2014/15, funding pressures on PCT-commissioned NHS services in England will rise by a further four per cent a year to £117 billion in real terms (at 2010/11 prices) in 2021/22 according to the following assumptions:

- **Demography.** Population growth and ageing continues in line with the ONS principal projections.
- **Health care activity.** Inpatient activity for chronic conditions continues rising at the rate observed between 2004/05 and 2009/10, and acute sector productivity is sustained at the level achieved in 2014/15 but not further increased. Primary and community care activity and prescribing costs continue to increase in line with previous trends, assuming that the extra activity needed to support reductions in acute sector activity is offset by improved productivity.
- **Health care costs.** NHS pay continues with a two per cent a year real-terms increase and the other costs of health care continue to rise in line with economy-wide inflation.

## 5.2 What funding will be available to the NHS during this period?

Three possible scenarios for the future funding of the NHS in England have been set out by the IFS as part of this programme of work (Crawford and Emmerson, 2012). To determine the scale of the financial challenge to the NHS over the period to 2021/22, we have compared our estimated funding pressure with government funding for the NHS under these scenarios. The figures we use here are lower than those used in the IFS report as we take only the portion of the health budget that is spent on PCT-commissioned services, which accounts for around £8 in every £10 spent on the NHS in England. We assume that this proportion of total NHS spending remains constant throughout the

## Figure 5.1: Funding pressure in relation to three possible funding scenarios for the NHS in England




Note: The funding gap for PCT-commissioned NHS services in England is displayed together with the estimate for the departmental expenditure limit, in brackets.

period. Our projection of required funding is illustrated, together with the three IFS funding scenarios, in Figure 5.1, and described beneath.

### Scenario 1: Spending is frozen in real terms

If austerity continues at the current level and spending on the NHS remains broadly flat in real terms, the funding gap in England will grow to around £28 to £34 billion in 2021/22. Meeting this challenge would require savings of at least four per cent a year. Coming after the period of austerity prior to 2015/16, this would represent unprecedented funding pressure for the NHS.

### Scenario 2: Spending grows in line with national income

If the government increases funding for the NHS in England in line with economic growth (GDP),[1] the funding gap would be around £12 to £14 billion by 2021/22. This would require savings of around two per cent a year.

### Scenario 3: Spending grows in line with the long-run average for the UK NHS (since 1950/51)

If funding for the NHS in England grows in line with the historic average for the NHS – four per cent a year – funding would match our estimate of pressure, leaving no gap. However, this is highly unlikely to be a realistic scenario, with further cuts to total public spending already announced for the period to 2016/17.

1. Based on OBR forecasts for economic growth used by the IFS.

## 5.3 What is the outlook for the NHS between 2015/16 and 2021/22?

A continued real-terms freeze in the NHS allocation after 2014/15 will result in a funding gap of £28 to £34 billion in real terms in 2021/22. This would require savings of at least four per cent a year over a decade, including the period between 2010/11 and 2014/15.

Even growth in line with the forecast for the whole economy will not be sufficient to meet additional pressures, and the NHS in England will face a funding gap of £12 to £14 billion in real terms in 2021/22, requiring savings of around two per cent a year beyond 2014/15.

If NHS funding returns to rising in line with the historic trend, requirements and allocation will be well matched. However, this is highly unlikely in light of the extended cuts to public spend that have been announced. Spending on health has already been relatively protected compared with other public services, and growth over this period would be at the continued expense of other services, which have already seen much greater relative financial hardship than the NHS.

## 5.4 What is the outlook for social care up to 2021/22?

As part of this work, the Personal Social Services Research Unit (PSSRU) undertook micro-simulation modelling to project the potential additional demand for social care services for people aged over 65 years, between 2010/11 and 2021/22 (Wittenberg and others, 2012). Funding pressures are projected to grow by two per cent a year, from £7 billion in 2010/11 to £9 billion in real terms in 2021/22.[1] This projection assumes that age-specific disability rates remain constant over this period. However, as with health care, the demand for social care for older people would be greater if age- and sex-specific prevalence of chronic conditions continues to rise. If prevalence continues to rise in line with projection from recent epidemiological models (Jagger and others, 2006; 2009; 2011), funding pressures would increase by an average of three per cent a year, to £10 billion in real terms by 2021/22.

The social care system in England also provides services to adults of working age with disabilities. The proportion of public spending on social care spent on services for working-age adults (aged under 65 years) rose from 47 per cent in 2003/04 to 50 per cent in 2009/10.[2] If this trend continues alongside the projected growth for adults aged over 65, the total demand for adult social care would rise by between three and four per cent a year between 2010/11 and 2021/22.

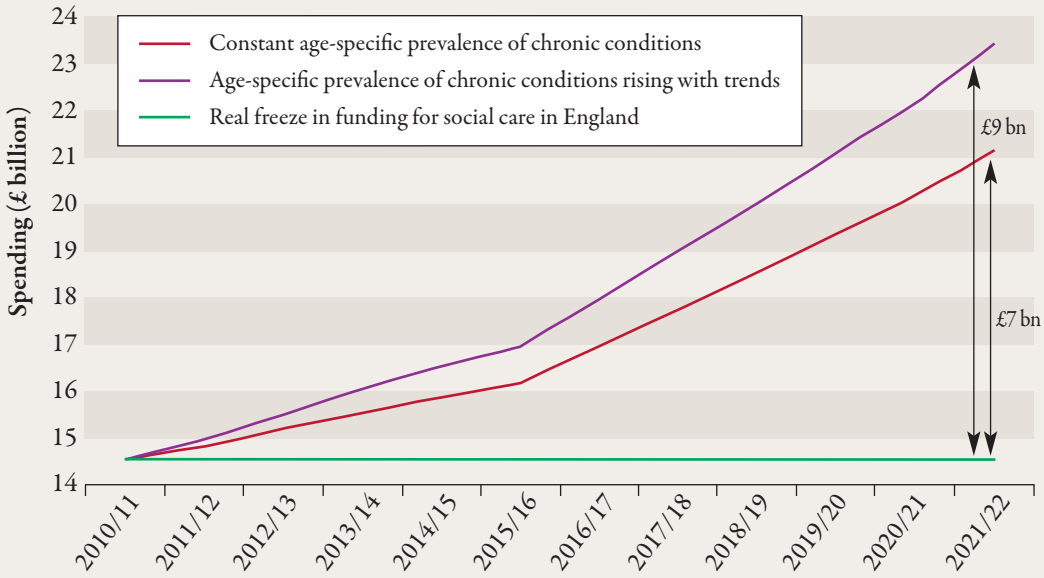
The funding that will be made available for social care is unknown, but in the current economic environment, a freeze in real-terms funding for the next decade may be unlikely.[3] If this occurs, there would be a funding gap for social care of between £7 and £9 billion by 2021/22 (see Figure 5.2).

1. We have used the figures without the addition of continuing health care, as this spending is already included in our NHS model.

2. Based on Nuffield Trust calculations on 2010/11 net current expenditure data produced by the NHS Information Centre.

3. In reality, with cuts in funding to local authorities, the money available for social care is likely to fall in real terms between 2010/11 and 2014/15. This scenario would therefore allow some increase in funds after 2014/15.

Figure 5.2: Additional funding pressures on social care, based on PSSRU model for the over-65s, and assuming the proportion of net current expenditure for the under-65s grows in line with trend between 2003/04 and 2010/11




In July 2011, the Commission on Funding of Care and Support produced a report recommending a cap on the amount that any individual pays towards their lifetime requirement for social care services (Dilnot and others, 2011). If this cap is implemented at £35,000, the funding gap could grow by a further 15 per cent, leaving a gap of between £10 and £12 billion (five to six per cent a year).

# 6. Closing the NHS funding gap: 2015/16 to 2021/22

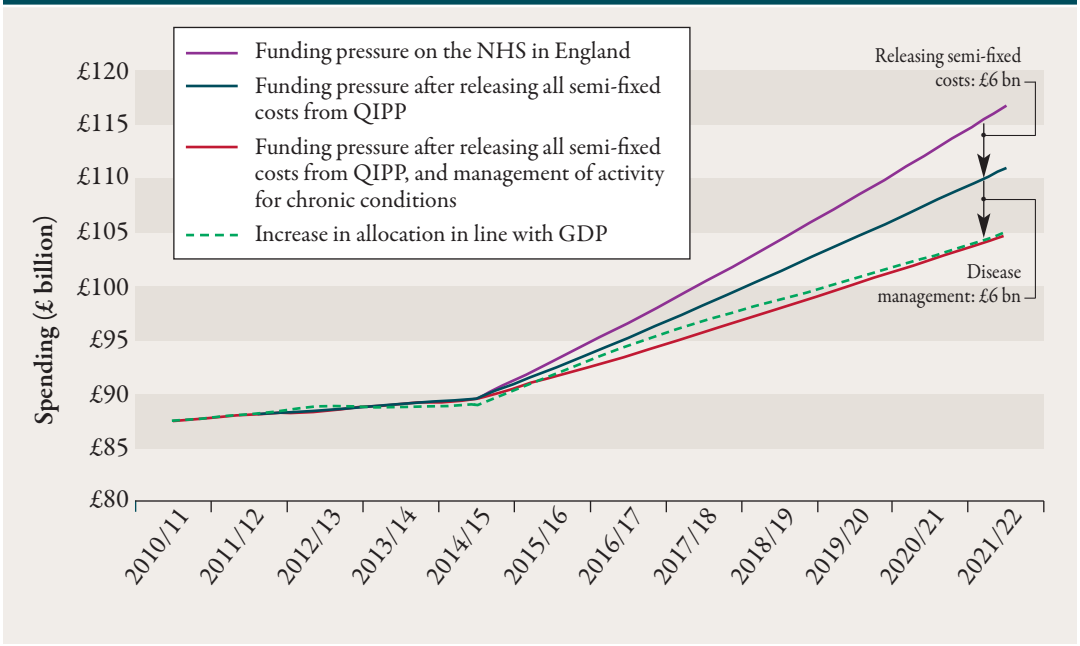
## 6.1 Translating productivity gains into cash savings

If NHS funding increases in line with economic growth (GDP), the funding gap for PCT-commissioned NHS services in England would be £12 billion in 2021/22. We have assumed that only one-third of the semi-fixed (staff) costs associated with the productivity gains achieved between 2010/11 and 2014/15 could be translated into cash savings during this period. If the remaining two-thirds of these semi-fixed costs can be released by 2021/22, further savings of £6 billion will be realised, reducing the financial challenge to £6 billion in 2021/22 (as illustrated by the blue line in Figure 6.1).

## 6.2 Managing pressure from chronic conditions

A funding gap worth £6 billion would remain in 2021/22 if inpatient activity for chronic conditions increases in line with pre-2010/11 trends between 2015/16 and 2021/22. If acute sector activity for chronic conditions is managed and the probability of receiving inpatient care for these conditions remains at the level observed in 2009/10, the remaining £6 billion funding gap in 2021/22 will be closed (as shown by the red line in Figure 6.1).

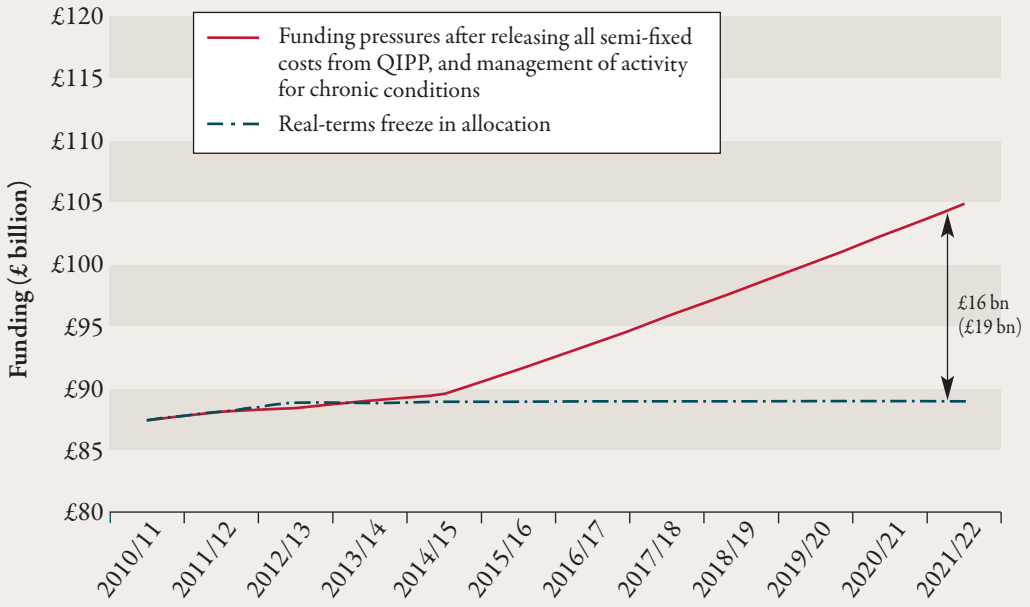
**Figure 6.1: Closing the funding gap resulting from funding growth in line with economy-wide inflation: 2015/16 to 2021/22**




## 6.3 Frozen funding to 2021/22: can the NHS meet this challenge?

Releasing savings and managing chronic condition-related demand will be sufficient to close the funding gap if funding grows in line with GDP, but not if it is frozen in real terms after 2014/15. A gap of between £16 and £19 billion would remain in 2021/22 (see Figure 6.2). Further efficiency savings of two per cent a year would be required to meet this challenge.

## Figure 6.2: The remaining financial challenge if funding for NHS services is frozen between 2015/16 and 2021/22




Note: The funding gap for PCT-commissioned NHS services in England is displayed together with the estimate for the departmental expenditure limit, in brackets.

We have assumed that pay in the NHS will rise by two per cent above inflation after 2014/15. If, instead, health service workers' pay grows in line with inflation, resulting in no pay growth in real terms between 2015/16 and 2021/22, the pressures on NHS funding would be reduced by a further £8 billion by 2021/22. However, following four years of relatively low pay awards, this may risk loss of staff or low morale. We have not modelled the impact on recruitment and retention of a sustained real-terms squeeze in health service pay.

The remaining £8 billion of required savings (one per cent a year) could be made through further productivity gains. This will be difficult to achieve in hospital services following those already made in the period to 2014/15, although reconfiguration of services may bring further savings. Additional savings may be possible in other sectors. For example, we currently assume that the number of GP consultations per person rises each year, but if this was held at the 2010/11 rate, the funding gap could be reduced by an additional £3 billion. However, it is likely that increases in primary and community care activity would be required to support the reductions in hospital activity for conditions that can be managed out of hospital. A reduction in GP consultations of this magnitude may prove detrimental under these circumstances.

## 6.4 A realistic challenge?

If funding rises in line with economic growth from 2015/16, the financial challenge in 2021/22 could be met through a combination of fully translating productivity gains into cash savings over this period, and preventing the probability of inpatient care for chronic conditions from rising above the 2010/11 level. However, if funding is frozen in real terms until 2021/22, the financial challenge to NHS services in England will be to make a further £16 billion in efficiency savings, equivalent to two per cent a year, on top of the previous efficiency savings and the continued management of chronic disease activity.

# 7. Discussion

If government funding for health remains flat in real terms for the decade 2010/11 to 2021/22, the funding gap for PCT-commissioned services in England would, in the absence of any productivity savings, amount to £44 billion in real terms in 2021/22. The NHS is currently striving to achieve the savings of four per cent a year required under the QIPP programme between 2010/11 and 2014/15. If this challenge is met, it is possible that the NHS will be required to continue making productivity gains of around four per cent a year for a further seven years.

Beyond 2014/15, a return to funding growth at the historic (pre-2010/11) average rate of four per cent a year in real terms would be sufficient to meet the pressures likely to be placed on health services based on historic trends. This is highly unlikely however, with further cuts to public spending already planned until 2017. If the government increases NHS funding in line with economic growth (GDP) following the 2010 Spending Review period, a funding gap worth £12 billion would remain, requiring savings of two per cent a year between 2014/15 and 2021/22.

## 7.1 Is the recent past a good guide to the future?

These projections for future pressures on health care considered supply and demand-side factors separately. Our approach extrapolates forward demand pressures on the NHS based on recent trends in activity by age, sex, geographical region and chronic conditions. However, in reality, demand and supply are inter-related, especially in a service which is free at the point of use. The last decade was a period of unprecedented growth in health service funding. Research shows that over half of the additional funding provided after 2002 went on rising real-terms pay for health care workers (Maybin and Thorlby, 2010). But there was also an increase in the number of doctors and nurses per head of the population in England. The government also introduced new services (such as walk-in centres, Improved Access to Psychology Services (IAPT) and NHS Direct), improved access to care by reducing waiting times, and improved quality standards were developed through the National Service Frameworks. These changes will have influenced GP and patient behaviour. In the coming decade, the financial environment is very different. As a result there may be fewer service developments, expectations of quality improvements may slow and demand pressures may not rise in line with recent trends.

## 7.2 Pay and prices

For each year of the current spending review period, pay is either frozen, or falling in real terms. This pay restraint is vital to achieving the QIPP challenge; contributing around 40 per cent of the necessary savings. Historically, earnings for health care staff have risen by two per cent a year above inflation. The scale of the challenge following 2015 is increased by the very different pay outlook between the current spending review period and beyond. It is highly unlikely that the pay freeze will continue throughout the following seven years without detrimental effects on care through difficulties with staff recruitment, retention and motivation; hence greater savings will need to be made in other areas of NHS spending. With this in mind, any future 'catch-up' pay growth to compensate for the freeze would increase the funding gap still further.

Nurses are the largest staff group in the NHS. Wages for nurses have been found to be generally inelastic in the short term, implying that a slight fall in wages will not decrease the supply of nurses substantially, at least outside of London (Crawford and others, in press). It is plausible therefore that the pay freeze between 2010/11 and 2014/15 may not have an overly detrimental impact on the supply of nurses. However, we do not know how this elasticity will change over a longer time period, in which current nurses are able to retrain, and those who may have considered nursing as a career are discouraged from training.

While pay presents a challenge after 2015, some of the assumptions in this research may provide some headroom in reality. The projections assume that the non-pay costs of providing health care rise in line with whole-economy inflation. In doing this, we assume that new activity will cost the same per unit as existing activity. However, in reality, the marginal cost associated with providing more care is likely to be lower than this, due to economies of scale.

## 7.3 Productivity

Increased productivity in the NHS is vital to achieving the QIPP challenge by 2014/15. Fully translating this into ongoing cash savings will be important to reducing the longer-term funding gap. Due to the nature of NHS costs, not all of the financial gains from the QIPP savings will have been realised as cash savings by 2014/15. In contrast to the variable costs directly associated with each unit of activity, semi-fixed staff costs cannot be released in direct proportion to reductions in activity. This is because permanent staff have responsibility for a certain quantity or diversity of activities, and are often on fixed-term contracts. Releasing these costs therefore happens in a more gradual manner, as natural attrition of staff occurs and staff can be redeployed. If all of the remaining semi-fixed costs related to the productivity gains made between 2010/11 and 2014/15 can be released by 2021/22, the funding gap could be reduced by £6 billion. Achieving further cash savings from the QIPP productivity gains has not been explored in this work; however, over the longer term, service redesign and reconfiguration may permit some of the fixed costs to be released. Neither have we looked at the impact of reinvesting money saved through productivity gains in NHS services, as was the intention of the QIPP programme.

## 7.4 Better management of long-term chronic conditions

Hospital inpatient activity for chronic conditions was rising prior to 2010/11. Managing demand for health care will be critical to the NHS meeting the financial challenge it faces over the next decade. While the growing and ageing population is often cited as driving the rise in demand for health care, the increase in age- and sex-specific hospital activity for chronic conditions presents an equal or greater pressure. If this activity is managed to prevent the age- and sex-specific probability of admission rising above the 2009/10 level, a further £6 billion of the potential funding gap would be closed.

Halting the rise in the probability of hospital care for people with long-term chronic conditions may not be outside the realms of reality under tighter financial conditions. The amount of funding available is a major driver of the amount of activity in the NHS. The recent years of funding increases are likely to have contributed to the increases observed in hospital care. Through our modelling we do not imply a 'correct' or desirable amount of care. To maximise productivity, it is important that the right care is provided to the right patients at the right time, but this does mean providing more care in all cases.

Indeed, as the amount of a given type of care rises, the balance of benefit to harm changes for the individual patient (Gray, 2012), hence greater quantities and intensity of health care are not necessarily markers of improvements.

The impact of an increasing number of the population having long-term chronic conditions on service planning and delivery is significant. Our modelled productivity gains would result in a slight drop in the number of hospital bed-days used between 2010/11 and 2021/22, assuming age- and sex-specific activity for people with long-term chronic conditions remains constant (see Table 7.1). The number of nurses required in England in 2021/22 will be similar to the level in 2010/11, although the distribution across England may change, as shown in Table 7.1. This will, however, represent a lower number of nurses per capita. If hospital pressures related to chronic conditions are not managed, and continue to rise in line with the trend over this period, there will be a 20 per cent increase in bed-days, requiring a similar proportional increase in the required number of nurses.

Primary prevention of chronic conditions to reduce their prevalence in the population will be vital to achieving long-term reductions in demand for hospital and other health care. However, pressures related to the cost of care for people with chronic conditions are not

Table 7.1: Projection of bed-days and nurse numbers required by region, assuming that the ratio of nurses per bed-day remains constant, and QIPP savings are made

| | | Projected inpatient bed-days (1,000) | | | Total nurses (assuming constant ratio of nurses to bed-days) | | | Change in nurse numbers compared to 2010/11 | |
|---|---|---|---|---|---|---|---|---|---|
| Region | Nurses per 1,000 inpatient bed-days | 2010/11 | 2014/15 | 2021/22 | 2010/11 | 2014/15 | 2021/22 | 2014/15 | 2021/22 |
| North East | 5.4 | 2,636 | 2,046 | 2,257 | 13,236 | 11,101 | 12,095 | -16% | -9% |
| North West | 5.1 | 7,476 | 6,570 | 7,246 | 36,542 | 33,654 | 36,642 | -8% | 0% |
| Yorkshire and the Humber | 5.1 | 5,409 | 4,555 | 5,126 | 26,332 | 23,556 | 26,088 | -11% | -1% |
| East Midlands | 3.9 | 4,657 | 4,146 | 4,749 | 17,788 | 16,619 | 18,702 | -7% | 5% |
| West Midlands | 4.2 | 5,726 | 5,028 | 5,629 | 23,291 | 21,477 | 23,688 | -8% | 2% |
| East | 3.5 | 5,760 | 5,147 | 5,906 | 19,847 | 18,620 | 20,960 | -6% | 6% |
| London | 6.0 | 6,901 | 5,820 | 6,328 | 39,934 | 35,571 | 38,244 | -11% | -4% |
| South East | 3.7 | 8,442 | 7,033 | 8,029 | 29,694 | 26,401 | 29,607 | -11% | 0% |
| South West | 3.8 | 6,266 | 5,557 | 6,351 | 23,215 | 21,630 | 24,285 | -7% | 5% |
| Total | 4.5 | 53,273 | 45,902 | 51,621 | 229,880 | 208,630 | 230,310 | -9% | 0% |

solely determined by their prevalence; increases in demand can be mitigated by timely delivery of appropriate care in the right setting. For the most part, this will be outside of hospitals. Pressure on secondary care services can be reduced by:

- enabling patients to manage their own conditions, through the use of emerging technologies
- delivering efficient, effective care through coordinated community and primary care services
- educating patients about the appropriate use of health care services.

This will require improved integration of health and social care services, and of primary and secondary health care services.

As described in the 2002 Wanless Review, spending requirements for the NHS will be highly dependent on the level of the public's engagement in relation to their health. In addition to productivity improvements, more success in health promotion and disease prevention strategies is important in reducing health care resource requirements in the future (Wanless, 2002).

## 7.5 Social care

Social care services in England are currently experiencing rising demands due to an ageing population and rising trends in the prevalence of chronic conditions. There have been real-terms cuts to social care funding. A recent survey of directors of adult social services indicated that a total of £890 million had been cut from budgets in 2012/13 (equivalent to 6.8 per cent), following a 7.7 per cent cut in the previous year (Smulian, 2012). This has resulted in services being restricted and a rising level of unmet need for care (Age UK, 2011). Shortfalls in social care funding are impacting on NHS services through:

- increased demand for NHS community services
- increased emergency and unplanned care admissions to hospital
- delayed transfers of care (NHS Confederation, 2012).

These extra demands on health care services are additional to the required spending modelled in this report.

Both increased funding of social care, and greater integration of health and social care services, are needed to ensure an efficient and sustainable system (NHS Confederation, 2012). Reducing unmet need for social care may contribute to reduced demand on the NHS, and better integration of services should help to maximise efficiency and productivity savings, although further evaluation of these inter-relationships is needed.

## 7.6 Implications of the 2010 Spending Review

A decade of flat spending on health in real terms would be unprecedented in England, or indeed in other advanced Western economies. Across the OECD, health spending took a progressively increasing share of GDP until 2010. The rate of increase has been higher than inflation in every OECD country over the last 40 years. Between 1970 and 2008, the average increase in health care spending was 3.9 per cent a year, which is 1.8 per cent a year faster than GDP growth across the OECD (Frogner and others, 2011). This increase

is explained partly by population demographics: the global population is increasing and ageing, resulting in greater demand for health care. The rising share of GDP devoted to health is also considered to be influenced substantially by supply-side factors. These include technology and the availability of health care (which drive demand), and also relative price effects: health care has become progressively more expensive to produce compared with other goods and services in the economy.

This relative price effect is an example of Baumol's 'cost disease' hypothesis (Baumol and others, 2012). This suggests that the real-terms cost of personal service sectors (which include health and social care, and also education, the performing arts, hairdressing and fine dining) has been rising because their nature makes it very difficult to reduce the amount of labour required to deliver a quality service. The impact of this is that the observed productivity of health and social care (and other personal services) is inherently lower than whole-economy productivity, and as a result the share of GDP devoted to them will increase. This is not necessarily a problem, as GDP growth is fuelled by productivity improvements in other sectors and real-terms reductions in their costs. So while health becomes relatively more expensive, computers, for example, become cheaper.

This hypothesis is not universally accepted, however (Pauly, 1993), and it is important to note that health is far more complex than many other personal services. While health involves very labour-intensive services such as care, it is also technology-rich. While new technologies increase demand for health care, they have also driven significant productivity improvements. For example, advances in anaesthesiology in surgical interventions have reduced hospital length of stay and readmission rates. Technology is also supporting new models of care in services that have in the past been considered intrinsically labour intensive, such as computerised cognitive behavioural therapy in mental health, and telehealth and telecare systems for the management of chronic conditions.

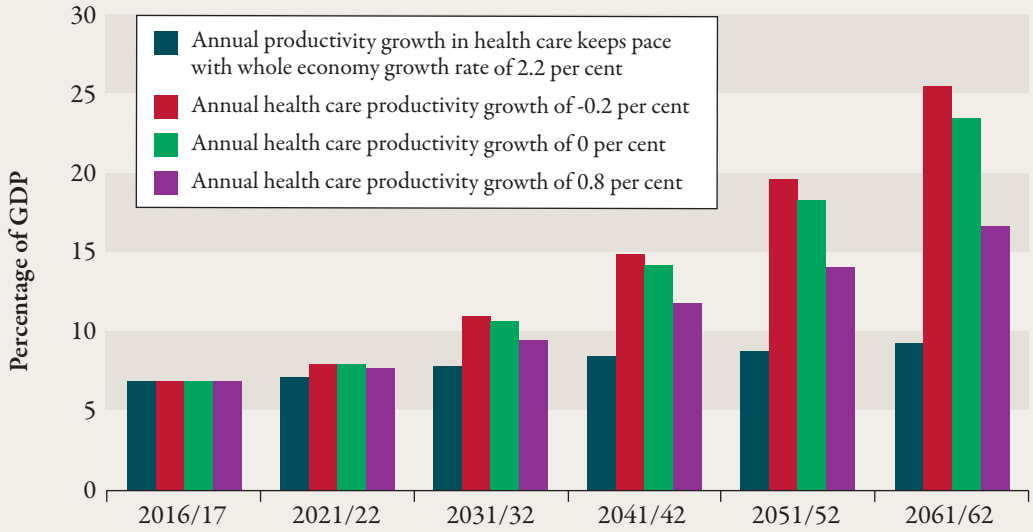
While it may not be possible to increase NHS productivity in line with economy-wide productivity growth, due to the nature of health care, improvements are needed. If productivity is flat, spending on health care will grow at rates that are not fiscally sustainable under current tax policy. If NHS productivity could grow by at least one per cent a year, the impact on the share of GDP and tax would be considerable, as shown in Figure 7.1.

Baumol (see Baumol and others, 2012) argues that the growth in other sectors means that health care will not become 'unaffordable'. Moreover, there are positive links between health and economic growth, as improvements in population health status have a positive impact on labour supply (Suhrcke and others, 2005). However, recent analysis of the macroeconomic implications of the rising real cost of personal services (including health) in the United States (Nordhaus, 2008) has found that economic growth has been lowered by around half of one per cent a year over the last 50 years, as a result of the structural shift in the economy away from sectors with high productivity growth towards those such as health with relatively low productivity growth.

Whatever the impact on overall economic growth, if health is to increase as a share of GDP, it will have fiscal implications. This can be managed in one of three ways:

- The share of spending on other public services (education, transport, criminal justice and defence) will have to decline.

## Figure 7.1: Impact on the proportion of GDP spent on health care under different assumptions of productivity growth




Source: Office for Budget Responsibility (2012)

- Spending on welfare, including payments to unemployed people, pensions and disability support, will have to be reduced in relative terms.
- Government spending will have to increase through higher taxes.

The scope for health spending to take an even greater share of public spending is increasingly limited. Spending on health accounted for 27 per cent of all spending on public services in 2010/11 (Institute for Fiscal Studies, 2012). This has grown substantially over the last 30 years, from 17 per cent, partly as a result of the government reducing its role in a number of other sectors, for example utilities and defence. Modelling by the IFS for the Nuffield Trust found that if health spending was to grow at the historic rate of four per cent a year between 2015/16 and 2021/22, all other public services would see a real-terms freeze in funding (Crawford and Emmerson, 2012). For the NHS to grow in line with national income, and allowing all other public services to match this rate of increase, there would need to be cuts to welfare spending, or increases in taxation worth £44 billion. This equates to an additional £1,400 for every family in the UK (Crawford and Emmerson, 2012).

**£44 bn**

Value of cuts to welfare spending, or increases in taxation, for the NHS and other public services to grow in line with national income

It is clear that there are no easy options for health beyond the current spending review period. The pressures on the health budget from demography, rising chronic conditions and increasing input costs (principally pay) will remain. Productivity must increase and be sustained. Management and clinical leadership will need to focus beyond the current four-year QIPP plans, extending them for at least the decade. Particular attention should be placed on improving quality and performance, and turning these improvements into cash-releasing efficiency savings. It is perhaps unrealistic to expect productivity in health care to match that of the whole economy. Hence, the government will need to balance the pressures on health

against pressures on other public services, welfare payments (including for older people) and/or additional taxation.

## 7.7 Summary of our analysis

Our analysis demonstrates that without unprecedented, sustained increases in health service productivity, funding for the NHS in England will need to increase in real terms between 2015/16 and 2021/22 to avoid cuts to the service or a fall in quality.

If spending on health care in England rises in line with overall economic growth between 2015/16 and 2021/22, the ability to manage demand will depend on three conditions:

- the ability to manage pay, avoiding a period of 'catch-up' increases following the freeze to 2014/15
- the ability to limit rising demand pressures for hospital care for chronic disease
- the translation of QIPP productivity gains into ongoing cash savings for reinvestment in the NHS.

> With no clear signs of economic recovery... NHS funding may be frozen for further years

The NHS has fared better under the current austerity measures than other areas of public spending. However, the funding allocation for the NHS beyond March 2015 will not be known until the next spending review. And further protection of the NHS budget is not guaranteed due to the uncertainty of the economic outlook for the country (Press Association, 2012). With no clear signs of economic recovery, it is conceivable that NHS funding may be frozen for further years. If this is the case, a major rethink of how health services in England are funded and organised will be needed. Sir David Nicholson recently stated that fundamental changes to the functioning of care systems are needed if the NHS is to make further efficiency improvements and quality gains (Limb, 2012).

While the absolute numbers are smaller for social care, the rate of funding increase required to maintain service access and quality may be as large, if not greater (between three and six per cent a year, depending on whether recommendations by the Commission on Funding of Care and Support (Dilnot and others, 2011) are implemented). To maximise productivity, while improving the quality of care, future planning must consider better integration across health and social care services.

This report makes a start at quantifying the funding pressures facing the NHS in England over the next decade, and estimating the impact of three key factors in reducing this pressure:

- holding down pay
- improving care for people with long-term chronic conditions
- reducing hospital activity.

This is only a beginning. Clearly there are many more factors that might help reduce funding pressures, as noted above. These could be modelled in line with emerging evidence from research findings, for example, the impact of:

- major service reconfiguration
- integrated care
- changing the skill mix of the workforce
- more or less publicly-funded social care
- greater use of assistive technologies such as telehealth and telecare.

Given the beginnings in this report, there is a role for much more comprehensive, independent and transparent analysis of research evidence and assumptions in future, given the current unusual funding squeeze, to help identify which policies and local initiatives might make most impact on quality and costs if rolled out nationally. This can only help to put the NHS on a more sustainable footing over the next decade.

# Appendix: Limitations of this work

The projections for the rising rate of chronic conditions used in our model are based on diagnosis codes recorded in hospital episode statistics (HES) inpatient records. Over time, the number of diagnosis codes recorded for each episode has risen. It is possible that some of the increase in treatment for chronic conditions arises from additional recording of co-morbidities, rather than a true change. To validate our projections, we compared our trends to gradients derived from estimates of future prevalence of these conditions (using those published by the Association of Public Health Authorities, where available), and found the resulting projections to be similar.

Our projections are of activity attributable to chronic conditions, as opposed to actual prevalence of the conditions. Activity reflects not only the prevalence of a condition but also the probability of receiving treatment for it. This is the appropriate variable for our purpose here as it is directly related to cost and it avoids the need to make assumptions about the proportion of people with a condition who should receive hospital care. Activity is influenced by patient factors including health-seeking behaviour, health care practices including guidelines and capacity, and technologies including the availability of effective and cost-effective treatments. As such, it encompasses all of these inter-related factors that would be highly complex to model individually due to a lack of understanding about how they interact.

Our projections for future probability of admission for each chronic condition, by age and sex, are based on a linear trend continuing over the next decade. Due to the high number of combinations (570) of chronic condition, sex and age group, it was not feasible to individually optimise each model. A number of trends may not be linear, which would alter the outcome.

Our projections are highly influenced by the ONS population estimates from 2008 and are therefore limited by the accuracy of these projections. Although more recent projections for England were available, we did not have these broken down by region.

The projection for prescribing spending is derived from national trends over time, and therefore is the only model that does not specifically include population change. Future attempts may wish to explore whether it is possible to model prescribing at the person level.

We have estimated that the savings required by 2014/15 will be achieved by reducing hospital activity. Reductions in hospital activity are likely to have knock-on effects on other service types, increasing the pressure on community services for example, which we do not account for here. However, we do not explore the effect of efficiency savings in other service types, such as reducing the number of GP consultations. We therefore assume that the extra burden placed on other service types can be balanced by efficiency savings made in those areas.

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