

# Securing the future: funding health and social care to the 2030s

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In association with

# **Securing the future: funding health and social care to the 2030s**

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## **This is a chapter from IFS report ‘Securing the future: funding health and social care to the 2030s’**

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### 3. Future pressures on the NHS and social care

Anita Charlesworth, Zoe Firth, Ben Gershlick, Adam Roberts and Toby Watt  
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#### Key findings

**Without major changes to the way healthcare is provided, meeting the needs of a growing and ageing population would require hospital activity to increase by a projected almost 40% over the next 15 years.**

It is estimated that there will be 5.9 million more people in the UK in 2033–34 than in 2018–19. The number of people aged 65 and over is growing three times faster than the number aged under 65 – 4.4 million more aged 65 and over and 1.5 million more under-65s. The burden of disease is also increasing. More of the UK's population will be living with a chronic disease and very many with multiple conditions, further adding to health and care demand pressures. This will have major implications for NHS workforce and capacity.

**To maintain quality and access to care at current levels for the growing and ageing population, health services in England would need an estimated 3.3% in additional funding per year over the next 15 years.**

This is the result of the growing and ageing population, rising chronic disease but also additional pay and price pressures which are not projected to be fully offset by productivity improvements. If pay grows in line with projections of public sector earnings (1.7%), it would increase at more than twice the long-run trend in healthcare productivity in the UK (0.8%).

**If the NHS in England is to meet waiting times targets for A&E and inpatient care, deliver parity of esteem for mental health and invest in modern technology and facilities, health spending would need to increase by a projected 4.1% per year over the next 15 years.**

Over the next 15 years, if the NHS is to improve the quality and range of care provided, spending would need to increase at a faster rate. Modernising the NHS to deliver improved outcomes could include: returning to the NHS constitutional standards for access to hospital services; significant progress towards the commitment to parity of esteem for mental health services; additional capital investment to upgrade NHS infrastructure, including scanners for cancer diagnosis; more investment in public health; and higher pay for NHS staff. There may be scope to offset some of these additional pressures with a sustained increase in the rate of productivity growth (at 1.4% a year).

**Healthcare funding has not kept pace with demand and cost pressures in recent years.**

The healthcare budget in England is £128 billion in 2018–19, following the announcement of additional funding in the Chancellor of the Exchequer's Autumn 2017 Budget. The NHS has built up unfunded, underlying cost pressures over recent years as funding has increased by less than demand. Over half of NHS hospitals are in deficit and capital investment and maintenance have been postponed to meet day-to-day running costs. To modernise the NHS, resource spending in England would need to increase by a projected 4.7% a year and capital funding 11.0% over the next five years. Even without modernisation, our projections show spending in England would need to increase by a projected 4.1% for day-to-day running costs and 2.3% for capital.

**Demographic and non-demographic pressures mean that maintaining current standards would require spending to increase by a projected 3.3% a year over the next 15 years. Modernising the NHS would require funding to grow by a projected 4.0% a year. Under these scenarios, healthcare spending would increase as a share of GDP from 7.3% in 2018–19 to 8.9% or 9.9% respectively in 2033–34.**

Demographic and non-demographic pressures would see healthcare spending across the UK increase from £154 billion in 2018–19 to £278 billion in 2033–34 if the NHS is modernised. As a result, the NHS would continue to consume an increasing share of GDP – in line with the trend over the last 70 years, other projections from the OBR and OECD, and consistent with expected trends in other EU15 and G7 countries.

**To maintain social care services at the levels available in 2015–16 would require spending to increase by a projected 3.9% a year over the next 15 years.**

Social care is facing high growth in demand pressures, which are projected to rise by around £18 billion by 2033–34, at an annual rate of 3.9%. This is a combination of growing and ageing populations, rising numbers of people living longer with long-term conditions, and rising costs of providing care services. Spending on social care would therefore grow as a share of GDP from 1.1% in 2018–19 to 1.5% 15 years later.

**The NHS is projected to need at least 179,000 more staff over the next five years if services grow in line with demand pressures. This is more than 100,000 more staff than the NHS is expecting to be able to recruit and retain over the next five years.**

If the NHS workforce grows in line with activity under the modernised scenario, then it would require a projected additional 179,000 staff over the next five years, rising to 639,000 full-time-equivalent additional staff by 2033–34. This would include 171,000 extra nurses and health visitors and a total 343,000 extra professionally qualified clinical staff.

### 3.1 Introduction

Chapter 1 charted the path of NHS spending since its inception, showing that, in common with countries across the EU and G7, healthcare spending in the UK has increased at a faster rate than inflation and GDP. As a result, publicly funded health spending is now 7.3% of national income (2018–19). In this chapter, we set out the results of economic modelling of current patterns of healthcare utilisation and costs, alongside trends in the key drivers of healthcare spending, to project future spending pressures for the NHS. We

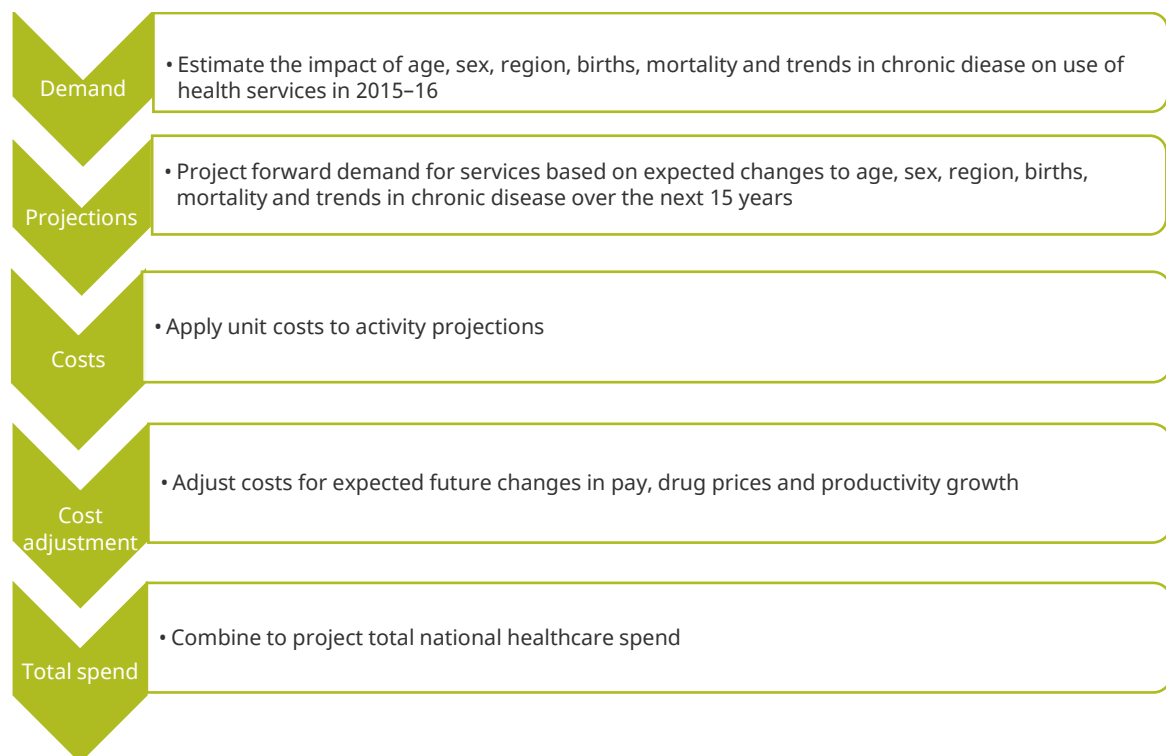
look forward 15 years from the NHS's 70<sup>th</sup> anniversary to the NHS at 85, and chart how the spending pressures evolve in five-year bands. The detailed component-based models we use to estimate spending pressures are based on projections of activity and their cost. We also set out the implied changes to utilisation of healthcare and what that might mean for the workforce. With the ageing of the population, it is increasingly important that healthcare services are planned and managed in an integrated way with social care services. We therefore also set out projections for social care spending from colleagues at the Personal Social Services Research Unit (PSSRU) over the same 15 years.

### 3.2 Methodology

This chapter presents the results of a detailed component-based economic model of the demographic and non-demographic determinants of healthcare spending. The model uses data on the use of health services and the cost of delivering care in the English NHS in 2015–16, to understand how healthcare cost and utilisation vary with people's age, sex, mortality and patterns of chronic disease, given current standards of access and quality of care, and the way in which services are delivered. It is significantly different from many existing projections of health spending, which are based on 'top-down' estimates (see Box 3.1).

The service delivery model includes factors such as: the balance of hospital-based, primary and community care; the mix of care provided in outpatient departments, as day cases or as inpatient admissions; and how long people stay in hospital.

**Figure 3.1. Steps for producing total NHS spending projection**



Source: Health Foundation analysis plan.

### Box 3.1. Top-down models of long-term spending on healthcare

The Office for Budget Responsibility (OBR) projects healthcare spending. These projections and those of international bodies<sup>a</sup> use top-down modelling techniques to project healthcare expenditure.

Top-down models identify three main drivers of healthcare spending:

- demographic factors – changes in the size, age structure and burden of ill health;
- income effects;
- other cost pressures, which include technological advance and rising relative prices.<sup>b</sup>

These methods assume that alongside demographic changes, non-demographic factors are a major contributor to rising healthcare costs. The leading non-demographic factors are morbidity, pay and price pressures, and the impact of rising income.

Within the burden of disease in the population, morbidity is a key driver of health spending. Chapter 1 showed that life expectancy has increased over the last 70 years. How much of that extra life expectancy is spent in good or poor health is an important determinant of healthcare spending. The OBR model explores the impact of different scenarios for morbidity – an expansion of morbidity means more years in ill health; a compression of morbidity means fewer years in ill health. Its central projection assumes an expansion of morbidity, continuing recent trends in health status.

The other important factor identified in top-down models of healthcare spending is the Baumol effect. William Baumol hypothesised that in service sectors such as healthcare, it is harder to increase productivity than it is in capital-intensive manufacturing sectors, but wage growth has to be broadly consistent between sectors for recruitment and retention purposes. The OECD and the OBR both assume there is a Baumol effect for healthcare, with pay increasing faster than productivity growth.

As UK national income (GDP) has increased over time, society has prioritised improvements in healthcare in line with that growing prosperity. This effect is measured by calculating the income elasticity of demand for healthcare. Various estimates have been made of the income elasticity of demand for healthcare – with most putting it at or just above 1. The OBR uses an elasticity of 1, meaning demand for healthcare rises in line with GDP growth – making healthcare in the UK a ‘normal good’, i.e. a good for which demand increases when income increases.

<sup>a</sup> European Commission, ‘Public expenditure on health: its growing importance, drivers and policy reforms to curb growth’, in *2013 Report on Public Finances in EMU, European Economy 4*, July 2013. OBR, ‘Fiscal sustainability analytical papers – 2016’, <http://obr.uk/fsr/fiscal-sustainability-analytical-papers-july-2016/>. OECD, *Fiscal Sustainability of Health Systems: Bridging Health and Finance Perspectives*, September 2015. IMF, ‘Public expenditure reform: making difficult choices’, *Fiscal Monitor*, April 2014.

<sup>b</sup> OBR, ‘Drivers of rising health spending’, 2015, <http://obr.uk/box/drivers-of-rising-health-spending/>.

<sup>c</sup> Y. Feng, T. Watt, A. Charlesworth, G. Marsden, A. Roberts and J. Sussex, ‘What determines the health care expenditure of high income countries? A dynamic estimation’, *Applied Economics and Finance*, 2017, 4(6), 1–16.



The NHS provides a wide range of services for the population, all of which face differing patterns of demand. To reflect this, we have modelled services separately, including inpatient (separated into emergency and planned elective and day case) hospital care, outpatient hospital care, A&E attendances, community care, primary care prescribing, mental health and primary care services (GP, dentistry, pharmacy and general ophthalmic services). This allows for greater flexibility for testing scenarios around how patterns of service provision might change. The modelling approach can be split into five steps, as shown in Figure 3.1.

Our model for acute care (inpatient, outpatient and A&E) is the most detailed. We are significantly hampered by major gaps in the data for community and primary care as there are no robust national data on the amount of care provided in these settings. There is little evidence on how care needs vary with patient characteristics, such as chronic conditions.

In our component-based model we can model many of the factors identified in top-down models in more detail. The factors we directly model are shown in Table 3.1.

We use these detailed models to estimate a base case scenario, which we call the ‘status quo’. Our status quo scenario looks at demographic changes, pay and price pressures with some offsetting productivity improvement. This provides an estimate of the minimum level of spending required to maintain the range and quality of current services at the level in 2015–16, without allowing for increasing expectations as the country gets richer (the income effect) or major new advancements in technology. Under this scenario, quality of care will not improve and public satisfaction is likely to decline.

As the top-down models used by the OBR and others show, this is unlikely to be realistic. Income effects and new technologies are important drivers of healthcare spending. We therefore also model a scenario that explores how the income elasticity of demand and new technology might affect pressures on healthcare over the next 15 years. We characterise the income elasticity of demand as the underlying factor that leads to rising expectations for quality of and access to care. We call this the ‘modernised NHS’ scenario. Our modernised scenario sets out a projection of NHS funding over the next 15 years in which the health service meets rising expectations for the quality and range of care provided and in which services adopt new technological advances. This is not a radical upgrade of the NHS and is unlikely to put us in the forefront of other European countries when it comes to either spending or outcomes.

**Table 3.1. Key drivers of healthcare spending modelled in our component-based approach**

Demographic factors	Supply factors
Changing size and age structure of the population	Real earnings growth for NHS staff
Burden of ill health	Productivity
	Drug price inflation

Source: OBR, ‘Drivers of rising health spending’, 2015, <http://obr.uk/box/drivers-of-rising-health-spending/>; Health Foundation analysis.

In this chapter, we present the results of our two scenarios for healthcare spending pressures as point estimates. These are projections, not forecasts. The projections are subject to considerable uncertainty – population estimates for the future change regularly, technological advance is non-linear and patterns of chronic disease may be different depending on public attitudes to risk factor behaviours such as smoking, alcohol consumption, diet and exercise. This uncertainty is unavoidable, but healthcare services need to plan for the future: capital investment, service redesign, medical and nursing education and training all have long-term horizons – for example, it takes more than 10 years to train a consultant. Making good decisions under uncertainty requires a sophisticated understanding of how different drivers of healthcare might affect funding, outcome, workforce and delivery. The evidence base for this is currently weak; it is not drawn together systematically and is not updated on a regular basis as underlying drivers change. This major gap should be addressed to help put the NHS on a more sustainable footing.

It is important to recognise that our model provides projections of the path of future spending pressures for the NHS, assuming that current patterns of care and recent trends are a reasonable guide to the future. Over the medium term, these modelling approaches tend to be a fairly reliable guide to the future, but they are much less reliable in the short term. They cannot anticipate ‘shocks’ to the system that require what is provided and the cost of care to adapt quickly and diverge from the trend. The amount spent is, of course, a political decision based on the priorities and preferences of the government and the population. Our projections reflect the spending implications of the current model of delivery of healthcare, with some improvement in productivity. They are not necessarily a model of the costs of the ideal or optimal model for delivering healthcare.

## Data

We use a number of different data sources, as set out in Box 3.2. We use this detailed modelling of the English NHS as the basis of UK-wide projections. We gross up estimated England spending pressures to the UK by calculating the health spend per head in 2015–16 for each country using data from Public Expenditure Statistical Analyses (PESA)<sup>1</sup> and ONS population data.<sup>2</sup> We increase spending per head for Scotland, Wales and Northern Ireland at the same rate as the modelled projected growth in spend per head for England. Multiplying the projected spend per head by the corresponding population projections for each constituent country (other than England) gives the total NHS spend for each year up to 2033–34. The sum of spend over all constituent countries gives the estimated projected UK health spend.

<sup>1</sup> Table 9.11 of HM Treasury, *Public Expenditure Statistical Analyses 2017*, <https://www.gov.uk/government/statistics/public-expenditure-statistical-analyses-2017>.

<sup>2</sup> Office for National Statistics, ‘Table A1-4, Principal projection – England summary’, <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationprojections/datasets/tablea14principalprojectionenglandsummary>.  
Office for National Statistics, ‘Table A1-5, Principal projection – Wales summary’, <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationprojections/datasets/tablea15principalprojectionwalessummary>.  
Office for National Statistics, ‘Table A1-6, Principal projection – Scotland summary’, <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationprojections/datasets/tablea16principalprojectionscotlandsummary>.  
Office for National Statistics, ‘Table A1-7, Principal projection – Northern Ireland summary’, <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationprojections/datasets/tablea17principalprojectionnorthernirelandsummary>.

### Box 3.2. Data sources

In this analysis, we use data from a number of different sources to build as complete a picture as possible of NHS and social care spending and activity. Full details of data sources are provided through the chapter.

Our model for the NHS has six core components: acute care, community care, primary care, prescribing, mental health and maternity. For acute care, we use pseudonymised patient-level Hospital Episode Statistics (HES), which are administrative data containing details of all admissions, outpatient appointments and A&E attendances at NHS hospitals in England. For community care, we take activity data from the NHS Reference Costs. For primary care activity, we use a combination of Q Research and GP Patient Survey data. The number of prescribing items dispensed is taken from NHS Digital Prescription Cost Analysis. For mental health prevalence data, we use the prevalence of common mental disorders, taken from the Adult Psychiatric Morbidity Survey. All activity was costed using NHS Reference Costs, except for primary care activity (costed using data from the Personal Social Services Research Unit) and prescribing (costed using data from NHS Digital Prescription Cost Analysis).

Population, fertility and mortality estimates (including projections) are all sourced from the Office for National Statistics (ONS).

Data for expected pay after 2020–21 are from the OBR, while data up to that point are based on modelling the impact of the proposed Agenda for Change pay deal using data from NHS Digital and the NHS Staff Council.

The English health budget was sourced from Department of Health (DH) accounts, grossed up to the UK using data from PESA. All economic variables, including GDP and the GDP deflator, are taken from the OBR's 2018 Economic and Fiscal Outlook.

Unless otherwise stated, all figures are in 2018–19 prices, although our detailed modelling is based on patterns of use for 2015–16 as this is the latest year for which highly disaggregated data are available. We uprate our figures to the current financial year (2018–19) as our base year.<sup>3</sup>

### 3.3 Assumptions

To model projected health spending pressures, we make assumptions about future changes in demography, chronic disease patterns, quality and access to care (reflecting changing expectations and new technology), input costs and productivity. We model two scenarios – status quo and modernisation. Some areas (demographic trends) are the same in both scenarios. In other areas (pay and productivity), we model higher values in the modernised scenario, to reflect its higher ambition. There are additional areas (mental health, NHS constitutional standards, capital spending and public health spending) where we model no changes in the status quo, but explicitly model service improvements and

<sup>3</sup> Note that 2018–19 figures are projected estimates based on 2015–16 activity data and 2016–17 cost share data. UK figures are grossed up from England data based on health spend per head.

**Table 3.2. Projections modelling assumptions for the status quo and modernised scenarios**

	<b>Status quo</b>	<b>Modernised NHS</b>
Population pressure	ONS central projections for population growth <sup>a</sup>	As in status quo
Chronic conditions	Continuation of the rising trend in chronic conditions – by age and sex – since 2003–04 <sup>b</sup>	As in status quo
Drug costs	5.5% real annual increase in hospital unit drug costs <sup>c</sup>	As in status quo
Pay	Annual real pay bill per head grows by 1.9% to 2020–21, moving to 1.7% from 2021–22. This reflects modelled earnings growth, followed by NHS earnings growing in line with OBR expectations for public sector earnings.	Annual real pay bill per head grows by 1.9% to 2020–21, moving to 3.0% from 2021–22. The higher pay allows some catch-up to be permitted to NHS staff after low levels of pay increases in recent years.
Productivity	0.8% throughout the period: long-run average public service healthcare productivity growth for the UK (1995–2015) <sup>d</sup>	0.8% until 2018–19 (as in status quo). 1.4% from 2019–20: returning to and maintaining the higher rate of public service healthcare productivity growth achieved since 2010. <sup>d</sup>
Mental health	Treated prevalence stays at 39%. <sup>e</sup> Annual prevalence growth is 0.6% from a baseline of 15.7%. <sup>e</sup>	Number of people with a mental health condition receiving NHS care increases to 70% from a current rate of 39% <sup>e</sup>
Constitutional standards	No catch-up to meet standards set out in NHS constitution. Activity grows in line with demand.	A&E activity increases to meet 95% within four-hour target, with emergency inpatient admissions increased in line. <sup>f</sup> Planned inpatient care activity growth to avoid increased wait times and clear care backlogs. <sup>g</sup> Outpatient activity to increase in line with planned admissions.
Capital	Capital spending grows in line with plans until 2020–21, and then at the same rate as total day-to-day health spending (RDEL)	Capital spending increases to 0.5% of GDP between 2019–20 and 2023–24, in line with the OECD average <sup>h</sup>
Public health	Public health maintains its current share of total RDEL	Public health (public health local authority grants) grows at 1ppt above RDEL growth

**Notes to Table 3.2**

<sup>a</sup> Office for National Statistics, 'National population projections: 2014-based statistical bulletin', 2015, <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationprojections/bulletins/nationalpopulationprojections/2015-10-29>.

<sup>b</sup> Health Foundation analysis of Hospital Episode Statistics.

<sup>c</sup> Health Foundation analysis of NHS Digital Prescription Cost Analysis and NHS Digital Hospital Episode Statistics online.

<sup>d</sup> Office for National Statistics, 'Public service productivity estimates, healthcare: 2015', <https://www.ons.gov.uk/economy/economicoutputandproductivity/publicservicesproductivity/articles/publicservicesproductivityestimateshealthcare/healthcare2015>.

<sup>e</sup> <https://digital.nhs.uk/data-and-information/publications/statistical/adult-psychiatric-morbidity-survey/adult-psychiatric-morbidity-survey-survey-of-mental-health-and-wellbeing-england-2014>.

<sup>f</sup> <https://www.health.org.uk/blog/winter-coming-how-much-would-it-cost-keep-pressure-down>.

<sup>g</sup> R. Findlay, 'The cost of restoring 18 week waits', November 2017, <https://www.hsj.co.uk/finance-and-efficiency/revealed-the-cost-of-restoring-18-week-waits/7021025.article>.

<sup>h</sup> [https://www.oecd-ilibrary.org/social-issues-migration-health/data/oecd-health-statistics\\_health-data-en](https://www.oecd-ilibrary.org/social-issues-migration-health/data/oecd-health-statistics_health-data-en).

additional investment in the modernised scenario to reflect rising expectations and new technology.

In this section, we explain the assumptions underpinning our projections and the rationale for choosing to model them in this way.

### Population change

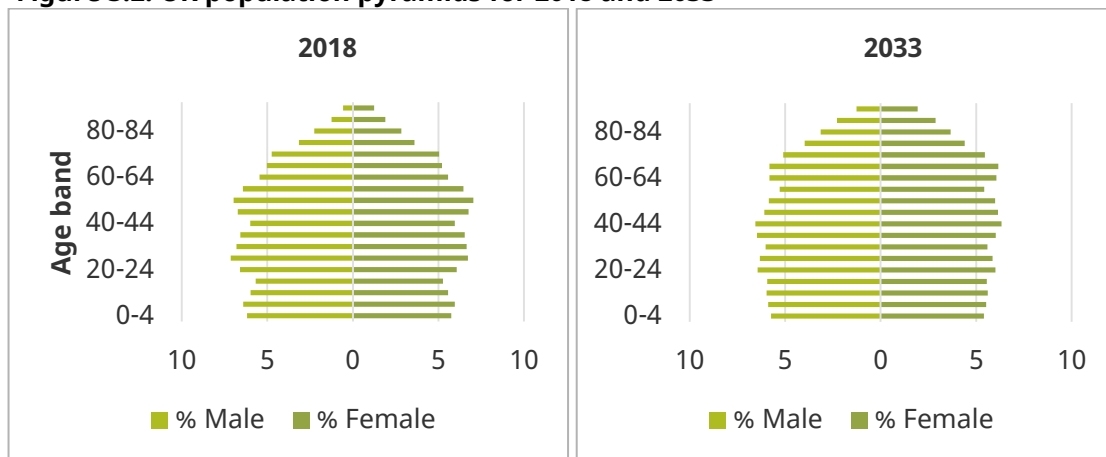
The population of the UK and its constituent countries has changed significantly over the last 70 years, and ONS projections show that further changes are expected. Health spending pressures will increase with the size of the population and with changes to the age profile. At present in England, healthcare spending per person is £2,400; however, this varies considerably across the life course. The figure is less than £1,000 per person for people aged up to 50. For people older than 50, costs then rise steeply: spending per head on those aged over 65 is more than three times spending per head on the under-65s.

Table 3.3 shows the population size of the UK and its constituent countries now, and the expected size in 15 years' time based on ONS projections. The UK is projected to have 5.9 million more people in 2033 than today. This represents average growth of 0.6% a year. Of the constituent countries, England is expected to have the highest annual average growth rate, of 0.6%, and Wales the lowest with 0.3%.

**Table 3.3. Projected population growth from 2018 to 2033**

	Population size (million)				
	UK	England	Wales	Scotland	Northern Ireland
2018	66.5	56.1	3.1	5.4	1.9
2033	72.4	61.5	3.3	5.6	2.0
Annual average growth	0.6%	0.6%	0.3%	0.3%	0.4%

Source: ONS 2014 projections – Office for National Statistics, '2014 principal population projections', <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationprojections>.

**Figure 3.2. UK population pyramids for 2018 and 2033**


Source: Office for National Statistics, ONS 2014 principal projections – UK: 2014 based, 2017, <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationprojections/datasets/z1zippedpopulationprojectionsdatafilesuk>.

As well as the size of the population, there have also been – and will continue to be – significant changes in the age and sex structure of the UK population. Figure 3.2 shows the current age and sex structure of the UK population and also what we expect in 2033, using data from ONS.

The number and percentage of the population by age group are shown in Table 3.4. Of note is the ageing population. The number of people aged 65 or over is expected to increase from 12.2 million (18% of the population) in 2018 to 16.7 million (23%) in 2033. Population growth over the next 15 years is heavily skewed towards older age groups. In 2033, there are expected to be 4.4 million more people aged 65 and over in the UK population, but just 1.5 million more under-65s.<sup>4</sup>

**Table 3.4. UK demographic composition: number and % of population by age**

	Population size (million)		% of total population	
	2018	2033	2018	2033
Total	66.5	72.4	100%	100%
Aged 0–14	11.9	12.3	17.9%	17.1%
Aged 15–39	21.3	21.8	32.0%	30.1%
Aged 40–64	21.1	21.6	31.7%	29.8%
Aged 65–84	10.6	13.7	15.9%	18.9%
Aged 85+	1.7	3.0	2.5%	4.2%

Source: Office for National Statistics, ONS 2014 principal projections – UK: 2014 based, 2017, <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationprojections/datasets/z1zippedpopulationprojectionsdatafilesuk>.

<sup>4</sup> It is not just ageing itself that increases healthcare costs but also the mortality rate. Those in their last year of life are often high-cost users of the health system. Using data from ONS mortality projections, in 2018 466,000 deaths were expected in England increasing to 536,000 in 2033, an average annual growth rate of 1%.

## Chronic conditions

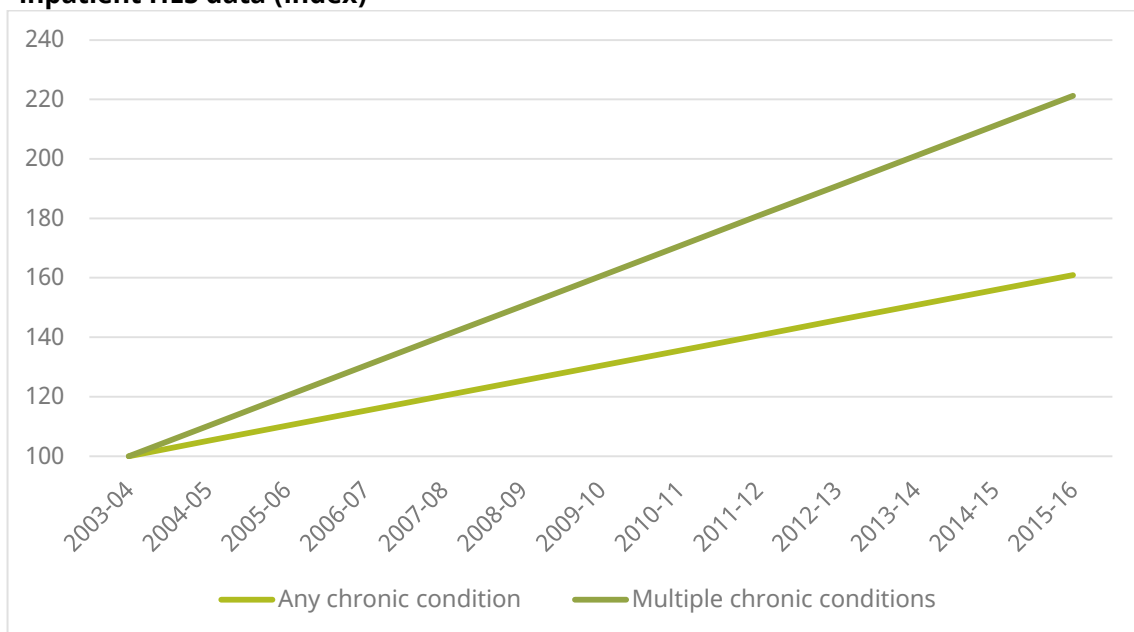
All other things being equal, the number of people living with chronic conditions is likely to increase in proportion to the growth and ageing of the population. But this has not been true over the last 70 years: the number of people with chronic conditions is growing faster than population growth and ageing. This is because, within age groups, the *prevalence* of chronic conditions – the percentage of people within that age group with a chronic condition – has been increasing.

Medical advances, public health interventions and lifestyle patterns mean the health problems that provide the greatest burden of disease are now long-term chronic health conditions, rather than the accidents and infectious diseases that dominated at the start of the NHS.

We model 10 such chronic conditions, selected based on the Department of Health chronic disease management compendium of information, with additions based on expert guidance. These are chronic obstructive pulmonary disease (COPD) or asthma, arthritis, cancer, diabetes, coronary heart disease (CHD) or heart failure, renal disease, epilepsy, stroke, mental ill-health and dementia. Figure 3.3 shows the trend in key chronic diseases between 2003–04 and 2015–16 for inpatients aged 65 and over.

In addition to a general increase in prevalence, there has also been a rise in the prevalence of people living with multiple chronic conditions. While the number of people living with a single chronic condition<sup>5</sup> has grown by 4% a year – outpacing population growth – the number living with multiple chronic conditions has grown by 8% a year

**Figure 3.3. Growth in chronic conditions for patients aged 65 and over identified in inpatient HES data (index)**

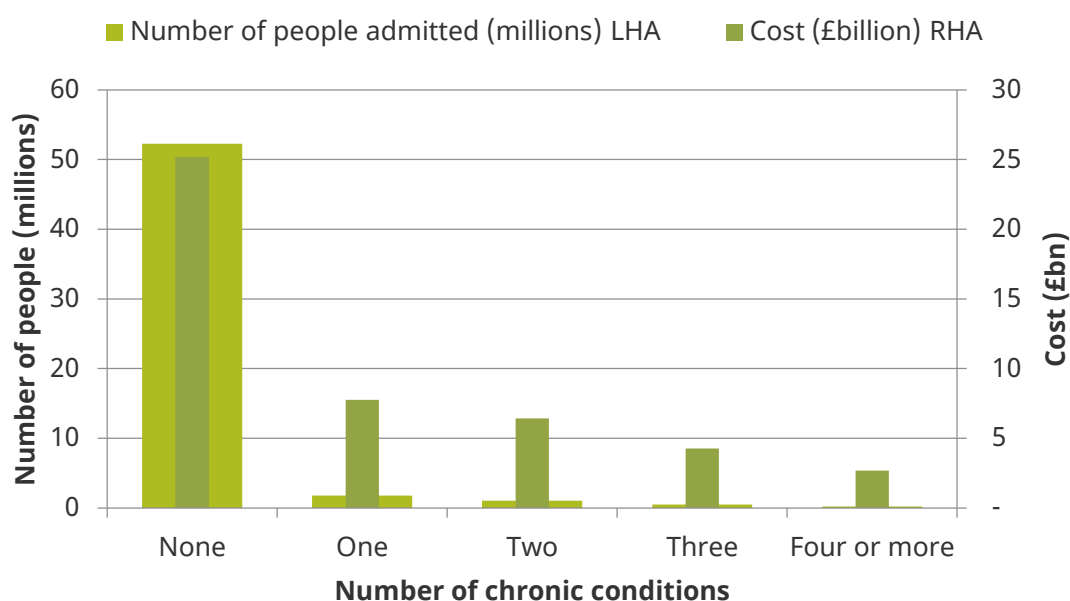


Note: Analysis of inpatient admissions only

Source: Health Foundation analysis of Hospital Episode Statistics.

<sup>5</sup> As identified in inpatient HES data.

**Figure 3.4. Projected cost of admissions, England, 2018–19 (status quo)**



Source: Health Foundation analysis of NHS Reference Costs data and NHS Digital, 'Hospital Episode Statistics', <https://digital.nhs.uk/data-and-information/data-tools-and-services/data-services/hospital-episode-statistics>.

between 2003–04 and 2015–16. People with multiple health problems are more costly to treat (see Figure 3.4). For this reason, we also model combinations of chronic conditions.

As set out in Chapter 1, a key driver of this within-age-group rise in the prevalence of chronic conditions is changing lifestyles. Unhealthy behaviours such as low levels of physical inactivity, poor diet, smoking and alcohol consumption have varied over the last 70 years; in recent years, smoking rates have fallen but obesity levels have increased, possibly offsetting the positive impact of this improvement. These behaviours are risk factors for chronic conditions – for instance, smoking increases people's likelihood of asthma and COPD.

Projecting trends in 'health behaviours' is challenging. The impact on the NHS is even harder to predict. Reducing the prevalence of risky health behaviours would reduce the costs of treating associated diseases, but is likely to increase overall healthcare costs as longevity improves.<sup>6</sup> Scenarios of reducing alcohol consumption even suggest increasing costs of treating alcohol-related cancers (e.g. breast cancer) as people are more likely to survive long enough to develop them.

After 70 years of technological progress and access to healthcare, people are much more likely to survive with a chronic condition as medical advances improve survival rates. In both the status quo and modernised scenarios, we assume that recent trends in the prevalence of chronic conditions within age and sex bands continue. We assume that while there may be some improvement in some population risk factors, such as smoking and alcohol consumption rates, over the next 15 years, overall there will continue to be an expansion in morbidity. This is consistent with the OBR and OECD model assumptions.

<sup>6</sup> For example, see J. Tiihonen, J., K. Ronkainen, A. Kangasharju and J. Kauhanen, 'The net effect of smoking on healthcare and welfare costs. A cohort study', *BMJ Open*, 2012; 2(6), e001678, doi: 10.1136/bmjopen-2012-001678.



### Box 3.3. Identifying people with chronic conditions

In our economic model, we identify people with chronic conditions using inpatient records. Many people with a chronic health problem will only need GP care, not inpatient hospital care, in a given year, so we cannot identify all the healthcare costs associated with chronic conditions.

Hospital inpatient admissions, while a smaller component of all healthcare activity than GP visits (there are 300 million GP visits a year compared with 17 million hospital admissions), are much more expensive, with an average GP consultation costing around £40 compared with over £1,000 for an inpatient admission. Hospital admissions therefore account for a large share of total NHS spending.<sup>a</sup> Data on diagnoses are not recorded in the same way in outpatient and A&E data; for this reason, our estimates of chronic conditions will be below national prevalence rates and, in turn, the modelled outpatient growth may be underestimated. Overall, our estimates of the impact of chronic conditions on future health spending are likely to reflect the minimum.

<sup>a</sup> PSSRU, 'Unit costs of health & social care 2017', 2017, <https://kar.kent.ac.uk/65559/>.

NHS Improvement, 'Reference costs', 2017, <https://improvement.nhs.uk/resources/reference-costs/>.

### Drug costs

The drugs bill in the NHS – the total cost of medicines dispensed in primary care and used in hospitals – has historically grown faster than inflation.<sup>7</sup> This is being driven by two things: increases in the number of drugs prescribed (volumes) and increases in the average unit cost of those drugs (prices).

Part of the increase is due to population growth and ageing, as well as improvement in diagnosis of certain conditions. The cost of the drugs associated with additional activity due to population growth and ageing is captured within our estimates of demographic effects.

But the volume increase also partly results from an increase in the number of medical conditions amenable to treatment with medicines: as new, cost-effective medicines are discovered and recommended by the National Institute for Health and Care Excellence (NICE), costs rise. This is the impact of new technology, which in top-down models is part of the residual effect. The Department of Health and Social Care's Accelerated Access Review highlights that medical advance is not expected to slow over coming years. The number of new medicines is expected to increase and more than 100 new products are projected to be launched in 2018. This is over three times the number launched in 2010.<sup>8</sup>

<sup>7</sup> L. Ewbank, K. Sullivan, H. McKenna and D. Omojomolo, 'The rising cost of medicines to the NHS: what's the story?', King's Fund, 2018, <https://www.kingsfund.org.uk/publications/rising-cost-medicines-nhs>.

<sup>8</sup> *Accelerated Access Review: Final Report – Review of Innovative Medicines and Medical Technologies*, 2016, [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/565072/AAR\\_final.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/565072/AAR_final.pdf).

These new drugs will be for a wide range of conditions, but within cancer care, since 2000, 183 drugs have been recommended for use by NICE.<sup>9</sup>

While this is a spending pressure, advances in drug treatment have been an important factor in improved outcomes for patients over the last 70 years, as set out in Chapter 1.

The volume of drugs is increasing in both hospital and primary care settings, but the trends in unit costs are very different. New medicines impact hospitals disproportionately, partly as they are increasingly focused on areas of specialist care such as cancer. Primary care prescribing is more concentrated on drugs that have been available for many years and that have reached the end of their patent, allowing competition and generic alternatives. New medicines tend to be more expensive, to reflect the high cost of research and development as well as the lack of generic (non-‘brand name’) alternatives.

This impact can be seen with drug costs rising sharply in recent years in hospitals – where the newer, more innovative technologies are trialled, with more complex, invasive procedures. In contrast, in primary care, the cost of prescribing items has fallen over time, although volumes have increased. The cost per item has fallen from £15 in 2004 to £9 in 2016 in real terms.<sup>10</sup>

There have been attempts to limit the costs of new drugs. For example, the voluntary Pharmaceutical Price Regulation Scheme has attempted to mitigate price increases for branded drugs by triggering reimbursement from pharmaceutical companies once NHS spending on these drugs reaches predefined limits. Equally, there has been the introduction of the budget impact test, meaning new products costing more than £20 million a year to the NHS would be subject to commercial negotiation, with access potentially delayed if a deal to lower the cost cannot be reached.

However, as the number of conditions amenable to pharmaceutical treatment continues to increase, meaning more drugs are dispensed and new drugs are introduced, and the average price of these new medicines stays high, it is likely that the unit cost of drugs in NHS hospitals will continue to rise. This is not due to ‘inflation’ (the additional price is not a like-for-like comparison; the basket of drugs being bought and their attributes and benefits are different over time) but is a technology effect, which we can only measure via price.

Therefore, our economic model holds unit costs in the primary care sector constant in real terms (assuming no relative price inflation for existing drugs) but projects a 5.5% real-terms annual increase in hospital drug unit costs.<sup>11</sup> This is based on recent trends in the total cost of hospital drug prescribing, removing activity growth. This would suggest that the current level of technological improvement is maintained.

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<sup>9</sup> Total including those with complete recommendations, for specific circumstances or for use in the Cancer Drugs Fund (<https://www.nice.org.uk/about/what-we-do/our-programmes/nice-guidance/nice-technology-appraisal-guidance/summary-of-decisions>).

<sup>10</sup> Health Foundation analysis of NHS Digital, ‘Prescription cost analysis, England 2017’, 2018, <https://digital.nhs.uk/data-and-information/publications/statistical/prescription-cost-analysis/prescription-cost-analysis-england-2017>.

<sup>11</sup> This figure is a Health Foundation analysis of provider accounts in 2016–17 taking account of activity growth from Hospital Episode Statistics online.

## Pay

Pay is the single largest cost of delivering healthcare, accounting for around two-thirds of NHS spending. Any change in pay therefore has major implications for total cost pressures on the NHS. In our model, increasing real-terms pay growth by 1 percentage point a year would cost the NHS an additional £18 billion by 2033–34. To estimate pay growth between 2016–17 and 2020–21, we combine actual pay bill assumptions from NHS Improvement<sup>12</sup> with an estimate of the impact of the new pay deal for Agenda for Change staff. This includes an estimate of pay drift,<sup>13</sup> which is assumed to match the average rate since 2011–12.

Our assumptions for 2021–22 onwards differ between the status quo and modernised scenarios.

In the status quo scenario, from 2021–22 until 2033–34, our assumption is that NHS pay growth will match the OBR's estimates of public sector earnings increases, which see real pay increases between 2021–22 and 2033–34 of 1.1% at the start of the decade and 2% a year in real terms by the end of the period.

As a result, we estimate the pay bill per FTE is likely to increase by an annual average of 1.9% to 2020–21, and 1.7% from 2021–22 to 2033–34, above inflation.

Pay for most NHS staff has been capped or frozen since 2010–11. As set out in Chapter 1, this has led to real-terms pay decreases; the NHS pay cost index increased by 2% in cash terms between 2011–12 and 2014–15, while whole-economy inflation increased by 5%. Consumer price inflation, which affects NHS staff living standards, rose by 6%.

Over this period, significant problems around the recruitment, retention and morale of staff have surfaced. Current total NHS vacancies for nurses, midwives and allied health professionals are almost 42,000 (9.4%) and some vacant shifts (about 8%) remain uncovered.<sup>14</sup> The percentage of nurses leaving the NHS for reasons other than retirement increased from 7.1% in 2011–12 to 8.7% in 2016–17. This means that 5,000 more nurses left NHS employment than in 2011–12. Had the rate remained at 2012 levels, we would have 16,000 more nurses working in the NHS today.<sup>15</sup>

For all staff at NHS trusts, the median stability index<sup>16</sup> has decreased from 89% in 2010–11 to 85% in 2016–17.<sup>17</sup> In the latest staff survey, the largest drop in satisfaction for NHS staff related to pay, with satisfaction falling by 6 percentage points to the lowest levels in the

<sup>12</sup> NHS Improvement, '2017/18 and 2018/19 National Tariff Payment System', 2017, <https://improvement.nhs.uk/resources/national-tariff-1719/>.

<sup>13</sup> Drift is the term for changes to pay over and above the basic pay settlement. This includes staff progression to higher bands.

<sup>14</sup> NHS, *Facing the Facts, Shaping the Future: A Draft Health and Care Workforce Strategy for England to 2027*, 2017, <https://hee.nhs.uk/sites/default/files/documents/Facing%20the%20Facts%2C%20Shaping%20the%20Future%20E2%80%93%20a%20draft%20health%20and%20care%20workforce%20strategy%20for%20England%20to%202027.pdf>.

<sup>15</sup> Ibid.

<sup>16</sup> The percentage of staff from the beginning of a year who are still at the trust at the end. Excludes doctors in training.

<sup>17</sup> J. Buchan, A. Charlesworth, B. Gershlick and I. Secombe, *Rising Pressure: The NHS Workforce Challenge*, Health Foundation, <https://www.health.org.uk/publication/rising-pressure-nhs-workforce-challenge>.

last decade. NHS Improvement analysis suggests around 14% of staff leave due to the pay/reward package.<sup>18</sup>

The OBR expects public sector earnings growth to reach 4.2% in cash terms in 2033–34 (2% after whole-economy inflation, as measured by the GDP deflator) from 2.8% in cash terms in 2021–22 (1.1% after inflation). If NHS earnings grew in line with this, as in our status quo, this would be real-terms growth in pay, but would not make up for lost earnings since 2009–10.

If staff had received pay increases of 2% in real terms since 2009–10, the earnings per FTE would have been about 20% higher in 2016–17 than they were. To make up for the earnings lost over this period would require unprecedented sustained increases in pay after 2021–22. For our modernised NHS scenario, we assume some catch-up for the real earnings lost during the years of austerity. In the modernised NHS scenario from 2021–22, we assume pay per head will increase by 3% in real terms and that this may improve recruitment, retention and morale.

The NHS and social care workforce combined total is approaching 3 million staff – making up around 1 in 10 of the entire workforce. If the NHS grows in line with projected activity, this total is likely to grow. Around 62,000 NHS staff in England are nationals of other EU countries (5.6%). Such staff are likely to become harder to recruit after Britain exits the EU. The combination of these factors makes it even more important that pay remains competitive to attract enough skilled staff.

## Productivity

Productivity is the relationship between the volume of outputs and the volume of inputs. A more productive system can achieve a set level of required output (e.g. activity) with less input (e.g. staff). Likewise, in a more productive system, the same number of staff (an input) could produce more activity (an output).<sup>19</sup>

As the Baumol effect highlights (Box 3.1), the degree of pay growth that can be offset by productivity is critical for the long-term path of healthcare spending as a share of GDP. Increases in the costs of delivering care can be offset through increased productivity. Estimates of the productivity of the health service vary, and most analyses focus on the English NHS. The latest research from York finds that NHS productivity increased between 2004–05 and 2015–16 and has been positive since 2009–10.<sup>20</sup>

ONS produces estimates of the trend in public service productivity. These data show the growth in quality-adjusted healthcare outputs produced and inputs used for the UK. For our projections model, in the status quo scenario, we assume productivity increases in line with the long-run trend of UK public service healthcare productivity of 0.8%. This is the ONS estimate of productivity growth between 1995 and 2015. It assumes no major, sustained increase or decrease in the trend rate of healthcare productivity in the UK.

<sup>18</sup> Where a reason for leaving is stated.

<sup>19</sup> S. Lafond and A. Charlesworth, *Hospital Finances and Productivity: In a Critical Condition?* Health Foundation, 2015, <https://www.health.org.uk/publication/hospital-finances-and-productivity-critical-condition>.

<sup>20</sup> A. Castelli, M. Chalkley and I. Rodriguez Santana, 'Productivity of the English National Health Service: 2015/16 update', University of York, Centre for Health Economics (CHE), Research Paper 152, [https://www.york.ac.uk/media/che/documents/papers/researchpapers/CHERP152\\_NHS\\_productivity\\_update2015\\_16.pdf](https://www.york.ac.uk/media/che/documents/papers/researchpapers/CHERP152_NHS_productivity_update2015_16.pdf).

Real-terms reductions in pay may impact on recruitment, retention and morale. This is one of the factors that may negatively impact productivity and may be one of the reasons why the latest data from York suggest English NHS productivity grew very little between 2014–15 and 2015–16. In a labour-intensive industry such as health, changes in productivity are largely driven by changes in the productivity of its workforce. Equally, hospital consultant productivity fell by an average of 2.3% a year between 2009–10 and 2015–16.<sup>21</sup>

Studies on staff turnover in the health sectors of different countries vary in approach, but point to significantly increased costs and potentially negative impacts on care outcomes.<sup>22</sup> There are costs due to the recruitment and training process but there are opportunity costs associated with people's time running the recruitment, time spent with vacant posts, and duplication and lack of continuity in patients' care.

If the NHS could increase pay to improve recruitment and retention and to reduce turnover alongside a concerted effort to improve the work-life balance for staff, it might be possible to increase productivity and reverse some of the recent falls in labour productivity.

The government's productivity framework identifies five drivers that interact to underlie long-term productivity performance: investment, innovation, skills, enterprise and competition.<sup>23</sup> These drivers are generally the areas targeted when policies attempt to improve productivity.

As such, rising pay will not be the only source of improved productivity. Increasing investment in capital, mental health and public health, as well as alleviating pressure on A&E through meeting NHS constitution standards, as in our modernised scenario, would likely increase NHS productivity.

In the modernised scenario, we therefore assume a higher rate of productivity growth from 2019–20, at 1.4%. This would represent returning to and maintaining the higher level of productivity growth achieved since 2010.<sup>24</sup> Higher productivity may be possible but there is little evidence that it has been sustained in the NHS. This is a stretching target – almost double the 20-year average of UK-wide productivity growth.

<sup>21</sup> S. Lafond, A. Charlesworth and A. Roberts, *A Year of Plenty? An Analysis of NHS Finances and Consultant Productivity*, Health Foundation, <https://www.health.org.uk/sites/health/files/YearOfPlenty.pdf>.

<sup>22</sup> C. B. Jones, 'The costs of nurse turnover: part 1: an economic perspective', *Journal of Nursing Administration*, 2004, 34, 562–70, <https://www.ncbi.nlm.nih.gov/pubmed/15632752>.

<sup>23</sup> Chapter 3 of Office for National Statistics, *The ONS Productivity Handbook*, <https://www.ons.gov.uk/ons/guide-method/method-quality/specific/economy/productivity-measures/productivity-handbook/productivity-theory-and-drivers/chapter-3---productivity-theory-and-drivers.pdf>.

<sup>24</sup> Office for National Statistics, 'Public service productivity estimates, healthcare: 2015', <https://www.ons.gov.uk/economy/economicoutputandproductivity/publicservicesproductivity/articles/publicservicesproductivityestimateshealthcare/healthcare2015>.

## Mental health

The Adult Psychiatric Morbidity Survey (APMS) provides periodic data on the prevalence of common mental disorders.<sup>25</sup> In 2014, 15.7% of the adult population had a common mental health disorder, up from 15.1% in 2007 – an annual average increase in prevalence of 0.6%. Of these, only 4 in 10 people received treatment (the treated prevalence).

As the NHS Five Year Forward View for Mental Health identified,<sup>26</sup> patients with mental health conditions do not have the same standards of access to cost-effective healthcare as patients with physical conditions. The health system is working towards parity of esteem between physical and mental health conditions. For the status quo scenario, we maintain the 2014 figure of 4 in 10 (39.4%) treated prevalence. For the modernised NHS scenario, we assume the public and political decision-makers will want to see significant progress towards parity of esteem over the next 15 years. To explore the cost of this, we model what would happen to NHS spending if we increased treated prevalence to 70%.

We assume this prevalence growth is representative of all mental health conditions and apply the treated prevalence across all mental health services for common mental disorders. Although we can use administrative hospital data to identify mental health as a chronic condition, the activity data for mental health within these data sets are weak. Instead, we use activity data from the Mental Health Minimum Dataset (MHMDs) bulletin 2016–17 to estimate the number of people treated in the NHS for common mental health problems and psychotic and organic mental health conditions.<sup>27</sup>

To find the cost of mental health, we use NHS Reference Costs, which categorise some mental health activity and unit costs into clusters that correspond to MHMDs. We apply the cost data to the activity data for 2016–17 and apply this to ONS population projections to create a mental health spending projection up to 2033–34.

## NHS constitutional standards

The NHS Constitution for England was first published in January 2009, following a recommendation from Lord Darzi's report *High Quality Care for All*.<sup>28</sup> It contains a set of guidelines, policy pledges for the NHS and descriptions of legal rights for patients and staff. It says, 'You have the right to access certain services commissioned by NHS bodies within maximum waiting times, or for the NHS to take all reasonable steps to offer you a range of suitable alternative providers if this is not possible'.<sup>29</sup>

These waiting times include starting consultant-led treatment within a maximum of 18 weeks from referral for non-urgent conditions and being seen by a cancer specialist within a maximum of two weeks from GP referral for urgent referrals where cancer is suspected.

<sup>25</sup> NHS Digital, 'Adult Psychiatric Morbidity Survey: survey of mental health and wellbeing, England, 2014', 2016, <https://digital.nhs.uk/data-and-information/publications/statistical/adult-psychiatric-morbidity-survey/adult-psychiatric-morbidity-survey-survey-of-mental-health-and-wellbeing-england-2014>.

<sup>26</sup> Mental Health Taskforce, *The Five Year Forward View for Mental Health*, 2016, <https://www.england.nhs.uk/wp-content/uploads/2016/02/Mental-Health-Taskforce-FYFV-final.pdf>.

<sup>27</sup> Table 3.1 of NHS Digital, 'Mental Health Bulletin: 2016-17 Annual Report, 2017', <https://digital.nhs.uk/data-and-information/publications/statistical/mental-health-bulletin/mental-health-bulletin-2016-17-annual-report>.

<sup>28</sup> [http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH\\_085825](http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_085825).

<sup>29</sup> <https://www.gov.uk/government/publications/the-nhs-constitution-for-england>.

In addition, there is a pledge in the constitution that at least 95% of patients attending A&E departments should be seen, treated and admitted, transferred or discharged within four hours of arrival.<sup>30</sup>

The NHS has been struggling to meet a number of the constitutional standards in recent years and, while more patients are being seen in an acute setting than ever before, performance against these standards has been deteriorating. In 2017–18, 2.8 million patients spent longer than four hours in A&E, an increase of 240,000 from 2016–17 and 2.4 million from 2007–08. As a result, only 88.4% of patients were treated within four hours in 2017–18.<sup>31</sup>

The NHS is also struggling to meet constitutional standards for time to planned treatment. At the end of 2017–18, 491,000 (12.8%) patients awaiting consultant-led treatment had been waiting longer than 18 weeks, considerably below the standard that at least 92% should have been waiting 18 weeks or less.<sup>32</sup> It is now two years since the NHS in England last achieved the standard for planned treatment, and five years since the A&E standard was met annually. On cancer, performance has generally been better but the NHS has not met the critical standard that at least 85% of patients should start treatment within 62 days of being referred with suspected cancer by a GP since 2013–14.<sup>33</sup>

These constitutional standards have maintained their importance under severe strain. They have been maintained for over a decade under three separate governments – Labour, the Conservative and Liberal Democrat coalition, and the current Conservative government. The standards are deliverables in the government’s mandate to NHS England, and are described as ‘must dos’ for 2017–19 in the NHS operational planning guidance.<sup>34</sup> Waiting times are also a priority for the public and patients, with a recent poll highlighting waiting times as people’s biggest concern by far (70%) when going to their local A&E department.<sup>35</sup>

The modernised NHS scenario includes our estimate of the cost of consistently meeting these constitutional standards. It includes estimates of the additional hospital activity (outpatient appointments and planned admissions) and extra emergency admissions.

The NHS needs to treat 170,000 more patients in hospital each year to avoid further increases in waiting times.<sup>36</sup> This is roughly 1.1% of the planned inpatient activity in 2015–16 (the base year for which we have detailed activity data).<sup>37</sup> In our modernised scenario, we therefore increase planned inpatient activity by 1.1% every year to 2033–34, in addition to growth estimates resulting from changing population and chronic conditions.

<sup>30</sup> <https://www.gov.uk/government/publications/supplements-to-the-nhs-constitution-for-england>.

<sup>31</sup> <https://www.england.nhs.uk/statistics/statistical-work-areas/ae-waiting-times-and-activity/ae-attendances-and-emergency-admissions-2018-19/>.

<sup>32</sup> <https://www.england.nhs.uk/statistics/statistical-work-areas/rtt-waiting-times/rtt-data-2017-18/>.

<sup>33</sup> <https://www.england.nhs.uk/statistics/statistical-work-areas/cancer-waiting-times/>.

<sup>34</sup> NHS, *NHS Operational Planning and Contracting Guidance, 2017-2019*, 2016, <https://www.england.nhs.uk/wp-content/uploads/2016/09/NHS-operational-planning-guidance-201617-201819.pdf>.

<sup>35</sup> <http://reader.health.org.uk/NHS-and-social-care-polling/introduction>.

<sup>36</sup> R. Findlay, ‘The cost of restoring 18 week waits’, 2017, <https://blog.gooroo.co.uk/2017/11/the-cost-of-restoring-18-week-waits/>.

<sup>37</sup> <https://www.gov.uk/government/statistics/hospital-admitted-patient-care-activity-2015-to-2016>.

Pressures on elective waiting times have been building for some time, which means a non-recurring clearance of the existing backlog of activity would be required: an estimated 600,000 admissions in 2018–19,<sup>38</sup> or 3.9% of the activity experienced in our most recent year of data. This clearance would not be possible overnight; we therefore increase activity by a further 600,000 admissions phased in over the period 2019–20 to 2023–24.

We expect that the additional elective admissions could lead to a similar number of additional outpatient appointments. We therefore also increase expected outpatient activity over and above our status quo projections.

In 2015–16, 91.9% of A&E patients were either admitted or discharged within four hours.<sup>39</sup> We therefore increase A&E activity in our modernised NHS projection to recover the 3.1 percentage point shortfall below target. This increase over baseline projections occurs between 2019–20 and 2023–24. In 2015–16, around 400,000 patients were not admitted within four hours. We assume that the additional 3.1 percentage points of A&E activity from 2019–20 to 2023–24 will result in 400,000 additional emergency admissions each year.

## Capital

The UK currently spends £6 billion on publicly funded healthcare capital. This is low compared to other similar countries, as Figure 3.5 shows.

Capital investment is important for productivity but also for improving outcomes. The UK performs comparatively poorly in survival rates for a number of the most common cancers. A significant part of these poorer outcomes has been attributed to late diagnosis. While GP referrals for the two-week cancer wait pathway have increased, access to scanning services for diagnosis is an issue.<sup>40</sup> The UK has 9.5 CT scanners per 1,000,000 population, less than half the OECD average of 26. It would cost up to £1 billion to bring the UK into line with the OECD average provision of CT scanners. The UK has 7.2 MRI machines per 1,000,000 population, less than half the OECD average of 16. It would cost up to £600 million to bring the UK into line with the OECD average provision of MRI machines.<sup>41</sup>

Investment in capital is essential for maintaining quality of care, achieving future transformation and improving productivity. This applies to a wide variety of items, ranging from buildings and land to machinery and IT, as well as depreciation and private finance initiative (PFI) costs.<sup>42</sup>

<sup>38</sup> R. Findlay, 'The cost of restoring 18 week waits', 2017, <https://blog.gooroo.co.uk/2017/11/the-cost-of-restoring-18-week-waits/>.

<sup>39</sup> <https://www.england.nhs.uk/statistics/statistical-work-areas/ae-waiting-times-and-activity/statistical-work-areas/ae-waiting-times-and-activity/ae-attendances-and-emergency-admissions-2015-16-monthly-3/>.

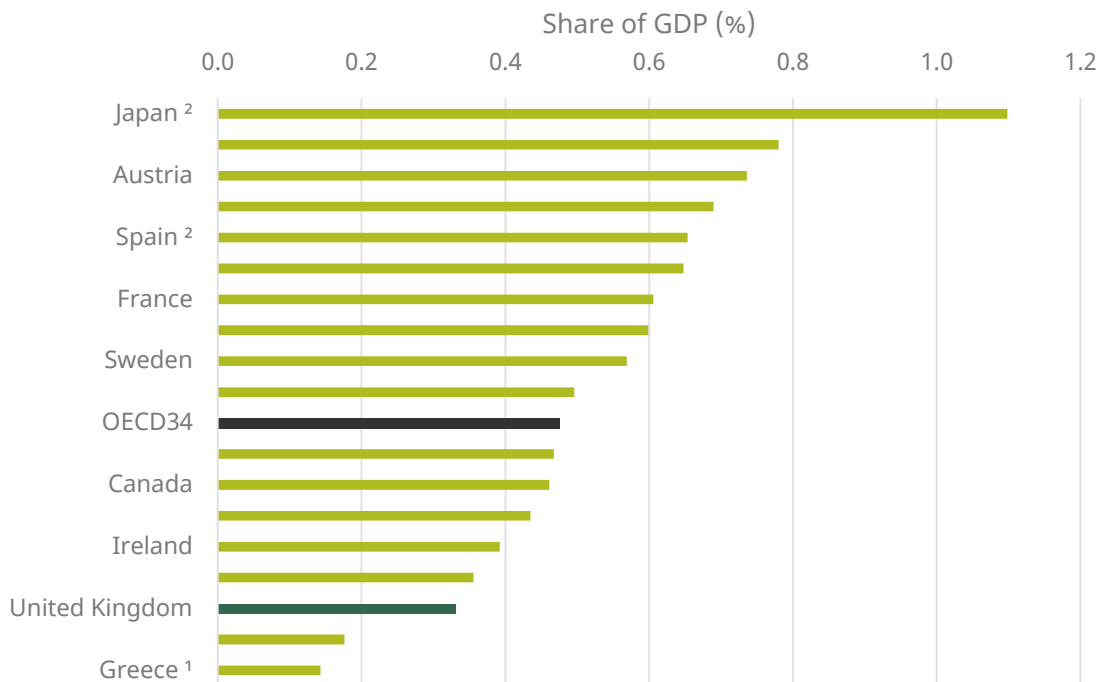
<sup>40</sup> Cancer Taskforce, *Achieving World-Class Cancer Outcomes: A Strategy for England 2015-2020*, [https://www.cancerresearchuk.org/sites/default/files/achieving\\_world-class\\_cancer\\_outcomes\\_-\\_a\\_strategy\\_for\\_england\\_2015-2020.pdf](https://www.cancerresearchuk.org/sites/default/files/achieving_world-class_cancer_outcomes_-_a_strategy_for_england_2015-2020.pdf).

<sup>41</sup> OECD Health Statistics, 2015.

<sup>42</sup> Department of Health, *Annual Report and Accounts 2016/17*, 2017, <https://www.gov.uk/government/publications/department-of-health-annual-report-and-accounts-2016-to-2017>.



**Figure 3.5. Gross fixed capital formation in the healthcare sector as a share of GDP, 2015 (or nearest year)**

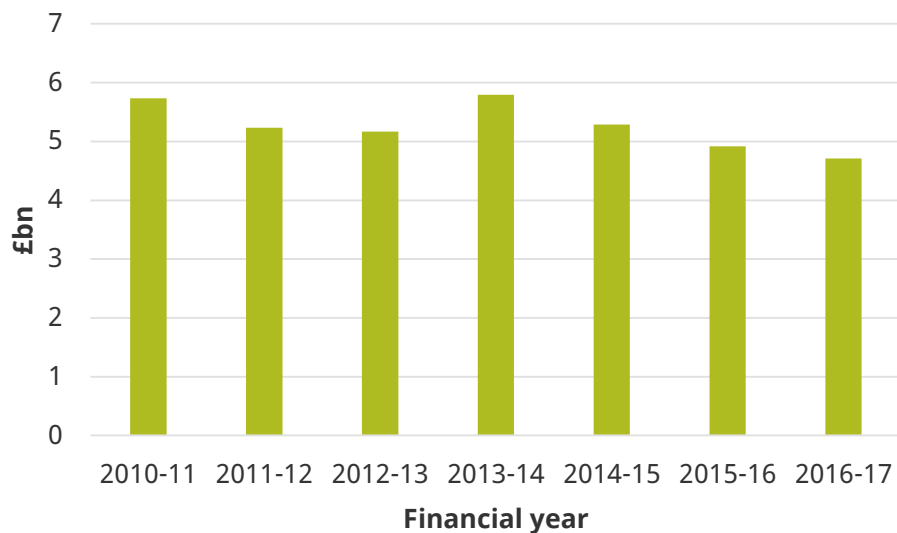


<sup>1</sup> Refers to gross fixed capital formation in ISIC 86: Human health activities (ISIC Rev. 4).

<sup>2</sup> Refers to gross fixed capital formation in ISIC Q: Human health and social work activities (ISIC Rev. 4).

Source: OECD, 'Gross fixed capital formation in the healthcare system', 2018, [http://stats.oecd.org/index.aspx?DataSetCode=HEALTH\\_STAT](http://stats.oecd.org/index.aspx?DataSetCode=HEALTH_STAT).

**Figure 3.6. NHS capital spending in England (2018–19 prices)**



Source: Department of Health, *Annual Report and Accounts 2016/17*, 2017, <https://www.gov.uk/government/publications/departments-of-health-annual-report-and-accounts-2016-to-2017>; Health Foundation, 'Autumn Budget 2017: what it means for health and social care', 2017, <https://www.health.org.uk/publication/autumn-budget-2017-what-it-means-health-and-social-care>.

Prior to 2009–10, there was a 10-year period of significant increases in capital investment as a percentage of the total budget.<sup>43</sup> However, spending on capital has declined in recent years – total capital spending was £1 billion lower in 2016–17 than in 2010–11 (see Figure 3.6). Since a rise in spend in 2013–14, capital spending has decreased by an average of 6.7% a year.

Decreasing capital expenditure has both financial and service impacts on providers. Trusts may not be able to purchase new equipment, and they may also face difficulties in making repairs and maintenance to existing facilities.

In 2016–17, there was an estimated maintenance backlog for hospital estates and facilities of £5.7 billion, up from £5.3 billion in 2015–16. Of this, £2.8 billion represents backlog that is high or significant risk, up from £2.5 billion in 2015–16. The risk ratings for estates refer to risks related to clinical service and safety.<sup>44</sup> In our status quo scenario, capital spending grows in line with projected spending on day-to-day running costs, maintaining the current share of total health spending. In the modernised NHS scenario, capital spending is increased to match the 0.5% of GDP spend on healthcare capital across the OECD. This is an increase of around one-third in real terms over a five-year period.

### Public health

Since 2013–14, the majority of healthcare funding for health promotion and disease prevention has been distributed via a ring-fenced grant to local authorities. In addition, Public Health England (PHE) oversees the national public health programme covering major vaccination programmes and surveillance and public health emergencies. Funding through the public health grant has fallen in real terms by 3.2% a year from £2.9 billion in 2013–14 to £2.6 billion in 2017–18.<sup>45</sup> This is despite the recognition in the NHS Five Year Forward View that there was an urgent need to radically upgrade prevention and public health. Chapter 1 shows that the UK has one of the highest rates of obesity in the EU15,<sup>46</sup> and while smoking and alcohol consumption are falling in the UK, many countries perform much better.

In our status quo scenario, public health spending grows in line with the overall healthcare budget. In the modernised scenario, we increase public health funding (PHE and the public health grant) by 1 percentage point more than the overall growth in the healthcare budget, so that public health funding accounts for 4% of health spending in 2033–34, up from 3% in 2018–19. This would be an increase of £4.6 billion, returning the public health budget to 2013–14 levels in real terms. In our modernised scenario, public health spending increases from £4.7 billion in 2018–19 to £9.3 billion in 2033–34.

## 3.4 NHS in England spending projections from 2018–19 to 2033–34

In our status quo scenario, the combined impact of demographic and non-demographic changes is projected to increase English publicly funded health spending by an average of

<sup>43</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/607725/Naylor\\_review.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/607725/Naylor_review.pdf)

<sup>44</sup> J. Appleby, 'NHS urgent facilities repairs: is your hospital on the critical list?', *BMJ*, 2017, 359, j5479.

<sup>45</sup> Health Foundation, 'Autumn Budget 2017: what it means for health and social care', 2017, <https://www.health.org.uk/publication/autumn-budget-2017-what-it-means-health-and-social-care>.

<sup>46</sup> EU15 countries are the first 15 countries that joined the EU.

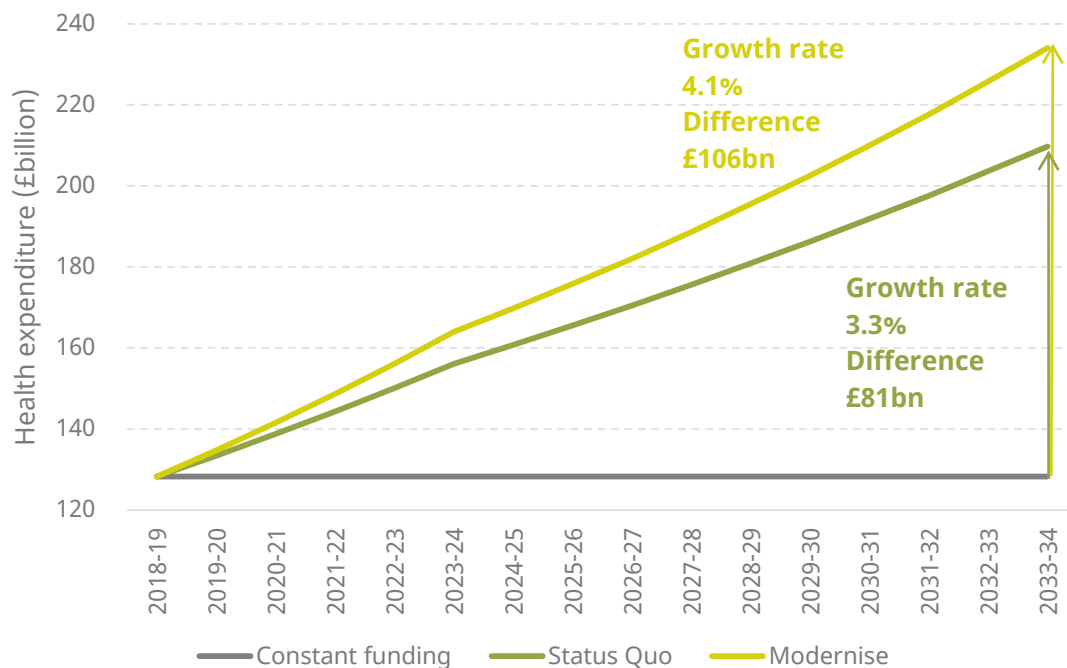
3.3% a year between 2018–19 and 2033–34. This would allow quality and access to care to be maintained at 2015–16 levels per person, taking account of ageing, rising chronic disease and modest pay and drugs pressures offset by some productivity growth. This amounts to a real-terms increase in spending from £128 billion in 2018–19 to £210 billion in 2033–34. In this section, we discuss projections for the NHS in England because our data and modelling rely on England; in Section 3.6, we gross up to whole UK cost projections.

The status quo scenario would not provide sufficient funding to return waiting times to their target levels, support improvements to quality and outcomes or modernise the physical infrastructure of the health service. If the NHS were to be improved in line with the modernised scenario, spending is projected to grow at 4.1% a year, from £128 billion to £234 billion in the same period.

Table 3.5 shows a breakdown of the extent of projected demand pressures after 5, 10 and 15 years under both the status quo and modernised NHS scenarios.

In this section, we describe in detail how different demographic and non-demographic pressures on the health service have led to the spending growth that is estimated to affect the NHS in England if we continue in the status quo. We then discuss the projected spending implications of moving to a modernised NHS and the relative spending impact of different improvements to the NHS.

**Figure 3.7. Projected England health expenditure under the status quo and modernising scenarios**



Source: Health Foundation analysis of Hospital Episode Statistics and NHS Reference Costs data. For more detail, see Box 3.2.

**Table 3.5. NHS spending pressures in England: status quo and modernised NHS**

	Status quo			Modernised NHS		
	2018–19 to 2023–24	2018–19 to 2028–29	2018–19 to 2033–34	2018–19 to 2023–24	2018–19 to 2028–29	2018–19 to 2033–34
<b>Total spending pressures</b>	<b>£28bn</b>	<b>£53bn</b>	<b>£81bn</b>	<b>£36bn</b>	<b>£67bn</b>	<b>£106bn</b>
Annual average growth	4.0%	3.5%	3.3%	5.0%	4.3%	4.1%
<b>of which:</b>						
<b>Resource</b>	<b>£27bn</b>	<b>£51bn</b>	<b>£78bn</b>	<b>£31bn</b>	<b>£62bn</b>	<b>£99bn</b>
Annual average growth	4.1%	3.5%	3.4%	4.7%	4.2%	4.0%
<b>Capital</b>	<b>£1bn</b>	<b>£2bn</b>	<b>£3bn</b>	<b>£4bn</b>	<b>£5bn</b>	<b>£7bn</b>
Annual average growth	2.3%	2.7%	2.8%	11.0%	6.4%	5.0%

Source: Health Foundation analysis of Hospital Episode Statistics and NHS Reference Costs data. For more detail, see Box 3.2.

### Spending pressures under the 'status quo' scenario

In 2018–19, the total Department of Health budget for England is set at £128 billion. Our projections show that to meet core demand and cost pressures, this would need to grow by 64% to £210 billion in 2033–34, an increase of £81 billion. Of this, £59 billion is the result of demand factors (population growth and need), £49 billion from pay and hospital drug spending growth and £3 billion from capital growth. These increases are offset by £29 billion of productivity gains.

The overall increase amounts to an average growth rate of 3.3% a year from 2018–19 to 2033–34.

We project a higher rate of healthcare spending growth to occur in the next five years. Figure 3.9 shows the contribution of different drivers of spending pressures over the shorter period from 2018–19 to 2023–24. We project that to maintain access and quality of care at 2015–16 levels, spending would need to increase from the 2018–19 budget of £128 billion to £156 billion in 2023–24. This increase of £28 billion is made up of £21 billion from demand and demographics (including current underlying, unmet funding pressures), £14 billion from pay and hospital drug cost growth and £0.8 billion from capital growth, offset by £9 billion of productivity gains.

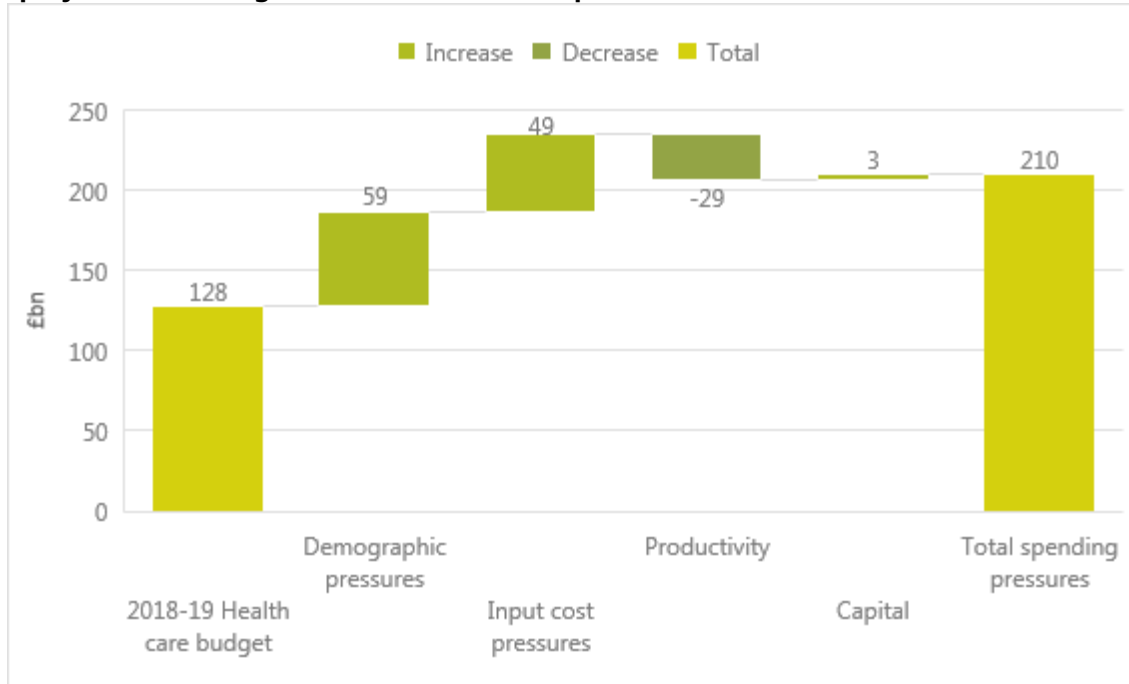
Our model is based on patterns of care in 2015–16. Using this model, we project healthcare demand in 2018–19 to be higher than the actual healthcare budget set for England following the 2017 Autumn Budget. In the recent period of low spending growth, the NHS has been unable to fund demand pressures on a sustainable basis. The service is therefore building up unfunded, underlying cost pressures, which it is managing through short-term cost containment measures. Across the NHS, there is recognition that headline financial data appear more robust than core financial performance and the NHS has an underlying deficit.<sup>47</sup> We assume that, alongside meeting new funding pressures, there is a

<sup>47</sup> National Audit Office, *Financial Sustainability of the NHS*, HC 785, Session 2016–17, <https://www.nao.org.uk/wp-content/uploads/2016/11/Financial-Sustainability-of-the-NHS.pdf>.

need to make good the underlying cost and demand pressures to put the NHS on a sustainable footing.

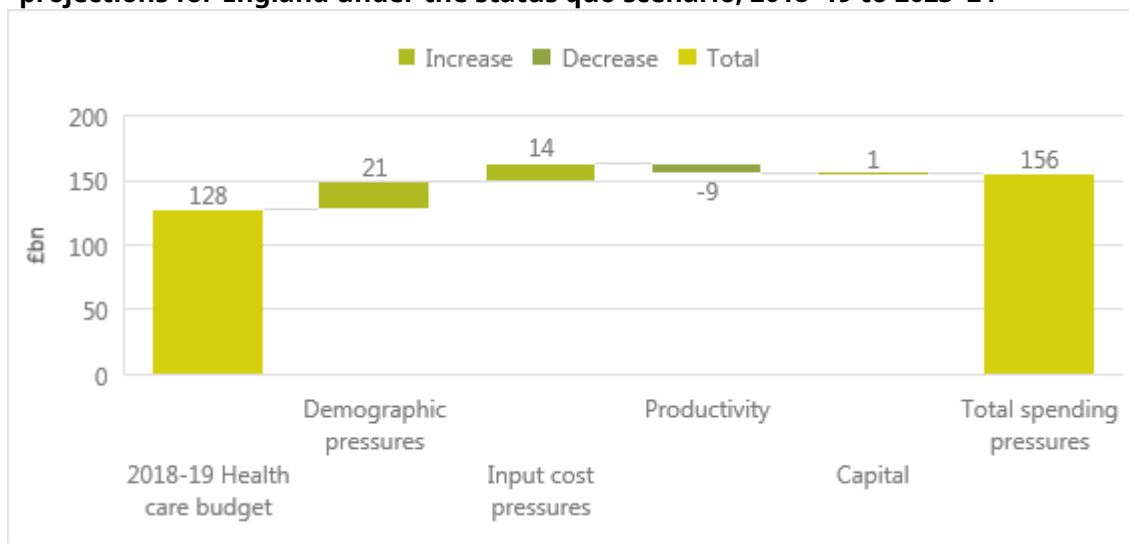
It is important to distinguish this unmet demand pressure as separate from demographics and other demand pressures, as it is a function of past funding decisions, not new

**Figure 3.8. Contribution of different demand and cost pressures to overall spending projections for England under the status quo scenario, 2018–19 to 2033–34**



Source: Health Foundation analysis of Hospital Episode Statistics and NHS Reference Costs data. For more detail, see Box 3.2.

**Figure 3.9. Contribution of different demand and cost pressures to overall spending projections for England under the status quo scenario, 2018–19 to 2023–24**



Source: Health Foundation analysis of Hospital Episode Statistics and NHS Reference Costs data. For more detail, see Box 3.2.

demand or cost pressures. We estimate that the existing build-up of underlying cost pressures that would need to be covered to return the NHS to 2015–16 levels of service is around £6 billion in England in 2018–19. This is presented as part of the £21 billion demographic pressures in Figure 3.9.

In the following subsections, we set out the impact of the different drivers of health spending in England under the status quo scenario. We will then present a detailed analysis of the additional cost pressures in the ‘modernised NHS’ scenario.

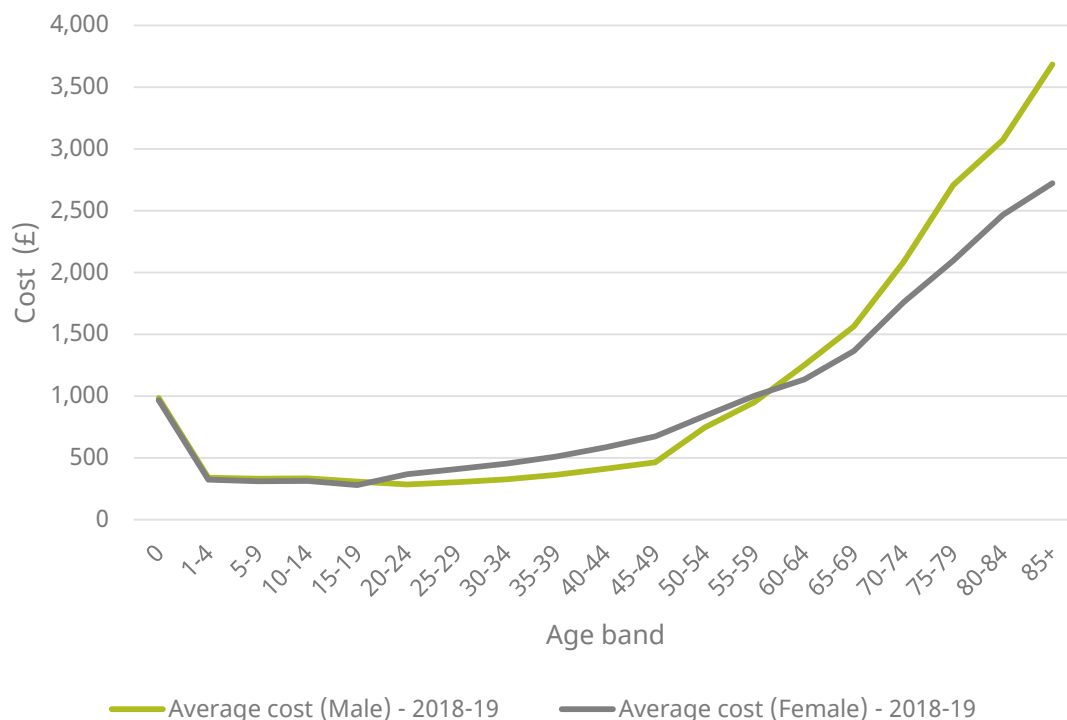
### Demographic pressures in acute care

Increased life expectancy is one of the great triumphs of the 20<sup>th</sup> century but it has implications for the cost of healthcare. In general, the likelihood of a person needing hospital services, and associated healthcare spending, rises as they age. Acute care costs therefore dramatically increase at older ages.

For both men and women, the average cost of acute care per person increases dramatically from the age of 50, with costs increasing for men from £465 per head at 45–49 to £3,683 when they are over 85. Women have a less steep increase, partly due to the additional cost of maternity care, but also because their hospital costs in old age tend to be lower than for men, at £2,722. An increase in the size of the elderly population is therefore likely to be a major driver of increasing healthcare costs.

These higher costs associated with older acute care users increase funding pressure on the health service in 2033–34. Figure 3.11 shows the change in the share of acute health spend on people aged 65 and over in England between now and 2033–34, if the NHS

**Figure 3.10. Average annual cost of acute care in England by age and sex, 2018–19**



Source: Health Foundation analysis of Hospital Episode Statistics and NHS Reference Costs data.

**Figure 3.11. Projected share of NHS acute care spend in England for people aged 65 and over**



Source: Health Foundation analysis of Hospital Episode Statistics and NHS Reference Costs data.

maintains quality and access to care but responds to demand pressures from population change and modest cost pressures (the status quo scenario). As the population ages, the share of total NHS acute spending on those aged 65 and over rises from 48% in 2018–19 to 60% in 2033–34. Within this, acute spending on the over-65s is projected to more than double in the next 15 years, from £24 billion to £52 billion.

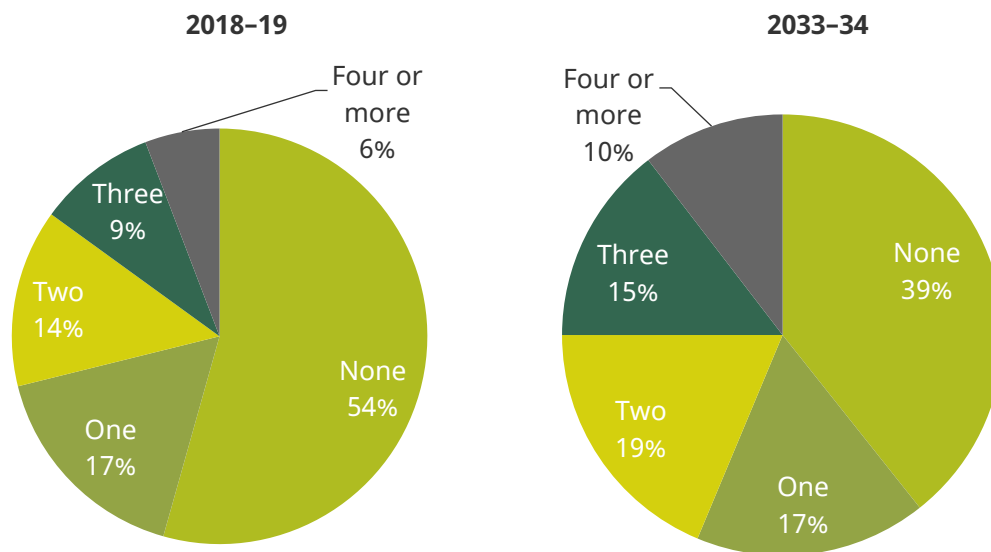
### Chronic conditions in acute care

The proportion of patients with multiple chronic conditions has increased in recent years, and this trend is projected to rise over the next 15 years. Figure 3.12 shows that the proportion of acute costs associated with people with chronic conditions is expected to rise from 46% to 61% over this period, an increase of 15 percentage points. Acute spending on patients with chronic conditions will increase by around £30 billion, an average annual growth rate of 6%.

Due to medical advances, chronic conditions have become more treatable and some people now live much longer lives with such conditions. As longevity with these conditions increases, we project a reshaping of the age cost curve, in which the costs of caring for older people increase (on a per-capita basis) relative to the costs for the rest of the population.

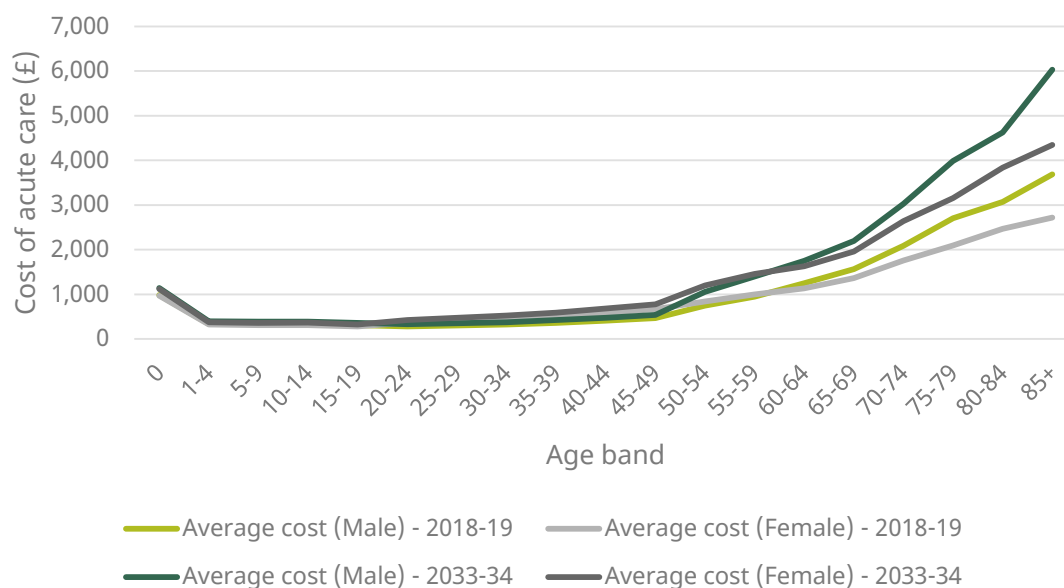
Figure 3.13 compares age cost curves for acute care in England in 2018–19 and 2033–34. For all years, costs increase with age (after the relatively high cost for newborns), but this gradient is steeper in 2033–34 than in 2018–19. Increases in chronic conditions, particularly multiple chronic conditions, are a key driver of the higher projected acute cost for older people in 2033–34.

**Figure 3.12. Projected proportion of costs from those admitted to hospital in England who have a common chronic condition**



Source: Health Foundation analysis of Hospital Episode Statistics and NHS Reference Costs data.

**Figure 3.13. Projected average annual cost of acute care in England by age and sex, 2018-19 and 2033-34**



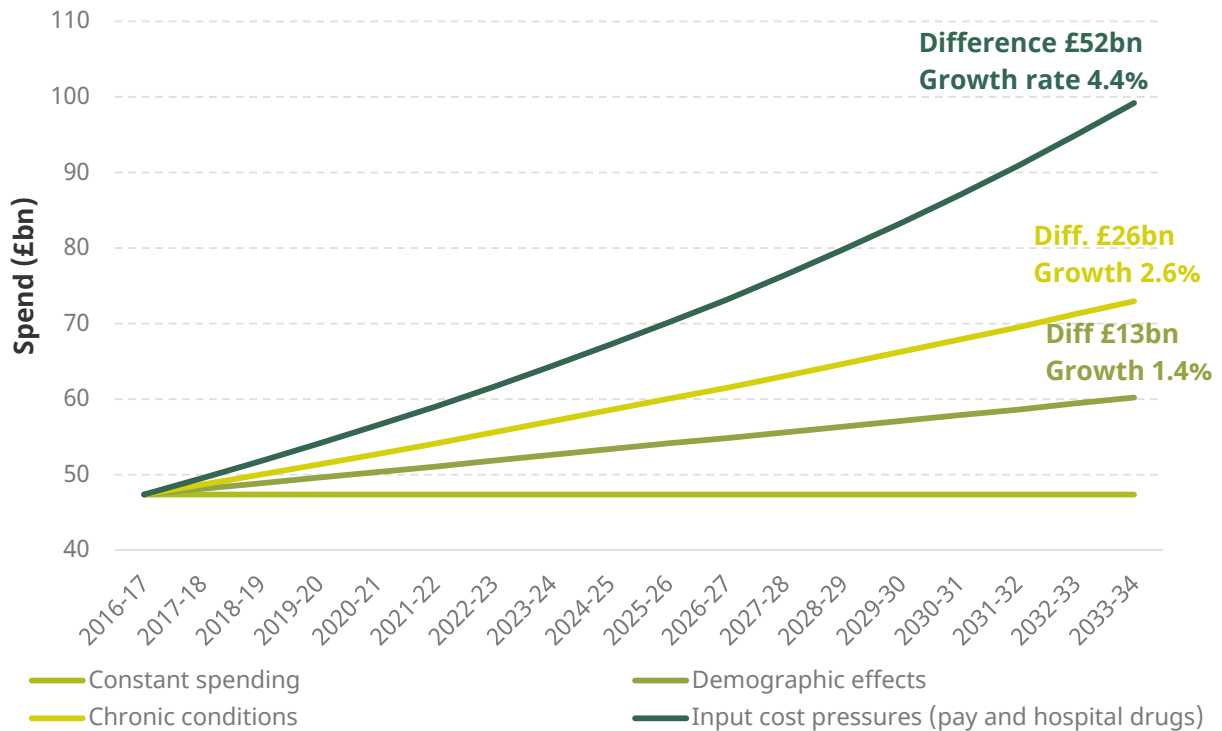
Source: Health Foundation analysis of Hospital Episode Statistics and NHS Reference Costs data.

### Relative pay, prices and productivity

Staff costs accounted for 62.5% of all acute hospital costs in 2016-17. NHS staff pay has fallen compared with comparable skilled wages in recent years. In the status quo, we assume that real-terms pay in the NHS in England grows by 1.9% to 2020-21, in line with the Agenda for Change pay deal, then 1.7% thereafter. Pay increases are responsible for £40 billion of the £49 billion input cost pressures in 2033-34.



**Figure 3.14. Projected NHS acute care spending pressures in England (status quo scenario) without any productivity gains**



Source: Health Foundation analysis of Hospital Episode Statistics and NHS Reference Costs data. For more detail, see Box 3.2.

Drug cost pressures are greatest in hospitals, as new medicines tend to be focused on care provided in these settings. Drugs prescribed by GPs and other primary and community staff tend to have lower unit costs and, over recent years, spending has been falling. We estimate that between 2018-19 and 2033-34, hospital prescribing costs (adjusting for hospital activity) will grow at 5.5% per year. In the period from 2009-10 to 2016-17, total hospital drug costs increased by 9.89%, while hospital activity grew at 4.34%. In both the status quo and modernising scenarios, drug costs grow at a faster rate than projected NHS spending. Under the status quo, hospital drug costs grow from 5% of RDEL in 2018-19 to 6% in 2033-34.

Productivity in healthcare has been relatively low compared with that in other sectors due to its high proportion of skilled labour as an input. Long-term productivity is estimated to be 0.8% for healthcare in the UK.<sup>48</sup> If the health service in England is able to maintain this level of productivity gain, then it will save an estimated £9 billion by 2023-24 and £29 billion by 2033-34.

### Aggregate acute care spending pressures

Our projections show that over the next 15 years, English NHS spending on acute care would need to grow by an average of 1.4% to keep pace with demographic pressures; this includes both population growth of around 0.6% a year and ageing. Adding the pressures

<sup>48</sup> Office for National Statistics, 'Public service productivity estimates, healthcare: 2015', <https://www.ons.gov.uk/economy/economicoutputandproductivity/publicservicesproductivity/articles/publicservicesproductivityestimateshealthcare/healthcare2015>.

from a rising burden of chronic conditions means we project NHS spending on acute care would need to grow by an average of 2.6% per year to keep pace with demographic change including chronic disease.

Accounting for rising pay and drug costs, NHS spending on acute care would need to grow by an average of 4.4% to keep pace, without any offsetting productivity improvement. If productivity improvements continue to be delivered at the 0.8% a year achieved between 1995 and 2015, projected acute pressures would be lower, at an overall growth rate of 3.6% between 2018–19 and 2033–34.

### Total healthcare spending pressures in England

Total healthcare spending pressures depend on the impact of demographic and non-demographic change across all healthcare sectors, not just acute hospitals. In Table 3.6, we present the percentage and absolute increases in spending for each area of healthcare under the status quo assumptions. Due to different recent trends and activity levels, as well as a different input mix, each area of spending is projected to grow at a different rate.

Due to an inability to model the prevalence of chronic conditions explicitly, cost pressures in community and primary care are almost certainly underestimated. Given the low level of births projected by the ONS over the next 15 years, maternity costs are projected to experience the slowest growth in cost pressures.

**Table 3.6. Spending growth rates and share of spending by service area in England under the status quo scenario**

Service area	Annual spending growth, 2018–19 to 2033–34	2018–19, £ billion (share of spending)	2033–34, £ billion (share of spending)
Acute care	3.6%	60.1 (45%)	102.1 (49%)
Community care	2.7%	14.4 (11%)	21.6 (10%)
Primary care	3.2%	8.9 (7%)	14.2 (7%)
Mental health	1.8%	11.6 (9%)	15.2 (7%)
Primary care prescribing	2.1%	10.1 (8%)	13.7 (7%)
Maternity	0.3%	4.0 (3%)	4.1 (2%)
Public health	3.0%	4.6 (3%)	7.2 (3%)
Capital	2.8%	6.4 (5%)	9.6 (5%)
Other	2.9%	14.3 (11%)	21.8 (10%)
<b>Total</b>		<b>134.2<sup>a</sup> (100%)</b>	<b>209.7 (100%)</b>

<sup>a</sup> This £134 billion is our projected figure and includes the £6 billion additional spending, on top of the £128 billion budget for 2018–19, required to meet recent unmet demand from 2015–16.

Source: Health Foundation analysis of Hospital Episode Statistics and NHS Reference Costs data. For more detail, see Box 3.2.

In addition to direct patient services and public health, healthcare spending includes capital investment. We add projections for capital to derive the projected growth in the total healthcare budget.

### Spending projection for English healthcare if the NHS is modernised between 2018–19 and 2033–34

Our modernised scenario for health services in England:

- increases capital expenditure to match the OECD average as a proportion of GDP;
- increases acute activity to return to NHS constitutional standards;
- increases productivity to 1.4% per year;
- increases pay growth to 3.0% above inflation after the Agenda for Change pay deal;
- improves treatment rates for mental health towards parity of esteem;
- increases spending on public health.

#### Improved quality

Healthcare in England has experienced a period of low funding growth since 2010. In that time, we have seen evidence of a reduction in quality of service in some key areas, such as waiting times. We therefore attempt to model the cost implications of returning to prior levels of care quality for hospital spending and improvements in key priority areas of unmet need, including mental health.

Mental healthcare treatment rates in the modernised scenario are assumed to increase from 39% to 70%. Under this assumption, spending more than doubles to £27.0 billion in 2033–34, adding £12 billion to the status quo scenario.

NHS constitutional standards have been a steadfast series of targets for health service performance but the NHS is not consistently achieving these waiting times standards. Returning to meet these standards, from a baseline of 2015–16 activity, is projected to cost an additional £2 billion in 2023–24. This would be additional to the £6 billion of unfunded underlying demand pressures between the current planned budget in 2018–19 and our status quo projections.

#### Higher value

In times of austerity, less visible areas of spending have borne the brunt of cost-saving programmes. The NHS in England has been moving money from capital investment to meet day-to-day running costs, staff pay has been capped or frozen since 2010–11, and public health spending has fallen by 12% since 2013–14.

Healthcare staff pay growth has fallen well below its long-run average of 2% per year in real terms. In the modernised scenario, we assume that pay grows faster than whole-economy earnings. In 2010, doctors were the third-best-paid occupation across the workforce as a whole; by 2015, they had fallen to eleventh.<sup>49</sup> We assume some ‘catching up of relative pay’. This would add £23 billion to the pay bill by 2033–34.

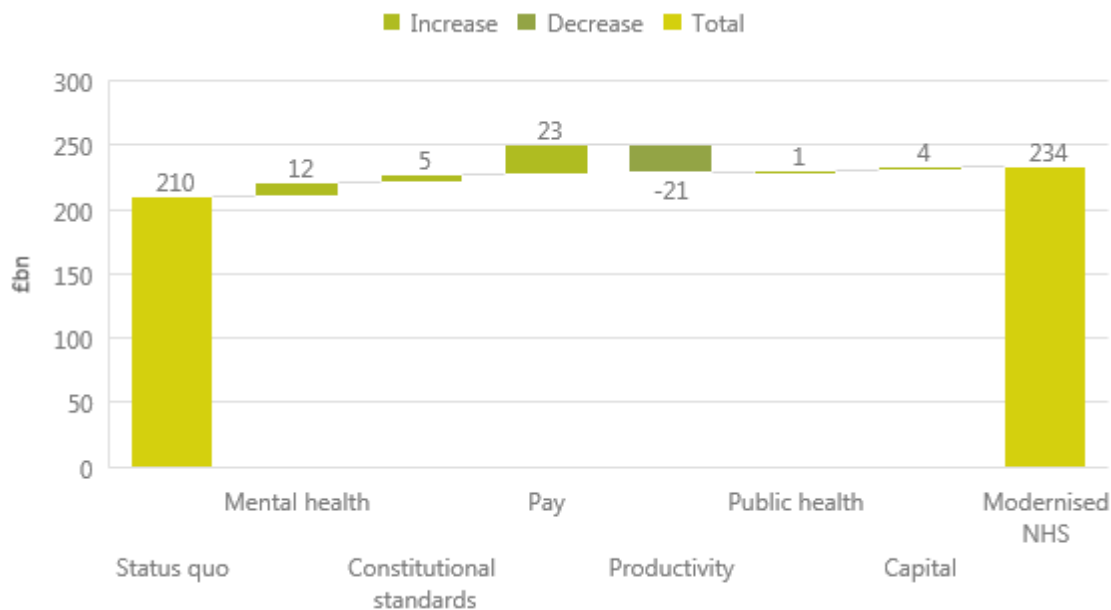
<sup>49</sup> A. Bryson and J. Forth, *Wage Growth in Pay Review Body Occupations*, Report to the Office of Manpower Economics, 2017  
[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/623810/Wage\\_Growth\\_in\\_PRB\\_Occupations\\_-\\_final\\_report\\_3\\_.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/623810/Wage_Growth_in_PRB_Occupations_-_final_report_3_.pdf).

Additional capital investment and public health spending may generate productivity savings. In addition, we assume a link between pay and productivity. Our central hypothesis is that high turnover, unstable staffing, and recruitment and retention problems have resulted in a reliance on temporary staff and a suboptimal skill mix, which has undermined labour productivity growth. Securing enough staff with high-level skills, reducing churn and reducing reliance on temporary staffing is likely to require some restoration of relative pay rates compared with other occupations.

The ONS calculates that the NHS in England experienced high levels of productivity growth at 1.4% per year between 2011–12 and 2015–16.<sup>50</sup> If the additional capital can be spent effectively, and wage growth promotes a better work environment with a less stretched healthcare workforce, it may be possible to return to and maintain this recent rate of productivity growth from 2019–20, saving the service an additional £21 billion in 2033–34 compared to the status quo assumption of 0.8%.

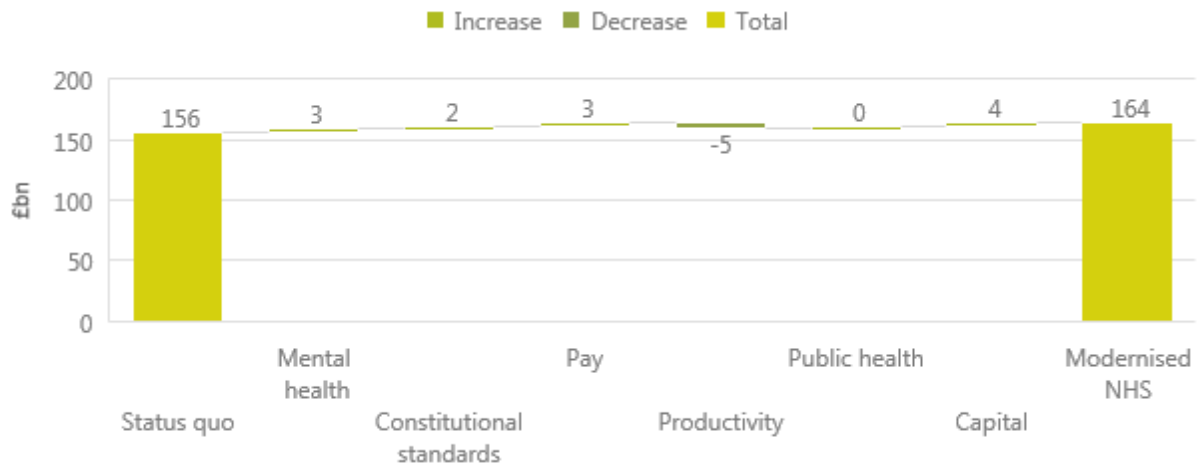
We project that the effect of these combined assumptions – a programme of modernising the NHS – would add £24 billion to spending pressures faced by the English NHS, over and above the core pressures set out in the status quo scenario, in 2033–34. To meet those pressures, English health spending would need to be £234 billion in 2033–34 – an annual increase of 4.1% over the next 15 years.

**Figure 3.15. Contribution of spending pressures for England health budget under the modernised NHS scenario in 2033–34**



Source: Health Foundation analysis of Hospital Episode Statistics and NHS Reference Costs data. For more detail, see Box 3.2.

<sup>50</sup> Office for National Statistics, 'Public service productivity estimates, healthcare: 2015', 2018, <https://www.ons.gov.uk/economy/economicoutputandproductivity/publicservicesproductivity/articles/publicservicesproductivityestimateshealthcare/healthcare2015>.

**Figure 3.16. Contribution of spending pressures for England health budget under the modernised NHS scenario in 2023-24**

Source: Health Foundation analysis of Hospital Episode Statistics and NHS Reference Costs data. For more detail, see Box 3.2.

**Table 3.7. Cost growth rates and share of spending by service area in England under the status quo and modernised NHS scenarios**

Service area	Annual spending growth, 2018–19 to 2033–34	2018–19, £ billion (share of spending)	2033–34, £ billion (share of spending, status quo)	2033–34, £ billion (share of spending, modernised)
Acute care	4.0%	60.1 (45%)	102.1 (49%)	107.8 (46%)
Community care	3.0%	14.4 (11%)	21.6 (10%)	22.3 (10%)
Primary care	3.4%	8.9 (7%)	14.2 (7%)	14.6 (6%)
Mental health	5.8%	11.6 (9%)	15.2 (7%)	27.0 (12%)
Primary care prescribing	1.5%	10.1 (8%)	13.7 (7%)	12.5 (5%)
Maternity	0.4%	4.0 (3%)	4.1 (2%)	4.2 (2%)
Public health	4.8%	4.6 (3%)	7.2 (3%)	9.3 (4%)
Capital	4.9%	6.4 (5%)	9.6 (5%)	13.3 (6%)
Other	3.2%	14.3 (11%)	21.8 (10%)	22.9 (10%)
<b>Total</b>		<b>134.2<sup>a</sup> (100%)</b>	<b>209.7 (100%)</b>	<b>234.1 (100%)</b>

<sup>a</sup> This £134 billion is our projected figure and includes the £6 billion additional spending, on top of the £128 billion budget for 2018–19, required to meet recent unmet demand from 2015–16.

Source: Health Foundation analysis of Hospital Episode Statistics and NHS Reference Costs data. For more detail, see Box 3.2.

To deliver the modernised NHS scenario, we have assumed that major changes would need to occur in the next five years; contributing drivers are shown in Figure 3.16. To move from the status quo to the modernised NHS scenario in 2023–24, an additional £9 billion of health spending would be required (above the status quo), with key increases in mental health, pay and capital.

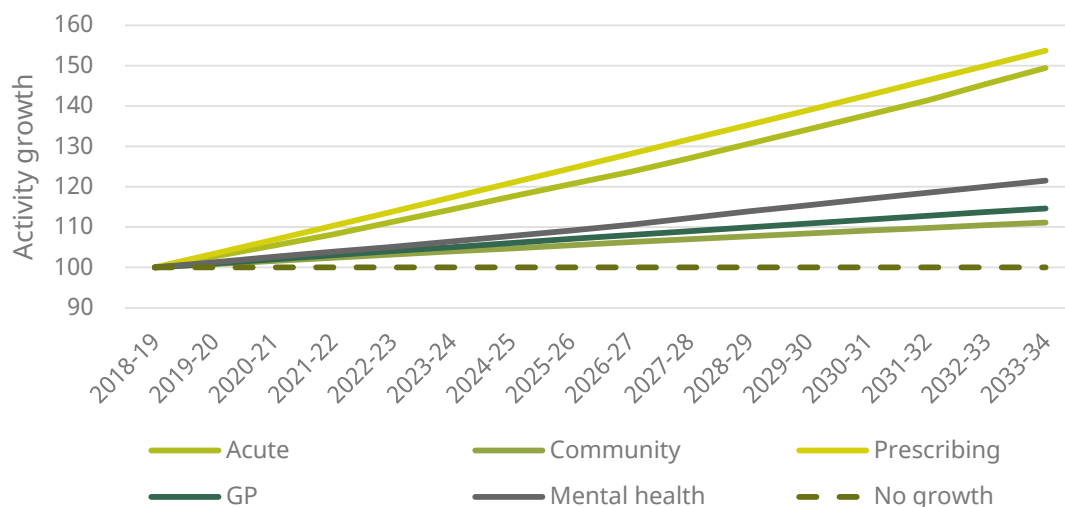
Modernising the NHS has implications for the relative spending growth of different areas of the service, as shown in Table 3.7. From 2018–19 to 2033–34, mental health and public health take an increasing share of English healthcare spending. Acute care grows as a share spending, but not as much as under the status quo: this is because the spending required to improve waiting times performance back to the NHS constitutional standards is relatively small compared to the projected growth in mental health spending.

### 3.5 Implications for English NHS activity levels and the workforce

The status quo scenario shows that the combined effect of population growth, ageing and an increased burden of chronic disease is that hospital activity will grow substantially over the next 15 years. Our model projects that in the status quo scenario, emergency admissions would almost double over the next 15 years. This would have major implications for the capacity needed in the health service. This is without significant changes to demand through better disease prevention and health promotion action and/or radically different models of care. While it may be possible to ‘bend’ the demand curve, our projections show that changes would need to be very substantial if acute activity were not to increase.

Figure 3.17 shows the projected annual growth in all the areas of healthcare activity in the status quo scenario from 2018–19 to 2033–34. Where the service area is made up of component parts – for example, community or acute care – we present the activity growth cost weighted by sub-area. The volume of primary care prescribed drugs is projected to increase the most, at 2.9% per year. This is followed by cost-weighted acute activity, which is projected to increase at 2.7% per year.

**Figure 3.17. NHS acute activity growth in England (status quo scenario)**



Source: Health Foundation analysis of data outlined in Box 3.2.

**Table 3.8. Activity growth rates and staff cost shares by service area in England, in the status quo scenario**

Service area	Annual average activity growth, 2018–19 to 2033–34 (%)	Staff cost share of service 2016–17 (%)
Acute care	2.7	60.1
Community care	0.7	66.3
Primary care	0.9	62.5 <sup>51</sup>
Mental health	1.3	73.7
Primary care prescribing	2.9	NA
Maternity	0	60.1

Source: Health Foundation analysis of Hospital Episode Statistics and NHS Reference Costs data. For more detail, see Box 3.2.

Acute activity is the area in which we have the most complete data, allowing us to identify patients with chronic conditions and estimate their associated increase in costs. Over the next 15 years spending in acute hospitals to treat people with chronic disease is expected to more than double. For the remaining areas of healthcare, we are unable to model increases in the prevalence of chronic conditions. We therefore increase activity per head at the trend rate of recent growth (as discussed in Section 3.3). We project lower levels of cost-weighted activity growth for community care (0.7%), primary care (0.9%) and mental health (1.3%) (without the major expansion set out in our modernised NHS scenario).

As shown in Table 3.8, staff costs are a large portion of total healthcare spending, accounting for over half of costs in each service area. Our projections model is therefore sensitive to assumptions about real pay growth over the next 15 years. For example, in England, an additional 1% on the rate of growth in real-terms pay adds around 0.6 percentage points to total annual spending growth. This amounts to an additional £18 billion in the status quo scenario by 2033–34.

At the end of 2017, the NHS in England employed 1.2 million people in Hospital and Community Health Services (HCHS). While this headcount has increased by 3% – 35,000 people – over the last eight years, filling 4.7% more full-time-equivalent jobs, the growth in the workforce has not kept pace with rising demand. As set out in Section 3.3, the population has grown, aged and become more medically complex.

The number and mix of staff required to provide care in the future are highly uncertain. The impact of having to provide significantly more care may be offset by productivity improvements, including through changes in skill mix, new roles and changes in the way care is delivered.

Using the changes in activity implied in the modernised NHS scenario, we estimate the number of staff needed to keep up with these increases in activity based on the current model of care and productivity. We increase the numbers of staff working in different

<sup>51</sup> We are unable to obtain data on staff cost levels as a share of total cost for GPs. We therefore use the average rate for the rest of the service.

**Table 3.9. Growth in selected NHS staff groups in England in the modernised scenario (FTE)**

	2018–19	2023–24	2028–29	2033–34	Annual growth	Extra FTEs, 2018–19 to 2033–34	% change
<b>Hospital and Community Health Services total, including:</b>	<b>1,069,400</b>	<b>1,248,500</b>	<b>1,459,600</b>	<b>1,708,600</b>	<b>3.2%</b>	<b>639,200</b>	<b>60%</b>
Professionally qualified clinical staff, including:	577,000	673,200	786,300	919,700	3.2%	342,700	59%
HCHS doctors	112,000	130,100	151,200	175,900	3.1%	63,900	57%
Nurses and health visitors	283,500	331,200	387,500	454,200	3.2%	170,700	60%
Support to clinical staff	320,300	374,400	438,200	513,800	3.2%	193,500	60%
NHS infrastructure support	167,500	195,700	228,900	268,000	3.2%	100,400	60%
<b>Primary care total, including:</b>	<b>127,700</b>	<b>133,700</b>	<b>140,100</b>	<b>146,700</b>	<b>0.9%</b>	<b>19,000</b>	<b>15%</b>
GPs	35,600	37,300	39,000	40,900	0.9%	5,300	15%
Nurses in GP practices	16,000	16,800	17,600	18,400	0.9%	2,400	15%

Note: Columns do not sum to totals as only selected staff groups are shown.

Source: Health Foundation Analysis based on NHS Digital Electronic Staff Record data, and Healthcare Workforce Statistics, September 2017.



areas – acute trusts, community providers and mental health trusts – separately (along with other staff at ambulance trusts and CCGs) and then combine them to project overall workforce growth.

If the NHS workforce grows in line with activity in the modernised scenario, it would require an additional 179,000 FTE staff over the next five years, rising to an additional 639,000 FTE staff by 2033–34. This would include 171,000 extra nurses and health visitors and a total 343,000 extra professionally qualified clinical staff.

This represents a significant increase on current staffing levels, equivalent to growing the workforce by over half over a 15-year period. This is not unprecedented; the NHS workforce grew by 78% between 1951 and 1971 and by 83% between 1961 and 1981.<sup>52</sup> More recently, the NHS workforce grew by 2.9% a year on average between 1998 and 2008 – similar to the 3.2% a year implied by our model for the period 2018–19 to 2033–34.

This does not include the independent sector workforce, which is small but accounts for about 50,000 FTE staff.

These workforce numbers assume no productivity gain as we do not know how much of the productivity gain in recent years has reduced the demand for labour. Opportunities for labour-saving productivity gains will occur, for example, through IT or the substitution of drug-based treatments for surgical interventions. If realised, they would allow the NHS to provide the same amount of care with fewer staff. It may also be that the marginal number of staff needed to provide care decreases with the number of staff there are; there may be economies of scale in administrative functions or ways of absorbing some increase in the number of patients or procedures. Our estimates are therefore likely to be an overestimate of staffing numbers. However, offsetting that are countervailing pressures to reduce bed occupancy rates, allow some staff such as GPs more time with each patient and increase ward staffing ratios. These could increase the staff needed to provide care for the same number of patients.

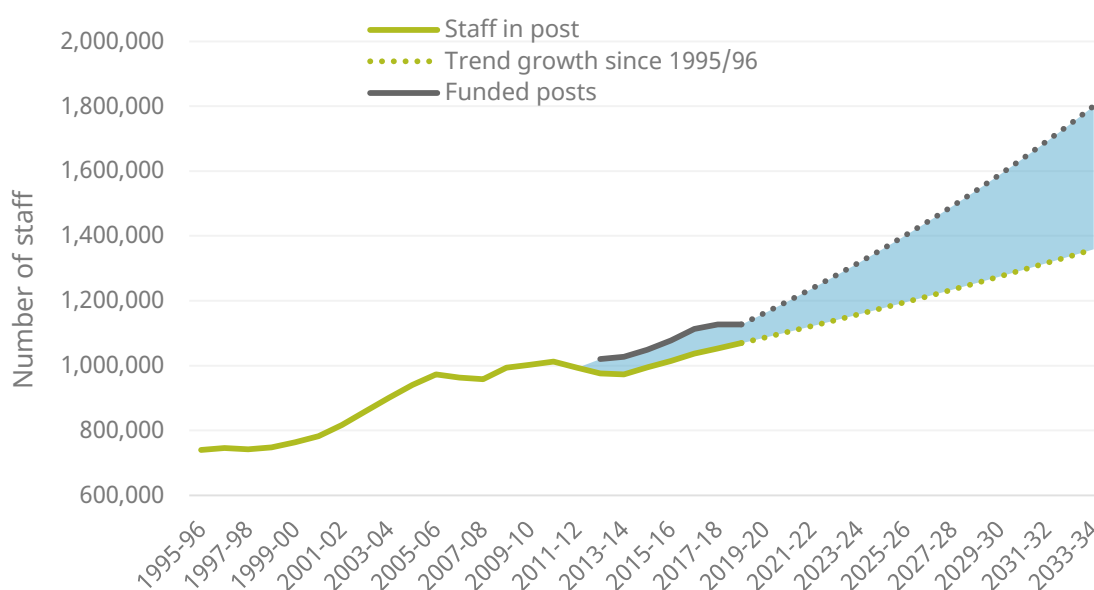
Modelling by Health Education England suggests a similar growth in the workforce is required. In its model, the number of FTE staff grows to just over 1.3 million by 2026–27. It also projects potential future supply, with the gap between demand and supply being 118,000 posts by 2026–27.<sup>53</sup>

If we assume the number of staff in post grows at the average rate since 1995–96 and compare that with the number of additional funded posts needed to keep pace with activity growth in our model, we see a gap between supply and demand of 440,000 posts by 2033–34, as shown in Figure 3.18.

Activity in primary care is projected to grow by 0.9% a year, and in social care by 2.2% (see Table 3.14 later). For primary care, this would imply that a further 19,000 FTE staff, including 5,300 GPs, may be required to keep pace with activity. As set out in Section 3.8, for social care, which has a larger workforce than the NHS, an additional 458,000 FTE staff

<sup>52</sup> E. Hawe, 'Sixty years of the NHS: changes in demographics, expenditure, workforce and family services', Office of Health Economics, 2008, [https://www.ohe.org/system/files/private/publications/312%20-%20Sixty\\_Years\\_NHS\\_9-2008.pdf](https://www.ohe.org/system/files/private/publications/312%20-%20Sixty_Years_NHS_9-2008.pdf).

<sup>53</sup> Health Education England, *Facing the Facts, Shaping the Future: A Draft Health and Care Strategy for England to 2027*, 2018, <https://hee.nhs.uk/our-work/workforce-strategy>.

**Figure 3.18. Potential gap between supply and demand of staff in the English NHS**


Source: NHS Digital; Health Education England; Health Foundation modelling

would be required. Many of these will be in the private sector, although around 37,000 will be directly employed by local authorities.

Taken together, the number of HCHS NHS staff and the workforces in primary care and social care in England may need to grow by over a million FTEs by 2033–34. This is growth of 47% overall, or 2.6% a year.

### 3.6 UK health spending projections

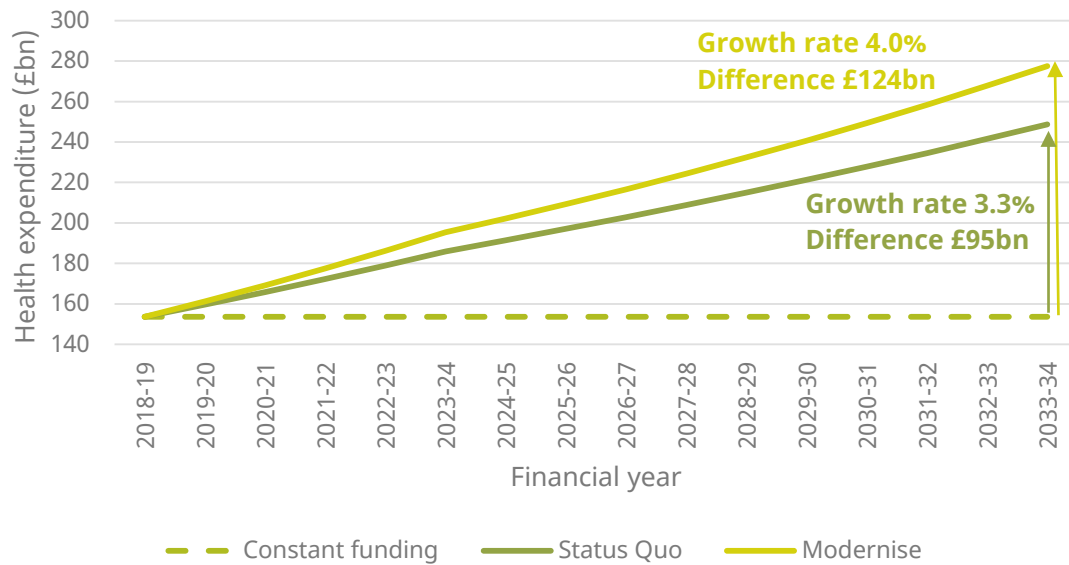
Using our projections for the NHS in England, we gross up spending to UK levels. We hold constant the current relative levels of spending per person across the four nations of the UK, as set out in Chapter 1. But we assume the increase in spending per head projected for England applies for the whole of the UK. Table 3.10 shows the spending projections in England and these uplifted to UK levels under the status quo scenario.

In our status quo scenario, the combined impact of demographic and non-demographic changes is projected to create pressures equivalent to an average annual increase in UK

**Table 3.10. Total projected health spending in England and uplifted to the UK under the status quo scenario**

	2018–19	2023–24	2028–29	2033–34
Total projected spending pressures in England	£128bn	£156bn	£181bn	£210bn
Total projected spending pressures in the UK	£154bn	£186bn	£215bn	£249bn

Source: Health Foundation analysis of Hospital Episode Statistics and NHS Reference Costs data. For more detail, see Box 3.2.

**Figure 3.19. Projected UK health expenditure under the status quo and modernising scenarios**

Source: Health Foundation analysis of Hospital Episode Statistics and NHS Reference Costs data. For more detail, see Box 3.2.

health spending of 3.3% between 2018–19 and 2033–34 to maintain quality and access at 2015–16 levels. This amounts to a real-terms increase in spending from £154 billion in 2018–19 to £249 billion in 2033–34.

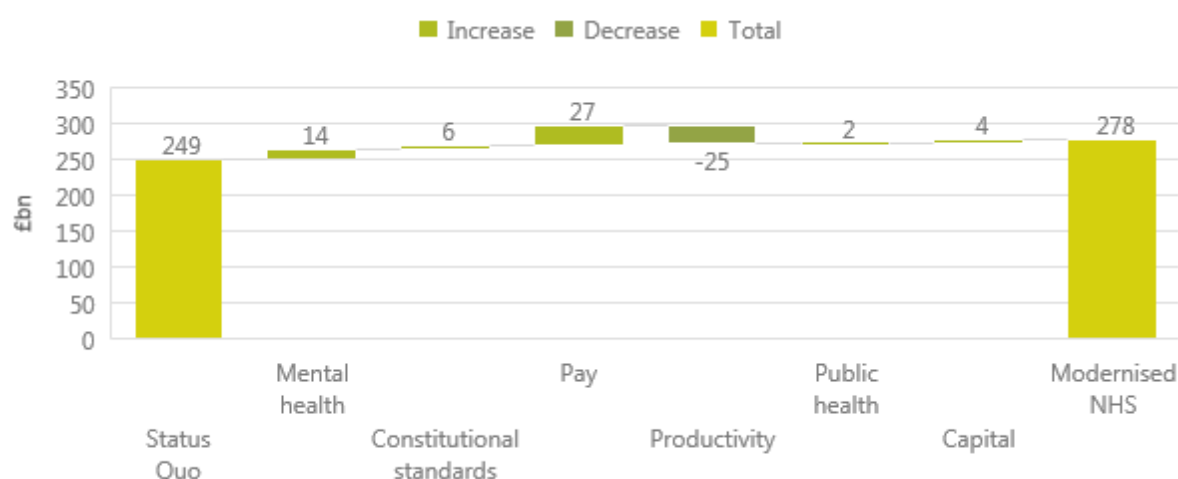
If the NHS were to be improved in line with the modernised scenario, spending in the UK would grow at 4.0% a year, from £154 billion to £278 billion in the same period. This would help to create an improved service with a sustainable workforce that is able to better meet constitutional standards and the goal of parity of esteem for mental health.

**Table 3.11. NHS spending pressures in the UK: status quo and modernised NHS scenarios**

	Status quo			Modernised		
	2018–19 to 2023–24	2018–19 to 2028–29	2018–19 to 2033–34	2018–19 to 2023–24	2018–19 to 2028–29	2018–19 to 2033–34
<b>Total spending pressures</b>	<b>£32bn</b>	<b>£61bn</b>	<b>£95bn</b>	<b>£42bn</b>	<b>£79bn</b>	<b>£124bn</b>
Annual average growth	3.9%	3.4%	3.3%	4.9%	4.2%	4.0%
<b>of which</b>						
<b>Resource</b>	<b>£31bn</b>	<b>£59bn</b>	<b>£91bn</b>	<b>£37bn</b>	<b>£72bn</b>	<b>£116bn</b>
Annual average growth	4.0%	3.5%	3.3%	4.6%	4.1%	4.0%
<b>Capital</b>	<b>£1bn</b>	<b>£2bn</b>	<b>£4bn</b>	<b>£5bn</b>	<b>£6bn</b>	<b>£8bn</b>
Annual average growth	2.2%	2.6%	2.7%	10.9%	6.3%	4.9%

Source: Health Foundation analysis of Hospital Episode Statistics and NHS Reference Costs data. For more detail, see Box 3.2.

**Figure 3.20. Estimated cost of implementing the modernised NHS in the UK, 2033–34**



Source: Health Foundation analysis of Hospital Episode Statistics and NHS Reference Costs data. For more detail, see Box 3.2.

Table 3.11 shows the spending projections for the UK in both the status quo and modernised NHS scenarios.

We estimate the spending implications for each country of the UK if the NHS were modernised along similar lines to England across the other devolved governments. Combining the estimates, we find that projected demand pressures in the UK in 2033–34 increase from £249 billion under the status quo to £278 billion under the modernised scenario.

Figure 3.20 presents the additional cost of rolling out the modernised NHS to the whole UK. In order to estimate the increase to the UK, it is assumed that each country experiences a proportional change in per-capita costs to that estimated for the modernised NHS in England. For instance, the cost of increasing mental health treatment prevalence in line with our assumptions is £12 billion in England and £14 billion for the whole of the UK. Pay is still the biggest driver of additional spending, at £27 billion, but it is almost completely recovered in productivity savings, provided the UK service is able to maintain the recent 1.4% rate of productivity growth in England.

**Table 3.12. NHS spend as a share of GDP**

	Healthcare share of GDP under status quo	Healthcare share of GDP under modernised NHS
2018–19	7.3%	7.3%
2023–24	8.2%	8.6%
2028–29	8.6%	9.3%
2033–34	8.9%	9.9%

Source: Health Foundation analysis of Hospital Episode Statistics, NHS Reference Costs data and OBR nominal GDP. For more detail, see Box 3.2.

In both the status quo and the modernised scenarios, demand and cost pressures are such that the UK would need to spend a higher proportion of GDP on the health service. The UK currently spends 7.3% of GDP on publicly funded healthcare. In the status quo scenario, this is projected to grow to 8.9% by 2033–34, while in the modernised scenario it takes a higher share, at 9.9%.

### 3.7 Comparison with other models

There have been a number of attempts to project spending pressures in the NHS. These have mostly been models that take a ‘top-down’ approach based on changes in demographics, national income and ‘other cost pressures’, including changes in technology or productivity. Our model considers many of the same drivers of spending pressures, but does so in a ‘bottom-up’ way based on granular data about the healthcare usage of different types of people.

Estimates of future health spending pressures range between 3% and 4% a year in real terms. This is consistent with long-run spending on the NHS, which has grown by 3.7% a year on average since 1948.

Using the assumptions about activity, pay and productivity changes from the status quo scenario, we project an increase in spending pressures on the UK health service of 3.3% per year from 2018–19 to 2033–34. This is below the average rate at which NHS spending increased in its first 70 years. If the NHS increased productivity growth, pay, capital investment and public health spending in line with the modernised scenario, we project that spending would grow at a faster rate of 4.0%.

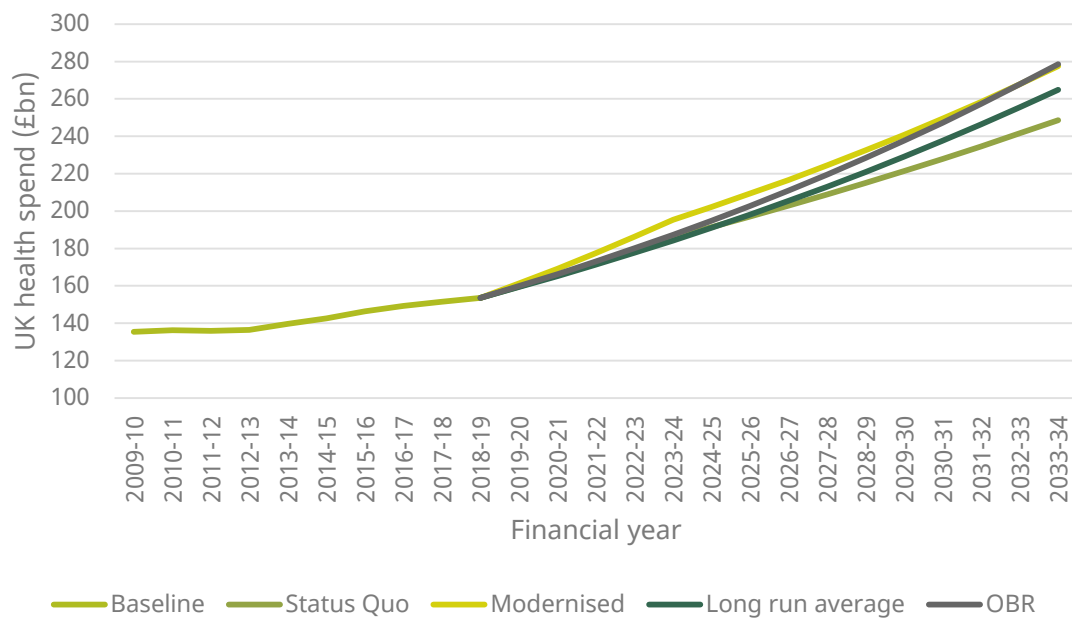
The OBR does not model healthcare spending pressures for the period during which there are firm government spending plans – instead modelling planned spending during that period.<sup>54</sup> The OBR’s projections methodology is used to project spending pressures after the current spending review period. For comparison purposes, we wish to assess how our healthcare spending projections compare with those that would be derived using the OBR’s methodology. To do this, we have taken the OBR’s growth rate from 2021–22 to 2033–34 and applied it to the whole period. This should allow us to more accurately compare the average growth rate in spending pressures, rather than the impact of current spending plans.

Under this method, if health spending grew in line with the OBR’s central projection, it would, on average, grow at a similar rate to that in our modernised scenario, at 4.0% a year.

However, spending in the modernised scenario would grow faster in earlier years to reflect the front-loaded spending in certain areas. The modernised NHS scenario is also consistent with the Institute for Public Policy Research (IPPR)’s projection model for the English NHS, which has a growth rate in health demand pressures of around 4.2%

<sup>54</sup> M. Licchetta and M. Stelmach, ‘Fiscal sustainability and public spending on health’, OBR Fiscal Sustainability Analytical Paper, 2016, [http://obr.uk/docs/dlm\\_uploads/Health-FSAP.pdf](http://obr.uk/docs/dlm_uploads/Health-FSAP.pdf).

**Figure 3.21. Alternative projections of health spending in the UK**



Source: OBR Fiscal Sustainability Report 2017; OBR Economic and Fiscal Outlook 2018; Office of Health Economics (OHE) historical health expenditure; Health Foundation analysis of Hospital Episode Statistics and NHS Reference Costs data. For more detail, see Box 3.2.

between 2016–17 and 2029–30. IPPR’s method is based on forecasting acute spending growth and applying this rate to the remaining health spending.<sup>55</sup>

In our model, around half of these spending pressures arise from demographic pressures from the growing and ageing population and the increased prevalence of chronic conditions, particularly multi-morbidity. In the status quo scenario, these pressures account for 55% of total spending pressures, before productivity improvements (see Figure 3.8). This includes some catch-up spending in early years to reflect spending pressures between 2015–16 and 2018–19, which were not funded and have accumulated as underlying pressures.

The OBR in its analysis concluded that ‘There remains considerable uncertainty over the contribution of demographic, income and other cost pressures among the drivers of health spending’ but also that ‘the impact of ageing on health spending has been relatively small historically’.<sup>56</sup> This is reflected in the variation between projections in the split between these different drivers. For example, the OECD found that real public health spending per capita in OECD countries between 1995 and 2009 was mainly driven by rises in income and other non-demographic drivers, rather than demographic effects.<sup>57</sup> Of the

<sup>55</sup> Institute for Public Policy Research, ‘The Lord Darzi review of health and care: interim report’, 2018, <https://www.ippr.org/research/publications/darzi-review-interim-report>.

<sup>56</sup> M. Licchetta and M. Stelmach, ‘Fiscal sustainability and public spending on health’, OBR Fiscal Sustainability Analytical Paper, 2016, [http://obr.uk/docs/dlm\\_uploads/Health-FSAP.pdf](http://obr.uk/docs/dlm_uploads/Health-FSAP.pdf).

<sup>57</sup> C. de la Maisonneuve and J. Oliveira Martins, ‘A projection method for public health and long-term care expenditures’, OECD Economics Department Working Paper 1048, 2013, <http://dx.doi.org/10.1787/5k44v53w5w47-en>.

annual average growth rate in per-person spending over this previous period of 4.6%, just 0.2% was demographics while other cost pressures accounted for 2.8%.

The relative pressures are sensitive to the approach taken to projections. In the OECD projection and in most models where the 'other cost pressures' category is included, this accounts for the majority of pressures. What this category consists of varies, but increasing relative healthcare costs and the effect of technological advances (e.g. medical equipment and pharmaceuticals) are the main drivers.

In the OBR's 2016 Fiscal Sustainability Analytical Paper, this 'other' category accounts for between 69% and 81% of total cost pressures (between 2020 and 2060) in its different scenarios.

One reason demographics are a bigger driver in our model than in others is that we explicitly model the impact of chronic conditions, whereas for most other models this is expected to be captured by 'other cost pressures' or not at all. We also include in the demographics some catch-up spending in early years to reflect spending pressures between 2015–16 and 2018–19. Because our method is bottom-up, we do not explicitly model income elasticity (countries choosing to spend more as their income grows); this is partly captured in our modernised scenario through increased spending reflecting growing expectations.

The estimates from our model are consistent in magnitude with existing projections, which suggests that spending pressures grow by around 3–4% a year over the medium term. Our use of a bottom-up model using patient-level data and explicit modelling of the impact of chronic conditions points to more of this growth being due to demographics than indicated by previous models.

### 3.8 Pressures on social care

Social care is the personal care and support required by some people because of needs arising from their age, illness, disability or other circumstances. Support is provided in residential and nursing homes, people's own homes and in other community settings. In the UK in 2015–16, £21.7 billion was spent on net public provision of adult social care (after accounting for private contributions). We estimate that the budget for adult social care will be £23.5 billion in 2018–19.

It is projected that spending on adult social care in the UK will reach £41.5 billion in 2033–34. This implies that an increase in spending of £18 billion is required to meet demand pressures associated with the access and quality levels from 2015–16.

The support provided and the financial arrangements vary across the four countries of the UK. For instance, in Scotland, there is a system of free personal care for everyone over the age of 65 who needs it. In England, publicly funded social care is provided under a means-tested system where only those with a low level of financial and housing assets are eligible. Table 3.13 shows spending on adult social care per capita in the UK across the four countries.<sup>58</sup>

<sup>58</sup> In 2018–19 figures, from PESA.

England currently spends the least per capita, at around 25–30% less than the others, with the majority of spending on working-age adults. Scotland, Wales and Northern Ireland spend a higher proportion on social care for adults over the age of 65.

**Table 3.13. UK adult social care spend per head across the four nations, 2015–16**

	England	Scotland	Wales	Northern Ireland
Adult social care spend per head	£310	£452	£408	£447
Share of social care spent on older adults	48%	61%	51%	62%

Note: Figures are in 2018–19 prices.

Source: NHS Digital for England, PESA for Scotland, Wales and Northern Ireland.

#### Box 3.4. PSSRU social care model

Researchers at PSSRU (which is based at LSE) have created a model of adult social care activity and funding based on the current system in England. It can be used to project total spending on both young adults and older people in need of publicly funded social care and has been used by the Department of Health<sup>a</sup> and the Office for Budget Responsibility to inform social care policy.

Importantly, the PSSRU's model produces a projection of the current system under the latest available data and does not make specific forecasts about the future. The projections indicate the costs of the system based on the following specific assumptions and trends in population and activity:

- The growth in population by age and gender changes in line with ONS 2016-based principal population projections.
- Real GDP rises in line with OBR projections.
- Unit costs of care increase as per OBR assumptions about productivity.
- Marital status rates change in line with the Government Actuary's Department (GAD) 2008-based marital status and cohabitation projections, except that they remain constant for people with learning difficulties.
- There is a constant ratio of single people living alone to single people living with their children or with others, and of married people living with only a partner to married people living with a partner and others.
- PSSRU does not assume any productivity gains in its projection modelling.
- Pay is assumed to rise in line with OBR projections for rises in average earnings.

<sup>a</sup> Now known as the Department of Health and Social Care.



Services are provided by an estimated 20,300 organisations,<sup>59</sup> delivering care from around 40,400 establishments.<sup>60</sup> The majority are in the private or not-for-profit sectors. Some care is paid for through private arrangements and some commissioned and arranged by local authorities. As a result, comprehensive national data on all social care activity and funding are limited.

Researchers at the Personal Social Services Research Unit (PSSRU)<sup>61</sup> have developed a cohort-based microsimulation model to project future social care activity and costs based on available data. This model is considered state-of-the-art in the analysis of social care in England, and is widely used in this area of research.<sup>62</sup> Box 3.4 contains more details about the model.

The PSSRU model estimates that cost and demand pressures for publicly funded adult social care will rise by an average of 3.7% a year in real terms between 2015 and 2030.<sup>63</sup> This is slightly lower for younger adults, at 3.6% a year, compared with 3.7% a year for people aged 65 and over.

### **Demand and cost pressures in England**

Figure 3.22 shows projected net spending on adult social care in England based on the PSSRU model. Spending is projected to grow from £17.1 billion in 2015–16 to £33.2 billion in 2033–34. This is an increase of £16 billion, almost doubling the entire adult social care budget in England, with growth at an annual rate of 3.7%. The increase is due to a combination of the growing and ageing population, rising numbers of people living longer with long-term conditions, and rising costs of providing care services.

A recent clarification of the law means staff must be paid at least the minimum wage during sleep-in shifts, but this is not included in the PSSRU modelling. We account for it by including an additional cost in backpay of £400 million in 2017–18 and an additional £100 million cost pressure in future years.

The PSSRU model can also project demand and cost pressures for publicly funded social care for both older and younger adults. In 2015–16, publicly funded social care for the elderly in England cost around £8 billion. Pressures on care for the elderly are projected to catch up with spending on younger adults, growing at 3.9% per year compared with 3.6%.

In the period from 2015–16, we estimate the budget for adult social care will not keep pace with demand pressures. Using NHS Digital data and local government core spending, we

<sup>59</sup> <https://www.nao.org.uk/report/the-adult-social-care-workforce-in-england/>.

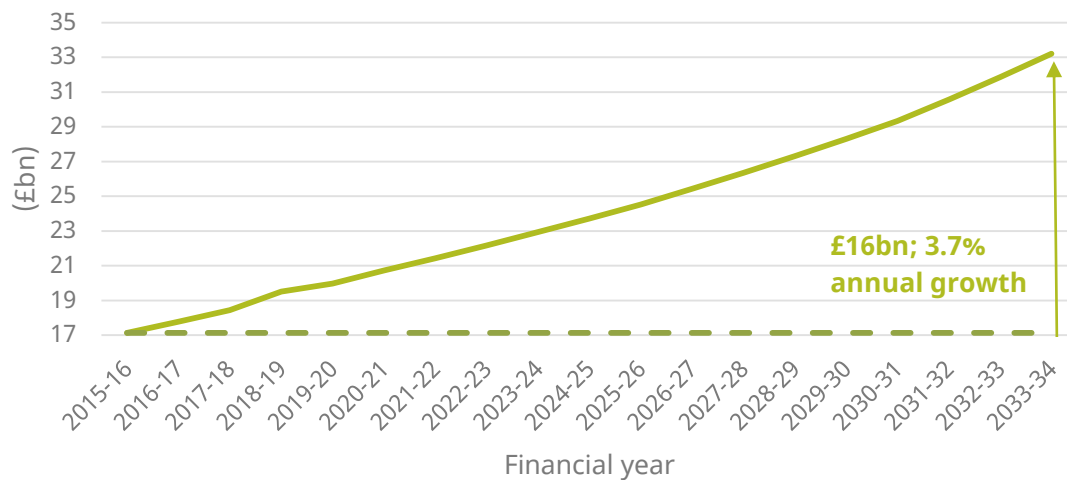
<sup>60</sup> <https://www.skillsforcare.org.uk/NMDS-SC-intelligence/Workforce-intelligence/publications/The-size-and-structure-of-the-adult-social-care-sector-and-workforce-in-England.aspx>.

<sup>61</sup> Based at the London School of Economics and Political Science (LSE).

<sup>62</sup> Data on social care use in 2015–16, as well as the projections used, are from an update to PSSRU, 'Projections of demand for and costs of social care for older people and younger adults in England, 2015 to 2035', 2015, [www.pssru.ac.uk/pub/DP2900.pdf](http://www.pssru.ac.uk/pub/DP2900.pdf). These data were provided by the PSSRU.

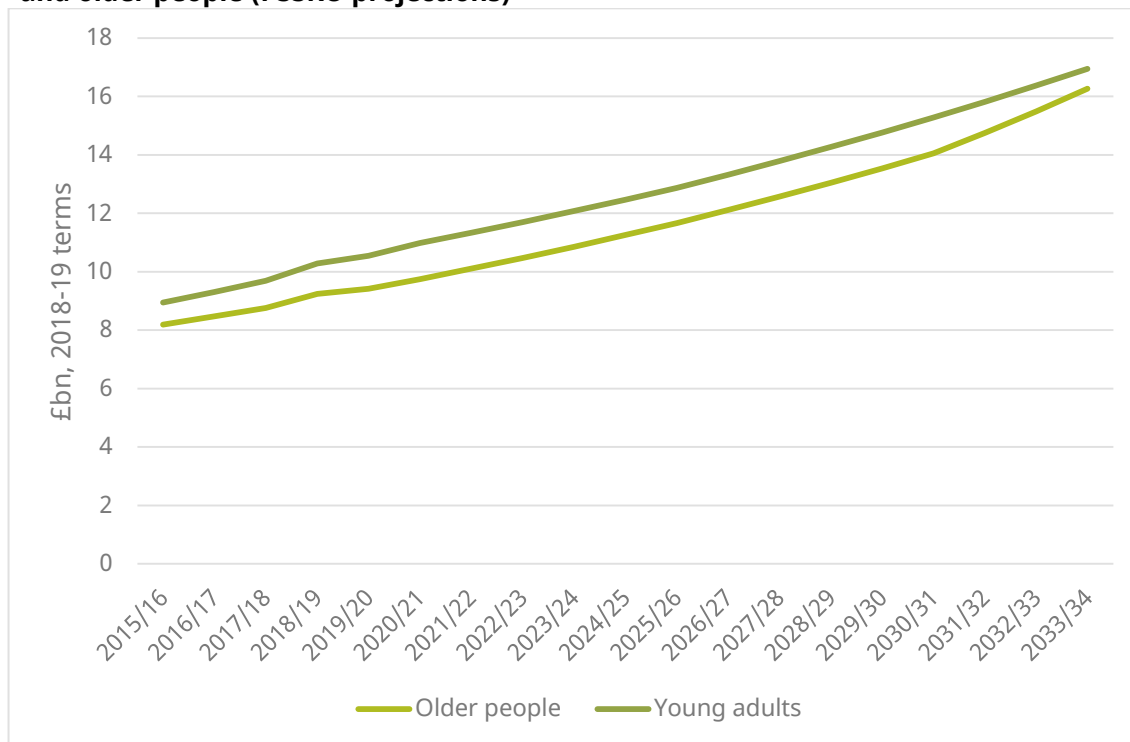
<sup>63</sup> This includes the increase in the national living wage – as a large number of social care workers are paid at or close to minimum wage, they benefit from the increases announced in the 2015 Comprehensive Spending Review.

**Figure 3.22. Demand and cost pressures for publicly funded social care in England (PSSRU)**



Source: Health Foundation analysis using PSSRU projections (<https://www.health.org.uk/sites/health/files/Social-care-funding-options-May-2018.pdf>), including local authority social care spending (<https://www.gov.uk/government/statistics/local-authority-revenue-expenditure-and-financing-england-2017-to-2018-budget>) and ONS population projection.

**Figure 3.23. Social care demand and cost pressures in England for working-age adults and older people (PSSRU projections)**



Source: Health Foundation analysis using PSSRU projections (<https://www.health.org.uk/sites/health/files/Social-care-funding-options-May-2018.pdf>), including local authority social care spending (<https://www.gov.uk/government/statistics/local-authority-revenue-expenditure-and-financing-england-2017-to-2018-budget>) and ONS population projection.

estimate the social care budget in 2017–18 and 2018–19.<sup>64</sup> This includes increases in the Improved Better Care Fund and use of the local authority precept for social care. These figures, placed in 2018–19 real terms for England, are £17.9 billion and £18.6 billion respectively, which gross up to UK-wide amounts of £22.6 billion in 2017–18 and £23.5 billion in 2018–19.

Given the budget growth from 2015–16 to 2018–19, we estimate that, in order to keep pace with demand pressures, from 2018–19 to 2033–34 the budget in England would need to rise by £14.6 billion. This figure is based on 2015–16 levels of access and quality in the publicly funded social care system – i.e. without reform to a system that has been strongly criticised, with the government planning a Green Paper on social care reform this summer.

Reform to the system, however, is likely to come at a cost: recent savings have been made in England by holding the means-test limits constant in nominal terms, therefore reducing the number of people who are eligible for state-funded care. Per-capita funding for adult social care in England has fallen from highs in 2009–10; even to return to levels of access and care quality then, it is estimated that an additional £9.9 billion would be required in 2033–34 on top of the current pressures of £14.6 billion. In a recent report, the Health Foundation also estimate that to introduce Free Personal Care, as in Scotland, would cost an extra £4.3 billion in 2015–16, while the ‘Cap and Floor’ which limits lifetime social care costs and adjusts the means test (similar to the model proposed by the Conservative party in the 2017 general election) could cost £3.2 billion more.<sup>65</sup> Introducing these models would mean that the £14.6 billion increase in 2033–34 would grow by £6.7 billion to £21.3 billion for the Cap and Floor model and by £9.1 billion to £23.7 billion for Free Personal Care.

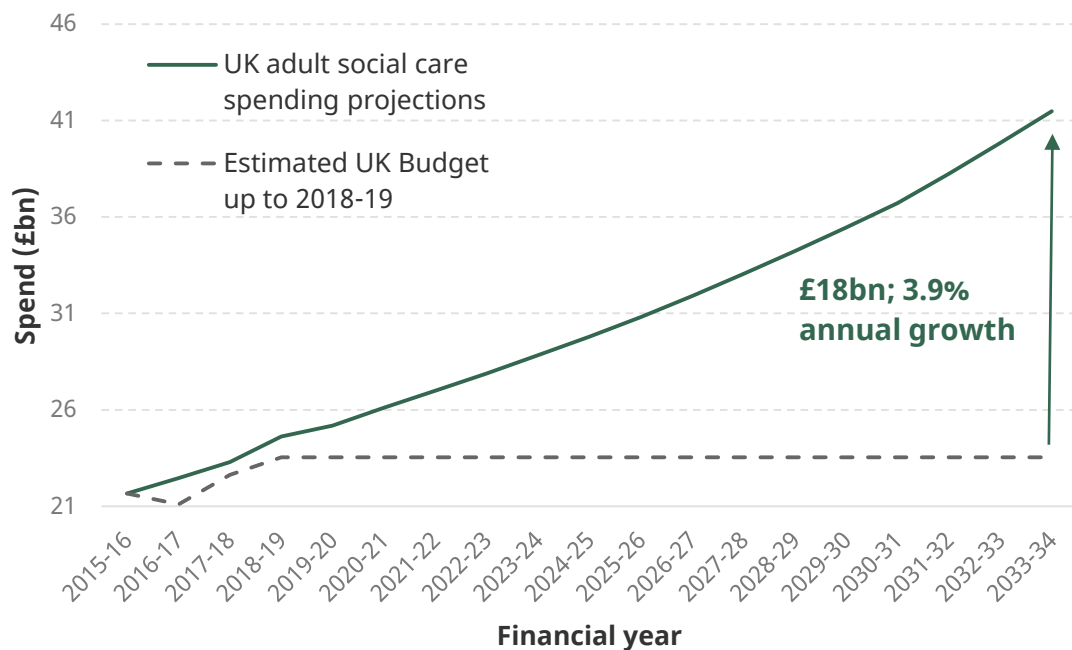
### **Demand and cost pressures in the UK**

The 3.7% projected current pressures from PSSRU in England amount to a 3.1% increase in spend per capita per annum. To estimate UK-wide cost pressures, we apply the 3.1% per-capita growth to the different levels of spend per head across the four countries.

Figure 3.24 presents the projected increase in UK spending on adult social care, based on the growth in spending projected in England. We compare the UK projections with the estimated budget for 2018–19. In order to keep pace with demand pressures based on adult social care activity from 2015–16, the budget for social care in the UK will need to grow by an estimated £18 billion from 2018–19 to 2033–34, at an annual average growth rate of 3.9%.

<sup>64</sup> Full details of this estimation can be found in <https://www.health.org.uk/publication/social-care-funding-options>.

<sup>65</sup> <https://www.health.org.uk/sites/health/files/Social-care-funding-options-May-2018.pdf>.

**Figure 3.24. Projections of adult social care spending in the UK**


Source: Health Foundation analysis using PSSRU projections (<https://www.health.org.uk/sites/health/files/Social-care-funding-options-May-2018.pdf>), including local authority social care spending (<https://www.gov.uk/government/statistics/local-authority-revenue-expenditure-and-financing-england-2017-to-2018-budget>), ONS population projection and PESA.

### Implications for the social care workforce

The social care workforce is a larger workforce than the NHS's, with around 1.1 million FTE workers in 2016. As the demand for social care grows, with a growing, ageing and increasingly co-morbid population, more staff will be required to provide care. If staff numbers grow in line with the activity growth implied by PSSRU's model, then an additional 458,000 staff would be required by 2033-34. Many of these will be in the private sector, although around 37,000 will be directly employed by local authorities. This would mean growing the social care workforce by around 2.2% a year.

**Table 3.14. Possible growth in the social care workforce (FTE)**

	2018-19	2023-24	2028-29	2033-34	Annual growth	Extra FTEs, 2018-19 to 2033-34	% change
All job roles	1,160,326	1,296,350	1,448,320	1,618,106	2.2%	457,800	39%
Local authority – all jobs	94,080	105,109	117,431	131,198	2.2%	37,117	39%

Source: Health Foundation Analysis using PSSRU projections, and Skills for Care 'The size and structure of the adult social care sector and workforce in England, 2017'

### 3.9 Conclusion

The economic modelling work undertaken for this study sets out projections of future healthcare spending pressures. These show that NHS funding will need to increase by 3.3% a year at the very least, if quality and access to care are to be maintained at 2015–16 levels due to a growing and ageing population and a rising burden of chronic disease, against a backdrop of pay and drug costs pressures which improvements in productivity cannot fully offset. This is above expected GDP growth but below the historic increases in funding. Without any major improvements in quality or access to care, to keep pace with population change and input cost pressures, the NHS will need to take a larger share of national income. The alternative is that standards of care will decline.

Aiming just to maintain quality and access standards at the current level for the next 15 years would be a low bar, and a marked change from the first 70 years of the NHS's history, which have seen continuous progress and improvement. This would leave healthcare in the UK in a very different place from other EU15 and G7 nations.

If the NHS is to continue to improve care, health spending will need to increase by around 4.0% a year in real terms over the next 15 years, as set out in our modernised scenario. This would allow the NHS to meet a wider range of needs, improve outcomes in key areas such as cancer, focus more on upstream prevention and improve productivity. This extra spending would modernise the NHS and, although it would increase spending, it could deliver greater value than the status quo scenario, with higher productivity and improvements in mental health treatment, which may have benefits beyond the NHS.

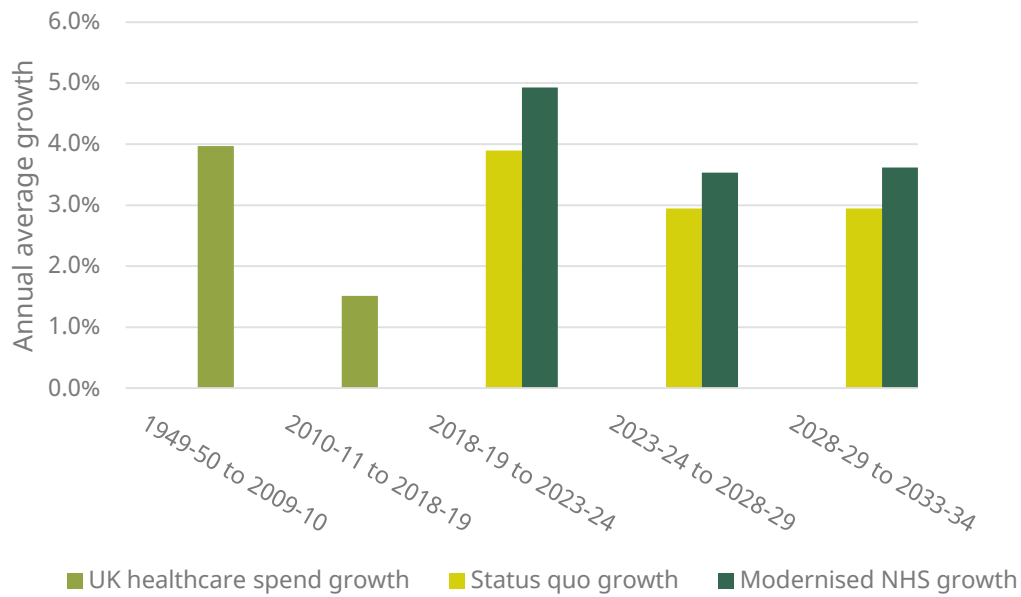
This modernised NHS scenario would see healthcare spending rise at a similar rate to the growth implied by the OBR's top-down projection modelling approach of 4.0% a year, and a slightly higher rate than the long-term trend of 3.7% a year since the NHS's inception.

From the NHS's inception to 2009–10, healthcare spending grew at just under 4% a year compared to GDP growth of 2.8% a year. Since then, both GDP and health spending have increased, but at a much lower rate than in the past. Our analysis suggests quality and access to care cannot be sustained if this low rate (1.5% a year) of health funding growth is continued beyond 2018–19.

The challenge is that these years of low healthcare funding growth have left the NHS with a backlog of cost pressures. More than three-quarters of NHS acute trusts are in deficit, waiting times standards are not being met, capital investment has been cut and, as a result, hospitals are building up large backlog maintenance programmes and working with out-of-date equipment. Investment in public health and prevention has fallen. Putting the NHS on a sustainable footing therefore requires a period of 'catch-up' funding growth. As Figure 3.25 shows, this would mean increasing health spending by around 5% a year for the next five years, after which funding growth would return to levels slightly below the pre-recession average.

Providing 'catch-up' funding over this period is likely to be challenging as GDP growth is forecast to be comparatively low over the next five years. The level of GDP growth is a key driver of healthcare spending – it influences pay and expectations. Before the 2007–08 recession, health spending grew by an average of 1.2 percentage points above GDP growth. Our analysis suggests the gap between GDP growth and health spending growth

**Figure 3.25. Historical and projected healthcare growth**



Source: OHE, OBR, Health Foundation analysis of Hospital Episode Statistics and NHS Reference Costs data. For more detail, see Box 3.2.

under the modernised scenario will be greater over the next 15 years, at around 2.1 percentage points. Part of the reason for this is that the next 15 years are a period of significant ageing in the population. Chronic disease is also expected to rise, drug costs are increasing with medical advance, and the scope to continue holding down nurses', doctors' and other NHS staff pay is limited.

One of the key issues for policymakers will be the pace of change and scale of ambition for improvement. Addressing the backlog of capital spending needs, waiting times problems and underlying financial problems is essential, but will consume considerable resource. If the government wants to address those problems and deliver marked improvements in quality of care over the next five years, it will have to resource a period of 'catch-up' funding which is higher than the growth rates across the remaining years.

The projections show what might be needed to deliver care in the next 15 years in the way we deliver care today, in terms of the balance of hospitals, primary care and community services. They imply a substantial expansion in hospital activity and therefore more staff.

They are also predicated on maintaining current roles and responsibilities of doctors, nurses and allied health professionals. There is evidence, however, that this would not be the best model of care to meet patient needs or use resources. Technology will facilitate new ways of working, new models of care and new roles for staff. These should be embraced.

Alongside any increased funding, significant changes would need to be made to use resources well. If the NHS is not to build a substantial number of new hospitals to meet rising demand, care models will need to be transformed so that care is based closer to people's homes. Expectations of the impact of changing models on the need for emergency hospital care will need to be realistic.

There will need to be a clear plan for how to spend additional funding, aligned with more effective workforce plans and prioritisation of extra resources. Practical support for staff and organisations tasked with implementing new models of care, policy and regulatory changes will also be needed to deliver transformative change. This approach would ensure that when the NHS reaches its 85<sup>th</sup> anniversary, additional spending has been translated into improved health and value for money. The scale of this task should not be underestimated.