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The future of the NHS: re-laying the foundations for an equitable and efficient health and care service after COVID-19

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Executive summary

The UK's response to the pandemic

The UK has recorded one of the highest death rates associated with COVID-19 globally, whether measured as deaths that are directly attributable to COVID-19 or by excess mortality. The reasons for this high rate are complex and not yet fully understood, but elements of the UK Government response have been criticised, including delayed implementation of physical distancing measures, poor coordination with local authorities and public health teams, a dysfunctional track and trace system, and an absence of consultation with devolved nations. The role of the National Health Service (NHS) and relevant national executive agencies in relation to testing capacity, availability of personal protective equipment (PPE), the cancellation and postponement of many aspects of routine care, and decisions around discharge from hospital to care homes should also be critically examined. Conversely, aspects of the response by the NHS and relevant national executive agencies deserve recognition. In only a few weeks, capacity for critical care was massively expanded, many thousands of staff were reallocated, and services were reorganised to reduce transmission of SARS-CoV-2. The NHS also collaborated with academic institutions to share knowledge about clinical characteristics of the disease and to establish world-leading clinical trials on vaccines and treatments.

The response to COVID-19 brings to attention some of the chronic weaknesses and strengths of the UK's health and care systems and real challenges in society to health. Failures in leadership, an absence of transparency, poor integration between the NHS and social care, chronic underfunding of social care, a fragmented and disempowered public health service, ongoing staffing shortfalls, and challenges in getting data to flow in real time were all important barriers to coordinating a comprehensive and effective response to the pandemic. More positively, the high amount of financial protection that was provided by the NHS and an allocation of resources that explicitly accounted for differing geographical needs have, to some extent, mitigated the already substantial effect of the pandemic on health inequalities.

The London School of Economics and Political Science–*Lancet* Commission on the future of the NHS

This UK-wide London School of Economics and Political Science (LSE)–*Lancet* Commission on the future of the NHS provides the first analysis of the initial phases of the COVID-19 response as part of a uniquely comprehensive assessment of the fundamental strengths of and challenges that are faced by the NHS. The NHS has long been regarded as one of the UK's greatest achievements, providing free care at the point of delivery for over 66 million people from birth to death.

Against this backdrop, and considering international evidence, this Commission sets out a long-term vision for the NHS: working together for a publicly funded, integrated, and innovative service that improves health and reduces inequalities for all. This Commission makes seven recommendations, and associated subrecommendations, for both the short term and long term, with a 10-year timeline. First, increase investment in the NHS, social care, and public health. This Commission proposes that yearly increases in funding of at least 4%, in real terms, are needed for health, social care, and public health. Second, improve resource management across health and care at national, local, and treatment levels. Third, develop a sustainable, skilled, and fit for purpose health and care workforce to meet changing health and care needs. Fourth, strengthen prevention of disease and disability and preparedness to protect against major threats to health. Fifth, optimise diagnosis to improve outcomes and reduce inequalities. Sixth, develop the culture, capacity, and capability to become a so-called learning health and care system (ie, in which data-enabled infrastructures are routinely used to support policy and planning, public health, and personalisation of care). Finally, improve integration between health care, social care, and public health and across different providers, including the third sector (ie, charity and voluntary organisations).

Central to the argument of this Commission is that an ongoing increase in funding for the NHS, social care, and public health is essential to ensure that the health and care system can meet demand, rebuild after the pandemic, and develop resilience against further acute shocks and major threats to health. This funding should be targeted towards increased investment in capital, workforce, preparedness, prevention, diagnosis, health information technology (HIT), and research and development. Furthermore, the NHS should develop new ways of working with patients and citizens. This Commission sets a vision of transformation to meet changing health and care needs of the UK population but rejects any calls for reorganisation of the NHS on a large scale. Past experiences have taught us that reorganisation on a large

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scale is often a disruptive process without any evidence of benefit.[1] We argue instead that the foundations of the NHS can be strengthened through further investment and integration of pre-existing operational institutions.

The COVID-19 pandemic has reinforced the economic case to invest in health, which is crucial for fiscal sustainability and enhancing societal wellbeing.[2] However, we acknowledge that committing to increased investment in the NHS, social care, and public health will be challenging in economically and geopolitically uncertain times. To implement the funding recommendations, this Commission estimates that total expenditure would need to increase by around £102 billion in real terms, or 3·1% of gross domestic product (GDP) in 2030–31. Taxation reforms would be required to increase funding and we provide an indicative analysis of the amount of potential change that would be required to personal income tax, national insurance contributions, and value-added tax.

This Commission serves as a call to action. We argue that, similar to the establishment of the NHS after World War 2, after the COVID-19 pandemic and leaving the EU, the UK faces a once-in-a-generation opportunity to invest in the health of all its population and secure the long-term future of the NHS. Failure to re-lay the foundations of the NHS (ie, strengthen through increased investment and commitment to its founding principles) risks a continued deterioration in service provision, worsening health outcomes and inequalities, and an NHS that is poorly equipped to respond to future major threats to health.

Introduction to this Commission

The UK's NHS, established in 1948, is one of the most comprehensive health systems worldwide, providing free care at the point of delivery to over 66 million people. The NHS has emerged from one of the longest periods of austerity in its history, which was attributable to the 2008 financial crisis, to face the challenge of the COVID-19 pandemic. The pandemic has been the largest acute shock that the NHS has had to respond to since its foundation.

The pandemic arrived at a time when many chronic challenges that were faced by the NHS and the wider public sector were being emphasised. The NHS had increasingly been characterised, by the media in particular, as being in a state of crisis as it sought to meet increasing demand in the context of severe budget constraints, an ever more stretched social-care sector, and within an environment of cuts to local government, public health, and the public sector more broadly.

Launched in late 2017, this joint LSE–*Lancet* Commission provides an analysis of the main opportunities and challenges facing the NHS, critically considers the COVID-19 response to date, and proposes a set of targeted policy recommendations that are framed around a long-term vision for the NHS: working together for a publicly funded, integrated, and innovative service that improves health and reduces inequalities for all.

As discussion of the COVID-19 response continues, our report is the first to provide recommendations within a long-term analysis of the NHS. By the COVID-19 pandemic emphasising the enduring strengths and weaknesses of the health and care system, it heralds a once-in-a-generation opportunity to strengthen the NHS and realise the long-term vision.

Commission remit

This Commission on the future of the NHS offers a distinct contribution. We combine an analysis of priorities for the future of the NHS that were identified before the COVID-19 pandemic with additional analysis of the COVID-19 response to derive recommendations that ensure both resilience to further major threats to health and the long-term advancement of the NHS to meet population needs. This Commission seeks to build on the many strengths of the NHS, supporting its fundamental and enduring principles; it also takes a broader perspective than might be common in the media, which typically focus on a narrow set of issues, such as waiting times, delayed transfers of care, access to new medicines, and so-called winter crises, treating each of them in isolation.[3] We systematically draw on international evidence and evidence from across the UK, assessing the direction of change over time, current challenges, and priorities for future change. This Commission builds on the findings and recommendations of other commissions and inquiries and goes further than their remit by looking to 2030 and beyond. We concentrate on a few recommendations of high priority that are ambitious yet targeted and state the bodies that are responsible for their implementation.

This Commission is informed by, but does not seek to provide a historical and political analysis of, current NHS and health policy in the UK as these are provided extensively elsewhere.[4–6] Further, this Commission favours policy analysis and recommendations that are informed by evidence and a pragmatic, grounded approach.[7] Market-based ideologies (ie, applying private sector management models to attempt to improve efficiency) have prevailed in previous NHS reforms without convincing evidence of benefit.[8] This Commission supports the continuation of a publicly funded NHS for all on the basis of evidence of benefit and an absence of evidence to support a greater role for privately funded health care in the UK.

Although this Commission contains important lessons for international audiences, its remit is to provide recommendations that are focused on the health and care systems across the constituent countries of the UK. We discuss the importance of broadening this perspective to develop an understanding of the role of other sectors (eg, housing, education, justice, etc) and wider environmental, social, economic, and commercial determinants of health within an accompanying Health Policy paper on changing health needs.[9] We do not directly consider other major health and societal challenges, such as global warming and the climate emergency, but recognise their importance, including how the NHS has a key role as an anchor institution (ie, a large organisation that has a crucial role in supporting the economy, promoting sustainability, and improving wellbeing through employment opportunities and procurement policies) to promote environmental sustainability.[10] We intend the recommendations made in this Commission to complement effective adaptation to promote climate resilience in the health system and protect health, and we envisage that improving health will be integral to the UK's commitment to the interrelated Sustainable Development Goals, including health and wellbeing, gender equality,

Panel 1: Overview of the London School of Economics and Political Science–*Lancet* Commission process (ie, 2017–20)

Origins of this Commission

EM and AlM were approached by *The Lancet* to be co-chairs of a Commission on the future of the National Health Service (NHS), to launch after the 70th anniversary of the NHS.

Commissioners

EM, AlM, and the *Lancet* editorial team selected commissioners according to various criteria: geographical location (ie, to ensure representation from the constituent countries of the UK), interdisciplinary background (ie, to achieve a range, including medicine, dentistry, public health, mental health, health policy, economics, and political science), experience within the NHS (ie, front-line and managerial experience), gender, and knowledge of health systems outside the UK (ie, to ensure learning from international experience).

Full details about the co-chairs and commissioners are provided on the London School of Economics and Political Science (LSE)–*Lancet* Commission website. Commissioners were involved throughout this Commission, meeting seven times as a whole group and multiple times within working subgroups.

LSE research team

A research team led by MicA and EP, combining expertise in public health, research into health systems and policy, health economics, and clinical NHS experience, were employed by LSE to work with the Commissioners and co-chairs throughout the process.

Underpinning analysis

The Commission team, with the commissioners, developed eight background papers in key domains, incorporating evidence from the UK and international evidence for: health and care funding;[14] health needs;[9] structure and organisation of the NHS (appendix 1 p 2); health outcomes, quality, and safety (appendix 1 p 29); patient and public engagement (appendix 1 p 26); workforce;[15] health information technology;[16] and evaluation of novel technologies (appendix 1 p 19). The eight domains were identified by the Commission team through in-depth interviews with each commissioner at the outset and a consensus process involving all commissioners.

UK perspective

Where possible, data from each of the four constituent countries of the UK were compared as part of the underpinning analysis. Where comparisons were not possible, England was used as the reference case. This Commission focuses on learning from key commonalities and differences between the countries that are centred on the eight domains. Our reporting and recommendations were tested with commissioners and stakeholders from the constituent countries and elements that were specific to particular countries were developed as required. Our recommendations focus mainly on desirable changes across the UK, although elements that are specific to particular countries are emphasised. Relevant implementing bodies are identified for each country.

Stakeholder consultation

In addition to reviewing evidence in each domain, extensive stakeholder consultation was done in all constituent countries, including meetings that were held in Edinburgh, Cardiff, Belfast, and London (UK). The views of government, professional bodies, trade unions, medical royal colleges, patient organisations, academics, citizens, and other stakeholders were sought and were an important contribution to this Commission. Methods of consultation included an open call for evidence submissions (ie, 33 submissions received), an evidence hearing (ie, 7 organisations gave evidence), and targeted meetings (ie, attended by 76 individuals).

A list of the organisations that were involved in the consultation and summaries of the hearings and meetings are provided in appendix 2 (pp 9–11). This Commission draws on these meetings and materials throughout.

International comparisons that were used

An important element of this Commission was to place the NHS in an international context and draw on international case studies. The G7 countries (ie, Canada, France, Germany, Italy, Japan, the UK, and the USA [although sometimes the USA is excluded as an outlier in terms of expenditure and variation in outcomes]) and EU15 countries (ie, Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, and the UK) in 2019 were used as standards.

For more on the **LSE–*Lancet* Commission** see https://www.lse.ac.UK/health-policy/research/LSE-Lancet-Commission/LSE-LANCET-COMMISSIONERS

See Online for appendix 1

ending poverty, quality education, and productive employment for all.[11]

Social care is intrinsically linked with health care but, unlike health care, was not nationalised into one public institution in 1948 and does not provide universal coverage that is free at the point of delivery. This Commission considers social care in terms of its interrelationship with the NHS and funding requirements. It also considers the effect of the NHS discharge policies on excess mortality in care homes during the

Panel 2: Health and care in the UK: strengths, weaknesses, and priorities for action

Strengths

Response to the COVID-19 pandemic

Some aspects of the National Health Service (NHS) response warrant commendation, such as the willingness of the workforce to adapt in unprecedented circumstances and implement changes at the system level (eg, rapid increase in uptake of remote consultations to prevent transmission of SARS-CoV-2).

Financial protection

The NHS continues to provide citizens with a high level of protection from the financial consequences of poor health, with some of the lowest worldwide incidences of catastrophic expenditure (ie, when health spending exceeds 10% of household consumption) due to out-of-pocket health spending.

Redistribution

Access to the NHS is not dependent on ability to pay, and there is redistribution of health-care costs from the rich to the poor, who tend to consume more health care, with some notable exceptions, including preventive care, diagnostic services, and a few specific treatments (ie, hip and knee replacement).

Resource allocation at the national level

Centralised and systematic resource allocation to local health authorities results in financial control and consideration of equity of access.

Health technology assessment

The NHS has a methodologically robust and transparent system for the evaluation of new pharmaceuticals and technologies.

Chronic disease outcomes

The NHS does well in health outcomes for some chronic diseases, for example, diabetes (ie, low rates of hospital admission and amputation) and kidney disease (ie, low rates of mortality and prevalence).

Research and innovation

The UK has a well-established history of world-leading health research, which is emphasised by the establishment of influential clinical trials on vaccines and treatments for COVID-19.

Weaknesses

Pandemic preparedness and response

To date, the UK has one of the highest death rates related to COVID-19 worldwide. A combination of factors, such as little excess capacity in NHS services, poor supply of personal protective equipment, initial low capacity for testing, an erosion of public health capacity, and barriers to integrating data, have all impeded the national response.

Funding

Over the past 3 decades, the UK has had consistently lower public spending on health than most other high-income countries.

Social care

At a time of increasing need, spending on social care has decreased in real terms and is also lower than in most other high-income countries.

Resource allocation at the local level

Robust methods for resource allocation and health technology assessment at the national level do not always translate to the local level, where there is often an absence of transparency and accountability in relation to resource management.

Inequalities

Substantial inequalities in life expectancy and healthy life expectancy persist between constituent countries of the UK and among different population groups that are classified by deprivation and ethnicity.

Health outcomes

Increases in life expectancy have slowed in the UK, and the UK does poorly in comparison to other high-income countries in relation to important health outcomes, including survival from common cancers, death associated with cardiovascular disease, and infant mortality. Treatment continues to be prioritised over prevention, with funding for public health continuing to decrease relative to NHS funding.

Workforce

The UK has fewer nurses and physicians per person than do many high-income countries. An absence of strategic direction and ineffective workforce planning have resulted in a failure to adapt roles and responsibilities of different health and care staff to respond to changing health needs and substantial and persistent shortfalls in staffing.

Patient engagement

Despite numerous efforts to increase responsiveness, the NHS has failed to fundamentally change the way in which it works with patients.

Priorities for action

NHS funding

Increase spending on health, funded through broad-based general taxation. This increase requires a commitment in the

(Continues on next page)

(Panel 2 continued from previous page)

long term to increase health spending by at least 4% per year in real terms to maintain and improve the quality of services.

Social care funding

Provide improved financial protection in social care through a substantial injection of public funding. This protection also requires a commitment in the long term to increase funding by at least on average 4% per year in real terms.

Spending wisely

Develop a so-called spending wisely framework to support resource management and priority setting across health and care at national, local, and treatment levels. Independent analysis of the workforce and resource needs for health and care is required to inform spending reviews.

Strategic workforce planning

Each constituent country should maintain a workforce strategy for the long term to optimise skill mix and prioritise the health and wellbeing of staff and informal carers. These strategies should be underpinned by effective integrated workforce planning across the UK that takes account of both the supply-side (ie, recruitment and retention) and demand-side (ie, demography, morbidity, and use of services) factors.

Pandemic preparedness and response

To reflect on lessons learnt, a public inquiry should be launched into the UK Government's response to COVID-19. To coordinate preparedness planning to protect against major threats to health, we recommend that structures and processes for consultation between the UK constituent countries are clarified and strengthened. Given the proximity to European countries, and the need to share intelligence on communicable disease, the UK should commit to rejoining the European Centre for Disease Prevention and Control.

Improving population health

Renew the focus on and provide funding for prevention and health promotion within the NHS and relevant sectors and evaluate the return on these investments. As part of this renewed focus, each constituent country should develop and implement a strategy across government departments to promote health, wellbeing, and equity in all public policies.

Optimising diagnosis

When there is evidence to support early diagnosis, improve health outcomes by increasing availability of diagnostics, testing new routes to diagnosis, and targeting populations who are at high risk, particularly the clinically vulnerable and disadvantaged.

Promoting innovation and quality improvement

Develop and implement the organisational culture, health information technology infrastructure, and capacity and capability to become a so-called learning health and care system across the UK, maximising the potential of a system that is rich in data to benefit patients. Rebalance and strengthen research and innovation efforts towards supporting delivery of health and care services.

Strengthening integration

Reduce structural barriers to the integration of care, increase accountability, and work in fundamentally different ways with patients, carers, and the public to achieve the aims of integration and development of seamless care for patients.

COVID-19 pandemic,[12] but this Commission's remit did not allow as thorough an analysis for social care as for the NHS. This Commission notes the historical disparities in funding, priority, respect, and political will that have been afforded to mental health compared with physical health since the NHS's inception, which legislation and policy are beginning to address.[13] If the NHS is to improve health, mental health should have parity and it will be crucial to recognise the role of organisations beyond the NHS.

Commission process and main messages

The members of this Commission come from a wide range of research, policy, management, and clinical backgrounds, representing the four constituent countries of the UK. The Commission process is detailed in panel 1.

The key findings from this Commission are summarised in panel 2. Fundamental to the prioritisation of these suggested actions were the goals of improving health outcomes and reducing health inequalities for the UK's population.

Structure of report

First, we give a brief outline of the NHS's founding mission and its role within the UK state's overall provision of welfare for its citizens, then place the NHS's performance, in terms of funding and health outcomes, in an international context. We next give an account of its structures across the four countries of the UK before analysing its common strengths, benefits not realised, and challenges facing the NHS across the UK. Separate Health Policy papers discuss at length the challenges that are facing the NHS and potential policy responses from the perspectives of finance,[14] workforce,[15] changing health needs,[9] and digital health.[16] The second half of the report outlines this Commission's vision for the NHS in 2030 and beyond and our detailed recommendations for change. Appendix 1 includes an expanded analysis of organisational and structural challenges that are facing the NHS across the four UK nations. Appendix 2 includes an overview of the processes underlying this Commission, including a review of recommendations from previous NHS commissions, a list of organisations and individuals who were consulted with, and written

Panel 3: Terminology used in this Commission report

Health and care refer to the whole health and care system, incorporating the National Health Service (NHS), social care, and public health. This definition is consistent with definitions of health systems as having the primary purpose of promoting, restoring, and maintaining mental and physical health.[17] The use of the phrase health and care allows us to refer to the whole health and care system without specifying the different institutional arrangements across the constituent countries of the UK. Where appropriate, we refer specifically to the NHS, social care, or public health, using the following definitions or assumptions.

The NHS refers to the public sector funding of public health, community services, mental health, hospital services, primary care, dental health services, specialist services, and community pharmacies. How funding is allocated to health, public health, and social care varies by constituent country of the UK.

Social care refers to social work, personal care, or social support services to children or adults who are in need or at risk. Adult social care (including working age [ie, 18–65 years] and older adults [ie, >65 years]) refers to the personal and practical support that is provided to enable adults of all ages to retain independence and the best quality of life possible. Adult social care is paid for either publicly or privately and can be provided by a range of public, private, and third sector providers (ie, formal care) or on a voluntary basis by family and friends (ie, informal care).[18]

Public health refers to primary, secondary, and tertiary prevention. Public health is seen as an integral part of an effective population health system.[19] Generally, across the UK, public health efforts aim to improve health and wellbeing and reduce health inequalities. Provision and funding of public health varies across countries (appendix 1 p 12). Public health not only includes provision by the NHS and local authorities as part of the health and care sector but also cross-sector partnerships with local authorities, the community and voluntary sector organisations, relevant commercial organisations, schools, and other statutory service organisations.

See **Online** for appendix 2

See **Online** for appendix 3

evidence submissions that were received during this Commission. Appendix 3 provides detail on the methods and assumptions underlying our funding calculations.

The provision of health, social care, and public health services in the four constituent countries of the UK is complex, as is the accompanying terminology. For clarity, panel 3 defines key terms as they are used throughout this Commission report.

The NHS in the UK: protecting the health of citizens

The origins of the NHS

Established on July 5, 1948, the UK NHS has led globally in terms of universal health coverage. The underlying principles—that the NHS should be funded predominantly through general taxation, care should be comprehensive, and access should be based on clinical need and not ability to pay—still largely hold true. The NHS was preceded by the 1911 National Insurance Act, which provided health insurance for industrial workers, allowing them access to a developing family doctor service.[20] World War 2 saw some nationalisation of health services, as hospitals were registered and centrally run from 1938.[21] To some extent, the NHS built on schemes that were already initiated in the constituent countries but extended coverage to all.[22,23] Social care has a more complex history than does health care in the UK. The 1948 National Assistance Act led to local authorities being responsible "for the welfare of disabled, sick, aged and other persons", and meant that there was a greater scope for means testing and private provision of care.[24] Changes have occurred over time within and between countries, leading to greater diversity in the financing, organisation, and provision of social care than for health (appendix 1 pp 1–25).

The NHS in the context of wider government spending

The original intentions of the NHS were not only to improve health but also to improve productivity and prosperity and to provide financial protection from the direct costs of ill-health. William Beveridge saw the NHS as a fully integrated component of welfare provision addressing the so-called five giants: want, disease, ignorance, squalor, and idleness.[25] The NHS, in providing universal access to health services, was envisioned as one element of a comprehensive welfare system, covering social security, education, and housing, and offering citizens protection "from the cradle to the grave".[25] Spending on health has largely seen real-term increases from year to year.[14] Other areas of social spending have not had the same increases. Spending on sectors such as education have seen little increase as a proportion of GDP since the 1950s and a falling proportion in the 2010s (figure 1). The NHS, by contrast, is still a so-called island of universalism in comparison with the provision of general welfare benefits in the UK.[28,29]

International comparisons

Many health outcomes are substantially worse in the UK than in other high-income countries (table 1), most of which spend a greater proportion of GDP on health and care (table 2). This Commission argues that not only can the UK, as a wealthy country, afford to increase spending on health but also that spending should increase if the UK's poor health outcomes, relative to other EU15 and G7 countries, are to be improved and that additional health expenditure can benefit macroeconomic growth and societal welfare. However, the effect of low amounts of health spending in the UK, relative to other EU15 and G7 countries, is compounded further by relatively low amounts of spending on social care (table 2). Consequently, in considering the public funding that is required for the NHS, an important consideration of this Commission has been to do so within the context of wider spending on the UK welfare system, most of which has major influences on health.[32] This consideration means that increased health-care spending cannot come at the expense of the wider welfare state.

The NHS across the UK: greater commonalities than differences

A key feature of this Commission is that it takes a UK-wide perspective, dealing with the challenges and opportunities that are common to all four constituent countries and acknowledging their differences. In 1999, the devolution settlement transferred powers for health from the Westminster UK Parliament to the Scottish Parliament, Welsh Assembly, and Northern Ireland Assembly. Before devolution, the NHS had operated against distinctive historical, legislative, and political backdrops in each constituent country.[33,34] Devolution has led to further divergence in health policy and, therefore, offers a natural experiment from which to derive health system and policy learning. This opportunity has never been fully exploited, frustrated by the scarcity of similar data,[34] little funding for intercountry research, few interactions between policy makers, and, as evidenced through our consultations, insufficient political will. 20 years after devolution, now is an opportune moment to make an assessment of health and care across the constituent countries. In this section, and within appendix 1 (pp 1–25), we summarise key differences between the countries but argue that common features make collective and comparative learning important. Stakeholders' views that were expressed as part of our consultations reflected a want to learn from international experiences but less so, in some cases, from other constituent countries of the UK. Not learning from other constituent countries is a missed opportunity.

From the initiation of this Commission, it was clear that, despite some differences in population (table 3; appendix 1 pp 1–25) and the structure and provision of services (table 4), many challenges across the constituent countries are common. Workforce planning, integration of health and care, advancing effective information technology and health information systems to benefit patient care, and strategic learning and planning were expressed as common priorities in all countries.

All systems are predominantly publicly financed through general taxation. Although differences exist with respect to where public health and social care sit within the system, the structures and organisation of health services are broadly similar (table 4). Primary care provides the first point of contact for patients. General practitioners coordinate care and are required for referral to specialists who, despite some changes in models of working, still work primarily in hospital.[48] A major difference has been the adoption of competition and the purchaser–provider split in England, whereby local commissioning bodies are responsible for purchasing health services[49] and the rejection of this model by Scotland and Wales with development of systems that are based on collaboration. Northern Ireland has maintained the purchaser–provider split in principle but not in practice. Northern Ireland has the only system in which health and care are fully organisationally integrated. However, all constituent countries are converging towards greater integration of health and care services than exists, perhaps most notably Scotland, where legislation was passed in 2014 to support this aim.[50]

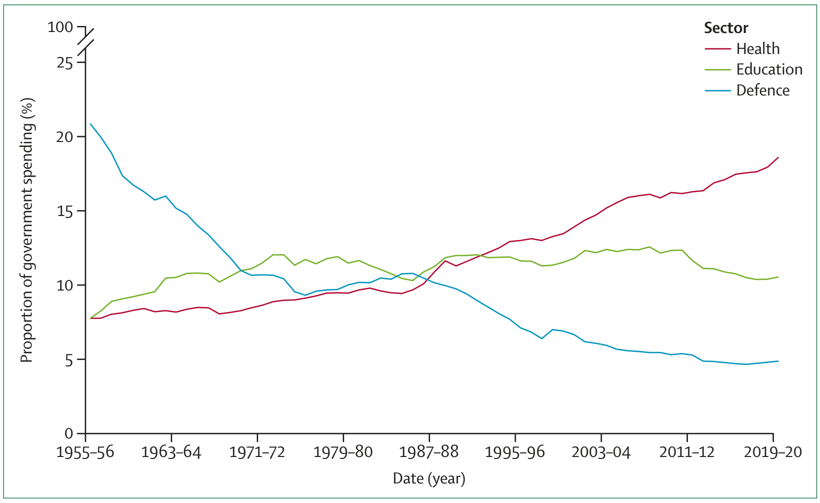

Figure 1: **UK health, education, and defence spending as shares of total spending**
Our calculations are based on data from The Health Foundation, the Institute for Fiscal Studies,[26] and Her Majesty's Treasury.[27] Date refers to one financial year at each time point.

The constitutional arrangements for devolution usually preclude mechanisms across the UK for agreeing common elements of public policy,[51] which has enabled differences in charges that are faced by patients. For example, prescription charges exist only in England. Entitlement to social care varies, with Scotland providing free access to personal and nursing care for people older than 65 years, unlike the other countries. Devolution to the constituent countries of the UK has been followed by increased devolution within England. For example, the Greater Manchester combined authority has agreed with NHS England to merge health and social care to enable integrated joint commissioning.[52]

In the early stages of the COVID-19 pandemic, the UK's response was almost identical across the constituent countries. All constituent countries received scientific advice from the Scientific Advisory Group for Emergencies (SAGE) and coordinated through the Civil Contingencies Committee, both of which have a remit across the UK. The experience in setting up field hospitals, first in London, UK, was also shared across the UK, and assisted by the British Armed Forces. All constituent countries implemented an enforced lockdown on March 23, 2020, supported by legislation, the Coronavirus Act 2020,[53] and promoted the message to stay at home. The UK also jointly procured PPE, diagnostics, and medical equipment, such as ventilators, throughout the pandemic. The response of the constituent countries began to substantially diverge when, on May 10, 2020, the UK prime minister announced a new slogan, "stay alert", and a phased lifting of lockdown measures from May 13, 2020, guided by a newly established Joint Biosecurity Centre.[54] Amid complaints about an absence of consultation, Scotland, Wales, and Northern Ireland chose not to endorse this message or the proposed timeline for lifting lockdown.[55] Following the lifting of lockdown measures

	Rank (best outcome to worst outcome)																		Mean	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	EU15	G7
Life expectancy and infant mortality (for latest available year)																				
Life expectancy of total population at birth, years	JPN: 84·2	ESP: 83·5	ITA: 83·4	FRA: 82·8	SWE: 82·6	IRL: 82·3	LUX: 82·4	CAN: 82·0	NLD: 81·9	AUT: 81·8	FIN: 81·8	BEL: 81·7	PRT: 81·4	GRC: 81·4	GBR: 81·3	DNK: 81·0	DEU: 81·0	USA: 78·7	82·1	81·9
Infant mortality per 1000 livebirths	JPN: 1·9	SWE: 2·0	FIN: 2·1	AUT: 2·7	ESP: 2·7	ITA: 2·8	IRL: 2·9	DEU: 3·2	PRT: 3·3	GRC: 3·5	NLD: 3·5	DNK: 3·7	BEL: 3·8	FRA: 3·8	GBR: 3·9	LUX: 4·3	CAN: 4·7	USA: 5·8	3·2	3·7
5-year net cancer survival, standardised by age (2010–14),* %																				
Colon cancer	BEL: 67·9%	JPN: 67·8%	CAN: 67·0%	USA: 64·9%	SWE: 64·9%	FIN: 64·9%	DEU: 64·8%	ITA: 64·2%	FRA: 63·7%	AUT: 63·7%	ESP: 63·2%	NLD: 63·1%	DNK: 61·6%	PRT: 60·9%	IRL: 60·5%	GBR: 60·0%	GRC: NA	LUX: NA	63·3%	64·6%
Breast cancer	USA: 90·2%	JPN: 89·4%	SWE: 88·8%	CAN: 88·6%	FIN: 88·5%	PRT: 87·6%	FRA: 86·7%	NLD: 86·6%	BEL: 86·4%	DNK: 86·1%	ITA: 86·0%	DEU: 86·0%	GBR: 85·6%	ESP: 85·2%	AUT: 84·8%	IRL: 82·0%	GRC: NA	LUX: NA	86·2%	87·4%
Lung cancer	JPN: 32·9%	USA: 21·2%	CAN: 20·6%	AUT: 19·7%	SWE: 19·5%	DEU: 18·3%	BEL: 17·3%	NLD: 17·3%	FRA: 17·3%	IRL: 17·0%	DNK: 16·6%	ITA: 15·9%	PRT: 15·7%	ESP: 13·5%	GBR: 13·3%	FIN: 13·0%	GRC: NA	LUX: NA	16·6%	19·9%
Prostate cancer	USA: 97·4%	BEL: 93·8%	CAN: 93·6%	FIN: 93·2%	FRA: 93·1%	JPN: 93%	DEU: 91·6%	IRL: 91·1%	PRT: 90·9%	SWE: 90·7%	AUT: 90·2%	ESP: 89·7%	ITA: 89·5%	GBR: 88·7%	NLD: 88·5%	DNK: 85·6%	GRC: NA	LUX: NA	90·5%	92·4%
30-day mortality rate per 100 patients aged ≥45 years after admission to hospital, standardised by age and sex†																				
Acute myocardial infarction	NLD: 4·0	CAN: 6·9	DNK: 7·0	FRA: 7·2	ESP: 7·2	PRT: 7·3	SWE: 7·5	ITA: 7·6	GBR: 8·6	FIN: 8·8	USA: 9·3	LUX: 10·8	AUT: NA	BEL: NA	DEU: NA	GRC: NA	IRL: NA	JPN: NA	7·6	7·9
Ischaemic stroke	NLD: 5·7	FIN: 9·3	ITA: 9·3	DNK: 9·4	CAN: 9·8	PRT: 10·0	SWE: 10·2	LUX: 10·3	ESP: 10·3	GBR: 11·6	AUT: NA	BEL: NA	DEU: NA	FRA: NA	GRC: NA	IRL: NA	JPN: NA	USA: NA	9·6	10·2

Data are sourced from the Organisation for Economic Co-operation and Development.[30] AUT=Austria. BEL=Belgium. CAN=Canada. DEU=Germany. DNK=Denmark. ESP=Spain. FIN=Finland. FRA=France. GBR=UK. GRC=Greece. IRL=Ireland. ITA=Italy. JPN=Japan. LUX=Luxembourg. NA=not available. NLD=the Netherlands. PRT=Portugal. SWE=Sweden. *The Organisation for Economic Co-operation and Development source cancer data from the CONCORD programme, which has collated cancer survival registry data from over 70 countries. Data for the UK reflect data from all four UK constituent countries. †Based on linked data from 2019 or latest available data from the Organisation for Economic Co-operation and Development **[A: OK to remove this part given the statement at the beginning of the legend?]**.[30] Please refer to the Organisation for Economic Co-operation and Development Health Care Quality Outcomes online sources and methods database for further information.[31]

Table 1: Comparison of health outcomes across G7 and EU15 countries

and subsequent repeat surge of infections in autumn of 2020, the response of the constituent countries diverged further.[56] The absence of a coherent and coordinated response across the UK has caused substantial confusion and disruption for many people.

The NHS across the UK: common strengths

This Commission, drawing on stakeholder consultations (appendix 2 pp 9–11), identified several common strengths of the NHS across the UK. These strengths include financial protection; redistribution; systematic allocation of resources to local health authorities; methodological appraisal of health technologies; some chronic disease outcomes; an internationally renowned reputation for health research and innovation; and finally, some aspects of its response to the COVID-19 pandemic.

Financial protection

Across the UK, the NHS provides care to all, covering the spectrum of prevention, treatment, rehabilitation, and palliation. Services are generally free at the point of delivery and are provided irrespective of ability to pay. This coverage protects people from the risk of financial hardship resulting from medical expenses,[57] with the UK reporting some of the lowest rates of catastrophic health spending in the world.[58] Although these crucial benefits are generally enjoyed across the UK, exceptions provide stark reminders of the potential for adverse consequences. For example, there are charges for NHS dentistry for adults who are not eligible for exemptions (ie, individuals aged <18 years, aged <19 years and in full-time education, or receiving low-income benefits), leading to substantial differences in access by socioeconomic groups.[59] For social care, public funding is restricted according to equity-based eligibility criteria (although to a lesser extent in Scotland than in other constituent countries) so the potential for large financial costs for individuals is substantial. The Dilnot Commission on social care in England found that one in ten people at age 65 years face catastrophic care costs of over £100 000 in their remaining lifetime.[60]

Redistribution

The supporting system of taxation for the NHS is generally progressive, imposing a higher tax rate for high-income earners compared with low-income earners. Broadly, the rich subsidise the poor and the employed subsidise the unemployed; and due to the positive association between health and income, people who are more healthy subsidise people who are less wealthy,[61] further reducing inequality. The redistributive effect also depends on the use of health care. Evidence from the NHS in England[62] estimated that lifetime hospital costs are substantially higher in more deprived populations than in less deprived populations, thereby increasing the redistributive effect. Other analysis showed that the distribution of NHS resources is generally poverty reducing, with some notable exceptions, including preventive care, diagnostic services, and a few specific treatments.[63]

Resource allocation

The NHS has developed several approaches for the systematic allocation of resources to commissioning bodies and health and care providers. In all four countries, the dominant form of payment to local health authorities (ie, clinical commissioning groups [CCGs] in England, Health Boards in Scotland and Wales, and the Health and Social Care Board in Northern Ireland) is in the form of a fixed annual budget, determined by resource allocation formulas, which is intended to reflect the comparative health needs of the locality's population. Specialised services are typically funded either directly from government or through collective arrangements between commissioners.[64] The benefits that are gained through systematic resource allocation in all four countries are generally good financial control, coupled with a consideration of cost-effectiveness and equity of access. However, geographical differences do exist in the provision of services within and between countries. For example, availability of in-vitro fertilisation[65] and some elective surgeries[66] varies between areas, reflecting local choices due to financial constraints. This variability leads to a so-called postcode lottery, over which local people have no control in the absence of mechanisms of public accountability. The actual formulas for allocation to local health authorities undergo continual refinement and allocations draw on routinely collected data to ensure that allocations are responsive to changing health needs.[67] Payments to providers, especially those that are case-based, are not well aligned with the intended integration of services and needs of patients with multiple conditions. Payments for mental health services are particularly problematic as it is especially difficult to capture the complexity of presentations to mental health services within national tariffs.[68]

Assessment of new technologies

The methodological appraisal of new technologies is a strength of the NHS. The UK bodies that are responsible for this function, including the National Institute for Health and Care Excellence (NICE), All Wales Medicines Strategy Group (AWMSG), and Scottish Medicines Consortium (SMC), have contributed robust and internationally regarded clinical guidance that integrates clinical and cost-effectiveness data. However, fundamental questions about how to assess the value of step-change technologies, which can be defined as novel treatments that offer "ground-breaking new opportunities for the treatment of disease and injury",[69] are increasingly important or are highly specialised and target small groups of patients with rare conditions. Advances and expansion of technologies, such as artificial intelligence, genomics, robotics, and digital apps, will also require

	Rank (best outcome to worst outcome)																		Mean	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	EU15	G7
Funding																				
Proportion of GDP spent on health care, %	USA: 17·0%	DEU: 11·7%	FRA: 11·2%	JPN: 11·1%	SWE: 10·9%	CAN: 10·8%	AUT: 10·4%	BEL: 10·3%	GBR: 10·3%	DNK: 10·0%	NLD: 10·0%	PRT: 9·6%	FIN: 9·1%	ESP: 9·0%	ITA: 8·7%	GRC: 7·8%	IRL: 6·8%	LUX: 5·4%	9·4%	11·4%
Health expenditure per capita, US$ (by use of purchasing power parity)*	USA: 9386	DEU: 5648	SWE: 4928	NLD: 4767	LUX: 4697	DNK: 4663	FRA: 4501	AUT: 4402	BEL: 4125	JPN: 4064	IRL: 3919	CAN: 3815	GBR: 3620	FIN: 3536	ITA: 2706	ESP: 2560	PRT: 2069	GRC: 1412	3837	4820
Proportion of GDP spent on welfare, %	FRA: 31·2%	BEL: 28·9%	FIN: 28·7%	DNK: 28·0%	ITA: 27·9%	AUT: 26·6%	SWE: 26·1%	DEU: 25·1%	ESP: 23·7%	GRC: 23·5%	PRT: 22·6%	LUX: 22·4%	JPN: 21·9%	GBR: 20·6%	USA: 18·7%	CAN: 17·3%	NLD: 16·7%	IRL: 14·4%	24·4%	23·3%
Workforce																				
Practising nurses per 1000 people	FIN: 14·3	DEU: 13·2	JPN: 11·8	LUX: 11·7	BEL: 11·2	NLD: 11·1	SWE: 10·9	CAN: 10·0	DNK: 10·0	GBR: 7·8	AUT: 6·9	ESP: 5·9	ITA: 5·6	GRC: 3·4	USA: NA	PRT: NA	FRA: NA	IRL: NA	9·3	9·7
Practising physicians per 1000 people	AUT: 5·2	DEU: 4·3	SWE: 4·3	DNK: 4·2	ITA: 4·0	ESP: 4·0	NLD: 3·7	IRL: 3·3	FIN: 3·2	FRA: 3·2	BEL: 3·1	LUX: 3·0	GBR: 3·0	CAN: 2·7	USA: 2·6	JPN: 2·5	PRT: NA	GRC: NA	3·7	3·2
Capital																				
Hospital beds per 1000 people	JPN: 13·0	DEU: 8·0	AUT: 7·4	FRA: 5·9	BEL: 5·6	LUX: 4·3	GRC: 4·2	FIN: 3·6	PRT: 3·5	NLD: 3·2	ITA: 3·1	ESP: 3·0	IRL: 3·0	USA: 2·9	DNK: 2·6	CAN: 2·5	GBR: 2·5	SWE: 2·1	4·1	5·4
Total MRI units per 1 000 000 people	JPN: 55·2	USA: 40·4	DEU: 34·7	GRC: 29·4	FIN: 28·8	ITA: 28·7	AUT: 23·5	ESP: 17·2	IRL: 16·0	FRA: 15·4	DNK: 15·4	LUX: 14·5	NLD: 13·1	BEL: 11·6	CAN: 10·4	PRT: 9·3	GBR: 7·2	SWE: NA	18·9	27·4
Total CT scanners per 1 000 000 people	JPN: 111·5	USA: 44·9	DNK: 40·7	GRC: 40·6	DEU: 35·1	ITA: 35·1	AUT: 28·8	PRT: 27·6	BEL: 23·7	IRL: 21·4	ESP: 19·1	FRA: 18·2	FIN: 16·5	LUX: 16·1	CAN: 14·8	NLD: 14·2	GBR: 9·5	SWE: NA	24·8	38·5

Data from 2019 or latest available data from the Organisation for Economic Co-operation and Development.[30] AUT=Austria. BEL=Belgium. CAN=Canada. DEU=Germany. DNK=Denmark. ESP=Spain. FIN=Finland. FRA=France. GBR=UK. GDP=gross domestic product. GRC=Greece. IRL=Ireland. ITA=Italy. JPN=Japan. LUX=Luxembourg. NA=not available. NLD=the Netherlands. PRT=Portugal. SWE=Sweden. *Purchasing power parity is a measure of prices at different locations by use of a common basket of goods, thereby allowing comparisons of prices between countries in the same currency.

Table 2: **Comparison of inputs to health and care systems across G7 and EU15 countries**

	England	Scotland	Wales	Northern Ireland
Population and demographic characteristics,[35] 2019				
Population size, millions	55·98	5·44	3·14	1·88
Population density, people per km^2	432	70	152	137
Proportion of population aged ≥65 years, %	18·4	19·1	21·0	16·6
Proportion of population aged ≥85 years, %	2·5	2·3	2·7	2·0
Financing model and expenditure on health[27,36,37]				
Predominant model of financing	General taxation	General taxation	General taxation	General taxation
Spending on health per capita (financial year 2017–18), £	2168	2353	2310	2306
Spending on adult social care per capita (financial year 2017–18), £	303	428	396	461
Annual spend on private health insurance per household (financial years 2013–14 to 2015–16), £	104	36	62	47
Life expectancy and health outcomes[38–40]				
Women				
Life expectancy at birth (2016–18), years	83·2	81·1	82·3	82·4
Healthy life expectancy (2016–18), years	63·9	62·2	62·0	61·8
Local area gap in healthy life expectancy at birth (2016–18), years	17·9	17·3	12·5	9·5
Leading causes of death (2018)	Dementia; heart disease; stroke	Dementia; heart disease; stroke	Dementia; heart disease; pneumonia	Dementia; heart disease; stroke
Men				
Life expectancy at birth (2016–18), years	79·6	77·1	78·3	78·7
Healthy life expectancy (2016–18), years	63·4	61·9	61·4	61·7
Local area gap in healthy life expectancy at birth (2016–18), years	18·6	13·6	10·9	11·0
Leading causes of death (2018)	Heart disease; dementia; lung cancer	Heart disease; dementia; lung cancer	Heart disease; dementia; chronic respiratory disease	Heart disease; dementia; lung cancer
Age-standardised avoidable mortality per 100 000 people (2018)	226·8	309·9	267·0	254·3
Workforce[41–47]				
General practitioners per 1000 people (2018)	0·58	0·76	0·63	0·67
Hospital consultants per 1000 people (2018)	0·88	1·04	0·86	0·96
Nurses per 1000 people (2018)	6·60	9·07	8·36	9·16
Responsibility for health-workforce planning	Health Education England and Department of Health and Care	National Health Service Education for Scotland	Health Education and Improvement Wales	Northern Ireland Department of Health
Patient charges and entitlements				
Free personal care for people aged >65 years	No	Yes (extended to people aged <65 years from April, 2019)	No	No
Free prescriptions	No (exemptions for individuals aged <16 years, aged 16–18 years and in full-time education, aged ≥60 years, and with comorbidities)	Yes	Yes	Yes
Education				
University fees	Yes	No (for Scottish students; fees apply to others)	Yes	Yes
Nursing bursaries (different levels of financial support exist between each constituent country)	Yes	Yes	Yes	Yes

Table 3: **Comparison of selected health and health and care indicators in constituent countries of the UK**

	England	Scotland	Wales	Northern Ireland
Government department	Department of Health and Social Care	Health and Social Care Directorate	Department of Health and Social Services	Department of Health
Purchaser–provider split	Yes	No	No	Yes (theoretical; not often implemented)
Integration	Various initiatives	Local health boards and local authorities work to produce single integrated plans	Yes, through regional partnership boards and public service boards	Health and social care trusts and local authorities required to work jointly to plan and deliver health and adult social care
Main bodies involved in commissioning and planning services	NHS England (ie, primary care, specialist services, and some public health services); clinical commissioning groups (ie, services for local communities); local authorities (ie, social care, public health, sexual health, and addiction services); Public Health England	Seven special NHS boards*; Public Health Scotland; integrated joint boards comprised of 14 regional health boards and local authorities (ie, social care)	Three NHS Trusts†; Welsh Health Specialised Services Committee (specialised and tertiary services on behalf of seven local health boards); seven regional partnership boards comprised of seven local health boards and local authorities (ie, social care)	Health and Social Care Board; Public Health Agency; five local commissioning groups
Responsibility for social care	Local authorities	Local authorities	Local authorities	Local authorities
Responsibility for public health	Local authorities and Public Health England	Public Health Scotland	Public Health Wales	Health and Social Care Public Health Agency
Main organisations with scrutinising or regulatory roles	Care Quality Commission (ie, all health and care services: public and private); NHS Improvement and NHS England	Healthcare Improvement Scotland (ie, health-care services: public and private); Care Inspectorate (ie, care services: public and private)	Healthcare Inspectorate Wales (ie, all health-care services: public and private); Care Inspectorate Wales (ie, all social care and child care)	Regulation and Quality Improvement Agency (ie, all health and care services: public and private)
Body responsible for health technology assessment	NICE	Scottish Medicines Consortium	NICE and the All Wales Medicines Strategy Group	No health technology assessment body but has arrangements for endorsement and implementation of NICE guidance as applicable

Other key regulators include the General Dental Council, General Medical Council, health and safety executives, Healthcare Products Regulatory Agency, Human Fertilisation and Embryology Authority, Human Tissue Authority, Information Commissioner's Office, national environment agencies, NHS Health Research Agency, Nursing and Midwifery Council, and Professional Standards Authority. Examples of other advising or supporting bodies include national audit offices, national health education bodies, national public health bodies, NHS Digital, NHSX, ombudsman, royal colleges and academies, and professional associations. Further information on regulators, advisory bodies, and their accountability mechanisms can be found in appendix 1 (pp 21–25). NHS=National Health Service. NICE=National Institute for Health and Care Excellence. *NHS Education for Scotland, NHS24, Scottish Ambulance Service, The State Hospitals Board for Scotland, NHS National Services Scotland, Healthcare Improvement Scotland, and NHS National Waiting Times Centre. †Ambulance services, cancer care and support services, and Public Health Wales.

Table 4: **Comparative structure of the NHS in 2020 across UK countries**

robust evaluation.[70] Challenges exist in translating the principles of health technology assessment (HTA), based on the cost per quality-adjusted life-year (QALY) approach, into broader decisions about how to allocate resources at the national level. For example, there appears to be bias towards treatment over prevention, despite analyses showing that additional spend beyond the current amount on public health is [A: or would be?] three to four times more effective than is NHS spending on health services, in terms of additional QALYs gained.[71] This bias has contributed to the decrease in public health capacity over the past decade, which we will discuss further, leaving the UK vulnerable to health crises, such as the COVID-19 pandemic.

Chronic disease outcomes

Comparative international data show that the UK has good health outcomes for some chronic diseases when compared with other similar high-income countries. A multisource analysis identified that the UK had the second lowest death rate and third lowest prevalence for chronic kidney disease in 2017, standardised by age, when compared with all EU15 and G7 countries.[72] The UK also provides high access to transplantation, with one of the highest kidney transplantation rates per 1000 dialysis patients worldwide.[73] According to the latest available data from the Organisation for Economic Co-operation and Development (OECD), the UK has the fifth lowest hospital admission rate for diabetes and the second lowest rate for foot and leg amputations for diabetes, standardised by age and sex, when compared with all EU15 and G7 countries.[30] However, OECD data also show that the UK has poorer outcomes for other chronic diseases, such as asthma, with the UK reporting the highest hospital admission rate for patients with asthma standardised by age and sex, when compared with EU15 and G7 countries.[30] Again, according to OECD data, the UK reports the highest hospital admission rate for asthma, standardised by age and sex, when compared with all EU15 and G7 countries.[30]

Research and innovation

The NHS continues to make the UK an attractive destination for clinical trials. The UK leads Europe in terms of early clinical research, with the highest number of phase 1 and phase 2 clinical trials and the third highest number of phase 3 clinical trials in Europe in 2017.[74] The ability to coordinate and rapidly initiate clinical trials on a large scale has been shown during the COVID-19 pandemic, as the NHS has been at the forefront of international research efforts to identify effective treatments. The RECOVERY trial is a multiple arm trial involving over 11 000 patients that aims to identify treatments that benefit people who are admitted to hospital with suspected or confirmed COVID-19.[75,76] Preliminary results have been released throughout the pandemic, informing treatment regimens internationally.[75,76] The UK has also been at the forefront of international research efforts to understand the drivers of the pandemic and the determinants of COVID-19 outcomes.[77] For example, NHS data were made rapidly accessible to researchers enable improvements to transmission models, and a symptom tracking app engaged members of the public in the largest citizen science project ever done.[78]

Response to COVID-19

The NHS, from a point of little excess capacity following years of austerity, has had to respond to the COVID-19 pandemic with speed and innovation. The workforce should be praised for their willingness to adapt and provide health care in unprecedented circumstances. Many staff were redeployed to unfamiliar service areas and were required to quickly learn and apply new skills. Thousands of health-care staff came out of retirement to bolster services, despite putting themselves at considerable risk,[79] and hundreds of thousands of people registered as volunteers to aid in the UK's response.[80] New ways of working have emerged. For example, community pharmacists have worked closely with general practitioners and district nurses to enable rapid access to emergency supplies of end-of-life medications for patients who are susceptible to deteriorating quickly;[81] primary care practices have actively sought out susceptible patients to develop personalised care plans;[82] and there has been close collaboration between primary and secondary care, as many general practitioners have sought specialist advice remotely to avoid hospital admissions and prevent unnecessary face-to-face specialist appointments.[82] The NHS showed its ability to embark on reorganisation of health-care services on a large scale in response to changing health needs. The NHS rapidly increased critical care capacity and set up several temporary hospitals over a matter of weeks. Although the Nightingale hospitals and their equivalents outside England have been underused to date, there are many other examples of reorganisation that should leave a lasting legacy: both primary and secondary care accelerated the digitisation of health-care services, providing consultations via telephone and video; emerging primary care networks were solidified as general practitioner practices worked together to triage patients to different sites on the basis of whether they had symptoms that were suggestive of COVID-19;[82] and NHS and independent sector providers collaborated to facilitate the continuation of some cancer services.[83]

The NHS across the UK: benefits not fully realised

Subsequent sections of this Commission and accompanying Health Policy papers provide detailed discussion of the opportunities and challenges in key areas of health and care systems in each constituent country (appendix 1, pp 1–32).[9,14–16] On the basis of this analysis and the stakeholder consultation, we argue that there are six broad areas where potential benefits of the NHS are not being fully realised and where there is potential for intercountry learning. These six areas include improved integration: of service provision, particularly across the health and care system; of public health capacity; of workforce planning in the long term; in evaluation of health technologies and service delivery; of health and care information technology systems, sharing learning to maximise improvements in quality of care; and in working with patients to achieve shared decision making and manage expectations.

These areas are not an exhaustive list of yet unrealised benefits, but rather priority areas where the NHS can work differently. The priorities indicate the range of areas that offer the opportunity to improve integration for patient benefit, consistent with a health-systems definition of integrated care - an approach to strengthening health systems that are centred on people, and designed according to the multidimensional needs of the population and the individual, delivered by a coordinated, multidisciplinary team of providers working across settings and levels of care, and effectively managed to ensure optimal outcomes and the appropriate use of resources on the basis of the best available evidence.[84]

Integration of the health and care systems

We found consensus on the need for improved integration of health and social care across all countries, with individual countries taking different steps to achieve integration (table 4). An expanded discussion of the challenges to integrated care can be found in appendix 1 (pp 4–9). Poor coordination of care and sharing of information lead to inefficient and ineffective use of resources and poor patient experience. Additionally, frequent controversy occurs over what constitutes NHS care and what constitutes social care, which, due to current means testing for social care, has substantial financial implications for individuals and their families, particularly in England. There is little evidence that frequent attempts at reorganisation on a large scale, such as the Health and Social Care Act 2012, have improved integration across health and care[85] or facilitated the shift of patient care to community settings.[86] By contrast, it has been argued by policy commentators that the Health and Social Care Act 2012 has led to greater fragmentation of services and challenges when commissioning services.[87] Other interfaces that continue to limit meaningful integration of care and require attention include the transition between paediatric and adult health services, which often leaves many young people without adequate continuity of care and support;[88] poor collaboration between mental and physical health services, despite their inter-related nature;[89] and the heavy reliance on the charitable sector for the provision of care, including dementia support, mental health services, and community palliative care. In the case of charitable services for the provision of palliative care, this reliance leads to patchy, fragmented, and poor quality care towards the end of life for many individuals.[90]

Although health and care services can be structurally aligned, Northern Ireland shows how other barriers, such as an overemphasis on the hospital sector, little interoperability between information systems, a scarcity of leadership at all levels of the system, and weak political will can reduce successful integration (appendix 1 pp 5–6). Scotland has taken legislative steps to create Integrated Joint Boards, which coordinate the efforts of health boards and local authorities to jointly plan and deliver health and care services.[50] These boards have been effective in bringing different parties together, but there is a perception that this arrangement is not yet functioning optimally and has merely added a further layer to the system (appendix 1 pp 6–7). The Welsh NHS has concentrated the delivery of all primary and secondary care, mental health, and public health services on a geographical basis, in seven local health boards.[91] This concentration has facilitated more collaboration between hospital and community health services, but despite the creation of regional planning boards, different borders between the health boards and local authorities has hindered the integration of NHS and social care services. [92]

The COVID-19 pandemic has shown how, despite progress towards improved integration, there is still a substantial disconnect in policy between the NHS and social care. In anticipation of a sudden surge of COVID-19 cases, most NHS hospitals across the UK introduced rapid discharge pathways to free up capacity. Before April 15, 2020, in England, these pathways did not have a standardised policy or requirement to test patients who were being discharged to care homes.[93] This absence of requirement most likely led to many people being discharged to care homes with undiagnosed COVID-19. Care-home staff have also reported that, during the pandemic, do not attempt cardiopulmonary resuscitation decisions were sometimes taken without adequate discussion with residents, families, or care-home staff.[94] Despite £1·6 billion of emergency funding that was allocated to local authorities in England,[95] social care providers felt that they did not have access to the resources that were necessary to respond to this wave of admissions. At the peak of the pandemic, 43% (45 of 105) of respondents to a survey of care-home providers were not confident in their supply of PPE and 58% (61 of 105) of respondents felt that they were unable to effectively isolate residents with symptoms that were suggestive of COVID-19, primarily because of inadequate staffing numbers.[96]

Integration of public health capacity

In 2013, some parts of the public health function in England were relocated from the NHS to local authorities, as part of widespread structural reforms that were triggered by the 2012 Health and Social Care Act.[49] Public health departments within local authorities became responsible for commissioning some sexual health services; smoking, alcohol, and drug addiction services; and the early years Healthy Child Programme. Other public health functions were brought together within Public Health England or stayed within the NHS, for example, the commissioning of vaccination programmes in primary care. In Scotland, Wales, and Northern Ireland, public health has continued to be structurally part of the NHS. The reforms in England were highly controversial. Some people supported the policy, framing it as public health “returning home”[97] and arguing that public health is better positioned within local authorities than within NHS organisations, as it could build bridges between multiple stakeholders, including hospitals, general practitioners, schools, and social services, to coordinate multisectoral strategies for public health.[97] However, other people felt that the restructuring fragmented public health services and served to create only new structural barriers to achieving meaningful integration of public health within health services.[98] The UK Government has announced that it is embarking on another structural reorganisation of public health services, with Public Health England now replaced with the UK Health Security Agency, which is responsible for pandemic preparedness and capability to deal with infectious disease outbreaks, and the Office for Health Promotion, which will be responsible for responding to other public health issues, such as growing rates of non-communicable disease.[99] The consequences of these actions are not yet clear, but commentators have emphasised how dismantling England’s public health agency during the pandemic has risked substantial disruption.[99]

The COVID-19 pandemic has exposed weaknesses in the public health system. Although the reforms facilitated closer working with schools under local authority control and with some elements of social services, they reduced opportunities for public health professionals and NHS organisations to work together.[98] Ineffective engagement between central government and local authorities contributed to local authorities not having access to local test data from centrally organised home test kits and mobile testing sites until June, 2020.[100] Moving responsibility for pandemic preparedness and communicable disease control to Public Health England reduced capacity and capability at the local level.[101] More fundamentally, public health capacity has weakened over the past decade and its funding has declined. In local authorities, the public health grant has decreased by £0·7 billion in real terms, an approximately 20% reduction, between the 2014–15 and 2019–20 financial years.[102]

Experiences with testing and contact tracing during the pandemic are further evidence of an absence of integration of public health capacity at the national and local level and within the NHS. The NHS, which is responsible for providing microbiology services nationally, was poorly prepared to provide the testing capacity that was required: pathology networks struggled to secure reagents for their machines;[103] not all laboratories had access to the National Pathology Exchange (ie, the information technology system that allows laboratories to collaborate and share materials);[104] and fragmented procurement by individual hospital trusts undermined the NHS's ability to act effectively. The NHS rapidly addressed these issues but not soon enough to meet the need for testing. This early absence of capacity contributed to the aforementioned discharging of thousands of untested patients to care homes.[93] The UK Government responded by centralising its approach, encouraging stand-alone testing facilities and engaging with commercial partners to organise home test kits and operate mobile testing centres. This strategy increased capacity to over 200 000 tests per day by the end of May, 2020.[105] The NHS Test and Trace system in England was launched on the May 28, 2020, with similar programmes launched in Scotland on May 28, 2020, Wales on June 1, 2020, and Northern Ireland on May 18, 2020.[106] However, despite substantial investment, the system has contacted 50–60% of known contacts as of Sept 9, 2020, which is substantially less than the 80% that is needed for tracing to be effective.[106] Several aspects of the system have been outsourced to private providers, involving contracts worth several billions of pound sterling, sometimes without competitive tendering.[107] Moreover, directors of public health have felt that this centralised approach to testing and tracing has not adequately engaged with local public health teams.[108]

The UK's approach to the procurement, storage, and dissemination of PPE, for which the NHS Supply Chain is responsible, has also been criticised by the media and trade unions. Large quantities of PPE were supplied to NHS and social care organisations with reassurances that they were safe to use and later recalled as faulty or thrown away as they were out of date.[109] The UK rejected offers to participate in European wide efforts to procure PPE.[110] Instead choosing to independently procure PPE from countries such as China and Turkey, including one high-profile instance whereby the UK purchased 400 000 gowns that did not conform to UK standards.[111]

The transparency and influence of scientific advice in the UK has been questioned. In 2016, the UK undertook a pandemic exercise on a large scale, called Exercise Cygnus, which showed how the UK would be under-resourced in terms of hospital beds, critical care capacity, and PPE in the event of an influenza pandemic.[112] The report was finally published in October, 2020,[113] after substantial public pressure. In the initial phases of the pandemic, the minutes or membership of SAGE meetings were controversially not published.[114] Therefore, it has been difficult to ascertain to what degree discussions during these meetings influenced the timing of the UK Government's decision to implement a national lockdown. This influence is crucial to establish, as international analysis suggests that earlier implementation of stringent measures would have saved lives.[115]

Integration of workforce planning in the long term

The health and care sector accounts for 13% of the UK workforce.[116] This sector includes approximately 1·8 million people working in the NHS and around 2 million people working in social care.[15] Additionally, it is estimated that approximately 9·1 million people in the UK are unpaid (ie, so-called informal) carers, notably family members.[117] During the pandemic, the number of unpaid carers has increased to more than 13·6 million people. Staff costs account for around 60% of NHS provider spending and around 6% of the pay bill is spent on temporary staff.[118] The contribution of health and care staff during the pandemic has been immense but has come at great cost, with several hundred staff deaths, approximately one in 10 of all COVID-19 infections being in patient-facing health and care workers,[119] and many staff having substantial psychological stress.[120] This trauma might lead to a growing burden of mental health issues, and the NHS and social care employers have a duty of care towards their staff to ensure that people who need additional support are identified. Without addressing the welfare of health and care staff, the UK risks exacerbating the already high turnover and vacancy rates.[15]

The UK has struggled to develop a comprehensive workforce strategy, incorporating sound workforce planning,[15] as evidenced by an inability to shape the workforce to meet changing health needs and persistent staffing shortfalls. Despite increasing demand, the number of nurses per 1000 people has hardly grown across each constituent country over the past decade.[15] There is also a differential growth rate across specialities—for example, the number of mental health nurses decreased by 8% in England between 2010 and 2020.[44] Despite a drive to move care into the community, the number of general practitioners (ie, full-time equivalent) per 1000 people has not changed much over the past decade;[41] meanwhile, the number of hospital consultants (ie, full-time equivalent) per 1000 people has increased by around 40%.[15] High vacancy rates persist across the four countries. In England alone, excluding general practice, there are almost 90 000 NHS vacancies, including 36 000 nursing vacancies.[121] In social care there are more than 110 000 vacancies, including 70 000 vacancies for care workers.[122] Deprived areas typically have the lowest numbers of health professionals, especially general practitioners.[123,124] Despite public health and prevention being central to the vision of the NHS,[125] the public health workforce in England particularly was identified as having a scarcity of senior leadership, with high vacancy rates.[126] The clinical academic workforce, which is key for current and future knowledge generation, has decreased by 2·5% between 2010 and 2018.[127]

Responsibility for workforce planning is devolved to the four countries, although regulatory and professional standards across the UK enable health professionals to move from one constituent country to another and thus countries share a common labour pool. Workforce planning in the UK has historically been driven by factors on the supply side, such as recruitment and retention. However, workforce planning should also incorporate factors on the demand side, such as demography, morbidity, use of health and care services, and GDP growth.[128] There has been an over-reliance on setting future workforce numbers by profession and less attention has been paid to requirements, such as skill mix or creating new, flexible roles. As discussed in our Health Policy paper on the health and care workforce,[15] of the constituent countries of the UK, Scotland has made the most progress in its approach to workforce planning, by drawing on factors from both the supply and demand sides and moving away from a focus on individual professions to consider the collective health and care workforce. However, improving workforce planning is only one component of a comprehensive health and care workforce strategy, which should also prioritise the health, morale, and wellbeing of its workforce to maximise the recruitment and retention of staff.

Working well together in evaluation of health and care technologies and service delivery

Although this Commission identified the evaluation of technologies as a strength of the NHS, current arrangements could still be improved. Within a devolved UK, there is potential for improved coordination, with notable duplication in efforts between NICE, SMC, and AWMSG. HTA has predominantly focused on new pharmaceuticals and not pre-existing interventions within health and care—particularly social care—that might add value to people's lives. This focus is changing, with NICE now producing clinical, social care, and public health guidelines that make evidence-based recommendations on existing and new interventions and services, including recommendations for disinvestment.[129] However, more can be done: for example, routinely integrating HTAs into clinical guidance that is produced by medical royal colleges and professional organisations and into medical school curricula. A need exists to introduce robust mechanisms to listen and respond to patient concerns about safety of medicines and medical devices.[130] In terms of translating clinical guidance into sustainable change at the local level, atlases of variation produced in England,[131] Scotland,[132] and Wales,[133] continue to identify notable unwarranted variation in the delivery of health services. Despite the availability of well-established frameworks for managing scarcity and setting priorities,[134] there are inadequate mechanisms for public involvement, transparency, and accountability in decisions about resource allocation at the local level.

Effective HIT systems to maximise learning and improve quality of care

HIT systems have an integral and growing role in the NHS. The consultation process and our Health Policy paper on HIT[16] noted frustration with existing systems, emphasising the absence of a basic information technology infrastructure within front-line care that facilitates rather than hinders care; little access to information from other parts of the health and care sector; difficulties in use of the large quantities of data within the health and care system to plan strategically and improve public health and patient care; and the scarcity of skills in the workforce that are necessary to maximise the use of routinely collected data for policy and planning. Action to address all four of these issues is essential. Furthermore, the role of patients and the public in relation to their data should fundamentally change to give people increased control over their own medical records, while maintaining the highest standards of confidentiality, and be combined with efforts to improve digital inclusivity. This Commission considers a range of possible actions relating to the capabilities and capacities that are required to improve and maximise benefits for patients and staff. Rather than seeing these actions in isolation, this Commission considers the wider context and the need for such capabilities and capacities to be embedded within a so-called learning health and care system, which is defined as the use of data-enabled infrastructures to support policy and planning, public health, and personalisation of care.[16]

The challenges previously listed have been exemplified in the UK's struggle to leverage HIT against COVID-19. The development of shielding patient lists generated substantial controversy and confusion. Initial lists had to be verified by health-care professionals as coding was inaccurate or out of date.[135] Linking and analysing data across health and care settings has also continued to be challenging, impeding efforts to trace contacts.[136] The challenges with information governance persist, which have rendered it difficult to create comprehensive national COVID-19 surveillance platforms.[137] NHSX attempted to develop an in-house mobile app for contact-tracing purposes, but development was abandoned in favour of a decentralised approach that was developed by Google and Apple after the NHSX pilot app was found to have several flaws, such as absence of reliability to detect iPhones, an absence of interoperability, and incorrect notifications.[138,139]

Notwithstanding these concerns, the COVID-19 pandemic has accelerated the digitisation of health and care services. As mentioned previously, primary care services moved to a model whereby patients are triaged by either a telephone or structured online form to either a telephone, video, or face-to-face consultation. Within a few weeks, over 80% of consultations were done remotely compared with fewer than 10% before the pandemic.[140] Similar developments occurred in secondary care, with many outpatient visits converted to remote teleconsultations. Additionally, there was a massive expansion in the use of the NHS 111 helpline; an app to track COVID-19 symptoms was developed to inform research and surveillance;[141] and the booking system for COVID-19 tests was set up online.[142] Careful evaluation is needed to ascertain whether the rapid expansion of remote consultations improved access to services, the implications for patient safety and staff morale, and the effect on population groups who were vulnerable to digital exclusion. Approximately 5 million people in the UK do not have access to the internet, and over 10 million people are estimated to either have no or little basic digital skills.[143]

Working differently with patients to achieve the aims of integration, shared decision making, and realistic expectations

The NHS maintains high amounts of public support, and international comparisons show that the NHS does well in terms of patient experience.[144] The nationwide clap for carers movement and response to stay at home, protect the NHS, save lives messaging during lockdown suggest that public support for the NHS might have been strengthened but evidence is needed.[145] There have been increased efforts across constituent countries of the UK to improve shared decision making and empower patients, such as Realistic Medicine in Scotland[146] and Choosing Wisely across the UK.[147] However, these initiatives have not always adequately considered how to engage marginalised and vulnerable groups, such as older people, people who are homeless, or migrants. In 2002, the Wanless review envisaged that high amounts of public engagement in relation to health would be fundamental to improve quality of care and health outcomes.[148] There is a strong base of support on which to build, achieving more meaningful engagement and empowerment by involving patients in treatment decisions and supporting self-care.[149] Public engagement is particularly important and timely in relation to self-management of chronic and comorbid conditions, emerging digital technologies, and efforts to improve integration. Such efforts should include greater honesty about the limitations of medical care, more patient involvement in decisions about treatment and care, closer partnerships with community groups and voluntary organisations, and a stronger commitment to tackle the wider determinants of health than currently exists. Giving people access to reliable, evidence-based information about treatment options and ensuring that it informs discussions between doctors and patients has been shown to produce more realistic expectations and greater congruence between patients' values and treatment choices.[150]

During the pandemic, patients have adapted to remote consultations and have been increasingly directed to online resources to help them self-manage and cope with chronic conditions. Importantly, coping during a period of crisis should not be confused with empowerment. As services develop, the NHS should look to advance research in this area[151,152] and consider targeted interventions, where appropriate, to avoid exacerbating already substantial health inequalities.

The future of the NHS across the UK: challenges faced

Having outlined common strengths and areas for strengthening within the NHS, it is important to consider the context in which health and care are being delivered and the challenges that it might pose in shaping the future of the NHS. We begin by considering the immediate challenges that are presented by COVID-19 and then consider broader issues that are related to health outcomes, inequalities, changing health needs, and the political and financial situation.

Addressing the growing unmet need for health services

A major and immediate challenge for the NHS will be to address the growing unmet need for health-care services that has been exacerbated by the COVID-19 pandemic. To free up capacity and protect patients against potential transmission of SARS-CoV-2, many elective procedures, diagnostic tests, and screening programmes were postponed or suspended.[153] At the height of the pandemic, cancer surgery was restricted to urgent and semi-elective cases (ie, life-saving surgery that does not need to be done immediately) and treatment pathways were adapted to minimise risks to patients.[83] Early data that were released from NHS England showed that a decade of progress in decreasing waiting times had been erased in a matter of weeks, as the number of patients waiting less than 18 weeks to start treatment from referral by a general practitioner reduced from 80% in March, 2020, to the lowest percentage since records began at 47% in July, 2020 (figure 2). To facilitate continuity of services, each constituent country has attempted to reorganise services to deliver care in a manner that minimises potential exposure to SARS-CoV-2, often drawing on additional capacity in independent sector hospitals. For example, consolidating cancer surgery into cancer hubs, which are less exposed to emergency COVID-19-related admissions than are other hospitals [A: correct comparator?], reduces the potential for hospital-acquired infection.[155]

Due to fear of infection or of overburdening health-care services, many people have been reluctant to seek medical advice during the COVID-19 pandemic. In England, attendances to accident and emergency departments decreased by 57% in April, 2020, compared with April, 2019;[156] similar decreases occurred in Scotland.[157] Substantial reductions have been reported in people attending hospital with signs and symptoms of heart attacks and strokes.[158,159] Primary care appointments decreased by 33% in April, 2020, compared with April, 2019.[160] Urgent referrals for cancer diagnoses from primary care also decreased by around 70% at the height of the pandemic.[161] The effect of these trends is yet to be fully established but they are likely to result in delayed diagnosis and an absence of support for many patients.[161]

Many marginalised and vulnerable groups, such as people working in the sex industry, people who were subjected to domestic abuse, people with problems with addiction, people who are homeless, people who are incarcerated, and unregistered migrants (which are circumstances that often coexist), who are less likely to have easy access to the internet to use remote services than are other people, have struggled to receive support during the pandemic.[162] The problem has been compounded by pre-existing shortfalls in statutory services which left them ill-prepared for an unexpected shock of this magnitude. Many people who are vulnerable or marginalised, particularly people whose immigration status prevents them from accessing public funds,[163] have been left to provide for themselves or relied on the support offered by charities, such as Shelter and Doctors of the World, which are themselves facing substantial financial constraints as a result of the global economic downturn.[53]

Population health and health inequalities

The NHS has adapted over time to changing demographic and health needs. Since the NHS was established, the burden of communicable diseases has lessened, care for chronic diseases has expanded, and genomic and personalised care are set to grow.[9] Despite these achievements, there are no grounds for complacency. Communicable diseases are a serious challenge, as shown by the COVID-19 pandemic and the emergence of antimicrobial resistant infections. The UK also compares unfavourably in terms of many measures of health internationally and there are widening inequalities in health.[144]

Life expectancy in the UK has worsened over the past two decades, with only the USA, Germany, and Denmark having lower life expectancy at birth for men and women among the EU15 and G7 countries (table 1). Mean healthy life expectancy in the UK (ie, 71·9 years) is also lower than the EU15 mean (ie, 72·4 years) and considerably lower than in countries such as Japan, where people can expect to have 3 more years in good health (ie, 74·8 years).[164] The UK also does less well than other high-income countries in terms of child outcomes.[165] Infant mortality continues to be higher than in Scandinavian countries and Japan (table 1). The UK also compares poorly to most comparator countries in terms of cancer survival (table 1). 5-year survival for colon cancer and lung cancer in the UK are the lowest among all G7 and EU15 countries, except for survival in Finland for lung cancer. For breast cancer, the difference between the UK and the best-performing country (ie, the USA) is not as great as for other cancers, but the UK is still fourth lowest of the countries shown. Survival for prostate cancer is the third lowest of the countries.

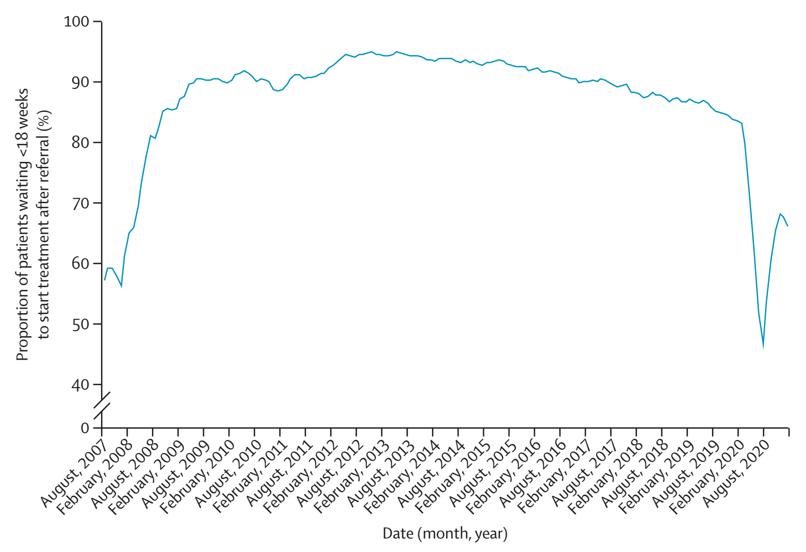

Figure 2: **Proportion of patients waiting less than 18 weeks to start treatment following referral by a general practitioner in England**
Data from National Health Service England waiting times for consultant-led referral to treatment.[154]

Inequalities are shown both within and between the constituent countries of the UK. Life expectancy in Scotland is markedly lower than in the other countries (table 3). England has the largest inequalities within the country in healthy life expectancy at birth, which varies by 17·9 years for women and 18·6 years for men between different local authorities, based on data between 2016 and 2018 (table 3). Oral health also varies substantially within the UK, with Northern Ireland, Scotland, and the north of England having much higher rates of edentulism and oral cancer than does the rest of the UK.[166] Differences are largely accounted for by levels of deprivation;[167] areas in all constituent countries of the UK that were deindustrialised in the late 20th century are characterised by particularly poor health outcomes.[9] There is evidence of widening gaps in female life expectancy between the least and most deprived areas.[168] Analysis of cancer incidence and survival across England has estimated that there would be around 19 000 fewer deaths per year if the most deprived groups had the

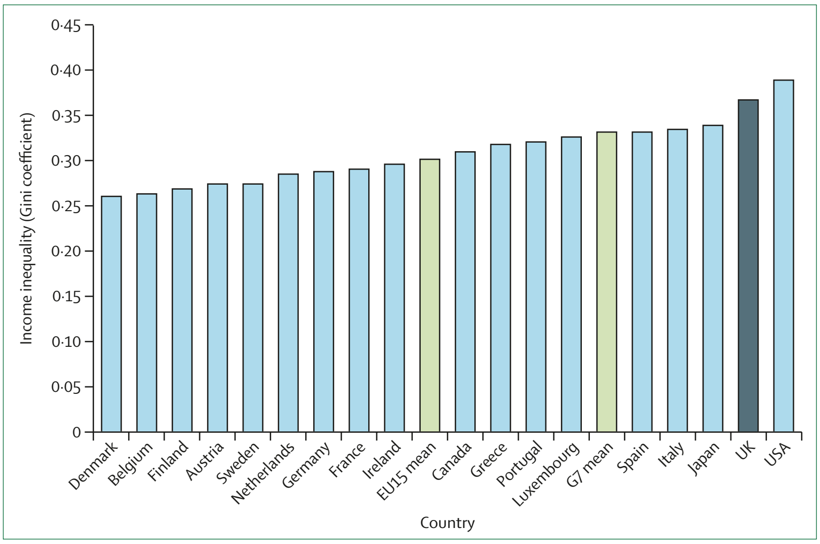

Figure 3: **Income inequality by Gini coefficient in comparator countries**

Gini coefficient shows income inequality, where 0·0 indicates complete equality and 1·0 indicates complete inequality, on the basis of 2018 data or latest available data from Organisation for Economic Co-operation and Development.[30]

same cancer incidence and survival as the least deprived groups.[169] People who are living in the most deprived areas of England are almost four times more likely to die prematurely from cardiovascular disease than people living in the least deprived areas.[170] People from Black, Pakistani, Bangladeshi, or Gypsy and Traveller ethnicities or Islamic religion have historically had worse health outcomes compared with people of White British ethnicity or Christian religion.[171] For example, disability-free life expectancy is much lower for Pakistani (men: 55·7 years; women: 55·1 years) and Bangladeshi (men: 54·3 years; women: 56·5 years) people than for White British (men: 61·7 years; women: 64·1 years) people.[172]

The underlying reasons for health inequalities involve a dynamic interplay between factors that are related to structure, history, politics, environment, services, and people.[173] The UK has a comparatively high level of income equality compared with other high-income countries (figure 3) and comparatively lower amounts of total social spending (table 2). Deprivation and vulnerability are consistently associated with high rates of preventable admissions to hospital, deaths that can be avoided in the presence of timely and effective care (ie, amenable mortality), poor mental health,[174] and lower uptake of screening and other preventive services.[63] Deprivation and poor health are also associated with ethnicity, with the racial hierarchies underpinning the UK's colonial past continuing to shape the lives and health of racialised groups.[175,176] Although the NHS might not be able to fully address many underlying societal factors contributing to poverty and income inequality, this Commission argues that the NHS should be accountable for improvements in health outcomes and reducing health inequalities, specifically through reducing inequalities in access to high-quality health services. To effectively address the wider determinants of mental and physical health, there should be a strong, broad public sector to complement the NHS.[177] Rather than having a detrimental effect on economic growth,[178] evidence suggests that high public spending can be beneficial for economic growth, income distribution, and external competitiveness.[179,180] Key drivers of inequalities, such as direct discrimination,[175] should be addressed as a priority within the NHS and social care organisations, where discrimination and structural racism interact and reinforce each other.[181]

Rather than being a so-called great leveller, the COVID-19 pandemic has brought under scrutiny the UK's stark socioeconomic and racial inequalities and the catastrophic consequences that these inequalities have for health. COVID-19 has had the greatest effect on people who are the most vulnerable in society, with death rates highest in the most socioeconomically deprived and ethnically diverse areas.[182] The repercussions of lockdown on work, education, income, and provision of basic needs have been greatest for people who were already living in poverty[183] and already at the highest risk of mental illness. It has become increasingly evident, as acknowledged by the chief executive of the NHS and the Public Health England's stakeholder engagement on the effects of COVID-19 on ethnic minorities, that these inequalities have been exacerbated by racism.[184,185] The numbers of doctors, nurses, and other health and care workers from Black, Asian, and minority ethnic groups who are dying from COVID-19 are disproportionate,[184] a pattern that is repeated in the wider population. Mortality rates related to COVID-19 for people of Black ethnicity were between two and three times those of people of White ethnicity,[186] and mortality rates for people declaring Islamic or Jewish religion were approximately double those of people who identified themselves as Christian.[187] Explanations for these inequalities range from differential exposure to SARS-CoV-2 associated with occupation and housing conditions, differential severity of COVID-19 associated with existing health conditions, and differential interactions with the health service.[188,189]

Changing health needs: multimorbidity and mental health

The NHS should adapt to changing patterns of mental and physical health, including a growing proportion of the population with more than one condition at the same time, which is termed multimorbidity.[190] Developed from a hospital structure that was designed to meet acute health needs and structured around pathways that are specific to disease and pathway, the NHS is not well suited to meeting the needs of people with multiple conditions. Patients with multiple conditions tend to report poorer experiences of health and care services,[191] fragmented, poorly coordinated care and the challenge of navigating a complex system with little guidance.[192] The resulting treatment burden can place additional pressures on people who are least able to cope.[193] The structural complexity of health and care services, particularly in England, contributes to this burden.

In England, the top 5% of users by cost of primary and secondary care services account for over half of total costs.[194] This population with high needs and costs is more likely to be older than 60 years and have a high rate of morbidity, with over half of this group having complex multimorbidity (ie, three or more conditions). Studies of populations in primary care in Scotland and England have shown the prevalence of multimorbidity to be between 23% and 27%, with the prevalence increasing with age.[195] The proportion of patients with multimorbidity exceeds 50% for patients aged 65 years or older and 80% for patients aged 85 years or older. The mean number of morbidities per person also increases with age.[195] However, notably, multimorbidity is not solely a feature of ageing and can be a substantial issue for some young patients.[196] In absolute numbers, more people who are younger than 65 years are living with multimorbidity than are people who are aged 65 years or older.[197] Multimorbidity is also associated with social deprivation, increasing from people who are least to most deprived.[195] The number of older people (ie, >65 years) with complex multimorbidity in England is projected to double between 2015 and 2035.[198]

A driving factor for multimorbidity has been the increasing prevalence of mental health issues over the past 2 decades. The latest 7-yearly NHS England survey (ie, published in 2016) on mental health and wellbeing showed that 17·5% of working-age adults (ie, aged 16–64 years) had a common mental disorder, such as depression or anxiety, compared with 14·1% of working-age adults in 1993.[199] Chronic mental and physical health disorders often coexist, with evidence that the relationship is often bidirectional.[200] To create a truly inclusive and comprehensive health service, it is crucial to address the long-standing neglect of the mental health needs of the UK population relative to physical health needs. This action is also crucial for economic productivity because absenteeism, often due to poor mental health, is responsible for substantial costs to the UK economy.[201] Examples do exist of integrated service models that recognise the complex interplay between mental and physical health,[89] but mental health and acute medical care in the UK are typically provided by different organisations, often with little or no interface. This division causes persistent difficulties in communication and is an obstacle to providing care of high quality. At its worst, division can lead to hazardous clinical duplications and errors. Although attitudes appear to be improving,[202] there is still a substantial degree of stigmatisation, not only of people with mental health problems but also the staff who treat them.[203] Patients with established mental illness often receive suboptimal care when they present to acute medical services,[204] and patients with severe mental illness have substantially lower life expectancy, largely as a result of preventable physical health conditions.[205]

The COVID-19 pandemic will most likely have a profound and lasting effect on mental health. Concerns about anxiety, isolation, becoming mentally unwell, accessing mental health support, and friends and family were emphasised in a large survey of people's concerns about the effects of the COVID-19 pandemic.[206] There is a need for high-quality data and research on the effect of COVID-19, particularly for vulnerable populations, such as older people, young people, people with pre-existing mental health issues, and health and care workers.[207] Mental health strategy should be integrated into plans for responses to future health shocks.[208] This Commission concurs with a UN call to adopt a whole-of-society approach to mental health; to strengthen community approaches, solidarity, and healthy coping mechanisms; and make large overall investments in mental health services.[208]

Financial and political context

The economic and political effects of the COVID-19 pandemic are still not fully understood. GDP fell by 9·9% in the UK in 2020, the largest decline of the G7 countries.[209] Efforts to support individuals and businesses—for example, through furloughing, grants, and loans—have substantially increased government borrowing, which reached approximately £350 million in 2020.[209] The pandemic occurred as the UK was exiting the EU, which in itself is forecast to have notable effects on the UK economy and the NHS, particularly affecting workforce, regulation, migration, cross-border cooperation, and economic growth.[210,211] The negative economic effects of the COVID-19 pandemic will be further compounded by the effects of leaving the EU, with nearly all projections indicating that the UK economy will be smaller after leaving the EU than it would have been with continuing membership of the EU.[212]

This Commission argues for increased public spending on health, social care, and public health, acknowledging that the economic context is challenging. This Commission emphasises the interrelatedness of public spending on health, improved health outcomes, and economic strength[14] and argues that a sustainable and resilient health and care system is necessary for a robust economic recovery. Beyond the contribution to health and wellbeing, the NHS makes a crucial contribution to the economy and employment, with an estimated 4·5 million jobs or approximately one in eight jobs in the UK (and nearly one in six jobs in Wales) in the health and care sector.[116] This Commission argues that years of austerity, and the effect of the costly multiple reorganisations without evidence of benefit over decades, left the NHS under-resourced in terms of workforce and capital, including hospital beds and medical equipment, and therefore exposed to major threats to health, such as the COVID-19 pandemic. In terms of staffing, the UK has a lower number of nurses and practising physicians than the means for EU15 and G7 countries (table 2). For number of hospital beds, MRI, and CT scanners, the UK also has markedly lower stocks than means for EU15 and G7 countries (table 2). Despite substantial efforts to improve workforce planning, all constituent countries of the UK are facing a health and care workforce crisis. In England alone, there are approximately 200 000 vacant posts combined across health and care, with one in 12 posts in the NHS[213] and one in 14 posts in social care unfilled.[122] Scotland, Wales, and Northern Ireland also have similar vacancy rates, although for some professions, such as nurses, vacancy rates are less than in England.[15] The growing backlog of unmet need for health services caused by COVID-19 only increases the imperative to secure sustained investment in the NHS.

Over the past 70 years, the model of funding for the NHS in the UK has been frequently challenged.[214] However, the UK has chosen not to change its funding model and for good reasons. The efficiency and equity benefits of public financing have often been emphasised; mitigating against causes of market failure in funding and provision of health services.[215,216] A clear counterfactual is the USA, where private expenditure exceeds public expenditure.[217] US spending on health (ie, 17·0% of GDP compared with 10·3% of GDP in the UK in 2019) is high but health system performance is poor compared with other high-income countries in terms of access, equity, administrative efficiency, and many health outcomes.[218] By contrast, in other tax-funded systems, such as Sweden, where most health expenditure is public, spending on health is higher than in the UK (ie, 10·9% of GDP in 2019) but health system performance is improved in terms of many health outcomes.[218] Public financing, access to health services regardless of ability to pay, and the integrated nature of the organisational structure and provision of health services has helped to maintain support for the NHS. Public support for the NHS in all constituent countries has been high through the life of the NHS and there is no reason to think that support will change.[219]

The process of leaving the EU and the COVID-19 pandemic means that there has been little consideration of domestic matters within the UK or devolved parliaments. In continuing economic and political uncertainty, it is crucial to implement the recommendations of this Commission both to equip the NHS to respond to further waves of COVID-19 and new threats to health and to underpin the UK's future economic prosperity.

The UK political context has changed considerably over the course of this Commission. At a time when the UK was preparing for probable poor cross-border cooperation with other EU countries, there was a strong possibility of further attempts for independence by constituent countries within the UK. Although the effect of the COVID-19 pandemic on public opinion in the devolved nations is not entirely clear, there are some signs that frustration with the response in England is encouraging separatism in Scotland and, to a lesser extent, in Wales. This Commission is not naive in making recommendations for increased collaboration between the countries. It was evident from the consultation that, for example, Scotland might look increasingly to Scandinavian countries rather than other constituent countries of the UK for learning, in contrast to the approach taken in England, which paid little attention to developments elsewhere.[220] It was also evident that there are areas where the constituent countries are already working together or seeking to learn from each other, for example, in relation to workforce development and research efforts. We argue that the leaders in health and care across the four countries should seek out and seize opportunities for their respective organisations to coordinate across countries, starting with the use of consistent data, rather than leaving collaboration to ad hoc arrangements and interested individuals. Political tensions will be inevitable, but we argue that the potential gains from increased coordination could be important. It can be misleading to talk of devolution leading to divergence in policy across the UK as divergence occurred beforehand and, although it has extended since devolution, change has been incremental and includes some convergence among the devolved administrations in terms of health policy.[221] Greater coordination in key areas will benefit all constituent countries of the UK and, in the case of data, enable evaluation and learning from differing policies that have not been possible to date.[222]

In summary, from now until 2030, our vision for the NHS stands against a backdrop of important political, social, and economic change. The challenges of growing inequalities, including intergenerational inequalities, slow growth in living standards, a growing sense of economic insecurity, and the cumulative importance of these factors to a sense of democracy, have been emphasised elsewhere.[223] After the COVID-19 pandemic, the vision of a publicly funded, innovative, and integrated health and care service across the UK that works together with patients to improve the health of all of the population is central to the UK's recovery.

The NHS to 2030 and beyond: recommendations of this Commission

The vision: working together for a publicly funded, integrated, and innovative service that improves health and reduces inequalities for all

Looking to the NHS in 2030 and beyond, this Commission has considered a vision for the NHS in the long term: working together for a publicly funded, integrated and innovative service that improves health and reduces inequalities for all. We want this vision to be

Panel 4: Overview of Commission recommendations

Recommendation 1: increase investment in the National Health Service, social care, and public health

Recommendation 1A: National Health Service (NHS) funding to increase by at least 4% per year on average, in real terms, over the next 10 years

Recommendation 1B: social care to receive an immediate injection of public funding to provide improved financial protection, and funding to increase by at least 4% per year on average, in real terms, over the next 10 years

Recommendation 1C: public health to receive an immediate injection of public funding to reverse cuts in England, for its funding to be reserved for public health purposes only, and for this funding to increase by at least 4% per year on average, in real terms, over the next 10 years [A: OK?]

Recommendation 1D: the increased investment to come from broad-based, progressive general taxation

Recommendation 2: improve resource management across health and care at national, local, and treatment levels

Recommendation 2A: at the national level, make resource allocation decisions in the context of a long-term strategic vision that takes account of projected need and focuses on optimising the balance of care

- Urgently commission an independent review of the resources that are needed to address the growing unmet need for health services that was caused by the COVID-19 pandemic and improve how well the UK is equipped to withstand major threats to health
- Spending reviews to take a long-term strategy to improving health system productivity and quality by balancing resource allocation to workforce, prevention, and capital
- In the long term, spending reviews to be informed by independent analysis of resource and workforce needs
- Spending reviews apply the key principles of economics, ethics, and evidence-based practice in increasingly integrated systems to improve the balance of health and care

Recommendation 2B: at the local level, develop and deploy resource management frameworks, encompassing principles of efficiency and equity, to enhance accountability in planning, budgeting, and organisational improvement

- Develop and use resource management frameworks, encompassing principles of efficiency and equity, to facilitate public involvement in decision making
- NHS England, NHS Scotland, NHS Wales, and Health and Social Care Board in Northern Ireland to review financial plans at a local level for quality assurance while acknowledging the need for flexibility to address local needs
- By 2022, the progress of local commissioning bodies in narrowing inequalities in health and access to health and care services is benchmarked by use of Health and Care Inequalities Indices

Recommendation 2C: at the treatment level, develop a structured approach to both investment and disinvestment to meet national constraints on resource allocation; facilitate more collaboration between the National Institute for Health and Care Excellence, Scottish Medicines Consortium, and All Wales Medicines Strategy Group; maintain a so-called observer status within the European Medicines Agency

- By 2022, develop and implement a transparent and structured approach towards budget impact assessments and managed access agreements
- By 2022, each constituent country to develop and implement a nationally led and structured approach to disinvestment for pre-existing health technologies, when there is insufficient evidence of clinical or cost-effectiveness
- National Institute for Health and Care Excellence, the Scottish Medicines Consortium, and the All Wales Medicines Strategy Group to do joint clinical assessment of novel health technologies
- The UK to commit to maintaining an observer status within the European Medicines Agency, including the option for the Medicines and Healthcare Products Regulatory Agency to recognise European Medicines Agency authorisation for some drugs on a case by case basis

Recommendation 3: develop a sustainable, skilled, and inclusive health and care workforce to meet changing health and care needs

Recommendation 3A: each constituent country to develop and maintain a workforce strategy for the long term, focusing on the collective health and care workforce and supported by workforce planning that is addressed at a crossprofessional level, coordinated across the UK, and tied into NHS and social care expenditure plans

- By 2022, each constituent country to develop (or maintain) a long-term health and care workforce strategy
- By 2022, workforce planning is coordinated on a UK-wide basis
- By 2022, develop and implement workforce planning models that focus on the collective workforce, taking account of the changing needs of the population, emerging technology, and changing skill mix

Recommendation 3B: workforce strategies to focus on achieving the optimal composition of multidisciplinary teams by working across traditional boundaries; introducing educational reform on the basis of competency-based training; incorporating technology to improve productivity; and developing new, collaborative models of care that actively engage patients, carers, and other service users

- Develop capacity, motivation, and opportunities to maximise the benefits from task-shifting between health professionals without increasing the burden on staff
- Educational reform based on competency-based training that enables transition between roles of health professionals more easily [A: correct?]

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- Make best use of pre-existing and emerging technology when optimising skill mix of health and care professionals
- By the end of 2021, launch an independent review across the UK of the consequences of expanding the provision of telehealth services
- For National Institute for Health and Care Excellence, Scottish Medicines Consortium, and All Wales Medicines Strategy Group to collaborate and be responsible for the evaluation of novel digital health technologies

Recommendation 3C: workforce strategies to be developed to monitor and be responsive to the health, morale, and wellbeing of the health and care workforce, including taking action to address discrimination and harassment

- NHS and social care organisations take a zero-tolerance approach to discrimination and harassment of marginalised groups, such as women and people from ethnic minority groups [A: see email]
- Introduce the mandatory requirement to independently examine the role of the work environment in the suicide of any health and care professional
- All constituent countries to invest immediately in increasing the availability and consistency of support for unpaid carers across the UK
- All health and care professionals, irrespective of role or stage of career, to receive an annual review of their professional development and training needs
- Launch an independent review to identify the most effective strategies to support an ageing health and care workforce

Recommendation 4: strengthen prevention of disease and disability and preparedness to protect against major health threats

Recommendation 4A: the NHS, social care, and public health to work in partnership with other public services, civil society, and other relevant organisations to take a whole-systems approach to prevention and environmental sustainability

- NHS and social care organisations to play a full part in cross-sector partnerships with local authorities, community and voluntary sector organisations, relevant commercial organisations, schools, and other statutory service organisations, with shared investment and benefits accrued across agencies
- All NHS and social care organisations to recognise their potential as anchor institutions within their local communities to maximise their effects on the health and wellbeing of local populations and address discrimination and inequalities experienced by ethnic minority groups [A: see email]
- Benchmark all NHS and social care organisations according to a composite indicator that reflects progress in reducing carbon emissions

Recommendation 4B: the NHS to invest in prevention, at both the national and local level, combined with measurement and evaluation, including estimating return on investment

- By 2022, the NHS in each constituent country to establish a separate funding stream for prevention, to be managed in a similar manner to a capital fund
- The chief medical officer in each constituent country to assume responsibility for measurement and evaluation of preventative activity, including ensuring sustained investment, particularly when the return on investment is positive

Recommendation 4C: all UK administrations to have a strategy across government departments to promote health, wellbeing, and equity in all policies

- Strategies across government departments to use fiscal and pricing policies to promote positive health behaviours
- By 2022, embed in legislation the statutory requirement to annually report to Parliament and in each devolved administration on progress in achieving additional healthy life-years and narrowing health inequalities

Recommendation 4D: develop a transparent and coordinated approach to preparedness planning and response to future major health threats across the UK

- Launch a public inquiry into the UK Government's response to COVID-19
- Clarify and strengthen structures and processes for consultation between the constituent countries of the UK in response to major threats to health, taking account of the extent to which different powers are devolved
- The UK to retain membership of and contribute to the activities of the European Centre for Disease Prevention and Control

Recommendation 5: improve diagnosis, in circumstances where evidence exists to support early diagnosis, for improved outcomes and reduced inequalities

Recommendation 5A: increase capital investment and optimise skill mix in both primary and secondary care to address unmet need for diagnostics that has been caused by the COVID-19 pandemic and to meet future need for diagnostics

- By the end of 2021, launch an independent review of diagnostic capacity in each constituent country and projections of current and future optimal diagnostic capacity that are required to meet changing health needs
- Include diagnostics within the remit of an annual capital investment plan (recommendation 2)
- Expand the roles of non-medical health professionals in making diagnoses
- Target investment in artificial intelligence capabilities for diagnosis to areas of greatest need, in terms of potential to benefit and where workforce shortages are most acute

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Recommendation 5B: novel diagnostics and routes to diagnosis to be developed and rigorously tested where evidence exists to support early diagnosis, with cost-effective treatment that changes outcomes for individuals

- Develop novel routes to diagnosis where conventional routes to diagnosis are associated with low or unequal uptake
- Co-develop and test approaches with local communities that address barriers to uptake of diagnostic services in populations who are at high risk of developing disease
- By 2022, co-develop a nationally agreed quality framework for the evaluation of novel diagnostics with health-care professionals, patients, and citizens
- By 2023, all novel diagnostic technologies to undergo mandatory evaluation by the National Institute for Health and Care Excellence diagnostics assessment programme before implementation

Recommendation 5C: a comprehensive professional and public dialogue to be encouraged regarding the understanding of uncertainty, risk, and benefit of testing and screening

- Update undergraduate and continuous training to equip health professionals with the skills that are needed to communicate uncertainty, risk, and benefit to patients effectively
- Extend efforts to improve shared decision making within the NHS around treatment to include diagnosis
- Public-facing campaigns to be evidence-based and designed in a manner that minimises anxiety and improves the uptake of diagnostics and interventions

Recommendation 6: develop the culture, capacity, and capability to become a learning health and care system

Recommendation 6A: each constituent country to deliver on commitments to give patients custodianship of a readily accessible, integrated, and electronic personal health record across health and care and support them to take more control of their health and care

- By 2022, give all patients, carers, and citizens control of an electronic personal health record, which allows them not only to read their records but also populate them, thereby facilitating supported self-management
- By 2024, make electronic personal health records accessible to patients and multiple providers throughout care pathways in a safe and secure manner
- Evaluate the dissemination of electronic personal health records with a particular focus on identifying and supporting marginalised groups who are at risk of digital exclusion

Recommendation 6B: foster health information technology and data science leadership that enable the routine use of data to continuously improve health and care planning, service delivery, and personalisation of health and care

- By 2024, all constituent countries to complete the process of transitioning from paper-based to electronic health records and make substantial progress in digitising social care records
- All constituent countries to develop data science leadership positions at national, local, and organisational levels to encourage a cultural shift towards maximising the potential of health and care data
- Develop data literacy and capability throughout the NHS and social care systems, including for executive leaders, managers, front-line staff, patients, and carers
- Performance management initiatives to be designed in partnership with health and care professionals and ensure that agreed targets are clinically relevant
- Broaden opportunities for health and care organisations across the UK to participate in large-scale data exercises, such as clinical audits and registries, pragmatic clinical trials, and quality improvement initiatives

Recommendation 6C: develop and implement a data and statistics strategy for health and care in the long term across the UK

- An overarching UK organisation to take responsibility for assessing current and future health and care data needs, mapping existing data collection and ensuring that data standards are met
- Ensure that health and care data are collected and coded in standardised ways by the constituent countries of the UK
- Mandate open application programme interfaces and develop closer alignment with health information technology and data science research investments
- Mandate and monitor compliance against minimum data security standards to maintain the confidentiality of data
- Develop a framework in conjunction with patients, citizens, and health and care professionals that defines the expected terms and conditions and codes of conduct for public–private partnerships in health and care

Recommendation 6D: rebalance and strengthen research and innovation efforts towards supporting health and care service delivery

- Rebalance pre-existing research funding towards public need, fully exploiting the potential of health and care service research delivery to improve population health and reduce health inequalities
- Increase investment in the academic health and care workforce and better integrate the academic and front-line health and care workforce

Recommendation 7: improve integration between health, social care, and public health and across different providers, including the third sector

Recommendation 7A: remove system barriers that reduce integration of care, supported by appropriate legislation

- Reinforce and reorient the capacity of primary care to enable its natural role as the key facilitator of integration

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- Remove the requirement to promote competition in England, with appropriate changes to legislation
- Develop and monitor metrics that indicate the quality of integration at the local level
- By 2024, implement linked personal information systems with secure access for patients and all relevant providers (recommendation 6)
- Establish a research programme to fund large-scale experimentation and yield evidence to use in the design and implementation of integration policies

Recommendation 7B: reform provider reimbursement to ensure that incentives are aligned across the health and care system, commensurate with the interdependencies of productivity in each sector

Recommendation 7C: improve and clarify the mechanisms ensuring the public accountability of organisations that are responsible for health and care delivery in the UK

- Clarify the legal requirements for organisations that are responsible for health and care delivery
- Introduce a mandatory requirement for organisations that are responsible for health and care delivery to report on their performance to an independent national audit body that is accountable to parliament in each constituent country

Recommendation 7D: by 2030, all constituent countries to have created single public sector entities at the local level with the responsibility to manage budgets and organise health and care for geographically defined populations

integral to NHS policy as each constituent country develops national recovery plans to rebuild following the COVID-19 pandemic. The COVID-19 pandemic has made us all re-evaluate how the NHS operates and fostered substantial appetite for change. We have a once-in-a-generation opportunity to change ways of working and make improvements to the NHS in the long term.

Our vision entails a publicly funded NHS that meets the needs of all, is free at the point of delivery, and provides care according to clinical need and not ability to pay[224] and a funding model for social care that is closely aligned to the NHS model, offering improved financial protection. The UK should allocate resources across the health and care system in a transparent and accountable manner that optimises the balance of care and maximises improvements in health and narrowing inequalities. A sustainable, skilled, and inclusive health and care workforce is needed that adapts to changing health and care needs, supported by workforce planning that is coordinated across the UK and based on demand-side and supply-side factors, maintaining consistency with NHS expenditure forecasts. The core goals for health and care organisations as anchor institution should be improving health and wellbeing, engaging patients and service users, and reducing inequalities in health with a renewed focus on prevention. The NHS should improve diagnosis, in circumstances where clear evidence exists to support early diagnosis, with a focus on improving outcomes and reducing inequalities in access to diagnostics. Improved diagnosis should be supported by a more comprehensive professional and public dialogue about the uncertainty, risks, and benefits of testing and screening. The NHS and social care should maximise data and data access and their institutional strengths to become a learning health and care system that supports quality improvement for the benefit of patients, adopting best practice from within the UK and internationally. The NHS, social care, and other sectors should work together, including with patients, carers, and the general public, to reduce the complexity of the system and to provide seamless, high-quality care for those in need; with systems, organisational structures, financial flows, incentives, and HIT infrastructure all designed to promote this aim.

Our vision for the NHS should be ambitious. At a time when other countries are trying to move towards universal health coverage, the UK should not retreat from having one of the most comprehensive public health systems in the world.

The recommendations of this Commission are summarised in panel 4 and given in detail later with clearly articulated changes and outcomes and are supported by our evidence-informed rationale. Where we have identified areas that need improvement, we have aimed to be specific in the short term and less prescriptive when outlining objectives for the long term. In some cases, these recommendations build on existing change.

Recommendation 1: increase investment in the NHS, social care, and public health

This Commission's Health Policy paper on health and care funding argues that there is a strong economic rationale to invest in health and that, if the UK wishes to have a sustainable health and care system, then increased public funding for the NHS, social care, and public health is required.[14] We define a sustainable health and care system as a system that provides, as a minimum, similar levels of quality and access to those that are currently enjoyed, taking into account future trends in demography, morbidity, and technology. We propose recommendations that outline the amount of funding required and provide guidance on how to raise the revenue that is necessary to implement these recommendations. These recommendations draw on projections of future needs that were made by the Institute of Fiscal Studies, The Health Foundation, the Institute for Public Policy Research, and the Care Policy and Evaluation Centre at LSE.[26,225,226] Consensus exists among these projections that funding for the NHS and social care needs to increase by approximately 4% per year on average, in real terms. We discuss these projections in detail within our Health Policy paper[14] and in appendix 3 (pp 1–5).

We do not consider any increases in expenditure that might be needed for other public services, such as education, transport, and infrastructure. We also focus only on funding the increase in spending as proposed within this Commission. Therefore, we acknowledge that the public might need to be prepared for larger tax increases than those that we recommend, especially to repay the increase in government debt as a result of the COVID-19 pandemic. Given the role of social determinants in health and health inequality, it is crucial that extra funding for the NHS and social care does not come from cuts to other public services and the welfare system. Politicians from all parties need to show leadership and make the case for tax increases in a non-partisan way to ensure a sustainable health and care system is complemented by a strong, broader public sector.

Recommendation 1A

To secure the future of the NHS, substantial workforce shortfalls need to be addressed, several years of austerity need to be rectified, and capital to improve resilience against major threats to health should be invested in. We recommend that NHS funding increases by a minimum of 4% a year in real terms, on average, over at least the next 10 years. Projections from the Institute of Fiscal Studies and The Health Foundation suggested that public spending on health in the UK would need to increase by 4% per year, on average, in real terms from financial year 2018–19 to 2033–34 to modernise the NHS.[26] This spending includes meeting waiting list targets, bringing capital spending more in line with OECD averages and compensating for past austerity. These projections were created before the COVID-19 pandemic and assume that GDP growth will increase, on average, by 1·9% per year until 2033–34.[26] Therefore, these projections give an indication of the amount of spending that is required for a long-term funding settlement for the NHS, assuming that GDP growth in the long term returns to prepandemic projections. It is too early to estimate the additional funds that are required for the NHS to respond to the pandemic, address the growing unmet need for health services that has been caused by the pandemic, and better equip the UK than it is now to withstand future public health shocks, such as another pandemic. We recommend an independent review to examine what will be needed (recommendation 2A).

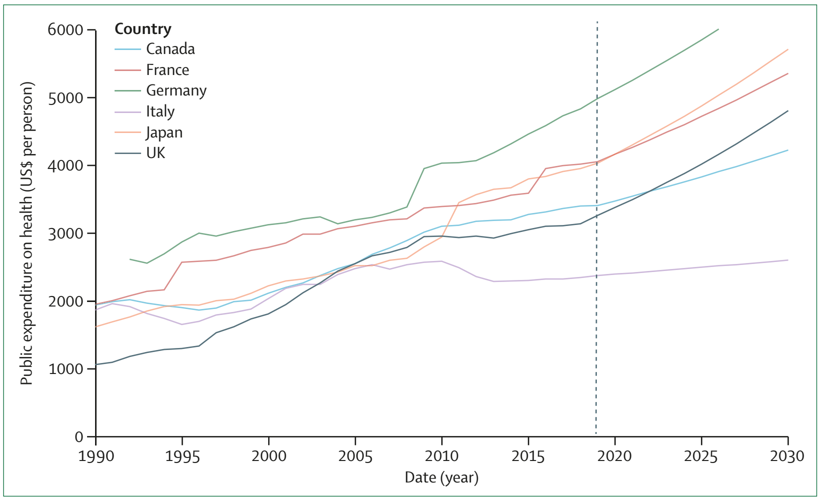


Figure 4: **Public expenditure on health between 1990 and 2030**
Our calculations are based on data from the Organisation for Economic Co-operation and Development.[30] This figure is intended as an illustrative example and is not indicative of expected future expenditure paths. For countries other than the UK, expenditure beyond 2019 (vertical line) is based on the mean annual growth rate from 1990 to 2019 or for the period where data are available for the respective country. For the UK, expenditure beyond 2019 reflects our recommendation that funding should increase at 4% per year, in real terms. There are series breaks in the historical data, which are not adjusted for.

The UK is a wealthy country but spent 87% of the mean spend of the G7 countries on health in 2019 (excluding the USA, which has a substantially higher outlying health expenditure than do the other countries). If health expenditure continued to grow at historical rates for these countries and grew at our recommended 4% per year, in real terms, for the UK, then spending in the UK would be around 98% of the mean of these countries by 2030 (figure 4). This Commission believes that this increase in position relative to other countries is appropriate and feasible for the UK and that funding less than this amount will pose a real risk of degradation of the NHS, reductions in coverage of benefits, increased inequalities, and increased reliance on private financing.

Recommendation 1B

We recommend that social care funding should receive an immediate injection of public funding to provide better financial protection and that funding should increase by at least 4% per year, on average, in real terms, over the next 10 years. A sustainable health service is only possible if it is accompanied by a high quality and efficient social care system. Years of underfunding social care alongside other factors, such as workforce shortfalls, delayed access to personal protective equipment and diagnostics, and poor coordination between NHS and social care organisations, contributed to substantial excess mortality in care homes throughout the COVID-19 pandemic.[12] The Institute of Fiscal Studies and The Health Foundation has estimated, on the basis of projections from Care Policy and Evaluation Centre, that to meet projected demand by use of eligibility criteria, social care funding needs to increase by 3·9% per year on average, in real terms, until at least 2033.[26] Furthermore, to ensure that the social care system supports the health and care system, this Commission's view is that public expenditure on social care should not decrease relative to health expenditure over time. We also encourage each constituent country to

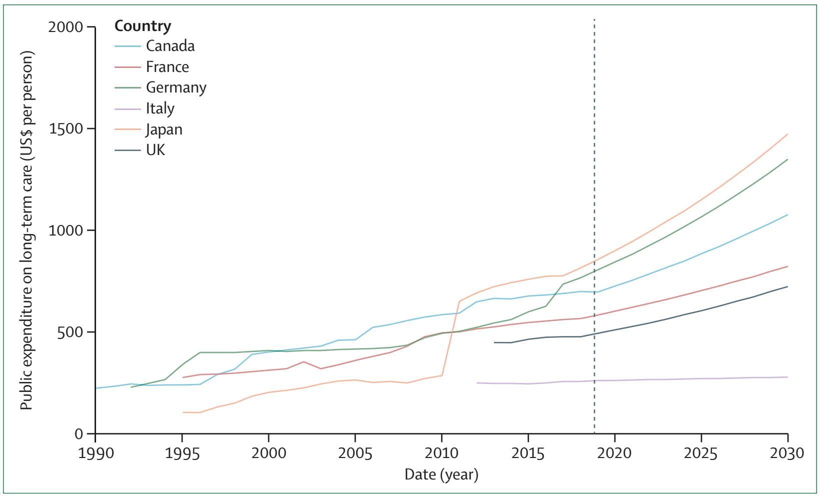


Figure 5: **Public expenditure on long-term care between 1990 and 2030**
Our calculations are based on data from the Organisation for Economic Co-operation and Development.[30] This figure is intended as an illustrative example and is not indicative of expected future expenditure paths. For countries other than the UK, expenditure beyond 2019 (vertical line) is based on the mean annual growth rate from 1990 to 2019 or for the period where data are available for the respective country. For the UK, expenditure beyond 2019 reflects our recommendation that funding should increase at 4% per year, in real terms. The series break in 2011 for Japan has been excluded from the calculation of the historical growth rate.

consider the use of legislation on the basis of the principle of at least parity in funding between social care and the NHS. If these increases in funding do not occur—assuming other G7 countries were to continue spending in line with historical trends—the UK would increasingly lag behind these countries in terms of public spending on care in the long term (figure 5).

Alongside 4% annual growth, in real terms, social care requires an immediate injection of public funding to increase financial protection for the most vulnerable people. The current financial eligibility criteria in England have not changed for almost a decade, with the threshold for the capital means test of £23 250 (ie, the so-called floor) unchanged since 2010–11.[227] As a result, the upper asset test threshold has effectively lowered due to inflation. Consequently, fewer people than in 2010–11 are now eligible for public funding of social care. Furthermore, more generous financial eligibility criteria exist in Scotland, Wales, and Northern Ireland, leading to inequalities of access across the UK.[228] This Commission recommends that the threshold for the capital means test is increased to £100 000 and, in line with recommendations from the Dilnot Commission, a cap on care costs of £75 000 is implemented. The introduction of a £75 000 cap and a £100 000 threshold for the capital means test in England has been estimated at £3·2 billion (in 2018–19 terms)[229] and would substantially improve financial protection by increasing the number of people who are eligible for funding support for social care.[230]

Recommendation 1C

We recommend that public health should receive an immediate injection of public funding to reverse cuts in England, its funding should be reserved for public health purposes only, and this funding should increase by at least 4% per year on average, in real terms, over the next 10 years [A: OK?]. There is evidence that additional spend beyond the current amount on the public health grant in England is [A: OK or "would be"?] three to four times more effective than is NHS expenditure, in terms of additional QALYs gained.[71] A strong economic case also exists for investment in public health, with many interventions shown to be cost-effective or cost saving (recommendation 4B). This Commission argues that funding for public health in each constituent country should at least increase in line with NHS and social care funding and we argue for a one-off uplift in public health spending. The allocation of the public health grant in England largely reflects historical spending[231] and has decreased by £0·7 billion in real terms between 2014–15 and 2019–20.[102] A renewed resource allocation index has been developed by the Advisory Committee on Resource Allocation that better reflects local public health needs than did the previous resource allocation index.[232] It has been estimated that to reverse cuts to the public health grant, implement this new resource allocation formula, and prevent any local area from having a reduction in funding would require a one-off increase of £3·2 billion in England (in 2018–19 terms).[102] This increase will also secure sustained investment in the public health workforce, who were crucial in coordinating the response to COVID-19 and will be essential when improving preparedness and resilience planning. Implementing this recommendation would provide additional funding for Scotland, Wales, and Northern Ireland that is allocated according to population size, as per the Barnett formula, which we argue should also be used for public health activity. This Commission acknowledges that it is challenging to monitor the amount of public health spending in Scotland, Wales, and Northern Ireland, as a separate public health grant does not exist in these countries.

Recommendation 1D

We recommend that increased investment should come from progressive, broad-based, general taxation. The NHS in the UK is primarily funded by general taxation, whereas social care is funded by a combination of private contributions and national and local taxes. We argue that the health system in the UK should continue to be primarily funded through general taxation as there is no evidence that the UK would benefit from an alternative funding model.[14] For example, hypothecated taxes are inflexible and vulnerable to changes in the economic climate.[233] Social health insurance has high administrative costs,[234] reduces competitiveness in the international labour market, and creates perverse incentives for employers, such as outsourcing work to self-employed contractors or offering unofficial employment.[235] Additionally, private medical insurance is particularly vulnerable to so-called cream skimming (ie, the practice of providing insurance to only insurees who are considered to be low cost and declining coverage to individuals who are considered to be high cost)[236] and adverse selection,[237] which can leave much of the population without coverage, driving inequalities in access to health services. Medical savings accounts do not pool risks between individuals or raise enough revenue, thereby leaving many people vulnerable to catastrophic health expenditure.[238] Finally, user charges disproportionately affect people who are poor and, as people are often unable to distinguish between care of low value and high value, can lead to avoidable increases in health and care costs over time as people might forgo preventive treatment.[239]

The 2019 British Social Attitudes Survey reported that 54% of respondents would prefer extra funding for the NHS to come from tax rather than, for example, patient charges.[219] The UK has one of the lowest tax burdens among the EU15 and G7 countries (figure 6), with 13 of 18 countries within these groups collecting more tax as a share of national income than does the UK. Furthermore, taxation in the UK is over 10% of GDP lower than in Belgium, Denmark, Finland, France, and Sweden.

This Commission has estimated that, to fund the recommendations, taxation as a share of GDP would have to increase by around 3·1% in 2030–31. This estimation assumes that the economy will return to prepandemic levels quickly. This increase would mean that the tax burden in the UK in 2030–31 would be only slightly more than the mean for the G7 countries and less than the mean for the EU15 countries. As such, there appears to be the capacity for a higher amount of taxation than currently exists.

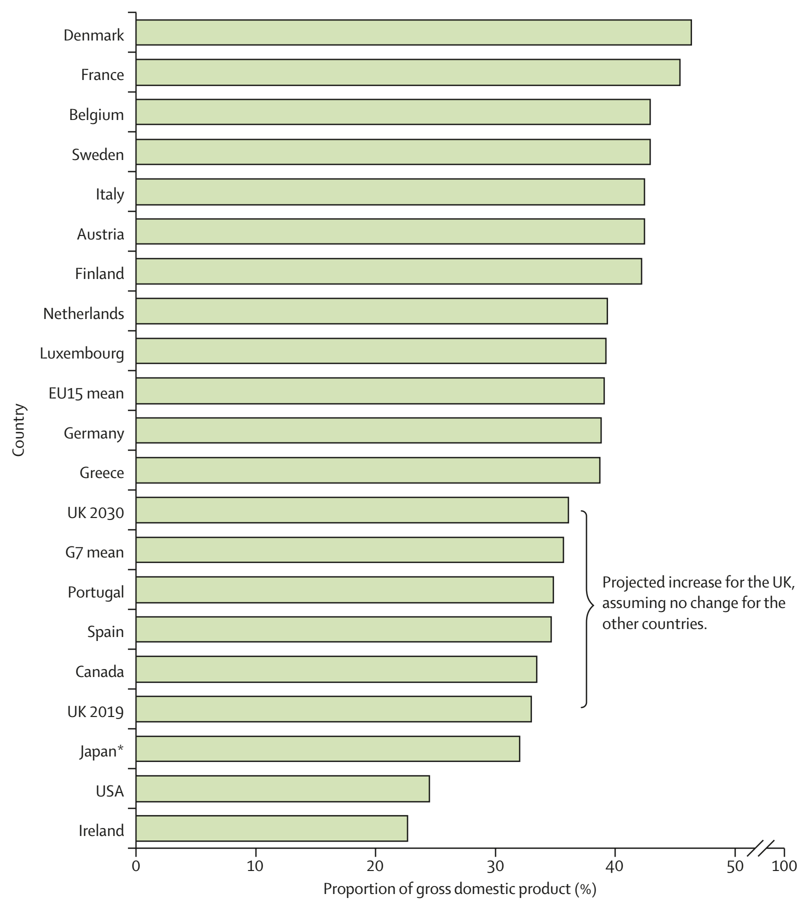


Figure 6: **Ratio of tax to GDP across the EU15 and G7 countries**
Our calculations are based on 2019 data from the Organisation for Economic and Co-operative Development.[30] *Data for Japan relates to 2018.

Given the strong positive correlation between health and income,[240] taxation reform needs to be progressive to ensure that it does not worsen already substantial income inequalities. To raise enough revenue from general taxation, taxation reform should cover a wide base. Some people have advocated for taxation reform on a small scale to support the NHS and social care, such as implementing means testing for winter fuel payments or collecting national insurance payments from people who are receiving a pension and continue to work and earn.[229] However, these changes would not raise enough revenue and would risk unintended consequences, such as older people forgoing heating in winter or a decreased incentive for people to work beyond retirement age.[241]

To show the magnitude of the proposed funding increase, we have prepared stylised examples that are based on tax revenue proportions before the pandemic, estimates from Her Majesty's Revenue and Customs ready reckoner statistics, which show the estimated effects if simple changes were made to various taxes, and methods used by the Institute of Fiscal Studies (panel 5).[26,243] We estimate that, to implement our funding recommendations, total expenditure would need to increase by around £102 billion, or 3·1% of GDP in 2030–31 (appendix 3 pp 1–5). If tax revenue was to return to prepandemic amount and continue to grow with GDP, then £37 billion of the £102 billion increase in expenditure could be funded from the increase in revenue, leaving a £65 billion funding gap. This funding gap would require reform to several taxes. The three largest taxes—personal income tax, national insurance, and value-added tax—collect around 63% of UK tax revenue.[242] If the three main taxes were to fund 63% of the funding gap, by 2025–26, the basic, higher, and additional personal income tax rates would need to increase by 1 British pence (1 p), employee and employer contributions to national insurance would need to increase by 1p, and the standard rate of value-added tax would need to increase by 1 p. By 2030–31, the basic, higher, and additional personal income tax rates would need to increase by 2 p, employee and employer contributions to national insurance would need to increase by 2 p, and the standard rate of value-added tax would not require further increases than 1 p. The other 37% of the funding gap would be funded by increases to several other, smaller taxes, including corporate and wealth taxes. The reforms

Panel 5: London School of Economics and Political Science–_Lancet_ Commission proposed taxation reforms

We estimate that to implement our funding recommendations, including a one-off increase in funding for social care and public health and a 4% average annual increase in funding per year, in real terms, to the National Health Service, social care, and public health, would require tax increases.

By financial year 2025–26:

- 1 British pence (1 p) increase in basic, higher, and additional personal income tax rates
- 1 p increase in employee and employer national insurance contributions
- 1 p increase to the standard rate of value-added tax

By 2030–31:

- 2 p increase in basic, higher, and additional personal income tax rates
- 2 p increase in employee and employer national insurance contributions
- 1 p increase to the standard rate of value-added tax

These increases assume that the taxation structure will not change and personal income tax, national insurance contributions, and value-added tax still account for 63% of total UK tax revenue.[242] Therefore, implementing our funding recommendations would also require increases to corporation tax and wealth taxes, such as capital gains tax. The detailed method for these calculations is shown in appendix 3 (pp 1–5).

	2019–20 tax policy	Tax reform	Change per year	Change per week
10 000	9837	9822	–14	–0
15 000	13 737	13 647	–89	–2
25 000	20 537	20 247	–290	–6
40 000	30 737	30 147	–590	–11
50 000	37 537	36 747	–790	–15
100 000	66 533	64 746	–1789	–34
125 000	76 033	73 621	–2414	–46
150 000	90 533	87 621	–2914	–56
200 000	117 033	113 121	–3914	–75
250 000	143 533	138 621	–4914	–95
300 000	170 033	164 121	–5914	–114
400 000	223 033	215 121	–7914	–152
500 000	276 033	266 121	–9914	–191

All measures are in British pounds. This table shows the effect on individual income of a 1 British pence (1 p) increase to the basic, higher, and additional personal income tax rates and a 1 p increase to employee and employer contributions to national insurance.

Table 5: After tax income under the 2019–20 financial year tax schedule compared with the suggested tax reform for 2025–26 by earned income

would need to be phased in to minimise distortions and any challenges to the economy that are caused by the COVID-19 pandemic and leaving the EU. These reforms do not consider behavioural responses, such as tax avoidance, and should be considered as indicative only. The reforms are also dependent on economic growth, which is highly uncertain. Further research to establish the preferred taxation reform and the distributional effect of the reform is recommended. The effect of these reforms on the income of individuals is presented in table 5.

Recommendation 2: improve resource management across health and care at national, local, and treatment levels

How resources are allocated, managed, and prioritised has a substantial effect on population health and the sustainability of the NHS. This effect has been shown during the COVID-19 pandemic after years of under-investment in capital left the NHS with little excess capacity and exposed to major threats to health. We argue that decisions about resource allocation should be underpinned by sound principles and robust methods and that a strategic view is taken of the long term. Within a theme of spending wisely, we suggest a series of principles to support resource management and priority setting across health and care at national, local, and treatment levels.

Recommendation 2A

At the national level, we recommend that resource allocation decisions should be made in the context of a long-term strategic vision that takes account of projected need and focuses on optimising the balance of care. A major immediate challenge for the NHS is to address the growing unmet need for health-care services that has been caused by postponing or cancelling elective procedures and diagnostic tests. Early data that were released by NHS England indicate that a decade of progress in reducing waiting times has been lost in just a few weeks.[154] The COVID-19 pandemic has also emphasised major issues in the capacity and resilience of the UK health and care systems. Additional investment is needed to reduce waiting lists, capital is needed to ensure the NHS has adequate surge capacity, and public health capacity is needed to contain infection outbreaks. It is too early and outside the scope of this report to provide such analysis. Instead, we recommend that the UK Government urgently commissions an independent review of the resources that are required to address the growing unmet need for health-care services that has been caused by the COVID-19 pandemic to mitigate the effect of the COVID-19 pandemic on delayed diagnosis and reduced access to care. The UK Government should also improve how well that the UK is equipped to withstand major threats to health to develop future resilience.

Spending reviews, which are crucial to determining amounts of public spending, should consider the appropriate amount of funding for health and care services, now and in the future. This decision requires reliable projections of health and care expenditure that are based on need for health and care services and the necessary workforce. Public health, capital, and training were notable in their absence from the NHS funding settlement in 2018.[244] To maintain productivity growth and improve quality, spending reviews should also consider the appropriate amount of investment in prevention, workforce, and capital. Resources have often been directed towards the hospital sector at the expense of primary care, despite a wider agenda to provide more care in the community. Investments in mental health services have been overlooked in preference for investment in physical health services, despite their interlinked nature. To address these issues, this Commission recommends that decisions about resource allocation are underpinned by independent analysis of resources and needs (panel 6), in a similar manner to that suggested by the UK Public Health Network, which calls for an office for budget responsibility for population health.[245]

This Commission argues that allocating resources efficiently across the health and care system is crucial to optimising the balance of care and supporting an increasingly older and multimorbid population. This optimisation will require applying the key principles of HTA in novel ways, including considerations of equity, to increasingly integrated systems.[247] To date, the focus of economic approaches has been too narrow, directed primarily towards the evaluation of novel pharmaceuticals. Generating usable evidence will require increased investment in research for health services (recommendation 6D), the use of pragmatic clinical trials, and approaches to economic evaluations, which take account of data from both inside and outside the health and care system.[248]

Recommendation 2B

At the local level, we recommend that resource management frameworks should be developed and deployed, encompassing principles of efficacy and equity, to enhance accountability in planning, budgeting, and organisational improvement. Several frameworks for resource management have been developed for this purpose, such as multicriteria decision analysis and programme budgeting and marginal analysis,[249–251] which involve mapping candidates for investment or disinvestment, evaluation of the benefits and drawbacks of alternative candidates based on stakeholder perspectives, and the economic concepts of opportunity cost and marginal gain.[252] These frameworks can improve public participation, accountability, and transparency in local decision making. However, there is inconsistency and uncertainty regarding how best to involve the public in decision making and to evaluate its effect.[253] Improved training is needed for commissioners, managers, and clinicians to facilitate meaningful inclusion of the public in decisions about local resource allocation.[254] For quality assurance purposes, this Commission argues that there is an integral role, at the national level, for NHS England, NHS Scotland, NHS Wales, and the Health and Social Care Board in Northern Ireland to review local financial plans and ensure consistent funding, while acknowledging the need for flexibility to address local needs. These frameworks could be used to manage competing claims for NHS and social care resources in the recovery phase, after the pandemic.

Panel 6: The case for an independent analysis of health and care workforce and resource needs

Building on the recommendations from the UK Public Health Network to establish an office for budget responsibility for population health[245] and the Health and Social Care Select Committee to establish an office for health and care sustainability,[246] this Commission argues for analysis of resource and workforce needs, independent of government. This analysis should be linked to financial planning. To sustain annual growth in the National Health Service workforce at approximately 2·4% and ensure pay increases at the same rate as average earnings in the UK, increases in health spending at 4% annually, in real terms, will be required.[15] The effect of spending reviews is felt by all constituent countries of the UK, as the Barnett formula ensures that resources that are allocated to public services are adjusted proportionally by population size to England, Scotland, Wales, and Northern Ireland. Therefore, this analysis would have a remit and be underpinned by health and care data and statistics strategy across the UK (recommendation 6C). This analysis could be done by a health division within the suggested office for budget responsibility for population health or a separate newly established, independent fiscal institution. Health and care is a complex sector, and producing projections and economic models requires specialist knowledge. This model would concentrate expertise to improve data analysis. A credible and independent body producing reliable projections of resource and workforce needs and estimates of return on investment of public health interventions could mitigate the nature of decisions about health and care funding, which are often politicised. The responsible body would provide:

- Projections of health and care expenditure, underpinned by estimates of future need for health and care services and the associated workforce
- Recommendations for funding allocations between the National Health Service and social care and between primary care, secondary care, and mental health based on unmet need and projections of changing health needs
- Recommendations for funding allocations for capital investment, to ensure that staff are equipped with the necessary buildings, equipment, and technology infrastructure to do their jobs effectively
- Estimates of future workforce requirement through the use of models for workforce planning (recommendation 3A)
- Analysis of the effect of public policies, including policies outside of health, on population health and need for health and care; this analysis would include estimating the return on investment of public health interventions (recommendation 4B)

Local entities that are responsible for health and care planning—such as CCGs and health boards, which are structurally separated from public health—have varying capacity and little incentive to prioritise equity.[255] Even between two local areas with similar average deprivation levels, there are significant differences in the extent and size of health inequalities.[256] This Commission recommends that frameworks for resource management include improving equity as a key principle and that progress be monitored with a health and care inequalities index (panel 7). By 2022, these indices could be used to benchmark regions according to their progress in narrowing inequalities in health and access to health and care services. These benchmarks would increase transparency and accountability in addressing health and care inequalities at the local level. Once validated, these indices could be tied to financial incentives to reward the highest achieving local entities, in terms of reducing health inequalities, that are responsible for delivery of

Panel 7: Developing the case for health and care inequalities indices

This Commission argues that each local entity that is responsible for delivery of health and care should embed an equity principle into their processes for resource allocation.[255] Alongside this principle, there is a need to develop metrics to assess how well inequalities in health and access to health and care services have been addressed One suggested metric assesses the divide between the least and most deprived populations in unplanned hospital admissions of patients with sensitive conditions that require chronic ambulatory care[257] and clearly shows that inequalities vary substantially, even between local areas, which are supposedly of a similar level of deprivation.[258] We urge the development of further metrics that are easily understandable by the public, health and care professionals, and policy makers. This development could be a priority of the data and statistics strategy across the UK (recommendation 6C).

Panel 8: National Health Service England Evidence-Based Interventions programme

The Evidence-Based Interventions programme[259] is a collaboration in England between four national organisations: the Academy of Medical Royal Colleges, National Health Service (NHS) clinical commissioners, the National Institute for Health and Care Excellence, and NHS England and NHS Improvement. The Evidence-Based Interventions programme aims to reduce avoidable harm to patients, save professional time, maximise value, and avoid waste by preventing unnecessary interventions in the NHS in England. Recommendations for the programme are developed through a review of literature, for example, Choosing Wisely initiatives and National Institute for Health and Care Excellence guidance. The activity data are examined for each intervention in terms of volume, geographical variation, and cost to the health service. The recommendations are then prioritised for implementation and developed into guidance in collaboration with clinical specialists, clinical commissioners, and patients. Two categories of interventions have been developed. The first is for procedures that are ineffective and should no longer be offered to patients. A zero tariff is applied to these procedures and, unless an exceptional individual funding request is approved, they are not reimbursed. The second category is for interventions that are appropriate in clear circumstances, for example, tonsillectomy. Implementation of the programme is supported with resources for patients and clinicians, including guidance, information leaflets, and videos. A community of over 64 clinical commissioning groups that are committed to implementing the Evidence-Based Interventions programme guidance and sharing learning has been established. The statutory guidance for the Evidence-Based Interventions programme was published in November, 2018, and came into effect in April, 2019. Early data show uptake of the guidance and a decrease in unwarranted variation and number of inappropriate interventions.[260] The strength of the programme is the collaboration between national organisations from different sections of the health system, including building on local experience and shared learning, a rigorous approach to putting evidence into practice, and measurement and feedback of effect. There needs to be a thorough evaluation of the programme and its potential consequences. It is possible that, as the NHS reduces access to treatments with little evidence of clinical effectiveness or cost-effectiveness, the private sector might seek to increase the provision of these services.

health and care. In some circumstances, regions that are consistently associated with widening health and care inequalities would prompt further investigation.

Recommendation 2C

At the treatment level, which considers the use of new and pre-existing drugs, procedures, and medical devices, we recommend that a structured approach to both investment and disinvestment should be taken to meet national constraints on resource allocation, more collaboration should be facilitated between NICE, SMC, and AWMSG, and a so-called observer status should be maintained within the European Medicines Agency. For investment in novel health technologies, we recommend a systematic approach towards budget impact assessments, including financing mechanisms for spreading cost sustainability over the medium to long term, in conjunction with negotiated managed access agreements, which facilitate timely and equitable access. These managed access agreements should include commitments to measure long-term outcomes combined with a redressing mechanism to claw back resources if desired outcomes are not reached. Our recommendation for development and implementation of a transparent and structured approach to budget impact assessments and managed access agreements by 2022 will ensure transparency and sustainability of NHS funding. For pre-existing health technologies, we recommend a systematic and transparent approach towards disinvestment in low-value interventions where there is little or no evidence of clinical effectiveness or cost-effectiveness. This approach requires input from medical royal colleges, professional societies, and medical schools, which have a key role in producing clinical guidance and developing educational curricula. Crucially, disinvestment should not take a top-down approach (ie, centrally driven policies that do not take account of local context and perspectives) but instead engage with relevant stakeholders, such as the public, clinicians, and commissioners, from the outset to agree on candidates for disinvestment. Our recommendation that each constituent country should develop and implement a nationally led and structured approach to disinvestment for pre-existing health technologies by 2022, where there is little evidence of clinical effectiveness or cost-effectiveness, will reduce unwarranted clinical variation and protect patient safety. There is scope to learn from England, where a partnership between several national organisations and CCGs has resulted in a programme that seeks to maximise value and reduce avoidable harm to patients by disinvesting in a series of interventions with little clinical evidence (panel 8).

From the HTA perspective, this Commission recommends increased collaboration between NICE, SMC, and AWMSG. Despite the substantial amount of time, technical expertise, and investment that is necessary for comprehensive technology appraisal, there is little collaboration between these agencies. The European Commission, on the basis of their experience from the joint actions by the European Network for Health

Technology Assessment,[261] has proposed a joint clinical assessment between all EU member states for all new pharmaceuticals and some class IIb and class III medical devices. The other domains of HTA, including the economic evaluation, will be the responsibility of EU member states, as will the decision or recommendation that they make on the basis of the HTA findings. The UK could adapt this model, with NICE, SMC, and AWMSG choosing to do a joint clinical assessment of some new health technologies, while still allowing NICE, SMC, and AWMSG to do separate economic evaluations and make divergent recommendations. The arrangement within Northern Ireland would be unchanged, whereby the Northern Ireland Department of Health endorses NICE guidance, unless it is not locally applicable. The suggested model would allow concentration of the necessary technical expertise that required for HTA and create a forum to discuss factors leading to divergent recommendations between NICE, SMC, and AWMSG, which can contribute to inequitable and delayed access to novel health technologies across the UK.

From the regulatory perspective, the UK will need to decide to what degree it wishes to align regulatory procedures for new drugs with the European Medicines Agency now that it has left the EU. So far, the UK has confirmed that it will continue to recognise medicine approvals from the European Medicines Agency for 2 years from Jan 1, 2021.[262] If the UK chooses to continue developing a separate approval process for all new drugs, then there is a risk that the process will delay access to new health technologies as many companies might choose to prioritise launching new drugs in Europe, which is a substantially larger market than is the UK.[263] Moreover, the UK's success in using temporary use authorisation processes for COVID-19 vaccines is not necessarily an indication that the Medicines and Healthcare Products Regulatory Agency has capacity to do robust regulatory evaluations of all novel health technologies in a timely manner. An alternative option, once this 2-year period has ended, would be to recognise authorisation for some new drugs from the European Medicines Agency by individual case, in a similar manner to countries such as Singapore,[264] subject to a so-called verification route lasting 60 days. The UK could commit to maintaining an observer status within the European Medicines Agency for the foreseeable future, which would allow the Medicines and Healthcare Products Regulatory Agency to continue to provide scientific input to marketing approvals by the European Medicines Agency, and vice versa. This observer status would minimise any potential disruption at the end of the 2-year period, while the UK builds capacity within the Medicines and Healthcare Products Regulatory Agency. This arrangement would be a temporary and could be reviewed in the future.

Recommendation 3: develop a sustainable, skilled, and inclusive health and care workforce to meet changing health and care needs

Health and care in the UK are facing a crisis in recruitment and retention of staff.[15] High vacancy rates directly affect patients, reducing access and quality of care, and staff, who have low morale and, in some cases, health problems. We recommend the development of health and care workforce strategies for the long term that take into account changing demands for health workers, skill mix, models of care, and advances in technology. Strategy implementation will require money but also changes in how things are done and a renewed emphasis on the health, morale, and wellbeing of the health and care workforce.

Recommendation 3A

This Commission recommends that each constituent country should develop and maintain a workforce strategy for the long term, focusing on the collective health and care workforce and supported by workforce planning that is addressed at a crossprofessional level, coordinated across the UK, and tied into NHS and social care expenditure plan. There is a distinct difference between workforce planning and a workforce strategy. Workforce planning is the process of analysing, forecasting, and planning workforce supply and demand.[265] A workforce strategy is the sum of efforts by relevant stakeholders to acquire, retain, develop, motivate, and deploy staff and should be informed by the various elements of workforce planning. This Commission acknowledges that, with devolution, each constituent country has, and will need, a separate workforce strategy.[15] We argue that, by 2022, each workforce strategy should take a long-term perspective and should: encompass the shape of the total future health and care workforce from the beginning of training until retirement; consider the entirety of the workforce rather than professional groups in isolation; focus on optimal skill mix for changing and increasingly integrated services; respond to demands that are created by changing health and care needs, emerging new models of care, and technological advancements; and prioritise the health and wellbeing of all members of the workforce, including informal carers. These actions will help to ensure high rates of recruitment and retention and to meet changing health needs. However, even though devolution requires separate strategies, as the UK operates in many respects as a single labour market, there is a strong case to coordinate the workforce planning that will feed into each strategy across the UK by 2022 (panel 9). This coordination would link financial planning to workforce planning, make best use of expertise, and ensure availability of essential data.

Workforce planning has too often considered health and care professionals in isolation and has focused predominantly on factors on the supply side, such as

Panel 9: The case for coordinating workforce planning across the UK

There are separate systems for workforce planning in each constituent country of the UK but inadequate collaboration and coordination between them. Despite devolution, each constituent country draws on a common UK, European, and global labour market, with regulatory and professional standards across the UK facilitating the movement of workers from one constituent country to another. Each constituent country has similar challenges, with substantial shortfalls and an imperative to adapt their workforce to meet changing health needs, implement new models of care, and capitalise on technological advances. This Commission believes that an approach across the UK would have the following benefits:

- Linking financial planning to workforce planning: although over half of health and care costs are attributable to staffing, there is a disconnect between workforce planning and health and care funding. Estimates of future requirements for the UK workforce would help to inform spending reviews that ultimately take place across the UK, with subsequent distribution according to the Barnett formula (panel 6).
- Making best use of expertise: workforce planning needs to cover the total workforce, take account of all relevant factors on the supply and demand sides, and incorporate alternative scenarios, including changing skill mix. Such planning is complex, and there is an argument for concentration of expertise to complete this challenging task.
- Ensuring availability of essential data: as emphasised throughout this Commission, health and care data that are collected by the constituent countries are often incompatible, which hampers comparisons and planning. Implementing workforce planning across the UK would stimulate efforts to improve the quality and consistency of data collection, as part of larger efforts towards a UK strategy for health and care data statistics (recommendation 6D).
- Generating evidence: understanding what works in terms of workforce planning and wider strategies to improve recruitment and retention of health and care staff is crucial to develop a sustainable, skilled, and fit-for-purpose health and care workforce. Each constituent country would benefit from improved coordination of research efforts, including a forum to share examples of best practice.

Panel 10: Workforce planning in the Netherlands

Workforce planning models are used by the Advisory Committee on Medical Manpower Planning, which was established in 1999. The inability of earlier models to consider substitution between health and care professionals was emphasised as a weakness.[266] The Advisory Committee on Medical Manpower Planning has developed a simulation model whereby alternative scenarios can be constructed involving both horizontal and vertical substitution between health and care professionals.[265] This model has been used in the primary care setting to consider scenarios that involve transferring tasks from general practitioners to physician associates and nurse specialists.[265] Comparisons between alternative scenarios are presented to stakeholders that are involved in planning. This process has contributed to a reasonable balance between supply and demand for the primary care workforce in the Netherlands. The success of this approach is reliant on the acceptability of the modelling method to stakeholders that are involved in the decision making process for training inflow numbers.

vacancies, recruitment, and retention. Instead, workforce planning should look at the collective workforce, taking account of factors on the supply and demand sides, and include alternative scenarios to adapt to changing health needs. Factors on the supply side should cover both entry to and exit from the workforce and current workforce characteristics. Demand factors include projections of changing health needs, estimates of unmet need, patients' self-care capabilities, and public expectations. Alternative scenarios to include in workforce planning models include different models of care, the introduction of new roles, and technological advancements, such as robotics and artificial intelligence. The UK can learn from modelling approaches across OECD countries.[265] For example, in the Netherlands, models for integrated workforce planning have been used to project alternative scenarios and inform the number of positions that are available for training places to achieve a more optimal balance between physicians and nurses in the primary care setting (panel 10). The development and implementation of these collective models for workforce planning will support the introduction of new roles and maximise opportunities for task shifting (ie, adapting roles and responsibilities between health-care professionals). However, this type of modelling should not be considered a solution for all. Indeed, the Netherlands does still have notable shortfalls in primary care, particularly in rural areas.[267] It is essential that workforce planning is seen as just one component of a broader workforce strategy, including several actions to improve recruitment and retention.

Recommendation 3B

We recommend that workforce strategies focus on achieving the optimal composition of multidisciplinary teams by working across traditional boundaries, introducing educational reform on the basis of competency-based training, incorporating technology to improve productivity, and developing new, collaborative models of care that actively engage patients, carers, and other service users. This Commission welcomes moves from all four countries to improve the skill mix in primary care[268,269] and acknowledges the consistent trend in the UK of a willingness by health and care organisations and staff to adapt, experiment, and implement task shifting between health professionals. The interim NHS People Plan rightly acknowledges that growth in the workforce alone will not be sufficient to meet future needs; additionally, skill mix needs to adapt to changing health needs and new ways of working.[270] However, task shifting between health professionals often occurs in an ad-hoc manner, frequently in response to acute staff shortages and vacancies.[15] Improved forward planning could help to ensure that appropriate knowledge and capabilities exist; overcome professional boundaries; and create the right organisational, institutional, and legislative environment to facilitate change.[271] Importantly, task shifting should occur in a manner that reduces pressure on a strained workforce. To enable this effective task shifting, we endorse the recommendations on task shifting from the EU Expert Panel on effective ways of investing in health.[272] The report rejected the traditional approach to task shifting, which is often viewed as a means to save money by transferring work to staff who are paid less than others. The report also extended the traditional model of task shifting by including not only transfer of tasks but also accompanying responsibilities and, where appropriate, rewards between different types of health workers, patients, or their carers and between all of these groups and technology (figure 7).

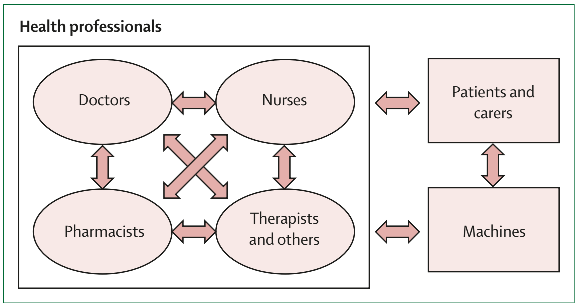


Figure 7: A new approach to task shifting
Our representation of task-shifting concepts from the report of the expert panel on effective ways of investing in health.[272]

The EU Expert Panel's report emphasised three main issues that should be addressed to implement change. First, capacity should be improved by promoting positive attitudes towards interprofessional working and working collaboratively with patients, reviewing existing training and education programmes, and ensuring that there are no legislative or regulatory barriers. Second, motivation of health-care professionals should be improved by engaging with people's expectations and fears regarding task shifting, improving organisational culture, and ensuring that task shifting to patients is closely monitored and empowers patients. Finally, opportunities for task shifting should be improved by ensuring robust evaluation of task shifting and that decision making is aligned with the overall goals of the health and care system, not solely driven by costs. Developing capacity, motivation, and opportunities to maximise the benefits from task shifting without increasing the burden on staff will ensure that the skill mix meets the changing needs of the population.

To improve opportunities for task shifting, this Commission endorses basing accreditation of health and care workers on competency rather than time, as recommended by the 2013 Shape of Training review. The review suggested that accreditation that is based on competency could allow doctors to change specialties by transferring competences, thereby allowing more career flexibility and the development of generalist skills in the workforce. Although the recommendations that were outlined in the Shape of Training have not been fully implemented, some UK medical royal colleges have taken action, such as the development of training for internal medicine by the Royal College of Physicians.[273] This Commission recommends that accreditation that is based on competency is extended across the health and care workforce. This extension would increase opportunities for career development, such as clinical support workers upskilling into nursing roles and nurses and allied health professionals moving between roles. Promoting career flexibility and creating additional opportunities for professional development will improve recruitment and retention and help individuals to be engaged throughout a potentially 40-year to 50-year career. To fully realise these goals, a fundamental shift in how health professionals are educated is required, including undergraduate training. Deans of medical schools have a responsibility to drive this change and to work collaboratively with health and care organisations at

Panel 11: A new model of community and hospital pharmacy

In England, there is approximately one community pharmacist for every two general practitioners.[443,277] Opportunities exist for pharmacists to work under supervision within general practitioner practices as part of primary care networks,[278] but expanding the role of pharmacists working within their own premises offers the potential to improve access to primary care services. Although progress to date has been disappointing, the next two decades could see the implementation of automated dispensing and systems for therapeutic decision making that are supported by artificial intelligence,[279] freeing up time for pharmacists to take roles with increased patient contact. To some degree, pharmacists are already taking this role. In England, a new 5-year contract has been agreed, including the development of a National Health Service community pharmacist consultation service, [280] through which National Health Service providers can refer service users to community pharmacists.

The hospital pharmacist workforce is smaller than the community pharmacist workforce, with approximately one hospital pharmacist for every 13 doctors in hospital settings in England.[44] Many efforts to expand the role of pharmacists, for example through independent and supplementary prescribing, have begun in the hospital setting.[275] Empirical studies have found no significant differences in the rate and severity of prescribing errors between pharmacists and doctors.[281–283] However, there is substantial variation in the degree to which pharmacist prescribers are used, with estimates ranging from fewer than 1% to 13% of medications prescribed in hospitals.[281,282] Barriers to expanding the role of pharmacist prescribers include a scarcity of ongoing professional development, a scarcity of engagement from general practitioners, and organisational factors, such as imposed formularies and a narrow scope of practice.[275]

To facilitate a meaningful shift in the model of community and hospital pharmacy, many steps need to be taken. Education and training of pharmacists at undergraduate and postgraduate levels need to adapt to include a greater focus on consultations, screening for red-flag symptoms, and taking social and medical histories. Adaption requires increased experimentation in and evaluation of novel patient pathways, including increased access to testing technologies at the point of care, referrals to medical and other service providers (eg, rapid diagnosis centres), and decision support systems that are enabled by artificial intelligence. Public and professional perceptions of pharmacists will need to shift to recognise them as independent health professionals who are capable of diagnosis and management of disease. Finally, for community pharmacists, reimbursement mechanisms will need to be reconsidered to reflect their changing responsibilities.

Panel 12: Opportunities for task shifting between health professionals and technology

According to the report of the expert panel on effective ways of investing in health,[272] tasks can be shifted from:

- community mental health nurses[288] and clinical psychologists[289] to autonomous embodied agents (eg, apps to support people with mental health problems);
- radiologists,[290] andrologists,[291] health scientists,[292] biomedical scientists, haematology laboratory technicians, clinical haematologists, and histopathologists[293] to digital image processing and analysis (eg, radiology, sperm counts, and haematology or cytology);
- medical laboratory assistants[294] and microbiology laboratory technicians[295] to automated production lines (eg, three-dimensional printing of implants, automated biochemical analysis, and microbial genetic analysis replacing culture);
- hospital care assistants, hospital nursing staff,[296] and community nursing staff[297] to autonomous monitoring and alert systems based on wearable technologies that are supported by artificial intelligence on servers and cloud technology (eg, electrocardiography; oximetry; and monitoring blood glucose, blood pressure, and ovarian cycle);
- physiotherapists[298,299] and occupational therapists to robot-assisted physiotherapy and rehabilitation;
- administrative staff (eg, clinical coders[300]) to automated systems (eg, automated hospital coding);
- pharmacists[301] and pharmacy technicians[302] to automatic or robotic ordering of medication and dispensing systems;
- and physicians[303] and public health clinicians and specialists[304] to decision making that is supported by artificial intelligence

the local level, and medical royal colleges and regulators have a responsibility at the national level. Additional recommendations that are related to reforming the training of health professionals are contained within our Health Policy paper.[15]

There are well-established examples of substitution between health professionals that can be developed further. First, there is a wealth of evidence that many tasks can be substituted effectively from doctors to nurses in ambulatory care settings without any negative implications for patient outcomes.[274] Second, the role of pharmacists in the UK has been expanding over several decades, through the use of independent and supplementary prescribing,[275] and by doing many tasks that are traditionally done by general practitioners in primary care.[276] This Commission believes that the role of pharmacists can be expanded further by empowerment as independent health professionals who are equipped with advanced skills in diagnosis and management (panel 11). Reforming workforce education through training that is based on competency will enable staff to transition between roles more easily, adapting the skill mix to meet the changing health needs of the population and ensuring high recruitment and retention rates.

As emphasised by the Topol Review,[284] workforce planning should explore opportunities for use of pre-existing and emerging technology as a substitute for health and care professionals to meet the changing health needs of the population and optimise the skill mix of health and care professionals. Emerging technologies have the potential to enable health and care professionals to spend more time with patients and reduce burnout. This Commission views this opportunity with cautious optimism, acknowledging that many human aspects of health and care delivery cannot be replaced or augmented by technology. Nevertheless, digital health technologies are already changing the relationship between health professionals and patients. Artificial intelligence has the potential to reduce the number of administrative tasks,[285] triage patients, and be used for image analysis,[286] and robotics are increasingly used to process pathology samples and within surgical operations.[287] To create a vision for the future, this Commission has reviewed many emerging opportunities for task shifting between health professionals and technology (panel 12). To support these efforts, undergraduate and postgraduate educational curricula need to rapidly adapt to ensure that staff are equipped with the right skills to maximise the use of these technologies.

A good example of harnessing technological developments is given by telehealth. This term refers to the use of telecommunications and virtual technology to deliver health services outside of conventional clinical settings. As noted previously, the COVID-19 pandemic has accelerated progress in implementing teleconsultation in both primary and secondary care settings. Many health professionals and patients are keen to ensure that this acceleration translates to sustainable change in the long term. Although telehealth providers might offer improved access to care for some groups of people, there are potential risks, such as misdiagnosis due to inability to do physical examinations; a tendency to overprescribe, overinvestigate, and over-refer; a scarcity of continuity of care; and the risk of digital exclusion.[305] Uncertainty exists regarding how current reimbursement mechanisms could be altered for telehealth providers, and there have been accusations of risk selection, with concerns that digital providers primarily register patients without complex needs.[306] This Commission recognises the potential of this technology to improve access for some groups of patients and supports NHS England's commitment that all patients will have the right to online and video consultation[307] but also recognises the potential for unintended consequences, such as undermining the financial sustainability of existing primary care services and excluding groups with low levels of digital literacy or people without internet access. We therefore recommends that a full independent review across the UK of the consequences of expanding the provision of telehealth services is commissioned by the end of 2021.

Now and in the future, the NHS will increasingly have to respond to emerging developments in digital health, such as wearables, image analysis that is supported by artificial intelligence, and rehabilitation robotics for people with disabilities. There is a need to put in place rigorous systems to evaluate and regulate the dissemination of digital health technologies across the NHS, especially given growing evidence of unintended consequences.[308] These systems should avoid creating unnecessary barriers to innovation and experimentation, while ensuring that necessary safeguards are in place. The use of robotics in the NHS has an existing regulatory framework under the framework for medical devices,[309] and NICE has developed an evidence-standards framework for digital health technologies, offering guidance to innovators and commissioners.[310] It is unrealistic to expect local commissioners to complete this process. This Commission recommends that NICE, SMC, and AWMSG should collaborate and be responsible for evaluating the clinical effectiveness and cost-effectiveness of novel digital health technologies, including any unintended consequences.

Recommendation 3C

We recommend that workforce strategies should be developed to monitor and be responsive to the health, morale, and wellbeing of the health and care workforce, including taking action to address discrimination and harassment. In embracing their role as anchor institutions (recommendation 4A), NHS and social care organisations have a responsibility to take actions to promote an inclusive culture, offer equal and fair employment opportunities, and have a zero-tolerance approach to discrimination and harassment of marginalised groups, such as women and people from a Black, Asian, and minority ethnic background [A: see email]. To this end, the NHS established the Workforce Race Equality Standard programme in 2015 to monitor racial disparities between staff, with annual reporting against nine key performance indicators.[311] These indicators have emphasised glaring disparities in how Black, Asian, and minority ethnic [A: see email] staff are treated in the NHS, and progress against these indicators over the 4 years during which they have been reported has at best been modest. Organisational leadership at high levels should take these standards seriously and put mechanisms in place to ensure that people in leadership roles in NHS organisations are held to account for failure to make substantial progress against the indicators that are monitored.

The COVID-19 pandemic has put unprecedented pressure on the health and care workforce, many of whom have been exposed to high-risk and challenging scenarios over an extended period.[120] There is a need to implement sufficient aftercare, including monitoring staff to identify people who need additional psychological support due to work-related stress.[120] This Commission also supports the recommendations of the NHS Staff and Learners' Mental Wellbeing Commission,[312] which recommended actions such as improving training in self-awareness and self-care, providing rest spaces during on-call shifts, enhancing peer group support mechanisms, and introducing a compulsory requirement in every NHS organisation to independently examine the death by suicide of any NHS staff member.

Unpaid carers form a crucial part of the health and care workforce, and estimates of the annual financial value of this contribution in the UK vary from £57 billion to £132 billion.[313] But pressure is building: the gap in the supply of and demand for unpaid carers is projected to reach 2·3 million people by 2035 in England alone.[314] Women provide most of the unpaid care in England and Wales, being more likely to be an unpaid carer and to provide care at higher intensities (ie, >20 h per week) than are men.[315] This amount of care has negative implications for the health and wellbeing of the unpaid carer, with evidence that the intensity of provision of unpaid care is associated with poorer mental and physical health.[316] Although evidence exists that the provision of care at low intensities (ie, <10 h per week) can actually improve health and wellbeing.[317] There are strong economic, health, equity, and moral arguments for immediately investing in consistent support for carers: to increase labour productivity, reduce projected shortage of unpaid carers, and improve the health and wellbeing of both carers and the people who they support. Policy should help to retain skilled workers within the workforce, even if they are also taking on carer roles.[318] Evidence suggests that the best approaches for supporting carers include a combination of interventions involving: indirect support (ie, support through providing services to people with care needs, such as respite care);[319] direct support (ie, support for carers, such as psychological therapy, training and educational interventions, and support groups);[320] and flexible employment conditions (ie, enablement of flexible working and care leave can help carers in employment).[321] Many psychosocial interventions involving cognitive behavioural therapy, educational programmes, and counselling to support unpaid carers are also cost-effective by use of a £20 000–30 000 per QALY gained threshold.[322]

There is a scarcity of training and professional development for some staff groups. Only 5% of the Health Education England budget is allocated to training clinical and non-clinical support staff.[323] Formal training and professionalisation of these roles would recognise the notable challenges that they face and give non-clinical and support staff the value and recognition that they deserve. There is also a scarcity of attention to the career development of health and care professionals who are in the middle of their career. This scarcity contributes to burnout and poor morale. As a basic principle, to ensure high rates of recruitment and retention, all workers should have access to opportunities for education, career progression, and professional development. This Commission recommends that all health and care workers, irrespective of role or stage of career, receive an annual review of their professional development and training needs. This action will also require a more proportional allocation of training funds to create enhanced opportunities for postgraduate training.

A major challenge for most health and care systems is an ageing workforce, and strategies need to be developed to support ageing staff. Many staff nearing retirement have considerable knowledge and experience that is of value to the NHS but retire early due to a scarcity of support or opportunities to adapt their roles. Reducing the number of NHS staff that retire early will require wider opportunities for job sharing, part-time working, and flexible working[324] and reducing on-call and out-of-hours commitments. Leadership roles, which are subject to high vacancy rates and short tenures,[325] should be made to look attractive, particularly for older staff, so that employers can make the most of their substantial experience. To meet this challenge, this Commission recommends that an independent review is launched to identify the most effective strategies to support an ageing health and care workforce.

Recommendation 4: strengthen prevention of disease and disability and preparedness to protect against threats to health

Since 2016, gains in life expectancy slowed in the UK. By use of data up to 2016, the Office for National Statistics estimated that, by 2043, life expectancy at birth would reach 83·7 years for men and 86·4 years for women.[326] Once updated by use of data up to 2018, the Office for National Statistics had revised their estimates down by 1·1 years for men and 0·9 years for women.[327] This Commission welcomes the ambitions of the UK Government to achieve 5 years extra of healthy life expectancy by 2030,[328] but argues that this goal will not be reached without a strengthened focus on prevention of disease and narrowing health inequalities. Such concerns are inextricably linked to the achievement of many UN Sustainable Development Goals by 2030,[329] which provide an important mechanism to hold governments to account for their policies. Prevention of disease should be incorporated into all aspects of action on health and wellbeing and sustained in the long term rather than with the variable commitment that has been evident over the past 30 years. Furthermore, the NHS should use all of its assets to make a full contribution to the health and wellbeing of society rather than focus mainly on treatment alone. Here, we make a series of recommendations with the aim of developing and embedding prevention and preparedness into the NHS and policy.

Recommendation 4A

We recommend that the NHS, social care, and public health should work in partnership with other public services, civil society, and other relevant organisations to take a whole-systems approach to prevention and environmental sustainability. NHS and social care organisations have a crucial role within prevention systems, which this Commission argues should: include truly integrated delivery of preventive services within the NHS and social care system that is aimed at both individual and collective action; encompass primary, secondary, and tertiary prevention; be based on the best contemporary evidence of effective action; minimise overtreatment, reduce preventable illness, and improve outcomes; focus across the entire life course (ie, childhood, working age, older age, and end of life); and address persistent health inequalities in the delivery of prevention and care.[63] As many preventive actions take place outside the health and care sectors, a whole-systems approach should be taken, where the NHS at the local level actively contributes to cross-sector partnerships with local authorities, community and voluntary sector organisations, relevant commercial organisations, schools, and other statutory service organisations, with shared investment and benefits accrued across agencies, to influence the contexts that create poor health and wellbeing and exacerbate inequalities.

We wish to emphasise three priority areas in which a whole-systems approach is urgently needed: childhood obesity, mental health, and health inequalities for Black, Asian, and minority ethnic [A: see email] groups. A whole-systems approach has successfully been applied to reduce obesity in Amsterdam, Netherlands,[330] and in Leeds, UK.[331] In Leeds, UK, much of this success has been attributed to the development of Health, Exercise and Nutrition for the Really Young, a preschool intervention (ie, for children aged 0–5 years) for obesity prevention that is targeted at disadvantaged areas, which engages with parents and young children to promote healthy lifestyles.[332] The Sure Start programme, which is aimed at preschool children, was an effective coordinator of activities that promote healthy lifestyles, such as the Health, Exercise and Nutrition for the Really Young programme, but requires substantial investment to reverse deep cuts that have been imposed since 2010.[333] A whole-systems approach is needed for the prevention of poor mental health, involving mental health services, primary and secondary care, children's social services, maternity services, schools, the police force, and transport services, where a clear economic case exists for investment (table 6). Addressing longstanding health inequalities for Black, Asian, and minority ethnic [A: see email] groups, which have been exacerbated by the COVID-19 pandemic, also needs a whole-systems approach. To address the health inequalities will require culturally competent health promotion and disease prevention programmes and actions to reduce inequalities that are caused by the wider determinants of health to be included as part of recovery strategies for COVID-19.[184] Trust needs to be rebuilt between health and care services and Black, Asian, and minority ethnic [A: see email] groups, and investment is needed in research and data collection to understand the societal drivers of health inequalities in Black, Asian, and minority ethnic [A: see email] groups.

	Partners involved	Evidence
Early intervention services for perinatal mental illness	Maternity services, primary care, and adult mental health services	Universal and selective interventions during the perinatal period can prevent or reduce mental illness and are cost-effective[334] (eg, parenting education and support and individual and group-based psychological approaches, including those offered by health visitors or internet facilitated)
Personal, social, health, and economic education	Schools	Personal, social, health, and economic education is a flexible curriculum that is intended to equip young people with the knowledge and skills to lead confident, healthy, and independent lives;[335] evaluation of Healthy Minds curriculum showed benefits for adolescents' mental and physical health at low cost[336]
Anti-bullying programmes in schools	Schools	KiVa is an evidence-based anti-bullying programme that is delivered by teachers, focusing on enhancing empathy, self-efficacy, and anti-bullying attitudes; an exploratory economic analysis of KiVa suggested that cost of delivery is small but generates substantial projected savings from reduced public sector spending and lost earnings, improved savings for individuals, and home ownership up to age 50 years[337]
Parenting programmes for conduct disorder	Children's social services, schools, primary care, paediatric services, child and adolescent mental health services, and youth justice system	The Incredible Years programme has consistently been shown to generate better outcomes for children and young people and be cost-effective;[338] modelling showed that the cost of the programme—at a mean cost of £973 per participant (2016 prices)—is fully recovered by the within 4 years, with further savings over subsequent years[339]
Early intervention services for psychosis	Primary care, emergency services, adult, and child and adolescent mental health services	Early intervention services offer intensive multifaceted support for young people who are experiencing a first psychotic episode;[340] there is a compelling economic case for early intervention compared with standard care;[340] potential short-term and long-term savings that are generated by early intervention services, accruing to the NHS (eg, through decreased inpatient admissions) and productivity gains (eg, through better engagement with employment)
Individual placement and support	Employers, adult mental health services, and employment support services	Individual placement and support aims to help individuals to obtain and maintain competitive employment; repeatedly shown to be effective in reaching higher rates of competitive employment, longer duration of employment, and more hours worked than have other approaches to employment support and to be cost-effective[341]
Multicomponent suicide prevention programmes	Primary Care, emergency services, secondary care, police forces, schools, adult, children and adolescent mental health services, and transport services	Multicomponent approaches to suicide prevention have been shown to be both effective and cost-effective; training general practitioners to recognise risk factors, followed by use of psychological interventions, and measures to reduce risks at potential suicide hotspots (eg, bridges) can reduce the risk of self-harm and suicide;[342] models have shown that increasing use of psychosocial assessment when individuals present to hospital emergency departments following deliberate self-harm has substantial economic benefits[343]
Collaborative care for physical health problems	Primary care; secondary care; and adult, child, and adolescent mental health services	A collaborative care approach that is delivered in primary care for individuals with diabetes or coronary heart disease, or both, and depression can be both effective and cost-effective;[344] modelling for Public Health England showed a substantial return on investment from a societal perspective and a relatively low cost per quality-adjusted life-year gained from a health and care perspective[343]

Table 6: **The economic case for a whole-system approach to the prevention of poor mental health by intervention**

NHS and social care organisations have an important role as anchor institutions within their local communities. This Commission argues that these organisations have a responsibility to take account of the health and wellbeing of local populations. They can maximise their effects on health and wellbeing through a wide range of actions, such as promoting an inclusive workplace, a zero-tolerance approach towards discrimination and harassment, facilitating equal employment opportunities, creating local employment opportunities, ensuring that procurement procedures do not disadvantage small-sized and medium-sized local organisations that provide benefit for the community, and delivering services in an environmentally sustainable manner.[345] By improving employment, through evidence-based actions relating to job design, effective management, and working conditions, NHS and social care organisations can have a marked effect on population health. The health and care sector accounts for between 10% and 17% of the workforce throughout the UK.[116] There are promising exemplars of anchor institutions that are improving fair and inclusive employment opportunities and changing procurement processes to benefit local communities and promote environmental sustainability, including in Leeds, UK (panel 13).

The NHS and social care organisations have made substantial progress in reducing their carbon footprint: in England, the health and care system reduced its carbon footprint by 18·5% between 2007 and 2017 while clinical activity grew by 27·5%.[348] The NHS England Sustainable Development Unit has categorised several specific actions, covering efficient energy use, waste management practices, and transport planning, according to their respective return on investment and

Panel 13: Maximising the health effects of anchor institutions in Leeds, UK

15 key anchor institutions in the Leeds City Region, Leeds, UK, including local authorities, universities, and hospitals, are estimated to employ approximately 150 000 people and spend £7·2 billion on goods and services.[346] 12 anchor institutions came together to identify and share good practice and focus on developing an initial strategic plan to guide anchor institutions on actions to take to maximise their social value.[346] The subsequent framework emphasised several core activities, including strengthening local supply chains, local procurement, social procurement, fair pay and quality jobs, inclusive opportunities, and place shaping. Many anchor institutions in the Leeds City Region have begun taking steps to maximise their social value to the local population. For example, action by the Leeds Teaching Hospital National Health Service Trust has included:

- ensuring that they provide good quality jobs that pay at least the national living wage[347]
- targeting recruitment drives (including apprenticeships) to the most deprived local communities
- changing procurement processes to enable the use of more local suppliers, bringing benefits to local employment, reduced transport costs, and associated environmental benefits[347]

tonnes of carbon emissions that are saved.[349] The Sustainable Development Unit collects annual data for the progress of NHS organisations in implementing these actions and reducing carbon emissions.[350] Similarly, NHS Scotland collects data for annual carbon emissions by health boards.[351] This Commission recommends that this reporting could form the basis of a composite indicator, developed to reflect the year-on-year progress of NHS and social care organisations in reducing carbon emissions. Each organisation would be ranked according to their performance, with updates published annually. A major challenge will be extending this indicator to social care organisations. However, NHS and social care organisations can work together at the local level to share best practices and improve compliance with reporting requirements. One priority area is to reduce unnecessary travel by patients, visitors, and staff, which accounts for 11% of total health and care carbon emissions.[348] COVID-19 has accelerated uptake of remote consultations; if this uptake can be converted into long-term and sustainable change then there is substantial potential to reduce carbon emissions.

Recommendation 4B

We recommend that the NHS should invest in prevention, both at the national and local level, combined with measurement and evaluation, including estimating return on investment. In addition to increased public health funding that is reserved for public health purposes only (recommendation 1C), we argue that the NHS in each constituent country should establish a separate funding stream for prevention by 2022. These funding streams would be used to sustainably invest in cost-effective or cost saving preventive interventions, thereby improving the efficiency and quality of care. Potential candidates for increased investment cover areas such as pre-conception care,[352] antenatal care,[353] postnatal care,[354] transitional care interventions,[355] case management programmes,[356] and personalised programmes for management of chronic diseases.[149] This fund should be managed in the same manner as a capital fund, with each constituent country required to set out a 10-year investment plan for national and local preventive interventions. In many cases, for example the prevention of poor mental health (table 6), investment will take place across multiple public sector organisations, thereby serving to improve the integration of care. An initial endowment would be topped up on an annual basis, overinvesting when possible, allowing the flexibility to underinvest in times of resource scarcity. This approach would smooth the availability of resources for prevention.

The economic case for investment in prevention is strong,[357] but too often policy makers ignore this evidence and prioritise funding for treatment over prevention. Attention is needed not only to generate evidence on prevention but also to identify effective dissemination strategies to emphasise the economic benefits of prevention to policy makers. By maximising the potential of data that are generated within and outside of the health and care system, return on investment of preventive interventions can be presented in the short, medium, and long term (recommendation 6C).[358] Return on investment should not exclusively be measured in financial terms but also incorporate estimates of improved mental and physical health and reduced health inequalities. Evaluating complex public health interventions will also require exploitation of natural experiments and methods that recognise this complexity in their evaluation.[248]

National, local, and organisational leadership at a high level should be responsible for the measurement and evaluation of activity and effect in relation to prevention. This responsibility includes measuring public health effect at the individual level, where health and care professionals can take advantage of routine encounters to “make every contact count”, and encourage positive health behaviours.[359] Potential measures include recording the use of screening questionnaires, the provision of brief advice, and referral for health checks.[360] Developing indicators and evidence generation should not be separated from usual service and it will be important to channel appropriate investment, such as National Institute for Health Research and infrastructure funding, and develop deep relationships with the academic public health and other disciplinary communities (recommendation 6D). Once preventive interventions are deemed to be cost-effective or cost saving, leadership at a high level has a responsibility to ensure that sustained investment takes place. This Commission recommends that the chief medical officer in each constituent country takes on this responsibility and reports annually on progress in reaching these goals to improve population health and reduce health inequalities.

Recommendation 4C

The drivers of poor health and inequalities lie across many sectors under the remit of multiple government ministries.[9] This Commission supports calls for action across governments by the All-Parliamentary Health Group[361] and argues that all UK administrations should have a strategy across government departments to promote health, wellbeing, and equity in all policies. The concept of health in all policies is not novel and it has been previously emphasised at both national[362] and local level.[363] The English health inequalities strategy (ie, 1997–2010) was associated with a decline in geographic inequalities in life expectancy, reversing a previously increasing trend.[364] Since the strategy ended, inequalities have increased. The key to developing an effective strategy across government departments is reporting and accountability, which can be achieved by embedding health, wellbeing, and equity in all policies within legislation, including the statutory requirement of all ministries to report to parliament each year. We emphasise developments in Wales, where sustainable development, including working towards a healthy and equal Wales, is already a legal obligation (panel 14). We recommend that the UK Government embeds a statutory requirement in legislation by 2022 to annually report on progress in achieving additional healthy life-years and narrowing health inequalities, aiming to improve accountability for cross-sectoral action on prevention and work towards achieving 5 years extra healthy life expectancy by 2030.

This Commission argues that fiscal and pricing policies should be included within strategies across government departments to improve health, wellbeing, and equity. These measures might generate powerful opposition from producers of harmful products and policy think tanks with funding from unclear sources. Therefore, the UK Government and devolved administrations should work closely with the public to inform and ensure that their health and wellbeing is paramount and considered above profit interests.

The most used fiscal and pricing mechanisms are taxes, charges, subsidies, and cash incentives.[368] Fiscal and pricing policies should target established risk factors that are linked to consumption behaviours that are driven by commercial interests. This targeting works best where demand is highly price elastic,[368] ensuring that consumers are responsive to changes in cost. The focus should be on curbing unhealthy behaviours through price regulation, such as minimum alcohol prices, and incentivising the uptake of consumption that is beneficial for health.[369] Scotland has shown the potential of minimum alcohol pricing to reduce alcohol consumption, with alcohol sales reducing by 4·2% in the first year following the introduction of a minimum price of 50 p per unit of alcohol in 2018.[370] Wales has also implemented legislation for minimum alcohol pricing.[371] Fiscal measures, such as product subsidies or other regulatory price measures, have been shown to be effective in increasing physical activity[372] and vaccination uptake.[373] Fiscal and pricing policies can also have a potentially catalytic effect on health. For example, emission policies, such as the congestion charge in London, UK, might not benefit only population health through reductions in pollution but also might encourage active travel, thereby reaping several public health benefits. Evidence suggests that fiscal measures can attract wide public support where revenue is earmarked for clear purposes (eg, sports facilities in schools and healthy breakfast clubs),[374] but these taxes should always be seen primarily as a means to encourage behaviour change, including, as with sugar taxes, reformulation by manufacturers. They should not be seen primarily as a means to raise revenue as, if they are successful, the income will decline.

Panel 14: Well-being of Future Generations (Wales) Act 2015*

Wales perceives good health and wellbeing for all (ie, Sustainable Development Goal 3) as an outcome, determinant, and enabler of all UN Sustainable Development Goals.[365] The Well-being of Future Generations Act, which passed in 2015, provides the Welsh Government and its 44 public bodies, including local government and health boards, with a legally binding commitment to sustainable development, including improving health, equity, and wellbeing of the population.[366] The Act includes several goals for the long term that focus on improving social, economic, environmental, and cultural wellbeing, with a statutory requirement to ensure that all public bodies adhere to ensuring that "the needs of the present are met without compromising the ability of future generations to meet their own needs".[366] These goals include safeguarding planetary health and promoting environmental sustainability. Notably, the Act established new structures, roles, and an accountability mechanism to improve implementation. At the local level, all public bodies must commit to wellbeing objectives and form local partnerships through public services boards with the responsibility to publish local wellbeing assessments.[367] At the national level, the auditor general for Wales has a duty to examine public bodies. Welsh ministers set out 46 indicators to assess progress towards wellbeing goals, and within 12 months of an election, the incumbent government is required to produce a report looking at the future social, economic, environmental, and cultural wellbeing trends to inform planning and policy.[367] Finally, the Act established the post of future generations commissioner to safeguard the interests of future generations by supporting public bodies in working towards achieving the wellbeing goals.

Recommendation 4D

We recommend that a transparent and coordinated approach to preparedness planning and response to future major threats to health should be developed across the UK. The contain-delay-mitigate-research strategy, which was promoted during the early phases of the COVID-19 pandemic, failed. Political leaders did not respond in time to the early warning from Wuhan, China.[375] Despite being invited, the UK Government controversially chose to not participate in EU efforts to jointly procure medical equipment, such as ventilators and PPE. Transparency has been scarce, as in the initial phases of the pandemic the UK Government decided not to release minutes of SAGE meetings.[114] To learn from this experience, it is crucial that a public inquiry is launched.[376] This inquiry is not only important to improve transparency and accountability but also to identify lessons learnt to ensure that we are prepared for future acute public health shocks.

This Commission recommends that structures and processes for consultation between the constituent countries of the UK in response to major threats to health are clarified and strengthened. So far, the Joint Biosecurity Centre has been established to review evidence on major threats to health in England, with little consultation with devolved administrations.[377] This Commission believes that improved systems for coordination, recognising the specific interests of each devolved nation and particularly that in many respects Ireland and Northern Ireland operate as a distinct phytosanitary unit, would facilitate improved preparedness planning through joint, regular exercises for health preparedness, through the critical appraisal of scientific advice, and when estimating resource needs to improve future surge capacity (panel 6). Preparedness planning across constituent countries of the UK should be transparent, avoiding a repetition of the secrecy and resulting inaction surrounding the 2016 Exercise Cygnus.[112]

A founding member of the European Centre for Disease Prevention and Control in 2004, the UK has played an active role in the institution's efforts to address communicable diseases, such as antimicrobial resistant infections, tuberculosis, and HIV in Europe. Maintaining membership of the European Centre for Disease Prevention and Control has practical benefits, such as access to the early warning and response system, an online portal that connects public health agencies in Europe. This system allows member states to share information regarding cases of communicable disease in as close to real time as possible. The European Centre for Disease Prevention and Control also offers a useful forum to share scientific advice and coordinate surveillance, preparedness planning, and response for communicable diseases across Europe. Since leaving the EU, the UK Government has withdrawn against the advice of the Department for Health and Social Care.[378] This Commission recommends that a future UK Government should revisit this situation to explore whether the UK could continue engagement with the European Centre for Disease Prevention and Control in a similar manner to other countries of the European Economic Area that are not members of the EU, such as Norway and Iceland.

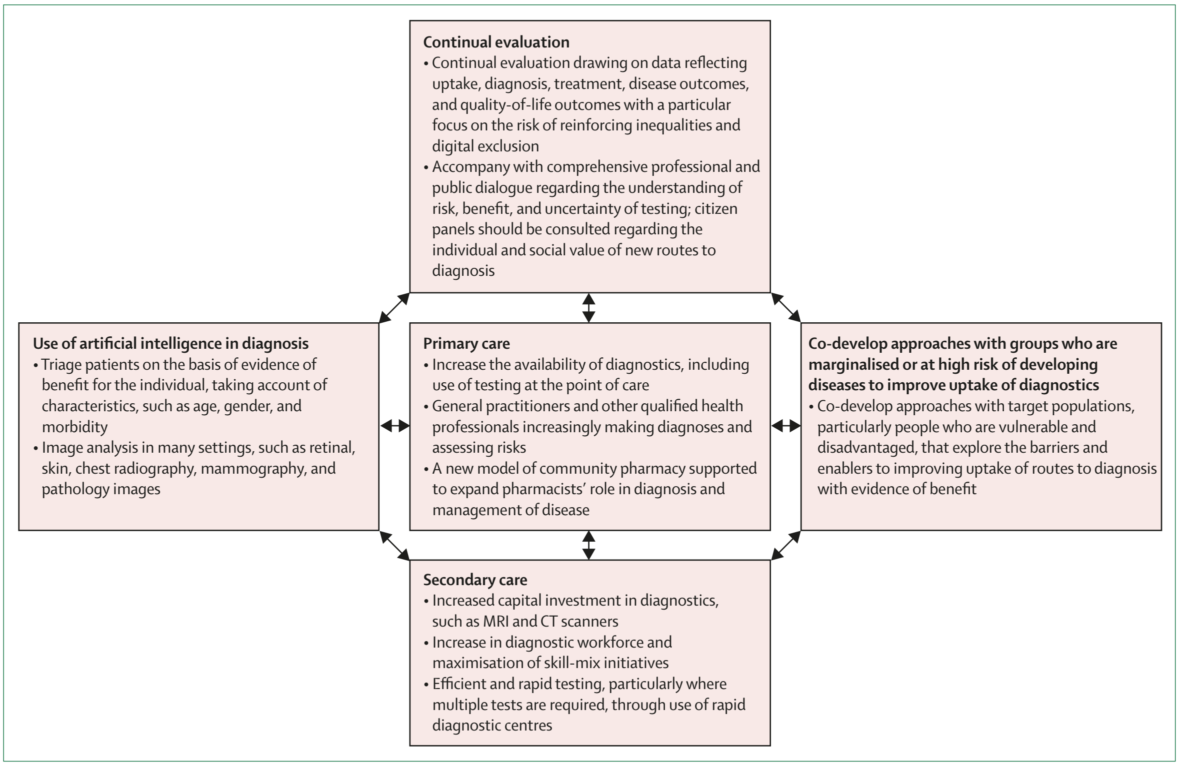
Recommendation 5: improve diagnosis, in circumstances where evidence exists to support early diagnosis, for improved outcomes and reduced inequalities

This Commission's view is that substantial scope exists to improve diagnosis, and subsequently outcomes, in the NHS while being appropriately cautious of the risks that are associated with overdiagnosis, which can cause complications, undue medicalisation, and mental distress.[379] We make several recommendations to improve diagnosis in the NHS. Importantly, these recommendations predominantly refer to areas where evidence exists that early diagnosis is beneficial. We argue for a more comprehensive dialogue and evidence on the benefits and risks of increased availability and access to diagnostics; the ethos of shared decision making and the fundamentally different relationship that is needed between the NHS and patients.

Recommendation 5A

We recommend that capital investment should be increased and skill mix should be optimised in both primary and secondary care to address unmet need for diagnostics that has been caused by the COVID-19 pandemic and to meet future need for diagnostics. Our recommendations (figure 8) are organised into: action that is required to meet current demand and recommendations for ongoing development of novel routes to diagnosis. In making these recommendations, fundamental prerequisites for improved routes to diagnosis include a recognised need within the target population, clear scientific evidence of effectiveness, and that the overall benefits should outweigh the harms.[380] The aim of these recommendations is to link investment in diagnostics to current and future needs, reduce inequalities in access to diagnostics, and reduce delays to diagnostics.

The immediate challenge for the NHS is supplying the required diagnostics and workforce to meet demand for pre-existing evidenced-based diagnostic pathways. In the short term, this supply is likely to involve substantially expanding diagnostic capacity to address growing unmet need for diagnostics for non-communicable diseases, such as cancer, cardiovascular disease, and diabetes, that has been caused by the COVID-19 pandemic.[83,381] Taking a long-term perspective, a growing ageing and multi-morbid population will continue to drive demand for diagnostics, and the UK is expected to diagnose approximately 500 000 cases of cancer per year by 2030 (ie, increased from approximately 360 000 in 2014).[382] Investment is required to purchase diagnostics, such as CT and MRI scanners, and the accompanying workforce. However, no clear plan exists regarding future diagnostic capacity, although it is clear that demand is rising rapidly and capacity is less than that in other OECD countries. To estimate what amount of investment is necessary, this Commission recommends that an



Continual evaluation
- Continual evaluation drawing on data reflecting uptake, diagnosis, treatment, disease outcomes, and quality-of-life outcomes with a particular focus on the risk of reinforcing inequalities and digital exclusion
- Accompany with comprehensive professional and public dialogue regarding the understanding of risk, benefit, and uncertainty of testing; citizen panels should be consulted regarding the individual and social value of new routes to diagnosis

Use of artificial intelligence in diagnosis
- Triage patients on the basis of evidence of benefit for the individual, taking account of characteristics, such as age, gender, and morbidity
- Image analysis in many settings, such as retinal, skin, chest radiography, mammography, and pathology images

Primary care
- Increase the availability of diagnostics, including use of testing at the point of care
- General practitioners and other qualified health professionals increasingly making diagnoses and assessing risks
- A new model of community pharmacy supported to expand pharmacists' role in diagnosis and management of disease

Co-develop approaches with groups who are marginalised or at high risk of developing diseases to improve uptake of diagnostics
- Co-develop approaches with target populations, particularly people who are vulnerable and disadvantaged, that explore the barriers and enablers to improving uptake of routes to diagnosis with evidence of benefit

Secondary care
- Increased capital investment in diagnostics, such as MRI and CT scanners
- Increase in diagnostic workforce and maximisation of skill-mix initiatives
- Efficient and rapid testing, particularly where multiple tests are required, through use of rapid diagnostic centres

Figure 8: Recommendations to improve diagnosis

independent review is commissioned by the end of 2021 in each constituent country of diagnostic capacity and projections of current and future optimal diagnostic capacity that is required to meet changing health needs. To help continual investment, diagnostics should be included within the remit of an annual capital investment plan (recommendation 2A). The counterfactual is increasing reliance on supplementary private health insurance to facilitate timely access to diagnostics, which will serve only to increase already notable inequalities in health outcomes.

Major shortfalls exist in the diagnostic workforce in areas such as radiology,[383] endoscopy,[384] and histopathology. [385] To address these shortfalls, skill mix needs to be optimised. Current examples include the use of non-medical endoscopists[386] and radiographer reporting,[387] but radical change is required. In primary care, new roles are emerging for allied health professionals,[268,269] but for such a model to be implemented effectively, physician associates, advanced nurse practitioners, and pharmacists should be enabled to make diagnoses and assess risk independently. A changing model of community pharmacy also has potential to improve access to diagnostic services (panel 11). At the level of secondary care, major opportunities involve artificial intelligence doing image analysis in many settings, such as retinal, skin, and chest radiography images.[286] Artificial intelligence can also be used to interpret digital mammography,[388] digital pathology,[389] and electrocardiograms.[390] Investment in artificial intelligence capabilities for diagnosis should be targeted to areas of greatest need in terms of potential benefit and where workforce shortages are most acute. However, like any new technologies, appropriately designed evaluation on a large scale is needed before widespread implementation. Risks include that artificial intelligence algorithms reinforce inequalities and the exclusion of marginalised groups by drawing on bias data.[16] For example, artificial intelligence algorithms that are designed to detect skin malignancy might not do as well across different ethnicities, or artificial intelligence algorithms that are designed for screening might underdiagnose some population groups if the training dataset is not representative of the general population.[391]

Recommendation 5B

We recommend that novel diagnostics and routes to diagnosis should be developed and rigorously tested where evidence exists to support early diagnosis, with cost-effective treatment that changes outcomes for individuals. The NHS needs to simultaneously be proactive and ambitious by considering multiple novel routes to diagnosis, particularly where conventional routes to diagnosis are associated with low or unequal uptake and there is evidence to support early diagnosis, and be responsive to emerging technological developments, which are creating a strong role for self-assessment through the use of wearables, self-testing, mobile apps, and artificial intelligence. Implementing novel routes to diagnosis risks increasing demand on an already strained service but also creates opportunities to improve both diagnosis and efficiency. In secondary care, the use of so-called one-stop clinics (ie, clinics where all the necessary tests for a diagnosis are available on the same day) can reduce the need for multiple visits to hospital, reduce time to diagnosis, and improve patient experience.[392] Novel diagnostics, particularly tests at the point of care, might reduce the need for otherwise invasive investigations. The Faecal Immunochemical Test can be used as a test at the point of care for symptomatic people who present to primary care.[393] This test could be a viable alternative to referral to colonoscopy, although the widespread use of the test before colonoscopy requires evaluation. Artificial intelligence algorithms, which capitalise on the increasing generation of data on patient pathways, that can be accessed through mobile apps might be able to triage some symptoms and offer a new route to accessing diagnostics.[394] Technological developments could forge a stronger role for people in diagnosis than now exists. For example, wearable devices have been developed to detect arrhythmias, such as atrial fibrillation.[395] However, the introduction of novel technologies by private companies without appropriate evaluation can create challenges, as frequent false positives could potentially overwhelm services. There will be, and is (eg, screening for dementia online), increasing self-testing through other commercial or NHS-provided diagnostics that can be used at home. Examples include the aforementioned Faecal Immunochemical Test, which is available within a home kit;[396] self-testing kits for sexually transmitted infections; and self-collection of vaginal swabs to screen for human papilloma virus in women who are eligible but do not attend screening, which is in use in Australia.[397] Challenges that are associated with self-testing include low reliability and the provision of inadequate information.[398] These challenges might lead to confusion, distress, and increasing demand on services.

When developing novel routes to diagnosis, we should be conscious of already persistent inequalities in the uptake of screening and testing for several diseases.[63] These inequalities are particularly prominent for many marginalised groups, such as Black, Asian, and minority ethnic [A: see email] groups, migrants, people who are incarcerated, and people who are subjected to domestic abuse.[399,400] Novel routes to diagnosis should be co-developed and tested with communities to ensure their acceptability to the populations that they seek to target, crucially not stigmatising groups with behaviours that put them at high risk and further decreasing the likelihood for engagement with diagnostic services. One positive example has been the implementation of low-dose CT screening for chest symptoms in deprived areas of Manchester, UK, which was co-developed with the community through social media, patient stories, awareness and briefing sessions, leafleting and posters, letters from general practitioners, and messages on prescriptions.[401] By use of this approach, screening adherence was high (ie, 1194 [90%] of 1323). Although, an expanded, larger, multisite trial is required before widespread implementation can be recommended.

Implementation of novel routes to diagnosis should be followed by rigorous evaluation, taking a mixed methods approach, that explores multiple perspectives and implications at the systems, organisational, and individual level. To support this evaluation, this Commission recommends that a quality framework for novel diagnostics should be co-developed with health professionals, patients, and citizens to provide evidence to society on these innovations by 2022. NICE has already developed a diagnostic assessment programme to assess the benefits and drawbacks of novel diagnostics,[402] but assessment is not mandatory. This Commission therefore recommends that, before the routine and widespread introduction of novel diagnostics in the NHS, they should undergo mandatory evaluation by the NICE diagnostics assessment programme by 2023. The aims of these recommendations are to improve the evidence base for new routes to, shorten pathways to, improve access to, and reduce inequalities in access and uptake of diagnostics.

Recommendation 5C

We recommend that a comprehensive professional and public dialogue regarding the understanding of uncertainty, risk, and benefit of testing and screeningshould be encouraged. Uncertainty exists when there is difficulty reaching an agreed quantification of risk or benefit.[403] Risk can be understood as the potential for harm, whereas benefit can be difficult to quantify because it is dependent on perspective and timeframe (ie, the benefit of testing for an individual can outweigh the benefits to society, and conversely, the benefits of testing for commercial companies can outweigh the benefit to both individuals and society).

A more comprehensive dialogue will involve effectively communicating risk to individuals on the basis of their characteristics, including age, gender, genetic profile, and morbidity, acknowledging the risk of harm and discussing the uncertain benefits to individuals who are diagnosed early, escaping progression and later manifestation. To achieve this dialogue, action needs to be taken at multiple levels. Undergraduate and continuous training needs to equip health professionals with the skills that are needed to make shared decisions with patients and communicate uncertainty, risk, and benefit effectively.[404] Patient decision aids can also help to enhance the appropriateness of screening and treatment choices.[405] Efforts to improve shared decision making should be extended within the NHS to include diagnosis. Guidelines and policies need to be informed by up-to-date and reliable evidence that takes account of issues, such as lead-time bias in clinical trials, and ensures that the identification of risk factors that takes place in contexts when communicating risk translates to health behaviours that reduce risks and improved health outcomes.[406] Public awareness campaigns should be designed in a manner that minimises anxiety and improves the uptake of diagnostics and interventions that are deemed to be cost-effective with a well-established and robust evidence base. Behavioural psychology, social sciences, and epidemiology can make an important contribution to this dialogue by producing research that identifies the most effective strategies. These actions will help to improve public debate and inform new models of shared decision making.

Recommendation 6: develop the culture, capacity, and capabilities of the NHS and social care to become a national learning health and care system

We make a series of recommendations, all centred around the vision of the NHS and social care in each constituent country becoming national learning health and care systems that are capable of serving multiple needs and goals with the ability to continuously improve.[16] The anticipated benefits of developing such capabilities would include a greatly enhanced ability to effectively prioritise, plan, and evaluate decisions about health policies; continuously improve the efficiency, quality, and safety of care delivery; personalise care; and create an ecosystem in which research and innovation flourish. Our Health Policy paper on HIT also discusses priorities for strengthening HIT in the UK,[16] including achieving the optimal balance between top-down and bottom-up implementation; improving usability and interoperability; developing capacity for handling, processing, and analysing data; addressing privacy and security concerns; and encouraging digital inclusivity.

Recommendation 6A

We recommend that each constituent country should deliver on commitments to give patients custodianship of a readily accessible, integrated, and electronic personal health record across health and care and support them to take more control of their health and care. All constituent countries have committed to giving patients access to their electronic personal health records.[16] Giving patients control over their own data can lead to improved professional practice,[407] decreased inappropriate interventions,[405] improved professional–patient communication (in part resulting from little use of medical jargon),[408] increased effective self-management, and improved health outcomes.[149] Achieving meaningful patient control of their medical records might require legislative change; will depend on effective political, managerial, clinical, and patient leadership that acknowledges that the system should be patient centred in practice, and not simply in rhetoric; and should be accompanied by appropriate investment in education, infrastructure, and support. The feasibility of such a system has been shown in the UK and in other countries (panel 15). The ambition in the long term should be to make patients the official custodians of their personal health records, while ensuring that data are accessible to patients and multiple providers throughout care pathways in a safe and secure manner by 2024, thereby acting as a key enabler to further integration of care, improvement of patient experience, and reduction of medical errors (recommendation 7). These goals will require investment in secure cloud-based computing to protect the privacy and confidentiality of patient information and achieve interoperability with pre-existing HIT products. They will also require changes to the way that data protection legislation is interpreted and implemented in the UK through local health and care record exemplars. Constituent countries should collaborate to reach these goals across the UK (recommendation 6C), particularly to account for the challenges that are associated with the provision of cross-border health and care services and the approximate 100 000 people per year who migrate between constituent countries.[412]

Concerns about patient access to patient health records include the risk of digital exclusion,[413] generating increased demand on clinicians' time,[414] or patients being reluctant to share sensitive information.[414,415] Studies suggest that many of these concerns are unfounded or the problems can be overcome, but much of this evidence has come from other countries, particularly the USA.[416] Emerging examples in the UK, such as Patients Know Best, PatientView, and Patient Access, also require thorough evaluation. The 2020 General Practitioner Survey identified that 5·8% of patients in England had accessed their medical record online.[417] More needs to be

For more on **PatientView** see https://www.patientview.org

For more on **Patient Access** see https://www.patientaccess.com

For more on **Patients Know Best** see https://www.patientsknowbest.com

Panel 15: Patients Know Best in Wales

Patients Know Best is an interactive electronic care record that is controlled by patients and was created by a social enterprise, which allows patients to access and add information to an account on the internet with smartphones and share it with health professionals in both hospitals and primary care. Already in use in many hospitals in England, after a pilot scheme in Abertawe Bro Morgannwg University Health Board, the Welsh Government launched a national roll-out, which started with providing access to all diabetic patients who were aged 16–24 years.[409] Although this patient health record system has many potential benefits, such as good usability and comprehensive data security, it is important that this initiative is carefully evaluated and accompanied by effective training for patients and health professionals. This system might not meet the needs of all personality types. Initial research from England suggests that patient health records met the needs of people with so-called controller and collaborator personality characteristics rather than avoider personality characteristics.[410] Barriers to uptake have also been identified, including concerns over security, risk averse attitudes of users, and problems with data integration.[411] Moreover, research needs to take place to understand whether platforms, such as Patients Know Best, are accessible and usable for older people or patients with multimorbidity and complex needs.

understood regarding who is accessing their personal health record and the barriers to improving uptake. Personal health records might be underused by population groups with low levels of digital literacy, such as older people or people with disabilities.[143] However, these groups can get considerable benefit from well-designed and carefully targeted digital tools, if given sufficient support. Enhancing health literacy and data literacy should be an NHS priority for patients and staff, and digital inclusion should be promoted in marginalised groups. Initiatives that seek to mitigate against the risk of digital exclusion, such as Digital Communities Wales[418] and the Widening Digital Participation programme in England,[419] should be encouraged.

Recommendation 6B

We recommend that HIT and data science leadership should be fostered to enable the routine use of data to continuously improve health and care planning, service delivery, and personalisation of health and care. The UK is making progress in transitioning from paper-based to electronic health records, although it still lags behind many other countries, such as Denmark, Estonia, and Sweden, which have successfully implemented HIT systems with high levels of interoperability across the health and care system.[416] Electronic health records are used more frequently in primary care than in secondary care and rarely used at all in social care.[16] The ambition should be to work towards electronic health records with high levels of interoperability, allowing the linking of health and care records and facilitating the efficient transfer of information between providers and with patients. There are many promising examples that have been developed locally across the UK, for example, the Connected Health Cities project in the north of England,[420] the Northern Ireland Electronic Care Record,[421] and the east London Patient Record.[422] We recommend that all constituent countries should complete the process of transitioning from paper-based to electronic health records and make substantial progress in digitising social care records by 2024 to create end-to-end digital infrastructures in health and care.

To achieve the vision of a learning health and care system, the NHS and social care in each constituent country need to develop increased capacity and capability to collect, process, link, analyse, interpret, and use data to improve decision making and delivery of care in secure and ethically sound ways. This improvement should include routine collection of measures of care experiences and health outcomes that are reported by patients. Investment will be needed in developing data literacy and facilitating earmarked time for activity to improve quality throughout the health and care system—including for executive leaders, managers, front-line staff, patients, and carers—so that the data that are generated as a natural by-product of care can be used to continuously support and improve policy making, care planning, service delivery, and personalisation of care.

Several cultural barriers have been emphasised for developing learning health and care systems, such as the higher status that is attributed to basic science research than to innovation or implementation, and the perceived low status of data analysts compared with other health professionals.[423] To overcome these barriers, strong leadership is needed at national, local, and organisational levels. The role of chief clinical information officer has been established at multiple levels in all constituent countries. The NHS Digital Academy is also building leadership capacity through a training programme, in which NHS Scotland, NHS Wales, and health and social care services in Northern Ireland are participating.[424] Leadership should prioritise encouraging the logistical, cultural, legal, and ethical shifts that are needed to ensure that data are used to support innovation, including enabling field experiments of different service models in real time, clinical pathways, and improvement strategies.[425]

A learning health system requires that data are seen as credible, secure, relevant, and actionable, while not too difficult or expensive to collect, process, and analyse.[426] Systematically collected data can show unwarranted variations in health and care practices, processes, and outcomes and identify areas for improvement,[427] but how this is done matters. As recommended by the Wachter Review,[428] engaging health and care professionals is key throughout the processes that are involved in data collection and analysis. Involving patients and lay people in the development of data-based apps and products is also important, particularly to ensure that mechanisms for meaningful informed consent are in place. Data clearly have a role in performance management, but the trade-offs that are involved in the use of data for this purpose need to be recognised and managed to avoid unwanted effects, such as gaming (ie, misrepresenting data), effort substitution (ie, a behavioural change that is tailored to measurable outcomes at the expense of outcomes that are not measurable), the creation of perverse incentives (eg, risk selection), and a culture of blame.[429] This recognition is particularly pertinent regarding systems that identify and respond to clinical error, which should be designed in a manner that encourages open disclosure, adequate investigation, and a willingness to learn, without fear of penalties or persecution.[430] Leadership has an important role in ensuring that initiatives for performance management are designed in partnership with health and care professionals, agreed targets are clinically relevant, and evaluation takes place to ensure that initiatives genuinely support continuous improvement.

This Commission argues that a major strength of the NHS and associated academic ecosystem is the many purposefully designed data exercises on a large scale, such as the National Clinical Audit Programme;[431] the National Reporting and Learning System for England and Wales and, its successor, the Patient Safety Incident

Management System;[432] the Health Data Research UK Digital Innovation Hub Programme;[433] and research projects, such as the UK BioBank, Understanding Society, and the English Longitudinal Study of Ageing. However, the effect of such exercises is dependent on their design and how outputs are presented and acted on. Outputs from many of these exercises tend to be reports or publications, which, although useful, do not necessarily support decision making.[434] Investment is needed in high-quality methods of data visualisation and in linking data to evidence-based strategies for quality improvement and decision aids for staff and patients.[435] Increasingly, the ambition should be to move towards as close to feedback in real time as possible. The UK can learn from abroad, where other countries, such as Sweden, have shown the potential of these exercises to drive quality improvement, improve health outcomes, and facilitate research (panel 16). The scope of data exercises on a large scale, particularly national clinical audits, should routinely extend across the UK. This extension would require coordinating funding across the UK and devolved governments but could facilitate sharing examples of best practice (particularly as health and care systems continue to diverge), identifying unwarranted clinical variation and emphasising inequalities in access. The remit of the Patient Safety Incidence Management System should be expanded to ensure that safety issues that are related to HIT can be captured, learnt from, and remedied. To achieve these aims, HIT vendors should be mandated to report any issues that they discover.

Recommendation 6C

We recommend that a data and statistics strategy for health and care in the long term should be developed and implemented across the UK. Health and care data across the UK are incredibly complex,[442] with national data collection from health and care collected by a multitude of organisations, each with its own scope, capacity, and capability to process and analyse data. Data linkage is scarce; often facilitated through several organisations (both not for profit and for profit) and resulting in data that are out of date and high access charges. Data application processes are lengthy and can take several months. There is substantial scope for each constituent country to learn from each other. The Secure Anonymised Information Linkage Databank in Wales has streamlined application processes and can now facilitate access to linked datasets on average in 12 weeks.[443] All constituent countries of the UK have also invested in national data safe havens,[444] which offer a platform to securely store, access, and analyse data. Although NHS Digital in England facilitates open access to many valuable datasets, barriers to maximising their use include many instances of longitudinal datasets changing structure or location without warning or documentation.[445] An overarching organisation could have an important role in coordinating pre-existing data authorities across the UK by mapping existing data collection, ensuring that data standards are met, linking datasets, and assessing current and future needs of health and care data. If their scope and responsibilities are expanded, then the UK Statistics Authority and Health Data Research UK are potential candidates. Efforts to deliver strategies for health and care data that are specific to the country and the system will still be relevant[446] but should be complementary to a strategy across the UK.

This Commission emphasises several priorities for a data and statistics strategy in the long term across the UK. First, a thorough review of data needs for health and care systems should take place with an emphasis on identifying unmet data needs for the public, policy makers, health and care professionals, and researchers. To begin this process, we have identified several data needs for health and care systems throughout this Commission (panel 17). Second, the introduction of standardised methods for data collection and coding can maximise the opportunity to link datasets and derive maximal public, patient, and consumer benefit from these diverse, complementary, and rich data assets. Crucial steps include the use of systematised nomenclature of medicine clinical terms by all health and care professionals operating across NHS and social care settings who enter data into electronic health records.[447] The collection and public reporting of reliable headcount and full-time equivalent numbers and the consistent use of surveys for all health and care staff groups across the UK are crucial steps to facilitating effective workforce

For more on the **UK BioBank** see https://www.ukbiobank.ac.uk

For more on **Understanding Society** see https://www.understandingsociety.ac.uk

For more on the **English Longitudinal Study of Ageing** see https://www.elsa-project.ac.uk

Panel 16: Quality registers in Sweden

The Swedish quality registers are a collection of over 100 clinician-led registers of patient-level data that are administered by the government in a diverse range of therapeutic areas, such as oncology, rheumatology, surgery, cardiology, and palliative care across the health and care system.[436] These registries include detailed data regarding patient characteristics, outcome markers that are reported by patients, biomarkers, and severity of disease and can be linked together to allow researchers to follow up with patients throughout the life course.[436] The registries are funded by financial support from either the Swedish Government or the Swedish Association of Local Authorities and Regions, and technical operations and analytical work are done by six university-based competence centres and six regional cancer centres.[436] The legal regulation of these quality registers is detailed within the 2008 Patient Data Act,[437] which states that patients must be informed that their data will be recorded in a particular quality register and be given the opportunity to opt out. Coverage is good, with approximately 60% of the quality registers covering greater than or equal to 80% of their target population.[436] There are many examples whereby Swedish quality registers have been used for purposes of quality improvement, such as improving adherence to national guidelines,[438] and for monitoring outcomes.[439] However, some people have expressed concerns that the registries are underused, and that there is a need for end users (eg, people who use the data for research) to receive training in registry-based research and benchmarking.[440] Since 2010, the quality registers have been used for so-called randomised registry trials, which offer potential to make routine, less expensive, and more efficient clinical studies than conventional clinical trials possible.[441]

Panel 17: Data needs for UK health and care systems

- Standardised data collection for the health and care workforce across all constituent countries (recommendation 3) to facilitate workforce planning
- Metrics to monitor and evaluate activity and effect in relation to prevention at both organisation and individual levels (recommendation 4) to identify the most effective preventive strategies
- Collection of comprehensive ethnicity data across the National Health Service and social care organisations including at death certification (recommendation 4) to understand and facilitate research into health inequalities for Black, Asian, and minority ethnic [A: see email] groups
- Metrics to evaluate the effectiveness of increased testing, screening, and novel routes to diagnosis (recommendation 5) to monitor risk of overdiagnosis, underdiagnosis, and iatrogenic harm
- Improved linkage of health and care datasets (recommendation 6) to map and evaluate pathways of care
- Metrics to contribute to an inequalities index to monitor and track the progress of local regions in narrowing health inequalities (recommendation 7) to identify enablers and barriers to narrowing health inequalities
- Metrics to assess the quality of integration of health and care at local level, accompanied by proportional collection of data across the total health and care system, including hospitals, primary care, social care, and mental health services (recommendation 7) to identify best practices in the integration of health and care services

planning (recommendation 3). Standardisation of data would also improve the reliability of aggregate data across the UK that is reported on a mandatory basis to international organisations, such as the OECD. Third, urgent attention is needed to improve access to linked health and care datasets, which can facilitate the evaluation of alternative policies and interventions across complete patient pathways. Improving access will require reducing costs and delays in access to linked data, improving workforce and infrastructure capacity to create linkages, and clarifying the legal frameworks that enable linkage of data. Fourth, mandating open application programming interfaces and coordinating closer alignment with research investments into HIT and data science will allow an ecosystem in which HIT research and innovation flourish and there is improved interoperability. NHS England recognises this benefit and promotes an open application programming interface policy.[448] Fifth, to build the trust and confidence of patients, citizens, and health and care professionals in the security of electronic health data, defining, implementing, and monitoring minimum standards for data security will be required. These standards involve regularly upgrading software, procedures for handling data breaches, use of virtual local area networks for secure cloud-based computing, and training users not to open suspicious emails. The public will also need to be counselled regarding the risk of sharing their personal health information. Finally, patients, citizens, and health and care professionals should be involved in mutually agreeing frameworks that define instances under which anonymised patient data can be shared with public or private organisations, expected terms and conditions, and codes of conduct for such partnerships to support the development of digital health technologies.

Recommendation 6D

We recommend that research and innovation efforts should be rebalanced and strengthened towards supporting health and care service delivery. Health services research examines access to and the use, costs, quality, delivery, organisation, financing, and outcomes of health, population health, and care services.[449] This research is not only about generating and analysing data but also about drawing on quantitative and qualitative research techniques and multiple disciplines, such as epidemiology, health economics, public health, and social sciences. This Commission believes that the research agenda is skewed towards novel treatments, with less focus on the use of research into health and care services, despite its potential to improve population health and narrow health inequalities. [450]

The UK has established an infrastructure to support research into health services. This support includes the largest funder in England, the National Institute for Health Research, which has an annual budget of around £1 billion.[451] In total, around £4 billion was spent on health research in the UK in 2018.[452] However, research into health and care services accounted only for around 6% of commissioned health research projects, with the other projects allocated to other research areas, such as the aetiology of disease, treatment development, and treatment evaluation.[452] Although this research is important, the crucial role of research into health and care service delivery in generating evidence on the optimal composition of services and their effectiveness for different patient groups needs to be better recognised than it currently is. This Commission recommends two key actions. First, research funding and activity needs to be distributed more effectively to public need and embedded through all parts of the health and care system and geographies of the UK to maximise the population benefit. This redistribution will require further coordination of the bodies that are responsible for health and care research in each constituent country, thereby facilitating opportunities for intercountry comparison and learning. Second, to capitalise on opportunities for knowledge generation (ie, developing and evaluating strategies to improve quality of care), the academic and front-line health and care workforce should be better integrated than it currently is. This integration will require investment in the development of the academic health and care workforce, which has reduced by 2·5% between 2010 and 2018.[127] Academic posts need to be created that are embedded across the health and care system, including in strategic positions, such as in CCGs and local authorities. To improve the pipeline of health and care academics, efforts for workforce planning are needed to map the pre-existing workforce and estimate future needs (recommendation 3). Multidisciplinary research skills and meaningful aspects of undergraduate and postgraduate training should be compulsory for all health and care professionals. Models that explicitly build capability and capacity for research in health, population health, and care services and produce high-quality research have been established in focused areas, such as stroke.[450] Learning from these models should be extended to cover the health and care system widely and be situated where population and patient needs are.

Two urgent priority areas for research into health and care services that were identified during this Commission include evaluating changes that were implemented at the system level in response to the COVID-19 pandemic, such as the rapid increase in uptake of remote consultations, and examining the effects of alternative policies that are used to promote integration between health and care. Although an academic community has built around research into health services, for example, through Health Services Research UK, there has not been the same amount of coordination between funders, the health and care system, research organisations, and research users as there has been for clinical research.[453]

Recommendation 7: improve integration between health, social care, and public health and across different providers, including the third sector

This Commission agrees with the almost universal consensus that improved integration of health and care is a high priority for the health and care systems in the UK. The four countries of the UK have progressed differently in integration at a systems level but all have ongoing challenges in providing seamless care, responsive to changing population needs. COVID-19 emphasised the continued absence of integration between NHS and social care, with many thousands of patients discharged to care homes without tests and major challenges in the procurement and planning for PPE and testing within social care.[454] The purpose of the recommendations here is not to suggest unnecessary reorganisation for which there will rightly be little appetite but to think to the long-term interests of the health and care system and the population that it serves. Current arrangements are dysfunctional. The recommendations run from those that can be enacted in the short term to those that will require more time but for which planning is needed now. We reiterate the paucity of evidence from which to evaluate and make more specific recommendations around models of integration and the need to not be overly prescriptive but to set principles for locally appropriate solutions.

Recommendation 7A

We recommend that system barriers that reduce integration of care should be removed, supported by appropriate legislation. It was evident throughout this Commission that all countries in the UK have similar challenges in improving integration. In emphasising systems barriers, there is a basis for sharing lessons learnt from successes and failures. To look only to non-UK countries for learning on integration is an important omission given that the systems in each constituent country resemble each other more than the systems elsewhere. We address organisational reform later (recommendation 7D) but recommend that several steps can be taken more immediately to reduce systems barriers and improve integration.

Primary care has a natural role as a key facilitator for many aspects of integrated care. However, its capacity to do so has been reduced with funding and workforce pressures. Many current integrated care programmes have not even adequately engaged with primary care.[455] Reinforcing and reorienting the capacity of primary care will help to reduce system complexity. This Commission therefore emphasises adequate funding and workforce planning for primary care as crucial to the success of integrated health and care systems in all constituent countries.

Competition between providers acts as a disincentive to collaboration across organisational boundaries. Competing tendering of contracts also generates avoidable transaction costs, with no discernible benefits on the quality of services. We recommend that the requirement to promote competition in England should be removed in line with current government proposals to repeal section 75 of the Health and Care Act 2012 in England.[456]

As part of a data and statistics strategy across the UK (recommendation 6C), metrics should be developed to track progress of the quality of integration at the local level. There are pre-existing metrics that are already used, including data for delayed transfers of care and unplanned hospital admissions, however, further metrics could be developed to capture data on patient experience, patient outcomes, and communication throughout pathways of care. The collection of high-quality data for integration of care can then be used to inform policy and practice.

A key enabler of integrated care is integrated care records with shared access that can facilitate joint working between health and care professionals and patients and improve seamless care (recommendation 6A). By 2024, information should follow the patient as they move within the health and care system in a way that can be securely accessed by patients and relevant providers, and when pre-existing health information systems are linked, data linkage should aim to be as close to real time as possible.

Throughout this Commission, we have emphasised diverging approaches to integration policies across and within the constituent countries. Further work needs to be done to systematically evaluate the effect of these policies. This work will involve drawing on embedded randomised or robust quasi-experimental designs.

Lessons can be learnt from the approach that is being taken to evaluate the Children and Young People's Health Partnership by use of a cluster randomised clinical trial (appendix 1 p 8).[457] The aim should be to improve the evidence base for what works well where and to identify potential candidates for replication elsewhere. This aim will require increased investment in research into health and care services, establishing a research programme to fund experiments on a large scale and yield high-quality evidence to use in the design and implementation of integration policies (recommendation 6D).

Recommendation 7B

We recommend that provider reimbursement should be reformed to ensure that incentives are aligned across the health and care system, commensurate with the interdependencies of productivity in each sector. Interventions, such as pooled budgets or personal health budgets, are unlikely to have a notable effect on the integration of services without structural changes to the way that providers are reimbursed on a large scale. This Commission recommends that payment should be aligned with promoting integration and efficiency. This alignment will require seeking an optimal mix between case-based, bundled, salaried, and capitation payments throughout the health and care system. To achieve this optimal mix, there needs to be a willingness to experiment with and evaluate potential alternative reimbursement mechanisms. This Commission commends the approach to reform of dental contracts in England and Wales, where several prototype contract models incorporating capitation and pay-for-performance reimbursement have been piloted.[458] An initial evaluation has indicated promising results in terms of improving quality, incentivising prevention, and maintaining access,[458] and there are provisional plans to roll out this contract from April, 2020.[459] Throughout this Commission, three policy options in primary care, dental care, and hospital settings were debated that could serve as potential candidates for future experimentation (panel 18). Principles to reform reimbursement of pharmaceuticals are discussed within recommendation 2.

Recommendation 7C

We recommend that the mechanisms ensuring the public accountability of organisations that are responsible for health and care delivery in the UK should be improved and clarified. Unlike some countries, constituent countries of the UK have neither a legally enforceable right to health or a defined benefit package setting out their entitlements.[466] As a consequence, there has been a progressive withdrawal by the NHS from some types of care, most notably a large share of dental care, optometry, some mental health services, and the long-term care of people with extreme frailty and dementia, in a process that has largely not had meaningful political scrutiny. Moreover, withdrawal of NHS care can occur in an implicit manner, for example, waiting lists for elective care have grown in the past decade, with one in five people in Northern Ireland now on a waiting list, thereby encouraging people to seek private care.[467] These numbers have undoubtedly increased during the COVID-19 pandemic. As noted earlier, some CCGs and previously primary care trusts have identified procedures that will not be funded by the NHS anymore, either for all or for some groups within the population, leading to what has been called a postcode lottery.[66] In principle, this technique can reduce waste, but these circumstances raise an important question. Are pre-existing accountability mechanisms for organisations concerned, including CCGs in England, health boards in Scotland and Wales, and health and social care boards in Northern Ireland, fit for purpose? New bodies, such as integrated care systems, have been adopted with an unclear statutory basis, although the new government white paper seeks to address this absence of clarity.[456] The proposed changes are welcomed, although pursuing legislative change through a parliament that is preoccupied with other issues, such as COVID-19, is challenging, exemplified by the ongoing delay in publishing a green paper on social care. Implementing the proposals should also be managed while local authorities, the NHS, and third sector organisations continue their pandemic response.

The decisions that still have to be made about health and care over the next few years will have a profound effect on the lives of many people, yet how their elected representatives can give voice to their interests and concerns is far from clear. We argue that clarity regarding the legal requirements of organisations that are responsible for health and care delivery is paramount to address what is, in effect, a democratic deficit.

A mechanism is required that creates accountability between the public and organisations that are responsible for integrating care. This Commission recommends that each local entity that is responsible for health and care delivery should report on their performance to an independent body that will be accountable to parliament in each constituent country. Reports of performance should include quality of integration and progress on narrowing inequalities in health and access to health and care services (recommendation 6C and 2B).

Recommendation 7D

We recommend that, by 2030, each constituent country should have in place single public sector entities with the responsibility of managing budgets and organising health and care (including primary care and public health) for geographically defined populations. This concept is already being worked towards. Northern Ireland has a long-standing presence of five health and social care trusts,[468] whereas Scotland and Wales have legislated for bodies that are responsible for planning and delivery of integrated health and care.[50,366]

Panel 18: Proposed policy options to reform provider reimbursement

Primary care

Policy option: offering all general practitioners National Health Service employment contracts

General practitioners would be offered voluntary National Health Service (NHS) employment contracts with similar terms and conditions to hospital consultants. This policy might begin in circumstances where primary and secondary care services are provided by the same organisation, such as health boards in Wales and Scotland and health and social care trusts in Northern Ireland, and later be extended to other settings.

Advantages

- General practitioners could focus on clinical activities as they would lose many of the management responsibilities that they currently have in running independent businesses.
- Facilitation of increased collaborative working between primary and secondary care, and reduce conflicting incentives to shift responsibility to one another.
- Increased certainty for trainees about their future pay and terms and conditions of employment, which will most likely increase recruitment and retention.

Drawbacks

- General practitioners might have decreased involvement in designing and running primary care services, despite useful insights into the local needs of the population.
- An employed model might reduce intrinsic motivations to improve or maintain the quality of services.
- An employed service might cost more and be less efficient than is the current model, which could have negative implications for patient access

Dental care

Policy option: abolishing co-payments for dental care

To align dental care with the rest of the NHS, we suggest experimenting with the abolition of patient co-payments for NHS dental care because an absence of affordability is a major barrier to dental care.[460] This suggestion would mean no co-payments to access or receive dental care, except for any prescription charges.

Advantages

- Improve access to dental care services, including preventive care for patients on middle and low incomes.
- Reduce health inequalities in dental health outcomes.
- Reduce administrative burden and costs that are associated with means testing for NHS dental care.
- Reduce burden on other NHS services that are created by poor dental health.

Disadvantages

- Would have substantial cost implications for the NHS (based on 2018–19 figures, the estimated UK costs would be approximately £1 billion per year).[461–464]

Hospital

Policy option: bundled payments for care episodes within a defined time frame for some diagnoses or procedures

Bundled payments are typically prospectively set and collectively cover multiple services within an episode of care, such as acute care, inpatient admissions, rehabilitation services, and ambulatory care, for a defined period of time.

Advantages

- Bundled payments incentivise improved coordination of care and integration of services, with the collective aim of reducing readmissions and avoiding complications.
- Bundled payments could reduce health and care costs[465] by discouraging unnecessary care and interventions.

Drawbacks

- It would be technically challenging to implement bundled payments for care episodes. Defining accountability is particularly challenging when care episodes involve multiple providers across the health and care system that rely on a complex landscape of pre-existing reimbursement mechanisms.
- There is the possibility of creating perverse incentives to reduce quality and access to services during the care episode.

This Commission does not make any recommendation as to whether the new entities be developments of existing NHS or local government organisations or entirely new creations. We acknowledge that the work to make this change, particularly in England, will be considerable and most likely take up to a decade. Systematically assessing the different options is beyond the scope of this Commission but should be urgently done. This assessment should draw on current and past (ie, from previous arrangements, such as district health authorities and regional health authorities) knowledge and experience to examine what models might work best in contemporary societies alongside current experience with devolution. An important requirement is that any new organisations be fully accountable for the health and wellbeing of their populations and for the public sector budget that is made available. The population size that is covered by such entities should make sense given pre-existing geographical boundaries and economies of scale that are associated with service delivery. We suggest that CCGs in England are too small to act as effective coordinators of services and that new, larger bodies should, where possible, be centred around local authorities, along the lines of many former rural and metropolitan county councils. Experiments that are underway in Manchester, UK, and elsewhere might offer useful evidence on which to base detailed proposals.[469] Where necessary, we recommend enactment of legislation to mandate such changes. The profession of public health has long had a core task of being the population's health advocate, but this central leadership role has been successively undermined by changes in health services over the past 3 decades.[470,471] The role requires re-examination to establish what leadership models should look like in the future.

Implementation of the recommendations

This Commission is conscious that many of the challenges for the NHS are not novel, and that there have been several other well-intentioned attempts to address these in the past (appendix 2 pp 1–8). This Commission does not seek to supersede these previous efforts; in some cases, we deliberately reiterate some recommendations. Although the implementing bodies that are responsible in each of the constituent countries are listed (panel 19), detailed plans for implementation were beyond the scope of this Commission. We do not intend this omission to reflect a neglect of the importance of implementation.

This Commission framed the recommendations within many key understandings. The process from agenda setting and policy formation to implementation is rarely linear.[472] The changes that we recommend are not purely technical processes but will require adaptive change. We recognise the challenges in implementation: the problems and organisational structures are complex, involving a broad range of stakeholders with differing institutional logics,[473–475] as we have described throughout the report. We recognise the political element of policy implementation and policy formation and the importance of understanding and taking account of the interests of multiple stakeholders.[476,477]

In forming the recommendations, this Commission considered the common impediments to policy success that were discussed by Hudson and colleagues.[478] We should temper our ambition with realism and avoid overly optimistic expectations. This realism is reflected in the timelines that are set and that some changes represent a continuation in direction of change rather than a radically new path. We have set out principles for changes to be implemented in dispersed governance (ie, at the national and local levels), rather than prescriptive models. Local context is often crucial. The recommendations also consider how to support learning for implementation within the NHS. – Interorganisational partnerships deliver health and care, and our policy making should likewise be fully shared and interorganisational. This Commission has stressed the need for integration, including policy design. The recommendations include consideration of organisational structures to bring administrations and organisations together. Finally, the political cycle might favour changes in the short term rather than efforts for the long term, which is a longstanding challenge for the NHS. Building on the common strengths and potential that are already in place, our changes require a vision for the long term, looking 10 years ahead. Throughout, we urge the strengthening of evaluation and use of data to inform change.

In summary, the recommendations respond to several issues that were emphasised repeatedly in the analysis of failures within the NHS and in challenges of implementation.[473–475] The recommendations emphasise the roles of strong leadership; relationships and collaboration; and improved accountability, capacity for monitoring, and evaluation as enablers for sustainable implementation.

Conclusion

The COVID-19 pandemic has brought the enduring strengths and weaknesses of the NHS and wider health and care system in the UK into sharp focus. Failures in leadership, an absence of integration between health and social care, chronic underfunding of social care, a fragmented and disempowered public health service, ongoing staffing shortfalls, and challenges in getting data to flow in real time are all important barriers to coordinating a comprehensive and effective response to the pandemic. Conversely, as one of the most comprehensive health systems in the world, providing free care at the point of delivery, the high amount of financial protection that is provided by the NHS and an allocation of resources that explicitly accounts for differing geographic needs have, to some extent, mitigated the already notable effect of the COVID-19 pandemic on health inequalities. Elements of the response by the NHS and other national executive agencies should also be commended and reflect the strengths of the health and care system and workforce. In a few weeks, critical care capacity was massively expanded, many thousands of staff were reallocated, and services were reorganised to prevent transmission of SARS-CoV-2. The NHS has collaborated with academic institutions in sharing knowledge about clinical characteristics of the disease and establishing world-leading clinical trials on vaccines and treatments.

Through this first and uniquely comprehensive analysis, this Commission has presented a vision for the NHS in 2030: working together for a publicly funded, integrated, and innovative service that improves health and wellbeing and reduces inequalities. Central to the argument of this Commission is that an ongoing increase in funding for the NHS, social care, and public health is essential to ensure that the health and care system can meet demand, rebuild after the pandemic, and develop resilience against further acute shocks and major threats to health, including multimorbidity and mental health. This funding should be targeted towards increased investment in capital, workforce, preparedness, prevention, diagnosis, HIT, and research and development and the NHS should develop new ways of working with patients and citizens. The NHS across the UK can leverage its strengths further and this Commission emphasises areas for more strategic collaboration between the constituent countries. In summation, our recommendations are about re-laying the foundations

Panel 19: Responsible organisations for implementation of recommendations

Recommendation 1: increase investment in the National Health Service, social care, and public health

National

Her Majesty's Treasury, Budget and Sustainability Directorate (Scotland), Financial Management Directorate (Scotland), Welsh Treasury, and Department of Finance (Northern Ireland)

Recommendation 2: improve resource management across health and care at national, local, and treatment levels

National

Her Majesty's Treasury, Department of Health and Care, Budget and Sustainability Directorate (Scotland), Financial Management Directorate (Scotland), Health and Care Directorate (Scotland), Welsh Treasury, Department of Health and Social Services (Wales), Department of Finance (Northern Ireland), Department of Health (Northern Ireland), National Health Service (NHS) England, NHS Scotland, NHS Wales, Health and Care (Northern Ireland), National Institute for Health and Care Excellence, Scottish Medicines Consortium, and All Wales Medicines Strategy Group

Local

Clinical commissioning groups, health boards, health and social care boards, and local authorities

Recommendation 3: develop a sustainable, skilled, and inclusive health and care workforce to meet changing health and care needs

National

NHS England, NHS Scotland, NHS Wales, Health and Care in Northern Ireland, Health Education England, Skills for Care, NHS Education for Scotland, Scottish Social Services Council, Health Education and Improvement Wales, Social Care Wales, Northern Ireland Medical and Dental Training Agency, Northern Ireland Social Care Council, General Medical Council, General Dental Council, Nursing and Midwifery Council, and medical royal colleges

Local

Hospitals, primary care providers, mental health trusts, social care providers, commissioning groups, local government (including social care and public health), health boards, health and social care boards, universities, medical schools, and the public

Recommendation 4: strengthen prevention of disease and disability and preparedness to protect against threats to health

National

UK Parliament, Welsh Government, Scottish Parliament, Northern Ireland Assembly, Department of Health and Social Care, NHS England, NHS Scotland, NHS Wales, Health and Care in Northern Ireland, National Institute for Health and Care Excellence, UK Health Security Agency, Office for Health Promotion, Public Health Wales, Public Health Scotland, Northern Ireland Public Health Agency, Ministry of Housing, Communities and Local Government **[A: correct?]**, Department for Work and Pensions, Department for Environment, Food and Rural Affairs, Department for Education, Department for Transport, and Ministry of Justice

Local

Hospitals, primary care providers, mental health trusts, social care providers, clinical commissioning groups, local government, health boards, health and social care boards, schools, universities, prisons, individual health-care professionals, and the public

Recommendation 5: improve diagnosis, in circumstances where evidence exists to support early diagnosis, for improved outcomes and reduced inequalities

National

Department of Health and Care, devolved governments, Health Education England, NHS England, NHS Scotland, NHS Wales, and Health and Care in Northern Ireland

Local

Hospitals, primary care providers, mental health trusts, clinical commissioning groups, local authorities, local health boards (Wales and Scotland), health and care boards (Northern Ireland), health and care trusts (Northern Ireland), and hospital trusts

Recommendation 6: develop the culture, capacity, and capabilities of the NHS and social care to become a national learning health and care system

National

UK Statistics Authority, Health Data Research UK, NHS England, NHS Scotland, NHS Wales, Health and Care in Northern Ireland, Health Services Research UK, UK Health Security Agency, Office for Health Promotion, Public Health Wales, Public Health Scotland, Northern Ireland Public Health Agency

Local

Hospital trusts, primary care providers, mental health trusts, local authorities, public health teams, and social care providers

Recommendation 7: improve integration between health, social care, and public health and across different providers, including the third sector

National

UK Parliament, Welsh Government, Scottish Parliament, Northern Ireland Assembly, Department of Health and Social Care, NHS England, NHS Scotland, NHS Wales, Health and Care in Northern Ireland, UK Health Security Agency, Office for Health Promotion, Public Health Wales, Public Health Scotland, and Northern Ireland Public Health Agency

Local

Clinical commissioning groups, local authorities (including social care and public health), local health boards (Wales and Scotland), health and care boards (Northern Ireland), health and care trusts (NI), hospital trusts, primary care providers, mental health trusts, and social care providers of the NHS to meet the changing needs of the whole population and ensure resilience to future health shocks.

Call to action

The NHS is one of the major achievements of the UK. A postwar context that was characterised by political and economic uncertainty was perhaps an unlikely setting for the foundations of universal coverage, but since July, 1948, millions of people have benefited, and continue to benefit, from access to care of a high quality that is based on clinical need and not ability to pay. The NHS has many immediate challenges, particularly addressing the growing unmet need that has been caused by the COVID-19 pandemic. The future is uncertain in terms of economic effects and the potential for a further pandemic. In the long term, we should strive for an innovative and resilient health and care system and provide outcomes for all citizens that align with being the fifth largest economy in the world.

Committing to increased investment in the NHS, social care, and public health to the levels that we set out will be challenging in economically and geopolitically uncertain times. But in the wake of this pandemic and leaving the EU, much like in the late 1940s, the UK will face a once-in-a-generation opportunity to invest in the health of all its population and secure the future of the NHS for the long term. The proposed changes to taxation are achievable; the UK has a lower tax burden than do many other similar high-income countries, and public support to increase tax to improve health and social care is high. Any decision not to increase funding and support the recommendations that are outlined here risks the UK falling further behind other countries in health outcomes, continued deterioration in service provision, and a weakened NHS to meet future major health threats. Similar to previous generations, the NHS exists under our custodianship and we have a responsibility to current and future generations to secure its survival in the long term.

Contributors

EM and AlM, as co-chairs of this Commission, developed the concept of the report and designed and supervised the study. MicA, EP, AlM, and EM, as a writing group, drafted the report. All commissioners participated in discussion of the study results and recommendations at every stage and contributed to the analysis of the results and the final manuscript. MicA and EP coordinated all Commission meetings and internal review processes.

Declaration of interests

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