The Future of the NHS: Re - laying the foundations for an equitable and efficient health and care service post COVID-19

Executive Summary

The UK's response to the pandemic

The UK has experienced one of the highest death rates associated with COVID-19 in the world, whether measured as deaths directly attributable to COVID-19 or by excess mortality. The reasons for this are complex and not yet fully understood, but elements of the UK government response have been criticised including delayed implementation of social distancing measures, poor coordination with local authorities and public health teams, a dysfunctional track and trace system, and a lack of consultation with devolved nations. The role of the 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, must also be critically examined. Conversely, aspects of the response by the NHS and relevant national executive agencies deserve recognition. In a matter of a few weeks, critical care capacity was massively expanded, many thousands of staff reallocated, and services re-organised to reduce transmission of coronavirus. The NHS has 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 the fore some of the chronic weaknesses and strengths of the UK's health and care systems, as well as the very real challenges in society to health. Failures in leadership, a lack 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 all proved to be important barriers to

coordinating a comprehensive and effective response to the pandemic. More positively, the high level of financial protection provided by the NHS and an allocation of resources that explicitly accounts for differing geographic needs have to some extent mitigated the already significant effect of the pandemic on health inequalities.

The LSE-Lancet Commission on 'The Future of the NHS'

This UK-wide 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 faced by the NHS. The National Health Service (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 the cradle to grave.

Against this backdrop and considering international evidence, the Commission sets out a long-term vision for the NHS of:

 'Working together for a publicly funded, integrated, and innovative service that improves health and reduces inequalities for all'.

The Commission makes seven recommendations, and associated sub recommendations, for both the short- and long-term, with a ten-year horizon:

1. Increase investment in the NHS, social care and public health. The Commission proposes that yearly increases in funding of at least 4% are needed for health, social care and public health.

2. Improve resource management across health and care at national, local and treatment levels.

3. Develop a sustainable, skilled and fit for purpose health and care workforce to meet changing health and care needs

4. Strengthen prevention of disease and disability, and preparedness to protect against major threats to health

5. Improve diagnosis, in circumstances where evidence exists to support early diagnosis, to achieve better outcomes and reduce inequalities in outcomes

6. Develop the culture, capacity and capability to become a 'learning' health and care system.

7. Improve integration between health, social care and public health and across different providers including the third sector.

Central to the argument of the Commission is that an ongoing increase in funding for the NHS, social care, and public health is essential to ensure the health and care system can meet demand, rebuild post pandemic, and develop resilience against further acute shocks and major threats to health. This funding must be targeted towards increased investment in capital, workforce, preparedness, prevention, diagnosis, health information technology, and research and development. Furthermore, the NHS must develop new ways of working with patients and citizens. The Commission sets a vision of transformation to meet changing health and care needs of the UK population but rejects any calls for a large-scale reorganisation of the NHS in order to achieve this. Past experiences have taught us this 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 pandemic has reinforced the economic case to invest in health, which is crucial for fiscal sustainability and enhancing societal wellbeing.[1] However, we acknowledge that committing to increased investment in the NHS, social care and public health will be challenging in economically and geo-politically uncertain times. To implement the funding recommendations, the Commission estimates that total expenditure would need to increase by around £102 billion in real terms, or 3.1% of GDP in 2030-31. Tax reforms would be required to increase funding and we provide

indicative analysis of the levels of potential change required to Personal Income Tax, National Insurance Contributions and Value Added Taxation.

The Commission serves as a call to action. We argue that, similar to the establishment of the NHS post-Second World War, post-pandemic and post-Brexit, 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 risks a continued deterioration in service provision, worsening health outcomes and inequalities and an NHS poorly equipped to respond to future major health threats.

Introduction to the Commission

The UK's National Health Service (NHS), established in 1948, is one of the most comprehensive health systems in the world, 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, attributable to the 2008 financial crisis, to face the challenge of the global COVID-19 pandemic. This 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 faced by the NHS and wider public sector were being highlighted. 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 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 and analysis of the COVID-19 response continues, our report is the first to provide this 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 this vision.

Commission remit

This Commission on the Future of the NHS offers a distinct contribution in that it:

1. Combines 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.

2. 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 media accounts of 'crisis' which typically focus on a narrow set of issues such as waiting times, delayed transfers of care, access to new medicines, and 'winter crises', treating each of them in isolation.[3]

3. Draws systematically on evidence from across the UK (England, Scotland, Wales and Northern Ireland) and internationally, assessing the direction of change over time, current challenges and priorities for change.

4. Builds on the findings and recommendations of other commissions and inquiries, and goes further than their remit by looking to 2030 and beyond. The recommendations are specific, but framed within wider long-term visions towards which the NHS is already moving.

5. Concentrates on a limited number of high priority recommendations that are ambitious yet specific and targeted, and specifies the bodies responsible for their implementation.

The 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, the Commission favours evidence-informed policy analysis and recommendations, and a pragmatic, grounded approach.[7] Ideology has prevailed in NHS reforms in recent decades without convincing evidence of benefit.[8] The Commission supports the continuation of a publicly funded NHS for all, on the basis of evidence of benefit and a lack of evidence to support change.

While the Commission contains important learning for international audiences, its remit is to provide recommendations focused on the health and care systems across the UK constituent countries. We discuss the importance of broadening this perspective to develop an understanding of the role of other sectors and wider environmental, social, economic, and commercial determinants of health within an accompanying background 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 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 envisage that improving health will be integral to the UK's commitment to the interrelated Sustainable Development Goals, including health and wellbeing, gender equality, ending poverty, quality education and productive employment for all.[11]

Social care is intrinsically linked with healthcare but was not nationalised into one public institution in 1948 and does not provide universal coverage free at the point of delivery. The Commission considers social care in terms of its interrelationship with the NHS and funding requirements. It also considers the impact of the NHS discharge policies on excess mortality in care homes during the COVID-19 pandemic,[12] but the Commission's remit did not allow as thorough an analysis for social

care as for the NHS. The Commission notes the historical disparities in funding, priority, respect and political will afforded to mental health compared to 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 must have parity and it will be vital to recognise the role of organisations beyond the NHS.

Commission process

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

Panel 1: Overview of the LSE-Lancet Commission process (2017–2020)

Origins of the Commission

Professor Elias Mossialos and Professor Alistair McGuire, London School of Economics and Political Science (LSE), were approached by The Lancet to be Co-Chairs of a Commission on the Future of the NHS, to launch after the 70th anniversary of the NHS.

Commissioners

The Co-Chairs, The Lancet Editor and Deputy Editor selected commissioners according to a number of criteria: geographical location (to ensure representation from the UK constituent countries), interdisciplinary background (to achieve a range including medicine, dentistry, public health, mental health, health policy, economics and political science); experience within the NHS (frontline and managerial); gender; and, knowledge of health systems outside the UK (to ensure learning from international experience). Full details about the Co-Chairs and Commissioners are provided http://www.lse.ac.UK/health-policy/research/LSE-Lancet-Commission/LSE-LANCET-COMMISSIONERS . Commissioners were involved throughout the Commission, meeting seven times as a whole group and multiple times within working sub-groups.

LSE Research Team

A research team led by Dr Michael Anderson and Dr Emma Pitchforth, combining expertise in public health, health systems and policy research, health economics and clinical NHS experience, were employed by LSE to work with the Commissioners and co-chairs throughout (see acknowledgements).

Underpinning analysis

The Commission team, with the Commissioners, developed eight background papers in key domains incorporating evidence from the UK and internationally on: health and care funding; health needs; structure and organisation of the NHS; health outcomes, quality and safety; patient and public engagement; workforce; health information technology (HIT); and evaluation of novel technologies. These are published contemporaneously in The Lancet publications,[9,14–16] or incorporated within appendices of this report. 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 UK constituent countries were compared as part of the underpinning analysis. Where comparisons were not possible, England was used as the reference case. The Commission focused on learning from key commonalities and differences between the countries centred on the eight domains. Our reporting and recommendations were tested with Commissioners and stakeholders from the constituent countries and country-specific elements developed as required. Our recommendations focus mainly on desirable UK-wide changes, although country-specific elements are highlighted. Relevant implementing bodies are identified for each country.

Stakeholder consultation

In addition to reviewing evidence in each domain, extensive stakeholder consultation was undertaken in all constituent countries including meetings held in Edinburgh, Cardiff, Belfast, and London. The views of government, professional bodies, trade unions, royal colleges, patient organisations, academics, citizens and other stakeholders were sought and were an important contribution to the Commission. Methods of consultation included:

- An open call for evidence submissions (33 received)
- An evidence hearing (7 organisations)
- Targeted meetings (76 individuals)

A list of the organisations involved in the consultation and summaries of the hearings and meetings are provided as Supplementary Material 2. The Commission reports draw on these meetings and materials throughout.

International comparisons used

An important element of the Commission was to place the NHS in an international context and draw on international case studies. The G7 countries and EU15 countries in 2019 were used as standards.

G7: Canada, France, Germany, Italy, Japan, the United Kingdom and the United States (sometimes the US is excluded as an outlier in terms of expenditure and variation in outcomes).

EU15: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom.

Main messages from the Commission

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

Panel 2: The Future of the NHS: strengths, weaknesses and priorities for action

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Health and care in the UK: strengths

- **Response to the COVID-19 pandemic:** Certain aspects of the NHS response warrant commendation such as the willingness of the workforce to adapt in unprecedented circumstances, and implement system-level changes such as the rapid increase in uptake of remote consultations to prevent transmission of coronavirus.

- **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 incidences of catastrophic expenditure due to out-of-pocket health spending in the world.

- **Redistribution**: access to the NHS is not dependent on ability to pay and the distribution of resources is generally poverty-reducing, except for preventative care, diagnostic services, and a few specific treatments.

- **Resource allocation (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 pharmaceuticals and new technologies.

- **Chronic disease outcomes:** the NHS performs well in outcomes for certain chronic diseases, for example diabetes and kidney disease.

- **Research and innovation:** the UK has a well-established history of world-leading health research, recently highlighted by the establishment of influential clinical trials on vaccines and treatments for COVID-19.

Health and care in the UK: weaknesses

- **Pandemic preparedness and response:** at the time of writing the UK has one of the highest death rates related to COVID-19 in the world. A combination of factors such as limited excess capacity in NHS services, poor supply of personal protective equipment (PPE), initial low capacity for testing, an erosion of public health capacity, and barriers to integrating data have all impeded the NHS response.

- **Funding:** over the last three 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 reduced in real terms and is also lower than in most other high-income countries. Resource allocation (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 a lack of transparency and accountability in relation to resource management.

- **Inequalities:** significant inequalities in life expectancy and healthy life expectancy persist between UK constituent countries and among different population groups classified by deprivation and ethnicity.

- **Health outcomes:** increases in life expectancy have stalled in the UK, and the UK performs poorly in comparison to other high-income countries in relation to important health outcomes including survival from common cancers, 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 head of the population than many high-income countries. A lack of strategic direction and ineffective workforce planning has resulted in a failure to adapt the skill-mix to respond to changing health needs, and significant 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.

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Health and care in the UK: priorities for action

- **NHS funding:** increased spending on health, funded through broad-based general taxation. This requires a long-term commitment 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 better financial protection in social care, through a substantial injection of public funding. This also requires a long-term commitment to increase funding by at least 4% per year, on average, in real terms.

- **Spending wisely:** develop a 'spending wisely' framework to support resource management and priority setting across health and care at national, local and treatment levels. Independent analysis of health and care workforce and resource needs is required to inform spending reviews.

- **Workforce planning:** each constituent country should maintain a long-term workforce strategy to optimise skill-mix and prioritise the health and wellbeing of staff and informal carers. These strategies should be underpinned by effective UK-wide integrated workforce planning that takes account of both supply- and demand-side 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. The UK should retain membership of the European Centre for Disease Prevention and Control (ECDC) post-Brexit.Workforce planning: each constituent country should maintain a long-term workforce strategy to optimise skill-mix and prioritise the health and wellbeing of staff and informal carers. These strategies should be underpinned by effective UK-wide integrated workforce planning that takes account of both supply- and demand-side factors.

- **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, each constituent country should develop and implement a cross-government strategy to promote health, wellbeing and equity in all public policies.

- **Diagnosis**: when there is evidence to support early diagnosis, to improve outcomes by increasing availability of diagnostics, testing new routes to diagnosis and targeting high-risk populations, particularly the vulnerable and less advantaged.

- **Learning**: develop and implement the organisational culture, health information technology (HIT) infrastructure, and capacity and capability to become a UK-wide 'learning' health and care system, maximising the potential of a data-rich system to benefit patients. Re-balance and strengthen research and innovation efforts towards supporting health and care service delivery.

- **Integration:** reduce structural barriers to the integration of care, increase accountability, and work in fundamentally different ways with patients, carers and the public in order to achieve the aims of integration and development of seamless care for patients.

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, UK-wide strengths, benefits not realised, and

challenges facing the NHS. Separate background papers discuss at length the challenges 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 the Commission's vision for the

NHS in 2030 and beyond and our detailed recommendations for change. Supplementary Material 1

includes an expanded analysis of organisational and structural challenges facing the NHS across the

four UK nations. Supplementary Material 2 includes an overview of the processes underlying the

commission including a review of recommendations from previous NHS commissions, a list of

organisations and individuals consulted with, and written evidence submissions received during the

Commission. Supplementary Material 3 provides detail on the methods and assumptions underlying

our funding calculations.

Panel 3: Terminology used in Commission report

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 used

throughout this Commission report.

Health and care refers to the whole health and care system, incorporating the NHS, social care and

public health. This is consistent with definitions of health systems as having the primary purpose of

promoting, restoring and maintaining health (mental and physical).[17] The use of 'health and care'

allows us to refer to the whole health and care system without specifying the different institutional

arrangements across the UK constituent countries.

Where appropriate, we refer specifically to the NHS, social care or public health, using the following

definitions/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, 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 in need or at risk. **Adult social care** (including working age and older adults) refers to the personal and practical support provided to enable adults of all ages to retain independence and best quality of life possible. This is paid for either publicly or privately and can be provided by a range of public, private and third sector providers (formal care) or on a voluntary basis by family and friends (informal).[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] In general, 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 (Supplementary Material 1). It includes provision by the NHS and local authorities as part of the health and care sector, but also cross-sector partnerships with local authorities, community and voluntary sector organisations, relevant commercial organisations, schools and other statutory service organisations.

The NHS in the UK: protecting the health of citizens

The origins of the NHS

Established on 5th July 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, that care be comprehensive, and access be based on clinical need and not ability to pay- still largely hold true. The NHS was preceded by the 1911 National Insurance Act that provided health insurance for industrial workers, allowing them access to a developing family doctor service.[20] World War II saw

some nationalisation of health services, as hospitals were registered and centrally run from 1938.[21]

To some extent the NHS built on schemes already initiated in the constituent countries but extended coverage to all. [22,23] Social care has a more complex history 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 has been 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 (Supplementary Material 1).

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, prosperity and to provide financial protection from the direct costs of ill-health. Beveridge saw the NHS as a fully integrated component of welfare provision addressing 'five giants': Want, Disease, Ignorance, Squalor and Idleness. 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 fared so well. 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, in contrast, has remained an 'island of universalism' in comparison to general UK welfare benefits provision.[26,27]

[Insert Figure 1: UK Health, education and defence spending as shares of total spending]

Source: Authors' Calculations using data from Health Foundation/Institute for Fiscal Studies[28] and HM Treasury[29]

International Comparisons

Many health outcomes are significantly worse for the UK than those of other high-income countries (Table 2), most of which spend a greater proportion of GDP on health and care (Table 1). This Commission argues that not only can the UK, as a wealthy country, afford to increase spending on

health, but that spending must increase if its relatively poor health outcomes are to be improved

and that additional health expenditure can benefit macroeconomic growth and societal welfare.

However, the impact of relatively low levels of health spending in the UK on health outcomes is

compounded further by relatively low levels of spending on social expenditure and welfare benefits

(Table 1). Consequently, in considering the public funding required for the NHS, an important

consideration of the 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.[30] This means that increased

healthcare spending cannot come at the expense of the wider welfare state.

**[Insert Table 1: Inputs to health and care systems across countries (ranked), 2019 or latest
available OECD data]**

Source: OECD data[31]

**[Insert Table 2: Comparison of health outcomes across countries (ranked), 2019 or latest available
OECD data]**

Source: OECD data[31]

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 common to all four countries whilst 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. Prior to devolution, the NHS

had operated against distinctive historical, legislative and political backdrops in each constituent

country.[32,33] Devolution offers a natural experiment from which to derive health system and policy learning. This has never been fully exploited, frustrated by the lack of comparable data,[33] limited funding for inter-country research, and interactions between policy makers, and, as evidenced through our consultations, a lack of political will. Twenty years after devolution, this is an opportune moment to take stock. In this section and within supplementary material, we summarise key differences between the countries but argue that common features make collective and comparative learning important. Stakeholders' views expressed as part of our consultations reflected an appetite to learn from international experiences but less so, in some cases, from other UK constituent countries. This is a missed opportunity.

The current structure and organisation of the NHS in the UK constituent countries is summarised in Table 3, with key population and health and care characteristics provided in Table 4. The latter includes a brief summary of the provision of and eligibility for social care in each constituent country, with detailed information provided in Supplementary Material 1. From the initiation of the Commission, it was clear that despite some differences in population and the structure and provision of services, many challenges experienced 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.

[Insert Table 1 : Comparative structure of the NHS across UK constituent countries (2020)]

[Insert Table 2: Comparison of selected health and health and care indicators in constituent countries of the UK]

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 3). Primary care provides the first point of contact for patients. GPs coordinate care and act as gatekeepers to access to specialists who, despite

some changes in models of working, still work primarily in hospital.[47] A major difference has been the adoption of competition and the purchaser-provider split in England,[48] and the rejection of this model by Scotland and Wales with development of systems based on collaboration. Northern Ireland has maintained the purchaser-provider split but has generally not employed the commissioning levers. Northern Ireland remains the only system where health and care are fully organisationally integrated. However, all countries are converging towards greater integration of health and care services, perhaps most notably Scotland, in 2014.[49]

The constitutional arrangements for devolution usually preclude UK-wide mechanisms for agreeing common elements of public policy,[50] which has enabled differences in charges faced by patients. For example, prescription charges only exist in England. Entitlement to social care varies, with Scotland providing free access to personal and nursing care for over-65s, unlike the other countries. Devolution to the constituent countries of the UK has recently 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.[51]

In the early stages of the COVID-19 pandemic, the UK's response was almost identical across the constituent countries. All constituent countries receive scientific advice from the Scientific Advisory Group for Emergencies (SAGE) and coordinated through the Civil Contingencies Committee, also known as COBRA, both of which have a UK-wide remit. The experience in setting up field hospitals, first in London, was also shared across the UK, and assisted by the British Armed Forces. All constituent countries implemented an enforced lockdown on 23rd March 2020, supported by legislation, the Coronavirus Act 2020, [52] and promoted the 'stay at home' message. The UK also jointly procured PPE, diagnostics and medical equipment such as ventilators throughout the pandemic. The response of the constituent countries began to significantly diverge when on 10th May the UK prime minister announced a new slogan, 'stay alert', and a phased lifting of lockdown measures from 13th May, guided by a newly established Joint Biosecurity Centre (JBC).[53] Amid

complaints about a lack of consultation, Scotland, Wales and Northern Ireland chose not to endorse this message or the proposed timeline for lifting lockdown.[54] Following the lifting of lockdown measures and subsequent repeat surge of infections in Autumn 2020, the response of the constituent countries diverged further.[55] The lack of a coherent and coordinated UK-wide response has caused significant confusion and disruption for many.

The NHS across the UK: common strengths

The Commission, drawing on stakeholder consultations (Supplementary Material 2), identified several common strengths of the NHS across the UK: 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 from 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,[56] with the UK reporting some of the lowest rates of catastrophic health spending in the world.[57] While 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 not eligible for exemptions, leading to significant differences in access by socio-economic groups.[58] For social care, public funding is restricted (to a lesser extent in Scotland) so the potential for significant financial costs being borne by individuals is substantial. The Dilnot Commission on social care in England found that one in ten older people could face catastrophic care costs of £100,000 in their lifetime.[59]

Redistribution

The supporting system of taxation for the NHS is generally progressive, imposing a higher tax rate for high-income earners compared to 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, the more-healthy subsidise the less-healthy,[60] further reducing inequality. The redistributive effect also depends on the utilisation of health care. Evidence from the NHS in England,[61] estimates the lifetime hospital costs as substantially higher in more deprived populations, thereby increasing the redistributive effect. Other analysis has shown that the distribution of NHS resources is generally poverty reducing, with some notable exceptions including preventive care, diagnostic services, and a few specific treatments.[62]

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, (i.e. 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 formulae, 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.[63] The benefits 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. Geographical differences in the provision of services within and between countries do exist, however. For example, availability of in-vitro fertilisation (IVF),[64] and certain elective surgeries,[65] varies between areas, reflecting local choices in light of financial constraints. This leads to what is termed a 'postcode lottery', over which local people have no control in the absence of mechanisms of public accountability. The actual formulae for allocation to local health authorities undergo

continual refinement and allocations draw upon routinely collected data to ensure they are responsive to changing health needs.[66] 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.[67]

Assessment of new technologies

The methodological appraisal of new technologies remains a strength of the NHS. The UK bodies responsible for this function, including the National Institute for Health and Care Excellence (NICE), the 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 are increasingly important, whether those offering 'ground-breaking new opportunities for the treatment of disease and injury',[68] or others, highly specialised, that target small groups of patients with rare conditions. Advances and expansion of technologies such as artificial intelligence (AI), genomics, robotics and digital applications will also require robust evaluation.[69] There remain challenges in translating the principles of health technology assessment, based on the cost per quality-adjusted life-year (QALY), into broader, national-level decisions about how to allocate resources. For example, there appears to be bias towards treatment over prevention, despite analyses showing that the marginal spend on public health is three to four times more effective than NHS spending on health services, in terms of additional QALYs gained.[70] This has contributed to the reduction in public health capacity over the last decade discussed further below, leaving the UK vulnerable to health crises such as the COVID-19 pandemic.

Chronic Disease Outcomes

Comparative international data shows the UK performs well for some chronic diseases. A multi-source analysis found that, the UK had the 2nd lowest age standardised death rate, and 3rd lowest

age standardised prevalence rate for chronic kidney disease in 2017 when compared to all EU15 and G7 countries.[71] The UK also provides comparatively high access to transplantation, with one of the highest kidney transplantation rates per 1,000 dialysis patients in the world.[72] Using the latest available OECD data, the UK has the fifth lowest age-sex standardised hospital admission rate for diabetes, and the second lowest age-sex standardised rate for foot and leg amputations for diabetes, when compared to all EU15 and G7 countries.[31] However, OECD also reveals the UK performs relatively poorly for other chronic diseases. Again, using OECD data, the UK reports the highest age-sex standardised hospital admission rate for asthma, when compared to all EU15 and G7 countries.[31]

Research and Innovation

The NHS continues to make the UK an attractive destination to conduct clinical trials. The UK leads Europe in terms of early clinical research, with the highest number of Phase I and Phase II clinical trials started in 2017,[73] and the third highest number of Phase III clinical trials. [73] The ability to coordinate and rapidly initiate large-scale clinical trials has been demonstrated during the COVID-19 pandemic, as the NHS has been at the forefront of international research efforts to identify effective treatments. The Randomised Evaluation of COVID-19 thERapY (RECOVERY) Trial is a multiple-arm trial involving over 11,000 patients that aims to identify treatments that benefit people hospitalised with suspected or confirmed COVID-19.[74] Preliminary results have been released throughout the pandemic, informing treatment regimens internationally.[74] 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.[75] For example, NHS data were made rapidly accessible to enable improvements to transmission models, and a symptom tracking app engaged members of the public in the largest citizen science project ever mounted.[76]

Response to COVID-19

The NHS, from a point of very limited 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 healthcare in unprecedented circumstances. Many staff were redeployed to unfamiliar service areas and were required to quickly learn and apply new skills. Thousands of healthcare staff came out of retirement to bolster services despite putting themselves at considerable risk,[77] and hundreds of thousands of people registered as volunteers to aid in the UK's response.[78] New ways of working have emerged. For example, community pharmacists have worked closely with GPs and district nurses to enable rapid access to emergency supplies of end-of-life medications for patients vulnerable to deteriorating quickly;[79] primary care practices have actively sought out vulnerable patients in order to develop personalised care plans;[80] and there has been closer collaboration between primary and secondary care as many GPs have sought specialist advice remotely to avoid hospital admissions and prevent unnecessary face-to-face specialist appointments.[80] The NHS demonstrated its ability to embark on large-scale reorganisation of healthcare services in response to changing health needs. The NHS rapidly increased critical care capacity and set up several temporary hospitals over a matter of weeks. While the Nightingale hospitals and their equivalents outside England have been under-utilised to date, there are many other examples of reorganisation which should leave a lasting legacy: both primary and secondary care accelerated the digitisation of healthcare services, providing consultations via telephone and video; emerging primary care networks were solidified as GP practices worked together to triage patients to different sites based upon whether they had symptoms suggestive of COVID-19;[80] and NHS and independent sector providers collaborated to facilitate the continuation of cancer services.[81]

The NHS across the UK: benefits not fully realised

Subsequent sections of the report and accompanying background papers provide detailed discussion of the opportunities and challenges in key areas of health and care systems in each constituent country. Based on this analysis and the stakeholder consultation, we argue that there are six broad

areas where potential benefits are not being fully realised and where there is potential for inter-country learning, all of which involve <u>greater integration</u>:

1. of service provision, particularly across the health and care system

2. of public health capacity

3. of long-term workforce planning

4. in evaluation of health technologies and service delivery

5. of health and care information technology systems, sharing learning to maximise improvements in quality of care

6. in working with patients to achieve shared decision making and manage expectations.

This is not an exhaustive list of yet unrealised benefits, but rather priority areas where the NHS can work differently. They 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 people-centred health systems 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 based on the best available evidence. [82]

Integration of the health and care systems

We found consensus on the need for better integration of health and social care across all countries, with individual countries taking different steps to achieve this (Table 3). Supplementary Material 1 includes an expanded discussion of the challenges to integrated care. Poor coordination of care and sharing of information lead to inefficient and ineffective use of resources and poor patient experience. Added to this, there is frequently controversy over what constitutes NHS care and what constitutes social care which, due to current means testing for social care, has significant financial

implications for individuals and their families, particularly in England. There is little evidence that frequent attempts at large-scale reorganisation such as the Health and Social Care Act 2012 have improved integration across health and care,[83] or facilitated the shift of patient care to community settings.[84] In contrast, it has been argued that the Health and Social Care Act 2012 has led to greater fragmentation of services and challenges when commissioning services.[85] Other interfaces which continue to hamper meaningful integration of care that require attention include the transition between paediatric and adult health services which often leaves many young people without adequate continuity of care and lacking in support,[86] poor collaboration between mental and physical health services despite their inter-related nature,[87] 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 latter case, this leads to patchy, fragmented and poor quality care towards the end of life for many individuals.[88]

While health and care services can be structurally aligned, Northern Ireland demonstrates how other barriers, such as an over-emphasis on the hospital sector, limited interoperability between information systems, a lack of leadership at all levels of the system, and weak political will can limit successful integration (Supplementary Material 1). 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. [49] This has 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 (Supplementary Material 1). 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 (LHBs).[89] This 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. [90]

The COVID-19 pandemic has demonstrated how, despite progress towards greater integration, there is still significant 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 15th in England, this was without a standardised policy or requirement to test patients being discharged to care homes.[91] This 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 (DNACPR) decisions were sometimes taken without adequate discussion with residents, families or care home staff.[92] Despite £1.6 billion of emergency funding allocated to local authorities in England,[93] social care providers felt they did not have access to the resources necessary to respond to this wave of admissions. At the peak of the pandemic, 43% of respondents to a survey of care home providers were not confident in their supply of PPE, and 58% felt that they were unable to effectively isolate residents with symptoms suggestive of COVID-19, primarily because of inadequate staffing levels.[94]

Integration of public health capacity

In 2013, some parts of the public health function in England were re-located from the NHS to local authorities as part of widespread structural reforms triggered by the 2012 Health and Social Care Act.[48] 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 (PHE) or remained within the NHS, for example the commissioning of vaccination programmes in primary care. In Scotland, Wales and Northern Ireland, public health has continued to remain structurally part of the NHS. The reforms in England were highly controversial. Some supported the policy, framing it as public health 'returning home', arguing that public health is better positioned within local authorities where it could build bridges between multiple stakeholders including the hospitals, GPs, schools, and social services to coordinate multi-sectoral public health

strategies.[95] However, others felt the restructuring fragmented public health services and served only to create new structural barriers to achieving meaningful integration of public health within health services.[96] The UK government has announced it is embarking on another structural re-organisation of public health services, with PHE to be replaced by a National Institute for Health Protection responsible for pandemic preparedness and infectious disease capability.[97] The consequences of these actions are not yet clear, but commentators have highlighted how dismantling England's public health agency mid-pandemic is likely to cause significant disruption.[97] There are also concerns regarding where responsibility will lie for national level policy to respond to other public health issues such as growing rates of non-communicable diseases.

The COVID-19 pandemic has exposed weaknesses in the public health system. While 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.[96] Ineffective engagement between central government and local authorities contributed to the latter not having access to local test data from centrally organised home test kits and mobile testing sites until June 2020.[98] Moving responsibility for pandemic preparedness and communicable disease control to Public Health England reduced capacity and capability at the local level.[99] More fundamentally, public health capacity across the board has weakened over the last decade and its funding has declined. In local authorities, the public health grant has reduced by £0.7 billion in real terms, an approximately 20% reduction, between 2014–15 and 2019–20.[100]

Experiences with testing and contact tracing during the pandemic is further evidence of a lack 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 level of testing capacity required: pathology networks struggled to secure reagents for their machines;[101] not all laboratories had access to the National Pathology Exchange (NPEx),[102] the IT system which allows them to collaborate and share materials; and fragmented procurement by

individual hospital trusts undermined the NHS's ability to act effectively. The NHS addressed these issues rapidly, but not soon enough to meet the need for testing. This early lack of capacity contributed to the aforementioned discharging of thousands untested patients to care homes.[91] 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.[103] The NHS Test and Trace system in England was launched on the 28th May 2020, with similar programmes launched in Scotland, Wales, and Northern Ireland.[104] However, despite significant investment the system has, at the time of writing, contacted 50-60% of known contacts, substantially less than the 80% needed for tracing to be effective.[104] Several aspects of the system have been outsourced to private providers, involving contracts worth several billions of pounds, sometimes without competitive tendering.[105] Moreover, some have felt this centralised approach to testing and tracing has not adequately engaged with local public health teams.[106]

The UK's approach to the procurement, storage, and dissemination of PPE, for which the NHS Supply Chain is responsible, has also been criticised. Large quantities of PPE were supplied to NHS and social care organisations with reassurances they were safe to use, and later recalled as faulty or thrown away as they were found to be out of date.[107] The UK rejected offers to participate in European wide efforts to procure PPE.[108] Instead choosing to independently procure from countries such as China and Turkey, including one high-profile instance whereby the UK purchased 400,000 gowns which did not conform to UK standards.[109]

The transparency and influence of scientific advice in the UK has been questioned. In 2016, the UK undertook a large-scale pandemic exercise, called Exercise Cygnus, which revealed how the UK would be under-resourced in terms of hospital beds, critical care capacity, and PPE, in the event of an influenza pandemic.[110] The report was finally published in October 2020,[111] after significant public pressure to do so. In the initial phases of the pandemic, the minutes or membership of SAGE

meetings were controversially not published.[112] It has therefore been difficult to ascertain to what degree discussions during these meetings influenced the timing of the UK's government's decision to implement a national lockdown. This is crucial to establish, as international analysis suggests that more stringent measures implemented earlier would have saved lives.[113]

Integration of long-term workforce planning

The health and care sector accounts for 13% of the UK workforce.[114] This includes around 1.8 million people working in the NHS, and around 2 million working in social care.[15] In addition, it is estimated that around 9.1 million people in the UK are unpaid (so-called 'informal') carers, notably family members.[115] During the pandemic, the number of unpaid carers has increased to over 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.[116] The contribution of health and care staff during the pandemic has been immense, but this has come at great cost, with several hundred staff deaths, approximately 1 in 10 COVID-19 infections experienced by patient-facing health and care workers,[117] and many staff experiencing significant psychological stress.[118] This trauma may 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 those who need additional support are identified. Without addressing health and care staff welfare, the UK risks exacerbating 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 (headcount) of nurses per 1,000 has not grown across each constituent country over the last decade.[15] There is also a differential growth rate across specialities – for example, mental health nursing numbers dropped by 8% in England between 2010 and 2020.[43]

- Despite a drive to move care to the community, GP numbers (full-time equivalent) per 1,000 population have remained relatively unchanged over the last decade,[40] hospital consultant numbers (full-time equivalent) per 1,000 population, meanwhile, have increased by around 40%.[15]

- High vacancy rates persist across the four countries. In England alone, excluding general practice, there are almost 100,000 NHS vacancies, including 40,000 nursing vacancies.[119] In social care there are over 110,000 vacancies, including 70,000 care workers.[120]

- Deprived areas are typically most underserved by health professionals, especially GPs.[121,122]

- Despite public health and prevention being central to the vision of the NHS,[123] the public health workforce in England in particular has been identified as lacking senior leadership, with high vacancy rates.[124]

- The clinical academic workforce, which is key for current and future knowledge generation, has reduced by 2.5% between 2010 and 2018.[125]

Responsibility for workforce planning is devolved to the four countries, although UK-wide regulatory and professional standards 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 supply-side factors, such as recruitment and retention. However, workforce planning must also incorporate demand-side factors such as demography, morbidity, use of health and care services, and GDP growth.[126] There has been an over-reliance on setting future workforce levels by profession and less attention paid to requirements such as skill-mix or creating new, flexible roles. As discussed in our background paper on the health and care workforce,[15] of the UK constituent countries, Scotland has made the most progress in its approach to workforce planning, by drawing upon both supply and demand side factors and moving away from a focus on individual professions to consider the collective health and care workforce. However, improving

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workforce planning is only one component of a comprehensive health and care workforce strategy, which must also prioritise the health, morale, and wellbeing of its workforce to maximise the recruitment and retention of existing staff as well as recruiting new.

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

While the 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 greater coordination, with significant duplication currently in efforts between NICE, SMC and the AWMSG. Health technology assessment (HTA) has predominantly focused on new pharmaceuticals and not pre-existing interventions within health – or, in particular, social care – that may add value to people's lives. This is improving, with NICE now producing clinical, social care, and public health guidelines that make evidence-based recommendations on interventions and services, including recommendations for disinvestment.[127] However, more can be done – for example, routinely integrating health technology evaluations into clinical guidance produced by medical royal colleges and professional organisations, as well as into medical school curricula. There is also a need to introduce robust mechanisms to listen and respond to patient concerns about safety of medicines and medical devices.[128] In terms of translating clinical guidance into sustainable change at the local level, atlases of variation produced in England,[129] Scotland,[130] and Wales,[131] continue to identify significant unwarranted variation in health service delivery. Despite the availability of well-established frameworks for managing scarcity and setting priorities,[132] there continues to be a lack of mechanisms for public involvement, transparency, and accountability in decisions about resource allocation at the local level.

Effective health information technology systems to maximise learning and improve quality of care

Health information technology (HIT) systems have an integral and growing role in the NHS. The consultation process and background papers noted frustration with existing systems, highlighting (i) the lack of a basic IT infrastructure within frontline care that facilitates rather than hinders care; (ii) the lack of access to information from other parts of the health and care sector; (iii) difficulties in using the wealth of data within the health and care system to plan strategically and improve public health and patient care; and (iv) the lack of skills in the workforce necessary to maximise the use of routinely collected data for policy and planning. Action to address all four of these is essential. Furthermore, the role of patients and public in relation to their data must fundamentally change to give people much greater control over their own medical records, while maintaining the highest standards of confidentiality, and combined with efforts to improve digital inclusivity. The Commission considers a range of possible actions relating to the capabilities and capacities required to improve and maximise benefits for patients and staff. Rather than seeing these in isolation, the Commission considers the wider context and the need for such capabilities and capacities to be embedded within a 'learning' health and care system, defined as the use of data-enabled infrastructures to support policy and planning, public health and personalisation of care. [16]

The challenges above have been exemplified in the UK's struggle to leverage HIT to combat COVID-19. The development of shielding patient lists (SPLs) generated significant controversy and confusion. Initial lists had to be verified by healthcare professionals as coding was inaccurate or out of date.[133] Linking and analysing data across health and care settings has also continued to prove challenging, impeding efforts to trace contacts.[134] The challenges with information governance persist, which have rendered it difficult to create national end-to-end COVID-19 surveillance platforms.[135] NHSX attempted to develop an in-house mobile application for contact tracing purposes, but this was abandoned in favour of a decentralised approach developed by Google and Apple after the NHSX pilot app was found to have several flaws such as limited ability to detect iPhones, a lack of interoperability, and incorrect notifications.[136,137]

Notwithstanding these concerns, the COVID-19 pandemic has accelerated the digitisation of health and care services. As mentioned above, 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 conducted remotely compared to fewer than 10% prior to the pandemic.[138] Similar developments occurred in secondary care, with many outpatient visits converted to remote teleconsultations. In addition, there was a massive expansion in the use of the NHS 111 helpline; a COVID-19 symptom tracker app was developed to inform research and surveillance;[139] and the COVID-19 test booking system was set up online.[140] 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 impact on population groups 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 limited basic digital skills.[141]

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

The NHS maintains high levels of public support, and international comparisons reveal that the NHS performs well in terms of patient experience.[142] The 'clap for carers' movement nationwide and response to 'stay at home, protect the NHS, save lives' messaging during lockdown suggest that public support for the NHS may have been strengthened, but this remains to be seen.[143] There have been increased efforts across UK constituent countries to improve shared decision making and empower patients, such as the 'Realistic Medicine' in Scotland,[144] and 'Choosing Wisely' across the UK.[145] However these have not always adequately considered how to engage marginalised and vulnerable groups such as older people, homeless or migrants. The Wanless review of 2002 envisaged that high levels of public engagement in relation to their health would be fundamental to improve quality of care and health outcomes.[146] 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.[147] This is particularly important and timely in relation to self-management of long-term and multiple conditions, emerging digital technologies and efforts to improve integration. Such efforts must include greater honesty about the limitations of medical care, more patient involvement in decisions about their treatment and care, closer partnerships with community groups and voluntary organisations, and a stronger commitment to tackle the wider determinants of health. Giving people access to reliable, evidence-based information about treatment options and ensuring that this informs discussions between doctors and patients has been shown to produce more realistic expectations and greater congruence between patients' values and treatment choices.[148]

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 long-term conditions. It is important not to confuse 'coping during a period of crisis' with 'empowerment'. Again, as services develop, the NHS must look to advance research in this area,[149,150] as well as consider targeted interventions where appropriate, to avoid exacerbating already significant 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 this may pose in shaping the future of the NHS. We begin by considering the immediate challenges presented by COVID-19, and then consider broader issues related to health outcomes, inequalities, changing health needs and the current political and financial situation.

Addressing growing unmet need for health services

A major and immediate challenge for the NHS will be to address growing unmet need for healthcare services created by the COVID-19 pandemic. To free up capacity and to protect patients against potential transmission of coronavirus, many elective procedures, diagnostic tests, and screening

programmes were postponed or suspended .[151] At the height of the pandemic, cancer surgery was restricted to urgent and semi-elective cases and treatment pathways were adapted to minimise risks to patients.[81] Early data released from NHS England showed that a decade of progress in reducing 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 GP reduced from 80% in March 2020 to 61% in September 2020 (Figure 2). To facilitate continuity of services, the NHS in each constituent country has begun to reorganise services to deliver care in a manner that minimises potential exposure to coronavirus – for example, by consolidating cancer surgery in cancer hubs to be kept as free as possible from coronavirus exposure,[152] often drawing upon additional capacity in independent sector hospitals.

[Insert Figure 2: Percentage of patients waiting less than 18 weeks to start treatment following referral by a GP in England]

Source: NHS England Consultant-led Referral to Treatment Waiting Times[153]

Due to fear of infection or of overburdening healthcare services, many people have been reluctant to seek medical advice during the COVID-19 pandemic. In England, attendances to accident and emergency department reduced by 57% in April 2020 compared to April 2019;[154] similar decreases were seen in Scotland.[155] There have also been reports of significant reductions in people attending hospital with symptoms of heart attacks and strokes.[156,157] Primary care appointments reduced by 33% in April 2020 compared to April 2019.[158]   Urgent referrals for cancer diagnoses from primary care also reduced by around 70% at the height of the pandemic.[159] The impact of these trends is yet to be fully determined but they are likely to result in delayed diagnosis and lack of support for many patients. [159]

Many marginalised and vulnerable groups , such as those working in the sex industry, victims of domestic abuse, those with problems with addiction, the homeless, prisoners, and unregistered migrants (circumstances which often co-exist), who are less likely to have easy access to the internet

to use remote services, have struggled to receive support during the pandemic.[160] 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 vulnerable and marginalised people, particularly those whose immigration status prevents them from accessing public funds,[161] have been left to fend for themselves or relied on the support offered by charities such as Shelter and Doctors of the World, who are themselves facing significant financial constraints as a result of the global economic downturn.[52]

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 remain a serious challenge, as demonstrated by the COVID-19 pandemic, and the emergence of antimicrobial resistant infections. The UK also compares unfavourably when compared internationally in terms of many measures of health and there are widening inequalities in health.[142]

The UK's relative position on life expectancy has worsened over the last two decades with only the US, Germany, and Denmark having lower life expectancy at birth (male and female) in our comparator countries (Table 2) Average healthy life expectancy in the UK (71.9 years) is also lower than the EU15 average (72.4 years) and considerably lower than countries such as Japan, where people can expect to have three more years in good health (74.8 years).[162] The UK also performs less well than other high-income countries in terms of child outcomes.[163] Infant mortality continues to lag behind Scandinavian countries and Japan in particular (Table 2). The UK also compares poorly to the majority of our comparator countries in terms of cancer survival (Table 2). For colon and lung cancer, five-year survival, at 60% and 13% respectively, is the lowest among all countries with comparable data, with the exception of Finland for lung cancer. For breast cancer, the difference

between the UK (85.6 %) and the best-performing country (the United States, at 90.2%) is not as great as for other cancers but the UK is still fourth lowest of the countries shown. Survival for prostate cancer, 88%, is the third lowest.

There are also demonstrable inequalities both within and between the UK constituent countries. Life expectancy in Scotland is markedly lower than the other countries (81.1 years compared to 83.2 years in England for females for the period 2016 to 2018) (Table 4). England has the largest within-country inequalities in Healthy Life Expectancy (HLE) at birth, which varies by 17.9 and 18.6 years for males and females between different local authorities based on data between 2016 to 2018 (Table 4). Oral health also varies significantly within the UK, with Northern Ireland, Scotland and the north of England having much higher rates of edentulism and oral cancer than the rest of the UK.[164] Differences are largely accounted for by levels of deprivation;[165] areas in all UK constituent countries that have experienced deindustrialisation 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.[166] Analysis of cancer incidence and survival across England has estimated there would be around 19,000 fewer deaths per year if the more deprived groups had the same cancer incidence and survival as the least deprived.[167] People living in the most deprived areas of England are almost four times more likely to die prematurely from cardiovascular disease than those in the least deprived.[168] People from Black, Pakistani, Bangladeshi, Gypsy and Traveller groups as well as those of Muslim faith have historically experienced worse health outcomes compared to people of white British ethnicity and Christian faith.[169] For example, disability-free life expectancy (DFLE) is much lower for Pakistani (men: 55.7, women: 55.1) and Bangladeshi (men: 54.3, women: 56.5) groups as compared to White British (men: 61.7, women: 64.1).[170]

The underlying reasons for health inequalities involve a dynamic interplay between structural, historical, political, environmental, service and person-related factors.[171] The UK has a comparatively high level of income equality compared to other high-income countries (Figure 3), as well as

comparatively lower levels of total social spending (Table 1). Deprivation and vulnerability are consistently associated with higher rates of preventable hospitalisations, deaths that can be avoidable in the presence of timely and effective care (amenable mortality), poor mental health,[172] and lower uptake of screening and other preventative services.[62] Deprivation and poor health are also patterned by ethnicity with the racial hierarchies underpinning the UK's colonial past continuing to shape the lives and health of racialised groups.[173,174] While the NHS may not be able to fully address many underlying societal factors contributing to poverty and income inequality, the Commission argues the NHS should be accountable for improvements in health outcomes and in 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 must be a strong, broader public sector to complement the NHS.[175] Rather than having a detrimental effect on economic growth,[176] evidence suggests that higher public spending can be beneficial for economic growth, income distribution and external competitiveness.[177,178] Key drivers of inequalities such as direct discrimination,[173] must be addressed as a priority within the NHS and social care organisations, where discrimination and structural racism interact and reinforce each other.[179]

Rather than being a 'great leveller', the COVID-19 pandemic has brought under scrutiny the UK's stark socio-economic and racial inequalities and the catastrophic consequences that these have for health. COVID-19 has had the greatest impact on the most vulnerable in society, with death rates highest in the most socio-economically deprived and ethnically diverse areas.[180] The repercussions of lockdown on work, education, income and provision of basic needs have been greatest for those already living in poverty,[181] and already at the highest risk of mental ill health. It has become increasingly evident, as acknowledged by the chief executive of the NHS and the PHE's stakeholder engagement on impact of COVID-19 on ethnic minorities, that these inequalities have been exacerbated by racism.[182,183] The numbers of doctors, nurses and other health and care workers from BAME groups dying from COVID-19 are disproportionate,[182] a pattern repeated in the wider population. Mortality rates of people of Black ethnicity related to COVID-19 infections were between

two and three times those of people of White ethnicity,[184] and those for people declaring Muslim or

Jewish faith mortality rates were approximately double those of people who identified themselves

as Christian.[185] Explanations for these inequalities range from differential exposure to coronavirus

patterned by occupation and housing conditions, differential severity of COVID-19 patterned by

existing health conditions, and differential interactions with the health service.[186,187]

[Insert Figure 3: Income inequality (shown by Gini coefficient) in comparator countries, 2018 or
latest available]

Gini coefficient shows levels of income inequality, with 0 = complete equality; 1=complete inequality

Source: OECD data[31]

Changing health needs: multimorbidity and mental health

The NHS must 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, currently termed

multimorbidity.[188] Developed from a hospital structure designed to meet acute health needs and

structured around disease and specialty-specific pathways, 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; [189] experiencing fragmented, poorly-coordinated care and

the challenge of navigating a complex system with limited guidance.[190] The resulting treatment

burden can place additional pressures on those least able to cope.[191] The structural complexity of

health and care services, particularly in England, contributes to this.

In England, the top 5% by cost of users of primary and secondary care services account for over half

of total costs.[192] This high-cost and high-need population is more likely to be older and suffer from a

high-level of morbidity, with over half of this group having complex multimorbidity, i.e. 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%, the number increasing with age.[193] The

proportion of patients with multimorbidity exceeds 50% from age 65 years onwards and for those

patients aged 85 or over exceeds 80%. The mean number of morbidities also increases with age.[193]

However, it is important to note that multimorbidity is not solely a feature of ageing and can be a

significant issue for some younger patients.[194] In absolute numbers, more people are living with

multimorbidity under 65 years of age than those aged 65 and over.[195] Multimorbidity is also socially

patterned, increasing from those who are least to most deprived.[193] The number of older people

with complex multimorbidity in England is projected to double between 2015 and 2035.[196]

A driving factor for multimorbidity has been the increasing prevalence of mental health issues over

the last two decades. The latest seven-yearly NHS England survey (2014) on the prevalence on

mental health and wellbeing showed that 17.5% of working age adults had a common mental

disorder (CMD) such as depression or anxiety, compared to 14.1% in 1993.[197] Chronic mental and

physical health disorders commonly co-exist, with evidence that the relationship is often bi-

directional.[198] In order to create a truly inclusive and comprehensive health service it is vital to

address the long-standing relative neglect of the mental health needs of the UK population. This is

also crucial for economic productivity, as absenteeism, often due to poor mental health, is

responsible for significant costs to the UK economy.[199] Examples do exist of integrated service

models which better recognise the complex interplay between mental and physical health,[87] 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 high-quality care. At its worst, it can lead to hazardous clinical duplications

and errors. Although there is evidence that attitudes have improved over recent years,[200] there

remains a significant degree of stigmatisation not only of people with mental health problems, but

also the staff who treat them.[201] Patients with established mental illness often receive sub-optimal

care when they present to acute medical services,[202] and those with severe mental illness have

significantly lower life expectancy, largely as a result of preventable physical health conditions.[203]

The COVID-19 pandemic is likely to have a profound and lasting impact on mental health. Anxiety, isolation, becoming mentally unwell, accessing mental health support and concerns about friends and family were highlighted in a recent large survey of people's concerns about the impacts of the COVID-19 pandemic.[204] There is a need for high-quality data and research on the effect of COVID-19, in particular for vulnerable populations such as older people, young people, people with pre-existing mental health issues, and health and care workers.[205] Mental health strategy must be integrated into plans for responses to future health shocks.[206] The Commission concurs with a recent UN call to adopt a 'whole of society' approach to mental health, to strengthen community approaches, solidarity and healthy coping mechanisms, and make much larger overall investments in mental health services.[206]

Financial and political context

Investing in the NHS in challenging economic context

The economic and political impacts of the COVID-19 pandemic are still not fully understood. Estimates of the impact on the economy vary significantly but there is consensus that the UK will at least suffer a significant short-term hit to GDP, with estimates ranging from 6% to 14% in 2020.[207–210] Efforts to support individuals and businesses – for example, through furloughing, grants and loans – have significantly increased government borrowing, estimated to reach just under £400 billion in 2020.[210] The pandemic occurred as the UK was exiting the European Union which in itself is forecast to have significant effects on the UK economy and the NHS in particular affecting, for example, workforce, regulation, migration, cross-border cooperation and economic growth.[211,212] The negative economic impacts of the COVID-19 pandemic will be further compounded by the impacts of Brexit with nearly all projections indicating the the UK economy will be smaller with leaving the EU than it would have been with continuing membership of the EU.[213]

The Commission argues for increased public spending on health, social care and public health, acknowledging the economic context is challenging. The 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 vital 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.[114] The Commission argues that years of austerity, and the impact of the costly multiple re(dis)organisations 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 is below the EU15 and G7 average for numbers of nurses and practising physicians (Table 1). For number of hospital beds, MRI, and CT scanners, the UK also has markedly lower stocks than EU15 and G7 averages (Table 1). Despite substantial efforts to improve workforce planning, all UK constituent countries are facing a health and care workforce crisis. In England alone, there are a combined 220,000 vacant posts across health and care, with 1 in 12 posts in the NHS,[214] and 1 in 14 posts in the social care unfilled.[120] Scotland, Wales, and Northern Ireland also experience 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 last 70 years, the model of funding for the NHS in the UK has been frequently challenged.[215] However, the UK has chosen not to change its funding model, and, for good reasons. The efficiency and equity benefits of publicly financing have often been highlighted; mitigating against causes of market failure in health service funding and provision.[216,217] A clear counterfactual is the United States (US), where private expenditure exceeds public expenditure.[218] US spending on health (16.9% GDP in 2018 compared with 9.8% in the UK) is high but health system performance is poor compared to other high income countries in terms of access, equity, administrative efficiency and

many health outcomes.[219] In contrast, in other tax-funded systems such as Sweden where the

majority of health expenditure is public, spending on health is higher than the UK (11% GDP in 2018),

but health system performance is better in terms of many health outcomes.[219] 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 remained high through the life of the NHS and

there is no reason to think this will change.[220]

Devolution, coordination and political uncertainty

The process of Brexit and the COVID-19 pandemic means that there has been little space to consider

domestic matters within the UK or devolved parliaments. At the time of writing, Brexit negotiations

are ongoing. Amid continuing economic and political uncertainty it is all the more vital 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 the Commission. At a time

when the UK was preparing for likely poorer cross-border cooperation with other EU countries,

there was a significant possibility of further attempts for independence by constituent countries

within the UK. While the impact 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, while cross-border

collaboration between Northern Ireland and Ireland has strengthened, a process that seems likely to

increase with the forthcoming institution of post-Brexit checks in the Irish Sea. The Commission is

not naïve in making recommendations for increased collaboration between the countries. It was

evident from the consultation that, for example, Scotland may look increasingly to Scandinavian

countries rather than other UK constituent countries for learning, in contrast to the approach taken

in England, which paid little attention to developments elsewhere.[221] It was also evident that there

are areas where the constituent countries are already working together or seeking to learn from

each other. 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 significant. As noted by others, it is misleading to talk of devolution

leading to divergence in policy across the UK, divergence occurred beforehand and, whilst it has

extended since devolution, change has been incremental and includes some convergence among the

devolved administrations in terms of health policy.[222] Greater coordination in key areas will benefit

all UK constituent countries and, in the case of data, enable evaluation and learning from differing

policies that has not been possible to date.[223]

In summary, from now until 2030, our vision for the NHS stands against a backdrop of significant

political, social and economic change. The challenges of growing inequalities including

intergenerational inequalities, slow growth in living standards and a growing sense of economic

insecurity as well as the cumulative importance of these to a sense of democracy have been

highlighted elsewhere.[224] Post-COVID-19, the vision of a publicly funded, innovative, and integrated,

UK-wide health and care service, working together with patients to improve the health of *all* the

population, is central to the UK's recovery.

The NHS to 2030 and beyond. Recommendations of the 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, the Commission has considered 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.'

We want this vision to be 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 significant appetite for change. We have a once-in-a generation opportunity to change ways of working and make long-term improvements to the NHS. 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;[225] a social care funding model closely aligned to the NHS model, offering improved financial protection.

- allocating 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 that adapts to changing health and care needs supported by workforce planning coordinated across the UK and based on demand- as well as supply-side forecasts, maintaining consistency with NHS expenditure forecasts.

- improving health and wellbeing, engaging patients and service users, and reducing inequalities in health set as the core goals for health and care organisations as anchor institutions, with a renewed focus on prevention

- 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; supported by a more comprehensive professional and public dialogue about the uncertainty, risks, and benefits of testing and screening.

- the NHS and social care maximise data and data access and their institutional strengths to become a 'learning' health and care system that better supports quality improvement for the benefit for patients, adopting best practice from within the UK and internationally.

- the NHS, social care and other sectors working 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 health information technology infrastructure all designed to promote this aim.

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

Panel 4: Overview of Commission Recommendations

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

- Recommendation 1A: 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 better 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, be ring-fenced and increase by at least 4% per year, on average, in real terms, over the next 10 years

- 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 national level, to make resource allocation decisions in the context of a long-term strategic vision which takes account of projected need and focuses on optimising the balance of care

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

- Recommendation 2C: At treatment level, to develop a structured approach to both investment and disinvestment in order to meet national resource allocation constraints, facilitate more collaboration between NICE, SMC and AWMSG; the UK to maintain an 'observer' status within the European Medicines Agency (EMA).

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 long-term workforce strategy focusing on the collective health and care workforce supported by workforce planning tackled at a cross-professional level and coordinated on a UK-wide basis that is tied into NHS and social care expenditure plans

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

- 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

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

- 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

- 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

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

- Recommendation 4D: Develop a transparent and coordinated approach to UK-wide preparedness planning and response to future major threats to health

Recommendation 5: Improve diagnosis, in circumstances where evidence exists to support early diagnosis, to achieve better outcomes and reduce inequalities

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

- 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

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

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

- Recommendation 6B: To foster HIT and data science leadership which enables the routine use of data to continuously improve health and care planning, service delivery and personalisation of health and care

- Recommendation 6C: To develop and implement a UK-wide long-term data and statistics strategy for health and care

- Recommendation 6D: To re-balance and strengthen research and innovation efforts towards supporting health and care service delivery

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

- Recommendation 7A: To remove system barriers which limit integration of care , supported by appropriate legislation

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

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

- Recommendation 7D: By 2030, all UK 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

Recommendations in detail

Recommendation 1: Increase Investment In The NHS, Social Care And Public Health

Organisations responsible for implementation:	*National* HM Treasury, Budget and Sustainability Directorate (Scot), Financial Management Directorate (Scot), Welsh Treasury, Department of Finance (NI)

The Commission's background 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 which provides, as a minimum, similar levels of quality and access to those currently enjoyed, taking into account future trends in demography, morbidity and technology. We propose recommendations which outline the level of

funding required, and provide guidance on how to raise the revenue necessary to implement these recommendations. These recommendations draw upon projections of future needs made by the Institute of Fiscal Studies (IFS), the Health Foundation (HF), the Institute for Public Policy Research (IPPR), and the Care Policy and Evaluation Centre (CPEC, formerly the Personal Social Services Research Unit (PSSRU)) at LSE.[28,226,227] There is consensus 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 background paper,[14] and in Supplementary Material 3.

We do not consider any increases in expenditure which may be needed for other public services such as education, transport and infrastructure. We also only focus on funding the increase in spending as proposed within this report. Therefore, we acknowledge that the public may need to be prepared for larger tax increases than those we recommended, especially to repay the increase in government debt as a result of the COVID-19 pandemic. Given the vital role of social determinants in health and health inequality, it is critical that extra funding for the NHS and social care does not come from cuts to other public services and the welfare system. There is a need for politicians from all parties 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: NHS funding to increase by at least 4% per year, on average, in real terms, over the next 10 years.

To secure the future of the NHS we need to address significant workforce shortfalls, rectify several years of austerity, and invest in capital to improve resilience against major threats to health. The Commission recommends that NHS funding increases by a minimum of 4% a year in real terms, on

average, over the medium term. Projections from the IFS and the Health Foundation found that public spending on health in the UK would need to increase by 4% per year, on average, in real terms from 2018–19 to 2033–34, in order to modernise the NHS.[28] This includes meeting waiting list targets, bringing capital spending more in line with OECD averages and compensating for past austerity.[1] It is too early to estimate the additional funds required for the NHS to respond to the pandemic, address the growing unmet need for health services caused by the pandemic, and better equip the UK to withstand future public health shocks such as another pandemic. We recommend an independent review to examine what will be needed (Recommendation 2A).

The UK is a wealthy country, yet in 2019 spent 87% of the average of the G7 countries on health (excluding the US, which has a significantly higher, outlying health expenditure). If health expenditure continued to grow at historical rates for these countries and grew at our recommended 4% real, per year for the UK, spending in the UK would be around 98% of the average of these countries by 2030 (Figure 4). The Commission believes this increase in relative position is appropriate and feasible for the UK and that funding below this level will pose a real risk of degradation of the NHS, reductions in coverage of benefits, increased inequalities and increased reliance on private financing.

[Insert: Figure 4 Public expenditure on health, $US per person, between 1990 and 2030]

Source: Authors' calculations based on OECD data[31]

Note: This is intended as an illustrative example, it is not indicative of expected future expenditure paths. Expenditure beyond 2019 is based on the average annual growth rate from 1990 to 2019 or for the period where data are available for the respective country. There are series breaks in the historical data which are not adjusted for.

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[1] These projections were undertaken prior to the COVID-19 pandemic, and assume that GDP growth will increased, on average, by 1.9% per year until 2033–34.[28] Therefore, these projections give an indication of the level of spending required for a long-term funding settlement for the NHS, assuming GDP growth in the long term returns to pre-pandemic projections.

Recommendation 1B: Social care funding to receive an immediate injection of public funding to provide better financial protection, and funding to 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 significant excess mortality in care homes throughout the COVID-19 pandemic.[12] The IFS and Health Foundation has estimated, based on projections from CPEC (formerly the Personal Social Services Research (PSSRU)), that in order to meet projected demand using current eligibility criteria, social care funding needs to increase by 3.9% per year, on average, in real terms, until at least 2033.[28] Furthermore, to ensure the social care system supports the health and care system, the Commission's view is that public expenditure on social care should not fall relative to health expenditure over time. Therefore, we recommend that public spending on social care increases by at least 4% per year, on average, in real terms over the medium term. The Commission also encourages each constituent country to consider the use of legislation based on the principle of 'at least parity' in funding between social care and NHS funding. If these increases in funding does 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 long-term care (Figure 5).

[Insert Figure 5: Public expenditure on long-term care, $US per person, between 1990 and 2030]

 Source: Authors' calculations based on OECD data[31]

Note: This is intended as a illustrative example and is not indicative of expected future expenditure paths. Expenditure beyond 2019 is based on the average annual growth rate for the respective country from 1990 to

Alongside 4% annual real growth, social care requires an immediate injection of public funding to increase financial protection for the most vulnerable. The current financial eligibility criteria in England have remained unchanged for almost a decade, with the capital means test threshold of £23,250 (the 'floor') unchanged since 2010–11.[228] As a result, the upper asset test threshold has effectively lowered due to inflation. Consequently, fewer people 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.[229] The Commission recommends that the capital means test threshold (the 'floor') 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 capital means test threshold (the 'floor') in England has been estimated at £3.2 billion (in 2018–19 terms),[230] and would significantly improve financial protection by increasing the number of people eligible for funding support for social care.[231]

Recommendation 1C: Public health to receive an immediate injection of public funding to reverse cuts in England, be ring-fenced and increase by at least 4% per year, on average, in real terms, over the next 10 years.

There is evidence that the marginal spend on the public health grant in England is three to four times more effective than NHS expenditure, in terms of additional QALYs gained.[70] There is also a strong economic case for investment in public health, with many interventions proven to be cost-effective or cost-saving (Recommendation 4B). The Commission argues that funding for public health in each constituent country should at least increase in line with NHS and social care funding and for a one-off uplift in public health spending. The allocation of the public health grant in England largely

reflects historical spending,[232] and has reduced by £0.7 billion in real terms between 2014–15 and 2019–20.[100] A renewed resource allocation index has been developed by the Advisory Committee on Resource Allocation which better reflects local public health needs.[233] It has been estimated that to reverse cuts to the public health grant, implement this new resource allocation formula, and prevent any local area experiencing a reduction in funding would require a one-off increase of £3.2 billion in England (in 2018–19 terms).[100] This will also secure sustained investment in the public health workforce, who were critical 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 allocated according to population size as per the Barnett formula, which we argue should also be used for public health activity. The Commission acknowledges it is more challenging to monitor the level of public health spending in Scotland, Wales and Northern Ireland, as a separate public health grant does not exist in these countries.

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

The NHS in the UK is primarily funded by general taxation, while 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;[234] social health insurance has relatively high administrative costs,[235] 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;[236] private medical insurance is particularly vulnerable to 'cream skimming',[237] and adverse selection,[238] which can leave much of the population without coverage, so

driving inequalities in access to health services; medical savings accounts do not pool risks between

individuals or raise enough revenue, thereby leaving many vulnerable to catastrophic health

expenditure;[239] user charges disproportionately impact the poor, and as people are often unable to

distinguish between low value and high value care, can lead to avoidable increases in health and

care costs over time as people may forgo preventative treatment.[240]

The 2019 British Social Attitudes Survey found that 54% of respondents would prefer extra funding

for the NHS to come from tax rather than, for example, patient charges.[220] Currently, the UK has one

of the lowest tax burdens in the EU15 and G7 (Figure 6), with 13 of the 18 countries within this

group collecting more tax as a share of national income. Furthermore, taxation in the UK is over 10%

of GDP lower than it is in Belgium, Denmark, Finland, France and Sweden.

The 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 is assuming the economy returns to pre-

pandemic levels relatively quickly. This increase would mean the tax burden in the UK in 2030–31

would only be slightly above the current average for the G7, and below the current average for the

EU15. As such, there appears to be the capacity for a higher level of taxation.

[Insert Figure 6: Tax-to-GDP ratios across the EU15 and G7 (2019)]

Source: Authors' calculations based on OECD data[31]

Note: *Data for Japan relates to 2018.*

Given the strong positive correlation between health and income, [241] tax reform needs to be

progressive to ensure it does not worsen already significant income inequalities.

To raise enough revenue from general taxation, it is important that the taxation reform covers a wide base. Some have advocated for small-scale tax reform to support the NHS and social care such as means testing winter fuel payments or collecting National Insurance payments from pensioners who continue to work and earn. [230] However, these would not raise enough revenue, and risk unintended consequences such as older people forgoing heating in winter or a reduced incentive for people to work beyond retirement age. [242]

To demonstrate the magnitude of the proposed funding increase, we have prepared stylised examples based on pre-pandemic tax revenue proportions, estimates from HM Revenue and Customs 'ready reckoner' 'rule-of-thumb' model, and methodology used by the IFS, have been prepared (Panel 5). [28,243] 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 (Supplementary Material 3). If tax revenue was to return to pre-pandemic levels and continue to grow with GDP, £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. Currently, the three largest taxes – personal income tax (PIT), national insurance (NI), and value added tax (VAT) – collect around 63% of UK taxation revenue. [244] Given the relative magnitude of these taxes it will be necessary to increase them. If the three main taxes were to fund 63% of the funding gap, by 2025–26, the basic, higher and additional PIT rates would need to increase by 1p, employee and employer NICs would need to increase by 1p, and the standard rate of VAT would need to increase by 1p. By 2030–31, the basic, higher and additional PIT rates would need to increase by 2p, employee and employer NICs would need to increase by 2p, and the standard rate of VAT would not require further increases than 1p. The remaining 37% of the funding gap would be funded by increases to several other, smaller taxes, including corporate and wealth taxes. The reforms would need to be phased-in to minimise distortions and any challenges to the economy caused by the COVID-19 pandemic and Brexit. These reforms do not consider behavioural

responses and should be considered as indicative only. They are also dependent upon economic growth which is highly uncertain. Further research to determine the preferred tax reform and the distributional impact of the reform is recommended.

Panel 5: LSE-Lancet Commission 'The Future of the NHS' proposed tax 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% annual increase, on average, in real terms, to NHS, social care, and public health funding per year, would require tax increases as follows:

- By 2025–26

    o 1p increase in basic, higher and additional Personal Income Tax (PIT) rates

    o 1p increase in employee the employer National Insurance Contributions (NIC)

    o 1p increase to the standard rate of Value Added Tax (VAT)

- By 2030–31

    o 2p increase in basic, higher and additional PIT rates

    o 2p increase in employee the employer NIC

    o 1p increase to the standard rate of VAT

This assumes that the current tax structure remains unchanged, and PIT, NIC, and VAT still account for 63% of total UK tax revenue.[244] Therefore, implementing our funding recommendations would also require increases to corporation tax and wealth taxes such as capital gains tax. The effect of this reform on the income of individuals is presented in Table 5. The detailed methodology for these calculations is contained within Supplementary Material 3.

 [Insert Table 5: After tax income under the current tax schedule compared with the illustrative tax reform for 2025–26]

Recommendation 2: Improve Resource Management Across Health And Care At National, Local And Treatment Levels

Organisations responsible for implementation:	*National* HM Treasury, Department of Health and Care, Budget and Sustainability Directorate (Scot), Financial Management Directorate (Scot), Health and Care Directorate (Scot), Welsh Treasury, Department of Health and Social Services (Wales), Department of Finance (NI), Department of Health (NI), NHS England, NHS Scotland, NHS Wales, Health and Care in Northern Ireland, National Institute for Health and Care Excellence (NICE), Scottish Medicines Consortium (SMC), All Wales Medicines Strategy Group (AWMSG) *Local* Clinical Commissioning Groups, Health Boards, Health and Social care Boards, local authorities

How resources are allocated, managed and prioritised has a significant impact on population health and the sustainability of the NHS. This has been demonstrated during the COVID-19 pandemic after years of underinvestment in capital left the NHS with little excess capacity and exposed to major threats to health. We argue that resource allocation decisions should be underpinned by sound

principles, robust methodology and that a long-term strategic view is taken. 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 national level, to make resource allocation decisions in the context of a long-term strategic vision which takes account of projected need and focuses on optimising the balance of care

Specific Actions	Objective
Urgently commission an independent review of the resources needed to address the growing unmet need for health services caused by the COVID-19 pandemic, and better equip the UK to withstand major threats to health	Mitigate the impact of the COVID-19 pandemic on delayed diagnosis and reduced access Develop resilience to future major threats to health
Spending reviews take a long-term strategy to improving health system productivity and quality by balancing resource allocation to workforce, prevention, and capital	Maintain productivity growth in health and care sector
In the long term, spending reviews are informed by independent analysis of resource and workforce needs	Offer technical support to spending reviews
Spending reviews apply the key principles of economics, ethics and evidence-based practice in increasingly-	Support the integration of health and care

integrated systems in order to improve the balance of health and care	

Rationale

A major immediate challenge for the NHS is to address the growing unmet need for healthcare services caused by postponing or cancelling elective procedures and diagnostic tests. Early data released by NHS England indicate that a decade of progress in reducing waiting times has been lost in just a few weeks.[153] The COVID-19 pandemic has also highlighted major issues in the capacity and resilience of the UK health and care systems. Additional investment is needed to clear waiting lists, capital to ensure the NHS has adequate surge capacity, and public health capacity to contain infection outbreaks. It is too early and outside the scope of this report to provide such analysis. Instead we recommend the UK government urgently commissions an independent review of the resources required to address the growing unmet need for healthcare services caused by the COVID-19 pandemic, and to better equip the UK to withstand major threats to health.

Spending reviews, which are crucial to determining levels of public spending, should consider what is the appropriate level of funding for health and care services, now and in the future. This requires reliable projections of health and care expenditure based upon need for health and care services and the necessary workforce. Public health, capital and training were notable in their absence from the 2018 NHS funding settlement.[245] To maintain productivity growth and improve quality, spending reviews must also consider the appropriate level 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, the Commission recommends that resource allocation decisions are underpinned by independent analysis of resource 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 (OBR) for population health.[246]

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 (OBR) for population health,[246] and the Health and Social Care Select Committee to establish an Office for Health and Care Sustainability,[247] the 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 NHS workforce at approximately 2.4%, increases in spending at 4% annually, in real terms, will be required.[15] The impact of spending reviews is felt by all UK constituent countries, as the Barnett formula ensures that resources allocated to public services are adjusted proportionally by population size to England, Scotland, Wales and Northern Ireland. Therefore, this analysis would have a UK-wide remit and be underpinned by a UK-wide health and care data and statistics strategy (Recommendation 6C). This analysis could be undertaken by a health division within OBR, 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, as well as estimates of return on investment of public health interventions could mitigate the often-politicised nature of health and care funding decisions. The responsible body would undertake:

- 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 NHS and social care, and between primary care, secondary care and mental health based upon current unmet need and projections of changing health needs.

- Recommendations for funding allocations for capital investment, to ensure staff are equipped with the necessary buildings, equipment and technology infrastructure to do their jobs effectively.

- Estimates of future workforce requirement throughout the use of workforce planning models (Recommendation 3A)

- Analysis of the impact of public policies, including those outside health, on population health and need for health and care. This would include estimating the return on investment of public health interventions (Recommendation 4B).

The 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 multi-morbid population. This will require applying the key principles of health technology assessment (HTA) in novel ways, including considerations of equity, to increasingly-integrated systems.[248] 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 health services research (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.[249]

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

Specific Actions	Objective
Develop and use resource management frameworks, encompassing principles of efficiency and equity, to facilitate public involvement in decision making	Improve transparency, accountability and participation
NHS England, NHS Scotland, NHS Wales and Health and Social Care Board in Northern Ireland review financial plans at a local level for quality assurance while also allowing flexibility to respond to local needs	Ensure consistent funding for health and care services
By 2022, the progress of local commissioning bodies in narrowing health inequalities is benchmarked using Health and Care Inequalities Indices	Narrow health inequalities

Rationale

At the local level, a more structured and transparent approach to resource allocation is needed. Several resource management frameworks have been developed for this purpose such as multi-criteria decision analysis (MCDA) and programme budgeting and marginal analysis (PBMA),[250–252] which involve mapping candidates for investment or disinvestment, and evaluation of the relative benefits and drawbacks of alternative candidates based upon stakeholder perspectives, and the economic concepts of 'opportunity cost' and 'marginal gain'.[253] These frameworks can improve public participation, accountability and transparency in local decision making. However, there remains inconsistency and uncertainty regarding how best to involve the public in decision making and to evaluate its impact.[254] Improved training for commissioners, managers and clinicians to

facilitate meaningful inclusion of the public in local resource allocation decisions is needed.[255] For

quality assurance purposes, the Commission argues 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, 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, post pandemic.

Local entities responsible for health and care planning – such as CCGs and Health Boards, which are

structurally separated from public health – have varying capacity and limited incentives to prioritise

equity.[256] Currently, even between two local areas with similar average deprivation levels, there are

significant differences in the extent and size of health inequalities.[257] The Commission recommends

that resource management frameworks include improving equity as a key principle and that

progress be monitored with a health and care inequalities index (Panel 7). These indices could be

used to benchmark regions according to their progress in narrowing inequalities in health and access

to health and care services. This 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 responsible for delivery of health and care.

In some circumstances, where regions are consistently associated with widening health and care

inequalities, this would prompt further investigation.

Panel 7: Developing the case for Health and Care Inequalities Indices

The Commission argues each local entity responsible for delivery of health and care should embed

an equity principle in their resource allocation processes.[256] Alongside this, there is a need to

develop metrics to assess relative performance in tackling inequalities in health and access to

health and care services .[256] One suggested metric assesses the divide in unplanned hospital

admissions of patients with chronic ambulatory care sensitive conditions between the least and

most deprived populations,[258] and clearly demonstrates that inequalities vary significantly even between local areas which are supposedly of a similar level of deprivation.[259] We urge the development of further metrics, which are easily understandable by the public, health and care professionals and policy makers. This could be a priority of the UK-wide data and statistics strategy (Recommendation 6C).

Recommendation 2C: At treatment level, to develop a structured approach to both investment and disinvestment in order to meet national resource allocation constraints, facilitate more collaboration between NICE, SMC and AWMSG; the UK to maintain an 'observer' status within the European Medicines Agency (EMA).

Specific actions	Objective
By 2022, develop and implement a consistent, transparent and structured approach towards budget impact assessments and managed access agreements	Ensure transparency and the sustainability of NHS funding
By 2022, each constituent country has developed and implements a nationally led and structured approach to disinvestment for pre-existing health technologies, when there is limited evidence of clinical or cost -effectiveness	Reduce unwarranted clinical variation and protecting patient safety
By 2022, NICE, SMC and AWMSG undertake joint clinical assessment of novel health technologies	Maximise the coordination of expertise in health technology assessment
Post Brexit, the UK maintains an 'observer' status within the EMA, including the option for	Ensure good access to new drugs post Brexit

the MHRA to recognises EMA authorisation for certain drugs on a case by case basis	

Rationale

At the treatment level, which considers the use of new and pre-existing drugs, procedures and medical devices, we argue that a structured approach to both investment and disinvestment be taken. 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 must include commitments to measure long-term outcomes combined with a redressing mechanism to claw back resources if desired outcomes are not achieved. For pre-existing health technologies, we recommend a systematic and transparent approach towards disinvestment in "low-value" interventions where there is limited or no evidence of clinical or cost effectiveness. This requires input from medical royal colleges, professional societies and medical schools, who play a key role in producing clinical guidance and developing educational curricula. Vitally, disinvestment should not take a top-down approach, but instead engage with relevant stakeholders such as the public, clinicians and commissioners from the outset to agree upon candidates for disinvestment. There is scope to learn from England, where a partnership between several national organisations and CCGs has resulted in a programme which seeks to maximise value and reduce avoidable harm to patients by disinvesting in a series of interventions with limited clinical evidence Panel 8.

Panel 8: NHS England Evidence-Based Interventions Programme

The Evidence Based Interventions Programme (EBI) is a collaboration in England between four national organisations, the Academy of Medical Royal Colleges, NHS Clinical Commissioners, the National Institute for Health and Care Excellence (NICE) and NHS England and NHS Improvement.

EBI aims to reduce avoidable harm to patients, to save professional time, to 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 NICE guidance. The activity data in terms of volume and geographical variation are examined for each intervention, as well as the 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 shown to be 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 (CCGs) committed to implementing the EBI guidance and sharing learning has been established. The statutory guidance for the EBI programme was published in November 2018 and came into effect in April 2019. Early data show uptake of the guidance and a reduction in unwarranted variation and volume of inappropriate interventions.[260] The strength of the programme is the collaboration between national organisations from different sections of the health system, building on local experience and shared learning as well as a rigorous approach to putting evidence into practice, and measurement and feedback of impact. There needs to be a thorough evaluation of the programme and its potential consequences. It is possible that as the NHS restricts access to treatments with limited evidence of clinical or cost-effectiveness, the private sector may seek to increase the provision of these services.

Produced by Dr. Aoife Molloy, Clinical Lead Evidence Based Interventions NHS England, at the request of the Commission. Further Details: https://www.england.nhs.UK/evidence-based-interventions/

From the health technology assessment (HTA) perspective, the Commission recommends more collaboration between NICE, SMC and the All Wales Medicines Strategy Group (AWMSG). Currently, despite the significant time, technical expertise and investment necessary to undertake comprehensive technology appraisal, there remains little collaboration between these agencies. The European Commission, on the other hand, based on their experience from the EUNetHTA joint actions,[261] has proposed that there will be a *joint clinical assessment* between all member states of all new pharmaceuticals and some Class IIb and III medical devices; the other domains of HTA, including the economic evaluation, will remain the responsibility of member states, as will the decision or recommendation based on the HTA findings. The UK could adapt this model, with NICE, SMC and AWMSG choosing to undertake *joint clinical assessment* of certain new health technologies, while still allowing NICE, SWMC and AWMSG to undertake separate economic evaluations and make divergent recommendations. The arrangement within Northern Ireland would remain unchanged, whereby the Northern Ireland Department of Health endorses NICE guidance, unless it is found to be not locally applicable. The suggested model would allow concentration of the necessary technical expertise 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 (EMA) post Brexit. If the UK chooses to develop a completely separate approval process for all new drugs, there is a risk this will delay access to new health technologies as many companies may choose to prioritise launching new drugs in Europe, which is a significantly larger market than the UK.[262] An alternative option would be to recognise authorisation for certain new drugs from the EMA on a case by case basis, in a similar manner to countries such as Singapore,[263] subject to a 60-day 'verification route.' The UK could commit to maintaining an 'observer' status within the EMA for the foreseeable future, which would allow the MHRA to continue to provide scientific input to EMA marketing approvals, and vice

versa. This would minimise disruption caused by Brexit while the UK builds capacity within the

Medicines and Healthcare products Regulatory Agency (MHRA). This would be an interim

arrangement, 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.

Organisations responsible for implementation:	*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 (HEIW), 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, 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

Health and care in the UK are facing a crisis in recruitment and retention of staff.[15] High vacancy

rates impact directly on patients, reducing access and quality of care, and on staff, who suffer low

morale and, in some cases, health problems. We recommend the development of long-term health

and care workforce strategies 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, as well as a renewed emphasis on the health, morale and wellbeing of the health and care workforce.

Recommendation 3A: Each constituent country to develop and maintain a long-term workforce strategy focusing on the collective health and care workforce supported by workforce planning, tackled at a cross-professional level and coordinated on a UK-wide basis that is tied into NHS and social care expenditure plans.

Specific actions	Objective
By 2021, each constituent country has developed (or maintained) a long-term health and care workforce strategy	Ensure high rates of recruitment and retention Meet changing health needs
By 2022, workforce planning is coordinated on a UK-wide basis	Link financial planning to workforce planning Make best use of expertise Ensure availability of essential data
By 2022, develop and implement workforce planning models which focus on the collective workforce, taking account of the changing needs of the population, emerging technology, and changing skill-mix	Support the introduction of new roles Maximise opportunities for task-shifting

Rationale

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.[264] 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. The Commission acknowledges that with devolution, each constituent country has, and will need a separate workforce strategy.[15] We argue that each workforce strategy must 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 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. 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 on a UK-wide basis Panel 9.

Panel 9: The case for coordinating workforce planning on a UK-wide basis

There are currently separate workforce planning systems in each UK constituent country but inadequate collaboration and coordination between them. Despite devolution, each constituent country draws on a common UK, European and global labour market, with UK-wide regulatory and professional standards facilitating the movement of workers from one constituent country to another. Each constituent country faces similar challenges, with significant shortfalls and an imperative to adapt their workforce to meet changing health needs, implement new models of

care, and capitalise on technological advances. The Commission believes that a UK-wide approach 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 UK workforce requirements would help inform spending reviews which ultimately take place on a UK-wide basis, 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 supply and demand side factors, and incorporate alternative scenarios, including changing skill-mix. Such planning is extremely complex, and there is an argument for concentration of expertise to undertake this challenging task.

- **Ensuring availability of essential data.** As highlighted throughout this commission, health and care data collected by the constituent countries are often incompatible, which hampers comparisons and planning. Implementing UK-wide workforce planning would stimulate efforts to improve the quality and consistency of data collection, as part of larger efforts towards a UK health and care data statistics strategy (Recommendation 6D).

- **Generating evidence.** Understanding what works in term 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 better coordination of research efforts including a fora to share examples of best practice.

Workforce planning has too often considered health and care professionals in isolation and has focused predominantly on supply-side factors such as vacancies, recruitment, and retention. Instead, workforce planning should look at the collective workforce, taking account of supply- and demand-side factors, and include alternative scenarios to adapt to changing health needs. Supply-side factors

should cover both entry to and exit from the workforce as well as 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.[264] For example, in the Netherlands, integrated workforce planning models have been used to project alternative scenarios and inform training places to achieve a more optimal balance between physicians and nurses in the primary care setting (Panel 10). However, this type of modelling should not be considered a panacea. Indeed, the Netherlands does still experience significant shortfalls in primary care, particularly in rural areas.[265] 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.

Panel 10: Workforce Planning in the Netherlands

Workforce planning models are used by the Advisory Committee on Medical Manpower Planning (ACMMP), established in 1999. The inability of earlier models to consider substitution between health and care professionals was highlighted as a weakness.[266] The ACMMP has developed a simulation model whereby alternative scenarios can be constructed involving both horizontal and vertical substitution between health and care professionals.[264] This has been used in the primary care setting to consider scenarios which involve transferring tasks from GPs to physician associates and nurse specialists.[264] Comparisons between alternative scenarios are presented to stakeholders 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 upon the acceptability of the modelling method to stakeholders involved in the decision-making process for training inflow numbers.

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

Specific actions	Objective
Develop capacity, motivation and opportunities to maximise the benefits from task-shifting without increasing the burden on staff	Ensure skill-mix meets the changing health needs of the population
Reform workforce education based upon competency based training that enables transition between roles more easily	Adapt skill-mix to better meet the changing health needs of the population Ensure high rates of recruitment and retention
Make best use of pre-existing and emerging technology when optimising skill-mix of health and care professionals	Reduce time spent on administrative tasks Increase time available to interact with patients Lessening risk of burnout
By 2021, launch a UK-wide independent review of the consequences of the expansion of teleconsultation services	Identify and respond to potential unintended consequences such as digital exclusion and financial impact on GP contracts

By 2021, the National Institute for Health and Care Excellence, the Scottish Medicines Consortium and the All Wales Medicines Strategy Group take responsibility for the regulation and evaluation of novel digital health technologies	Ensure novel digital health technologies are cost-effective and accessible to all

Rationale

The Commission welcomes recent moves from all four countries to improve the skill-mix in primary care,[267,268] 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; in addition, skill-mix needs to adapt to changing health needs and new ways of working.[269] 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 appropriate knowledge and capabilities exist, overcome professional boundaries and to create the right organisational, institutional and legislative environment to facilitate change.[270] It is important that task-shifting occurs in a manner that reduces pressure on a strained workforce. To enable this, the Commission endorses the recent recommendations on task-shifting from the EU Expert Panel on Effective Ways of Investing in Health.[271] That report rejected the traditional approach to task-shifting, often viewed as a means to save money by transferring work to lower paid staff. The report also extended the traditional model of task-shifting by including not just 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).

[Insert Figure 7: A new approach to task-shifting]

Source: Authors' representation of concepts from Task-shifting and Health Systems Design: Report of the Expert Panel on effective ways of investing in Health (EXPH) [271]

The EU Expert Panel's report highlights three main issues that must be addressed to implement change:

- **Improving capacity** – promote positive attitudes towards inter-professional working and working collaboratively with patients, review existing training and education programmes, and ensure there are no legislative or regulatory barriers.

- **Improving motivation –** engage with people's expectations and fears regarding task-shifting, improve organisational culture, and ensure task-shifting to patients is closely monitored and achieves the goal of empowering patients.

- **Improving opportunities** – ensure robust evaluation of task-shifting, and ensure that decision making is aligned with the overall goals of the health and care system, not solely driven by costs.

To improve opportunities for task-shifting the 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 competency-based accreditation could allow doctors to change specialties by transferring competences, thereby allowing more career flexibility and the development of generalist skills among the workforce. While the recommendations outlined in the Shape of Training have not been fully implemented, certain UK royal colleges have taken action such as the development of internal medicine training by the Royal College of Physicians.[272] The Commission recommends that competency-based accreditation is extended across the health and

care workforce. This 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 remain engaged throughout a potentially 40- 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 the local level, and royal colleges and regulators at the national level. Additional recommendations related to reforming the training of health professionals are contained within our background paper.[15]

There are well-established examples of substitution between health professionals which 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.[273] Second, the role of pharmacists in the UK has been expanding over several decades, through the use of independent and supplementary prescribing,[274] and by undertaking many tasks traditionally done by GPs in primary care.[275] The Commission believes that the role of pharmacists can be expanded further, by being empowered as independent health professionals, equipped with advanced skills in diagnosis and management (Panel 11).

Panel 11: A new model of community and hospital pharmacy

In England there is approximately one community pharmacist for every two GPs.[42,276] Currently, there are opportunities for pharmacists to work supervised within GP practices as part of primary care networks,[277] but expanding the role of pharmacists working within their own premises offers the potential to improve access to primary care services. While progress to date has been disappointing, the next two decades could see the implementation of artificial intelligence (AI)-

supported automated dispensing and therapeutic decision-making systems,[278] freeing up time for pharmacists to undertake more patient-facing roles. To some degree, this is already happening. In England a new five-year contract has recently been agreed including the development of an NHS 'Community Pharmacist Consultation Service' (CPCS), [279] via which NHS 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.[43] Many efforts to expand the role of pharmacists, for example through independent and supplementary prescribing, have begun in the hospital setting.[274] Empirical studies have found no significant differences in the rate and severity of prescribing errors between pharmacists and doctors.[280–282] However, there is significant variation in the degree to which pharmacist prescribers are used, with estimates ranging from fewer than 1% to 13% of medications prescribed in a hospitals.[280,281] Barriers to expanding the role of pharmacist prescribers include a lack of ongoing professional development, a lack of engagement from GPs, and organisational factors such as imposed formularies and a narrow scope of practice.[274]

To facilitate a meaningful shift in the model of community and hospital pharmacy a number of steps need to be taken. Education and training of pharmacists at undergraduate and postgraduate levels need to adapt to include a greater focus on conducting consultations, screening for red-flag symptoms and taking social and medical histories. This requires increased experimentation in and evaluation of novel patient pathways, including increased access to point-of-care testing technologies, referrals to medical and other service providers, including – for instance – rapid diagnosis centres, and AI-enabled decision support systems. Public and professional perceptions of pharmacists will need to shift, to recognise them as independent health professionals capable

of diagnosis and the management of disease. Finally, for community pharmacists, reimbursement mechanisms will need to be reconsidered to reflect their changing responsibilities.

As highlighted by the Topol Review,[283] workforce planning should explore opportunities for using technology to substitute for health and care professionals to meet the changing health needs of the population. Emerging technologies have the potential to enable health and care professionals to spend more time with patients and reduce burnout. The 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. AI has the potential to reduce the number of administrative tasks,[284] triage patients and be used for image analysis,[285] and robotics are increasingly deployed to process pathology samples and within surgical operations.[286] To create a vision for the future, the Commission has reviewed a number of emerging opportunities for task-shifting between health professionals and technology (Table 6). To support these efforts, undergraduate and postgraduate educational curricula need to rapidly adapt to ensure staff are equipped with the right skills to maximise the use of these technologies.

[Insert Table 6: Opportunities for task-shifting between health professionals and technology]

Source: adapted from Task-shifting and Health Systems Design: Report of the Expert Panel on Effective Ways of Investing in Health [271]

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 conventional clinical settings. As noted above, 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 this translates to long-term and sustainable change.

While telehealth providers may offer better access to care for certain groups of people, there are potential risks, such as misdiagnosis due to inability to conduct physical examinations, a tendency to over-prescribe, over-investigate and over-refer, a lack of continuity of care, and the risk of digital exclusion.[304] There is uncertainty 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.[305] The Commission recognises the potential of this technology to improve access for certain groups of patients and supports NHS England's commitment that all patients will have the right to online and video consultation,[306] but also recognises the potential for unintended consequences such as undermining the financial sustainability of existing primary care services, and the exclusion of groups with lower levels of digital literacy or those without internet access. The Commission therefore recommends a full UK-wide independent review of the consequences of expanding the provision of telehealth services.

Now and in the future, the NHS will increasingly have to respond to emerging developments in digital health, such as wearables, AI-supported image analysis 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.[307] These systems must 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 umbrella of medical devices,[308] and NICE has developed an evidence standards framework for digital health technologies, offering guidance to innovators and commissioners.[309]It is unrealistic to expect local commissioners to undertake this process. The Commission recommends that NICE, SMC, AWMSG should collaborate and be responsible for evaluating the clinical and cost effectiveness of novel digital health technologies, including any unintended consequences.

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

Specific actions	Objective
NHS and social care organisations take a zero-tolerance approach to discrimination and harassment experienced by marginalised groups such as women and people from a BAME background	Promote an inclusive work environment Eliminate discrimination and harassment in the workplace
By 2021, introduce the mandatory requirement to investigate the role of the work environment in the suicide of any health and care professional	Identify and respond to drivers of work-related stress
All constituent countries invest immediately in increasing the availability and consistency of support for unpaid carers across the UK	Reduce projected shortage of unpaid carers
All health and care workers, irrespective of role or stage of career, receive an annual review of their professional development and training needs	Retain staff Ensure staff feel valued
By 2021, launch an independent review of the most effective strategies to support an ageing health and care workforce	Retain staff

Rationale

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 to have a zero-tolerance approach to discrimination and

harassment experienced by marginalised groups such as women and people from a BAME

background. To this end, the NHS established the Workforce Race Equality Standard (WRES)

programme in 2015 to monitor racial disparities between staff with annual reporting against nine

key performance indicators.[310] These indicators have highlighted glaring disparities in how BAME

staff are treated in the NHS and progress so far against these indicators over the four years during

which they have been reported has at best been modest. High-level organisational leadership must

take these standards seriously and put mechanisms in place to ensure that those in leadership roles

in NHS organisations are held to account for failure to make substantial progress against the

indicators 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 a prolonged period.[118] There is

a need to implement sufficient after-care, including activity-monitoring of staff to identify those who

need additional psychological support.[118] The Commission also supports the recommendations of

the NHS Staff and Learners' Mental Wellbeing Commission,[311] which recommended actions such as

improving training in self-awareness and self-care, the provision of rest spaces during on-call shifts,

enhancing peer group support mechanisms and the introduction of a compulsory requirement in

every NHS organisation to independently examine the death by suicide of any NHS staff member.

Unpaid carers form a vital part of the health and care workforce, and estimates of the annual

financial value of this contribution in UK vary from £57 billion to £132 billion.[312] But pressure is

building: the gap in the supply of and demand for unpaid carers is projected to reach 2.3 million by

2030 in England alone.[313] Women provide the majority of unpaid care in England and Wales, being

more likely to be an unpaid carer and to provide care at relatively higher intensities (> 20 hours per week) than men.[314] This has negative implications for health and wellbeing, with evidence that the intensity of provision of unpaid care is associated with poorer mental and physical health.[315] Although evidence exists that the provision of care at relative low intensities (< 10 hours per week) can actually improve health and wellbeing.[316] There are strong economic, health, equity and moral arguments for investing in support for carers: to increase labour productivity, and to improve the health and wellbeing of both carers and the people they support. Policy should help retain skilled workers within the workforce even if they are also taking on carer roles.[317] Evidence suggests that the best approaches for supporting carers include a combination of interventions involving: *indirect support* – support through providing services to people with care needs, e.g. respite care;[318] *direct support* – support for carers such as psychological therapy, training and educational interventions, and support groups;[319] *flexible employment conditions* – enablement of flexible working and care leave can help carers in employment.[320] Many psychosocial interventions involving cognitive behavioural therapy, educational programmes, and counselling to support unpaid carers are also cost-effective using a £20,000 to £30,000 per QALY gained threshold.[321]

There is a lack of training and professional development for certain staff groups. Only 5% of the Health Education England budget is allocated to training clinical and non-clinical 'support staff'.[322] Formal training and professionalisation of these roles would recognise the significant challenges they face and give non-clinical and support staff the value and recognition they deserve. There is also a lack of attention to the career development of mid-career health and care professionals. This 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. The 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 will also require a more proportional allocation of training funds to create enhanced postgraduate training opportunities.

A major challenge for most health and care systems is an ageing workforce, and strategies need to be developed to support ageing staff. Many older staff have considerable knowledge and experience which is of value to the NHS but retire early due to a lack of support or opportunities to adapt their roles. Changing this will require wider opportunities for job-sharing, part-time and flexible working,[323] as well as reducing on-call and out-of-hours commitments. Leadership roles, which are subject to high vacancy rates and short tenures, [324] must be made more attractive, particularly for older staff, so that employers can make the most of their significant experience. To meet this challenge, the 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

Organisations responsible for implementation:	*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 (NICE), The National Institute for Health Protection, Public Health Wales, Public Health Scotland, Northern Ireland Public Health Agency, Ministry of Housing, Communities & Department for Work, Pensions, Department for Environment Food & Rural Affairs, Department for Education, Department for Transport, 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 healthcare professionals and the public.

During the Commission gains in life expectancy slowed in the UK. Using data up to 2016, ONS estimated that by 2043 male life expectancy at birth would reach 83.7 years, and 86.4 years for females.[325] Once updated using data up to 2018, ONS had revised their estimates down by 1.1 and 0.9 years respectively.[326] The Commission welcomes the ambitions of the UK government to achieve five extra years of healthy life expectancy by 2030,[327] but argues that this will not be achieved without a strengthened focus on prevention and narrowing health inequalities. Such concerns are inextricably linked to the achievement of many UN Sustainable Development Goals by 2030,[328] which provide an important mechanism to hold governments to account for their policies. Prevention must be incorporated into all aspects of action on health and wellbeing and sustained long term rather than with the 'seesaw' commitment evident over the last 30 years. Furthermore, the NHS must use all its assets to make a full contribution to the health and wellbeing of society, rather than focus mainly on treatment alone. Below we make a series of recommendations with the aim of developing and embedding prevention and preparedness in the NHS and in policy.

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.

Specific actions	Objective
NHS and social care organisations 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.	To achieve five extra years of healthy life expectancy by 2030
All NHS and social care organisations to recognise their potential as 'anchor institutions' within their local communities to maximise their impact on the health and wellbeing of local populations, and address discrimination and inequalities experienced by BAME groups	Create local employment opportunities Shift procurement to local organisations that provide benefit to the community
Benchmark all NHS and social care organisations according to a composite indicator which reflects their efforts to promote environmental sustainability	Promote environmental sustainability

Rationale

NHS and social care organisations have a crucial role within 'prevention systems' which the Commission argues should: include truly integrated delivery of preventative services within the NHS and social care system aimed at both individual and collective action; encompass primary, secondary and tertiary prevention; be based on the best contemporary evidence of effective action; minimise over-treatment, reduce preventable illness and improve outcomes; focus across the entire life course (childhood, working age, older age, end of life); and address persistent health inequalities in the delivery of prevention and care.[62] As many preventative actions take place outside the health and care sectors, a whole-systems approach must be taken, where the NHS at 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 to influence the contexts that create poor health and wellbeing and exacerbate inequalities.

The Commission wishes to highlight three priority areas in which a whole-systems approach is urgently needed: childhood obesity, mental health, and health inequalities experienced by BAME groups. A whole-systems approach has successfully been applied to reduce obesity in Amsterdam,[329] and in Leeds.[330] In Leeds much of this success has been attributed to the development of HENRY, a pre-school obesity prevention intervention targeted at disadvantaged areas, which engages with parents and young children to promote healthier lifestyles.[331] The Sure Start programme aimed at pre-school-children was an effective coordinator of such activities, but requires substantial investment to reverse deep cuts imposed since 2010.[332] 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 7**[Insert Table** illustrates the amount of evidence to inform policy making. Addressing longstanding health inequalities experienced by BAME groups, exacerbated by the COVID-19 pandemic, also needs a whole-systems approach. This will require culturally competent health promotion and disease prevention programmes and actions to reduce inequalities caused by the wider determinants of health to be included as part of COVID-19 recovery strategies. [182] Trust between health and care services and BAME groups needs to rebuilt, as well as investment in research and data collection to understand the societal drivers of health inequalities in BAME groups.

NHS and social care organisations have an important role as anchor institutions within their local communities. The Commission argues that these organisations have a responsibility to take account

of the health and wellbeing of local populations. This includes a wide range of actions such as promoting an inclusive workplace, a zero-tolerance approach towards discrimination and harassment, facilitating equal employment opportunities, ensuring that procurement procedures do not disadvantage small and medium-sized local organisations which provide benefit for the community, and delivering services in an environmentally sustainable manner.[333] By being a better employer, through evidence-based actions relating to job design, effective management and working conditions, NHS and social care organisations can have a marked impact on population health. The health and care sector accounts for between 10 and 17% of the workforce throughout the UK.[114] There are promising exemplars, including in Leeds (Panel 12).

Panel 12: Maximising the health impact of anchor institutions in Leeds

Ten key anchor institutions in the Leeds City Region (LCR) including local authorities, universities and hospitals are estimated to employ approximately 150,000 people and spend £7.2 billion on goods and services.[334] Recently, 12 of these 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.[334] The subsequent framework highlighted several core activities including strengthening local supply chains, local procurement, social procurement, fair pay and quality jobs, inclusive opportunities and place shaping. A number of anchor institutions in the LCR have begun taking steps to maximise their social value to the local population. For example, action by the Leeds Teaching Hospital NHS Trust has included

- ensuring they provide good quality jobs which pay at least the national living wage.[335]

- targeting recruitment drives (incl. 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.[335]

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%.[336] The NHS England Sustainable Development Unit (SDU) has categorised several specific actions covering efficient energy use, waste management practices, and transport planning according to their respective return on investment and tonnes of carbon emissions saved.[337] The SDU now publishes annual progress of NHS organisations in implementing these actions and reducing carbon emissions.[338] Similarly, NHS Scotland reports annual carbon emission data by health board.[339] The Commission recommends 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 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, accounting for 11% of total health and care carbon emissions.[336] COVID-19 has accelerated uptake of remote consultations, if this can be converted into long-term and sustainable change this has significant potential to reduce carbon emissions.

[Insert Table 7: The economic case for a 'whole-systems approach' to the prevention of poor mental health]

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

Specific Actions	Objective
By 2021, the NHS in each constituent country establishes an earmarked fund for prevention, which is to be managed in a similar manner to a capital fund	Sustained NHS investment in prevention
The Chief Medical Officer in each constituent country assumes responsibility for measurement and evaluation of preventative activity, including ensuring sustained investment, particularly when the return on investment is positive	Improve population health and reduce health inequalities

Rationale

In addition to increased and ring-fenced public health funding (Recommendation 1C), the Commission argues that the NHS in each constituent country establishes a separate funding stream for prevention. This would be used to invest in cost-effective or cost-saving preventative interventions, thereby improving the efficiency and quality of care. Potential candidates for increased investment cover areas such as pre-conception care,[351] antenatal care,[352] postnatal care,[353] transitional care interventions,[354] case management programmes,[355] and personalised chronic disease management programmes.[147] 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 preventative interventions. In many cases, for example the prevention of poor mental health (Table 7), this will require investment in programmes implemented 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 relative resource scarcity. This approach would smooth the availability of resources for prevention.

The economic case for investment in prevention is strong,[356] but too often policy makers ignore this evidence and prioritise funding for treatment over prevention. Attention is needed not just on generating evidence on prevention, but also identifying effective dissemination strategies to emphasise the economic benefits of prevention to policy makers. By maximising the potential of data generated within and outside of the health and care system, return of investment of preventative interventions can be presented in the short, medium and long-term (Recommendation 6C).[357] 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.[249]

High level national, local and organisational leadership must be responsible for the measurement and evaluation of activity and impact in relation to prevention. This includes measuring public health impact at the individual level, where health and care professionals can take advantage of routine encounters, to 'make every contact count', to encourage positive health behaviours.[358] Potential measures include recording the use of screening questionnaires, the provision of brief advice, and referral for health checks.[359] Developing indicators and evidence generation should not be separated from usual service and it will be important to channel appropriate investment such as NIHR and infrastructure funding, while developing deep relationships with the academic public health and other disciplinary communities (Recommendation 6D). Once preventative interventions are deemed cost-effective or cost-saving, high-level leadership has a responsibility to ensure sustained investment takes place. The Commission recommends that the Chief Medical Officer in each

constituent country takes on this responsibility, and reports annually on progress in achieving these goals.

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

Specific Actions	Objective
Cross-government strategies use fiscal and pricing policies to promote positive health behaviours	Reduce demand for NHS services
By 2021, as part of wider efforts to achieve the UN sustainable development goals, 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	Improve accountability for cross-sectoral action on prevention Work towards achieving 5 extra years of health life expectancy by 2030

Rationale

The drivers of poor health and inequalities lie across many sectors under the remit of multiple government ministries.[9] The Commission supports calls for cross-government action by the All-Parliamentary Health Group,[360] and argues that all UK administrations should have a cross-government strategy 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,[361] and local level.[362] The English health inequalities strategy (1997- 2010) was associated with a decline in geographic inequalities in life expectancy, reversing a previously increasing trend.[363] Since the strategy ended, inequalities have increased. The key to this approach 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 highlight developments in Wales, where sustainable development including working towards a healthier and more equal Wales is already a legal obligation (Panel 13).

Panel 13: Well-being of Future Generations (Wales) Act 2015

Wales perceives good health and well-being for all (SDG-3) as an outcome, determinant and enabler of all United Nations (UN) sustainable development goals.[364] The Well-being of Future Generations Act 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.[365] The Act includes several long-term goals which focus on improving the social, economic, environmental and cultural well-beings, with a statutory requirement to ensure 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'.[365] These goals include safeguarding planetary health and promoting environmental sustainability. Significantly, the Act established new structures, roles and accountability mechanism to improve implementation. At local level, all public bodies must commit to well-being objectives and form local partnerships through public services boards with the responsibility to publish local well-being assessments.[366] At national level, the Auditor General for Wales has a duty to carry out examinations of 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 well-being trends to inform planning and policy.[366] 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.

Adapted from Sustainable development in Wales and other regions in Europe – achieving health and equity for present and future generations (2017).[366]

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

The most commonly employed fiscal and pricing mechanisms are taxes, charges, subsidies and cash incentives.[367] Fiscal and pricing policies should target established risk factors that are linked to consumption behaviours driven by commercial interests. This works best where demand is highly price elastic,[367] ensuring that consumers are very responsive to changes in cost. The focus should be on both curbing unhealthy behaviours through price regulation, such as minimum alcohol prices, and incentivising the uptake of consumption that is beneficial for health.[368] Scotland has recently demonstrated 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 pence per unit in 2018.[369] Wales has recently followed suit and implemented minimum alcohol pricing legislation.[370] Fiscal measures such as product subsidies, or other regulatory price measures, have been shown to be effective in increasing physical activity,[371] and vaccination uptake.[372] Fiscal and pricing policies can also have a potentially catalytic impact on health. For example, emission policies like the congestion charge in London may not only benefit population health through reductions in pollution, but may also encourage active travel, thereby reaping several public health benefits. Evidence suggests that where revenue is earmarked for clear purposes – sports facilities in schools and healthy breakfast clubs for example – fiscal measures can attract wide public support,[373] 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.

Recommendation 4D: Develop a transparent and coordinated approach to UK-wide preparedness planning and response to future major threats to health

Specific Actions	Objective
By the end of 2020, launch a public inquiry into the UK government's response to COVID-19	Improved transparency and accountability To identify lessons learnt for future major threats to health
Clarify and strengthen structures and processes for consultation between the four nations in response to major threats to health, taking account of the extent to which different powers are devolved.	Improved UK-wide coordination for preparedness planning and response to major threats to health
Post Brexit, the UK retains membership of and contributes to the activities of the European Centre for Disease Prevention and Control (ECDC)	To maintain access to European coordination and information-sharing systems for communicable diseases

The contain-delay-mitigate-research strategy, promoted during the beginning phases of the COVID-19 pandemic, failed. Political leaders did not respond in time to the early warning from Wuhan, China.[374] 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 lacking, as in the initial phases of the pandemic the UK government decided not to release minutes of SAGE meetings.[112] To learn from this experience, it is crucial a public inquiry is launched.[375] This is

not only important to improve transparency and accountability but also to identify lessons learnt to ensure we are better prepared for future acute public health shocks.

The Commission recommends that structures and processes for consultation between the UK constituent countries in response to major threats to health are clarified and strengthened. So far, the Joint Biosecurity Centre (JBC) has been established to review evidence on major threats to health in England with little consultation with devolved administrations.[376] The Commission believes that improved systems for coordination, recognising the specific interests of each devolved nation, and in particular the fact that in many respects the island of Ireland operates as a distinct phytosanitary unit, would facilitate improved preparedness planning through joint regular health preparedness exercises, the critical appraisal of scientific advice, and when estimating resource needs to improve future surge capacity (Panel 6). Preparedness planning across UK constituent countries must be transparent, avoiding a repetition of the secrecy, and resulting inaction, surrounding the 2016 Exercise Cygnus.[110]

A founding member of the European Centre for Disease Prevention and Control (ECDC) in 2004, the UK has played an active role in the institutions efforts to tackle communicable diseases such as antimicrobial resistant infections, tuberculosis, and HIV in Europe. Maintaining membership of the ECDC has practical benefits such as access to the Early Warning and Response System, an online portal which connects public health agencies in Europe. This allows member states to share information regarding communicable disease cases in as close to real time as possible. The ECDC also offers a valuable forum to share scientific advice and to coordinate surveillance, preparedness planning and response for communicable diseases across Europe. So far, the UK government has withdrawn, against the advice of the DHSC.[377] The Commission recommends that a future UK government revisit this situation to explore whether the UK could continue engagement with the ECDC in a similar manner to other EEA countries which are not members of the EU such as Norway and Iceland.

Recommendation 5: Improve Diagnosis, In Circumstances Where Evidence Exists To Support Early Diagnosis, To Achieve Better Outcomes And Reduce Inequalities

Organisations responsible for implementation:	*National* Department of Health and Care, Devolved Governments, Health Education England, NHS England, NHS Scotland, NHS Wales, 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 (NI), Health and Care Trusts (NI), hospital trusts

The Commission's view is that there is significant scope to improve diagnosis and subsequently outcomes in the NHS while being appropriately cautious of the risks associated with over-diagnosis which can cause complications, undue medicalisation and mental distress.[378] We make a number of recommendations to improve diagnosis in the NHS. Importantly, these predominantly refer to areas where evidence exists that early diagnosis is known to be beneficial. We argue for a more comprehensive dialogue and evidence on the relative benefits and risks of greater 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: To increase capital investment and optimise skill-mix in both primary and secondary care to address unmet need for diagnostics caused by the COVID-19 pandemic and to meet future need for diagnostics.

Specific Actions	Objective
By 2021, launch an independent review of current diagnostic capacity in each constituent country, as well as projections of current and future optimal diagnostic capacity required to meet changing health needs.	Link investment in diagnostics to current and future needs
Include diagnostics within the remit of an annual capital investment plan in order to help continual investment (see Recommendation 2)	Reduce inequalities in access to diagnostics
Expand the roles of non-medical health professionals in making diagnoses and independently assessing risk.	Reduce delays to diagnosis
Target investment in AI capabilities for diagnosis to areas of greatest need, in terms of potential to benefit and where workforce shortages are most acute.	

Rationale

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.[379]

[Insert Figure 8: Recommendations to improve diagnosis for High Risk Populations]

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 is likely to involve significantly expanding diagnostic capacity to address growing unmet need for diagnostics for non-communicable diseases such as cancer, cardiovascular disease, and diabetes caused by the COVID-19 pandemic.[81,380] Taking a longer-term perspective, a growing ageing and multimorbid population will continue to drive demand for diagnostics, the UK is expected to diagnose approximately 500,000 cases of cancer per year by 2030 (from approximately 360,000 in 2014).[381] Investment is required to purchase diagnostics such as CT and MRI Scanners and the accompanying workforce. However, currently there is no clear plan regarding future diagnostic capacity, though it is clear that demand is rising rapidly and capacity is well below that in other OECD countries. To estimate what level of investment is necessary, the Commission recommends an independent review of diagnostic capacity is commissioned in each constituent country, as well as projections of current and future optimal diagnostic capacity 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 only serve to increase already significant inequalities in health outcomes.

Major diagnostic workforce shortfalls exist in areas such as radiology, [382] endoscopy, [383] and histopathology. [384] To address this, skill-mix needs to be optimised. Current examples include the use of non-medical endoscopists,[385] and radiographer reporting,[386] but more radical change is required. In primary care, new roles are emerging for allied health professionals, [267,268] 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 secondary care level, major opportunities involve AI undertaking image analysis in settings such as

retinal images, chest radiographs and skin images.[285] AI can also be used to interpret digital

mammography,[387] digital pathology,[388] and electrocardiograms.[389] However, like any new

technologies, appropriately designed large scale evaluation is needed before widespread

implementation. This are risks that AI algorithms reinforce inequalities and the exclusion of

marginalised groups by drawing upon bias data.[16] For example, AI algorithms designed to detect skin

malignancy may not perform as well across different ethnicities, or AI algorithms designed for

screening may under diagnose certain population groups if the training dataset is not representative

of the general population.[390]

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.

Specific Actions	Objective
Develop novel routes to diagnosis and give priority to areas where conventional routes to diagnosis are associated with low and/or unequal uptake.	Improve the evidence base for new routes to diagnosis
To improve the uptake of diagnostics, co-develop and test approaches to address barriers and facilitate enablers of diagnostic services in high-risk populations, particularly for high-risk and marginalised groups	Shorten pathways to diagnosis Improve access to diagnostics
By 2021, co-develop a nationally agreed quality framework for novel diagnostic technologies, with healthcare professionals, patients and citizens to drive evaluations	Reduce inequalities in access and uptake of diagnostics

By 2022, all novel diagnostic technologies undergo mandatory evaluation by the NICE diagnostics assessment programme before implementation	

Rationale

The NHS needs to simultaneously be (i) pro-active and ambitious by considering multiple novel routes to diagnosis, particularly where conventional routes to diagnosis are associated with low and/or unequal uptake and there is evidence to support early diagnosis; and (ii) responsive to emerging technological developments which are creating a stronger role for self-assessment through the use of wearables, self-testing, mobile applications and artificial intelligence.

Implementing novel routes to diagnosis does risk increasing demand on an already strained service but also create opportunities to improve both diagnosis and efficiency. In secondary care, the use of 'one-stop' clinics can reduce the need for multiple visits to hospital, reduce time to diagnosis and improve patient experience.[391] Novel diagnostics, particularly point-of-care tests (POCTs), may reduce the need for otherwise invasive investigations. The Faecal Immunochemical Test (FIT), can be used as a POCT for symptomatic people which present to primary care.[392] This could be a viable alternative to referral to colonoscopy, although requires thorough evaluation. AI algorithms, which capitalise on the increasing generation of data on patient pathways, accessed through mobile applications may be able to triage certain symptoms and offer a new route to accessing diagnostics.[393] Technological developments could forge a stronger role for people in diagnosis. For example, wearable devices have been developed to detect arrhythmias such as atrial fibrillation.[394] 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 (e.g. screening for dementia online) increasing self-testing through other

commercial and/or NHS provided home-use self-test diagnostics. Examples include the aforementioned faecal immunochemical test which is available within a 'home-kit',[395] sexually transmitted infection (STI) self-testing kits and the use of self-collection of vaginal swabs for HPV screening in under-screened women, currently in use in Australia.[396] Challenges associated with self-testing include low reliability as well as the provision of inadequate information.[397] This may 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.[62] This is particularly the case for many marginalised groups such as BAME groups, migrants, prisoners, and victims of domestic abuse.[398,399] Novel routes to diagnosis should be co-developed with communities to ensure their acceptability to the populations they seek to target, crucially not stigmatising groups with high-risk behaviours 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, co-developed with the community, through networks, social media, patient stories, awareness and briefing sessions, leafleting and posters, GP letters and messages on prescriptions.[400] Using this approach, screening adherence was high (90%, 1194/1323). Although, an expanded larger multi-site trial is required before more wide-spread implementation can be recommended.

Implementation of novel routes to diagnosis must 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, the Commission recommends that a quality framework for novel diagnostics should be co-developed with health professionals, patients and citizens providing evidence to society on these innovations. The National Institute for Clinical Excellence (NICE) has already developed a diagnostic assessment programme to assess the relative

benefits and drawbacks of novel diagnostics,[401] but assessment is not currently mandatory. The

Commission therefore recommends that before the routine and widespread introduction of novel

diagnostics in the NHS, that they should undergo mandatory evaluation by the NICE diagnostics

assessment programme.

Recommendation 5C: A more comprehensive professional and public dialogue to be encouraged

regarding the understanding of uncertainty, risk and benefit of testing and screening

Specific Actions	Objective
Update undergraduate and continuous training to equip health professionals with the skills needed to communicate uncertainty, risk and benefit effectively	Improved public debate and information to inform new models of shared decision making
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	

Rationale

There is a need to encourage a more comprehensive professional and public dialogue regarding the

understanding of uncertainty, risk, and benefit of testing and screening. Uncertainty exists when

there is difficulty reaching an agreed quantification of risk or benefit.[402] Risk can be understood as

the potential for harm. Whereas, benefit can be difficult to quantify as it is dependent upon

perspective and timeframe, i.e. the relative benefit of testing for an individual may outweigh the

benefits to wider society and conversely the benefits of testing for commercial companies may outweigh the benefit to both individuals and wider society.

A more comprehensive dialogue will involve effectively communicating risk to individuals based upon their characteristics including age, gender, genetic profile and morbidity, acknowledging the risk of harm and discussing the uncertain benefits to those individuals diagnosed 'early' who escape progression and later manifestation. To achieve this, action needs to be taken at multiple levels. Undergraduate and continuous training needs to equip health professionals with the skills needed to undertake shared decision making with patients and communicate uncertainty, risk and benefit effectively.[403] Patient decision aids can also help to enhance the appropriateness of screening and treatment choices.[404] Guidelines and policies need to be informed by up-to-date and reliable evidence, which take account of issues such as lead-time bias in clinical trials and ensures the identification of risk factors takes place in contexts when communicating risk translates to risk-reducing health behaviour and improved health outcomes.[405] Public awareness campaigns should be designed in a manner that minimises anxiety and improves the uptake of diagnostics and interventions deemed 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 which identifies the most effective strategies.

Recommendation 6: Develop The Culture, Capacity And Capabilities Of The NHS And Social Care To Become A National 'Learning' Health And Care System

Organisations responsible for implementation:	*National*

	The UK Statistics Authority, Health Data Research UK, NHS England, NHS Scotland, NHS Wales, Health and Care in Northern Ireland, Health Services Research UK, The National Institute for Health Protection, 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, social care providers

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 health policy decisions; continuously improve the efficiency, quality and safety of care delivery; personalise care; and to create an ecosystem in which research and innovation flourish. Our background paper on health information technology (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: Each constituent country to deliver on commitments to give patients custodianship of a readily accessible, integrated and electronic personal health record (PHRs) across health and care and support them to take more control of their health and care.

Specific Actions	Objective
By 2022, give all patients, carers and citizens control of a PHR, which allows them to not only to read their electronic records but also populate these thereby facilitating supported self-management	Encourage patient-centred care
By 2024, make PHRs accessible to multiple providers across patient pathways in a safe and secure manner allowing the transition of information throughout the health and care system with patients' agreement	Facilitate integration of care Improve patient experience Reduce medical errors
The roll-out of PHRs to be evaluated with a particular focus on identifying and supporting marginalised groups at risk of digital exclusion	Promoting digital inclusion among marginalised groups

Rationale

All constituent countries have committed to giving patients access to their electronic PHRs.[16] Giving patients greater control over their own data can lead to improved professional practice,[406] fewer inappropriate interventions,[404] improved professional-patient communication this in part resulting from less use of medical jargon,[407] more effective self-management and better health outcomes.[147] Achieving meaningful patient control of their medical records may require legislative change and will depend on effective political, managerial, clinical and patient leadership, that acknowledges the system should be patient centred in practice and not only in rhetoric, together with appropriate investment in education, infrastructure and support. The feasibility of such a system has been demonstrated in the UK and in other countries (Panel 14). The long-term ambition should be to make patients the official custodians of their PHRs, while ensuring data is accessible to both patients

and multiple providers throughout care pathways thereby acting as key enabler to further integration of care (Recommendation 7). This will require investment in secure cloud-based computing to protect the privacy and confidentiality of patient information and achieving interoperability with pre-existing HIT products. It will also require changes to the way data protection legislation is interpreted and implemented in the UK through Local Health and Care Record Exemplars. Constituent countries should collaborate to achieve these goals on a UK-wide basis (Recommendation 6C), particularly to account for the challenges associated with the provision of cross-border health and care services and the around 100,000 people per year who migrate between constituent countries.[408]

Panel 14: Patient Knows Best in Wales

Patient Knows Best (PKB) is an interactive electronic care record controlled by patients created by a social enterprise, [409] which allows patients to access and add information to an Internet based account with smartphones and share it with health professionals in both hospitals and primary care. Already in use in a number of hospitals in England, after a pilot in Abertawe Bro Morgannwg University Health Board, the Welsh Government launched a national roll-out which started with providing access to all diabetic patients aged 16 to 24 years.[410] While this PHR 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. It may not be the case that it will meet the needs of all personality types. Initial research from England suggests that PHRs met the needs of those with 'controller' and 'collaborator' rather than 'avoider' personality characteristics.[411] Barriers to uptake have also been identified including concerns over security, risk averse attitudes of users and problems with data integration.[412] Moreover, research needs to take place to understand whether platforms such as PKB are accessible and usable for older people and/or multimorbid patients with complex needs.

Concerns about patient access to PHRs include the risk of digital exclusion,[413] generating increased demand on clinician's 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 US.[416] Emerging examples in the UK such as PKB, PatientView,[417] and PatientAccess,[418] also require thorough evaluation. The 2020 GP Survey found that 5.8% of patients in England had accessed their medical record online.[419] More needs to be understood regarding who is accessing their PHR and the barriers to improving uptake. PHRs may be underutilised by population groups with lower levels of digital literacy such as older or disabled people.[141] However, these groups can achieve 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 as well as staff. Initiatives that seek to mitigate against the risk of digital exclusion such as 'Digital Communities Wales',[420] and the 'Widening Digital Participation' programme in England, [421] should be encouraged.

Recommendation 6B: To foster HIT and data science leadership which enables the routine use of data to continuously improve health and care planning, service delivery and personalisation of health and care.

Specific Actions	Objective
By 2024, all constituent countries complete the process of transitioning from paper-based to electronic health records (EHRs) and make substantial progress in digitising social care records	Create end-to-end digital infrastructures in health and care
All constituent countries develop data science leadership positions at national, regional and local organisational levels	Enhance capabilities to use data routinely in (near) real-

to encourage a cultural shift towards maximising the potential of health and care data	time for a broad range of policy and service needs
Develop data literacy and capability throughout the NHS and care systems, including for executive leaders, managers, frontline staff, patient and carers	
Performance management initiatives to be designed in partnership with health and care professionals and ensure that agreed targets are clinically relevant	Improve patient safety Avoid a blame culture
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	Identify and act on unwarranted clinical variation Improve health outcomes

Rationale

The UK is making progress in transitioning from paper-based to electronic health records (EHRs), 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] Currently, EHRs are used more frequently in primary care than secondary care, and rarely used at all in social care.[16] The ambition should be to work towards EHRs 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 developed locally across the UK, for example the Connected Health Cities project in the North of England,[422] the Northern Ireland Electronic Care Record (NIECR),[423] and the East London Patient Record.[424]

To achieve the vision of a 'learning' health and care system, the NHS and social care in each constituent country needs to develop greater 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 should include routine collection of patient-reported measures of care experiences and health outcomes. Investment will be needed in developing data literacy and facilitating earmarked time for quality improvement activity throughout the health and care system – including for executive leaders, managers frontline staff, patients, and carers – so that the data generated as a natural by-product of care can be used to continuously support and improve policymaking and care planning, service delivery and personalisation of care.

Several cultural barriers have been highlighted for developing learning health and care systems such as the higher status attributed to basic science research than to innovation or implementation, and the perceived relatively 'low status' of data analysts compared to other health professionals.[425] To overcome these barriers, strong leadership is needed at national, local and organisational level. The role of Chief Clinical Information Officer (CCIO) 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 & Social Care Services in Northern Ireland are participating.[426] Leadership should prioritise encouraging the logistical, cultural and legal and ethical shifts needed to ensure that data are used to support innovation, including enabling real-time field experiments of different service models, clinical pathways, and improvement strategies.[427]

A 'learning' health system requires that data be seen as credible, secure, relevant and actionable, while at the same time not too irksome or expensive to collect, process and analyse.[428] Data systematically collected can reveal unwarranted variations in health and care practices, processes and outcomes and identify areas for improvement,[429] but how this is done matters. As

recommended by the Wachter Review,[430] engaging health and care professionals throughout is key. Involving patients and lay people in the development of data-based applications and products is also important, particularly to ensure that meaningful informed consent mechanisms are in place. Data clearly have a role in performance management, but the trade-offs involved in their use for this purpose need to be recognised and managed to avoid unwanted effects such as gaming, effort substitution, the creation of perverse incentives such as risk selection, and a culture of blame.[431] This is particularly pertinent regarding systems which 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.[432] Leadership has an important role in ensuring performance management initiatives are designed in partnership with health and care professionals, agreed targets are clinically relevant and evaluation takes place to ensure they genuinely support continuous improvement.

The Commission argues that a major strength of the NHS and associated academic ecosystem is the many purposefully-designed large-scale data exercises, such as the National Clinical Audit Programme (NCAP),[433] the National Reporting and Learning System (NRLS) for England and Wales and its successor the Patient Safety Incident Management System (PSIMS),[434] the Health Data Research UK (HDRUK) Digital Innovation Hub Programme,[435] and research projects such as the UK BioBank,[436] Understanding Society,[437] and the English Longitudinal Study of Ageing.[438] However, the impact of such exercises is dependent upon their design, and how outputs are presented and acted upon. Currently outputs from many of these exercises tend to be reports or publications, which whilst useful do not necessarily support decision making.[439] Investment is needed in high-quality methods of data visualisation and in linking data to evidence-based quality improvement strategies and decision aids for staff and patients.[440] Increasingly, the ambition should be to move towards as close to real-time feedback as possible. The UK can learn from abroad, where other countries such as Sweden have demonstrated the potential of these exercises to drive quality improvement, improve health outcomes and facilitate research (Panel 15). The scope of large-scale data exercises,

particularly national clinical audits, should routinely extend across the UK. This 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 highlighting inequalities in access. The remit of PSIMS should be

expanded to ensure HIT related safety issues can be captured, learnt from and remedied. To achieve

this, HIT vendors should be mandated to report any issues that come to light.

Panel 15: Quality Registers in Sweden

The Swedish Quality Registers are a collection of over a 100 government administered clinician-

led registers of patient level data in a diverse range of therapeutic areas such as oncology,

rheumatology, surgery, cardiovascular disease and palliative care across the health and care

system.[441] These registries include detailed data regarding patient characteristics, patient

reported outcome markers, biomarkers and severity of disease and can be linked together to

allow researchers to follow patients throughout the life course.[441] They are funded by financial

support from either the Swedish Government or the Swedish Association of Local Authorities and

Regions (SALAR) and technical operations and analytical work is undertaken by six university-

based 'competence centres', as well as six regional cancer centers.[441] The legal regulation of these

Quality Registers is detailed within the 2008 Patient Data Act,[442] which states patients must be

informed their data will be recorded in a particular quality register, and are given the opportunity

to opt out. Coverage is good, with approximately 60% of the quality registers covering ≥80% of

their target population.[441] There are many examples whereby Swedish Quality Register have been

used for quality improvement purposes, such as improving adherence to national guidelines, [443]

and for monitoring outcomes.[444] However, some have expressed concerns that the registries are

underutilised, and that there is a need for end-users to receive training in registry-based research

and benchmarking.[445] In recent years, the Quality Registers have been used to undertake

'Randomised Registry Trials', which offers potential to make routine, less expensive and more efficient clinical studies possible.[446]

Recommendation 6C: To develop and implement a UK-wide long-term data and statistics strategy for health and care

Specific Actions	Objective
By 2021, an overarching UK organisation takes responsibility for assessing current and future health and care data needs, mapping existing data collection and ensuring data standards are met.	Better coordination between data authorities across UK
This organisation ensures, to what degree is possible, that data are collected and coded in standardised ways across health and care in the UK	Maximise the utility and value of health and care data Facilitate inter-country learning across the UK
This organisation mandates open application programme interfaces (APIs) and develops closer alignment with health IT and data science research investments	Improve interoperability Encourage HIT research and innovation

This organisation mandates and monitors compliance against minimum data security standards in order to maintain the confidentiality of data	Builds public trust in security of their data
This organisation develops 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.	Supports the development of digital health technologies

Rationale

The health and care data landscape across the UK is incredibly complex,[447] with national data collection from health and care collected by a multitude of alternative organisations, each with its own scope, capacity and capability to process and analyse data. Data-linkage is limited; often facilitated through several organisations (not-for-profit and for-profit) and resulting in out-of-date data and high access charges. Data application processes are lengthy and can take several months. There is significant scope for each constituent country to learn from each other. The Secure Anonymised Information Linkage (SAIL) Databank in Wales has streamlined application processes and can now facilitate access to linked datasets on average in 12 weeks.[448] All UK constituent countries have also invested in national data safe havens,[449] which offers a platform to securely store, access, and analyse data. While NHS Digital in England does facilitate 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.[450] An overarching organisation could play an important role in coordinating pre-existing data authorities across the UK by mapping existing data collection, ensuring data standards are met, linking datasets, and assessing current and future health and care data needs. If their scope and responsibilities are expanded, the UK Statistics

Authority and HDRUK are potential candidates. Country and system-specific efforts to deliver health and care data strategy will still be relevant,[451] but should be complementary to a UK-wide strategy.

The Commission highlights several priorities for a UK-wide long-term data and statistics strategy. First, a thorough review of data needs for health and care systems needs to 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 the Commission (Panel 16). Second, the introduction of standardised ways 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. Vital steps include the use of Systematized Nomenclature of Medicine Clinical Terms (SNOMED CT) by all health and care professionals operating across NHS and social care settings who enter data into EHRs.[452] 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 is a crucial step to facilitating effective workforce planning (Recommendation 3). Standardisation of data would also improve the reliability of UK-wide aggregate data 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. This will require reducing costs and delays in access to linked data, improving workforce and infrastructure capacity to undertake linkages and clarifying the legal frameworks that enable linkage of data. Fourth, mandating open application programming interfaces (APIs) and coordinating closer alignment with HIT and data science research investments will allow an ecosystem in which HIT research and innovation flourish to maximise the benefits for the NHS and patients and the public. NHS England recognises this and promotes an open API policy.[453] Fifth, to build trust and confidence of patients, citizens and health and care professionals in the security of electronic health data; defining, implementing and monitoring minimum data security

standards will be required. This will involve regularly upgrading software, procedures for handling data breaches, the use of virtual local area networks 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, there is a need for patients, citizens and health and care professionals to be involved in mutually agreeing frameworks that define instances under which anonymised patient data can be shared with public or private organisations as well as expected terms and conditions and codes of conduct for such partnerships.

Panel 16: Data needs for UK health and care systems

Data Needs	Function
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 impact in relation to prevention at both organisation and individual level. (Recommendation 4)	To identify the most effective preventative strategies
Comprehensive ethnicity data collection across NHS and social care organisations including at death certification. (See Recommendation 4)	To understand and facilitate research into health inequalities experienced by BAME groups
Metrics to evaluate the effectiveness of increased testing, screening and novel routes to diagnosis. (Recommendation 5)	To monitor risk of over- and under-diagnosis 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

Recommendation 6D: To re-balance and strengthen research and innovation efforts towards supporting health and care service delivery

Specific Actions	Objective
Re-balance 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	Maximise population benefit from research funding
Increase investment in the academic health and care workforce and better integrate the academic and frontline health and care workforce	Develop and evaluate strategies to improve quality of care

Health services research examines access to, and the use, costs, quality, delivery, organisation, financing, and outcomes of health, population health and care services.[454] This is not just about generating and analysing data, but also about drawing upon quantitative and qualitative research techniques and multiple disciplines such as epidemiology, health economics, public health and social sciences. The Commission believes the research agenda is skewed towards novel treatments, with

less focus on the use of health and care services research, despite its potential to improve population health and narrow health inequalities. [455]

The UK has established an infrastructure to support health services research. This includes through the largest funder in England, the National Institute for Health Research (NIHR), which has an annual budget of around £1bn.[456] In total, there was around £4bn spent on health research in the UK in 2018.[457] However, health and care services research only accounted for around 6% of commissioned health research projects, with the remaining allocated to research areas such as the aetiology of disease, treatment development and treatment evaluation.[457] While this research is important, the vital role of health and care service delivery research in generating evidence on the optimal composition of services, and their effectiveness for different patient groups, needs to be better recognised. The 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. This will require further coordination of the bodies responsible for health and care research in each constituent country, thereby facilitating opportunities for inter-country comparison and learning. Second, to capitalise upon opportunities for knowledge generation, the academic and frontline health and care workforce should be better integrated. This will require investment in the development of the academic health and care workforce, which has reduced by 2.5% between 2010 and 2018.[125] 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, workforce planning efforts are needed to map the pre-existing workforce and estimate future needs (Recommendation 3). Multidisciplinary research skills should be compulsory and meaningful aspects of undergraduate and postgraduate training for all health and care professionals. Models that explicitly build capability and capacity for research in health, population health and care services as well as producing high quality research have been established in focused areas such as stroke.[455]

Learning from these should be extended to cover the health and care system more widely and be situated where population and patient needs are.

Two urgent priority areas for health and care services research identified during the Commission include evaluating system-level changes implemented in response to the COVID-19 pandemic, such as the rapid increase in uptake of remote consultations, and examining the effects of alternative policies used to promote integration between health and care. Although an academic community has built around health services research in recent years, for example through Health Services Research UK (HSRUK), there has not been the same level of coordination between funders, the health and care system, research organisations and research users as there has been for clinical research.[458]

Recommendation 7: Improve Integration Between Health, Social Care, And Public Health And Across Different Providers Including The Third Sector

Organisations responsible for implementation:	*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, The National Institute for Health Protection, Public Health Wales, Public Health Scotland, 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 (NI), Health and Care Trusts (NI), Hospital Trusts, primary care providers, mental health trusts, social care providers

The Commission agrees with the almost universal consensus that better 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 achieved different progress in integration at a systems level but all experience ongoing challenges in providing seamless care, responsive to changing population needs. COVID-19 emphasised the continued lack 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.[459] The purpose of the recommendations below is not to suggest unnecessary reorganisation for which there will rightly be limited appetite, but to think to the longer-term interests of the health and care system and population it services. Current arrangements are dysfunctional. The recommendations run from those which can be enacted in the shorter term those which 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 also the need to not be overly prescriptive but to set principles for locally appropriate solutions.

Recommendation 7A: To remove system barriers which limit integration of care, supported by appropriate legislation

Specific Actions	Objective
Reinforce and reorient the capacity of primary care, to enable its natural role as the key facilitator of integration	Reduce system complexity
By 2021, remove the requirement to promote competition in England, with appropriate changes to legislation	Enable effective inter-organisation working

By 2021, develop and monitor metrics indicating the local quality of care integration	Collect high-quality data on integration of care to inform policy and practice
By 2024, implement linked personal information systems with secure access for patients and all relevant providers (see Recommendation 6)	Improve seamless care for patients
By 2021, establish a research programme to fund large-scale experimentation and yield evidence to use in the design and implementation of integration policies	High-quality research on integration of care informs policy and practice

Rationale

It was evident throughout the Commission that all countries in the UK face similar challenges in improving integration. In highlighting systems barriers there is a basis for sharing lessons learned from successes and failures. To look only to non-UK countries for learning on integration is an important omission given that the systems still resemble each other more than anywhere else. We address organisational reform below (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 failed to even adequately engage with primary care.[460] The Commission therefore emphasises the importance of adequate funding and workforce planning for primary care as vital 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. Legislation which promotes competition, ie the Health and Care Act 2012 in England,[48] should be altered or superseded.

As part of a UK-wide data and statistics strategy (Recommendation 6C), metrics to track progress of the quality of integration at local level should be developed. There are pre-existing metrics which are already used including data on delayed transfers of care and unplanned hospital admissions, however further metrics could be developed which capture data on patient experience, patient outcomes and communication throughout pathways of care.

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 (Recommendation 6A). Information should follow the patient as they move within the health and care system, 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 highlighted diverging approaches to integration policies across and within the constituent countries. More needs to be done to systematically evaluate the impact of these policies. This will involve drawing upon embedded randomised or robust quasi-experimental designs. Lessons can be learnt from the approach being taken to evaluating the Children and Young People's Health Partnership using a cluster randomised clinical trial (Supplementary Material 1).[461] The aim should be to improve the evidence base on what works well where and to identify potential candidates for replication elsewhere. This will require increased investment in health and care services research (Recommendation 6D).

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

The Commission takes the view that interventions such as pooled budgets or personal health budgets (PHBs) are unlikely to have a significant impact on the integration of services, without large-scale structural changes to the way providers are reimbursed. To address this, the Commission recommends that payment should be aligned with promoting integration and efficiency. This will require seeking an optimal mix between case based, bundled, salaried and capitation payments throughout the health and care system. To achieve this there needs to be a willingness to experiment with and evaluate potential alternative reimbursement mechanisms. The Commission commends the approach to dental contract reform in England and Wales, where several prototype contract models incorporating capitation and pay for performance reimbursement have been piloted.[462] An initial evaluation has indicated promising results in terms of improving quality, incentivising prevention and maintaining access,[462] and there are provisional plans to roll-out this contract from April 2020.[463] Throughout the commission, three policy options in primary care, dental care and hospital settings were debated, which could serve as potential candidates for future experimentation (Panel 17). Principles to reform reimbursement of pharmaceuticals are discussed within recommendation 2.

Panel 17: Proposed policy options to reform provider reimbursement

Primary Care
Policy Option: Offering all GPs NHS employment contracts - GPs would be offered voluntary NHS employment contracts with similar terms and conditions to hospital consultants. - This may 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

- GPs could focus more on clinical activities as they would lose many of the management responsibilities they currently have in running independent businesses.

- Facilitate more collaborative working between primary and secondary care, and reduce conflicting incentives to shift responsibility to one another.

- Salaried GPs are protected by the European Working Time Directive, which would limit their working week.

- Increased certainty for trainees about their future pay, and terms and conditions of employment, which will likely increase recruitment and retention.

Drawbacks

- GPs may have less involvement in designing and running primary care services, despite useful insights into the local needs of the population

- An employed model may reduce intrinsic motivations to improve or maintain the quality of services

- It is possible an employed service would cost more and be less efficient, 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 as lack of affordability is a major barrier to dental care.[464]

- This would mean no co-payments to access or receive dental care, except for any prescription charges.

Advantages

- Improve access to dental care services, including preventative care for patients on middle and low incomes.

- Reduce health inequalities in dental health outcomes.

- Reduce administrative burden and costs associated with means testing for NHS dental care.

- Reduce burden on other NHS services created by poor dental health.

Disadvantages

- Would have significant cost implications for NHS – based upon 2018-19 figures the estimated UK costs would be approximately £1 billion per year.[465–468]

Hospital

Policy Option: 'Bundled payments' for care episodes within a defined time frame for certain 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 incentivises better 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,[469] 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 which rely upon 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.

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

Specific Actions	Objective
Clarify the legal requirements for organisations responsible for health and care delivery	Improve accountability of organisations responsible for health and care delivery to citizens of UK
Introduce a mandatory requirement of organisations responsible for health and care delivery to report on their performance to an independent national audit body accountable to parliament in each constituent country	

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.[470] As a consequence, there has been a progressive withdrawal by the NHS from certain 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 lacked meaningful political scrutiny. Moreover, withdrawal of NHS care can occur in a more implicit manner, for example in the last decade, waiting lists for elective care have grown, with one in five people in Northern Ireland now on a waiting list, thereby encouraging people to seek private care.[471] These numbers have undoubtedly increased during the COVID-19 pandemic. Moreover, as noted earlier some CCGs and previously Primary Care Trusts (PCTs) have identified procedures that will no longer be funded by the NHS, either for all or for certain groups within the population, leading to what has been called a 'postcode lottery'.[65] In principle, this may 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 Board in Northern Ireland fit for purpose? New bodies such as Sustainability and Transformation Partnerships (STPs) and Integrated Care Systems (ICSs), are being adopted with an unclear statutory basis. In part this is pragmatic and reflects the tension between the need for new legislation and the challenges associated with navigating controversial legislation through a parliament currently preoccupied with other issues such as COVID-19 and Brexit, exemplified by the ongoing delay in publishing a Green Paper on Social Care.

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

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

Recommendation 7D: By 2030, all UK 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.

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 is the direction of travel

already. Northern Ireland has a long-standing presence of five Health and Social Care Trusts,[472] whereas Scotland and Wales have more recently legislated for bodies responsible for integrated health and care planning and delivery. [49,365]

The 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 undertaking to make this change, particularly in England, will be considerable and likely take up to a decade. Systematically assessing the different options is beyond the scope of this Commission but should be urgently carried out, This should draw on knowledge and experience, current and from the past, for example from previous arrangements such as district health authorities and regional health authorities, 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 made available. The population size covered by such entities should make sense. We suggest that CCGs in England are currently too small to act as effective coordinators of services and that new bodies should also where possible be centred around local authorities, along the lines of many former rural and metropolitan county councils. Experiments under way in Manchester and elsewhere may offer useful evidence on which to base detailed proposals.[473] 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 last three decades.[474,475] This requires re-examination to establish what leadership models should look like into the future.

Implementation of the recommendations

The Commission is conscious that many of the challenges facing the NHS are not novel, and that there have been several other well-intentioned attempts to address these in the past (Supplementary Material 2). This Commission does not seek to supersede these previous efforts; in some cases, we deliberately reiterate certain recommendations. While the implementing bodies responsible in each of the constituent countries is listed, detailed plans for implementation were beyond the scope of the Commission. This is not to neglect implementation.

The Commission framed the recommendations within a number of key understandings. The process from agenda setting and policy formation to implementation is rarely linear.[476] The changes 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 actors, with differing institutional logics,[477–479] as we have described through the report. We recognise, too, the political element of policy implementation, as well as policy formation, and the importance of understanding and taking account of the interests of multiple actors.[480,481]

In forming the recommendations, the Commission considered the following common impediments to policy success discussed by Hudson et al. 2019:[482]

1. Overly optimistic expectations – We must temper our ambition with realism. This is reflected in the timelines set and that some changes represent a continuation in direction of change rather than a radically new path.

2. Implementation in dispersed governance – We have set out principles for changes, national and local, rather than prescriptive models. Local context is often crucial. The recommendations also consider how to support learning for implementation within the NHS.

3. Inadequate collaborative policy making – Inter-organisational partnerships deliver health and care, and our policy making must likewise be fully shared and inter-organisational. The Commission has stressed the need for integration and this includes policy design. The

recommendations include consideration of organisational structures to bring

administrations and organisations together.

4. The political cycle may favour short-term pushes rather than longer-term efforts. This is a longstanding challenge for the NHS. Building on the common strengths and potential already in place, our changes require a longer-term vision, looking 10 years hence. Throughout, we urge the strengthening of evaluation and use of data to inform change.

In summary, the recommendations respond to several issues highlighted repeatedly in analysis of failures within the NHS and in challenges of implementation.[477–479] The recommendations emphasise the role of strong leadership, relationships and collaboration, improved accountability and 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, a lack 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 all proved to be 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 level of financial protection provided by the NHS and an allocation of resources that explicitly accounts for differing geographic needs have to some extent mitigated the already significant effect of the COVID-19 pandemic on health inequalities. Elements of the response by the NHS and other national executive agencies must also be commended and reflect the strengths of the health and care system and workforce. In a matter of a few weeks, critical care capacity was massively expanded, many thousands of staff re-allocated,

and services re-organised to prevent transmission of coronavirus. 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, the Commission has presented a vision for the NHS in 2030 as:

'Working together for a publicly-funded, integrated and innovative service that improves health, wellbeing and reduces inequalities'

Central to the argument of the Commission is that an ongoing increase in funding for the NHS, social care, and public health is essential to ensure the health and care system can meet demand, rebuild post pandemic, and develop resilience against further acute shocks and major threats to health, including multimorbidity and mental health. This funding must be targeted towards increased investment in capital, workforce, preparedness, prevention, diagnosis, health information technology, and research and development and the NHS must develop new ways of working with patients and citizens. The NHS across the UK can leverage its strengths further and the Commission highlights areas for more strategic collaboration between the constituent countries. In summation, our recommendations are about relaying the foundations of the NHS to meet the changing needs of the whole population and ensure resilience to future health shocks.

Call to Action

The NHS remains one of the major achievements of the UK. A post-war context 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 high quality care based on clinical need, not ability to pay. The NHS faces many immediate

challenges, particularly addressing growing unmet need caused by the COVID-19 pandemic. The

future is uncertain in terms of economic impact and the potential for a further pandemic. Longer

term we must strive for an innovative and resilient health and care system and achieve 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 we set

out will be challenging in economically and geo-politically uncertain times. But in the wake of this

pandemic and Brexit, 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 long-term future of the NHS. The proposed

changes to taxation are achievable; the UK has a lower tax burden than many comparable countries

and public support to pay more tax to improve health and social care is high. More starkly, any

decision not to increase funding and support the recommendations outlined 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. Like previous generations, the NHS exists

under our custodianship and we have a responsibility to current and future generations to secure its

long-term survival.

Acknowledgements

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