

Agility: the missing ingredient for NHS productivity

Some improvement approaches that can increase productivity, and how to make them happen

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Key points

- Maximising productivity is critical if the NHS is to survive the pressures it faces in the aftermath of COVID-19 and from the long-term growth in demand for health care.
- Making sustainable improvements to productivity will require reshaping and improving the delivery of care. In this long read we highlight some service improvement agendas that offer opportunities to improve productivity. We look at skill mix change, patient activation, improving flow and the use of technology. We explore both how these approaches can be used ‘incrementally’ to improve existing models of care, and also how they can be used ‘transformationally’ to create new models of care.
- We often see a disconnect between identifying an opportunity for productivity gains in principle and realising the benefits in practice. This underlines the critical importance of successful implementation. We argue that provider motivation and capability are particularly relevant in understanding this gap between policy and practice.
- We argue that motivation and capability determine the ‘agility’ of an organisation to grasp opportunities, and that this is critical for improving productivity. Too often policy is concerned with identifying opportunities and setting objectives for change, but not with providers’ ability and readiness to respond effectively. In particular, policy must not focus only on the supply of things that can enhance productivity (new workforce roles, equipment, promising innovations, etc), but also on whether providers are in a position to take advantage of them.
- Action is needed to strengthen provider agility, including investment in improvement capability and digital infrastructure, providing implementation assistance within national change programmes, supporting effective management and leadership, and ensuring that regulation and payment systems support innovation.
- Service improvement agendas driven and owned by front-line teams offer an opportunity to harness the intrinsic, vocational motivations of the NHS workforce more effectively than an economically framed agenda.

1. Introduction

As we approach the Spending Review, NHS productivity – what the health service produces for the resources it uses – should be on Treasury ministers’ minds for several reasons. The health of the population is an **economic asset**, so NHS performance is critical to our future prosperity. Representing more than a third of public spending, NHS productivity is also a **major factor** in the productivity of the economy as a whole. And, most immediately, **maximising NHS productivity is critical** if the health service is to survive the pressures it faces in the aftermath of the COVID-19 pandemic and from the long-term growth in demand for health care. So it’s no surprise that, following the recent **NHS funding announcement**, the **latest planning guidance** signals increasing efficiency requirements on providers: the less productivity increases, the bigger the gap that will need to be filled with extra funding.

Before COVID-19 hit, health care productivity growth **had been stronger** than in the economy as a whole, though **in 2018/19 it fell** for the first time in a decade. Recent Health Foundation **analysis** suggests a further fall was likely during the pandemic – due to infection control measures, the suspension of some services and high rates of staff absence – and considers the potential ongoing impact of COVID-19 on productivity (including through continued need for infection control measures). Looking at the next few years, the analysis estimates that every 1% reduction in productivity will require around an extra £1.5bn of funding per year in order to maintain quality and access to services. So even small changes in NHS productivity make a big difference financially.

Of course, a focus on productivity should not distract from the fact that a major source of NHS pressures has been underfunding – ultimately a political choice – and that the major determinant of NHS fortunes is whether it gets the funding it needs. But nor is there any escaping the fact that, for any given spending level, every pound wasted contributes to unmet need or worse services elsewhere.

2. In search of sustainable approaches to improving productivity

After the 2008 financial crisis, the NHS relied on national policy levers for efficiencies, such as restraining pay and reducing the tariff for hospital services. While these actions generate savings, they don't necessarily improve productivity and, crucially, are **not sustainable**. Pay freezes effectively reduce input costs rather than increasing productivity and may affect service delivery if they undermine morale, recruitment and retention. Tariff reductions only increase productivity if providers can deliver the same services for less. Otherwise, care quality will suffer, or provider finances will deteriorate (by 2018 **46% of trusts were in deficit**).

Making sustainable productivity improvements ultimately requires reshaping and improving the delivery of care. So what approaches should the NHS be considering in order to increase productivity now?

In this long read, we'll look at how skill mix change, patient activation, improving flow and the use of technology could improve NHS productivity (primarily in the context of the NHS in England – though the issues we explore are relevant to health systems in other nations too). We explore first how these improvement approaches can be used 'incrementally', to improve the efficiency of existing models of care – either by altering resources required (eg skill mix change) or increasing throughput (eg improving flow). We then consider how these approaches can be used 'transformationally', to create new models of care which can achieve outcomes more efficiently. The former is concerned particularly with the notion of technical efficiency; the latter with both technical efficiency and allocative efficiency (see box below).

We then move on to explore challenges of implementation and why it can be hard to realise the productivity benefits of these approaches in practice. We conclude that policy needs to be concerned not simply with ideas for improving productivity but also with whether providers have the agility to seize and adopt them effectively.

Technical efficiency and allocative efficiency

Productivity and efficiency can both be defined as output per unit input. The terms are often used interchangeably. While there are some differences between them, they are not especially relevant here (for example, efficiency is often measured using current prices, meaning a reduction in input costs can be regarded as an efficiency, whereas productivity is often measured in volume terms, meaning that changes in input costs are deflated out of productivity calculations).

In health care, inputs comprise labour inputs (staff costs) and non-labour inputs (such as buildings, equipment and drugs). Output tends to be measured in terms of cost-weighted health care activity (such as hospital inpatient episodes). Given that value in health care is about health outcomes rather than outputs, measures of productivity often aim to adjust output measures to reflect changes in the quality of services. For example, **ONS adjustments for quality** when measuring productivity take into account factors such as estimated health gain, survival rates, waiting times, primary care outcomes and results from national patient surveys. There are many challenges, however, in measuring quality in health care that can make this process difficult, including the challenge of capturing changes in health outcomes that can be attributed specifically to health services and the challenge of aggregating different dimensions of quality (such as clinical effectiveness and patient experience).

Two kinds of efficiency that are particularly important for thinking about health care productivity are technical efficiency and allocative efficiency.

Technical efficiency relates to a particular activity or output, such as a procedure or episode of care. Improving technical efficiency means increasing output per unit input – either performing the procedure with fewer resources or more procedures with the same resource.

- Taking quality into account is important to avoid interpreting increases in output per unit input that inadvertently harm outcomes as productivity improvements. For example, cutting the number of sessions in a psychological therapy course could allow more patients to be treated but reduce recovery rates.
- Taking quality into account also means that improvements in the effectiveness rather than the volume of care can increase productivity and efficiency. While they don't affect crude output per unit input, such improvements do increase quality-adjusted output per unit input. Improvements in clinical practice of this type are happening continuously in all areas of medicine (and are beyond the scope of our analysis here).
- Challenges in measuring health outcomes and in capturing the effects of specific service changes make it difficult but critically important to scrutinise efficiency-led service changes for unintended impacts on care quality.

Allocative efficiency considers what mix of activities (outputs) most effectively achieves desired health outcomes. In doing so, it allows consideration of the productivity of a whole pathway or set of services (such as diabetes care or end-of-life care), rather than of a single activity in isolation. For example, we could consider how productively a health system uses a notional annual capitated budget to maintain and improve health outcomes for a diabetes patient.

- Given that health outcomes are generated by a whole pathway – often with multiple organisations and stages, and where opportunities for adding value at one stage may be dependent on what happens elsewhere – considering the productivity of a pathway as a whole has a powerful logic. In his [review](#) of the measurement of public service productivity 15 years ago, Tony Atkinson argued that to measure health care output effectively we would ideally look at a whole course of treatment for an illness rather than its individual components, which could take better account of the quality of care. (At the same time, he noted the difficulties of achieving this in practice, not least because of the challenges in measuring quality highlighted above.)
- Taking a whole-pathway perspective can change the calculus of costs and benefits, justifying increased costs at one point in the pathway if this enables better productivity overall. Indeed, whereas technical efficiency takes an activity as given, allocative efficiency allows that changes at one point in a pathway can avoid activity elsewhere – and reducing avoidable activity is essential if the NHS is to tackle demand pressures.
- Measures of productivity may necessarily have to use activities as proxies for outcomes, but this makes it critical that activity-based measures are chosen intelligently, based on which activities are likely to be features of an allocatively efficient system. For example, a surgical team could work to increase the number of diabetes-related foot amputations it can perform within available resources, but this doesn't mean a diabetes service with a high number of amputations is efficient; it will have a higher cost per patient than services which prevent complications.

Improving productivity within existing models of care

1. Skill mix change

With almost 65% of the NHS **operational budget** spent on staff, improvements in how workers are deployed hold significant potential for increasing productivity. Traditional care models have resulted in the skills, knowledge and potential of various workforce groups being under-utilised. Many staff have not been supported to develop their skills and practice or work at the top of their skill set. **Skill mix changes** can boost productivity by developing staff to undertake tasks traditionally undertaken by higher band colleagues and organising teams such that all staff can work at the high end of their skill set more often.

This kind of role development is a strategy we've seen in a range of sectors, including law (paralegals), education (teaching assistants) and policing (police community support officers). For example, there is evidence that upskilling nurses and **pharmacists** in outpatient or primary care teams to play a greater role in managing conditions like diabetes or cardiovascular disease is cost effective and can improve key outcomes. Nevertheless, quality and safety must be at the heart of skill mix change, as there can be risks when transferring tasks to staff with less training; for example, simply replacing registered nurses with lower skilled staff can **harm patient safety**.

Case study 1: Developing community pharmacy staff to support medication monitoring in children and young people with ADHD

Children and young people who are prescribed medication for attention deficit hyperactivity disorder (ADHD) need regular monitoring of their height, weight, blood pressure and pulse. Monitoring is usually performed in specialist child and adolescent mental health service (CAMHS) clinics, but this is not always convenient for families and CAMHS teams are struggling to meet increased demand. This has been exacerbated by shortages of appropriately trained staff to carry out monitoring in CAMHS clinics.

Supported by the Health Foundation, in 2016 Sussex Partnership NHS Foundation Trust **trained** local community pharmacy staff (such as technicians, assistants and pharmacists) to provide physical monitoring. Families taking part in the project selected a pharmacy for regular monitoring at a convenient time with results available to the CAMHS team via a secure website. By utilising community pharmacy staff, the team sought to provide a more convenient service for patients while also freeing up time and resources within CAMHS services.

This skill mix change led to an increase in the number of patients engaging with medication monitoring and receiving care closer to their home. This also freed up specialist clinical time, allowing clinical provision to be targeted to those with greater need. An internal cost impact analysis estimated that, for a typical stable patient, having community pharmacy staff perform physical monitoring was 41% cheaper than it being done in a CAMHS clinic. According to the team involved, key to the success of the project was co-designing the intervention with all relevant groups from the start, including CAMHS staff, community pharmacy teams and patients.

Skill mix change can also boost productivity by increasing the range of knowledge and skills in a team – for example through the creation of multi-disciplinary teams – improving performance and service delivery. Indeed, rather than simply transferring tasks between staff, effective skill mix changes focus on getting the most effective teamworking in place. Conversely, badly implemented skill mix changes can reduce productivity if they **generate confusion** about ways of working, **create professional tensions or harm team dynamics**. It's therefore essential to involve staff in designing new working arrangements and to provide clarity about the scope of new roles.

Historically, much focus of skill mix change has been in secondary care, but now there is growing interest – including through the **NHS Long Term Plan** and **People Plan** – in opportunities within primary care. This includes making **greater use of allied health professionals** (AHPs) whose skills have historically been undervalued, such as paramedics, physiotherapists and pharmacists, in ways that would not only help meet demand but also potentially improve quality and widen the service offer available. **Many challenges remain**: overcoming professional boundaries; addressing regulatory rigidity (for example, extending the scope of practice for AHPs); reshaping pathways and ways of working; and supporting the development and regulation of lower paid bands, where there has hitherto been insufficient investment in training to fully capitalise on the potential for skill mix change.

Tackling **workforce shortages** is also clearly essential as the lack of staff in relevant roles also contributes to suboptimal task distribution and lower productivity. For example, our report **Falling short** highlighted a 'hollowing out' of the NHS workforce over the last decade, with the number of doctors and clinical support staff both increasing faster than the number of nurses. This created gaps in skill mix – with just 2.6 nurses per doctor in 2018/19 compared with 3.0 in 2010/11 – that have been associated with lower productivity: further Health Foundation **analysis** found that hospitals with more productive consultants are significantly more likely to have a higher proportion of nurses.

2. Patient activation

Health care isn't a product but a service, where outcomes are necessarily **co-produced** with users. So patients are always involved in their own health care and the question is how they can be supported to contribute to their health as effectively as possible – especially for the many people living with long-term conditions who are only in contact with health professionals for a small fraction of their lives. Health care isn't alone in this: recent decades have seen service industries strongly emphasise the role of users in co-creating value – as seen, for example, in how financial services have been **transformed**.

Patient activation describes the knowledge, skills and confidence a person has in managing their own health, though here we use it as a shorthand to refer to interventions that can increase activation, such as self-management support, health coaching and shared decision-making, including approaches that draw on community resources, such as peer support and social prescribing.

Greater patient activation can improve productivity by increasing the effectiveness of health care interventions, for example through **increased medication compliance** or better **preparation for operations**. On some occasions, there may also be some shift in activity from staff to patients, with

staff capacity freed up (essentially a type of skill mix change). For example, **shared haemodialysis** helps patients become active partners in their care by training those who can to perform key haemodialysis tasks, which improves motivation, confidence and wellbeing, and frees up nurses to focus on patients who need more support. In this way, patient activation can also help optimise use of staff time by helping indicate where professional efforts are best directed.

Case study 2: Prehabilitation to reduce complications and length of stay in hospital after major surgery

Post-operative pulmonary complications are common in major surgery and can affect up to 30% of patients. These complications are associated with increased length of stay in hospital and in some cases increased postoperative mortality rates.

A team at Manchester University NHS Trust developed the **ERAS+** ‘prehabilitation’ programme, a pre- and post-surgery training programme that aims to better equip patients and their families for preparation and recovery from major surgery in order to help reduce complications and length of stay in hospital. This involves training in exercise, nutrition and lifestyle advice, the use of a respiratory care bundle and a stepped recovery programme in hospital. More than 1,000 patients at Manchester Royal Infirmary received ERAS+ in 2014, which led to a 50% reduction in complications and a **3-day reduction in length of stay** compared with patients admitted before the programme.

The Health Foundation supported the team to implement ERAS+ **in six other NHS trusts** during 2018 and 2020, with more than 2,500 patients undergoing major surgery during this period. Initial data has shown a 3-day reduction in length of stay for colorectal cancer patients with no increase in readmission rates. Patient-reported satisfaction with ERAS+ has also been excellent.

An upcoming independent evaluation will inform how to develop and spread ERAS+ further, which will also be helped by the introduction of the UK’s first system-wide cancer prehabilitation programme, **prehab4cancer**. Prehabilitation is also now endorsed by several royal colleges as key to **supporting NHS recovery** and helping tackle significant backlogs in hospital care.

Beyond improving the productivity of individual health care interventions, patient activation also has broader implications for resource use through its potential to achieve better health and reduce subsequent demand for care due to ill health. **Research** suggests patients with less knowledge, skills and confidence to manage their health tend to engage less with preventative health care and require more care episodes, generating higher costs.

While blanket generalisations are dangerous – in some contexts increased activation could lead to higher health care use – there is growing evidence of **cost effectiveness** in particular areas, such as self-management support for **asthma** and **cardiovascular disease**, and peer support for **mental health** and

coronary heart disease. There is also evidence that **shared decision making** leads to patients being less likely to choose intensive treatment options (such as surgery) and more likely to choose conservative – and generally less costly – approaches (such as physiotherapy).

Amid the pressures the NHS faces, it can be tempting to see these kinds of approaches as ‘nice to have’. But in many cases such approaches will be essential for reducing avoidable demand and maximising the value of care. 20 years ago, **Derek Wanless’ review** of NHS funding highlighted that key to sustainability was a world where patients are ‘fully engaged’ in their health, though we are still some way from that. While these approaches don’t necessarily require major funding, they do require a willingness to work differently and to value patients as active partners in their care. National bodies have an important role in supporting local systems to do this well – building, for example, on the **NHS Comprehensive Model of Personalised Care** and the **National Academy for Social Prescribing**.

3. Improving flow

Whereas skill mix change and patient activation both alter the inputs to health care activities, improving flow is about better movement of patients, resources and information along care pathways, with the potential to increase throughput. Poor flow can **negatively affect** patient outcomes as well as resource use by prolonging length of stay and increasing risk of errors.

A range of approaches exist for **improving flow**, of which perhaps the most well-known in health care is Lean (developed from the Toyota Production System in the mid-20th century). Flow improvement **techniques** involve stripping out unnecessary actions, movement or waiting (‘waste’) from processes, and applying insights from queuing theory to improve throughput, such as reducing demand variation or better matching capacity to demand.

Opportunities for improving flow exist in many health care settings. One example is operating theatres, where **38% of theatre lists** do not run to capacity due to late starts, slow turnarounds and early finishes. Recently a major focus for flow improvement has been emergency care (driven partly by the 4-hour target), with efforts to improve the ‘front door’ (eg early access to a senior decision maker), and ‘back door’ (eg timely access to discharge-related diagnostics). One of the most well-known examples of flow improvement in emergency care is **Discharge to Assess** (D2A), ‘discovered’ by a team at Sheffield in one of the Health Foundation’s improvement programmes. D2A involves discharging patients once they no longer need hospital care and assessing their ongoing care needs at home, rather than keeping them in hospital for assessment. Now D2A is being **encouraged** by NHS England, with the Health and Care Bill aiming to remove legal barriers, although recent **planning guidance** has confirmed that central funding to support D2A will stop after March 2022, raising **concerns** as to whether local health and care systems will be able to sustain the model. With the advent of Integrated Care Systems (ICSs), attention is increasingly turning to flow across whole pathways and **systems** – discussed in more detail below.

Case study 3: Improving patient flow and discharge of frail older patients

Delayed discharge is recognised to be a system-level problem which can **increase** costs and congestion while placing stress on patients, staff and systems. Major disruptions in the flow of patients, especially those **aged 75 and older**, can in particular occur due to delayed assessments and clinical decision making.

Several years ago, the Health Foundation supported a team at Sheffield Teaching Hospitals NHS Foundation Trust, as part of a **programme** to understand how to manage patient flow more effectively, in order to improve patient safety and reduce costs. The team evolved the **Discharge to Assess** (D2A) approach, which involved frail older patients leaving hospital as soon as they were medically fit and then having their support needs assessed at home, rather than being kept in hospital until the assessments had been made and the package of care arranged. This enabled quicker identification of the right level of home care and support, and also freed up hospital capacity without resulting in increased mortality or re-admissions.

The team found that using the D2A model in their Frailty Assessment Unit led to a 34% increase in patients discharged on their day of admission or the following day. As a **consequence** they were able to close one ward and transfer the nursing, therapy and clerical staff to fill staff vacancies elsewhere, reducing agency costs.

D2A has now been spread across other health and care systems but requires dedicated **resources** to deliver assessments and support in people's homes. NHSEI has now allocated **additional funding** to help roll out D2A, although this funding will only last until March 2022. The Sheffield team has also since gone on to develop the **Flow Coaching Academy (FCA) programme**, which aims to support other organisations to develop the capability to improve patient flow.

But while some flow problems and solutions are generalisable, many are specific to the contexts in which staff work, meaning teams on the ground need to be able to diagnose problems and design bespoke solutions. This means that only so much can be achieved through programmes to spread specific interventions like D2A. Instead, the emphasis must be on producing guidance to support providers (such as the **SAFER patient flow bundle**), and on building providers' capability to identify and tackle issues (such as through the **NHS-VMI partnership**, which involves five hospital trusts working with the Virginia Mason Institute to develop Lean approaches). The insight that capability and methodology matter also lies at the heart of the **Flow Coaching Academy (FCA)**, set up by the Sheffield team behind D2A. Rather than spreading specific interventions, the FCA trains people to lead flow improvement in their organisations, combined with guidance on methodology.

4. Technology-assisted working

Technology can boost productivity by improving processes in many different ways – supplying or analysing information, enabling communication, executing movements, and so on. Like skill mix change and patient activation, technology can rebalance the resources applied to an activity – such as when automation frees up staff to focus on areas where humans add more value. For example, a **team** at Imperial College Healthcare NHS Trust are using natural language processing to help analyse patient feedback surveys, thereby allowing the patient experience team to focus on improving services.

Alternatively, technology can improve flow by speeding up processes – through faster information processing, for example. It can also improve productivity by improving care quality – enabling greater analytical accuracy to enhance the effectiveness of diagnosis and treatment, for example. In many cases, technology can act as an enabler of the first three approaches described above.

Case study 4: Using technology to speed up the analysis of patient feedback

The NHS Friends and Family Test was introduced in 2013 to help patients give feedback to providers and commissioners. The form includes unstructured ‘free text’ fields which can contain rich data to guide improvement efforts. However, opportunities to use this data are currently under-utilised due to the significant staff time needed to extract useful insights.

In 2017, the Health Foundation supported Imperial College Healthcare NHS Trust and Imperial College London to develop a natural language processing tool which can analyse unstructured text comments from the Friends and Family Test and summarise the results into easily digestible reports.

The tool can analyse 6,000 comments in 15 minutes, compared with 4 days if the same analysis was undertaken by a member of staff. This allows the patient experience team to spend more time supporting staff to act on patient feedback and improve services. For example, staff in the outpatient department were quickly able to identify improvements such as better informing patients of their position in the clinic queue. Elsewhere, improvements were made to discharge processes through developing checklists.

The team are now working with NHS England and NHS Improvement to spread the tool to other NHS trusts in England. A further Health Foundation grant is supporting the team to test and evaluate the wider application of this tool across NHS trusts.

While cutting-edge, medical applications of technology – such as robotic surgery or AI-driven scan analysis – often steal the headlines, there are also important productivity gains to be made through applying technologies to **administrative tasks**. This is especially true for high-volume, repetitive tasks like appointment scheduling, prescription management and payroll. This includes making better use of existing technologies. Robotic process automation, for example, uses software to allow transaction processing, data manipulation and communication across multiple IT systems; it has been **deployed**

to improve administrative work in many industries, but not yet widely in the NHS, and is now a major focus of NHSX's **Digital Productivity Programme**. Indeed, in some cases administrative and 'back office' work can be simpler to automate than clinical tasks, as there may not be immediate issues of clinical risk attached, and such changes may enjoy greater support if they free up staff for more rewarding work.

The key **challenge** for improving productivity is that technology produces benefits not in isolation, but only when embedded and used effectively, and this can require **considerable effort** to redesign roles, processes and ways of working.

Improving productivity by creating new models of care

The four approaches above can be used 'incrementally' to increase productivity within existing models of care. But they can also be used 'transformationally', to redesign pathways and create new models of care.

From a productivity perspective, pathway redesign is especially important because it creates the opportunity to consider value along the whole care pathway, rather than simply attempting to optimise productivity at isolated points. Crucially, rather than taking activity at any point in the pathway as given, considering productivity along a whole pathway opens up the possibility of reducing activity (and saving resources) at one point through changes at other points.

Historically, health services have evolved in ways that are too fragmented, reactive and hospital-centred for today's health needs. These patterns of delivery can reduce effectiveness and create unnecessary costs, undermining the productivity of care pathways as a whole. Recent decades have seen considerable focus on specific types of redesign to address the fragmented, reactive and hospital-centred nature of services. These include:

- **Integration:** joining up, or coordinating between, services previously provided separately, to streamline delivery and potentially increase effectiveness. For example, skill mix changes can create multidisciplinary teams to deliver multiple components of care in the same setting (eg a **multidisciplinary COPD clinic**).
- **Prevention:** intervening earlier in a pathway to reduce avoidable demand later on. For example, creating enhanced support (eg community nurses) in **care homes** or providing **self-management support** (eg access to a health psychologist) to those with COPD.
- **Enabling services closer to home:** providing services in more convenient and less resource-intensive contexts to improve access and free up estate. For example, using smartphone apps and medical devices to manage patients at home (eg **home monitoring of hypertension during pregnancy**).
- **Consolidation:** concentrating services in specialist hubs to improve quality, increase throughput and generate economies of scale. For example, consolidation could involve the use of flow improvement approaches for high-volume elective procedures to reduce turnaround time and maximise theatre use (eg for **cataract surgery**).

Case study 5: Home monitoring of hypertension in pregnancy

Women who have high blood pressure in pregnancy are advised to attend hospital frequently to monitor for pre-eclampsia, a condition that can be life-threatening for the mother and baby. These frequent hospital visits can cause anxiety for pregnant women and their families and have significant cost implications for the NHS.

During 2016/17, the Health Foundation supported the **HaMpton project**, led by a team at St George's University Hospitals NHS Trust. The team wanted to develop a new model of care to reduce the stress of frequent hospital visits for women with hypertension and ease pressure on the maternity assessment unit, without impacting on patient safety or experience. This involved supporting women to monitor their health at home rather than attending routine appointments. The team provided women with a blood pressure machine and urine dipsticks and asked them to input their findings and answer prompt questions via a smartphone app. The app then alerts the patient and the clinical team if they need to attend hospital for further investigation. Routine appointments are replaced with appointments based on the results of their self-monitoring and clinical need.

The team tested the new model of care with a group of 83 patients and found it led to a **significant reduction** in the number of appointments (by 53%) and the average length of appointment (halved from 114 minutes to 66 minutes) compared with standard care pathways. Cost analysis estimated that, by using home monitoring, costs per patient per week could be **reduced** from around £200–£300 to £50–£100.

Feedback received from staff and service users was also **positive**. Staff found the new care model freed up their time to offer greater continuity and personalised care to women. Service users also reported high levels of satisfaction with the care provided and benefited from fewer unnecessary appointments and reduced costs of travel.

In summary, findings from the project suggest that home blood pressure monitoring using the app is safe, clinically effective, cost-effective and improves patient experience, and it is now routine care within the maternity assessment unit. The Health Foundation have since provided further funding to support the team to spread the model across 33 hospitals. The Royal College of Obstetricians and Gynaecologists has produced **guidance** for health professionals on the self-monitoring of blood pressure in pregnancy, and recommends use of the HaMpton app as part of this.

The [Five Year Forward View](#) and the [NHS Long Term Plan](#) sought to encourage these kinds of new models of care. And some of the pathway changes seen during COVID-19 have accelerated these plans, especially greater use of digital consultations and increased delivery of care and support in people's homes. Post-pandemic, there is greater [focus on pathway changes](#) that can support elective recovery and wider NHS recovery, such as community diagnostic hubs and surgical hubs, with the [2021/22 planning guidance](#) calling for 'whole pathway transformations' in three high-volume specialties: ophthalmology, musculoskeletal and cardiac services.

It would be wrong to assume, however, that all transformative changes result from a single redesign process or represent the application of just one improvement approach. [Alderwick and colleagues](#), for example, document how reductions in acute length of stay in recent decades have increased productivity, driven by improvements in drugs, technology and processes. For some surgical procedures, these kinds of improvements enabled wholesale shifts to treating patients as day cases, delivering significant productivity gains. For example, the authors estimated that for cataract operations the shift from inpatient cases to day case activity between 1998/99 and 2013/14 saved an average of around £40m per year by 2013/14 – equivalent to a productivity improvement of 14%. But these shifts were in several cases made possible by the gradual accumulation of benefits from multiple improvements over time, for example, new surgical techniques, advances in anaesthesia, better analgesics, improvements in discharge processes, and so on. So although significant gains can be realised at 'tipping points', such as shifting to day case surgery for a procedure, progress is often made through a series of steps rather than a single leap.

In addition to the general challenges of service change (such as double running services while innovations are tested), something that makes pathway redesign particularly difficult is that it usually involves working across organisational boundaries, both horizontally and vertically, where different teams and organisations face different costs and have different incentives. It is hoped ICSs will facilitate change by sharing costs and aligning incentives. But to be successful, legislative and structural changes will need to be accompanied by support to help ICSs redesign and implement new pathways in practice.

3. The gap between policy and practice

Given the range of improvement approaches that can help to increase productivity, why does it nevertheless remain a challenge?

We often see a disconnect between identifying an opportunity for productivity gains in principle and realising the benefits in practice. On some occasions changes may be resisted; more commonly, they may be implemented with disappointing results or unintended consequences; on still others, they may be successfully implemented but not sustained. This diversity of outcomes can be seen in the published literature, where studies, trials and systematic reviews often show **mixed results**. Skill mix change, for example, is often fraught with unintended consequences: less experienced staff working in extended roles may carry out more investigations or recall patients at a higher rate or take longer to complete tasks, all of which could mean that such changes **may not be cost saving**. Even when the majority of instances of a service change achieve the desired results, the fact that some still do not achieve such results highlights the gap in the causal chain between intervention and results.

Our report *The spread challenge* documented this ‘replicability problem’ – the difficulty of effectively adopting ideas from elsewhere. This highlights the critical importance of successful implementation. Many of the service changes described above are complex, meaning they can’t be separated from the environments in which teams are working, and this puts a premium on providers’ ability to adapt and embed ideas in their own setting. The changes required are often **adaptive** (requiring modifications in deep-seated behaviours) rather than simply technical.

Health technology offers many examples of how differences in implementation can result in dramatic differences in outcomes. **Coiera and colleagues** discuss a case where three US hospitals adopted the same electronic record and order entry systems to improve quality and safety; the first saw a significant rise in mortality, the second saw no significant change and the third a significant fall. Elsewhere, differences in the impact of **virtual wards** also highlight the importance of effective implementation. Even where technology is implemented well, benefits can sometimes take **years to emerge** because of the time required to evolve new roles, processes and ways of working. For example, a Health Foundation funded **study** comparing the effectiveness of robot-assisted prostatectomies to standard laparoscopic procedures across a cohort of hospitals found that even though most of the hospitals had adopted the technology by 2014, efficiency gains were not seen until the 2018 data became available. And this kind of time lag can exist across all the types of service change discussed here, highlighting the difference between fast initiation of change and fast benefits realisation. If we want the latter, we have to care about effective implementation.

Two factors loom especially large in explaining this gap between policy and practice: motivation and capability.

Motivation: do providers want to do it?

New ways of working must be accepted by staff if they are to be effective. If people don't want to work in a different way or have concerns about it, they won't do it wholeheartedly or effectively, even if it is mandated.

Skill mix change, for example, can challenge long-standing roles and professional identities, lead to concerns about care quality or job quality, or create confusion about how things will work in practice, all of which can **undermine** motivation and successful implementation. Productivity gains can also fail to materialise because time freed up **isn't subsequently used** as intended. For example, staff may continue to do their old work because they enjoy it, have other priorities competing for their time, or be unable to absorb more complex work without burnout. Likewise, attempts to increase patient activation are particularly susceptible to whether **professionals are on board or not**; if they are unconvinced about the value of the approach or view it as 'yet another initiative' being foisted on an **overstretched workforce** then it is unlikely to be successful.

So it is essential that service changes are preceded by genuine staff consultation and that those affected have ownership of new working arrangements and the ability to shape them in practice.

Particular challenges can arise if changes are framed in terms of improving productivity or efficiency, which is a hard agenda to mobilise people around. On occasions, it may be seen as conflicting with care quality. It may sound too much like 'work harder' when staff are exhausted and often working unpaid overtime. It may be perceived as compensating for underfunding. For clinicians, a focus on improving care quality is often a bigger motivator: some of the biggest productivity gains we've seen in Health Foundation improvement programmes have come from projects that haven't set out to improve productivity per se, but rather quality. So it is important that national initiatives promote change in a way that resonates with the NHS workforce.

Capability: are providers and systems able to do it?

Organisations can only implement changes effectively if they are able to. But NHS providers vary in terms of their capability and culture. Just because one has done something well, it doesn't follow that others are in a position to follow. It depends on their skills and infrastructure – for example, digital maturity, quality improvement (QI) expertise, and access to timely and accurate data. It also depends on **good management and leadership**, which are essential for ensuring organisations are supportive environments for adopting innovation. It particularly depends on capacity for reflection and strategic thinking; organisations trapped in 'firefighting' mode have little bandwidth for planning and designing change. And of course it depends on having the time and resources available to implement change effectively (here we include these factors within capability; **elsewhere**, they have been described in terms of the concept of 'opportunity').

A recent **programme** to improve flow in hospitals in Wales, for example, struggled because of lack of alignment with organisations' strategic goals and because staff weren't always given protected time to undertake training and deliver improvements. Emerging findings from the **NHS-VMI partnership** show that unless trusts are culturally ready (in terms of values, leadership style, etc) they will find it

hard to adopt the new ways of working associated with the VMI model. As one trust **chief executive** in the programme put it, in the absence of a pre-existing improvement culture, the new model ‘had nothing to plug into’. **Evaluation of the special measures regime** has found how the absence of QI capability and culture can act as a drag on a trust’s efforts to improve performance, and vice versa.

And these challenges of variable capability multiply when it comes to service change involving several different organisations along a pathway. Historically, improvement capability has been concentrated in the acute sector, but many of the shifts in care we need to see will require increased capability in primary, community and social care.

4. Agility – the missing ingredient for improving productivity

These factors – motivation and capability to implement change successfully – can be thought of as the ‘agility’ of an organisation to grasp opportunities. It should be clear that agility is a critical component of any attempt to improve productivity. If the provider sector isn’t agile then initiatives will founder, no matter how well-conceived. Too often, policy seems concerned with identifying opportunities and setting objectives for change but not with providers’ ability to respond effectively. So we need to recognise factors such as provider motivation and capability as an explicit part of the ‘theory of change’ for improving NHS productivity.

There is an analogy here with attempts to improve productivity in the wider economy. Government policy has tended to focus on boosting ‘drivers’ of productivity growth, most notably the **five drivers** set out in the 2000s: investment, innovation, enterprise, skills and competition. The resulting policies have often had a ‘supply’ focus – with measures to increase capital investment, innovations, skills, etc – based on the assumption of a ‘supply-push’ effect, namely, that increasing the quantity of these things will stimulate businesses to shift to more productive business models. The mixed impact of this approach, however, has led to the conclusion that focusing on supply is insufficient without also having a strategy to ensure that increased skills, innovation and investment are subsequently used by businesses to raise their productivity. This has been the thinking, for example, behind the *Be the Business* campaign and more recently the **Business Productivity Review** which aims to help businesses shift to higher-value production strategies through supporting leadership training, peer networks and change management skills.

Similarly for the NHS, policy cannot just focus on the supply of things that enhance productivity, such as developing new workforce roles, purchasing new equipment, promoting promising innovations, and so on; it also has to be concerned with whether providers can take advantage of these things and shift to more productive ways of working. In this sense, organisational agility could be thought of as the missing ‘sixth’ driver of productivity, without which action on the other five will have limited effect.

These issues of capability and motivation are often picked up in growth accounting studies and economic analyses of **total factor productivity**, where they are bundled together under labels like ‘management practices’ or ‘intangibles’. And management quality (which **correlates** with hospitals’ clinical and financial performance) is in many ways a good proxy for organisational agility. But agility extends beyond management per se to include culture, infrastructure, quality improvement skills, capacity for reflection and learning, and more. Workforce morale, health and wellbeing are also essential: service change is difficult in a system that is understaffed and where many are at risk of burnout and ill health due to work pressures (which have been further exacerbated by the pandemic). So it will be important to invest in staff wellbeing and to prioritise post-pandemic ‘staff recovery’ alongside ‘service recovery’, as well as to ensure that pay rewards staff, encourages recruitment and supports retention.

5. Actions to strengthen provider and system agility

So closing the gap between policy and practice is going to require steps to strengthen provider agility. How?

First, support is required to improve providers' ability to take up new ideas and ways of working:

- Investment in providers' **capability for innovation and improvement** – QI skills, data analysis, capacity for evaluation, etc – following through on the **NHS Long Term Plan** commitment to help providers build their improvement capability. A large proportion of English trusts rated 'outstanding' have built up their improvement capability over a number of years; but while pockets of excellence exist, more needs to be done to move from this being the exception to the norm. **Evidence** suggests building improvement capability can reap long-term productivity dividends, though requires upfront investment – a barrier at a time of wider financial pressure.
- Investment in **digital infrastructure** across the NHS – an important enabler of many types of innovation and improvement. The **recently announced** £250m technology fund is a promising start, albeit primarily focused around elective recovery solutions. Despite recent progress, challenges remain in **developing digital capability** and improving the **interoperability** of health information technology systems. Historically, much attention has typically been paid to cutting-edge technological innovation in leading providers, less to organisations lower down the curve where the real barriers to improvement lie. **NHSX's Digital Aspirant programme** is a positive development here but covers only a minority of trusts; this kind of support should become a regular funding stream and expanded to more organisations. More focus is also needed on the challenges of digital infrastructure in **primary and community care**.
- Taking a fresh look at how **management** in the NHS can be better supported and effective management practices spread. Recent **reviews** have questioned whether NHS managers have the requisite skills and support. Some **studies** suggest there could be performance benefits from greater clinical involvement in management decision making. Wider economic evidence also highlights the important role played by middle managers in creating an effective environment for adopting innovation, but there has arguably been a **lack of attention** to developing this tier of management in the NHS. If the recently announced **leadership review** is to live up to its billing of ensuring NHS managers are driving efficiency and innovation then it will need to address these kinds of issues.
- Including **effective implementation support** in central programmes to improve quality and productivity. To date, programmes like **GIRFT** and **Model Hospital** have used benchmarking to catalyse improvement, but there is a growing view that joining up guidance on the 'what' of change with guidance on the 'how' could help generate faster progress in reducing variation and driving up quality. The **PReCePT** project – increasing uptake of magnesium sulphate to protect preterm babies – provides a nice example of how capability building underpins the successful spread of best practice. Central implementation support can be also complemented by peer learning and support through collaboratives, professional networks and the **Q community**.

Case study 6: Scaling up a cost-effective treatment to prevent cerebral palsy in pre-term babies

Premature birth is the leading cause of brain injury in babies and can result in cerebral palsy. Evidence shows that pre-term babies can be protected by giving women who are at risk of having a premature delivery magnesium sulphate. This reduces the risk of cerebral palsy in a third of cases – a highly cost-effective treatment at approximately £1 per dose. Despite this, as recently as a few years ago, **more than half** of pre-term babies in the UK did not receive it.

PReCePT, a quality improvement package, was developed to provide practical tools and training to support staff in hospital settings to increase the uptake of this treatment. It was piloted in five NHS trusts across the West of England in 2015, where the proportion of women at these units receiving magnesium sulphate **increased** from an average of 21% before the intervention to around 88% afterwards. The Health Foundation subsequently supported a **project** led by University Hospitals Bristol NHS Foundation Trust, in partnership with the National Institute for Health Research Collaboration for Leadership in Applied Health Research and Care West (NIHR CLAHRC West), and the West of England Academic Health Science Network (WEAHSN) to scale up the programme across the UK. The **evaluation** found that the target uptake of 85% was achieved nationally by the end of the implementation period. Initial results from a national annual audit reflect these increases in the **uptake** of magnesium sulphate which are likely to reduce avoidable cerebral palsy.

A clear lesson from the evaluation has been the importance of supporting effective implementation – including training for staff, and providing sufficient resources and time for planning, preparation and delivery.

Second, policy will need to address that other component of agility: motivation. How can the uptake of productivity-improving practices and pathways be more effectively encouraged across the system?

- **External incentives** such as regulation and tariffs can play an important role in supporting adoption. The **CQC's recent moves** to place greater emphasis on providers' **quality improvement** work and on the **adoption of innovation** are positive steps. Tariffs and payments often don't support the upfront costs associated with adopting innovations (backfilling staff time, providing training, etc), so reforming them to better support implementation costs will be important.
- External incentives don't always make it down to the front line, however. Within a provider, much depends on culture and on **the management and leadership of change**: Are staff involved in shaping new proposals? Do they feel ownership of them? Are changes aligned with other strategic priorities and organisational values? Factors such as these will play a significant part in securing support for new ways of working.
- National leadership in signalling priorities is also crucial. A **key lesson** from service change during COVID-19 has been the importance of a **shared mission** at all levels of the system for

galvanising action. The pandemic not only created pressure for service innovation, but also the common purpose that is key to translating pressure into results. The challenge for NHS leaders post-pandemic will be to recreate a sense of shared mission anew – as the **best moments** of health care reform in the past have managed to achieve – one that is about improving NHS care, not cutting costs. Equally important will be avoiding a ‘priority thicket’ of disparate initiatives which can stymie local leadership and make it harder to improve productivity.

- The dismantling of the NHS competition framework creates a moment to think again about the dynamics that drive service improvement. Over the last two decades, policies have placed heavy emphasis on **external ‘levers’** (targets, competition, regulation, etc) but tended to underplay the contribution of the NHS workforce themselves, and the potential for change to come **‘from within’**. An important thing about the improvement approaches highlighted above is that they are first and foremost quality improvement agendas, driven and owned by front-line teams; as such, they offer an opportunity to engage staff and to **harness the intrinsic, vocational motivations of the workforce** more effectively than an economically framed agenda.

These factors – improvement skills, infrastructure, management, culture, reflective capacity, shared mission, and so on – make possible the agility that enables successful organisations to seize opportunities and implement new ways of working rapidly and effectively. And they need attention in their own right. They don’t necessarily require vast amounts of funding, but they do require some – a tough ask when there are big financial pressures on the NHS. It’s always easier to justify investment when it’s linked to a particular solution. But while there are many ideas out there for improving NHS productivity, to really take advantage of them Government and NHS leaders must invest in creating a more agile provider sector independently of the specific improvements this will subsequently enable. Only by ensuring providers are in a position to take advantage of productivity-enhancing improvements across the board will the NHS be able to meet the demand pressures ahead.

6. Supporting information

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