

Institute for Public Policy Research



THE INNOVATION LOTTERY

UPGRADING
THE SPREAD OF
INNOVATION
IN THE NHS

**Chris Thomas, Harry Quilter-Pinner
and Prashant Verma**

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CONTENTS

Summary.....	3
1. Introduction.....	6
2. Could innovation support the recovery?: Quantifying the opportunity ...	11
2.1. Innovation spread will improve health outcomes, for everyone	11
2.2. Innovation gains will improve NHS efficiency, providing a dividend for reinvestment.....	13
2.3. Innovation gains will support a strong life science sector and UK economy.....	13
2.4. There is a virtuous circle that could offer an ambitious government an economic return of £20 billion, and reduced costs worth £10 billion	15
3. Empowering the frontline: The opportunity to spread the science across the NHS.....	18
3.1. Transforming The relationship between national and local bodies on innovation.....	18
3.2. A risk-averse culture	20
3.3. The complexity of the NHS	21
3.4. A lack of funding	22
4. Phase one: Long-term strategy and stability from the centre	24
4.1. A long-term vision that the demand-side has confidence in	24
4.2. Clarity on responsibility and regulation.....	25
4.3. Clarity on decision-making	26
4.4. A conduit between the centre and places	27
5. Phase two: Create and support a thriving ‘demand-side ecosystem’.....	28
5.1. From risk-averse culture, to incentives towards excellence	29
5.2. From a complex system, to highly networked hub.....	31
5.3. From systematic lack of resource, to clear and accessible transformation funding.....	32
6. Conclusion: Innovation after Covid-19.....	33
References	34

ABOUT THIS PAPER

This report fulfils IPPR's educational objective by publishing research to inform the public on the role of the innovation in the continued health and wealth of the country. It also fulfils IPPR's objective to advance physical health, by providing recommendations to better implement best practice in the NHS.

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SUMMARY

The UK has always been a leader in medical invention - the challenge is to spread that innovation quickly and consistently. Despite a good track record of invention – often driven by UK universities, researchers and businesses – it finds it harder to provide quick, equitable access to new innovations. This avoidable variation – sometimes called the postcode lottery – hampers our ability to achieve the best health and wealth outcomes. Moving into a new decade, there is a substantial opportunity to do better.

New analysis, presented in this report, shows that if we were to match the performance of our international peers we could save an estimated 20,000 avoidable deaths each year. One of the (though not the only) key drivers of this is variation in access to best practise treatments, care models and technologies, with other countries consistently better at spreading innovation than the UK. Our model also shows a prospective economic dividend from addressing this worth an estimated £20 billion - through people remaining active in the workforce and the economic contributions of a strong life science industry. A further £10 billion could be saved from reduced costs related to health, social care and unpaid care. This annual benefit could also increase further in subsequent years, as more people benefit from access to health innovations.

Seizing this opportunity requires not just exciting science and bold invention, but an upgrade in our ability to realise the full potential of exciting advances across the NHS. There has been no shortage of health innovation policy this decade. It has particularly focused on what national bodies can do to make innovations more accessible and affordable for the system (a 'supply side' focus). However, less has been done to empower the NHS frontline ('the demand side') – the people who are expected to reach out, understand, implement and champion innovations in practice. This presents an opportunity for government to deliver on the promise of science, technology and health management advances, by investing in the capacity of the NHS itself.

This will be central to the Covid-19 recovery. Conditions like cancer and cardiovascular have been significantly impacted by the disease. For example, cancer 'urgent referrals' have dropped 75 per cent (Hiom 2020), while A&E presentations for heart attack symptoms have halved (Bakker 2020). Without intervention, this will cause increased demand in the coming years, and excess mortality. More ambition on the spread of innovation could help alleviate pressure across the whole country.

Progress is being made, but being even bolder on spread will be critical to delivering a 'science based economy'. The Accelerated Access Collaborative (AAC) has been a welcome scheme, acknowledging the importance of spread as one of its six priorities. This paper outlines what bold delivery of this priority would look like – and quantifies the opportunity in terms of health and wealth gains.

IPPR's research with people working in the system showed three thematic barriers experienced by the frontline, which should be immediate priorities. These are responsive to policy change and should become priorities for a more managed approach to the spread of innovation.

- A risk-averse culture, driven by the approach to performance management and focus on short-term targets.
- The sheer complexity of the NHS, coupled with a lack of networks, creating a 'not invented here'¹ culture.
- A lack of resource, including a lack of financial support.

Covid-19 has proven such barriers are surmountable. The crisis accelerated many innovations, that had otherwise been taking decades. For example, 71 per cent of general practice consultations happened in face-to-face in 2019. As of April, 71 per cent were remote (RCGP 2020). Success like this can be explained by the center setting a clear 'mission'. By mission, we mean they stated a clear goal, added flexibility to existing policy and regulation, provided resource, and then empowered local areas to deliver change in their setting, within the set framework. It is important that lessons like this from Covid-19 are reflected in how we approach the adoption and spread of innovation going forward.

To learn the lessons of Covid-19, support recovery and ensure transformation in NHS provision, we recommend two key shifts in policy. Together, we define this as a mission based approach to the spread of innovation.

First, the centre must set the rules of the game in the long-term – by making minimum standards, accountability, roles and regulations clear. This will provide a predictable framework for innovation. It will also provide much needed permission to spread innovation, and provide direction to commissioners, providers and practitioners, helping them push in the same direction.

Policy recommendation 1: NHS England should publish National Service Frameworks. These should set ambitious and timebound targets for innovation – giving objective and rationale for a mission-based approach.

Policy recommendation 2: The Care Quality Commission should actively regulate on the basis of innovation. This means considering missed opportunities to innovate in their 'needs improvement', 'good' and 'excellent' ratings.

Policy recommendation 3: Value assessments should be centralised in the NHS. Local tendering processes do not have the technical expertise to make clinical differentiation between medicines - and their efforts to save money do not make sense in the context of a capped medicines budget. Government should ban such processes. They should also fix distributional problems with the voluntary reimbursement scheme for branded medicines, so local providers do not miss out when they invest in innovation. Government should finally ensure NICE have the capacity necessary to deliver quick, high quality and modern assessments that keep up with the science..

Policy recommendation 4: CCGs and ICSs should be jointly responsible for NSF implementation in an area – with a duty placed on them on the basis of 'comply or justify'. In practice, this should mean publishing – and accountability for – strategies on catalysing, resourcing and supporting provider implementation of NSFs.

¹ This refers to a cultural phenomenon in the NHS where leaders strongly prefer innovations researched, piloted or created in their own setting – even if similar work has already been done elsewhere.

Second, there must be much more active support for local providers and commissioners. The goal must be to create an ‘innovation eco-system’ where the NHS workforce have the relationships and resources to engage with spread. Such a paradigm shift would create a step-change in the system’s performance.

Policy recommendation 5: There needs to be a shift in payment by activity to payment by outcomes. Incentives on innovation should be linked to the standards set out in the NSF. This shift should begin with the Clinical Excellence Award budget being reinvested into a new ‘Innovation Award’, with payments made to those measurably achieving the best performance against the criteria set as priorities in the NSFs.

Policy recommendation 6: The spread of innovation should be part of the NHS’s DNA. This means individuals should be both expected to spread innovation and rewarded for doing it well. The spread of innovation should be put into competency frameworks at all grades in the NHS, as a key skill within recruitment processes and as a criterion for appraisal and promotion outcomes.

Policy recommendation 7: Clinicians need time to innovate. Workforce funding streams should include bespoke time for clinicians to focus on innovation and adoption, with local freedom on how that is allocated to roles.

Policy recommendation 8: At an individual level, clinical networks should be formed, offering those working on innovation access to peer support and shared learning. At an organisation level, a ‘Health Innovation Challenge’ should be launched – following the model of the London Challenge. Providers with the best track records should be designated ‘anchor institutions’ and given responsibility for raising performance in their footprint. This should focus on peer-support and shared training. In return, they should receive small amounts of funding to pilot new ideas, feeding into future iterations of NSFs.

Policy recommendation 9: The demand-side needs access to the funding needed to support innovation. A transformation fund equivalent to £10 billion should be implemented over four years. This will support the commissioning and decommissioning of services and allow clinicians to ‘see the difference’ from a new practice before committing.

1. INTRODUCTION

HEALTH INNOVATION IN ENGLAND

That healthcare is a priority for the British people is indisputable. Despite ongoing Brexit negotiations, polling has consistently shown that they consider the state of the NHS amongst the most important issues facing the country today (Ham 2018). At the same time, there is rising concern about its ability to provide world class services. For example, NatCen's annual British Social Attitudes Survey shows the public fear that the NHS lacks the money and staff if needs to deliver quality outcomes (Robertson et al 2018).

In light of this, IPPR have previously established the public's relative priorities for health. In a 2018 survey, their first and third priorities were better quality cancer and mental health care. Quicker access to ground-breaking treatments, better care for dementia and cardiovascular disease, and more efficient care pathways were also considered highly important (Quilter-Pinner 2018). In short, the desire is for continued evolution in health service provision, not a less ambitious period of consolidation.

It is highly unlikely that the NHS will be able to continue delivering treatment and care to a competitive standard without transformation. Not least because it will face substantial challenges in the decades to come. Most notably, ONS population statistics continue to show an ageing population – with one in four people in the UK expected to be aged 65 or over by 2050 (ONS 2019). This means more long-term conditions (DHSC 2012), more people living with multiple complex conditions (Stafford 2018, The Richmond Group of Charities 2018); and a reliance on a larger range of clinical and non-clinical services.

This poses an existential threat to the health service. The provision of universal healthcare has remained popular since the NHS was founded in 1948. Yet this popularity relies on continued provision of high-quality care for all. In this context, it is concerning that many of the gains on the leading causes of mortality have plateaued in recent years (figures 1.3 and 1.4). If the NHS becomes consistently unable to keep up with advances in science, technology and care deliver people may begin to look elsewhere, undermining the core principle of universal provision.

This has been underscored by Covid-19. While the health system's capacity was not entirely overwhelmed by the outbreak's peak, there were significant concessions. Notably, routine operations were cancelled, while urgent cancer referrals and treatments declined (Hiom, 2020). Elsewhere, people felt less able to access services, leading to reductions in demand on primary care and A&E settings. Getting back on track and maintaining a universal service means swiftly rectifying this. Quality improvement and innovation will have a key role to play.

There is no reason to believe it will become impossible to improve outcomes, equitably, through universal health provision. Crucial will be the NHS's ability to drive forward improvements and seize new opportunities - particularly as new treatments, therapies, care pathways, technologies and digital tools emerge (Darzi 2018). Indeed, taking the best practices available to the system today, and spreading them more consistently across the whole NHS, was at the very heart of the Long-Term Plan (NHS England 2018). Nothing in that plan was not already in use at least somewhere in the health system.

This does, however, make it necessary to confront the fact that this ‘spread’ of innovation has not been the NHS’s traditional strong suit (Greenhalgh and Papoutsis 2019). ‘Spread’ can be defined as the final stage of the ‘innovation process’ (figure 1.1).

FIGURE 1.1

The innovation pathway



Source: Authors’ analysis

Though improvements are always possible, the UK is considered to have a good environment for invention – anchored by a world-class university system and research infrastructure (Horton et al 2018). Equally, the UK funds and leads on a large number of clinical trials (Cancer Research UK 2018a). Yet, despite this pipeline, the adoption and spread of best practice is much weaker, with avoidable variation in adoption by geography an accepted feature of the health service (Castle-Clarke et al 2017).

Curiously, the NHS’s difficulty with the spread of innovation cannot be attributed to any lack of policy. There have been numerous policy reviews and agendas over the last decade (figure 1.2) that have attempted to address this fundamental challenge.

FIGURE 1.2

Major health innovation policies since 2010



Source: Authors’ analysis

Reassuringly, the Accelerated Access Collaborative has shown government's awareness that spread should be a priority. Indeed, innovation spread is one of its six core priorities. The next step in continuing this progress is an evidenced and compelling vision for what spread might deliver, how it might contribute to the 'science based economy', and how it can be best achieved.

A key element of that will be learning from Covid-19. During the crisis, we adopted and spread some innovations at often unheard of pace. This includes innovations that we've been looking to implement for years, including integrated data, digital triage and telehealth. It also included innovation tailored to the crisis - for example, hot and cold zones in general practice. Successes here should inform our theory of change on innovation going forward.

It is in that context that this report provides new evidence and practical recommendations for the health innovation agenda. Specifically, it focuses on three research questions.

1. What is the opportunity and potential return on investment for government and the NHS in maximising spread of innovation?
2. What are the barriers and enablers to the spread of innovation across the NHS?
3. What would a coherent theory of change look like in the post-Covid-19 NHS?

In short, it calculates the return of investment possible through better spread and provides a roadmap for government to achieve those gains.

METHODOLOGY AND SCOPE

This report focuses on the spread of health innovation, defined as follows.

- **Spread:** The systematic uptake of an idea product or service across the health system (see Quilter-Pinner and Muir 2015).

This is opposed to the other stages within the innovation pathway.

- **Adoption:** The individual process of taking up a new practice, treatment, pathway or technology.
- **Trial and licencing:** The process of establishing the efficacy, safety and cost-effectiveness of an innovation.
- **Research and development:** The process of inventing and designing a new tool, treatment or way of delivering care.

Throughout this report, innovation is referred to in terms of the 'demand side' and the 'supply side' – defined as the following.

- **Supply side:** The inventors, NHS staff and/or businesses who create, market and sell innovations into the NHS.
- **Demand side:** Those within the NHS who are expected to find, purchase, understand, implement and champion innovation within the system.

For spread to work, both supply and demand are necessary. There is little point having innovation available if there is no one willing and able to use it; there is little point having people ready to use innovation if none is available.

The three stated research questions have been approached in different ways. For the first, quantitative modelling has been used to assess the UK's performance in comparison to other, similar health systems in advanced economies. This proxies the gains available by adopting the best practices currently available to us, following other studies which compare similar health systems in advanced economies to identify the role of specific practices or treatments in defining health outcomes (see Forbes et al 2013, Rose et al 2015, Weller et al 2018). It further controls for public health, to focus on the health system specifically. That is not to say that public health is not considered important, and IPPR has undertaken recent research on that topic (Hochlaf et al 2019).

The second and third questions have been tested qualitatively through a series of expert interviews. These were semi-structured and held with senior leaders and practicing clinicians and commissioners from across the NHS.

Throughout, analysis has focused on four case studies: stroke, cardiovascular disease, cancer and dementia. These are the four largest drivers of mortality in England (figures 1.3 and 1.4). It also uses a holistic definition of innovation – where innovation includes any advance that

changes practice and provides *substantial* improvement. Within that, the focus is on three broad areas.

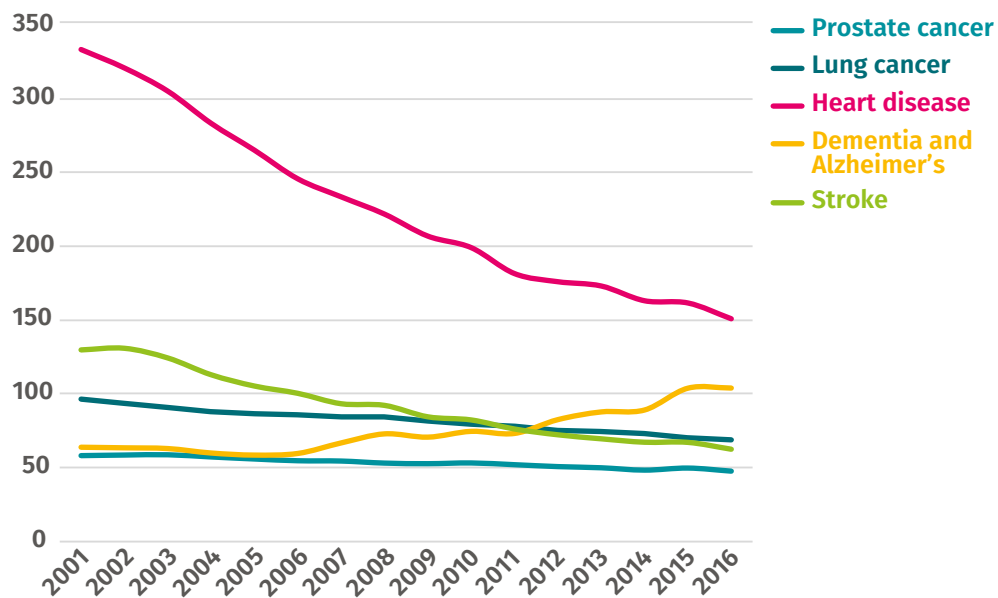
- **Treatment and therapies:** including but not limited to new drugs and medicines.
- **Digital and AI:** including self-management tools, apps and automation.
- **Care pathways:** including new ways of delivering care, designing pathways and stratifying patients.

The conclusions are not intended to be specific, but rather to inform the wider reforms needed to catalyse rapid and consistent spread across the NHS.

FIGURE 1.3

Except for significant improvements in cardiovascular mortality, progress for men has stalled recently

Age-standardised trends in mortality per 100,000 people (male)

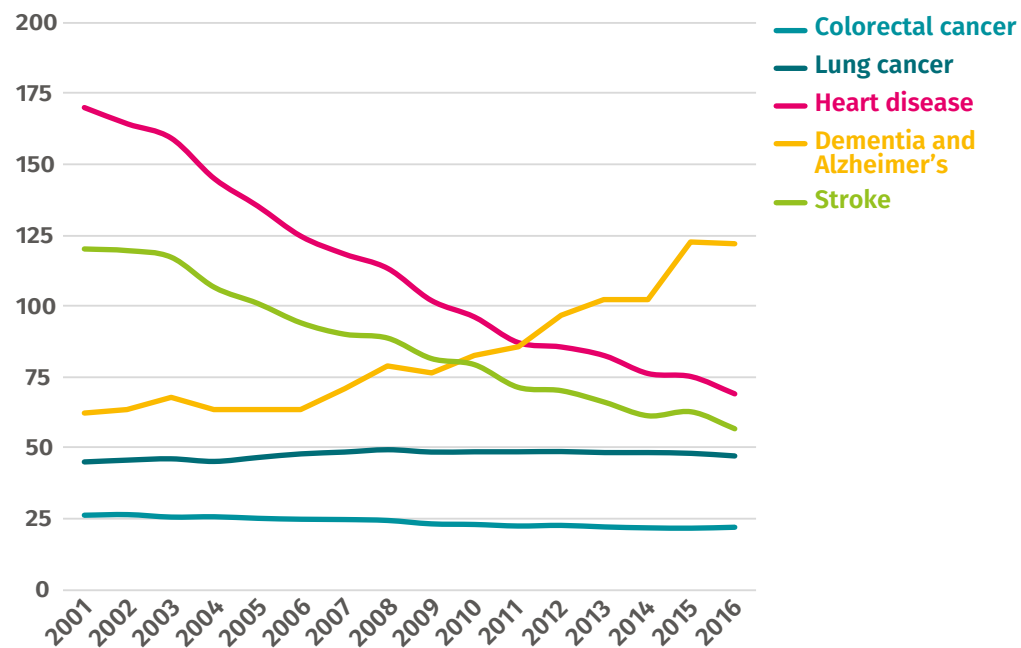


Source: Recreated from Public Health England (2018)

FIGURE 1.4

Progress has been made on mortality for women, but this has plateaued more recently, while dementia mortality has risen sharply

Age-standardised trends in mortality per 100,000 people (female)



Source: Recreated from Public Health England (2018)

2.

COULD INNOVATION SUPPORT THE RECOVERY?:

QUANTIFYING THE OPPORTUNITY

Covid-19 has caused significant health, societal and economic damage. The NHS has got through the first peak, but not without significant impact of other activity. Urgent cancer referrals dropped 75 per cent (Hiom 2020), while presentations for heart attack symptoms reduced by half (Bakker 2020).

Innovation could support recovery, for both the health system and the economy. This section quantifies the health and wealth gains more consistent spread of innovation could achieve.

The spread of health innovation delivers value in three ways.

1. It generates better health outcomes.
2. It supports NHS efficiency enabling investment elsewhere.
3. It provides economic gain by enabling people to continue contributing to the economy where illness may otherwise have impeded them, and by supporting a strong life science industry.

This chapter models the opportunity the UK has to produce value across these four metrics.

2.1. INNOVATION SPREAD WILL IMPROVE HEALTH OUTCOMES, FOR EVERYONE

Substantial reductions in morbidity and mortality are possible through more consistent spread of innovations already available to the NHS. To quantify the potential, models were produced to compare UK performance with that of similar western European and Anglophone countries. In each case, a top performing peer was identified for comparison. These were countries with comparable health systems (as defined elsewhere) and economy sizes. They all have the same access to innovations at the international level but different ways of adopting and diffusing them at the local level. This, in turn, suggests that access to best practice treatments, care pathways and technology is a key variable² – as used to establish the impact on innovation and best practice on health system performance and outcomes elsewhere (see Forbes et al 2013, Rose et al 2015, Weller 2018).

The model showed that UK mortality lags behind comparable countries – by 20,000 avoidable deaths (table 2.1). It also lags behind on mortality – by 300,000 avoidable incidents of illness (table 2.2). The total associated economic gain if the country were to match optimal performance, in line with that seen in other countries, would total £8.3 billion (figure 2.1). This is equal to the total economic contributions of those in the working age population who avoid death, illness or disability.

2 Though there are other potential drivers such as funding level and structure of the health system.

TABLE 2.1

Large health and economic gains are possible through reduced mortality

	Mortality		
	CVD inc. Stroke	Cancer	Dementia
Mortality in the working age population (per year)	25,655	47,457	1,262
Reduction possible (%)	25	27	42
Reduction possible within working age population (per year)	6,346	12,822	531
Reduction possible in employed people in working age population (per year)	4,843	9,758	404
Associated economic benefit (£m)	124.23	250.28	10.37

Source: CF analysis of British Heart Foundation (2018); GHDx (2019); ONS (2019b, 2019c); HM Government (2017); Lewer et al (2018); Alzheimer's Society (2019)

TABLE 2.2

Large health and economic benefits are possible through improvements in morbidity

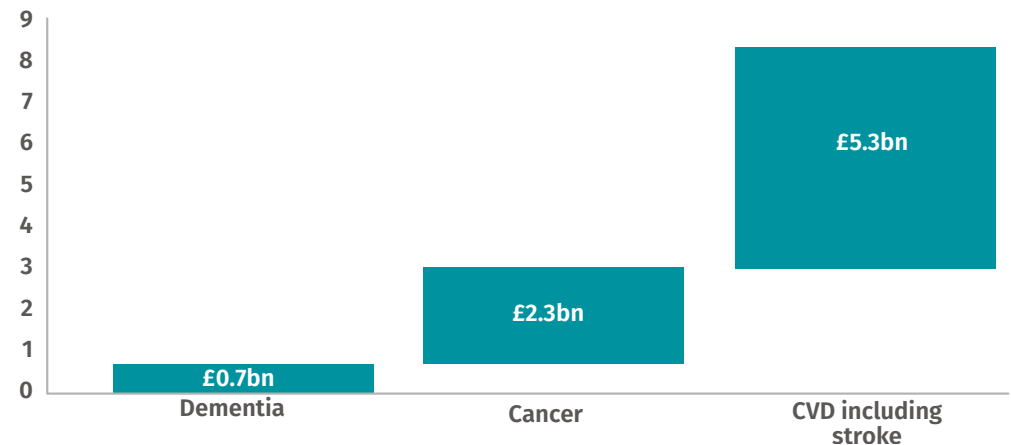
	Morbidity		
	CVD inc. Stroke	Cancer	Dementia
Prevalence (rate/100,000)	10,773	3,936	1,227
Reduction possible (%)	25	26	28
Reduction of morbidity in working age population (per year)	233,367	90,092	29,459
Associated economic benefit (£m)	5,219	2,015	659

Source: CF analysis (ibid)

FIGURE 2.1

Combined this presents a significant opportunity for creating economic value by improving the nation's health

Increase in economic contribution attributable to matching health outcomes across four conditions (£bn)



Source: CF analysis (ibid)

2.2. INNOVATION GAINS WILL IMPROVE NHS EFFICIENCY, PROVIDING A DIVIDEND FOR REINVESTMENT

Long term conditions are expensive for both health and care providers. Innovation that reduces prevalence or harm can, therefore, create large savings for both. To model the possible savings, analysis identified the prevalence and annual care cost for each condition in the UK by disease area. This allowed the avoided cost for the health and care systems to be quantified, based on bringing performance up to the best performing advanced economy (table 2.3).³

TABLE 2.3

Reducing morbidity and mortality through innovation would create efficiency savings for the NHS

Net reduced costs (health and care) predicted by matching top performing peer country

	CVD inc. stroke	Cancer	Dementia
Costs, health (£/person)	2,432	2,135	5,059
Costs, social care (£/person)	689	-	12,117
Costs, incurred (£/person)	932	991	13,778
Possible reduction, prevalence (%)	25	27	42
Reduced cost (total, £bn)	7.2	2.2	11.1
Reduced cost (attributable to healthcare, £bn)	3.6	1.1	5.5

CF analysis of Alzheimer's Society (2019); GHDx (2019); Leal et al (2012); Luengo-Fernandez et al (2006); Xu et al (2017)

Overall, across health and care, the savings possible total £10.3 billion per year – and this could increase further in subsequent years as more people benefit from advances on innovation spread. This is over half the full settlement given by the government in the 2018 funding settlement – a huge prospective return that, if reinvested in the NHS, would have significant benefits.

2.3. INNOVATION GAINS WILL SUPPORT A STRONG LIFE SCIENCE SECTOR AND UK ECONOMY

The life science sector represents one of the 'dominant economic sectors in the UK' (Bell et al 2017). In 2018, the pharmaceutical industry's gross value added (GVA) to the UK economy was £13.9 billion – driven in particular by a GVA per worker four times higher than the manufacturing industry average. In 2014, employment within life sciences stood at 180,000 people over 4,800 businesses – with £55 billion per annum total revenue (Klein 2015).

In theory, combined with excellent research and manufacturing infrastructure, this should give the UK a strong foundation to derive increasing amounts of economic value from the sector. The opportunity is there. Global pharmaceutical research and development spend is rising year on year, creating value for the countries attracting that spend (EvaluatePharma 2019).

New treatments, such as gene therapies, have proven their ability to generate high sales. Should the UK be able to attract their manufacture, it would constitute a boost for the sector and create high-skilled jobs outside of London.

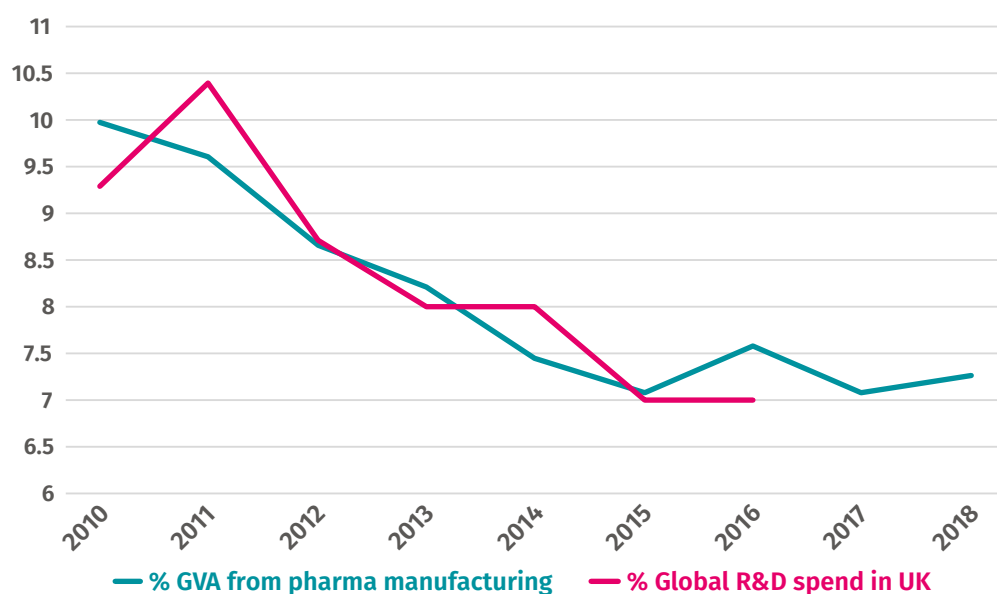
³ Controlling for socio-economic status and employment rates.

However, the UK is failing to capitalise on this opportunity. Both its share of global R&D spend, and the relative economic value it derives from pharmaceutical manufacturing, is decreasing (figure 2.2). The cost of this decrease has been over £40 billion this decade so far (Thomas 2019c). To put this in context, the US has increased its share from just over 50 per cent of all global R&D spend to almost 60 per cent in the same time period (ABPI 2017).

FIGURE 2.2

The UK has lost a decade in progressing the life sciences

The change in life science global research spend (%) in the UK and change in pharmaceutical manufacturing GVA as a percentage of total UK manufacturing industry GVA



Source: CF analysis of ABPI (2017); EvaluatePharma (2019); ONS (2019d)

A return to the 2011 peak would represent an achievable ambition. In terms of R&D, a return to a 10 per cent share of global pharmaceutical spend would translate to an economic boost of £4.3 billion per year. In terms of manufacturing, a return to pharmaceuticals representing 10 per cent of the industry GVA would translate to an economic boost of £5.3 billion per year. Combined, this means a potential wealth dividend of £9.6 billion annually – a welcome boost for the UK’s economic outlook.

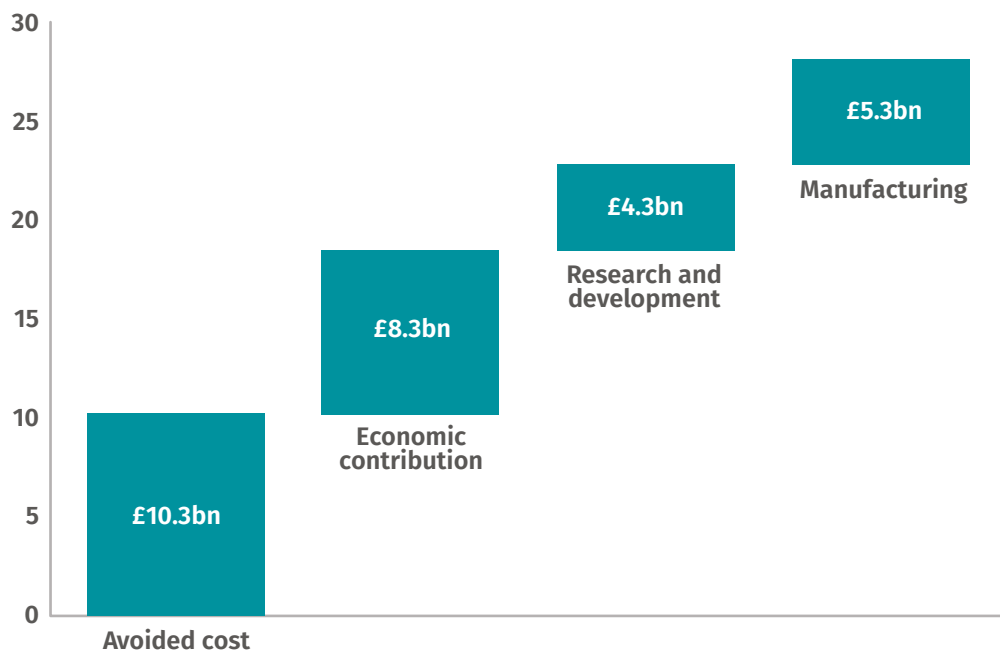
Better spread could be a significant catalyst in achieving these gains. Both R&D and manufacturing decisions are driven by a complex set of factors including proximity to academic research centres, corporate incentives (taxation), access to high quality workers and ease of trade (amongst others). However, better spread of best practise innovation could make the UK a more attractive market for innovators who would be incentivised by a greater potential pay-off, and by the opportunity for their innovations to have greater patient benefit. The link between spread and a strong life science industry is widely accepted (Freeman 2015, DHSC 2011, ABHI 2011).

2.4. THERE IS A VIRTUOUS CIRCLE THAT COULD OFFER AN AMBITIOUS GOVERNMENT AN ECONOMIC RETURN OF £20 BILLION, AND REDUCED COSTS WORTH £10 BILLION

Matching international performance levels would provide both health and wealth benefits (figure 2.3). This indicates a virtuous circle, where investment in life science and better care provides a direct economic boost (industry), improves health outcomes and also increases NHS efficiency. In sum, a willing health secretary could have a rare win-win, where economic value, NHS efficiency and better patient outcomes are simultaneously possible. The total return on investment possible is up to approximately £20 billion for the economy, and £10 billion in reduced costs.

FIGURE 2.3

Uplifting health and care performance could achieve a wide range of wealth benefits
Return on investment possible through analysis model (£bn)



Source: CF analysis (ibid)

It is critical to note that this is the value of the first year benefit. Though the data to provide an exact figure, subsequent years could deliver significantly higher returns as more people's lives are benefited by wider, faster access to innovation.

MAKING THE GAINS: CASE STUDIES OF UNTAPPED POTENTIAL

The stroke postcode lottery

Major variation remains across the country in stroke, including avoidable variation. This includes:

- access to specific psychological support in North Lancashire, but not in Cumbria
- access to specific physiotherapy support in Sheffield, but not in Harrogate
- access to six-month assessments in Swindon, but not in Somerset
- a 15 per cent rate of thrombolysis in a stroke unit within four hours in Wexham Park, compared to an 82 per cent rate in Ipswich
- 100 per cent of people receiving a brain scan within 12 hours in Chelsea and Westminster, compared to 63 per cent in North Tees and Hartlepool
- 13 per cent of people accessing a stroke unit within four hours in South Tyneside, compared to 86 per cent in Bedford (Stroke Association 2016).

This does not constitute an exhaustive list, but it is an excellent indication of the variation in how and how well innovations are spread, and of the gains still to be made by maximising on the innovation already available to the health system.

Further, some areas have had their stroke services reorganised to a more optimal delivery model. London, as well as Greater Manchester and Northumbria, have changed how hospital stroke services work. This has been linked to tangible impact on lives saved, disability avoided, and efficiencies created. In London alone, the evidence shows almost 100 lives are saved per year just because of this reorganisation in how services are delivered, and money is also saved (Stroke Association 2019). Yet, whilst the NHS has noted the overwhelming case for reorganisation, the Stroke Association has described this as ‘patchy’ (ibid; NHS England 2014).

Reigniting progress on CVD

Cardiovascular disease has been a success story of the last few decades, with mortality dropping sharply. However, significant gains are still needed, and progress has begun to stall. Better implementation of innovations remains one of the best ways to push forward that progress.

To take one example, there is still a discrepancy in the distribution of percutaneous coronary intervention (PCI) centres across the UK. This is a non-surgical procedure that improves blood flow to the heart, reducing angina and – when used correctly – the risk of heart attack. The total number of PCI procedures has steadily increased since 1991 – from around 10,000 to 100,000 today (NCAP 2018).

Yet, this progress is slowing, and may require much greater availability of PCI procedures where centres are less common in the UK (for example in the North, the South West and the devolved nations) (ibid). The rate of increase in the use of PCI in the UK peaked in 2000 at 20 per cent but has since fallen to 2.34 per cent, meaning progress will be slow without active efforts to catalyse improvements (BCIS 2017).

Delivering a radical upgrade in early cancer diagnosis

Cancer survival rates in the UK are improving but have historically lagged comparative western countries (Coleman et al 2011). The most recent international comparison showed that, even where improvements can be observed in the UK, they are slower than in other advanced economies (Arnold et al, 2019). There are also variations in both survival and access

to treatment within the country (Thomas 2019c). The National Lung Cancer Audit further showed that different CCGs had very different success rates in provision of active treatment to people with a lung cancer diagnosis.

The biggest marginal gains to survival will come from improvements to the stage of detection, and likely also from the introduction of more personalised treatments, as they become available and cost effective. In terms of the former, the government has made very specific commitments. Continuing with the lung cancer example, these are shown in table 2.4.

TABLE 2.4
Ambitions for early diagnosis of lung cancer

Stage	Current lung cancer stage distribution	Target lung cancer stage distribution
I	19	39
II	7	28
III	20	8
IV	50	22

Source: CF – A Healthcare Consulting and Analytics Company (2020)

Modelling by CF projects this would translate to 19,200 less deaths from just lung cancer by 2028 – with substantial reductions in cost for the NHS. It would also entail improvements on health inequality. Lung cancer is 159 per cent more common in the most socio-economically deprived group, has a low survival rate if diagnosed late, and has not seen substantive improvements to survival in the last half a century (Cancer Research UK 2019a).

There are innovations with large capacity to provide the step change needed in lung cancer outcomes. Improvements in screening have been linked to both mortality improvements and can improve cost efficiency against the standard NICE threshold of £20,000 per quality adjusted life year (Landy et al 2016, Pharoah 2013, Public Health England 2016). ‘Straight to CT’ arrangements, and direct GP access to diagnostics tests, can provide more rapid diagnosis (Cancer Research UK et al 2017). Lung health checks have been successful in Liverpool and Manchester but will need to spread more widely to fully impact on early diagnosis outcomes (Macmillan Cancer Support 2017). And new treatments have shown promise, with several emerging through the Cancer Drugs Fund (NICE 2019) – but will need to buck a trend of very little improvement in lung cancer survival for 50 years (from 3 per cent 40 years ago, to 5 per cent today) (Cancer Research UK 2019a). Spreading these equitably will be critical to progress.

3. EMPOWERING THE FRONTLINE: THE OPPORTUNITY TO SPREAD THE SCIENCE ACROSS THE NHS

3.1. TRANSFORMING THE RELATIONSHIP BETWEEN NATIONAL AND LOCAL BODIES ON INNOVATION

Our failure to capitalise on the spread of innovation has not been due to a simple lack of policy. The last decade has seen numerous initiatives and strategies aimed at driving the health innovation agenda forward. The critical question is why, despite this, measurable progress has not been made.

The key problem has been a predominant focus on a cost-efficient supply of innovation, to the exclusion of policy to support and empower the frontline (or ‘demand side’) in spreading said innovation. This has led to some useful policy – with the Voluntary Scheme for Branded Medicines and Pricing and Access (VPAS) both popular. Yet, it has equally capped the capacity of the NHS to keep pace with exciting science and increasing supply:

“You almost get the sense from national policy that we’re all just too stupid to not do things that work, and that underlies quite a lot of the narrative I think about if only you’d do this and do better ... the reason we don’t adopt innovations is because we’ve got to adapt a whole system where we already deliver 3 million patient contacts a year, you need to find a way for that to dock into what we already do. So for example [an innovation] where a patients details are taken only once at the front door by junior doctors, absolutely obvious, has been done elsewhere, and we’ve been trying to work out how to do it for nine months, because you’ve got to entirely change all the processes about the arrival of acutely unwell patients, and you’ve got to change how you organise your junior doctors ... I think we need to pay much more attention to what is the process of adaption, because adaption is really, really hard.”

A chief executive of a large NHS Trust

There has been recent progress towards getting the balance between invention and spread right - namely, the Accelerated Access Collaborative and the Academic Health Science Networks (AHSNs). However, there remains an opportunity to do much more. Key to this will be a fundamental change in how the center works with local bodies. This is something NHS England have been trying to get right for decades – most recently in the Five Year Forward View (NHS England 2014).

“However, England is too diverse – both in its population and its current health services – to pretend that a single new model of care should apply everywhere. Times have changed since the last such major blueprint, the 1962 Hospital Plan for England and Wales. What’s right for Cumbria won’t be right for Coventry; what makes sense in Manchester and Winchester will be different.

But that doesn’t mean that there are an infinite number of new care models. While the answer is not one-size-fits-all, nor is it simply to let ‘a thousand flowers bloom’. Cumbria and Devon and Northumberland have quite a lot in common in designing their NHS of the future. So do hospitals on the outer ring around Manchester and the outer ring around London. So do many other parts of the country.

That’s why our approach will be to identify the characteristics of similar health communities across England, and then jointly work with them to consider which of the new options signalled by this Forward View constitute viable ways forward for their local health and care services over the next five years and beyond.”

NHS England (2014)

In 2019, at the end of the five years envisioned by the Five Year Forward View, such a harmonious relationship has not been achieved – with the focus still, disproportionately, on letting ‘1,000 flowers bloom’. This is for two reasons. First is the prevalent idea that a light-touch approach will be enough to catalyse demand – and that anything more involved is unnecessarily interventionist.

“[A previous secretary of state] made, I felt, a very naïve statement at the time that all you have to do is present the evidence to these hospitals and they will do the right thing.”

A previous NHS clinical director

“The NHS never capitalises on being a single organisation. It’s a vast healthcare system. I’ve just got back from China who are undertaking vast innovation and if they want to do it, they just do it, it’s command and control.”

A leading general practitioner

The second is an almost constant process of health service reorganisation – leaving the frontline subject to an insecurity that is not conducive to innovation.

“The constant restructuring of the health service has also really made it very difficult. So when the Lansley reforms were brought in and CCGs created, led by people who had in many cases very little experience in the commissioning of care ... it’s not surprising that you get to a state of paralysis where all we’re doing is repeating what we’ve done before while we try to learn how the system works. So, I think we’ve had a period of five, six, seven years where it’s been quite difficult to persuade the CCGs, and of course now we’ve got STPs, we’ve got ICSs...”

A previous NHS clinical director

“We have far, far too much reorganisation, far, far too much. We put the flowers in the ground, new shoots that just come above the ground, and we pull them out to check how they’re growing, and we kill them off. Since the Lansley review in 2012, we’ve had five further reforms – can you believe it ... I can’t keep up with acronyms now, it’s a nonsense.”

A leading general practitioner

The consequence of such churn is that the rules of the game have become unclear and lacking in direction. This makes it difficult for local leaders to make consistent and consistently constructive decisions. And it stops national leaders from actively managing the quality improvement or the spread process constantly and constructively.

A better national/local relationship needs to be put at the heart of health innovation policy. This would see the centre set a long-term (and fixed) vision and framework for spread, ensuring local actors have the consistency and confidence they need to deliver. Then, we must free up and empower local areas to deliver. Empowerment must not, as it had this decade, be mistaken for leaving them to their own devices. Instead, it means supporting them to overcome specific barriers to progress. In relation to spread, we identified three barriers at a local level.

- A risk-averse culture, due to the system's approach to targets and performance management.
- A poorly networked and complex NHS.
- A lack of resource.

3.2. A RISK-AVERSE CULTURE

The NHS is risk-averse. This is clear from the performance metrics it prioritises: patient safety, waiting times and financial accounts. While all are of course important, this leaves little space for a focus on long-term transformation, innovation or shift-changes in outcomes.

“As a health service we are quite conservative, where I think there are other countries that I think would be more likely to say ‘let’s give that thing a go’. That needs to be counterbalanced against the risk of doing the patient harm.”

A leading expert on care quality improvement

“We have a blame culture; things go wrong and people get fired. That needs to be changed.”

A senior leader at NHS England

These priorities at the top translate into targets and performance management within the system. Providers are judged on short-term waiting time targets (often to the minute), their annual CQC rating and whether their budget is in surplus quarter to quarter. The evidence shows that such targets drive trusts to pursue consistency, and to view longer-term transformation with suspicion (Ham 2014, Heather 2017, Loveday 2008).

“... being innovative and allowing people try and fail is quite challenging in structures when you have a lot of governance around the system. If you take nurses, for example, nurses, for very obvious reasons are trained to follow protocol ... it’s not surprising that they are a bit risk-averse. The structure is not set up to allow them to try and fail ... so they’ll look for reasons not to try things. We need to start to give freedom and permission.”

A director of innovation in an NHS Trust

This is then replicated at an individual level. In some ways, this is cultural: people intuitively conform to the behaviour of the organisation they work in. In other ways, it is through the formal process that emerge around performance management, career progression decisions, and the types of job description put out for recruitment (and people subsequently recruited). At best, this means innovation is often done outside accountabilities, in staffs' own time, without reward. At worst, it means it is actively avoided.

“Chief executives ... I thought would be quite excited by the idea of a brand-new technology, completely free, for 12 months. My view was, why wouldn't you? His idea was, well, what happens after 12 months ... it's going to be more of a problem down the line.”

A director of innovation in a large NHS Trust

Underpinning this risk aversion is a systematic lack of time. Taking risks and spreading innovation requires time – to identify innovation, understand the evidence, assess the risks, create networks and to build a business case.

“It's time, time, time. Time is the one thing that the NHS lacks...”

A senior general practitioner

Without time, leaders and clinicians are less likely to focus on innovation beyond their job description, and beyond the narrow targets they will be appraised on. Rather, spread is done on the side of desks, outside of normal working hours, and despite annual targets, appraisal goals or performance standards.

Policymakers have been excited by the capacity of innovation to save time (eg Freeman 2015) and enable increased care. The returns could, indeed, by large – IPPR calculations suggest automation could free up £12.5 billion worth of time in the NHS alone (Darzi 2018). However, the evidence is also clear that to get to a point that innovation releases clinical time, clinicians need to be given dedicated time to invest in the adoption and spread of innovation (Robert et al 2009).

3.3. THE COMPLEXITY OF THE NHS

It is tempting to think of the NHS as one organisation. In fact, it is made up of a huge number of individual bodies. There are 44 Sustainability and Transformation Partnerships, over 7,000 GP practices, 207 CCGs, 152 acute trusts, 54 mental health trusts, 35 community providers and 10 ambulance trusts – each with different populations, processes and pathways.

This introduces huge, perhaps unique, complexity into the system – complexity that, from an innovation perspective, creates two major problems. On the one hand, it limits bandwidth – it is impossible for people within the system to have tabs on everything entering the system, let alone to understand in detail how they work. Secondly, where innovations are identified, it makes spread difficult – as often something that works in one place, with one population, creates unforeseen consequences elsewhere.

This sum of these problems is an unhelpful ‘not invented here’ culture within the health system. Faced with complexity, and the possibility of unforeseen consequences, trusts are often fearful of implementing other's ideas. Otherwise, they may not know that what they are reinventing already exists. In either case, the system encourages a preference for (re)invention rather than the adaptation of what already works.

“One of the biggest challenges is the ‘not invented here’ mentality you sometimes get.”

A representative from a leading pharmaceutical company

“It's culture. It's a ‘it's not built here, so we don't want to use it’. It'll be a cultural fear.”

A senior general practitioner

“I know a urologist ... with a new device for stopping nasty bleeds who has had massive trouble getting it picked up, even by their own colleagues! It's partly a ‘not invented here’ attitude.”

A senior leader at NHS England

Capacity to identify and understand innovation is critical to any system expected to adopt or spread quickly, consistently and efficiently.

3.4. A LACK OF FUNDING

The NHS dedicates relatively little funding to spreading innovation - particularly compared to, say, the amount a private company might allocate to the same goal (Collins 2018). Without sufficient funding, it is impossible to double-run services – often a prerequisite for implementing innovation. A relatively small capital budget further restrains capacity to make the upfront investments that might be necessary – in equipment or technology (Thomas, 2019b). Equally, those we might hope to lead the spread of innovation have an inability to access even small pots of money for this work.

“Innovation is a managed process and people get stuck ... if you start with a good idea and then don’t know what to do with it, you then fall off and there’s no one to pick you up. The infrastructure I’m thinking of is like ... service support costs ... for staff to help us manage the trials.”

A director of innovation at a large NHS Trust

“I think lack of funding is also a barrier. I understand that things are financially very tough, but do we want to have good outcomes, that’s what we have to ask ourselves.”

An expert in care quality improvement

“[The NHS Long Term Plan] addresses the revenue budget for the next five years but does not address the capital budget. I think the bizarre thing about the public sector in the UK is that you can have a plan that is funded on a revenue basis but no capital agreement ... how can you get progress and improvement in a system without spending capital?”

A senior manager in NHS England

This is compounded by a system where budgets are siloed and short-term (single year). Short-term budget cycles mean innovations that do not create a rapid cost-saving are likely to impact deficits, even if they are sound long-term investments, creating a further disincentive (Quilter-Pinner and Muir 2015). Ring-fenced and long-term funding, managed by providers, would be a significant improvement – much as the process works for research through NIHR.

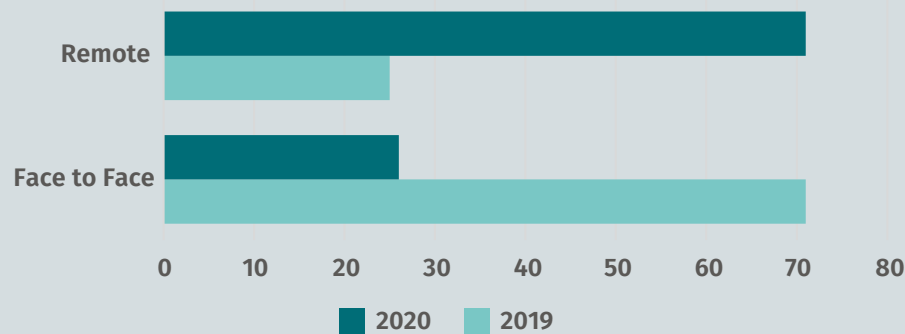
CASE STUDY: INNOVATION DURING COVID-19

Covid-19 has catalysed innovation across the health system. Transformations years in the waiting have happened, sometimes, in a matter of weeks. One of the most remarkable examples of this is the shift to digital in primary care. RCGP surveillance data from a year ago shows that 71 per cent of appointments in general practice were face to face. The same data this year suggests that has fallen to just 26 per cent, with 71 per cent now remote (RCGP 2020)

FIGURE 3.1

The shift to digital has been rapid

Face to face and remote appointments in general practice (%), March to April 2019 and 2020



Source: RCGP (2020)

Our interviews highlighted how traditional barriers to adoption and spread had been removed during the crisis. First, there has been a clear goal and clear guidance. As highlighted elsewhere, NHSX issues clear guidance, while there has also been access to resource:

“The centre were very clear about how they wanted us to work to keep people safe – remote consultations first...[there was then] a little bit of support in terms of guidance...the centre have put a few things in place, which has opened the floodgates for how we work”

A GP working in the South East

Outside of a clear goal and clear guidance, the centre provided local leaders and practitioners the permission to take good risk – coordinated between NHS England and the regulators.

“One thing the centre has definitely done is given practices “permission”... in a cultural sense that its okay to do this, and in a formal legal sense as well...[A] letter went to all practices highlighting that the default practice should be digital”

A GP working in London

This has facilitated significant, locally led spread of digital innovation during Covid-19. As one GP put it, a ‘bit of trust and a bit of resource’ were critical – while others highlighted that working in an innovative setting had improved their morale significantly.

“Give us the tools, we’ll build the house”

A GP working in the South East

This proves that our struggles with spread are not inevitable. Central to successful change was what might be called a ‘mission based approach’ – with the centre setting a clear objective, providing resource and guidance, but then allowing and empowering local adaptation and delivery. We discuss this in more detail in chapter 4.

While innovation in a complicated system is inevitably difficult, the challenge for the NHS now is to ensure that this lesson can be carried forward.

4.

PHASE ONE:

LONG-TERM STRATEGY AND STABILITY FROM THE CENTRE

In the following chapters, we outline how the NHS can take forward a more rigorous theory of change for innovation spread. This focuses on insights from the system itself, as well as what can be learned from Covid-19. Implementation of such policies are crucial as we move to the recovery. The first chapter focuses on the need for the center to recreate the 'common purpose' of Covid-19 - by pushing in the same direction, outlining a common framework, and then empowering local actors on delivery.

A MISSION BASED APPROACH

Previously, IPPR have advocated a 'mission-based approach' to R&D spend. We have defined this as having three key traits.

- The establishment of a long-run goal and a broad plan for meeting it.
- Tailored management of relevant policies and regulation to support achievement, often by allowing greater flexibility.
- A clear commitment on associated spending.

(Parkes 2019)

This approach helps coordinate action, build partnership and prioritise long-term societal gains.

Our qualitative findings, and lessons from Covid-19, show that there is also a case for a mission based approach to spreading innovation. This would see the centre state a clear goal for the spread of innovation; provide guidance and ensure flexibility in policy and regulation; but then empower local delivery, through networks, peer support and allocation of resource and time.

4.1. A LONG-TERM VISION THAT THE DEMAND-SIDE HAS CONFIDENCE IN

The last time the NHS delivered a Long-Term Plan (2000), it was accompanied by a series of National Service Frameworks (NSFs). They set minimum standards for the system on both inputs and outputs. The frameworks are credited with subsequent improvements in health outcomes relative to other countries. A retrospective cohort study attributed key improvements in cardiovascular outcomes to the frameworks (Graham et al 2006). The King's Fund's evaluation of the Mental Health Framework concluded that it's "undeniable that huge transformation was delivered across community services" (The King's Fund 2014).

The strength of the frameworks was threefold. First, they constituted an active steer from the centre. This gave providers direction, helped them identify evidenced interventions, and gave them permission to implement. Second, they

provided a consistent offer to patients, and clear accountability should that not be provided. Finally, they were long-term (10 years) – giving the demand-side the confidence that they would have sufficient time and support to implement new standards, treatments, tools and pathways.

They offer a useful framework for catalysing implementation on innovation. They should be reintroduced to formalise a more active relationship between the centre and places within the health system. Specifically, they should specify long-term objectives, and timelines for delivery. These long-term objectives should be based on the possibilities presented by the science, and include detail on how policy and regulation will be adapted to support delivery. While standards should be a component, frameworks should accept that adaptation is often important in a complex and diverse system.

This comes with three caveats. First, NSFs should not be short-term targets of the kind we've described as drivers of risk aversion (Blunt 2015). Rather, they should be a specific and ambitious account of commitments being made to all patients and service users, universally, based on the possibilities presented by existing, evidenced innovations. Second, they should not constitute 'nice to haves' – but rather firm commitments by the NHS to the innovations patients can expect to access as a minimum standard. Finally, they should recognise future health challenges will not be condition specific and look to avoid clinical siloes. Frameworks for future challenges – multiple conditions, health inequalities or children's health – could reasonably be considered.

Policy recommendation 1: NHS England should publish National Service Frameworks. These should set ambitious and timebound targets for innovation - giving objective and rationale for a mission-based approach.

4.2. CLARITY ON RESPONSIBILITY AND REGULATION

It is important that there is clarity on how innovation, particularly the NSFs, will be regulated. This is important for the centre, who may need the recourse. However, it is also important to set out the rules of the game to local leaders, providing the stability they need to set up their approach to this.

The Care Quality Commission should be the primary enforcer of the centre's priorities on innovation. Currently, innovation is not a consistent element of their work. Far more bearing is given to doing something wrong, rather than failing to do something better. Yet, the consequences for patient safety or patients' outcomes could be just as detrimentally impacted by a missed opportunity as by negligence. A larger focus on innovation by the regulator - including as a key criterion in receiving good and outstanding ratings - is justified on these grounds.

Where the service frameworks are not being implemented, consistently or well, the Care Quality Commission should act. Given that service frameworks are intended as a minimum standard for the spread of innovation, not achieving those standards should have a bearing on a provider's rating. Consistently missing targets should be grounds for decertification. We endorse early moves by CQC towards this approach, such as the 'well led' framework.

Policy recommendation 2: The Care Quality Commission should actively regulate on the basis of innovation. This means considering missed opportunities to innovate in their 'needs improvement', 'good' and 'excellent' ratings.

4.3. CLARITY ON DECISION-MAKING

This research process regularly highlighted that NICE are an excellent institution with an international reputation, but that some of their authority has been lost in recent years. This has been driven by two key factors:

- An increase in the pace of scientific advancement, putting strain on NICE's resource
- A rise in local commissioning – a symptom of financial pressure on the NHS – but which often undercuts or duplicates NICE's work

This presents both a challenge and an opportunity.

“One of the challenges that we’ve increasingly seen over the last five years is the overlapping and sequential access steps which are adding no value to the assessment of a medicine but which are only adding additional hurdles into the system, which are all broadly focused on cost control... when we talk with global colleagues, it’s getting increasingly difficult to describe a clear picture on how a product will get to patients.

[NICE] has a pretty well-respected formula. Ultimately, we knew if we engaged with NICE and our medicine was found to be cost effective, our medicine would be available on the NHS. The NICE step is now really just the first step ... it gets you in the game. There is the potential for budget impact tests ... we’ve also seen tenders used in some areas and tenders are really just a crude metric which reduces any clinical differentiation and generates a race to the bottom. That’s all within the context of a medicines budget which is capped anyway.”

A senior policy expert within the life sciences sector

“We can do more with NICE, yes. I am very keen to get some changes at NICE ... a lot can be done to improve NICE.”

A senior manager at NHS England

If NICE approve a medicine as cost and clinically effective, there is no reason it shouldn't be made available to everyone - not least because of the capped medicine budget and industry reimbursement scheme. Value assessments and commercial arrangements should be centralised, with a single point of contact. Local tendering of medicines, by those without the technical expertise to make clinical differentiation, should be explicitly banned. To ease this change, government should fix problems with reimbursement from the voluntary scheme for branded medicines. Currently, those local areas that invest in medicine do not always receive the right rebate, incentivising cost control rather than high quality service delivery.

This would free up time locally, which can be spent on spread, and help provide a more universal offer to service users across the country. In turn, this puts an onus on government to provide NICE with sufficient resources to keep up with the pace of scientific advance. It also means that NICE must be ambitious in developing the methods necessary to keep up with the science, which is developing more specific and personalised interventions. This should be a consideration of its ongoing methods review. This broadly reiterates recommendations made by the Life Science Industrial Strategy.

Policy recommendation 3: Value assessments should be centralised in the NHS. Local tendering processes do not have the technical expertise to make clinical differentiation between medicines - and their efforts to save money do not make sense in the context of a capped medicines budget. Government should ban such processes. They should also fix distributional problems with the voluntary reimbursement scheme for branded medicines, so local providers do not miss out when they invest in innovation. Government should finally ensure NICE have the capacity necessary to deliver quick, high quality and modern assessments that keep up with the science.

4.4. A CONDUIT BETWEEN THE CENTRE AND PLACES

Good periods of innovation have relied on a strong conduit between the centre and the local NHS. A frequently cited example is London's reform of stroke care – a process of service centralisation that has improved outcomes. Here, the regional role of the strategic health authorities played a critical, anchoring role between the centre's ambitions and local impetus.

“[For the best outcomes in stroke] you need to centralise care in a smaller number of units, units where you can guarantee that patients whenever they arrive will be met by experts that are skilled in that care. So we need to go through a process of reconfiguration. We achieved that in London very successfully, but that was at a time when we had strategic health authorities, we had structures in place where it was possible to impose ... the best solution.

[On more recent attempts at service configuration] in Kent, a decision was finally made after endless consultation ... and there are then appeals to the secretary of state and judicial review so further delays, local populations mobilised to argue they need to keep their own local hospitals even though they're performing badly.”

A leading expert on stroke services

Equally, many interviews described that the national/local relationship does not work nearly as well today – due to a lack of communication or authority.

“The steer from the top is very important, but then it needs a local or regional vehicle to drive that. You can have ministers and national clinical directors or whatever pontificate from the centre. But if we only pontificate from the centre and don't have a challenge to make things happen we won't make enough progress.”

A leading expert on care quality improvement

There is a strong case for larger regional bodies to be empowered to take clear, more active leadership roles on innovation – particularly, to provide a conduit between national priorities and local actions. In 2019, the two most important bodies are clinical commissioners and integrated care systems (ICS).

A duty should subsequently be placed on both to oversee the NSF implementation in their footprint - working with the Academic Health Science Networks (AHSNs). This should be based on 'comply or justify' – allowing some local variation where its effectiveness can be evidenced. In practice, this should mean ICSs and CCGs publish joint plans on the support they will provide local providers; how they will act to provide impetus and momentum to the innovation agenda; and how they will ensure adequate funding is available. Such a conduit will ensure national priorities are met with a response in the system itself.

Policy recommendation 4: CCGs and ICSs should be jointly responsible for NSF implementation in an area – with a duty placed on them on the basis of 'comply or justify'. In practice, this should mean publishing – and accountability for – strategies on catalysing, resourcing and supporting provider implementation of NSFs.

5.

PHASE TWO:

CREATE AND SUPPORT A THRIVING 'DEMAND-SIDE ECOSYSTEM'

Once there is consistent, clear and long-term structure from the centre, attention can turn to more actively empowering the frontline to deliver spread. This is where the largest gains will be made, and is central to any conception of a mission-based approach to the spread of innovation.

Much can be learned from approaches taken by the best innovators outside the NHS. Often, their success can be traced to the creation of an innovation 'ecosystem' within their organisation (and often through their supply chain). Such systems are defined by an engaged, networked and incentivised workforce – working with a clear framework, with clear expectations. In defining them, Hwang and Horowitz (2012) describe:

“A human social network that behaves like a socio-biological system, wherein people have developed patterns of behaviour that minimize transaction costs caused by social barriers resulting from geography, lack of trust, differences in language and culture and inefficient social networks.”

While Patel and Pavitt (1994) highlight:

“The national institutions, their incentive structures and their competencies, that determine the rate and direction of technological learning (or the volume or composition of change generating activities)...”

The barriers identified on the demand side are in direct contradiction to the principles of such a system. Transaction costs are high, driven by poor networks, an unconstructive culture and a lack of resource. To create the change needed to better empower the demand-side of innovation, three paradigm shifts are needed.

1. **From a risk-averse culture, to incentives towards excellence:** Currently, the NHS is structured around maintaining standards. This means opportunities for transformation are consistently lost. Making innovation 'business as usual' means more clearly linking reward with improvement.
2. **From a complex system, to a highly networked hub:** The complexity of the system requires bandwidth, peer support and collaboration on a much larger scale.
3. **From a lack of resource, to clear and accessible transformation funding:** The NHS spends less than one hundredth of a percent on the spread of innovation. This is unsustainable and needs to be rectified by a sensible amount of investment in transformation.

5.1. FROM RISK-AVERSE CULTURE, TO INCENTIVES TOWARDS EXCELLENCE

The right kind of encouragement is needed to make sure the right risks can be taken in a system that is risk-averse by default. This means the health system needs to introduce innovation specific **incentives, accountabilities** and **working time**.

The right incentives

The approach to incentives in the NHS is not conducive to innovation adoption or spread. This underpins a culture of risk-aversion, and also misses opportunities to change behaviour and incentivise NHS staff and leadership to take the right risks for their populations.

“One solution is to look at how clinicians get paid in this country. I think that’s a big barrier to innovation like this ... the way that we pay for stroke care with a large proportion of the money going to payment by results there is very little incentive to get people out of hospitals quickly.”

A previous NHS national director

Perverse outcomes occur most often where incentives are not outcome focused, measurable or transparent. Most problematic is any continued use of ‘payment by activity’ – which makes change difficult. If a hypothetical surgical technique has historically had an associated payment by activity – to drive uptake – it makes it much harder to change the practice when a new and better approach is invented. A better system would be a shift to incentive by outcome, basing payments around population health outcomes.

This is happening, partially, as the NHS introduces integrated care systems. However, not all incentives are covered – particularly individual incentives. One particular miss are the Clinical Excellence Awards. These are the largest incentive for individual innovation, awarding over £150 million to individuals each year. This is intended to allow the centre to define excellence, and then reward those who change behaviour to meet that definition.

However, evaluations of the award show it has failed to change definitions of excellence. Winning the award is more closely linked to the ability to write a good application, rather than tangible behaviour change (Exworthy 2016). It has also failed to free itself from accusation of bias, with women and BAME candidates still far less likely to apply or receive an award (ACCEA 2018). This is indicative of a poor relationship between the award and clinical excellence – attributable to a system where “staff are evaluated infrequently on ill-defined measures of performance, rather than explicit monitored performance targets” (Bloor and Maynard 2012).

A more transparent system would invest the Clinical Excellence Awards into a new Innovation Award. This would be given specifically and only on the basis of innovation adoption and spread. The receipt of the award would be linked very explicitly to the size of progress made towards implementing the innovations, and exceeding set standards as set out by the National Service Frameworks. This would reward success rather than cronyism or parochialism, and provide a fairer, outcome focused fiscal incentive for that actually catalyses innovation spread by the best people in the NHS.

Policy recommendation 5: There needs to be a shift in payment by activity to payment by outcomes. Incentives on innovation should be linked to the standards set out in the NSF. This shift should begin with the Clinical Excellence Award budget being reinvested into a new ‘Innovation Award’, with payments made to those measurably achieving the best performance against the criteria set as priorities in the NSFs.

The right accountabilities

There should be clarity around who is responsible for innovation throughout the NHS. As such, innovation should be made part of competency frameworks and staff objectives throughout the NHS. To support this, all appraisal processes, promotion decisions and recruitment panels should refer the efforts made by an individual to spread innovation.

It is important that this happens throughout the NHS. While having the spread of innovation better represented in leaders' priorities is important, it is also critical that more junior staff are developing their interest and skillset around this. As such, it is preferable that this competency is one expected – at some level – from all staff – not just senior leaders.

This will have two impacts. First, it will make it easier to justify working on spread. Second, it will change culture and accountabilities – meaning those that succeed in the NHS are those who take good risk. Both will be conducive to a longer-term process of culture change.

Policy recommendation 6: The spread of innovation should be part of the NHS's DNA. This means individuals should be both expected to spread innovation and rewarded for doing it well. The spread of innovation should be put into competency frameworks at all grades in the NHS, as a key skill within recruitment processes and as a criterion for appraisal and promotion outcomes.

Time to deliver

Currently, clinicians who want to spread best practice are required to do so on top of an already full workload without any specific training. This is an unsustainable base for consistently spreading the innovation available to the NHS – and is in direct contrast to how, for example, the success story of how clinical research is done by the health system.

First, many described these roles happening despite a full case load, outside working hours, on the side of their desk. This is not sustainable. It is important that trusts receive the funding they need, through their workforce funding streams, to introduce and ringfence time to innovate. This would likely be cost saving in the long-term.

Time to spread innovation needs to be introduced in a transparent way, and that time needs to be clearly dedicated. This requires two changes. First, more consistency on responsibility for innovation is needed. Trusts might have a director of transformation, an innovation manager or a Chief Information Officer. Others will have no such role. Very few will have specific roles for clinicians interested in championing the spread of innovation, despite clear evidence that clinical championing is one of the most effective catalysts for spread of service changes and technology adoption (Robert et al 2009, Greenhalgh et al 2004, Shaw et al 2012, Kaasalainen et al 2015). More clinical leaders are needed, focused on spread. Second, those clinicians need time in their role to focus on spread. This should be formalised, ringfenced and funded.

Providing ringfenced time is unlikely to be overly expensive, given the gains innovation offers.⁴ Any new funding for time to innovate should be ringfenced, allowing geographies to define how they allocate time and resource into clinical roles, in a way that works for them. Logistically, this should be introduced through the NHS People Plan.

⁴ To indicate costs, providing one in five staff a day a week to lead innovation within their clinical team would cost approximately £2.0 billion/year – based on National Audit Office estimates of clinical salary spend in the NHS (NAO 2016).

Policy recommendation 7: Clinicians need time to innovate. Workstream funding should include bespoke time for clinicians to focus on innovation and adoption, with local freedom on how that is allocated to roles.

5.2. FROM A COMPLEX SYSTEM, TO HIGHLY NETWORKED HUB

The ability of a system to navigate complexity comes down to the number and efficacy of designated networks, collaborations and peer support within the system (The Bayswater Institute 2019, Marjanovic et al 2017). It is important that both local NHS organisations and individual clinicians have the networks around them to identify best practice, provide peer support and provide a conduit to share learning and champion successes.

Clinical Networks

Clinical networks have previously proven highly useful within the health service. One example was the Cancer Networks, which were disbanded earlier this decade. Research has supported their utility and impact (see, for example, Macmillan 2012), and our own interviews highlighted their popularity.

“I think we did quite well between 2000 and 2012 both for cancer and for heart disease to a certain extent for stroke as well. And that’s because we had cancer networks ... the decision to axe cancer networks as part of the reforms was a major retrograde step and everyone that I interviewed at the time agreed with that statement. I don’t think anyone was opposed to that view. They brought together local clinical innovations.”

A leading expert of cancer and care quality

Clinical innovation leads, described above, should be grouped into clinical networks. These should be explicitly focused on supporting the spread and adoption of innovation in the context of a complex system. In reintroducing networks, we should be careful not to create condition-specific or site-specific siloes. Rather, communities of practice should be formed based on NHS priorities as defined by the NSFs.

Organisational networks

The best example of networks benefiting service transformation was the London Challenge, a school improvement programme launched in 2003 and credited explicitly with a significant improvement in the London education system (Kidson and Norris 2015, The King’s Fund 2015). In their evaluation, Ofsted noted that the “London Challenge has continued to improve outcomes for pupils in London’s primary and secondary schools at a faster rate than nationally” (Ofsted 2007), a sentiment also found by the CfBT Education Trusts more recent evaluation (CfBT Education Trust 2014).

The challenge focused on partnership. High performing schools were designated teaching schools and given remit to mentor other schools in their local areas. School families further grouped similar schools into networks, to share learning. The focus was not on shaming poor performance, but on providing a clear framework for transforming outcomes (called ‘Steps to Success’), supported by those with experience of success.

We recommend the launch of a parallel scheme called the ‘England Health Challenge’. This should see those performing best on implementing service framework innovations designated ‘anchor institutions’, partnered with a range of providers within their footprint, and given a lead role in raising performance. The focus within the networks should be tackling clearly defined problems through shared learning, training and peer support.

To provide an incentive, anchor institutions would have access to a small amount of funding, with which to pilot and test new inventions within their area. Successful pilots would then feed into future iterations of the national service frameworks.

Policy recommendation 8: At an individual level, clinical networks should be formed, offering those working on innovation access to peer support and shared learning. At an organisation level, a ‘Health Innovation Challenge’ should be launched – following the model of the London Challenge. Providers with the best track records should be designated ‘anchor institutions’ and given responsibility for raising performance in their footprint. This should focus on peer-support and shared training. In return, they should receive small amounts of funding to pilot new ideas, feeding into future iterations of NSFs.

5.3. FROM SYSTEMATIC LACK OF RESOURCE, TO CLEAR AND ACCESSIBLE TRANSFORMATION FUNDING

The demand-side also faces significant problems in terms of innovation funding flows. Whilst the UK’s research and development spend needs to be increased (Bell et al 2017), it does at least enable a functioning and well-regarded service in the form of NIHR. By contrast, the spend allocated to spreading innovation in the health system is a very small proportion of the NHS’s total budget (Collins 2018).

This contrasts how all other successful innovators work. A private company focused on innovation would spend several of orders of magnitude more on building awareness of their products – and more on supporting those who purchase it, implement it. By that comparison, it is not hard to understand why awareness of the range of innovations within the system, and how to implement them effectively, are low (ibid).

Beyond funding to build awareness of innovations in the NHS, the implementation process is not free – it requires upfront investment to work (Thomas 2019b). Funding is needed, particularly, to allow clinicians and providers to manage the process of commissioning and decommissioning services properly (The King’s Fund 2015). It is also easier to engage clinicians where they can ‘see the change first’ from an innovation, before fully committing (DHSC 2008).

The best model of the funding needed to support transformation comes from the King’s Fund, who estimate that investment of £10 billion over four years would enable a high-quality transformation agenda. In the context of the return on investment our models suggest is possible, this represents a highly affordable level of investment (The King’s Fund 2015).

Further, there is an opportunity to alleviate the current pressure to fund innovation within a one-year funding cycle. NSF funding should be provided over a full 10-year period, rather than every year, giving trusts more time to implement and spread innovation, and helping them manage concerns around impact on their deficit. This will provide more certainty and allow better planning of the implementation process.

Policy recommendation 9: The demand-side needs access to the funding needed to support innovation. A transformation fund equivalent to £10 billion should be implemented over four years. This will support the commissioning and decommissioning of services and allow clinicians to ‘see the difference’ from a new practice before committing.

6. CONCLUSION: INNOVATION AFTER COVID-19

This analysis shows the UK still has room for improvement in implementing innovation for all. Compared to other international countries, it is behind both on mortality and morbidity. Given that comparators had similar health systems, similar economy sizes and given the controls used in the model, this indicates that the UK is not using the practices and innovations available to it in the best way. This is across treatments, service design, care pathway and technology.

The problem we identify is the focus of government policy, not the quantity. National strategy and supply-side problems have been the focus. This has been to the detriment of empowering the demand-side and ensuring the doctors, health professionals, commissioners and managers expected to find, reach out and implement innovation have an optimal environment to do so.

Covid-19 has proven that the spread of innovation can be rapid, even in a complex system. Learning from this experience, we recommend a mission-based approach. In the context of the NHS, this would see the centre provide a clear objective, guidance and resource. Local providers would then be empowered to adapt and deliver innovations, to improve outcomes (figure 6.1). This shift will help build an innovation eco-system and deliver culture change that could create significant health and wealth gains. As we recover from Covid-19, that is of critical importance.

FIGURE 6.1

A mission-based approach to the spread of innovation in the National Health Service

At the centre: A long-term, objectives-based approach, which provides consistency, standards and transparency to the frontline		At the frontline: Create an innovation ecosystem that recognises demand is as important as supply	
National service frameworks, making a long-term commitment to named innovation and standards.	Consistent signal to the market from NICE, empowered to take full responsibility judging the efficacy and cost effectiveness of innovations through a single, centralised and transparent process.	Funding to innovate through a £10 billion transformation fund allocated over several years to support on costs of innovation.	Innovation in the NHS' DNA, by inclusion of spread in competency frameworks, promotion or recruitment decisions and annual appraisals.
A clear expectation of comply or justify on CCGs and ICSs – and to publish plans on funding and supporting NSF implementation and delivery.		Time to innovate, with ringfenced time for spread allocated to trusts through their workforce funding stream.	
Consistent and meaningful regulation that takes missed opportunities to innovate as seriously as any other poor performance that harms patients.		Incentives that drive excellence through a shift to outcome-based incentives, beginning with a reformed Clinical Excellence Award.	Peer support and networks through the return of clinical networks and a countrywide 'Health Innovation Challenge'.

Source: Authors' analysis

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