The AHSN Network

AHSN Network Digital & AI Reset Report

Lessons and legacy from the COVID-19 pandemic in health and care

Foreword

Gary Ford

Guy Boersma

Richard Stubbs

Digital technologies that harness the power of data present huge opportunities to transform health and care, improve the quality of people's lives, and make the job of working within the healthcare system more rewarding.

These opportunities have come to the fore in the response to COVID-19, as the health and care system and wider public have had to rapidly embrace the use of new technologies.

Changes triggered by the pandemic have shone an important spotlight on how digital and AI solutions can be used to make services more accessible, make it easier for people to self-manage their health conditions, help people connect and collaborate across organisational barriers, encourage physical activity, and so much more.

The Academic Health Science Networks (AHSNs) have been supporting health and care partners at a local, regional and national level to introduce and make the most of digital and AI technologies as part of the response to COVID-19, and witnessed first-hand the opportunities and challenges this has presented. This has also involved supporting industry partners and innovators to work in new and different ways with the NHS.

As this report highlights, it is vital we do not lose this momentum and return to 'business as usual'. We must learn from these lessons to become a more integrated health and care system with people at the centre of our vision.

Through our partnership with the NHS Confederation and the Health Foundation on the national *NHS Reset* campaign, we have been helping to lead a public debate to shape what the health and care system should look like in the aftermath of the COVID-19 pandemic.

As well as understanding what changes have taken place in response to COVID-19, through *NHS Reset* we are exploring what clinicians, leaders and innovators believe should be retained, adapted, reinstated or stopped, and for which populations or settings. Furthermore, our ambition is for these insights to be used to collectively build on the progress made in order to accelerate the reset and ongoing improvement of health and care planning and delivery.

This AHSN Network report summarises our learning from COVID-19 around the use of digital and AI technologies and forms an important part of our contribution to the *NHS Reset* debate. We hope it will be of value to the wider health and social care system in guiding future developments and action to nurture health as our most precious national asset.

Gary Ford
Chair of the AHSN Network and Chief Executive of Oxford AHSN

Guy Boersma
AHSN Network Lead for Digital & AI and Managing Director of Kent Surrey Sussex AHSN

Richard Stubbs
AHSN Network Lead for NHS Reset and Chief Executive of Yorkshire & Humber AHSN

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The big lesson of the COVID-19 crisis is that health must be treated as our greatest national asset

Introduction

The COVID-19 pandemic is the greatest disruptive force so far of the 21st century. The virus has exposed the fracture lines of society with the most vulnerable hit hardest, highlighting existing health inequalities and, in some cases, increasing them [1,2]. The OpenSafely study published in *Nature* [3] showed that people with obesity, diabetes, coronary heart disease and hypertension were much more likely to die from COVID-19, all mostly preventable diseases linked to social inequalities.

Health - our greatest asset

The big lesson of the COVID-19 crisis is that health must be treated as our greatest national asset – as it is inextricably linked to the wealth of the nation too.

Health is linked to the wealth of the nation and is everyone's business

A recent report [4] estimates that the cost of ill health was about 15 percent of global real GDP in 2017 and states: "The COVID-19 pandemic forced health onto the agenda of every organisation and every household around the world. Keeping it there can deliver significant benefits. Long-term prevention and health promotion, which encompasses more than 70 percent of the benefits we identified, cannot simply be left to healthcare providers or healthcare systems. It is quite literally everybody's business".

So then, it is incumbent on all of us to rebuild, develop and nurture our health, our greatest national asset, and the NHS is but one stakeholder in this mission. We also need to involve public health and social care provided and/or commissioned by local authorities, the business community (from large corporates, to small and medium enterprises (SMEs), start-ups and social enterprises) and the third sector, whilst at the same time reminding ourselves it was primarily ordinary citizens who were behind the extraordinary community mobilisation we have seen throughout the crisis. One example is the rapid recruitment of volunteers, including 'Rapid Responders'.

The strategic importance of an integrated Population Health effort has also emerged as key during the COVID-19 pandemic. Whilst the Lansley reforms resulted in Local Authorities being responsible for their populations' health, the NHS retained responsibility for providing services for the sick and ill - it is only through joint working that we can start to address the crisis. The Local Government Association (LGA), →

for instance, highlights that councils, including directors of public health, have been crucial in helping communities to ensure supplies of personal protective equipment (PPE) got through to care homes, while providing critical advice to schools, carrying out vital modelling work for hospitals and helping to redeploy staff and reconfigure teams to keep vital local services running [5].

A reset for health and care

On 11 May 2020, the UK government published its COVID-19 recovery strategy, entitled, 'Our plan to rebuild' [6], with proposals to maximise health, economic and social outcomes. In response, many initiatives have been started and other reports published with recommendations on what to do ahead in the 'new normal'.

Examples include *NHS Reset* [7], an NHS Confederation initiative to contribute to the public debate on what the health and care system should look like, with its aspirations to rebuild local systems and reset the way we plan, commission and deliver health and care.

'Products and services that would have taken months and years to develop before the epidemic have been developed and deployed in days or weeks to respond to immediate needs.'

The *AHSN Network's Health and Care Reset Campaign* [8] is another example. The campaign aims to bring together work by individual AHSNs and the wider national network identifying, evaluating, and sustaining positive changes and rapid innovation brought about by the COVID-19 pandemic relevant to the future. These changes include, for example, more collaborative working between SMEs and the NHS, which may also bring about less cynicism and scepticism on both sides in future private-public sector partnerships [9].

Products and services that would have taken months and years to develop before the epidemic have been developed and deployed in days or weeks to respond to immediate needs. The biggest change arguably is the shift towards more patients accessing their GPs remotely. The recent report by the Kings Fund, commissioned by the AHSN Network, *Technology and innovation for long-term health conditions* [10] goes into detail: patients receiving remote consultations by phone or online went from 15 percent in December 2019 before the pandemic to over 90 percent now. While it is too early to assess the long-term impact of this shift, and whether it will be sustained, positive benefits include immediate reduction in waiting times for GP appointments, the ability to make better use of different members of staff, and more time to care for people with complex needs. However, there are concerns that the move to online services will disadvantage the most vulnerable and digitally excluded populations, and make it more difficult for staff to deliver more holistic care that addresses the psychological and social aspects as well as the biomedical aspects of illness.

Many regional considerations are highlighted by the AHSN Network's Reset campaign, which links to the Government's 'leveling up' agenda. Yorkshire and Humber AHSN recently produced its report, *Levelling Up Yorkshire and Humber: health as the new wealth post-COVID* [11]. Its 10 recommendations include empowering local leaders with the tools to improve health outcomes and deliver inclusive growth and wider prosperity; giving greater priority to wellbeing in investment decisions; and ensuring health is included as an outcome in all economic development policies, and embedded as a priority in all government departments (ie 'health-in-all-policies').

Finally, the RSA report, *Re-imagining the Future of Health and Social Care* [12], has highlighted three areas to focus on in the 'new normal' more from a citizen perspective: changing ways of working, applying new technological innovation equitably and at scale, supporting communities and promoting health, care and wellbeing. It recommends a People's Health and Social Care Commission, to inform large scale systems change in the NHS Long Term Plan led by citizens and embedding the following values: resilience, responsiveness, connectedness, care and equity.

'Preventative health needs to be at the centre to build up long-term health and economic resilience.'

Preventative health at the centre

As lessons from the pandemic unfold, it is inarguable that preventative health needs to be at the centre to build up long-term health and economic resilience. There have been notable positive behavioural shifts resulting from lockdown, such as the increased use of apps to encourage physical activity.

However, on the negative side there is a looming chronic disease 'epidemic': delays in cancer diagnosis and backlogs of cases have all increased with people feeling anxious about seeing doctors and going to hospitals, only adding to the significant burden that existed before the pandemic.

Being able to manage the chronic disease epidemic will require the same urgency and agility as the response to COVID-19: by →

investing in prevention and public health, engaging citizens, changing metrics to value outcomes rather than simply activity, cutting bureaucracy further, and implementing ways of working around a common purpose - to build up health resilience.

This will need a long-term focus on prevention. Long-term investment and bold, strategic partnerships with industry will be required for high-level sustainable transformation and disruptive innovation.

‘There is a need for social care and NHS services to be better integrated and seen as ‘equal partners’.’

Levelling up social care and seamless pathway integration

Levelling up the institutional imbalance between NHS and social care is a critical part of the future scenarios being contemplated, from a moral and ethical perspective too, particularly regarding mental health, community care and the care sector. By the beginning of June 2020, almost one third of COVID-19 deaths had occurred in care homes, exposing the shocking impact of inadequate testing and raising questions about how we care for our most vulnerable elderly citizens [13].

A recent report by Public Health England highlighted a number of disparities in the risks and outcomes of COVID-19. The mortality rates from COVID-19 in the most deprived areas were more than double the least deprived areas, for both males and females. Comorbidities and ethnicity also impact risks related to diagnosis and outcome. Diabetes was mentioned on 21% of death certificates where COVID-19 was also mentioned. This proportion was higher in all BAME (Black, Asian and other Minority Ethnic) groups when compared to White ethnic groups and was 43% in the Asian group and 45% in the Black group. The same disparities were seen for hypertensive disease [14].

Statistics such as these highlight the need for social care and NHS services to be better integrated and seen as ‘equal partners’, which will also help to restore public trust and reduce social inequalities.

COVID-19 also has demonstrated the need for patient pathways to be reconfigured and seamlessly integrated to deliver enhanced patient benefits. This is not about digital transformation *per se* but rather clinical transformation to achieve better outcomes for patients and citizens, using digital technologies as an important tool and driver to make this happen.

Centralised information governance and decentralised decision-making

The pandemic has illustrated the need to effectively mobilise local networks and community data intelligence. Feedback loops between central and local command centres can be improved still further to avoid confusion. The COVID-19 Test and Trace system is an example of where these strengthened national-local relationships could prove beneficial.

On 18 August 2020, it was announced that a new National Institute for Health Protection (NIHP) would be established. In parallel, health improvement will be managed via a different mechanism to embed the levelling up agenda and involve local authorities more strategically.

Moving forward, the right balance between centralised information governance, including data sharing agreements and data standards to facilitate interoperability, and decentralised decision-making will be important to leverage the value of data and potential of artificial intelligence (AI) in disruptive innovation and sustainable health improvement.

Data-driven collaboration and innovation

As outlined in a recent report by the All-Party Parliamentary Group on AI, the experience with COVID-19 has shown what can be achieved with data collaboration and open innovation. While the development of preventive and curative interventions was initially limited by the data available, as research developed and data was shared around the world AI technologies made significant contributions in the analysis of this research through their ability to process vast amounts of different types of data in a short time [15].

This scenario could be applied to unblock what has been hampering progress in healthcare generally, namely that datasets for algorithm training and validation have been limited due to the absence of standardised electronic medical records and strict legal and ethical requirements to protect patient privacy [16]. NHSX’s role in developing standards will be essential here. If standards could be developed to support increased data sharing, the accuracy of data based estimations would increase, data biases would decrease, and trust in the use of AI for the public good would outweigh concerns over privacy.

‘The right balance between centralised information governance and decentralised decision-making will be important to leverage the value of data and potential of artificial intelligence (AI) in disruptive innovation and sustainable health improvement.’

The true power of AI can be unleashed when devices capturing data are connected and algorithms can analyse datasets across these devices. The datasets collected from multiple sources can be described as 'multimodal datasets'. When these multimodal datasets are consolidated into one model, and algorithms can generate completely novel insights spotting the patterns that would otherwise not be spotted in individual datasets, this is called 'multimodal learning'.

Developments in 'federated learning' are also very important, especially with regards to public trust. Federated learning is a promising approach to obtaining powerful, accurate, safe, robust and unbiased models. By enabling multiple parties to train collaboratively without the need to exchange or centralise datasets, it neatly resolves privacy concerns while opening up novel research and business opportunities [17].

'The lessons from COVID-19 have highlighted the need for a robust national data infrastructure, information governance, and common standards.'

National data infrastructure, information governance and strategy

The lessons from COVID-19 have highlighted the need for a robust national data infrastructure, information governance, and common standards to support better and quicker data sharing, in both public and private domains and in a way to make available datasets for multimodal AI and federated learning.

This must be a focus of government and industry attention and investment ahead. Data sharing agreements agreed centrally will facilitate data interpretation and data impact assessments. This will facilitate health and care integration, enable local networks to mobilise their communities and harness data intelligence more effectively, and support preventative health measures at both an individual and population health level.

As part of this, NHSX is exploring areas such as ethical governance frameworks that need to be put in place that will promote data sharing for wider public benefit and the social good. A 'decentralised national health resilience model' could reduce health inequalities, empower communities, build public trust and overall national health and economic resilience.

Central to making this happen is ensuring health literacy, underpinned by digital literacy at all levels of society, to promote better decision-making while minimising the risk of digital exclusion. Health Education England argues the move towards a digital world of service delivery needs to be reflected rapidly in education and training to maintain the disruptive innovation.

This report aims to build on the good work that already exists on post-COVID lessons and to put forward key insights and recommendations that will harness the full potential of digital and data-driven technologies including AI ahead.

But in order to secure Britain's edge in technology we need to support the healthtech SME sector, which represents 127,000 jobs across more than 3,800 companies, generating a combined annual turnover of £24 billion. As part of this we must help these companies to scale through the boosted Accelerated Access Collaborative (AAC) and the Academic Health Science Networks (AHSNs) providing a vehicle for regional support for healthtech SMEs across the UK [18].

'Health literacy, underpinned by digital literacy, is crucial at all levels of society to minimise digital exclusion and health inequalities.'

This is crucial, especially at a time when NHSX launches its £250 million AI Lab initiative, the National Data Strategy has been moved to No 10, and the Treasury maps out its investment into data infrastructure and interoperability as a priority in the next spending review to propel the UK into being a scientific superpower [19].

Part of a Global Reset

Meanwhile, around us, geopolitical conflicts simmer post-COVID, with China and the US in a tussle over who will lead an increasingly data-driven digital world (WeChat vs Big Tech) and western nations call for a new form of 'stakeholder capitalism' with equity and social justice at the core- coined the 'Global Reset' by the World Economic Forum.

This will influence government thinking at the highest level in the UK, especially as more and more people realise that the nation's health - our greatest asset - is far bigger than the NHS. We need to mobilise all stakeholders, and COVID-19 has shown we can do it.

AHSN study methodology

The AHSN Network undertook a short research study to understand how technology has been an enabler in reducing the care burden and coping with the crisis, and to identify what should be sustained in the ‘new normal’ longer-term.

The research involved gathering insights from three deep-dive ‘mini-huddle’ focus groups with identified individuals from the 15 Academic Health Science Networks (AHSNs) and key health, government and industry players. A short questionnaire was sent out prior to each session to engage with participants on the identified topics ahead of the discussion, as well as to inform the discussion itself.

The survey questions can be found in the Appendix. Four virtual focus groups were held to discuss the feedback, and involved the following individuals:

- Andy Gill, Deputy Head of Strategy, Health Education England
- Alan Davies, Innovative Programmes & Partnerships Director, Health Education England
- Breid O’Brien, Director of Digital Transformation, Health Innovation Network (seconded to NHSX during the COVID-19 pandemic)
- Dominic Cushnan, AI Lab Lead, NHSX
- James Flint, Co-Founder & CEO, Hospify
- James Teo, Clinical Director of Data Science at King’s College Hospital NHS Foundation Trust, KCL
- Helena Zaum, Social Care Lead, Microsoft UK
- Neil Sebire, Professor and Chief Research Information Officer (CRIO) Great Ormond Street Hospital, HDR UK Chief Clinical Data Officer
- Nicola Skinner, Head of Strategy, Health Education England
- Richard Barker, Chairman, Health Innovation Network
- Richard Turnbull, Strategy Lead, Health Education England

Finally, a series of discussions and mini-huddles with AHSN and Health Education England representatives were held to review key findings and achieve consensus on the action plan, involving:

- Guy Boersma, Managing Director, Kent Surrey Sussex AHSN and Digital and AI Lead, AHSN Network
- Patrick Mitchell, Director of Innovation and Transformation, Health Education England
- Denis Duignan, Head of Digital Transformation and Technology, Health Innovation Network (South London AHSN)
- Frank Ratcliff, Associate Director of Industry and Enterprise, Wessex AHSN
- Guy Rooney, Medical Director, Oxford AHSN
- Neil Mortimer, Head of Digital Health, West Midlands AHSN
- Neil Ralph, Head of Technology Enhanced Learning, Health Education England
- Stuart Monk, Programme Director, South West AHSN
- Sue Lacey Bryant, National Lead for NHS Library and Knowledge Services Directorate of Innovation and Transformation, Health Education England
- Tim Robinson, Commercial Director, East Midlands AHSN

The goals of the AHSN Network study

This report was created to catalyse an action plan in the following areas:

- Apply the digital/AI lessons learned from COVID-19, looking at the methodological approach taken to-date to diffuse and adopt technologies as a response to COVID-19
- Share insights on what has worked and what has been less successful through case studies, exploring both barriers and enablers
- Provide guidance on how to achieve enduring behavioural change in the health and care system and wider public ahead, learning from what worked during the crisis
- Outline approaches to minimise health inequalities and prevent ill health especially in disadvantaged communities
- Guide the adoption and evolution of industry collaboration, innovation and public-private partnerships, expanding the role of business as a stakeholder in the nation’s health, and promoting local partnerships nationally.

Key findings

The key findings from the AHSN Network study highlight the importance of:

1. Treating health as our greatest national asset to nurture and protect, with preventative health requiring more attention in the long-term

2. Giving equal weighting to social care as to the NHS to accelerate the move towards health and social care integration

3. Instilling greater urgency, speed and agility as the ‘new normal’: to address the ongoing chronic disease ‘epidemic’ and minimise the impact of future viral pandemics

4. Mobilising people more effectively to solve problems through more flexible roles guided by a shared purpose

5. Ensuring a robust data infrastructure and data operability/standards to facilitate data sharing within national policy and governance frameworks

6. Moving towards less centralised control and empowering people, communities and NHS and social care staff to serve local needs, thereby minimising health inequalities and rebuilding communities in line with the ‘Levelling Up’ agenda

7. Reconfiguring patient pathways to integrate NHS and social care around patient/citizen needs so that improved outcomes are the goal, with digital and data technologies utilised as enablers - the means to the end, rather than the end in itself

8. Promoting access to digital technologies and ensuring digital, information and health literacy at all levels within society to minimise digital exclusion and ensure health inequalities do not get worse.

These findings are explored in turn in greater detail in the following sections.

1. Health as our greatest asset

‘The further empowerment of individuals around personal health records is vital, including the capability for people not only to have wearable devices, but also to be able to contribute actively to their health record and have that health record shared.’

Alan Davies, Health Education England

Health needs to be seen as an asset to protect and nurture - to maximise national health and wealth. Prevention at an individual and population level needs to be prioritised to build resilience to the current pandemic and minimise risk of future ones; while investment may not yield immediate short term returns the gains will be significant longer-term.

We need to measure what matters to develop and protect the nation’s health. This requires a much broader view of the determinants of health, with metrics focussed on outcomes, not activities.

‘There’s a real opportunity to boost people’s health resilience by giving them tools to manage their own health.’

Richard Barker, Health Innovation Network

‘If you look at Japan the demographic time bomb has already hit and they are incorporating the digital agenda in solutions for care because they don’t have sufficient people in their care industry to cope. We know in the UK the growing elderly population is really testing our health and care system now and is going to be an even greater challenge when I am that age and in need of care. In addition, more modern day disease burdens such as obesity and mental health challenges as a result of daily living are all impacting on the NHS. This requires us to think differently about how we shape the workforce to meet these demands.’

Patrick Mitchell, Health Education England

‘We know that lots of people started walking during lockdown and taking exercise and found out that it isn’t that bad after all. ...We found a significant increase in demand for tools from SME startups that our AHSN is incubating that work on using AI to shift behavioural change, particularly around lifestyle.’

Neil Mortimer, West Midlands AHSN

‘To encourage people to live healthier longer lives, we need to think about the person as a whole person, not just as a patient, and in the context of where they live and everything we know about them. How can we empower people to take more control over their health and wellbeing? What are the enabling factors that will allow that to happen? A super health system is going to be one of them. Decent housing is going to be another, as are friendly neighbours who are willing to help.’

Helena Zaum, Microsoft UK

‘Prevention is massively important, but the incentives are perverse and the hospital system is not at all incentivised to keep people out.’

Neil Sebire, Great Ormond Street Hospital

2. Integration of health and care as equal partners

‘We really need to think about the data opportunity for the whole system, including domiciliary care, care homes, local authorities and public health professionals, and so on - really critical parts of the system. All parties need to feel equal, valued and informed.’

Helena Zaum, Microsoft UK

Social care needs to be valued in the same way as the NHS - with more investment to match. Social care data and other data on determinants of health found in both public and private sectors needs to be leveraged to furnish important insights on health.

As part of this, effective partnerships between public and private sectors need to be supported and led by people with commercial skills. Increased positive social impact by business may reduce ‘antibodies’ to private sector involvement in the NHS and represent encouraging signs that ‘stakeholder capitalism’ promoted by the World Economic Forum in its Global Reset initiative can succeed in the health and care context in the UK.

Health Education England highlights the opportunity to build consistent integration with social care - including how we provide better support, develop a joint/streamlined workforce, and create a compelling career pathway. COVID-19 showed how multi-disciplinary working, including more effective cross-sector working with social care and care homes, yielded immense benefits.

‘If there’s one thing that I feel personally sad about, it is the care sector. ... It just highlights the lack of investment and the fact that when I last worked in an acute hospital, 30% of our patients in hospital beds did not need to be there. But there was nowhere else to go.’

Breid O’Brien, Health Innovation Network

The three aspects of the ‘big magic wand’, according to Helena Zaum:

First

‘Proper sharing of information between the NHS, social care, local authorities and the care ecosystem. In some cases that does need to be at the individual level, because you need to be able to act on the needs of a person, within their local context. We also need anonymised data to be shared at a regional and national level to support the system as a whole.’

Second

‘Budgets to allow local authorities and other local actors to be able to deliver critical services, proactively.’

Third

‘Social care needs to be on an equal footing with the NHS. Along the same lines of how we value what Matt Hancock refers to as ‘our NHS,’ - we need to think about ‘our care system’ nationally in the same way.’

‘What we found is that the people who are on the clinical teams are super keen to work with industry partners. Industry partners are super keen to work with the clinical teams. It’s the bit in the middle that is causing all of the problems... nobody in the NHS has any commercial background - and that is a massive blocker.’

Neil Sebire, Great Ormond Street Hospital

3. Urgency, speed and agility as the ‘new normal’

‘The health crisis doesn’t stop at COVID …. can we agree that chronic diseases are ‘continuing crises’, and that we are going to need to address them in the same way we worked together to address the COVID-19 crisis.’

Richard Barker,
Health Innovation Network

New roles and ways of working need to be explored to expand the capability of the workforce post-COVID; including joining up teams across pathways and creating more hybrid roles in care. This agility and urgency needs to continue post-COVID to address the ‘continuing crises’ in chronic diseases. As part of this, the acceleration of innovation we have seen with SMEs and private/public partnering should continue, though navigating the system is an ongoing challenge for innovators that needs to be addressed, and this will continue to be a key role for the AHSNs and the AAC.

‘We have a short window of time to examine the lessons learned and pull together a compelling roadmap that continues to see the evolution of the remote total triage blueprint for the vast majority of the public that have benefited from its introduction to date. For those members of the public who have struggled or are unable to use it however, alternative forms of triage must be maintained and it is imperative health and care staff are trained in, comfortable with and capable of supporting both.’

Alan Davies, Health Education England

‘I’ve had video consultations with my GP for 12 or 13 years. And so, what we’ve done is we’ve accelerated it, we’ve not started it, we’ve accelerated and scaled at an astonishing pace. So we’ve gone from 6% in 12 years to over 90% in six weeks.’

Neil Mortimer,
West Midlands AHSN

‘“This is really hard, we can’t do this” - there are all these reasons why you can’t do it. And suddenly within two or three weeks, during the COVID period, we’ve managed to do it. Essentially, we have prioritised some of the work.’

Neil Sebire, Great Ormond Street Hospital

‘…we’re going to fast track a pilot for a network of GPs and community pharmacists in order to help them better communicate prescriptions for patients who are self-isolating…’

James Flint, Hospify

‘…probably the single biggest change in kind of practice through the COVID-19 emergency is a remote consultation. Where is the strategy locally and nationally for how we leverage that for the next stage of remote consulting, home monitoring etc?’

Neil Sebire, Great Ormond Street Hospital

4. New ways of working around a shared purpose

‘That common sense of purpose was so powerful; we were working outside the rules…so hierarchy was flattened.’

Breid O’Brien,
Health Innovation Network

Working together through a shared sense of purpose to save lives during the crisis made rigid hierarchies bound by strict role definitions disappear. This inspired collaboration, a ‘can-do’ spirit and speedy action where it was needed, even in the midst of confusion. Health Education England argues that short term solutions that have been developed in response to COVID-19 have the potential to be continued in the longer term, but this will require longer term, strategic thinking for how multi-disciplinary teams can best continue to work together to redesign patient pathways that integrate NHS and social care and enhance outcomes.

‘I think the shared purpose bit is quite key because that leads to a lot of the other things. Psychological safety was quite important. The crisis flattened hierarchies so people at all levels felt quite comfortable to act because no one person, regardless of hierarchy had all the answers. We saw more systems working between organisations and across system barriers.’

Stuart Monk, South West AHSN

‘So we’ve seen local authorities step up really fast… moving services online, doing three years’ worth of innovation in three weeks. The long term legacy this leaves actually is that many of them have now digitised the front door to their social care service. This has activated and digitally recorded the critical work of many local volunteering organisations, and local authorities are now starting to think, right, okay, how can I deliver more assessments online, how can I build this up, how can I maintain the great work being done by voluntary organisations and the community as a whole?’

Helena Zaum, Microsoft UK

‘Everything was centrally driven… instructions were changing every hour, you would have lots of confusing messages because different individuals would be approached by different NHS central agencies. So that was a significant source of confusion. …It’s becoming less now. But what we learned along the way is that we just have to make the decisions ourselves and ask for forgiveness later.’

James Teo, King’s College Hospital NHS Foundation Trust

Building the skyscraper: trust amongst multi-professional team members is key

‘And it’s also about trust when you are around the negotiation table, and understanding that you’ve got equal partners - and all the partners - have to have got the same vision of what you want to do with someone with lung cancer. They all recognise they need each other.

It’s like building a big tall skyscraper. It can’t just be the architects. You’ve got to have the structural engineer and the electrical engineer and the stakeholders contributing to the aesthetic design. It is pointless building a skyscraper if the front lawn and the entrance look shabby. So everyone has to recognise their place in what they’re designing and building. I think that’s very true for AI and …as we push the multiprofessional agenda, that is what’s going to open the doors for people to realise that they are one part of the whole.’

Patrick Mitchell, Health Education England

5. Centralised information governance, decentralised decision-making

Overall, the view emerged from the participants in our study that we need to 'think big but act local' by enabling hyperlocal communication through data, tools and trust delivered via a patchwork of local solutions, and underpinned by the appropriate governance and standards set at a national level.

The application of decentralised, federated learning techniques that reduce the need for centralised databases will enhance innovation, encourage civic data sharing (at a local level too) and increase public trust. Examples include Hospify (see case study on page 46), which showed how communication was expedited across teams and institutions using a simple, GDPR-compliant messaging app, and civic data cooperatives (see case study on page 40), used to enhance local government responses to COVID-19, including testing and supporting 60 voluntary organisations in preparing neighbourhoods to cope.

'The COPI (Control of Patient Information) notice, implemented so that NHS providers can share data with NHSD and NHSE in response to the COVID crisis, has provided a good glimpse into the insights of what we could do, should we have the infrastructure in place, to respond to ongoing operational issues inside the health system. ...It's opened up a much wider robust policy debate on national versus local, what are we doing for data collection? What does it mean for our country? What is it? What are the benefits for us to help the deployment of safe algorithms?'

Dominic Cushnan, NHSX

'The level of complexity in the response to COVID was due to overlapping multiple agencies operating in the same space... The different models that emerged in each region were largely determined by the relative strengths of the arm's length organisation or organisations. Quite a lot of energy went in the first instance to kind of dancing around - who's going to take a lead on this? That was where centralisation could have been better than local.'

Tim Robinson, East Midlands AHSN

'We have complex funding streams within the NHS. You would think that Foundation Trusts can do everything. ...'you're a big hospital, you've got a £400 million budget, why can't you just do it?' Most are in debt, and they can't often do anything until the CCG or NHS England agree to commission it. They all need to come together to agree the pathways that allow the AI to go in it, and to agree the funding structure to go towards it - otherwise that will really hold things up.'

Guy Rooney, Oxford AHSN

'So, you need a centralised element to create an environment which then allows decision making to be decentralised. Which is to say that you want the centralised bodies to make the framework and interoperability decisions and then communicate those out to the edge, so that the edge can make decisions about either how to build a product or which products to buy without having to go through the whole cycle of assessment from scratch every time.'

James Flint, Hospify

'The AHSNs' edge lies with more local regional knowledge....'

Tim Robinson,
East Midlands AHSN

'Part of the problem with information governance is that it's interpreted very differently locally. Things can be made easier centrally, with data sharing agreements for example.'

Guy Rooney, Oxford AHSN

6. Data infrastructure and interoperability

‘As we start to embed AI driven algorithms into clinical workflows it is essential we have the skills and tools that we need to assess and address unconscious bias. It is as much about clinical risk, patient safety considerations (eg where a risk calculator is inherently biased) as about compounding / widening inequalities.’

Sue Lacey Bryant,
Health Education England

The pandemic has highlighted the importance of data access, infrastructure and interoperability in order to spur scientific collaboration and to create data pathways connecting citizens, communities and care. It has also highlighted the critical role of information governance at a national level.

The extraordinary degree of collaboration seen with research into COVID-19 can be replicated in other contexts, including the analysis of data sets across and outside the healthcare system to distill key insights and develop interventions to keep us healthy and well in the preventative health context.

But AI technologies can only deliver accurate results when they are run with adequate quantities of reliable data. They can only reveal new opportunities for intervention at an individual and population health level when they can detect patterns that humans cannot across diverse, ‘multimodal’ datasets provided by people willing to share their data. In addition, as AI and machine learning become more widespread, it will become increasingly important to ensure that data biases do not negatively impact decision making.

‘It feels like we need to step back and try to look at it from the customer/ patient perspective…. If I’m a consumer of healthcare, or a patient with a long term condition in the digital world, I now may have five different ways of entering the system (as in five different products), which could cause confusion.’

Breid O’Brien,
Health Innovation Network

‘The priority of data platforms, informatics, maximising use of tech and data and standardising this, has massively gone up the agenda.’

Neil Sebire, Great Ormond Street Hospital

‘And now that the first peak has passed, we have a lot of data to try to work out which is the higher risk and the lower risk. Now the issue, then, is can we produce a risk scoring system? You can do a complicated one or an easy one… NHS Digital and regulators… may specify a required standard. But that’s just a standard, no one’s going to help you implement it. It’s all about implementation, and you have to recognise the limits of what’s possible on the ground.’

James Teo, King’s College Hospital NHS Foundation Trust

‘Real-world data becomes even more important than before… if you’re going to do observational work, particularly across institutions, you’ve got to have good data standards.’

Richard Barker, Health Innovation Network

‘The pandemic has allowed or enabled a more nuanced conversation about digital architecture in this country, both NHS and social care. Obviously social care is constructed and delivered in a very different way. ...The thing that I’ve learned over the last couple of years in healthcare is that data is fractured, it’s all over the place. This kind of idea that we can throw an algorithm and it’s gonna solve all of our problems – it’s not true. ...We have a lot of work to do to get organisations to work in a more robust digital manner, before we can start thinking about how we create efficiency gains for how a care home might send data. ...We need to come together on a problem statement that enables a robust conversation on data quality biases, ethics. How do we do this technically? What’s the architecture for this? What’s the long tail on research? How do we enable this?’

Dominic Cushnan, NHSX

‘I’ve certainly seen a lot of the CCGs and ICS’s that are scrambling to get better data to inform decision-making. And we’ve certainly put a lot of work and effort into doing that for them, providing medical informatics ....and what we’ve seen is that they don’t do anything with the data. They talked about using it to target specific support and interventions, but that hasn’t happened. So, now we’re seeing really good data, it should translate into action, but it hasn’t really materialised.’

Denis Duignan, Health Innovation Network

‘Somebody ought to be working on one portal to all these different products and applications.’

Richard Barker, Health Innovation Network

7. Health, digital, and information literacy

‘There have been some really positive changes in terms of the role and prominence of good data, it’s almost as though we have had a massive pilot. We need to continue to have a national dialogue about what data we share and how it is used.’

Helena Zaum, Microsoft UK

‘If you look at just digital skills, people start to think about people who know products and technology, whereas actually what’s really apparent is that boots on the ground works based on personal relationships.’

Breid O’Brien, Health Innovation Network

The government’s Information Economy Strategy [20] called for greater focus on digital inclusion to:

- help businesses make smart use of information technology and data
- ensure citizens benefit from the digital age
- underpin economic growth.

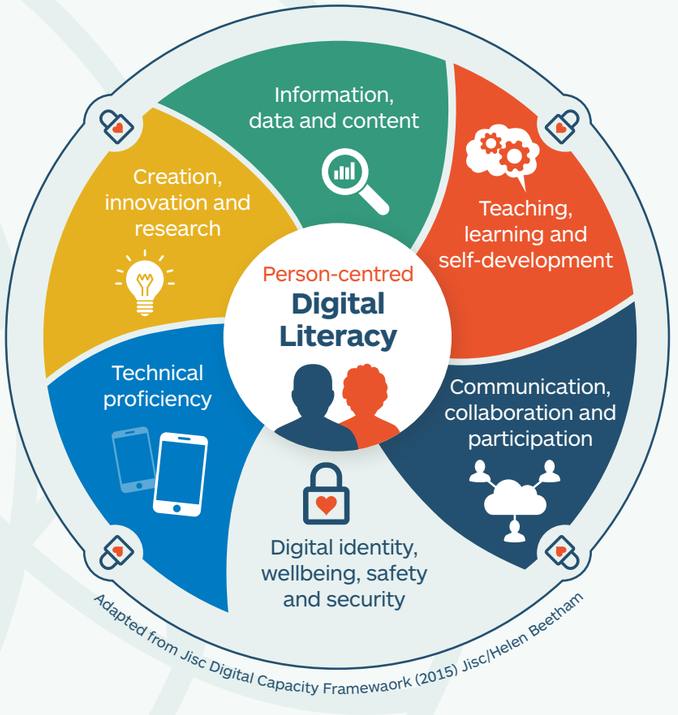
The extent of digital immaturity in many organisations - particularly in social care - has been exposed during COVID-19. Digital access, training and literacy for NHS and care workers as well as the general public needs to be a priority as things move increasingly online post-COVID, in order to both maximise the use of digital to support social and community connectivity and to minimise the real risk of a growing digital divide [21].

Health Education England says we need health literacy, underpinned by digital literacy, fit for the 21st Century. The pandemic has highlighted the importance of our health - and with that, health literacy to maximise citizen participation in their health - to relieve the pressures of an ageing population and chronic disease ‘epidemic’. But as things move increasingly online, the pandemic has also highlighted the importance of digital literacy, not only for health and care workers but the general public too. About 16% of the public have a reading age less than 11 and just under 10% of the adult population may never be able to gain basic digital capabilities, because of disabilities or basic literacy skills [22]. On the flip side, there is anecdotal evidence that less digitally literate patients often are able to get through on the phone to the GP surgery more easily on Monday mornings, because others submitted their webforms over the weekend, due to backlogs at practice level.

‘Local authorities are thinking about digital infrastructure, but also about digital skills, not only within schools, but for citizens more broadly so that everyone can be connected. And that’s one of the reasons we were really excited to hear about the work that Connecting Scotland have been doing and have accelerated as a result of COVID. They are doing things like making sure that people have got broadband and that they have a device… We need to make sure that everyone has access to the online world and ensure that COVID does not exacerbate digital exclusion. So we need to think about some of those infrastructure questions and digital literacy needs for people who are, for whatever reason, not engaging with digital.’

Helena Zaum, Microsoft UK

In response, Health Education England is in discussions with the Department of Education and developing an ambitious programme to address needs in digital and information literacy through its Transformation Collaborative, ‘Person Centred Digital Literacy, and argues for continuing the ‘system by default’ approach and emphasis on skills and competencies rather than roles:



The Six Domains Of Digital Literacy, Health Education England

Meanwhile, Health Education England is working with academia and industry to increase collaboration and awareness of the important role of data science in the future of health and care. It is also supporting changes in medical school training: doctors will need the skills to work collaboratively with bioinformaticians and recognise the value of their work too.

There is significant potential for the AHSNs to support Health Education England with place-based planning and local spread and adoption of health, digital and information literacy.

‘Place-based planning is key. People who are in a given geography know best about that geography and are going to come up with the best solutions… because what’s right for Grimsby or Cleethorpes is going to be totally different to North Lambeth. What we can do is to facilitate some train tracks for them to use and some tools … and approaches which will allow local people to plan.’

Patrick Mitchell, Health Education England

8. Patient pathways first: digital and AI are but enablers in transformation

‘We’ve now embedded all this remote working across primary care organisations with technology. Initially, we saw a huge usage, but within two months that usage has really dropped off and practices are reverting to face to face appointments. Practices never really got to the point of thinking about how they might change the contracts of employment with their staff to facilitate these ways of working.’

Denis Duignan,
Health Innovation Network

Digital and data technologies are enablers to deliver better care and outcomes and should be seen as the means to an end, and not the end itself. It is useful to refer to the NHS Change Model [23], a framework for any project or programme that is seeking to achieve transformational, sustainable change:

‘I’m hoping AHSN stakeholders and funders see a role for AHSNs to support the change management of digital as well as clinical transformation. First and foremost, AHSNs have the knowledge and skills to act as honest brokers, building relationships around a common purpose. We can also bring other expertise to bear: scoping digital programmes using driver diagrams and logic models; using quality improvement tools to deliver digital programmes; delivering spread at pace using tried and tested methods. We can also support rapid evaluation and measurement to share learning and support spread in real time. I think AHSNs are able to offer real value related to all of this work.’

Stuart Monk, South West AHSN

‘Don’t ‘do’ digital. Don’t ‘do’ AI. Don’t ‘do’ social care. Do pathways. You’ve got to do the pathway first. Work with your clinical teams to find a solution for the patient pathway... Design around pathways of care.’

Guy Rooney, Oxford AHSN

‘If you attempt a digitally-led transformation project, somebody somewhere will say, ‘now that’s just an IT project - they’ll go away, I’m gonna carry on doing what I do today.’ Everything has to be a clinical transformation, you have to justify the transformation on clinical grounds... focusing on the clinical benefits.’

Frank Ratcliff, Wessex AHSN

Views from Frank Ratcliff, Associate Director of Industry and Enterprise, Wessex AHSN.

‘Digital’ should be an enabler to clinical transformation programmes, rather than there being a specific programme for Digital.

I don’t think Digital is particularly different from other innovations, you still have to have a clear value proposition, a clear budget impact model, you have to be able to provide evidence to support your claims. You have to understand change management, you have to plan the implementation.

Spray and pray is not enough. Doing an RCT (randomised control trial) and saying we’ve got the evidence to go and use it isn’t enough. We’ve seen numerous examples of things that just flop because no one’s worked out whose behaviour has to change all the way through the pathway in order for the change to become embedded.

An example of this is a commissioner trying to digitise a dermatology pathway. They paid for digital devices. They took GPs off their clinical duties for an afternoon to train them. They negotiated advice and guidance paired with a local provider.

The idea was that a GP would use the device to take a photo of someone’s skin and send it to the dermatologist, who looks at it, provides advice and guidance and recommends if we need to see the patient in person. But over the summer, the devices did not get used.

So the commissioners held a roundtable meeting and said, “I want these devices to get used.”

The GPs responded, “Well, we quickly learned that it doesn’t matter what we send, the consultants always call the patient in. So there’s no need, there’s no point as we’re not saving any appointments.”

So the commissioners said, “Okay, Consultant. Why do you always call the patient in?”

The consultant responds, “Well, we always call them in because the images have such low resolution. You know, we can’t see anything to make a diagnosis. We have to call the patient in.”

The commissioner, confused, replies, “We did not expect that response because when we reviewed the system and looked on the screen, the image quality was amazing - we could zoom and stretch to your heart’s content and look deeper and deeper.”

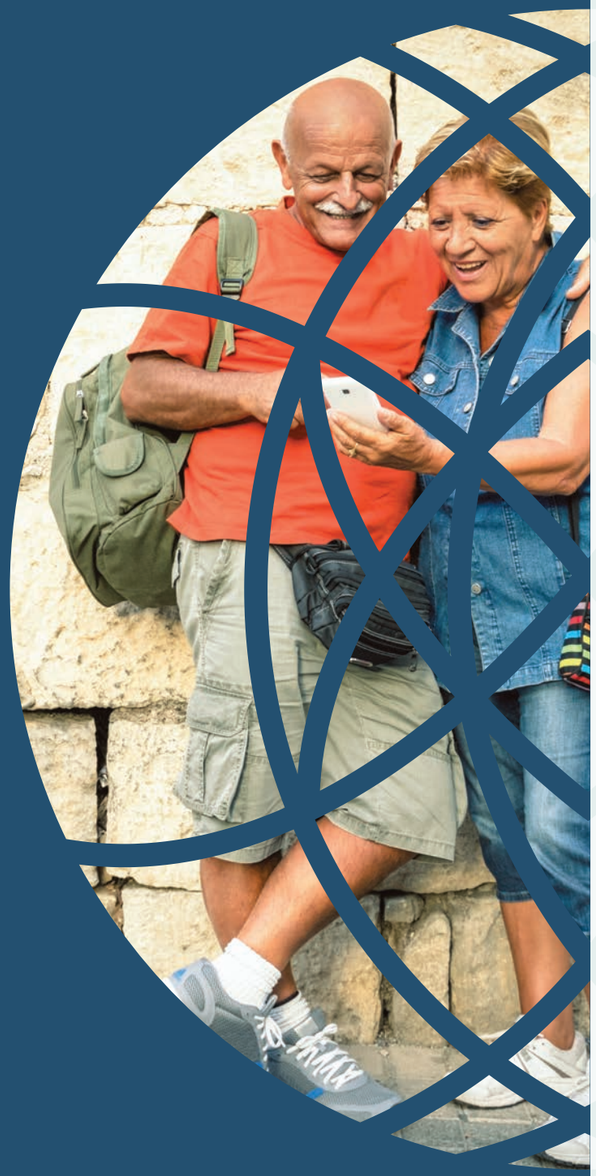
And the consultant says, “Ohhh - we didn’t see that. We only get a black and white print-out of the image!”

Why did this happen? Because in the pathway map, it was not clear whose behaviour had to change - and as a result, no one had spoken to the medical secretaries to show them how the consultants can use the screen to zoom in and out on the image. Instead, the consultants’ medical secretaries used black and white dot matrix printers to print out hundreds of dermatology images!

So this illustrates another one of my hobby horses, which is the difference between digital in its own right and using digital as part of a larger clinical pathway transformation process.

‘Spray and pray is not enough. Doing a randomised control trial and saying we’ve got the evidence to go and use it isn’t enough. We’ve seen numerous examples of things that just flop because no one’s worked out whose behaviour has to change all the way through the pathway in order for the change to become embedded.’

Moving forward



‘Building on lessons gleaned from this AHSN Network study, a number of key themes have emerged that are worth further exploration as part of wider conversations around reset and recovery.’

Building on these findings, a number of key themes have emerged that the AHSN Network is keen to explore with health and care partners as part of the NHS Reset campaign, led by the NHS Confederation:

1. Work more closely with Health Education England on adoption and spread of health, digital and information literacy via regional networks - part of cultural change that ‘health is much bigger than the NHS - it is everyone’s responsibility’

2. Facilitate and broker strategic partnerships with industry and academia for large-scale, long-term sustainable patient pathway transformation and preventative health, whilst advocating nationally for system incentives and levers to be more supportive of preventative health initiatives

3. Play a larger pivotal role in local/regional health improvement, preventative health and care integration working with local authorities, councils and communities

4. Facilitate development of decentralised data models guided by centralised information governance and data standards

5. Identify more innovative place-based projects to scale up nationally for maximum impact in terms of outcomes - developing local social assets as part of levelling up agenda

6. Unleash the behavioural change methods and approaches from the AHSN national and local programmes, including patient safety collaboratives, to provide ‘boots on the ground’ support to COVID-19 reset transformation initiatives

7. Scale up the AHSN Network’s strengths in real world evidence and evaluation, including developing models and support tools around implementing innovations and related evidence

8. Provide more dedicated support to drive healthtech innovation into the NHS, including advising SMEs on key NHS needs, so they can focus limited resources on these innovations and develop successful commercial strategies.

Going forward, the AHSN Network welcomes further collaboration and discussion with partners across health and care to determine how to make some of these ideas a reality - thus harnessing the AHSN Network’s considerable skills and experience to best effect, to lock in the beneficial changes brought forward during the first months of the COVID-19 pandemic, and to meet the challenges that lie ahead.

Case studies

Virtual support for expectant and new parents

Situation: During the lockdown many local maternity and health services stopped face-to-face clinics with sparse replacement via virtual consultations and many health professionals redeployed into ICU care to treat COVID-19 patients. GP and hospital care was restricted with social isolation for new parents, exacerbated by gaps in usual support from grandparents who themselves were self-isolating.

Action: The TechForce19 competition led by NHSX, PUBLIC and the AHSN Network funded 18 digital solutions to test rapid deployment over a three week period. One of the projects was testing remote support for 1,000 families using the Peppy mobile app in partnership with the National Childbirth Trust and the Lactation Consultants of Great Britain. The Peppy app provided access to mental health wellbeing and maternity expert support through facilitated group chat by a perinatal practitioner, one-to-one chat support with a perinatal practitioner and one-to-one chat support with a mental health practitioner. Remote video calls provided advice on breastfeeding, baby sleep and mental health and wellbeing.

Result: Over 10,000 applications from families to join the pilot within a 48-hour window, with 1,075 trial participants selected across England. Participants were selected to target groups that have been historically marginalised or under-represented in maternity services and/or likely to be disproportionately affected by the pandemic. They successfully targeted Black Asian Minority Ethnic (BAME) families (double the national average) and at least 64% of participants were below the low household income threshold. The evaluation showed a significant impact upon mental wellbeing: 66% of participants that scored as ‘possible depression/anxiety’ have moved into the ‘normal/moderate’ range. These results demonstrate the benefits of remote chat and video support from experts for this vulnerable group.
A second stage will focus upon a specific geographical area to test out greater integration with local health services to improve engagement and public health outcomes such as breastfeeding initiation rates.

Contact:
Lesley Soden -
Head of Innovation,
Health Innovation Network

Grid of civic data cooperatives for distributed health and care system resilience

Contacts:
Iain Buchan, Executive Dean, Institute of Population Health, University of Liverpool;
Séamus O'Neill, CEO, Northern Health Science Alliance and former AHSN Network Chair

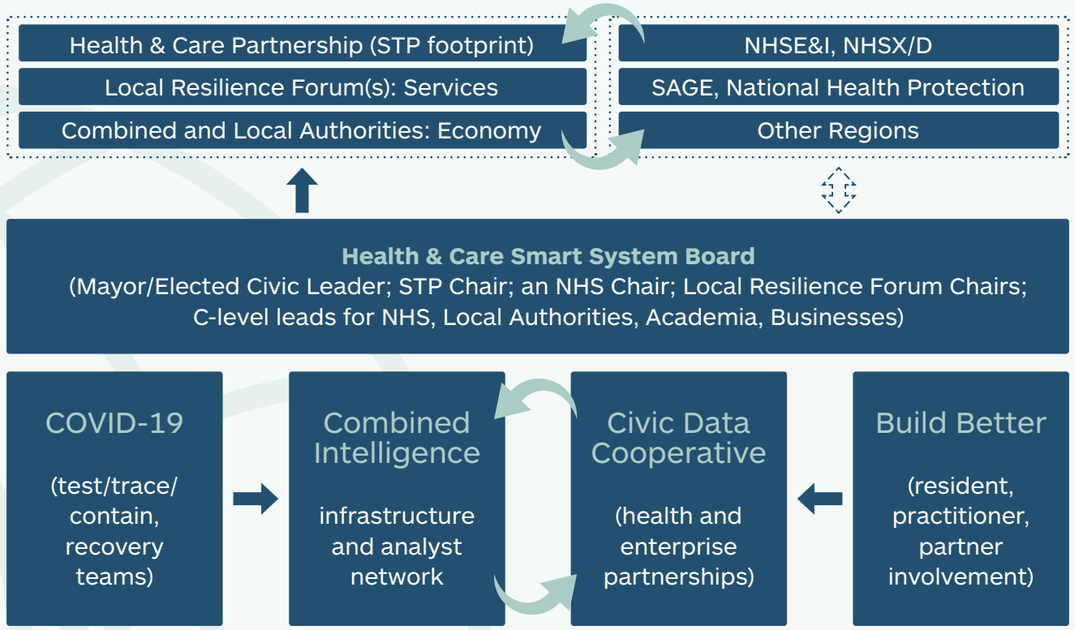
Situation: In 2019, Liverpool City Region agreed to build a networkable Civic Data Cooperative (CDC) for mobilising health and care data, with large-scale public involvement and best practice governance, for the dual purpose of improving local services and fuelling economic growth. The CDC is designed to be connectable with other civic data/intelligence 'power stations' on a 'national grid' borrowing and loaning strength across regions through national data services, such as NHS Digital, NHSX, the Office for National Statistics, NHSEI Data and Analytics. The CDC is also designed to be sufficiently resilient that it can provide the intelligence the civic system needs for responding quickly to challenging situations such as COVID-19.

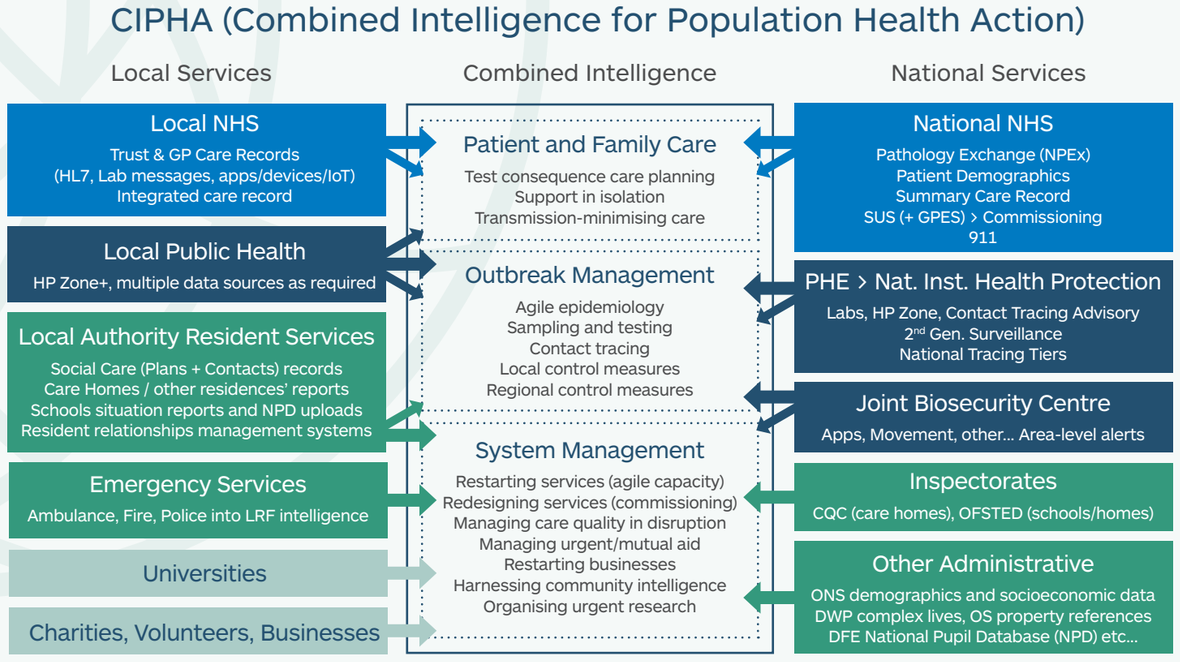
In 2020, the pandemic has seen Liverpool bringing its CDC plans forward to deal with local health and care system challenges, while mobilising some of the UK's key infection research assets into national and international responses.

Action: Cheshire & Mersey Health & Care Partnership have accelerated the development of the Liverpool City Region Civic Data Cooperative (CDC) as a COVID-19 response to the need for better, intelligence-led coordination of NHS and local authority services, supported by innovation partners in universities and businesses.

A strong lesson from COVID-19 has been the success of accelerating and extending the CDC across Cheshire and Merseyside as CIPHA (Combined Intelligence for Population Health Action), which has been adopted as core business of the whole Integrated Care System. A c-level group of NHS, local authority, university and public health leaders is driving CIPHA with a strong common purpose. Around 500 people are working on CIPHA and there is considerable energy at all levels of seniority for deploying the system. Analysts and data-savvy practitioners in particular are energised over creating a system-wide intelligence community sharing a common data resource.

Result: The operations and data plumbing for CIPHA can be represented as in the diagram below. One of the early system impacts has been to move to an agile, distributed innovation model – Health Innovation Liverpool – to meet the demands of an intelligence-led health system. A national grid of CDCs could have enabled the UK to be more resilient to COVID-19 with quicker, better-targeted local system responses. Such a CDC grid now has strong potential to support local health and economic recovery.





Remote monitoring of cancer outpatients

Contact:
Lesley Soden -
Head of Innovation,
Health Innovation Network

Situation: Patients with cancer who receive systemic anticancer treatment experience a wide number of symptoms leading to unplanned visits to GP, A&E and secondary care. At the same time there is a need to reduce these unplanned visits and free up bed capacity to accommodate for the COVID-19 crisis. To keep patients in their homes and away from hospital during this time, there was a need to replicate normal cancer outpatient assessments (clinical examinations, tests and close monitoring of vital signs) within remote monitoring.

Action: The TechForce19 competition led by NHSX, PUBLIC and the AHSN Network funded 18 digital solutions to test rapid deployment over a three-week period. Aparito tested out the feasibility of multidimensional remote monitoring of cancer outpatients with digital tools (smartphone app and wearable sensor) providing the near real-time health status and specific COVID-19 symptoms to a nominated clinical team.

Result: For this pilot, 43 patients in north Wales activated the app to provide data and 33 patients used the wearable device. The project tested the feasibility of multidimensional remote monitoring of cancer outpatients using their digital tools. The patients were satisfied overall and found the technology easy to use. The pilot enabled learning for this type of digital deployment, the hardware and wifi / 3G requirements and adaptations required to maximise the use of this remote monitoring solution for cancer patients.

Digitising Care Homes

Contact:
Michael Goodeve –
Associate Director
of Communications,
Wessex AHSN

Situation: Wessex AHSN identified the need to digitally enable care homes to ensure that the best level of care possible was being delivered for their residents. Care home staff required technology for new ways to communicate with general practice and monitor their residents for early signs of a change in health. They also required digital access to enable the training and implementation of digital technologies.

Action: Wessex AHSN developed partnerships with central NHS colleagues and industry to explore opportunities to meet the emerging digital needs of care homes. Drawing on innovation adoption expertise, the AHSN has overseen solution scoping, and provided digital access and implementation support for small scale pilots for rapid upscaling, using a User Centred Design approach.

Result: A pilot for assessing the acceptability of Lifelight – contactless vital signs monitoring - in a care home setting, has been developed with Hampshire Hospitals NHS Foundation Trust (HHFT) and Wessex innovators. Care homes and CCGs have collaborated with the AHSN to develop a methodology and tools to support the optimisation of Microsoft Teams in the care home setting. At the same time, the AHSN is developing a blueprint for digital literacy training to be rolled out in collaboration with the Barclays Digital Eagles Team with the aim to improve acceptability and utilisation of digital technology and further aid the adoption and implementation of digital solutions for remote monitoring.

Optimising the use of digital technology in primary care across the South West of England

Contact:
Janina Cross – Chief Digital Transformation Officer, West of England AHSN; Joe Sladen - Associate Director of National Programmes, Wessex AHSN; Stuart Monk, Programme Director, South West AHSN

Situation: As was the case across the rest of the country, around 570 primary care practices in the South West were closed due to lockdown to in-person patient appointments with many clinicians working from home. Local systems needed to rapidly implement and then begin optimising the use of online and video consultation tools to enable virtual patient contact.

Action: A collaborative working model with NHS England and NHS Improvement's Regional Team, together with the three AHSNs in the South West, and Chief Information Officers (CIOs) and Chief Clinical Information Officers (CCIOs) was operationalised through daily huddles and Gold Calls and the legacy of this approach continues to yield results (such as closer working relationships between specific CCGs and an appetite to share and join up approaches). The AHSNs' pre-established network of CIO/CCIOs and contacts across all parts of the system (operational, clinical, executive) meant that the right people could be brought around the table to facilitate rapid decision- making. The AHSNs used their quality improvement training and coaching skills and proven spread methodologies to ensure as many practices as possible were supported through the process.

Result: 100% (570) of practices across the South West implemented video consultation and 80% of practices implemented online consultation. Different technologies have progressed at different speeds in a stressed environment containing conflicting information; what worked well in one system or PCN/practice may be very difficult to implement and adopt in another.

This rapid implementation is only a small part of the journey – there now follows a long period of optimising the transformation, by providing ongoing change support through workshops and the use of quality improvement and spread methodologies.

The benefits of electronic Repeat Dispensing (eRD) in supporting the COVID response

Contact:
Michael Goodeve – Associate Director of Communications, Wessex AHSN

Situation: eRD has been part of the community pharmacy contract since 2005; and from 2019, has been a GMS contract requirement. eRD has a number of well-documented benefits for primary care. However, uptake of eRD is hugely variable even though 77% of all prescription items are repeat prescriptions. On average, each week a GP issues around 375 repeat medicines. Department of Health and Social Care work in 2002 showed that, if 80% of all repeats were given as eRD, 2.7 million GP hours would be saved. For example, in Wessex this means that if we moved 80% of all repeats to eRD we would save 108,000 GP hours, which is roughly 61 full-time GPs.

Action: Working with NHS Business Services Authority (NHSBSA), patient data tools have been made available to GP practices. NHSBSA has generated and sent to GP practices lists of patients who may be suitable for eRD.

Alongside, a wide range of resources has been developed with multiple partners, and using the expertise of the Wessex eRD steering group to cover the implementation process, offering assistance and explanations at every step to GPs, pharmacists and patients.

Result: NHSBSA contacted GP practices on 27 March to offer the service and, as at mid August, 3,473 practices have requested and received the NHS number data for their patients. 950 people have joined national, regional and local webinars. Despite no national commission for this work, AHSNs are seen as supporting spread, with Wessex acknowledged as national lead by NHSE, NHSD, and NHSX. During the initial launch period, eRD web page views increased by 414% to almost 9,000 views. Collectively, medicines videos have been viewed and seen over 350,000 times. Early data shows an increased utilisation of eRD, with a national increase of (on average) 400,000 eRD items per week. Locally (in Wessex) over 63,000 more eRD items were prescribed in March.

Hospify healthcare messaging - preparation for market

Contact:
Nuala Foley,
Kent Surrey Sussex AHSN,
Sara Nelson,
Health Innovation Network,
Steve Adams,
The Innovation Agency

Situation: Intense pressures on the healthcare system prompted the requirement for a secure messaging system that is easy to adopt and allows for the exchange of sensitive and confidential information, including patient data.

Action: Hospify reports a four-fold increase in the uptake of its free messaging system and of its paid-for admin Hub since the start of the pandemic.

Hospify was approved by the NHS Apps Library earlier this year, the only messaging service of its type to receive such approval. It provides a 'free, data-compliant, secure text and photo messaging app' for use by clinicians and patients. As healthcare staff were told to work remotely they adopted Hospify as a secure service. It is likely the company's approval by the NHS Apps Library, and the media coverage that generated, pushed Hospify to the top of online searches.

Three AHSNs have been instrumental in helping with this. Nuala Foley led a project at KSS to produce a full budget impact analysis of the service, based on existing messaging studies; Steve Adams at the Innovation Agency has unlocked funds for Hospify to do a proper quantitative pilot (to start in Sept 2020), and brought in academic partners UCLAN (University of Central Lancashire) to conduct the analytical side of the study. And Sara Nelson at the Health Innovation Agency helped mentor Hospify's successful application for inclusion on the NHSX Clinical Communication Tools framework. In addition, advice and guidance from all those listed and their respective teams enabled Hospify to become the first and to date only messaging platform for both patients and clinicians to be listed in the NHS Apps Library.

Result: As a result of these efforts, Hospify was able to start making its first sales to NHS Trusts and GP surgeries during the COVID-19 lockdown - the very moment that its services were most needed in a system stressed by extra demand but in which both patients and clinicians were being forced to self-isolate.

Care Plus Group delivery of Pulmonary Rehab using Zoom

Contact:
Victoria Vaines – Programme Manager & Ruth Pitman-Jones, Project Manager, Yorkshire & Humber.

The AHSN recently conducted a rapid insights and evaluation review, which identified innovation which has happened in Yorkshire & Humber as a result of COVID-19. The following case study was identified as exemplary, and is currently under consideration by the AHSN for spread and adoption support.

Situation: The Care Plus Group focuses on the co-creation and development with patients and the public to ensure services are optimised for patient use. The Pulmonary Rehab (PR) programme involves the use of cognitive behavioural therapy and peer mentorship in the education part of the programme. They wanted to be able to continue delivering this method virtually and chose Zoom as the platform for PR. At the start of the pandemic, all patients were contacted by the team to triage needs. Those who were eligible were provided with the MyCOPD app to support patient self-management.

Action: The team assessed potential platforms for the continuation of PR and agreed upon Zoom. When talking to PR patients, the team found that approximately 10% of them didn't have access to the internet, but most were receptive to technology if it were provided and the team supported them with using Zoom. One of the key functionalities Zoom offers is the ability to have breakout rooms. The patients benefit from the education and peer support aspect of the course together but are then assigned breakout rooms to complete the exercise element and clinical discussion. Physiotherapists and Occupational Therapists can attend breakout rooms when needed.

Risk assessments and disclaimers have been amended, reflecting the difference in service delivery and the pre-assessment process has been streamlined. Amendments have been made to patient assessments reflecting the use of Zoom, and it has been so successful that the Care Plus Group are utilising it for other services change to delivery whilst continuing to monitor a patient's progress.

Result: Even though the first programme hasn't finished, patients are already reporting that their activity has increased as has their confidence. Expectancy moving forward is that some PR will be delivered virtually, and some will go back to face to face interactions.

Virtual Reality Pulmonary Rehab (PR) in North Lincolnshire

Contact:
Victoria Vaines – Programme Manager & Ruth Pitman-Jones, Project Manager, Yorkshire & Humber.

The AHSN recently conducted a rapid insights and evaluation review, which identified innovation which has happened in Yorkshire & Humber as a result of COVID-19. The following case study was identified as exemplary, and is currently under consideration by the AHSN for spread and adoption support.

Situation: Due to the rurality of the North Lincolnshire area, some people struggle to access hospital, GP appointments and clinics. In response to this, North Lincolnshire CCG has been working in partnership with Concept Health and Manchester Metropolitan University to pilot a Virtual Reality (VR) PR programme to address this.

Action: Concept Health provided North Lincolnshire CCG with 'kits', which included VR headsets and wrist devices. Participating GPs identified qualifying COPD patients and provided them with the kits to participate in a six-week PR programme at home**.**

The programme allows the patient to access modules via the VR headset, including educational modules about how to manage their COPD symptoms, as well as active modules, which get progressively more difficult. The setting of the VR module is designed to encourage participation and incentivise the patient to complete the programme. It gives them the ability to view heart rate and oxygenation level statistics on-screen.

Result: A sense of community is conveyed using virtual workout partners – two other virtual participants can be seen taking part alongside the patient during the programme. This allows the correct technique to be demonstrated, whilst also ensuring that the patient does not miss out on a sense of community and membership that they would have otherwise experienced as part of the traditional in-person clinic. If patients do not take part in the programme for three consecutive days, they are contacted by the Concept Health Team to understand the reasons behind this and provide support to enable compliance with the programme. Patient feedback highlighted that the programme was easy to use and quite straightforward.

Brainomix: Artificial intelligence technology speeds up care and cuts costs in the management of acute strokes

Contact:
Guy Rooney, Medical Director, Oxford AHSN

Situation: The arrival of COVID-19 has highlighted the continuing need to co-ordinate stroke care across providers and networks, to support those that may be affected in their delivery of care because of staff illness or increased patient infection, and/or to allow the rapid identification of patients who would benefit from mechanical thrombectomy.

Action: The e-Stroke Suite is artificial intelligence (AI) based technology developed by Brainomix (https://www.brainomix.com), an Oxford-based company spun out of the University of Oxford in 2010. Its development has also been supported by the National Consortium of Intelligent Medical Imaging (NCIMI).

The innovative decision support tool helps clinicians to rapidly and accurately decide the type and severity of stroke, and the most appropriate treatment. Initially introduced before the pandemic, it has demonstrated added benefits in recent months by enabling new ways of working in a world disrupted by COVID-19. For example, if one hospital is overburdened with COVID-19 another within the regional network can provide help by interpreting brain scans without delay.

Result: Six NHS trusts serving more than three million people have come together to harness state-of-the-art technology to help clinicians make the right decisions and overcome disruption caused by COVID-19, so that more patients receive the most effective treatment and recover following stroke. Brought together by the Oxford AHSN, the Thames Valley hospitals have established the first integrated regional stroke network of its type in the country, sharing high quality CT brain scans quickly and securely using the e-Stroke Suite imaging AI software.

NHS England South East wants to move at pace and deploy similar solutions across the region and the Oxford AHSN is working to deliver this and evaluate this roll-out after six months.

Appendix:
AHSN Network Digital and AI Reset Survey Questionnaire

1. How has your life (including home and work) been most affected by the pandemic? What would you like to keep and start doing going forward? (max 100 words)

2. What are the top three most important positive lessons/impacts of the pandemic, relevant to the health and care system, so far?

3. In your opinion, what is the single most important lesson/impact we should keep/start doing in the 'new normal' to have the most impact on improving the health of the nation? What is critical for the enduring legacy? (max 250 words)

4. What examples of 'good' should we acknowledge? (max 100 words)

5. What are the top three most important barriers/issues we need to address, relevant to the health and care system, that have been exposed by the pandemic?

6. In your opinion, what is the single most important barrier/issue we should address/stop doing in the ‘new normal’ to have the most impact on improving the health of the nation? What is critical in the enduring legacy? (max 250 words)

7. What examples of ‘bad’ should we call out/stop? (max 100 words)

8. What are some of the key inequalities you have observed? (max 100 words)

9. What interesting geospatial outcomes have you noticed throughout this pandemic in the health and care sphere? (max 100 words)

10. We will be including a selection of cases studies in the report that exemplify what we should recognise and take forward as learning examples in the ‘new normal’ (i.e. both successful and less successful stories). What business, innovation or team would you put forward? (max 100 words)

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The 15 Academic Health Science Networks (AHSNs) were established by NHS England in 2013 to spread innovation at pace and scale – improving health and generating economic growth. Each AHSN works across a distinct geography serving a different population in each region.

As the only bodies that connect NHS and academic organisations, local authorities, the third sector and industry, we are catalysts that create the right conditions to facilitate change across whole health and social care economies, with a clear focus on improving outcomes for patients. This means we are uniquely placed to identify and support health innovation, driving the adoption and spread of innovative ideas and technologies across large populations.

Find details for your regional AHSN at **www.ahsnnetwork.com**

For case studies on innovations supported by the AHSNs visit our Atlas of Solutions in Healthcare at **www.ahsnnetwork.com/atlas**

info@ahsnnetwork.com
@AHSNNetwork
The AHSN Network

Acknowledgements

Authors

Tina Woods, AI Adviser, AHSN Network
Melissa Ream, AI Lead, AHSN Network
Marie-Anne Demestihas, Senior Workstream Lead,
Kent Surrey Sussex AHSN

Editors

Wayne Chang, Programme Coordinator – Artificial Intelligence and Disruptive Innovation, Kent Surrey Sussex AHSN
Ben Augustine, Content & Community Manager, Health Innovation Network, AHSN Network
Annabel Stiles, Communications Officer, AHSN Network
Vanesther Hamer, AHSN Network

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