



Health and social care innovation, research and collaboration in response to COVID-19

Evidence report

December 2020



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This work aims to identify changes across health and social care in response to COVID-19 that could offer potentially sustainable benefits

The Accelerated Access Collaborative (AAC) brings together leaders from industry, government, regulators, patient groups and the NHS to identify and address barriers and get the best new treatments and technologies into the hands of the patients and clinicians who need them. The Beneficial Changes Network (BCN) is a group of health and social care stakeholders and people with lived experience who aim to capture and evaluate the benefits of changes that have taken place through COVID-19, to embed the learning of local experiences. The AAC and BCN are working together to understand which innovations that have been initiated or accelerated by the pandemic response could be spread more widely. Frontier Economics, Kaleidoscope Health and Care, and RAND Europe have been commissioned to lead this independent rapid review.

3 core aims of the rapid review

1. Understand the impact of the response to the COVID-19 pandemic in relation to innovation, research and collaboration across the health and care system
2. Identify any methods/practices which would support the development and adoption of high impact changes identified in the existing BCN evidence, whilst considering the impact on health inequalities, and
3. Propose recommendations to support current activities and inform future priorities of the AAC and BCN, and the wider health and social care system.

Mixed methods approach

The work has been undertaken in five Phases. This evidence report focuses on the first three:

- Phase 1: Evidence synthesis; Phase 2: Deep dives; Phase 3: International insights; Phase 4: Validate; and Phase 5: Report

Across the Phases different types of evidence were used:

- Desk based research, including grey literature and evidence
- BCN evidence, research and analysis
- Interviews with experts
- Workshops with stakeholders
- A summit to collate findings



7 'deep dives' provide a closer look at particular aspects of innovation, research and collaboration

In Phase 2 of the work seven deep dives into particular aspects of innovation were explored to better understand the potential sustainability of the benefits, what the implications for inequalities could be, and what the enablers and challenges were. These deep dives were selected from shortlists identified in Phase 1, using criteria to ensure the work would produce tractable, helpful and relevant findings. They are:

- Innovation: (1) remote triage; (2) remote monitoring; and (3) new ways of working, with a focus on changes in clinical pathways
- Research: (4) faster approval and setup of clinical trials; and (5) rapid and effective dissemination of research findings
- Collaboration: (6) place-based networks (between the NHS and/or social care and community organisations); and (7) rapid delivery of new or adapted services through partnerships, including industry partnering with NHS and/or social care

For the purposes of this rapid review, working definitions of ‘innovation’, ‘research’ and ‘collaboration’ were developed to guide the work

To manage the scope of the analysis, the following working definitions have been applied:

Innovation	<ul style="list-style-type: none">▪ New ways of delivering services to people using health and care facilities.▪ Beneficial outcomes could include services which are safer, faster, lower cost, more resilient, more targeted, or enhance well-being for patients or colleagues in the health and social care system. Potential adverse effects are also within scope to explore.
Research	<ul style="list-style-type: none">▪ Improved process of undertaking clinical research and generating improved knowledge▪ Beneficial outcomes for process include speed, scale and cost improvements▪ Beneficial outcomes for knowledge include a larger-scale evidence base; more granular evidence; more targeted research. Potential adverse effects are also within scope to explore.
Collaboration	<ul style="list-style-type: none">▪ New or more effective partnerships involving the NHS and/or social care with other sectors or organisations/ groups. Partnerships could include, for example, commercial entities working with the NHS; social care, local authorities and the voluntary sector working with the NHS; or the military working with the NHS.▪ Beneficial outcomes could include cost savings to the NHS and/or social care; improved skills and capability in the NHS and social care (through spillovers); improved lived experience for individuals and improved health and care outcomes. Potential adverse effects are also within scope to explore.

Core findings for innovation were derived from the evidence and tested with stakeholders in a series of workshops



Unifying around a national priority

The common national priority of COVID-19 provided a focus for action which brought together health and care professionals, industry, people with lived experience and communities, and the wider health ecosystem to rapidly find solutions and address challenges. The pandemic response has further highlighted the importance of international collaboration and the value of UK embeddedness in international research landscapes.



Supportive national and local leadership

Frontline teams had more power to implement change for the benefit of patients, carers and wider communities. This was enabled by greater local agency for frontline staff and streamlining administrative processes where appropriate.



Virtual workspace for professionals

Virtual working allowed barriers to collaboration to be broken down by saving time and the need to travel to meetings. This allowed health and social care professionals to get together more rapidly, and work together towards integrated solutions.



Data Sharing Agreements

The ability to share data in a timely way was important for facilitating integrated care and safe access to relevant clinical and care records for those that need it.



Adaptation and scaling-up of previously tried solutions

Accelerated deployment of digital solutions (specifically remote triage and remote monitoring) delivered benefits to the system and to many people – but not all. For some people this exacerbated exclusion. Training for online / remote service providers and people receiving them is essential to maintain empathy, flexibility and quality of care.



Person-empowerment and self-care

The wide-scale shift to online communication and remote monitoring enabled some people to have more control over their self-care – but the shift to online was not appropriate or accessible for some people and risks exclusion.



Bespoke engagement necessary alongside digital

Blended service delivery is essential, offering people bespoke options so that their needs can be met. The provision of multiple channels of care allows diverse populations and individuals to access care on the basis of their needs and preferences.

Core findings for research were derived from the evidence and tested with stakeholders in a series of workshops



Unifying around a national priority



The common national priority of COVID-19 provided a focus for action which meant that clinical trials could be designed, approved, set up and implemented much more rapidly than standard processes. Accelerated deployment of research findings was also supported with rapidly generated evidence, efficiently developed guidelines and system-wide communication.



Awareness of research



Wide-scale awareness and acceptance of the need for more and better knowledge about COVID-19 (including its impacts, treatments and infection control) across professionals and the wider public helped to quickly attract and recruit volunteers to be part of the clinical trials.



Lack of diversity in trial recruitment



COVID-19 highlighted how people are affected differently by the virus. However, some groups particularly vulnerable to adverse impacts of the virus were potentially under-represented in some clinical trials.



Innovative trial delivery processes



Innovative changes to the way particular clinical trials were identified as a priority and subsequently approved led to faster delivery of those trials and deployment of the findings. Innovative ways to collect data from participants also proved to be effective in some trials.



Perception of research



Perceptions of research as an “academic” activity can act as a barrier to people wanting to learn more about research or be involved, and as a barrier for professionals to see it as an inherent part of their role in delivering better care.



Open publishing and pre-peer review



The shift further towards “Open Access” publishing (open to all) and publishing findings before formal peer review allowed information to be shared earlier – but this raises risks of misinterpretation or misuse that need to be managed.



Remote and on-line working



Remote and online working proved invaluable for Committees and collaborations to be set up and operate in a more flexible way. This led to a speeding up decision making and approval processes.

Core findings for collaborations and partnerships were derived from the evidence and tested with stakeholders in a series of workshops



Nationally and locally coordinated place-based collaboration

Public health needs in relation to COVID-19 varied across individuals and places. Local and national collaborations delivered place-based support to meet those needs, including addressing the social determinants of health.



Collaborating to find solutions quickly

The nationally recognised challenges in relation to COVID-19 brought the public sector, industry, regulators and the voluntary sector together to quickly find solutions across therapeutics; testing; diagnostics equipment; and protecting the vulnerable.



Access to skills and capacity

Partnerships brought together the skills and capacity needed to quickly meet particular clinical or social needs. Industry, the military, local authorities, voluntary organisations and communities were able to provide skills and resources to deliver outcomes that may not otherwise have been feasible, or only at a much slower pace.



Co-production of training and learning materials

The fast uptake and use of remote monitoring by some people was helped by partners (including the health and care professionals, industry and people with lived experiences) co-producing training and education materials, using the strengths of each partner.



Flexibility of existing partnerships

Existing partnerships were flexible to provide support to vulnerable groups and meet people's needs, at both a national and local place-based level. Not all new service delivery required new partnerships where existing partnerships could be repurposed to respond to COVID-19.



Clear communications using several methods

Consistent and clear communication is vital. Communication needs to be adapted to meet different needs (such as materials in different languages; engaging via faith groups or community groups; blending digital with non-digital): there is not a one size fits all option.



Importance of volunteers, charities and community groups

Individual volunteers, charities and the wider community groups have played a vital role in delivering a place-based response to COVID-19. However, pressure on funding sources poses a risk to the resilience of this service.

The insights from innovation, collaboration and research from this rapid review have been synthesised into six core findings across the areas

The core findings from the rapid review were analysed and presented at engagement events, inviting a wide group of stakeholders to discuss, consider and respond to the analysis. The findings are presented below.

Core finding

Clarity of purpose

A system-wide shared understanding of the need for action mobilises partners quickly and breaks down barriers to collaboration.

Leadership and agency

Beneficial change is accelerated by leadership that supports appropriate agency across organisational levels, and supports innovation and collaboration.

Inclusion and personalisation

Addressing health inequalities requires greater inclusion and involvement of diverse perspectives, and the better personalisation of services to different populations.

Skills and capability

Change was enabled by those who had appropriate skills to solve problems, then adapt to new ways of working.

Data and technology infrastructure

Critical enablers of rapid change included the safe and timely sharing of data, and appropriate and resilient technology infrastructure.

Evidence-based decision making

For impacts over time to be fully understood, there is a need for robust evaluation evidence to understand what works, for whom and under what circumstances.

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This jointly commissioned independent rapid review explores how the health and social care system has responded to COVID-19 so that learning can inform future strategy

The Accelerated Access Collaborative (AAC) brings together leaders from patient groups, industry, government, regulators, and the NHS to identify and address barriers and get the best new treatments and technologies into the hands of the patients and clinicians who need them. The Beneficial Changes Network (BCN) is a collaborative group of health and social care stakeholders and people with lived experience who want to harness and capture the benefits of changes that have taken place through COVID-19 and evaluate these changes, to share the knowledge and embed the learning of local experiences across the entire health and care sector.



The AAC and BCN jointly commissioned Frontier Economics, Kaleidoscope Health and Care, and RAND Europe to lead an independent rapid review in order to:

- 1. Understand the impact of the response to the COVID-19 pandemic in relation to innovation, research and collaboration across health and care;**
- 2. Identify any methods/practices which would support the development and adoption of high impact changes identified across stakeholders/workstreams of the BCN, whilst considering the impact on health inequalities; and**
- 3. Propose recommendations to support current activities and inform future priorities of the AAC and BCN, and the wider health and social care system.**



This work aims to identify potentially beneficial interventions, technologies and tools deployed during the pandemic which may bring further benefits to people, clinicians and systems. There will be a particular focus on understanding and reducing any impact on health inequalities.



This work was undertaken between October and December 2020. It builds on the considerable work already undertaken by members of the Beneficial Changes Network since April 2020.

The work is underpinned by three key principles to enable the work to be impactful and to integrate different perspectives

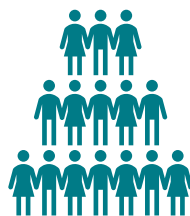
Integrating perspectives of people with lived experience, and considering health inequalities

- Ensure the perspectives of those who receive services, their lived experiences and in particular, implications for inequalities are appropriately integrated in the analysis and considerations.
- Recognising that new evidence is emerging on the lived experience of people during the pandemic.



Broad base of stakeholder views from across the health and care ecosystem

- Ensure stakeholders' views are appropriately integrated throughout at various points, recognising the ongoing impact of the pandemic and new published evidence, and the experiences of stakeholders, are emerging.



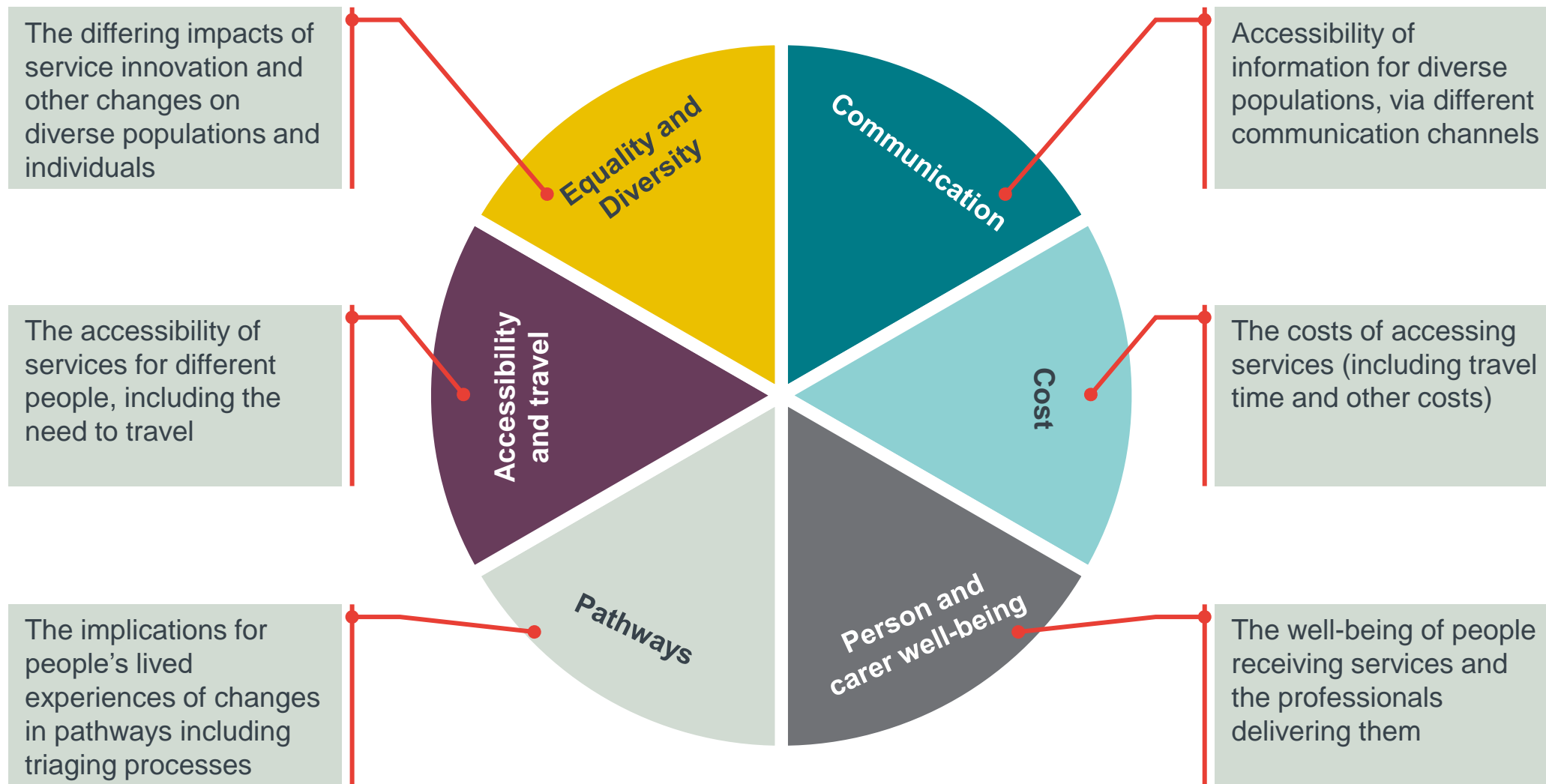
Delivering pragmatic and actionable recommendations

- Ensure recommendations are clear, pragmatic and are actionable either by the AAC and BCN directly, or others in the AAC and BCN networks.



Inequalities and the perspectives of people with lived experience are embedded in this rapid review

Workshops¹ held by the BCN identified the following important aspects to consider:



Examples illustrate how issues relating to inequalities and lived experience are observed in practice

Equality and diversity

Different people have different experiences, home circumstances, vulnerabilities, incomes etc. The BCN workshops helped draw attention to some of these considerations:

- Some people are less familiar with digital technology and find it harder to use.
- Some people have more complex needs meaning that 'standardised' digital options may not meet bespoke needs.
- Some people, such as the homeless or others in shared housing, may not have digital access or private spaces to conduct remote consultations.
- Alternative options for engaging people may be valuable such as via community groups, faith groups or other local groups.

Accessibility of services

The large-scale adoption of remote care and digital technologies can have implications for the accessibility of services, both positive and negative.

- Some people with disabilities and chronic pain sufferers who find it difficult to travel can experience digital options as a more accessible and functional form of service.
- However, digital services may negatively affect the accessibility of services for some people, such as some people with learning disabilities or who may not have access to digital connections at home.

Issues around accessibility also include offering options to best adapt to different languages and routes through which people are engaged or receive information.

Cost of accessing services

Accessing health and social care services can involve certain costs that are often overlooked. The pressures on the carers, for example, can have detrimental effects on their well-being, as highlighted during the pandemic.

- In particular, the switch to digital service delivery has further blurred the lines between work and life for some carers, negatively affecting their health and well-being.

Digital methods for the provision of services can also imply certain unintended consequences for some people, which can influence the costs they face. For example, the cost of mobile data to join remote consultations.

This report presents the findings from Phases 1, 2 & 3

Structure of this report

1 Core findings summary

2 Introduction

3

Method and approach

- Describes the 5 Phases of work
- Provides the working definitions of innovation, research and collaboration
- Describes the types of evidence used, and the limitations

4

Rapid review findings – Phase 1

- Summarises the evidence from the BCN and wider published material
- Shortlists areas of innovation, research and collaboration for potential deep dives
- Describes the core criteria for selecting deep dives to look more closely at and explains how the deep dives were selected

5

Deep dive findings – Phase 2

- Presents evidence on the deep dive changes

6

International insights – Phase 3

- Provides evidence from interviews with stakeholders who are able to provide international perspectives on responses in health and social care to COVID-19

7

Learning and insights

- Summarises the core learning and insights from all evidence reviewed

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To undertake this rapid review, the work has been taken forward in 5 Phases. This document focuses on Phases 1, 2 and 3

Phase 1: Rapid evidence review and select deep dives

Focuses on responses to COVID-19 across innovation, research and collaboration.

- Draws out key evidence and themes from the BCN's wealth of evidence; desk-based reviews; and a small number of stakeholder interviews
- Develops and applies criteria to select 7 deep dives (across innovation, research and collaboration) to focus on in Phase 2

Phase 2: Deep dive analysis

For each of the 7 deep dives explores:

- The context surrounding the changes observed; barriers and enablers; evidence of impacts and potential sustainability of benefits; and potential impacts on inequalities along with other unintended consequences (positive or negative)

Phase 3: International insights

Expands the learning from Phases 1 and 2 with insights from interviews with experts who are able to provide an international perspective on responses to COVID-19 across innovation, research and collaboration.

Phase 4: Validate

Involves three online workshops and one online Summit to engage key stakeholders, present evidence, share, test and validate findings and draw out practical and pragmatic recommendations.

Phase 5: Report

Delivers impactful and influential evidence-based report with clear and pragmatic recommendations, supported by the evidence pack from Phases 1-3.

This analysis was rapid and focused. Some important context and limitations therefore need to be noted to interpret findings appropriately

Rapid review timeframe

- This project is a rapid review of evidence undertaken over ten weeks (between October and December 2020). It aims to collate available evidence and draw out the insights in the time available.
- Wider work programmes are underway in parallel across different partners in the health and social care system. This report will complement those programmes.

Evidence is continually emerging

- At the time of writing, the COVID-19 pandemic is on-going. Evidence is continually emerging and the health and social care system is continually adapting. Therefore stakeholder experiences and the evidence base will continue to rapidly evolve. However, every effort has been made to focus on insights that will add value over time.
- At this stage most benefits identified have not yet been formally and robustly evaluated.

Focus on where the report can add value

- Due to the time constraints this report has focused on where value can be added:
- It seeks to add value by generating new insights, and therefore does not focus on specific topics already reviewed in-depth by others, such as remote consultations.
 - The scope has been defined to keep the work tractable in the time available. *Innovation, research* and *collaboration* have therefore been defined for the purposes of this work only, and each could be considered through a wider perspective in other work.

The aim of this work is therefore to identify areas of *potential* and high impact benefits

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The wealth of work undertaken by the Beneficial Changes Network identified some key changes made in innovation during the pandemic

- The COVID-19 pandemic has posed a variety of challenges to the health and care sector, to which the sector has responded with new ways of delivering services in an unprecedented timescale.
- Evidence for Phase 1 draws heavily from the work undertaken by the Beneficial Changes Network (BCN) which conducted a rigorous programme to explore the responses to the pandemic across the health and social care system. Their approach to identifying these changes is described below.

1
Stakeholder engagement
The BCN's work involved collating evidence and learning from over 3,000 stakeholder submissions and 250 documents to identify over 700 headline potentially beneficial changes which were categorised into workstreams in the health and social care sector.

2
Identifying a longlist of potentially beneficial changes
The BCN invited these workstreams to generate a list of observed changes. These lists were collated to develop a longlist of beneficial changes across the health and social care system, and were then mapped to five pillars of change.

3
Identifying the five priority areas with potential sustainable benefits
Finally, the BCN worked with stakeholders of the network to further narrow this longlist to five priority high impact changes, that could offer potentially sustainable benefits beyond the pandemic.

The BCN collated all the changes identified across the health and social care system, and mapped them to five consistent pillars of change

- The evidence collected by the BCN from stakeholders and partners highlighted more than 700 potentially beneficial changes made in health and social care service delivery, across a range of workstreams from primary care and secondary care to mental health and community care facilities.
- To provide structure to these identified changes, the BCN mapped them to five pillars of change. The pillars represented the themes across which the majority of these changes have affected the delivery of care.
- The five pillars are listed below and discussed in more detail in the following pages.

Patients, carers
and communities

People and
culture

Clinical and
service

System and
partnerships

Digitally-enabled
care

The BCN pillars “Patients, carers and community” and “People and culture” view changes from the perspective of those who benefit directly

Patients, carers and community¹

- This pillar highlights solutions to provide remote support, information and monitoring for those in care homes and at home with long-term physical or mental health conditions.
- These include changes that set up virtual networks and learning communities to support both, people using services and their carers, with a particular focus on vulnerable groups.
- The improved connectivity in social care has helped to enhance people and carer support systems.
- With the increased focus on community, the co-production of service design and delivery can offer a valuable way to bring people together effectively



“In Southwark and Lambeth, a network was created for local care homes allowing care home staff, GPs, geriatricians, psychiatrists and others to share advice and information regarding COVID-19.”

People and culture²

- This pillar highlights the move to a more flexible and upskilled workforce, rapidly redeployed across workstreams to deal with the pressures of the pandemic.
- There has been a particular focus to the well-being of these teams, heavily supported by former employees and volunteer staff, through support networks and protective equipment.
- This flexible, agile and remote way of working by the staff was imperative to respond to the pandemic, with collaborative and inclusive leadership an important driver.



“Ambulance service providers built on their existing relationships with volunteer groups (such as St John's Ambulance) and were quickly able to increase their response capacity³”

The BCN pillars “Clinical and service” and “Digitally enabled care” highlight changes to the delivery of care and the use of digital services

Clinical and service⁴

- This pillar considers changes made to the provision of primary and secondary care.
- **Primary care:** There has been a large-scale shift to virtual consultations to reduce unnecessary referrals, admissions and face-to-face attendances at health and care settings, along with the integration of urgent and emergency care for clinical assessment and onward referral.
- **Secondary care:** This pillar also considers the changes made to clinical pathways in hospitals – collaboration with primary care to avoid unnecessary conveyance to emergency departments, and promoting safe, effective discharge from hospital.



“In Greater Manchester, an under-utilised hospital site in Rochdale was developed as a unit for post operative care for cancer patients. More than 1,000 patients have been seen at the unit since and it is expected that the site will continue to be used in the future⁶.”

Digitally-enabled care⁵

- This pillar focuses on the large-scale adoption of digital solutions that enable virtual consultations, remote triage and remote monitoring processes to maintain the provision of quality care, while minimising the risk of infection.
- With a greater focus on virtual care and unprecedented data sharing agreements across sectors and organisations, the wide-scale uptake provided many with benefits and greater accessibility. Though importantly, this was not the case for some with more bespoke needs.



“With the acceleration of the Electronic Prescribing Service in General Practice, 82.5% of all prescriptions are now delivered digitally for dispensing. Given the success in primary care services, the next objective is to roll it out to secondary care.”

The final BCN pillar, “System and partnerships” considers collaboration across care systems as well as regulatory and legislative changes

System and partnerships⁷

- This pillar highlights the collaboration across the health and social care sector to deliver care to people and streamline clinical pathways.
- During the pandemic, health and care providers have collaborated in new ways outside the ‘traditional’ boundaries and have shared workforce, space and data to allow for a more combined response. A shared identity and a common challenge have reduced barriers and enhanced care.
- This pillar also includes changes to the legislation and the regulatory requirements that has allowed clinical pathways to have fewer barriers. There have been changes to guidance and legislation (particularly the Coronavirus Act 2020) that have facilitated a faster discharge process, movement of staff across trusts and more simplified data sharing agreements that have allowed more streamlined clinical flows.
- These regulatory and governance changes have helped create a more permissive environment for rapid change and innovation. For instance, the government issued COVID-19 Hospital Discharge Requirements in March 2020 which organised the safe and rapid discharge of people who no longer needed to be in a hospital bed. The guidance suspended the need for Continuing Health Care (CHC) assessments and choice of nursing home, with the NHS fully funding the additional costs in health and social care.



“In Southwest London, analysts from a Commissioning Support Unit (CSU), units established to provide administrative support to clinical commissioning groups, helped triangulate the national shielded patient data list with GP data to develop a local shielded patients list.”



“The introduction of the Coronavirus Act 2020 has enabled the rapid deployment of NHS former employees and volunteers, suspended the requirement to assess patients for continued health care (CHC) prior to being discharged, and given the ability to local authorities to apply for Care Act easement on care assessment.”

The BCN identified 5 priority changes which their evidence considered most likely to deliver potentially sustainable benefits in the future

The 5 priority areas are below:



Remote triage and reducing unnecessary admissions

- Infection control has made it more crucial than ever to be able to triage people remotely and identify the most appropriate clinical pathways.
- The use of a remote, single access point for triage and professional services was therefore important for both people receiving health and care services and healthcare professionals.



Video and remote consultations

- The national lockdown restrictions reduced the scope for people to travel for face-to-face meetings with their GPs, specialists and other health or care professionals.
- Therefore, an important area of change identified across all health and social care settings is the increased significance of video and telephone consultations and other related services.



Integration in service delivery

- The pandemic has required an agile workforce that can be rapidly upskilled and redeployed to address the pressures on the system.
- A big part of this is the collaboration and integration between different partners in health and social care from primary and secondary care to ambulatory services, to work together in integrated pathways.



New ways of working for staff and enabling new pathways

- It has been imperative to streamline clinical pathways and enable new ones to ensure that the current capacity of our healthcare system is utilised as efficiently as possible.
- This has been seen in the form of the provision of remote entry pathways as well as more supportive exit pathways for people accessing health and social care.



Remote monitoring

- An increase in the use of remote monitoring equipment such as sensors, medical devices and wearables has allowed patients to monitor their health independently and seek help when needed.

BCN priority 1: Remote triage and reducing unnecessary admissions

Out-of-hospital triage through digital care and ambulance services



The provision of a remote, single point of contact for people receiving care as well as health and care professionals has helped ease pressure on health and care facilities during the pandemic.

What is this area of focus?

- This priority area explores the use of a single, remote point of access for triage and professional advice.
- Total triage in primary care allowed people to receive medical advice remotely, with many people directed to the appropriate pathway without the need for a GP appointment.
- By harnessing the power of a multi-disciplinary team, people can be referred to the most appropriate health or care pathway, in some cases helping to avoid unnecessary hospital admissions.

What are the potentially sustainable benefits?

- The use of the remote triage during the pandemic has enabled people to be signposted and directed to the appropriate pathway remotely, in a more efficient manner, reducing the inconvenience caused to them as a result of chain referrals.
- By reducing unnecessary admissions, BCN evidence suggests that hospitals can better manage infection control, prevent overcrowding, increase patient turnaround and improve the overall care experience.

Examples of how this has been implemented in practice

- South Warwick gave the West Midlands Ambulance Service paramedics direct access to the Community Integrated Single Point of Access (ISPA) which allowed them to share assessments with senior clinicians and avoid unnecessary admissions⁸.
- Northampton General Hospital organised their same day emergency care (SDEC) services, focused on an acute cohort of patients, to minimise non-COVID-19 admissions, enabling significant admission avoidance and reducing exposure risk for patients⁹.

BCN priority 2: Video and remote consultations

The use of digital technologies for video consultations



Video and remote consultations harness the power of digital technologies for remote, digital consultations. A significant proportion of the benefits from video consultations can also be contextualised from the perspective of remote triage and remote monitoring.

What is this area of focus?

- This area explores the significant uptake in the use of telephones, text messages and video devices for consultations which has allowed patients to receive care remotely.
- These have been adopted across many settings in primary care, secondary care, community care, mental health care as well as in care homes.

What are the potentially sustainable benefits?

- The primary benefit during the pandemic has been the reduction of the risk of exposure to both care receivers and care givers. Provision of digitally-enabled care can increase accessibility to services for some people, including some people with mobility concerns or people with disabilities. However, it does not meet the needs of all people, for whom more bespoke forms of engagement are needed.
- BCN evidence showed that the use of remote consultations allowed healthcare facilities to manage patient footfall, use space more efficiently, and provide their staff with a better work/life balance.

Examples of how this has been implemented in practice

- National procurement of home spirometers allowed people to test themselves at home allowing for a more in-depth remote consultation, negating the need for them to visit the hospital and conduct the test, exposing themselves to the virus.
- Video consultations between health professionals across different services allowed better knowledge sharing, data collection and digital handovers. This multi-disciplinary approach has facilitated quick decisions and early interventions, allowing many patients to receive a much better quality of care.

BCN priority 3: Integration in service delivery

Collaboration between different professionals to provide holistic care



This area focuses on collaboration between the different health and social care sectors to be able to deliver a more informed and enhanced quality of care.

What is this area of focus?

- The pandemic has seen unprecedented collaboration between different partners within health and social care to create single points of access, healthcare hubs and new clinical pathways which have helped to bring together a whole range of services.
- This priority area explores the various instances of collaboration between the primary and secondary care sectors, the community and social care sector as well as the voluntary sector.

What are the potentially sustainable benefits?

- By collaborating in new and innovative ways, healthcare providers were able to offer a higher quality of care by employing resources and knowledge from across the breadth of the health and social care system.
- By having a more integrated service delivery, the system can better respond to times of high demand.
- Through the sharing of information, expertise and workforce, the system as a whole can be made more fluid and flexible.

Examples of how this has been implemented in practice

- Emergency call handlers were dual-trained to respond to both 999 and the NHS 111 helplines which allowed a more flexible response to emergencies¹⁰.
- The Frailty Intervention Team (FIT) monitored the safe triage system and accepted patients directly into their care rather than waiting for a referral from the Emergency Department¹¹.

BCN priority 4: New ways of working for staff / enabling new pathways

Identifying processes that enabled streamlining of clinical pathways



This area focuses on the processes that enabled the streamlining of existing patient pathways and the introduction of new pathways.

What is this area of focus?

- This area of focus primarily considers the processes put in place that have enabled new care pathways and streamlined existing pathways to deal with the pressures of the pandemic.
- By identifying new ways of working, the system has been able to use available resources more efficiently. This has been seen with healthcare staff who have been made more flexible and agile through training and upskilling.

What are the potentially sustainable benefits?

- Understanding the processes that act as catalyst for enabling new pathways can allow the provision of more accurate and streamlined medical support, as well as to reduce pressures on healthcare staff.
- According to BCN evidence, having a shared workforce during the pandemic allowed the quick redeployment of healthcare staff to respond to areas of high demand, without increasing pressures on a particular segment of the workforce.

Examples of how this has been implemented in practice

- A Commissioning Support Unit (CSU) has developed and launched a regional Deployment Hub for the coordination of all workforce deployments on behalf of several organisations. The Hub was resourced with repurposed staff from the CSU to ensure that participating organisations were not placed under further pressure.
- To enable staff to move more easily within NHS organisations, a digital staff passport was designed to supersede paper passports and local workforce sharing agreements.

BCN priority 5: Remote monitoring

The use of digital equipment to provide out-of-hospital care



This area focuses on use of digital equipment and technologies to provide out-of-hospital care and increase personal responsibility and self-management.

What is this area of focus?

- This area explores the use of apps, sensors and other home equipment to allow people and their carers to continuously monitor their health condition and contact health and social care professionals when required.
- Along with providing post-operative or ongoing care for people with long term conditions, remote monitoring can also be used as a triage tool to identify the most appropriate pathway.

What are the potentially sustainable benefits?

- Remote monitoring and self-assessment can allow people to be able to provide real-time medical data to healthcare professionals and receive timely interventions. They have more engagement with, and responsibility for, their treatment, giving them more power over the care they receive.
- Some people with disabilities or other issues can do their routine tests remotely and only visit the hospital if needed, potentially addressing issues around accessibility for some people.

Examples of how this has been implemented in practice

- Remote devices such as pulse oximeters have been used in Torbay and South Devon to collect data from patients with long term conditions via a smart home assistance device and an app that charts the results over time.
- The use of home spirometers for cystic fibrosis patients has allowed patients to monitor and share vital lung function information with clinicians remotely.

Several key changes in research practices during the pandemic were identified within the published evidence and through stakeholder interviews

- Over the last few months, the UK research community mobilised with unprecedented speed to develop multi-agency collaborative systems that enabled accelerated setup and rapid delivery of high priority clinical research. This approach required research institutions and funders, clinical research experts, regulators and the life sciences industry all working together.
- Of particular interest for the purposes of this rapid review is how the response to the pandemic improved the process of undertaking clinical research and generating improved knowledge.

1 **Reviewing background documents from BCN and AAC**

The BCN team shared an evidence review that brought together some of the work they had undertaken to collate learning. This included examples of innovations in the way clinical researchers share information (such as the international Severe Acute Respiratory Infection Consortium or the New COVID-19 Research Committee), discussions around new ways that findings are disseminated (such as unprecedented use of pre-print servers), etc.

2 **Evidence synthesis**

Published evidence sources were also reviewed including reports and analysis by: health associations such as the Association of the British Pharmaceutical Industry; health journals such as Nature; grey sources such as newspapers and industry blogs; websites and articles from key industry players.

3 **Interviews with key stakeholders**

Interviews with several targeted experts provided valuable insights from the operational and policy perspective which enhanced the evidence base.

The evidence suggests that the UK clinical research community deployed its multi-agency systems to accelerate setup and rapid delivery of high priority research

The rapid evidence review has revealed four particular changes in clinical research:



Faster approval and setup of clinical trials

- According to many stakeholder interviews, the average length of time taken for COVID-19 related clinical trials has significantly decreased (e.g. the RECOVERY trial was setup in 9 days and recruited 10,000 patients across 176 hospitals in less than two months; some trials would otherwise have taken perhaps 1-2 years).
- Some of the changes in the approval and setup processes offer valuable lessons about how processes could be improved on an on-going basis while maintaining safety and quality standards.



Dissemination of research findings

- During the COVID-19 pandemic, researchers and publishers have accelerated the dissemination of their findings so that clinical practice could be amended more rapidly for the benefit of people receiving care.
- More widespread use of open access journals, pre-print servers and faster publication cycles have potential to stay in place and speed up dissemination in the post pandemic world.



Data collection through digital technology

- In response to the pandemic, in order to minimise disruptions to trials, Medicines and Healthcare products Regulatory Agency (MHRA) established that no notification was needed to use digital technologies to remotely monitor participants' health.¹
- This experience proved that the use of remote monitoring technologies to collect patient data has the potential to make some trials (at least observational ones) more cost efficient and a better experience for participants.



RECOVERY trial case study

- The trial has demonstrated the UK's exceptional capabilities for delivering clinical trials at pace and scale across the NHS.
- Valuable learning is being generated from the RECOVERY trial to facilitate patients to benefit faster than under standard processes.

Research priority area 1: Faster approval and setup of clinical trials



Creating the conditions for a faster approval and setup of clinical trials was an important area of activity during the pandemic due to the urgent need for more information about the characteristics of the virus, its impacts on different population groups, effectiveness of different treatments and the need for a vaccine.

What is this area of focus?

- As scientists urgently needed to understand the coronavirus, the process of designing research trials, collecting data and submitting studies to journals for expert review was accelerated or some processes were taken forward in parallel.
- This area considers the regulatory and process changes put in place during the pandemic that can be sustainably maintained in the post-COVID-19 world, leading to faster and better research.

What are the potentially sustainable benefits?

- More rapid and efficient ways to design, gain approval for, set up and implement clinical trials.
- More rapid generation of evidence and knowledge to inform clinical practice.
- Faster decision-making reduces uncertainty for research applicants about future work programmes.
- However, these benefits are in the context of the rapid pace having been facilitated by diverting resources from non-COVID research.

Examples of how this has been implemented in practice

- The Health Research Authority (HRA) implemented a fast-track approval process for COVID-19 studies, enabling their Research Ethics Committee to complete a full review of a study in 72 hours or less² (pre-COVID average approval times in the EU are estimated at 43-75 days³).
- The National Institute for Health Research (NIHR) co-ordinated the Urgent Public Health Group to rapidly convene and make decisions about trial applications so that they could be set up and delivered more rapidly, without any loss of rigour in the process⁴.

Research priority area 2: Dissemination of research findings



Dissemination of research findings was enhanced and accelerated during the pandemic. Multi agency initiatives were set up, there was a significant shift to open access journals and pre-print servers and rapid peer review and retraction processes were also observed.

What is this area of focus?

- Effective dissemination of evidence is important to bridge the gap between research and policy implementation and avoid research duplication.
- This area considers the changes implemented to face the emergency that facilitated information sharing between scientists and speeded up dissemination of research findings both within and outside the scientific community.

What are the potentially sustainable benefits?

- Better dissemination of research findings and better information sharing can avoid some research duplication and speed up research advancement.
- A better dissemination strategy for a research project can lead to increased awareness, and therefore, maximize the impact that the research can have in improving the health outcomes.
- A faster publication cycle can empower scientists and clinicians to address challenges more rapidly (mental health, etc.).

Examples of how this has been implemented in practice

- RAPID C-19 is a multi-agency initiative that aims to accelerate dissemination of information and findings in order to get treatments for COVID-19 to NHS patients quickly and safely.⁵
- Accelerated shift to open access journals, unprecedented use of pre-print servers (servers for pre-peer review publication) and rapid peer review and retraction processes have speeded up the publication cycle.
- Central repositories for literature searches on COVID-19 were set up, partitioned into broad domains for easy exploration: two examples are EPPI Centre COVID-19⁶ and COVID-19 Search bank.⁷

Research priority area 3: Data collection through digital technology



Wider adoption of digital technology for data collection in clinical trials was observed. The MHRA changed guidelines for clinical trials to facilitate the adoption of Investigational Medicinal Products for remote data collection, where this was appropriate.

What is this area of focus?

- Widespread adoption of home-based testing or monitoring technologies and provision of courier pick-up and delivery of participant samples and investigational products facilitate trial participation.
- This area considers how such technologies, which were already emerging, were deployed more widely due to COVID-19 but have created an opportunity to further expand their adoption.

What are the potentially sustainable benefits?

- Participants would have to travel less to health settings and risk infection.
- Conducting remote visits by telehealth, using home based testing or monitoring technologies, providing courier pick-up and delivery of participant samples and investigational products could be viable options that can lower costs, increase the number of participants and speed up research processes.
- However, this may not be appropriate for all patients, depending on their personal circumstances.

Examples of how this has been implemented in practice

- The MHRA guidelines on clinical trials have been modified such that during the pandemic the delivery of Investigational Medicinal Products (IMP) to patient's home was acceptable and no substantial amendment notification to the MHRA was required. Sponsors could do a risk-assessment and record this internally⁸.

Research priority area 4: Recovery trial case study



The national RECOVERY clinical trial aimed to identify treatments that may be beneficial for people hospitalised with suspected or confirmed COVID-19.

What is this area of focus?

- In mid-March researchers in the UK began a randomised control trial of COVID-19 therapies, known as RECOVERY, that involves almost every hospital in England. The goal was to conduct large, rapid and simple randomised trials to define standard treatment.
- This area considers the design and specific trial characteristics that made it possible to enrol the first patient only nine days after the protocol was written and to recruit more than 10,000 patients across almost 180 trial sites across all four countries of the UK in about two months.

What are the potentially sustainable benefits?

- The global research community can learn much from examining the RECOVERY design and process.
- The RECOVERY trial could set a new standard of best practice in the industry that has potential to improve speed of setup, quality of design, recruitment protocols and many other aspects of clinical trials.
- The wide involvement of the public and staff at all levels and the dissemination of results in communities made participants more aware of the importance of research findings. This could create lasting relationships and increase the scale of future research projects.

Examples of how this has been implemented in practice

- The speed of the trial was record-breaking: the period from protocol to first patient recruitment was nine days, with the 176 UK hospitals recruiting more than 10,000 hospitalized patients within a few months (and the total was even higher), and it provided clear answers within a few months on the effectiveness of dexamethasone and the ineffectiveness of hydroxychloroquine and lopinavir-ritonavir⁹.

Several key changes in collaborative working and partnerships during the pandemic were identified within the published evidence and by stakeholders

- Over the last few months there has been a marked increase in collaborations between the NHS and other partners, including with social care facilities such as care homes and community organisations. Collaboration has been a fundamental facilitator of innovation and has enhanced the effectiveness of research.
- Collaboration as discussed in this report explores how new or more effective partnerships involving the NHS and/or social care with other sectors or organisations/ groups (including voluntary organisations, local authorities, commercial entities and the military) emerged in response to COVID-19.

1 **Reviewing background documents from ACC and BCN**

The AAC and BCN shared a number of internal documents that collated learning. This included examples of partnerships such as the UK Lighthouse Labs and the Rapid Testing Consortium and the COVID-19 Genomics UK consortium, discussions of challenges faced and how the voluntary sector has both been affected and able to provide more partnerships.

2 **Evidence synthesis**

Published evidence sources included for example: health think tanks such as the Health Foundation and King's Fund; health journals such as the British Medical Journal; grey sources such as newspapers and industry blogs; websites and articles from key industry players.

3 **Interviews with key stakeholders**

Interviews with several targeted experts provided valuable insights from the operational and policy perspective which enhanced the evidence base.

These collaborations can be grouped by the entities involved (eg a collaboration between the NHS and the military; between social care and local government) or by the purpose of the collaboration (eg logistics or supporting vulnerable groups). For this rapid review, collaborations according to their purpose have been considered to highlight multiple-partner collaborations.

There have been collaborations across the NHS, industry, academia, local government and communities for a range of different purposes

The evidence suggested four particular types of collaboration (beyond those within the health and social care system):



Place-based local networks

- Collaborations involving the NHS, social care, community and voluntary organisations, and local authorities enhanced networks that focused on place-based activities. Local networks existed before COVID-19 but the response to the pandemic increased this local focus. There is no defined geographical boundary for a place-based local network: ie there is not a maximum physical area or number of people that can be considered for this topic, but it is broadly interpreted in line with published guidance on Integrated Care Systems (ICS).
- The focus of these networks is associated with a population within a particular place, or it can refer to sub-populations in specific locations. For example Norfolk County Council launched the Norfolk Vulnerability Hub and Local Resilience Forum.



Working in partnerships to rapidly deliver new or adapted services

- Partnerships with industry, such as those involving the NHS, social care and other government bodies and industry, more actively emerged in response to COVID-19.
- These partnerships were often new and formed quickly to provide new ways of delivering services. They facilitated, for example, improved clinical pathways or new uses of technology.



Practical support (e.g. logistics and technology)

- Partnerships between the NHS and/or social care and industry and/or the military to provide practical support on areas such as logistics and supply chains for resources, or practical support on using new technologies such as improved mapping software.



Enhanced support systems for vulnerable groups

- Partnerships between the NHS and/or social care with local governments and the voluntary sector provided enhanced services and support systems for vulnerable groups of people.
- These support systems tended to be focused on a particular topic, e.g. diabetes, or group of people, e.g. those who were shielding.

Collaboration priority area 1: Place-based networks

Networks have emerged in localities, providing new levels of support



Evidence suggests that new or enhanced partnerships provided services and support to people in specific locations, by drawing on knowledge of local facilities, resources, population groups, health needs and social needs.

What is this area of focus?

- Collaborations involving the NHS, social care, community organisations and local authorities enhanced networks that focused on place-based activities. Local networks existed before COVID-19 but the response to the pandemic increased this local focus. There is no defined geographical boundary for a place-based local network: i.e. there is not a maximum physical area or number of people that can be considered for this topic, but it is broadly interpreted in line with published guidance on Integrated Care Systems (ICS).
- The focus of these networks is associated with a population in a place rather than a particular activity, but it can refer to specific populations in specific locations. For example Norfolk County Council launched the Norfolk Vulnerability Hub and Local Resilience Forum.

What are the potentially sustainable benefits?

- Better local support and community services can help people understand their options on clinical and social care pathways, which include not travelling (far) to receive health and social care
- These networks can help people to better control and manage their own health and well-being, and receive support from the community rather than only through formal NHS or social care routes
- The success of these networks depends on local knowledge and effective communication between the partner bodies and the local community/group that they are serving – and this differs across places

Examples of how this has been implemented in practice

- Local Mutual Aid groups are providing place-based local support services working informally with the NHS and social care services. These are sometimes known as “hyper-local” networks.
- Food for Good coalitions have sprung up across Scotland, where the hospitality sector has partnered with local councils and volunteers to cook and deliver food in local areas for shielding populations.
- The Local Government Association has seen a rise in collaboration between councils, the NHS and voluntary sector bodies to deliver coordinated communications to local communities

Collaboration priority area 2: Rapid delivery of new or adapted services

New partnerships were quickly formed to deliver new services



Evidence suggests that new partnerships have emerged or existing relationships enhanced in order to meet new or more urgent needs during the pandemic. The new services delivered are varied but were made possible through rapid collaborative working.

What is this area of focus?

- Partnerships can be between the NHS and/or social care and other government bodies and industry.
- These partnerships are often new, or were existing relationships that were expanded or enhanced and formed quickly to provide new ways of delivering services. The services can be for a range of issues such as improved clinical pathways or new uses of technology.

What are the potentially sustainable benefits?

- Partnerships can deliver improved quality of care more quickly where there is a common aim than if working separately.
- These can deliver more efficient ways of working for NHS and social care staff, improving work/life balance and well-being of the workforce
- These partnerships can also create better use of digital technologies, therapeutics and clinical pathways, improving overall health and social care outcomes

Examples of how this has been implemented in practice

- Lighthouse Labs and Rapid Testing Consortium as a joint venture to deliver rapid testing
- COVID-19 Genomics UK Consortium brings together universities and regional health bodies to do large scale and rapid genome sequencing.

Collaboration priority area 3: Practical support

Collaborative working has delivered practical help for NHS/social care



Evidence suggests several examples across the country of partnerships quickly forming to provide practical support and skills. For example, NHS and social care services have received practical help from industry, military and voluntary, charity and social enterprise (VCSE) to respond to the pandemic.

What is this area of focus?

- Partnerships between the NHS and/or social care and industry and/or the military to provide practical support on areas such as logistics and supply chains for resources, or practical support on using new technologies such as improved mapping software

What are the potentially sustainable benefits?

- NHS and social care teams can learn from best practice on logistics and resource management through the practical support given by industry and the military
 - Most of the practical support itself on logistics and resources will likely not continue once we move out of crisis mode and back to business as usual. But it provides valuable learnings to help preparedness planning and response to future pandemics.
- Practical support on using new types of technology can upskill the NHS and social care workforce and share best practice

Examples of how this has been implemented in practice

- The military has been working with the NHS and commercial bodies such as the ExCel Centre and Principality Stadium to provide the locations for the Nightingale hospital sites. Construction companies were also involved from the private sector in building the hospitals.
- Support on geospatial data through the Geospatial data giving access to Ordnance Survey data and software providers like ESRI enabling spatial analysis.

Collaboration priority area 4: Support for vulnerable groups

Some partnerships support vulnerable groups



Evidence suggests that enhanced support systems for vulnerable groups have emerged in response to COVID-19. The NHS and social care services collaborated with industry and VCSE to improve health and social care outcomes for specific groups of vulnerable people.

What is this area of focus?

- Partnerships between the NHS and/or social care with local governments and the voluntary sector have provided enhanced services and support systems for vulnerable groups of people.
- These support systems tend to be focused on a particular topic, such as diabetes, or a group of people, such as those who were shielding.
 - It is different to the place-based collaborations as this does not need to be focused on a specific location and will (as defined here) be focused on vulnerable individuals and groups. There can be overlap with place-based networks which focus on a group of vulnerable people in a particular place.

What are the potentially sustainable benefits?

- Better local support and community services can help people understand their options on clinical pathways, which include not travelling (far) to receive health and social care
- These networks can empower people to better control and manage their own health, and receive support from the community rather than through formal NHS or social care routes
- These groups of people may experience better health outcomes and lived experiences as a result.

Examples of how this has been implemented in practice

- Technology firms have worked with the NHS to support vulnerable people who have diabetes, including working with charities such as Diabetes UK to create a helpline for those who need help with insulin.
- Social prescribing for well-being increased in several areas during the pandemic.
- Funding from NHSX on new technologies and ways to enable vulnerable people to safely stay at home.

Given the range of responses identified, criteria have been applied to select 7 deep dives on which to focus the remaining analysis

Core criteria were agreed with the AAC and BCN so that the deep dives would produce tractable, helpful and relevant findings. The implications for inequalities is common to all as a necessary consideration in any deep dive.

The following pages show a mapping of each priority area against these core criteria.

Aligned with NHS and social care policy objectives

The NHS published its long-term plan in 2019 which highlights a set of practical and realistic set of changes to improve care quality and health outcomes.

Have implications for at least one of 7 key categories

The chosen deep dives must relate to at least one of: therapeutics, diagnostics, digital technologies, medical devices, clinical pathways, regulation and workforce.

Assessment of the implications for **inequalities** is central to all analysis

Offer sustainable benefits to people or service providers

The chosen deep dives must offer the potential to provide material and sustainable benefits to people, the health and care system, and more widely.

Have sufficient evidential backing

The chosen deep dives must have credible evidence of the potential to provide sustainable benefits beyond the COVID-19 pandemic response.

Offer feasible potential to be rolled out to different contexts

The chosen deep dives must have the potential to be rolled out to other settings and places including some other acute providers, other primary care providers, mental health providers, and community care.

The five BCN priority areas for innovation met the criteria to varying degrees, but greater value could be added from 3 particular deep dives

3 deep dives selected	Aligned with NHS and social care policy objectives	Have implications for at least one of 7 key categories	Offer sustainable benefits to people or service providers	Have sufficient evidential backing	Offers feasible potential to be rolled out to different contexts
Remote triage	Lowers costs by avoiding inappropriate referrals and enables better care in an appropriate setting	Significantly speeds up the diagnostic process and streamlines clinical pathways	Helps people receive a better quality of care and allows health settings to use space efficiently	The COVID-19 pandemic has shown multiple examples of remote triage clearing pathways in practice	The innovation was used primarily to minimise non-COVID-19 admissions and is therefore BAU suitable
Remote monitoring	Aligns with aim to facilitate digitally-enabled care and enabling patient control	Gives the people who receive care more responsibility to manage their health through the use of digital technologies	Increases personal responsibility for self-management and relieves pressure on professionals – but risks digital exclusion	Several examples exist with evaluation evidence (COVID-19 accelerated trends towards this)	Remote monitoring has been accelerated by COVID-19 - benefits can be realised in BAU conditions
New ways of working / enabling new pathways	Enables better care in an appropriate setting along with workforce development	Streamlines clinical pathways and improves flexibility of the workforce	More streamlined pathways allow better quality care for people and more structure for professionals	There are several examples of changes made to existing pathways to respond to the pandemic	The processes that enable new pathways can teach valuable lessons in BAU conditions
Integration in service delivery	By providing multi-disciplinary collaboration across sectors, this aligns with integrated care systems	Allows collaboration of the workforce and streamlines clinical pathways	Enabling integrated care aims to enhance efficiency and improve care	Several specific examples e.g. cancer hubs	Many aspects of crisis response but multi-disciplinary collaboration already existed so can be scaled
Video consultations	Aligns with the aim to upgrade technology and provide digitally-enabled care	Realises the large-scale take-up of digital technologies while also streamlines clinical pathways.	Enables accessible and convenient appointments. However, runs the risk of digital exclusion	A large portion of evidence is in the context of remote triage and monitoring	Video consultations were accelerated by COVID-19 - benefits can be realised in BAU conditions

The 4 changes in research all met the 5 criteria, but the selected deep dives show the greatest potential to provide value-added insights

2 deep dives selected	Aligned with NHS and social care policy objectives	Have implications for at least one of 7 key categories	Offer sustainable benefits to people or service providers	Have sufficient evidential backing	Offers feasible potential to be rolled out to different contexts
Fast track approval and setup of clinical trials	Faster approval processes make research progress faster leading to better care quality	Research progressing faster impacts therapeutics, diagnostic and potentially other areas	Clinical research progressing faster improves overall quality of care	Fast-track approval process for COVID-19 studies implemented by the HRA	There is potential for transition to business as usual, although need to manage risks to ethical and quality standards
Dissemination of research findings	Better information sharing enables research to progress faster leading to better care quality	Research progressing faster impacts therapeutics, diagnostic and potentially other areas	Clinical research progressing faster improves overall quality of care	Resource/learning hubs set up by Global Health Network etc	There is potential for transition to business as usual, although need to manage risks to ethical and quality standards
Data collection through digital technology	Aligns with the aim of increasing digitally-enabled care	Improved research quality impacts therapeutics, diagnostic and potentially other areas	Better clinical research improves overall quality of care	COVID-19 Symptoms tracker app	The adoption of digital technologies to gather patients' data will accelerate in the future
RECOVERY trial case study	Increases research quality leading to improved care quality	Improved research quality impacts therapeutics, diagnostic and potentially other areas	Better clinical research improves overall quality of care	The RECOVERY trial and the COVID-19 trial are two ground-breaking clinical trials	The RECOVERY and Vaccine trial set a new standard that has potential to be replicated

The 4 particular types of collaborations all mostly met the criteria but 2 were considered to provide value-added insights

2 deep dives selected	Aligned with NHS and social care policy objectives	Have implications for at least one of 7 key categories	Offer sustainable benefits to people or service providers	Have sufficient evidential backing	Offers feasible potential to be rolled out to different contexts
Place-based local networks	Helps to boost out of hospital care and gives people more control over their health	These new networks can affect clinical pathways, and reduce strain on NHS and social care workforce	Better local support and community services can improve people's overall quality of care	These networks have been set up in a variety of locations using a variety of partnership models	There is potential to bring these localised networks into business-as-usual if the resources remain
Rapid introduction of novel delivery	Better service delivery, and implemented faster, leads to better care quality	New service delivery through partnerships can change clinical pathways, therapeutics and possibly more	Better service delivery improves people's overall quality of care	Many examples of new partnerships with industry/ community, including Lighthouse Labs (rapid testing)	New services and types of collaboration can improve care for issues outside of COVID-19
Practical support	Reducing the pressure on NHS and social care teams improves the overall quality of care	Changes in practical support affects the workforce and can involve new digital technologies	Reducing the burden on and increasing the efficiency of NHS and social care can lead to a more resilient workforce and better quality of care	Several examples of practical support from the military and industry for providing logistics, resources and technological support.	It is less clear if these changes will transition to business-as-usual as most examples are of crisis responses
Support systems for the vulnerable	Helps to address health inequalities and gives people more control over their health and care	Enhanced support systems for vulnerable groups can involve medical devices, digital technologies and change clinical pathways	Better local support and community services can improve overall quality of care	Several examples of collaborations involving public sector bodies, third sector and industry.	Improved quality of care and control over their health for vulnerable people can continue

The 7 deep dives selected across innovation, research and collaboration were considered to be able to add value beyond wider work

The selected 7 deep dives are below. Other changes are of course important, but some have been explored in detail by others. These 7 were identified as offering the potential to generate new insights.

Innovation	<ol style="list-style-type: none">1. Remote triage2. Remote monitoring3. New ways of working, with a focus on changes in clinical pathways	<ul style="list-style-type: none">▪ Explore the large-scale adoption of digital technologies and remote healthcare during the pandemic at different stages of pathways. This includes initial triaging and diagnoses to post-treatment monitoring and support, and what the implications are for outcomes including inequalities.▪ Consider the processes that enabled the setup of new care pathways and the streamlining of existing care pathways, and what the implications are for outcomes including inequalities.
Research	<ol style="list-style-type: none">4. Faster approval and setup of clinical trials5. Dissemination of research findings	<ul style="list-style-type: none">▪ Explore how the speed of approval and set up of clinical trials was affected and what could be learned for future practice, and what the implications are for outcomes including inequalities.▪ Explore changes in the way research findings were disseminated and applied, and what the implications are for outcomes including inequalities..
Collaboration	<ol style="list-style-type: none">6. Place-based networks (between the NHS and/or social care and community organisations)7. Rapid introduction of novel service delivery through partnerships, including industry partnering with NHS and/or social care	<ul style="list-style-type: none">▪ Explore collaborations in localised geographical areas to meet particular local needs▪ Understand more about partnerships with industry, communities, the voluntary sector and local authorities, and what the implications are for outcomes including inequalities.

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Deep dive 1 Innovation: Remote triage

The provision of a single point of access for referrals and advice

Remote triage offers a remote, single point of access for both, people receiving care and healthcare professionals, into health and social care services for referrals and advice. Total triage in primary, secondary and community care matches the needs of people to the most appropriate care pathway, allowing them to get the right care, first time.

This evidence report contains several examples of how remote triage services were accelerated during the pandemic to provide a single point of referral. These are some illustrative examples of how this was implemented in practice.

Ambulatory triaging: the London Ambulance Service (LAS)



The London Ambulance Service (LAS), who run a single London-wide Integrated Urgent and Emergency Care system, integrated the NHS 111 and 999 care lines to allow a seamless transfer of patients. Senior clinicians provided an increased number of call-backs to patients in emergency operation centres and played a fundamental role in ensuring that patients were directed to the most appropriate care pathway. Through working with multiple organisations, including GP practices, mental health services and rapid response services, the LAS were able to achieve a reduction in conveyance to the ED of more than 50%, relative to the same day the previous year¹.

Frailty response line: Hull and East Riding



The Hull and East Riding Frailty Response Line was set up by the community services provider in Hull, to provide a frailty support service at their integrated care centre. The objective was to provide the frail population with out-of-hospital care and reduce unnecessary trips to the hospital. This was done by setting up a response line, accessible by ambulance clinicians, primary and community care staff, to provide direct advice to COVID-19 and non-COVID-19 patients. The team set up remote consultations to support the decision making of care home staff to provide the right treatment to frail patients².

Digital triage in primary care: eConsult



The need for infection control during the pandemic meant that patients required a remote resource to access primary care while avoiding a visit to the GP as much as possible. The availability of the digital triage tool, eConsult, has allowed people to be triaged to the appropriate resource, without leaving their homes. People can input their symptoms into an online questionnaire allowing them to be reviewed remotely and prescribed to the best pathway for their needs. This could range from self-help information and video consultations to, if needed, a face-to-face appointment with a GP. eConsult has allowed GP practices to significantly reduce unnecessary in-person consultations, with 70% of requests made on eConsult closed without the need for a face-to-face appointment³.

Deep dive 1 Innovation: Remote triage

There are various potential benefits

The potentially sustainable benefits can accrue to people and the health and care system



Potentially sustainable benefits to people

- The system enables people to receive health and care services while staying in their usual place of residence. During the pandemic, this has been crucial due to the lockdown restrictions and potential for exposure to infection so keeping people out of hospital where appropriate was important.
- Similarly, the option of digital tools has helped people access primary care remotely and be triaged to the most appropriate service, therefore reducing the duplication of assessments⁴ and referrals. From the provision of informative advice to a video or telephone consultations with a GP, digital triage in primary care aims to allow people to receive the right care, often from the convenience of their homes³.
- By acting as a single point of contact into multiple care pathways, from acute long-term care to community care services, triaging from primary care can reduce unnecessary hospital admissions for people who would be better served by a referral to community care. This can save people the anxiety of hospital admissions but also reduces the risk of infection from unnecessary exposure⁵.

Potentially sustainable benefits to the health and care system



- In primary care services, the use of digital solutions for remote triage allows GP practices to better signpost people to the most appropriate service, reducing the number of face-to-face appointments. This allows the GPs to use their time and resources more efficiently, while allowing the GPs to work remotely³.



- By providing more appropriate referrals and co-ordinating between acute care and community care services, hospitals can reduce unnecessary admissions and keep hospital capacity for those who need it most. From a long-term perspective, this can allow hospitals to use their space more efficiently and better respond to patient flows⁵.
- The integration between the different health and care settings for the provision of remote triaging services can also help manage pressures across the system by sharing responsibilities and workforce. This was seen during the pandemic, with national care lines set up for the purpose of pre-triaging, alleviating pressure from the core services¹.
- The alternative referral route for GPs provides an improved access to a wider range of services, particularly community care. By building these pathways, there can be a more efficient use of community services, allowing people to get the care they need⁵.

Deep dive 1 Innovation: Remote triage

Potential disparities in impacts across groups need to be considered

Some implications and unintended consequences for inequalities

Different socio-economic groups experience the provision of healthcare differently, so a switch towards a single point of access may have implications for health inequalities, positive or adverse. The examples below are illustrative and are not comprehensive of all potential effects on inequalities of remote triage services.



- By establishing a multi-disciplinary network of experts across the different areas of care, remote triaging services can support the decision making of staff in care homes and keep vulnerable populations from unnecessary hospital visits and admissions. This can improve accessibility of to the right care, closer to home. Carers who facilitate healthcare access for people they look after can get more support in their decision making. The remote triage system also provides direct access to specialist geriatrician support and the development of person-centred care and treatment plans¹.



- The large-scale adoption of digital methods to deliver remote triaging services, particularly in primary care, during the pandemic means that certain groups are likely to have reduced access to these services. Those without the required technological proficiency, such as some older people, can be digitally excluded, if the right advice and information is not in place⁶.
 - Another issue related to accessibility is the availability of a private space to conduct remote consultations. For instance, the homeless population is less likely to have access to a private space and can therefore be excluded from this offer⁷.
 - Additionally, some people with learning disabilities may require more interactive support from health and care providers, making accessibility to remote care challenging⁷.

Other potential unintended consequences



Evidence suggests potential unintended consequences of developing a single point of access, in addition to unintended implications for health inequalities, for example:



- In some cases, people with complex care needs may require face-to-face time with clinicians and carers if, for instance, physical examinations are needed. For some of these people, remote access into health and social care, particularly through digital triage, may be a less appropriate care pathway⁸.
- One stakeholder interview for this rapid review has suggested that in some cases, the use of remote triaging has served to place the administrative burden of filling in medical forms onto the people accessing care, rather than the healthcare professionals. This can be particularly challenging to deal with for those in distress or those without the means to navigate the systems.

Deep dive 1 Innovation: Remote triage

Benefits from remote triage are enabled through several factors

Enablers

There are a range of enablers that have allowed positive changes from COVID-19 impacts to arise through the more extensive setup of remote, single point of access for triaging and professional advice.

- There is a growing consensus that ‘front-loading’ care pathways with expert staff, like senior clinicians, would maximise the likelihood of people being directed to the most suitable care pathway, enabling faster access to the right care and reducing the need for multiple assessments⁹.
- Providing triage call handlers with the right support and multi-skill training, with the input of senior nurses, was crucial for the effective provision of the triage system¹⁰. Similarly, the adoption of resilient IT infrastructure across the care lines has been important to cope with the increasing call volumes, while enabling a seamless transfer of patients¹.
- A clear delineation of the roles of NHS 111 and 999 care lines, along with clear communication to the people accessing care on how to contact care services helped streamline the response¹.
- A key enabler for the successful implementation of integrated services is efficient and timely data and knowledge sharing across professionals. For instance, in the Hull and East Riding area during the pandemic, an Agreement was reached with all primary care practices in the area that superseded the usual need for a data sharing agreement when accessing patient data. This means that the ambulance service had access to full GP records, which was instrumental to the rapid assessment of patients. The Yorkshire Ambulance Service experienced materially reduced the rate of conveying patients to the hospital after being attended by a paramedic².
- This also extended to information sharing across organisations through a comprehensive directory of services which can identify the capacity of every partner community service, along with operating hours and response times. This would allow fewer inefficiencies in referrals¹⁰.



Deep dive 1 Innovation: Remote triage

Challenges remain for sustaining the benefits from innovation

Challenges

There are a range of challenges that may need to be overcome in order for the benefits to be realised and sustainable.



- Due to the pandemic, the front end of the single point of access had to be accessed digitally by professionals in some situations. This meant that the system ran the risk of inefficiencies due to the potential lack of digital training in professionals⁷.



- Complexities in the needs of those that receive care may imply a need to have multiple channels of care available. Having standardised forms and pathways may not be amenable to some people being able to communicate everything that is important. For instance, some people may have reduced accessibility to primary care services if digital triage is the only option, either due to the lack of the necessary technical proficiency, or the need or a preference for in-person care⁷.



- If the triaging team deem the quality and completeness of the information provided by the GP to be inadequate, they may reject the triage, subject to getting more information. At the same time, if the GPs must fill out large forms with detailed information, it can be a time-consuming process. Inaccurate information for the triaging team could risk signposting people to the wrong service team¹¹.



- Remote triaging processes involve a need for immediate feedback on symptoms. As a result, people may have to enter their data, medical and personal, directly into a computer interface. This can lead to potential data security issues, complying with data governance regulations and apprehensions from the person accessing the service to engage with such systems¹².



- Some studies have found that people are likely to disclose more about their condition to clinicians who are empathetic. The inability to pick up on body language and other visual cues may make online communication challenging and may require training to communicate effectively online. This emphasises that along with providing medicine, health care also provides well-being and mental support, and without the proper training, remote consultations could miss important information¹³.

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Deep dive 1 innovation: remote triage

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Deep dive 2 Innovation: Remote monitoring

The offer of digital technologies for remote self-management

Remote monitoring services include the use of digital technologies and equipment that enables people and their carers to self-assess and monitor their condition. There is an increased focus on remote self-management, with the automatic transfer of data guiding healthcare professionals on how and when to intervene

This evidence report contains several examples of how the offer of remote monitoring services was expanded during the pandemic to manage infection risk with the continued provision of care. These are some illustrative examples of how this was implemented in practice.

Hot-car service: Virtual ward monitoring in Slough



The Frimley Health and Care partnership in Slough piloted a virtual ward during the pandemic, utilising their existing infrastructure to offer a wider service. People who would call in would be assessed remotely through the hot-care service and triaged according to their symptoms. For people in the ‘mild’ zone, an oximeter would be dropped off with instructions for use and advice on self-care. They would continue to be monitored daily in the community virtual clinic, allowing the clinicians to triage them remotely and direct them to the most appropriate pathway¹.

Remote Therapeutic Drug Monitoring (TDM): Nottingham Children’s Hospital



The Paediatric Nephrology department at Nottingham Children’s Hospital piloted a medical device, procured from a private company that allowed patients to conduct routine blood tests remotely and send their samples to the hospital by post, where their drug levels could be monitored and kept within the therapeutic window. In the absence of this remote monitoring opportunity, some patients had to travel for more than two hours for these routine tests, a challenge that was exacerbated due to the pandemic².

Virtual Pain Management Programme: Connect Health



Connect Health developed, piloted and rolled out a digital pain management programme (PMP) as an alternative to in-person pain management in response to COVID-19. This included an online portal where patients could access pre-recorded videos of PMP sessions, relaxation audio tracks and information handouts. As an alternative to the in-person sessions held prior to the pandemic, Connect Health provided a virtual offer of pre-arranged phone calls with a specialist pain clinician, along with live group webinars with other people accessing the service. Despite some technical complaints, the overall experience for the users was positive, with many preferring the virtual offer, as it allowed them to complete sessions flexibly, around friends and family³.

Deep dive 2 Innovation: Remote monitoring

There are various potential benefits

The potentially sustainable benefits can accrue to people and the health and care system

Potentially sustainable benefits to people



- The primary aim of accelerating the use of remote monitoring models during the pandemic was to enable the provision of care to people in the right setting, while avoiding unnecessary admissions into hospitals to reduce the rate of hospital infections and the demand for acute care beds⁴.
- Remote monitoring models can identify the deterioration of symptoms early so they can be acted upon. People can take regular observations remotely and identify, with the help of a healthcare professional, the best course of action⁴. Remote monitoring can therefore be a useful channel of triage to identify the most appropriate entry pathways.
- The availability of virtual ward solutions has increased the ability of people with health and care needs to take control over their own condition. With access to round-the-clock education on how to use the equipment, and guidance on how to look after themselves, people can have more power in managing their own health and be more informed about when to contact healthcare professionals⁵.
- Some people preferred the digital system as it allowed them to complete their session flexibly, from the convenience of their home, around their family and friends. The offer of remote self-management served to avoid time and travel to receive care³.
- Remote monitoring can also benefit patients in a 'step-down' setting, where patients can be discharged from hospitals and safely monitored at home⁴. In post-operative care, remote monitoring can reduce the number of follow-up visits by providing patients with advice on best practices after the procedure and to identify problems that might require an appointment. This can also lead to better care as physicians can make more frequent adjustments⁶.

Potentially sustainable benefits to the health and care system




- Overbooked outpatient clinics can be used more efficiently by providing a remote monitoring service that can provide care to the patient without them necessarily having to book an in-person appointment⁷.
- By offering a remote monitoring service where appropriate, some may be more inclined to engage with clinicians, as they better understand the direct benefits of the care and receive personalised feedback⁷.
- The availability of information and guidance can support the decision-making of some carers and care home staff to keep those they care for from unnecessary hospital visits and in-person appointments⁸.
- Most interventions can be delivered with minimal senior clinical oversight, allowing a more efficient use of staff⁹.


Deep dive 2 Innovation: Remote monitoring


Remote monitoring services can have unintended consequences


Some implications and unintended consequences for inequalities


The shift towards remote technologies during the pandemic was largely effective for many people. However, due to the necessarily rapid adoption experiences differed across groups. The examples below are illustrative and are not comprehensive of the overall effects on inequalities of offering remote monitoring services, but are important.

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▪ A precondition for effective remote monitoring is its accessibility. Some people may therefore be digitally excluded, including some people who could potentially benefit from digital technologies¹⁰. Additionally, since remote monitoring requires access to high-quality communication devices and a Wi-Fi or mobile data signal⁵, some people, particularly the homeless, may not be able to financially support these requirements and avail the benefits.
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▪ However, there have also been positive implications for health inequalities. By accelerating the offer of remote monitoring services, some people with disabilities experienced greater access to services from the convenience of their home³.
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▪ Evidence suggested that some people with diabetes are vulnerable to developing a serious illness if they are infected with COVID, with data from NHS England showing that the risk of death is higher for people with diabetes¹¹. There was therefore an urgent need to provide remote solutions for some people with diabetes to monitor their glucose levels. For example, the FreeStyle Libre flash glucose monitoring system that allows people to self-monitor and share their data with medical professionals was more rapidly deployed. FreeStyle Libre sensing technology has been widely adopted prior to the pandemic but since the onset there has been a significant increase in use of the associated digital tools which support remote monitoring and enable informed remote consultations. Easily accessible education materials, for both people with diabetes and Health and Care Professionals (HCPs), have been provided online to support uptake.
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▪ By increasing the roll-out of remote monitoring services to people with chronic diseases, some of those individuals across all age groups can access a better quality of care¹².
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▪ Training and education for those using the remote monitoring services is central to their efficacy. This emphasises the need for this material to be accessible by all people. People with learning disabilities may require additional support to avail the benefits. Similarly, it is important to tailor the material to provide accessibility to people with more bespoke or complex needs, or with different cultural and linguistic backgrounds⁴

Other unintended consequences

There may be other unintended consequences of remote monitoring:

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▪ Along with the pressures on the health and care professionals related to the pandemic, the rapid, unplanned shift to digital ways of working served to increase the workload for some teams. This was down to the relative lack of preparedness of the system for a full-scale switch to digital care, lack of training and the inability of the existing infrastructure to support the increased online traffic³.

Deep dive 2 Innovation: Remote monitoring

Factors that enabled the acceleration of remote monitoring solutions

Enablers

There are a range of enablers that have allowed positive changes from COVID-19 impacts to arise through the provision of remote monitoring services through digital technologies. For example:



- It is important to look at the virtual ward pathways as a means to deliver care in the right setting, and not just a means to avoid hospital admissions. By adopting a person-centric mindset, there can be a more efficient assessment of which patients stand to benefit and which patients are better suited to more conventional pathways⁴.



- Education and training of the people using the service is central to the success of remote health solutions since this ensures that readings and observations are used accurately. Additionally, education about the concept of a virtual ward and the benefits that arise from it can help placate anxieties and initial reluctance to switch to a new channel of care. Therefore, it is important to provide good quality and accessible training with virtual or real-person points of contact for continued support⁹.



- Similarly, training professionals to be able to support people remotely is also a key ingredient for success. This includes providing clinicians with the training to identify the right pathway for their patients⁴. Additionally, providing staff with technical support training and instructional modules on interaction can help defuse initial frustrations of adapting to new ways of working¹¹.



- Having the necessary infrastructure in place, both, for the person using the remote service and the healthcare facility, can greatly streamline the use of digital technologies¹³.



- The effective delivery of remote care hinged on the availability of multiple channels of engagement. Even though the use of apps and sensors allowed a wider and faster data collection process, the offer of paper-based and telephone reporting allowed greater accessibility for some⁴.



- For some facilities, having pathways in place greatly helped accelerate the virtual offer. For instance, the existing hot-car service in Slough allowed for a simple transition to the provision of remote monitoring equipment¹.

- With the increased impetus on data sharing across sectors to deliver an integrated care service, there were concerns about information governance and patient data security. To support this, NHS Digital collected healthcare information from GP records so they could act as a central access point for health and social care data and allow quicker access¹⁴.

Deep dive 2 Innovation: Remote monitoring

Challenges that were observed in relation to remote monitoring

Challenges

There are a range of challenges that may need to be overcome in order for the benefits to be realised and sustainable. For example:

- One of the biggest challenges faced by the adoption of remote monitoring was the initial reluctance of some people with long-term conditions who were used to meeting their doctors regularly, to get used to a more remote approach. Virtual declarations of 'no evidence of disease' are not as reassuring for some people as when they are examined and interacted with face-to-face¹⁵.
- During the initial months of the pandemic, the lack of clear and structured referral criteria meant that some people that were unsuitable for remote monitoring were enrolled in programmes and some people that would have benefitted were left out. Despite the importance of bespoke engagement, having a broad set of criteria can help identify those that would benefit from different care pathways⁴.
- Some of the staff and resources that were central to the remote monitoring interventions came from other services, in response to the pressures of the pandemic. From a long-term perspective, with the sector returning to a normal distribution of workloads, the availability of sufficiently trained staff and the necessary resources are important considerations for remote care⁴.
- The offer of remote monitoring services has been significant to care home residents during the pandemic, with the need for continued care. However, stakeholder interviews suggest that the initial speed of the rollout depended on the size and scale of the care home, as well as the capabilities of the IT infrastructure.
- There tended to be a greater degree of data integration in remote monitoring models in secondary care due to previously existing patient systems in hospitals. However, some primary care models faced challenges regarding data integration and availability⁴.
- Several stakeholders interviewed for this rapid review stressed that despite the widespread adoption and success of remote monitoring solutions, it is important to maintain a blended approach of digital and interactive care. Despite supporting self-management, remote monitoring can contribute to anxiety and stress if results look different to 'normal' for that person. It is important to maintain access to human support alongside remote care¹⁶.



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Deep dive 2 innovation: remote monitoring

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Deep dive 3 Innovation: Changes in clinical pathways

Streamlining patient pathways to provide a better quality of care

The pandemic saw several examples of healthcare staff and organisations change the way they operate to allow people to have access to more streamlined care pathways. These included setting up or adapting existing virtual entry pathways through remote consultations and triage and streamlining exit pathways by offering more options for integrated post-treatment support, among others.

This evidence report contains several examples of how the offer of remote monitoring services was expanded during the pandemic to manage infection risk with the continued provision of care. Below are some illustrative examples of how this was implemented in practice.

SPACES process: Glenfield Hospital



The University Hospitals of Leicester NHS Trust at the Glenfield hospital introduced the SPACES project as a direct means for infection control. The pre-pandemic practice of having multiple members of staff in contact with patients served to increase staff exposure and the usage of protective equipment. The Sharing Patient Assessments Cuts Exposure for Staff (SPACES) process was developed with the principle that each patient would have ‘maximum contact’ with the ‘minimum number’ of staff. This allowed the minimisation of staff exposure to infection, but also meant that each patient had more substantial contact with each member of staff, allowing them to receive a more personalised care¹.

Safe, timely discharge and transfer of care: Derbyshire Community Health Service



The delay in the transfer of care once older patients are clinically ready to be discharged increased their risk of hospital-related harm, while reducing in-patient capacity for hospitals. It is important to have coordinated discharge planning with community care services to ensure safe and timely discharge. The Derbyshire Community Health Service relocated their previously underutilised Discharge Lounge staff to develop an integrated ‘Discharge Assessment Unit’, which brings together secondary care and community care therapists to co-ordinate discharge planning, allowing patients to be discharged at the right time, on the right pathway with the correct follow-up care².

Virtual pathways: Pennine Acute Trust



The team at the Pennine Acute Trust transformed clinical templates across the Northern Care Alliance (NCA) to accommodate virtual pathways. In case where the existing clinical infrastructure could only accommodate face-to-face appointments, a non-face-to-face standard operating procedure was developed to allow the delivery of virtual care³.

Deep dive 3 Innovation: Changes in clinical pathways

There are various potential benefits

The potentially sustainable benefits can accrue to people and the health and care system

Potentially sustainable benefits to people



- Through streamlined clinical pathways, some people were able to access a higher quality of care, in a more efficient manner. For example, the Leicestershire Partnership Mental Health Urgent Care Hub provided alternative pathways to people presenting with an urgent mental health crisis. Staff were redeployed from other mental health service areas to the Hub that helped diverted patients from A&E services to access a more appropriate care pathway. The Hub also received referrals from other partners including the police, NHS 111 and GP practices⁴.
- The creation of discharge to assess pathways, particularly for some post-operative patients, has shown to help their well-being. Video calls to provide patients with advice on how to look after themselves, conduct remote monitoring tests and discuss fears and discomforts allowed clinicians to detect and diagnose physical or psychological concerns post-discharge⁵.

Potentially sustainable benefits to the health and care system



- There are several instances of hospitals converting under-utilised wards to COVID-19 wards and local facilities sharing physical spaces. For instance, St Wilfred's Hospice in Eastbourne repurposed its Wellbeing Centre therapy rooms to provide six extra inpatient rooms. Similarly, The Nuffield Health Ipswich Hospital provided space for the East Suffolk and North Essex Foundation Trust to move their oncology department and provide patients with chemotherapy treatments at this new location. Beyond the pandemic, the ability for facilities to flexibly respond to times of demand by re-allocating space between departments and organisations can help utilise it more efficiently, improving patient flows⁶.
- Several settings have made significant strides in supporting the well-being of their staff. For instance, Rosecroft Care Ltd and Tamarisk Services Ltd organised a carpool share to avoid the staff having to use public transport. Similarly, the set-up of well-being support helplines and better staff management hubs by the Hillingdon Hospitals NHS Foundation all aim to ease the pressures on the frontline carers⁶.
- By developing virtual pathways and enabling non-face-to-face appointments, healthcare facilities were able to give the people a safer, higher quality of care while making strides towards the NHS and social care long-term objective of switching to digital provision of care⁷.
- Some care home staff have been provided a stronger voice in shaping what they need from health colleagues, with better access to support and training, and a greater feeling of community. This has allowed better sharing of information across partners and more integrated workforce planning².

Deep dive 3 Innovation: Changes in clinical pathways

Changes in clinical pathways can have unintended consequences

Some implications and unintended consequences for inequalities

The processes that have enabled new clinical pathways and streamlined existing ones have generally allowed health and care settings to respond to the demands of the pandemic. However, some groups experienced the changes differently with potential implications for health inequalities. The examples below are illustrative and are not indicative of the overall effects on inequalities of changes in clinical pathways:



- By following a person-centric approach and aiming to reduce unnecessary hospital visits, the new, virtual entry pathways allowed a greater accessibility of care to some people with disabilities, for example⁴.



- A stakeholder interview for this rapid review has suggested that new virtual pathways are not appropriate for everyone who presents due to the complexity of needs of some people.



- Similarly, communication with patients has not appropriately accounted for different languages in all cases. Recognising this, a virtual ward in Slough recognized that 1 in 6 households does not have an English-speaking member. To ensure that the linguistically diverse population had access to the same resources and care, the virtual ward published instructional and informative videos in different languages to inform people about COVID-19 and how they can self-monitor and keep themselves safe⁸.



- The pandemic caused delays for people accessing mental health services, which caused further anxieties for some people. Proactively keeping people with mental health needs informed over changes to service may help reassure them⁹.

Other unintended consequences

Evidence suggests potential unintended consequences of new care pathways beyond implications for health inequalities:



- With the integration across the system central to streamlining patient pathways, the unprecedented degree of data sharing meant that there were several concerns about data security¹⁰.



- With rapid changes in clinical pathways, communication with people accessing health and care services plays an important role in helping them understand not only what the changes are, but why they are needed and how the changes will benefit or affect them. In some cases, the lack of clear communication during the pandemic served to add to the stress and anxiety⁴.

Deep dive 3 Innovation: Changes in clinical pathways

Benefits are enabled through several factors

Enablers



- The COVID-19 pandemic presented a common challenge faced by everyone in the health and care sector, which served as a central motivation for organisations and sectors to work in collaboration to accelerate change and break down barriers⁹.
- The rapid response of the healthcare system to the demands of the pandemic required different health, care and community teams to come together and share responsibility, often virtually. The rapid up-skilling and redeployment of NHS staff meant that the workforce has been more fluid and has been able to support priority areas⁴.
- The unprecedented degree of data and knowledge sharing between practices and organisations was central to the response – new Data Sharing Agreements were implemented which allowed patient data to be shared as appropriate^{10,11}.
- In several cases, clinical pathway change was facilitated by converting under-utilised wards and rooms to COVID-19 wards for use by other local facilities that were under pressure. This flexibility of space helped respond to the high demands⁶.
- The healthcare system required efficient management of patient flows; however, existing administrative and regulatory requirements often served to slow down the process. By modifying legislation (such as discharge requirements under the Care Act, and the Coronavirus Act 2020) and rapidly publishing guidelines for healthcare professionals, pathways were streamlined, allowing better quality of care¹².
- The pandemic saw innovations in service delivery made directly by frontline staff who had the operational knowledge about what could be done safely and effectively. This required an appropriate balance between affording healthcare teams the freedom to innovate, while maintaining responsibility and upwards accountability¹². Interviews for this rapid review suggest that the NHS empowered clinicians by giving them time to plan and implement change.
- Another stakeholder interview for this rapid review suggested that the ability of healthcare professionals to work remotely has allowed them to engage with colleagues more closely and design more integrated and efficient processes, where previously, barriers such as time and travel would have limited engagement.

Deep dive 3 Innovation: Changes in clinical pathways

Challenges remain for sustaining the benefits

Challenges



There are a range of challenges that may need to be overcome in order for the benefits to be realised and sustainable.

- Some of the changes to clinical pathways involved a greater reliance on digital technologies, like developing non-face-to-face operating procedures to allow for better data quality and pathway management. However, the lack of existing infrastructure served to make its adoption very resource-intensive³.
- The set-up of a local, out-of-hospital Rapid Diagnostic Centre (RDC) in Greater Manchester to provide cancer patients with a single point of referral faced challenges with regards to the availability of physical spaces and integrated digital systems across sites to maintain the single point of access⁷.
- For some, a lack of clear communication from their GP practice served to further the confusion and anxiety around the pandemic. In particular, the inconsistency of approach across GP practices, coupled with the lack of information provided to patients about COVID-19 and how to access care services for COVID-19 and non-COVID-19 care meant that some people were unsure about the right steps to take⁴.
- One stakeholder interview for this rapid review suggested that this lack of clear communication also applied to staff, with guidance for health and care practitioners published by a range of parties, across multiple sources making it difficult to know where to look. The lack of consolidated guidance created confusion for some professionals, which extended to some people receiving care.
- Some people were ill-informed about the choices available to them, with many believing online appointments to be the only way to access care. This deterred them from accessing the care they needed¹³. The general lack of input from those receiving care services in redesigning pathways meant that sometimes their needs were not fully considered⁹.
- Another stakeholder interview for this rapid review suggested that there is no one-size-fits-all solution to the provision of healthcare. Some people have complex needs and require bespoke engagement, so offering choice is important.

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Deep dive 3 innovation: changes in clinical pathways

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Evidence across the three innovation deep dives was synthesised into a set of core insights



Unifying around a national priority

The common national priority of COVID-19 provided a focus for action which brought together health and care professionals, industry, people with lived experience and communities, and the wider health ecosystem to rapidly find solutions and address challenges. The pandemic response has further highlighted the importance of international collaboration and the value of UK embeddedness in international research landscapes.



Supportive national and local leadership

Frontline teams had more power to implement change for the benefit of patients, carers and wider communities. This was enabled by greater local agency for frontline staff and streamlining administrative processes where appropriate.



Virtual workspace for professionals

Virtual working allowed barriers to collaboration to be broken down by saving time and the need to travel to meetings. This allowed health and social care professionals to get together more rapidly, and work together towards integrated solutions.



Data Sharing Agreements

The ability to share data in a timely way was important for facilitating integrated care and safe access to relevant clinical and care records for those that need it.



Adaptation and scaling-up of previously tried solutions

Accelerated deployment of digital solutions (specifically remote triage and remote monitoring) delivered benefits to the system and to many people – but not all. For some people this exacerbated exclusion. Training for online / remote service providers and people receiving them is essential to maintain empathy, flexibility and quality of care.



Person-empowerment and self-care

The wide-scale shift to online communication and remote monitoring enabled some people to have more control over their self-care – but the shift to online was not appropriate or accessible for some people and risks exclusion.



Bespoke engagement necessary alongside digital

Blended service delivery is essential, offering people bespoke options so that their needs can be met. The provision of multiple channels of care allows diverse populations and individuals to access care on the basis of their needs and preferences.

Deep dive 4 Research: Faster approval and setup

RECOVERY is an example of faster setup of a clinical trial

In response to the pandemic, various changes were made to the process of application, approval and set up of clinical research trials that were designated by the Urgent Public Health Group. Much can be learned about those changes and aspects could be considered for wider clinical research.



The Randomised Evaluation of COVID-19 thERapY (RECOVERY) trial

- RECOVERY is a national clinical trial that aims to identify treatments that may be beneficial for people hospitalised with suspected or confirmed COVID-19¹. The RECOVERY trial has recruited more than 10,000 patients in 176 hospitals in just two months, making it the fastest ever recruiting individually randomized controlled trial. From conception to launch it only took nine days.
- As an “Urgent Public Health Research Study”, RECOVERY qualified for a £2m grant from UK Research and Innovation and the Department of Health and Social Care, through the National Institute for Health Research.
- With the RECOVERY trial, an accelerated approvals process was applied so that decisions were made quickly, while keeping reviews appropriately robust. The trial management group meets daily. The Data Monitoring Committee, which would usually meet every six to twelve months, is meeting fortnightly. The Trial Steering Group, which would usually meet similarly often, is meeting every week. Statistics team meetings are also very frequent.
- The consent process has been optimised, with the patient information sheet just two pages and covering the key points that patients need to know. The treatment processes mirror care pathways which are already happening, so it is second nature to the medical staff on the ground. Likewise a lot of data being used in the trial are from routine sources, minimising the burden on hospital staff and so reducing the likelihood of errors². Data on patient outcomes are being provided through NHS DigiTrials, a new service that is being developed by a consortium of partners to enable more efficient clinical trials³.
- A randomisation system would normally take months to develop, test to destruction (including security against hacking, resilience for multiple users, glitches and inconsistencies), and be approved for release. In the RECOVERY trial, the three software developers took just 72 hours to initially come up with the key IT systems (randomisation, clinical and administrative databases), and within a week they were tested and finalised².

Deep dive 4 Research: Faster approval and setup

There are various potential benefits

Potentially sustainable benefits to people



Faster protocols for approval and setup of clinical trials can help develop new drugs, treatments and diagnostics. This will have a positive impact on patients' outcomes (e.g. better quality of life, better prognosis etc.). Shortening the times at each stage of the process, or undertaking some in parallel, could be particularly important for patients who have severe diseases whose prognosis may bring as little as a few months of life expectancy. Before the pandemic some clinical trials could take 1-2 years to set up and implement.



Potentially sustainable benefits to the health and care system

Faster approval and setup of clinical trials allow knowledge to be generated faster, which enables



- Faster implementation of new treatments and diagnostics;
- Reduction of uncertainty for researchers and research funders (especially commercial research funders who can setup research projects more rapidly);
- The implementation of a more agile and resilient public health system, better able to face the upcoming public health challenges for the next decades (new epidemics, antibiotics resistance, population ageing etc.)



Potentially sustainable benefits to the wider economy

Facilitating the approval and setup processes can make recruitment faster and easier (e.g. by enabling the use of digital consent and/or more generally by optimising the consent process). Easier recruitment facilitates the involvement of local hospitals and embedding research into everyday care (e.g. RECOVERY trial). Embedded research has the ability of facilitating interactive contacts, collaborative relationships between researchers and end users and the involvement of decision makers in research processes – these factors are associated with improved use of evidence in different settings⁴.

Deep dive 4 Research: Faster approval and setup

There are several important enablers

Enablers

There are a range of enablers that have allowed positive changes from responses to COVID-19:



- The Urgent Public Health Group (UPH) was set up to enable more rapid access to funding for priority research – according to several stakeholder interviews for this rapid review, if a proposed piece of research was badged to fall within the remit of the UPH, it was eligible for an accelerated approvals process. For example, the CONDOR trial (COvid-19 National DiagnOstic Research and Evaluation platform) funded by NIHR, UK Research and Innovation (UKRI), Asthma UK and the British Lung Foundation.



- The national priority status of COVID-19 was fundamental to get the most important studies up and running. The recruitment of 10,000 participants in the RECOVERY trial was enabled by the large-scale redeployment of delivery staff. One stakeholder interview pointed out that under pandemic conditions NIHR and UKRI jointly put out calls for research and jointly managed them through a single portal (which required the rapid building of a new IT system). This meant that all applications were dealt with fairly and that appropriate prioritisation occurred. Another stakeholder interview highlighted that to identify and prioritise trials quickly, an independent COVID-19 Therapeutics Advisory Panel was setup. Its role was to carry out the due diligence around which drugs should be put into trial.



- All trials identified by the Chief Medical Officer as Urgent Public Health studies, or have been determined to be studies of national interest by a government department or by Public Health England or equivalent national bodies were to be reviewed within 24 hours from submission. Studies of a vaccine, treatment or diagnostic for COVID-19, studies to understand immune response to COVID-19 and studies to understand prevalence or transmission of COVID-19 were to be reviewed within 36-72 hours of submission⁶ (pre-COVID average approval times in the EU are estimated at 43-75 days).



- NIHR facilitated new ways to increase efficiency of trial applications. For example, the Respiratory Translational Research Collaboration was deployed for some research programmes to help researchers improve their applications by making sure that the methodologies were appropriately high quality, with the aim of shortening the average approval time (it can otherwise take around a year for an application to be reviewed, improved, resubmitted and meet the required standards to secure funding)⁷.



- National awareness of the research produced in response to the pandemic increased interest from the public in participating, making recruitment larger and more rapid. Several stakeholder interviews suggest that this increased awareness positively affected the framing of research in the public's mind.

Deep dive 4 Research: Faster approval and setup

Enablers (continued) and challenges could be identified

Enablers (continued)



- Remote and online working among health professionals has been an important enabler for setting up and convening Committees and collaborations in a more agile way, speeding up decision and approval processes. Ethics committees meeting daily/weekly enabled decisions to be made quickly with no loss of rigour.



- Optimisation of patient consent process has proven effective in the RECOVERY trial as the patient information sheet just two pages and covering the key points that patients needed to know. In addition to this, for patients who lacked capacity to consent due to severe disease requiring ventilation, and for whom a Legally Acceptable Representative (LAR) was not available, randomisation could be done with consent provided by a treating physician, who was independent of the investigator conducting the clinical trial, and who would act as the legally designated representative⁸.



- Innovative regulatory approaches were observed as the MHRA and HRA have shown significant flexibility in supporting both COVID-19 and non-COVID-19 research. Examples include expedited scientific advice, rapid peer review of clinical trial applications and remote auditing and monitoring. This approach has improved speed and efficiency of clinical research as well as ensuring safety of research staff⁹.

Challenges



There are a range of challenges that may need to be overcome in order for the benefits to be realised and sustainable.

- Experiences from other countries (e.g. Canada¹⁰) show that safety warnings over a drug can be more likely after fast-track approval in those countries than they are with drugs approved through the usual regulatory process¹¹.



- The Urgent Public Health Group badging of various clinical trials was a process used to ensure that COVID-related clinical research could be undertaken rapid and rigorously. This however was largely achieved by diverting resources from other areas of clinical research.



- One stakeholder interview suggested that the speed of getting trials underway before the pandemic was often relatively slow because of delays in universities due to the administrative requirements or lack of equipment to deploy resources to move things quickly. Yet the COVID trials have shown that trial set up is possible within 2 weeks.

Deep dive 4 Research: Faster approval and setup

Changes can have unintended consequences

Some implications and unintended consequences for inequalities

- Encouraging participation among the groups of the population where there is a health problem to address can be challenging. The Equality Diversity and Inclusion (EDI) Board ensures that patients are better represented, but there remains a risk of under-representation.
- COVID-19 has shone a spotlight on the apparent under-representation of diverse population groups in research. In particular, stakeholders interviewed have pointed out that :
 - Data is not always systematically and centrally collected on the characteristics of research participants to allow diversity and inclusion to be monitored.
 - Methods used for recruitment into clinical trials may not facilitate the involvement of participants from a diverse range of communities. Interviews for this rapid review have suggested that recruitment tends to be from catchments close to the funded research institution. Additionally, researchers tend to work with Trusts who are more experienced in undertaking clinical research.
 - Some research studies have their materials only in the English language, posing a barrier to participation for some subgroups of the population.
- After the beginning of the pandemic almost all non-COVID-19 trials came to a halt. According to a stakeholder interview the impact on health inequalities may be significant if restarting trials is not done in a considered and targeted way aligned with likely benefits.

Other unintended consequences

- Since the beginning of the pandemic there has been more rapid approval and set up of the COVID-19 response portfolio of research programmes . However, alongside this other research was stopped or not being taken forward. Staff were redeployed (sometimes also to frontline service delivery) on to these trials and resources were redirected.
- Urgent Public Health Status was established to ensure that the priority research programmes (e.g. RECOVERY trial) would receive the necessary clinical research resources on the ground. One stakeholder interview highlighted that in some instances local research projects absorbed all the available capacity (in terms of researchers, patients to recruit, etc.) risking other important research.

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Deep dive 5 Research: Dissemination of findings

Examples include RAPID-C19 and accelerated pre-publication

Dissemination of research findings is “a planned process that involves consideration of target audiences and the settings in which research findings are to be received and, where appropriate, communicating and interacting with wider policy and service audiences in ways that will facilitate research uptake in decision making processes and practice”¹.



Research to access pathway for investigational drugs for COVID-19 (RAPID-C19)

RAPID-C19 is a multi-agency initiative and aims to help frontline staff in health and social care understand the options they have for treating affected patients and to get treatments for COVID-19 to NHS patients quickly and safely². Here is how it works:

1) The NIHR Innovation Observatory scans all national trials for COVID-19 treatments

2) NICE gathers information from collaborating organisations, companies and other sources and develops a briefing note and a rapid action plan for the RAPID C-19 oversight group

4) The MHRA considers how to accelerate the regulatory access to the identified treatments.

3) The collaborating organisations consider and discuss the briefing notes to identify treatments to be accelerated

5) The NHS makes sure the selected treatments can be delivered.

6) NICE starts the HTA process and the MHRA completes any remaining licensing arrangements for each of the selected treatments.



Acceleration to pre-publication

Throughout the pandemic, researchers have embraced open publishing platforms and preprint servers to share their findings as quickly as possible. Following a global call from science advisors, more than 50 publishers have agreed to make all their COVID-19 and related content freely available and accessible through PubMed central and Europe PMC. More than 50,000 research articles have already been made available through this initiative, which will complement the open access research published³. Some publishers (such as the Royal Society⁴ and the Biochemical society⁵) are going further and making all their content openly available. Others are speeding up their processes so that manuscripts can be published as soon as possible⁶

Deep dive 5 Research: Dissemination of findings

There are various potential benefits



Potentially sustainable benefits to people

- A better dissemination strategy for a research project will lead to increased awareness of the research, and therefore, maximize the impact that the research can have in improving the health outcomes of the patients that will benefit from it⁷.
- Several stakeholder interviews have suggested that better dissemination of research findings outside the scientific community is needed in order to raise the public awareness about the importance of research and to frame research as an activity aimed at the improvement of patients care and at a better functioning of the NHS (changing the prevalent perception of research as a merely academic activity).
- As many subpopulations of patients are hesitant to trust researchers, dissemination of research within these communities can create lasting relationships that enable more effective engagement with individuals within these communities. A comprehensive dissemination strategy that targets these subpopulations can also help reduce health disparities and inequalities that might exist within these communities.⁷



Potentially sustainable benefits to the health and care system

- Better dissemination of research findings and better information sharing can avoid some research duplication and speed up research advancement⁸.
- According to a study from the University of Maryland, learning about clinically relevant findings from a study in which a patient has participated could make patients feel more integrated into the process and could encourage more patients to participate in future studies, increasing the potential scale of future research projects⁹.



Potentially sustainable benefits to the wider economy







- The use of preprint servers and Open Access for research results and scientific publications implies a remarkable improvement on the workings of the scientific community. As articles are available without any barriers, the use and impact of the content increases, the quality of research improves and costs can be drastically reduced. Furthermore, Open Access also generates direct benefits on the society, since it facilitates the direct transfer of knowledge to the economic and social environment and also dissolves the barriers between rich and poor countries¹⁰

Deep dive 5 Research: Dissemination of findings

Benefits from better dissemination are enabled through several factors

Enablers

There are a range of enablers that have allowed positive changes from responses to COVID-19:

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 ■ Multi-agency, collaborative approaches to research proved invaluable. For example, for RAPID C-19, the agencies involved worked in close coordination, proactively planning the actions to take should a promising clinical signal be generated from a relevant clinical trial in order to enable medicines to be available to patients in an extremely short time frame.
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 ■ Switch to Open Access journals and unprecedented use of pre-print servers was observed. Throughout the pandemic researchers have embraced open publishing platforms and preprint servers to share their findings as quickly as possible. Traditional publishing models (where the typical time from submission to publication is around nine months) are too slow to respond to such a fast-moving pandemic³. The peer review process is crucial to guarantee the quality of published research. However, it adds time to the process of making research findings publicly available and yet there is no correlation between the number of rounds of manuscript review and revision and the subsequent citation count for the paper¹¹. Preprint benefits include rapid dissemination of results, establishing priority of concurrence, receiving feedback and facilitating collaborations¹². Benefits of Open Access include increased citations and usage, better non-academic dissemination, increased interdisciplinary conversation, wider collaborations.
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 ■ Setup of web-based cascading systems to facilitate spread of public health information was observed. The Central Alerting System (CAS) was used to cascade the information about new therapeutics quickly. The CAS is a web-based cascading system for issuing patient safety alerts, important public health messages and other safety critical information and guidance to the NHS and others, including independent providers of health and social care.¹³
- 
 ■ Resource/learning hubs established since the beginning of the pandemic enabled research teams to find the support, tools, resources and guidance that they need to progress their study at a faster pace during the emergency (e.g. the one setup by Global health Network and the Royal Society of Medicine)^{14,15}.
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 ■ Remote and online working among health professionals has been an important enabler for setting up and convening Committees and collaborations in a more agile way, speeding up information sharing and dissemination of research findings.
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 ■ A system wide approach unified partners around national priorities and this was fundamental for the setup of multi-agency initiatives (e.g. RAPID C-19) or research hubs that speeded up information sharing and results dissemination in the scientific community.

Deep dive 5 Research: Dissemination of findings

Challenges remain for sustaining the benefits from better dissemination

Challenges

There are a range of challenges that may need to be overcome in order for the benefits to be realised and sustainable.



- Open Access publishing has become associated with a “pay-to-publish” model (publication subsidised by the author or a funding institution). Published evidence suggests that some journals might feel incentivised to publish as many articles as possible to maximise revenues, with a negative impact on the perceived neutrality of peer review. Some researchers may struggle to procure funds in order to publish and conform to mandates at different levels. This might impact early-career researchers and those working in fields where research grants and publishing fees are more difficult to obtain¹⁶



- Pre-print servers do not undertake peer review, but restrict scrutiny to basic screening and legal checks (e.g. plagiarism). At the start of the COVID-19 pandemic preprints have helped drive the early discourse and have influenced policy-making¹⁷. The UK government cited a preprint in their first COVID-19 action plan.¹⁸ Some observers have argued that, if not well regulated, preprints may represent a risk and cause harm giving space to commentators who cite invalid, poorly vetted or false facts¹⁹.



- There is a risk of misinterpretation of findings by the media. There have been some reported instances of inaccurate results having been published by journalists without scientific expertise failing to communicate the meaning of a study not having been peer reviewed, thus spreading inaccurate information and generating confusion in the public opinion¹⁹.

Deep dive 5 Research: Dissemination of findings

Changes can have unintended consequences



Some implications and unintended consequences for inequalities

- Dissemination of research within communities can facilitate lasting relationships that enable more effective engagement with individuals from these communities. A comprehensive dissemination strategy that targets these subpopulations can also help reduce health disparities and inequalities that might exist within these communities.⁹

Other unintended consequences

Evidence suggests potential unintended consequences beyond implications for health inequalities:



- RAPID-C19 provided an important example of how the clinical research application, approval, set up and dissemination pathway can be considerably shortened if system partners work together and are willing to collaborate, trust to share certain information, act more collegiately and balance individual organisation remit with the task at hand. While RAPID-C19 is focused on therapeutics, the principles and approaches may be considered for MedTech and diagnostics in the future.
- One unintended consequence of the widespread use of preprints is occasional spread of misinformation by media. An example of this is a bioRxiv preprint article that reported similarities between HIV and the new coronavirus²⁰, which scientists immediately criticised as poorly conducted science that would prop up a false narrative about the origin of SARS-CoV-2. After being criticised on social media by researchers around the world, it was withdrawn 48 hours later. However, the study was reported by many newspaper websites that, in many cases, did not effectively explain the meaning of it not having been peer reviewed²¹
- Editing and publishing quality materials requires significant resources. If readers do not pay then the cost may fall on others. Another potential unintended consequence of shifting to Open Access is that payment for publication could create conflict of interest and create the perverse incentive for some journals to publish as many articles as possible, with a negative impact on the perceived neutrality of peer review.



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Evidence across the two research deep dives was synthesised into a set of core insights



Unifying around a national priority

The common national priority of COVID-19 provided a focus for action which meant that clinical trials could be designed, approved, set up and implemented much more rapidly than standard processes. Accelerated deployment of research findings was also supported with rapidly generated evidence, efficiently developed guidelines and system-wide communication.



Awareness of research

Wide-scale awareness and acceptance of the need for more and better knowledge about COVID-19 (including its impacts, treatments and infection control) across professionals and the wider public helped to quickly attract and recruit volunteers to be part of the clinical trials.



Lack of diversity in trial recruitment

COVID-19 highlighted how people are affected differently by the virus. However, some groups particularly vulnerable to adverse impacts of the virus were potentially under-represented in some clinical trials.



Innovative trial delivery processes

Innovative changes to the way particular clinical trials were identified as a priority and subsequently approved led to faster delivery of those trials and deployment of the findings. Innovative ways to collect data from participants also proved to be effective in some trials.



Perception of research

Perceptions of research as an “academic” activity can act as a barrier to people wanting to learn more about research or be involved, and as a barrier for professionals to see it as an inherent part of their role in delivering better care.



Open publishing and pre-peer review

The shift further towards “Open Access” publishing (open to all) and publishing findings before formal peer review allowed information to be shared earlier – but this raises risks of misinterpretation or misuse that need to be managed.



Remote and on-line working

Remote and online working proved invaluable for Committees and collaborations to be set up and operate in a more flexible way. This led to a speeding up decision making and approval processes.

Deep dive 6 collaboration: Place-based networks

Examples include vulnerability hubs and national volunteer groups

Collaborations involving the NHS, social care, community organisations and local authorities enhanced networks at a more deliberative local level, focused on place-based activities than before the COVID-19 pandemic. There is no defined geographical boundary for a place-based local network: i.e. there is not a maximum physical area or number of people that can be considered for this topic, but it is broadly interpreted in line with published guidance on Integrated Care Systems (ICS).

This evidence report includes several examples of place-based networks. This is not an exhaustive list, but it illustrates the range of place-based networks that have brought about positive changes in response to COVID-19



Local Authority-led network: Norfolk Vulnerability Hub and Local Resilience Forum

One example is that Norfolk County Council launched the Norfolk Vulnerability Hub and Local Resilience Forum to make sure social care for vulnerable and shielding residents was continued during the pandemic. The Hub is a single point of access and coordination for food and prescription delivery services, drawing across multiple organisations working in partnership^{1,2}. The Local Resilience Forum collates information on risks and ways to request help, including how COVID-19 can interact with other resilience issues, such as what to do in case of flooding during the pandemic²².



National programme: NHS call for reservist volunteers

The NHS Reservists is a national campaign with local pilots to invite former healthcare staff back to support health, social and community care³. These volunteer reservists would commit to 20 days a year, with a minimum of five training days. This scheme is designed to allow the volunteering for the NHS seen during the pandemic to continue, for instance through the NHS Volunteer Responders. The NHS Volunteer Responders were a national partnership that delivered services a local place-based networks, bringing together the NHS, Royal Voluntary Service and Good Samaritans²⁴.



Volunteer-led local group: Food for Good Edinburgh

Local food partnerships existed before COVID-19 but in response to the pandemic they evolved and grew to help make sure that those in need of food, such as individuals who were shielding, received it. Food for Good in Edinburgh was established in response to COVID-19 to lead the community and hospitality response, building on the existing networks of Edible Edinburgh and Edinburgh Food Social. Edinburgh Council and the Edinburgh Council for Voluntary Services (EVOC) established a formal network to deliver food, drawing on funding from the Scottish Government's Food Fund. The Council identifies those in need and EVOC leads the coordination on delivery by volunteers. The key theme of the initiative is to “think local, act local and to encourage people to be good neighbours”²¹.



Deep dive 6 collaboration: Place-based networks

There are various potential benefits

Potentially sustainable benefits to people



Some people can see immediate benefits such as shopping runs and deliveries by Mutual Aid groups⁴ for vulnerable populations and those shielding, and meals cooked and delivered for these groups as well²¹. Dementia patients who were diagnosed with COVID-19 benefitted in some locations from ward reconfigurations which reduced the risk of infection while supporting mental health, and communications links to families to provide more updates and reassurance²⁵. Benefits with the potential to be more sustainable include reduced anxiety and confusion from simplified and streamlined communications across health, social care and community services⁵. Some people could better understand how to navigate the health and social care system, as well as how to manage their conditions better where VCSE targeting specific conditions are part of the local network⁶. This includes ways of not travelling or not travelling as far to access health and social care. People can also benefit from improved discharge outcomes, as seen in the Essex Wellbeing Services which used volunteers to work with social care, public health and the Care Quality Commission². Greater use of social prescribing in local networks has also provided a more integrated response according to an interview for this rapid review.

Potentially sustainable benefits to the health and care system



Health and care systems can benefit from place-based networks helping shape prevention and early intervention, and help scarce health and social resources go further in the community⁶ by feeding in information about local lived experiences. Several interviews for this rapid review noted that the regional focus appeared to be the right level for collaborations that allowed innovation rollouts. These local networks can help to build the promotion and prevention method within the system but focused on the local area⁷. In particular, place-based networks can help improve the discharging between hospitals and care homes where care homes are given more support on infection, prevention and control training and a single point of advice and support for the care home staff⁸. The use of volunteers can take workload off of health and social care staff in the local area, and staff/carer well-being is often overlooked^{7,14}. For instance the COVID Protect Scheme used volunteers to check in with high risk individuals (those shielding or identified by local GPs). Over 250,000 people were involved across Norfolk and Suffolk, with over 23,000 people helped, and a place-based network that involved the NHS, CSU and the Red Cross⁹. The general participation of communities and volunteers in obeying restrictions and providing informal support networks was critical in the collective response to limiting the impacts of COVID-19, including through reducing transmission¹⁴. Another potential benefit is for some people potentially needing less medication from the reduction in anxiety, which is enabled by people understanding their options and what local support they can receive⁷.

Potentially sustainable benefits to the wider economy







The wider economy can benefit through these changes as they can help to understand and address social determinants of health⁶. The overall processes may be more streamlined and efficient. The networks can focus on what issues are specific to their location so that there is not a one-size fits all. Improved health and social care outcomes for people means that the wider economy can benefit from scarce resources used more efficiently and fewer sick days/ low productivity from people better managing their health and care.

Deep dive 6 collaboration: Place-based networks

Changes can have unintended consequences

Some implications and unintended consequences for inequalities

Some place-based networks directly affected health inequalities, and others had unintended implications for health inequalities. The examples below are illustrative and are not indicative of the overall effects on inequalities of all place-based local networks.

- 
 - A one-size fits all approach can lead to people not having access to services¹¹. For instance, cultural and behavioural differences between health and social care staff and communities can lead to inequalities if they are not explicitly addressed. One study found that specific guidance for Muslim communities for activities such as last rites of deceased and suspension of religious services worked well¹¹.
- 
 - Where communications are digital this can exclude groups like the homeless. Alternative formats like audio versions and translations are also needed in many cases⁷. Many Mutual Aid groups rely on WhatsApp and Facebook and this could be excluding groups of people who either cannot afford the data required to access or do not understand the technology. People experiencing domestic violence can have communication devices monitored or forbidden¹⁰.
- 
 - Some place-based networks are designed to improve health outcomes and reduce inequalities for groups of people in a specific area. The place-based local networks which, for example, were created to support vulnerable and shielding populations and simplify communications for this group of people from multiple locations are likely to reduce health inequalities otherwise faced by this population.
 - The COVID Protect scheme in Norfolk and Surrey led to over 12,000 calls to action which were responded to by a partnership across NHS bodies and other institutions, such as the West Social Prescribing team and Red Cross⁹.
- 
 - Networks which targeted how elderly patients were discharged into care homes and the community could improve the health inequalities faced by this group. There has been some evidence of reduced risks to elderly in care homes when collaboration is done effectively⁷.

Unintended consequences for areas other than health inequalities



Evidence reviewed suggests that there is potential for unintended consequences, in addition to unintended implications for health inequalities.



- Mutual Aid groups set up to provide practical support are providing mental health benefits and alleviating loneliness. These consequences likely began as unintended but became important as the pandemic has continued to affect daily lives and ability to socialise with family and friends.
- More people have received safeguarding training as a result of more volunteering. This means there are more people who can safely deliver support in the VCSE sector⁴.

Deep dive 6 collaboration: Place-based networks

Enablers of place-based collaborations

Enablers



There are a range of enablers that have allowed positive changes from COVID-19 impacts to arise through collaboration for local networks.

- The urgency and defined goal of combatting COVID-19 has enabled place-based networks and encouraged more volunteers and community-led groups than seen before¹⁴. The pressure on Local Authorities has caused them to work in new ways with communities and other bodies, and proactively plan communications with partners⁵¹². Coping with the effects of the pandemic, gave a reason for new networks to exist and for existing networks to adapt a place-based focus¹³. Some networks have been led by volunteers²⁰ and some NHS bodies have created a volunteer coordinator role to effectively use these new volunteered resources¹⁴.



- Digital partnerships have made working easier especially with online meetings requiring no travel or accommodation⁵. An interview highlighted the importance of the deployment of digital solutions. More informal methods of communication, such as Facebook and WhatsApp, have been used by Mutual Aid groups and other VCSE groups to organise and share information⁴.



- However, this can also lead to the negative impact on health inequalities where people or VCSE organisations do not have the skills or resources to use technology to the same extent.

- Place-based communication has enabled people in specific geographies to receive consistent information through multiple channels (this is general information rather than patient data). This includes localised communications on notice boards and bus stops, and this is possible only with partnership working with local authorities⁷.



- Partnership working with specific people or communities to both share information and understand lived experiences has also been important: for instance, including local Imams to reach Muslim communities. This kind of “cultural intelligence” can also be seen as a challenge to overcome.

- Learning from previous grassroots movements and partnerships have allowed new place-based organisations to grow quickly and operate effectively¹⁰. This includes coalescing around a common aim.



- There has been some funding provided by government agencies, including the NHS, which have allowed new place-based networks to be trialled. For instance, there has been £750m made available to ensure vital VCSE can continue¹⁵ and funding through NHSX which covers social and mental health services to enable vulnerable people to stay safely at home¹⁶. While not all of this funding will go to place-based networks, it is relevant to consider how additional funding for the VCSE and services which allow vulnerable groups to receive local care can enable changes.

Deep dive 6 collaboration: Place-based networks

Challenges remain for sustaining the benefits from collaboration

Challenges

There are a range of challenges that may need to be overcome in order for the benefits to be realised and sustainable.

- Place-based networks are more effective where communication is simplified and streamlined, and actions are clear. In part, this requires effective partnership working but command and control decision making from some central bodies has left some partners feeling left out and relationships damaged. While this has allowed some areas to take control and make decisions quickly, the other side is groups who feel marginalised and willingness to cope with this 'for the greater good' is waning. There is also a fear of scapegoating where new changes to do not work¹⁷.
 - Keeping all partners informed, including where it was required through bureaucratic rules, was raised as a challenge by one stakeholder as it is a time consuming activity.
 - Communication needs to consider the target audience. An interview for this rapid review suggested that "Protect the NHS" slogan acted as a disincentive for some people seeking necessary care and communications around how to provide actual care in homes and the community has been insufficient:
 - One study suggests that some people stopped seeking the care they needed and that this could cause or exacerbate health anxiety²⁶
 - Another study showed that only 53% of respondents in a particular area were confident on accessing support of COVID-19 systems¹¹.
 - Councils are, according to one study, more likely to proactively plan communications with partners but this needs a sustained culture shift⁵.
 - Where collaboration and communication is ineffective, one study suggests that some people can be at risk, such as when elderly patients with COVID-19 were discharged¹⁷.
- New community networks can be fragile as they are often dependent on volunteers¹³. Funding and resources for Patient Groups who have been hit by the economic downturn¹⁸. If the economic downturn is prolonged and/or severe then the VCSE may continue to be affected and unable to provide the same levels of service, even where these services may be needed more.
 - The sources of funding identified as enablers may not be sustained in the future. And the scale of the funding needs may go past what has been provided so far.
 - Social care is resourced differently to the NHS. One study suggests that a population perspective would require collaboration¹³.
 - When the NHS resets for post-COVID-19, evidence suggests there needs to be engagement with VCSE and this needs to be ongoing and not episodic/only during consultations. ICSs need to make use of VCSE¹⁹.
- There has been limited thorough evaluation of changes so far, although evaluations are already underway and ongoing in some cases. For pilot programmes/ new place-based networks to continue and receive support they may need to demonstrate that they are providing both valued services and value for money.

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Deep dive 6 collaboration: place-based networks

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Deep dive 7 collaboration: Rapid delivery of new or adapted services

Examples include new technologies and partnerships enabling change

Partnerships can be between the NHS and/or social care and other government bodies and industry. These partnerships are often new, or were existing relationships that were expanded or enhanced and formed quickly to provide new ways of delivering services. The services can be for a range of issues such as improved clinical pathways or new uses of technology.

This evidence report includes several examples of rapid partnerships delivering novel services. This is not an exhaustive list, but it illustrates the range of novel service delivery that have brought about positive changes through collaboration in response to COVID-19.

Accelerated pathways and building new networks



Lighthouse Labs, which test for COVID-19 in patient samples is an example of a (new) partnership that accelerated a pathway and rapidly developed and adapted it for the pandemic, bringing new technology where needed. It is a partnership between the NHS, government, academia and industry. A Lighthouse Laboratory is a high throughput facility that is dedicated to COVID-19 testing, as part of the National Testing Programme. These labs are managed collaboratively by the Department of Health and Social Care (DHSC), NHS trusts, commercial suppliers, academia and not-for-profit organisations. While these groups have worked together before in different formats, this is a new partnership which has set up an entirely new network of testing sites. It has involved investing in new technology in order to process tests faster, as well as automating parts of the process²⁴. Other examples of rapid testing include the Rapid Testing Consortium, which is a partnership led by Abingdon health bringing together scientists and medical technology manufacturers to develop rapid antibody tests²⁵ and pilot testing for rapid lateral flow tests to be able to visit care homes²⁶.

New partners coming together rapidly



One of the novel ways of delivering health care during the pandemic was the creation of field hospitals: Nightingale Hospitals. Nightingale hospitals are temporary hospitals which were constructed to meet projected increases in critical care. To deliver these needed types of partnerships that are uncommon in pre-COVID-19 times. These include partnerships with the military to deliver additional capacity through Nightingale Hospitals and support on rapid testing centres. The Nightingale field hospitals were built with the support of military planning and engineers¹⁷. Military aid to civil authorities, through the Standing Joint Command, is usually called on for natural disasters such as wildfires and flooding²².

The partnerships to deliver the Nightingale hospitals also involved private companies that are not usually involved directly in health and social care. These include the ExCel Centre in London and Principality Stadium in Cardiff. Both of these venues collaborated with the NHS and the military to provide the sites for the temporary Nightingale Hospitals. Private sector construction companies were also involved.

Deep dive 7 collaboration: Rapid delivery of new or adapted services

There are various potential benefits

The potentially sustainable benefits can accrue to people, the health and care system, and the wider economy



Potentially sustainable benefits to people

People are seeing immediate benefits such as getting tests through collaborations to develop rapid testing technology and logistic collaborations for delivering testing kits^{1,16}. The rapid partnerships involving the NHS, academics and industry on vaccine and therapeutics developments are expected to provide benefits in the future through limiting sickness, death and economic effects of the pandemic, noting that the vaccine will be developed at a much faster pace than vaccines usually are. Specific groups of people are also seeing new care pathways. For example, the NHS created a new dementia well-being during COVID-19 resource that draws on support from charities like Alzheimer's Society and wider government guidelines such as visiting care homes during the pandemic⁴.

Potentially sustainable benefits to the health and care system



There can be benefits from new partnerships providing novel service delivery that reduces the strain on the system, such as the Nightingale hospitals delivered through industry and military partnerships provided additional capacity⁵, secondment of industry professionals to the NHS and donations of PPE⁶. Some of these sites have been able to provide extra capacity to take non-COVID-19 patients in order to reduce pressure on local hospitals²², but others were temporary sites that expect to be (or have been) decommissioned once they are not needed to cope with COVID-19 cases²². Other types of potentially sustainable changes to the system include the use of geospatial data to plan better demand models for transportation², the use of new technologies like artificial intelligence (AI) to understand the modelling of diseases and predicting the most at risk groups^{3,8} and how to quickly standardise assays to compare which tests are most appropriate⁷. In between these immediate and sustainable benefits, the system could benefit from reduced pressure from effective COVID-19 vaccines and therapeutics.

Potentially sustainable benefits to the wider economy



The potentially improved processes for strategic involvement of industry and charities can improve health outcomes and the system. Improved health and social care outcomes for people means that the wider economy can benefit from scarce resources used more efficiently and fewer sick days/ low productivity from people better managing their health and care. Involving private sector construction companies can also boost economic activity in sectors outside of health and social care. Finally, one interview for this rapid review commented that the collaboration between MHRA and partners to develop 'Target Product Profiles' which set out the outcomes required of new devices or medical products for which a high demand had been demonstrated, meant that the manufacturers could more quickly ascertain that their products would meet the required needs therefore reducing uncertainty and making manufacturing more efficient.

Deep dive 7 collaboration: Rapid delivery of new or adapted services

There are potential implications for inequalities

Some implications and unintended consequences for inequalities

Some new service delivery partnerships have addressed specific health inequalities but the evidence suggests this is not always the case. The examples below are illustrative and are not indicative of the overall effects on inequalities of all new services delivered quickly by partnerships.



- People with chronic conditions and co-morbidities are sometimes not being fully considered as novel service deliveries are rolled out¹⁰. This often includes where the delivery involves a digital technology:
 - For instance, some services rely on people having smart phones and this can exclude groups of people who do not have them, particularly from lower socio-economic backgrounds. It also needs people to understand how to use the app for checking in and reporting symptoms.
 - One stakeholder interview highlighted that digital service delivery was particularly challenging for people with dementia.



- Challenges for inequalities remain with decisions to be made on who can access an effective vaccine first¹¹.
 - Barriers to vaccine uptake for some groups of people may also need to be overcome¹².



- However, some collaborations can improve inequalities. For instance, geospatial data about where people and care facilities are can be used in the future to understand health inequalities and regional differences. It can be combined with other types of data to allow more targeted health interventions¹³.
 - Other novel service deliveries have been aimed at addressing health inequalities such as improving health outcomes for people with dementia during the pandemic⁴.

Unintended consequences for areas other than health inequalities

Evidence reviewed suggests that there is potential for unintended consequences, in addition to unintended implications for health inequalities.



- New, and better, relationships have been forged between partners across health, social care, industry and voluntary and community organisations which could continue in the future and make new collaborations easier to form and/or more effective more quickly



- Diverting resources to new collaborations in response to COVID-19 meant that some people went without services that they otherwise would have had²⁸. There is also a future implication from delays in research for non-COVID-19 areas.

Deep dive 7 collaboration: Rapid delivery of new or adapted services

Enablers of new or adapted services

Enablers



There are a range of enablers that have allowed positive changes from COVID-19 impacts to arise through collaboration for partnerships forming quickly to deliver new services.

- Research by the Institute for Voluntary Action Research (IVAR) found 8 enablers that lead to successful collaboration: 1) common issue; 2) shared sense of urgency; 3) recognition and appreciation of strengths; 4) involving VCSE from start; 5) removing bureaucracy and hierarchy; 6) communication; 7) sharing and collating data and intelligence; 8) agility of voluntary, community and social enterprise (VCSE)¹⁴.



- Other studies have identified additional enablers such as:
 - More freedoms to make changes and retain sufficient oversight from regulators¹⁵
 - Good public engagement and clear legal boundaries help overcome concerns on data privacy for public/private partnerships like Lighthouse Labs^{16,8,18}.
 - The significant increase in data and workload made stronger arguments for using AI technology¹⁹
 - The overall response to COVID-19 has seen a “culture change” with a shift in the appetite and drive for solutions, according to some stakeholders



- Funding for new partnerships like the COVID-19 Genomics UK Consortium, where £20m was made available by a partnerships across DHSC, UKRI and the Wellcome Sanger Institute²⁰.
- One stakeholder interview for this rapid review highlighted that the very specific clinical needs from COVID-19 made collaboration for medical devices easier than in pre-COVID-19.



- For example, the clinical need for ventilators; personal protective equipment; and diagnostics and testing was rapidly identified. In response, the Medicines and Healthcare Products Regulatory Agency (MHRA) worked with partners to develop Target Product Profiles (TPPs) to help manufacturers design and deliver equipment that might be useful in delivering the UK response strategy. These TPPs were also used to aid procurement decisions.
- Another stakeholder interview discussed that the speed of collaboration was enabled both by new resources, improvements and by redeploying existing staff. Stakeholders agreed that this was an aspect of the common issue and sense of urgency.

Deep dive 7 collaboration: Rapid delivery of new or adapted services

There are some important challenges

Challenges



- Not all enablers can be sustained in a post-COVID-19 world, such as a shared sense of urgency and a willingness to divert resources from other research/ service delivery. Additionally, resources donated by industry and military support are unlikely to continue once the urgency of the COVID-19 crisis has passed:
 - There is a backlog of other health and social care issues from resources diverted to fight COVID-19 and these will require resources
 - One study has found evidence that people using health and care services may not continue with new behaviours where they have a choice, such as remote appointments, post-COVID-19²⁸
- There has been limited thorough evaluation of changes so far. For pilot programmes/ new place-based networks to continue and receive support they may need to demonstrate that they are providing both valued services and value for money. Without robust evaluation it is hard to know what works as well as what provides good value.
- One stakeholder interview for this study flagged that the lack of face-to-face networking makes it harder to develop relationships, although it was also noted that online working can increase access to senior decision makers in some cases, and that it is easier to convene meetings virtually than face to face.
- Another stakeholder interview raised the issue that changes made during COVID-19 could revert if this will preserve jobs.
- The challenge of working in partnership to deliver, and have internally, clear communications was not always overcome. Some of the poorer outcomes could have been avoided with clearer communication²¹.
- Fast changes to enable collaboration, such as faster guidance from the National Institute for Health and Care Excellence, did not always give sufficient opportunity for industry or community representation in the process.



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Deep dive 7 collaboration: Rapid delivery of new or adapted services

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Evidence across the two collaboration deep dives was synthesised into a set of core insights



Nationally and locally coordinated place-based collaboration



Public health needs in relation to COVID-19 varied across individuals and places. Local and national collaborations delivered place-based support to meet those needs, including addressing the social determinants of health.



Collaborating to find solutions quickly



The nationally recognised challenges in relation to COVID-19 brought the public sector, industry, regulators and the voluntary sector together to quickly find solutions across therapeutics; testing; diagnostics equipment; and protecting the vulnerable.



Access to skills and capacity



Partnerships brought together the skills and capacity needed to quickly meet particular clinical or social needs. Industry, the military, local authorities, voluntary organisations and communities were able to provide skills and resources to deliver outcomes that may not otherwise have been feasible, or only at a much slower pace.



Co-production of training and learning materials



The fast uptake and use of remote monitoring by some people was helped by partners (including the health and care professionals, industry and people with lived experiences) co-producing training and education materials, using the strengths of each partner.



Flexibility of existing partnerships



Existing partnerships were flexible to provide support to vulnerable groups and meet people's needs, at both a national and local place-based level. Not all new service delivery required new partnerships where existing partnerships could be repurposed to respond to COVID-19.



Clear communications using several methods



Consistent and clear communication is vital. Communication needs to be adapted to meet different needs (such as materials in different languages; engaging via faith groups or community groups; blending digital with non-digital): there is not a one size fits all option.



Importance of volunteers, charities and community groups



Individual volunteers, charities and the wider community groups have played a vital role in delivering a place-based response to COVID-19. However, pressure on funding sources poses a risk to the resilience of this service.

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Valuable learning has been derived from international perspectives – though with some limitations on the evidence

Aims of Phase 3

As part of the project, the evidence based has been enriched with examples derived from international experiences of innovation in service delivery and collaboration in response to the COVID-19 pandemic. This generated an understanding of several approaches that differed from 'business as usual', with potential implications for the future in the UK.

Stakeholder evidence collated

With informed consent, representatives were interviewed at senior executive levels from four organisations: the World Health Organisation (WHO), International Hospital Federation (IHF), the McMaster Health Forum COVID-END initiative and the Association of the British Pharmaceutical Industry (ABPI). These interviews sought to understand their views on international learning from the COVID-19 experience - ABPI is a UK body heavily engaged with international activity and was well positioned to provide a valuable international learning perspective.

Triangulation of the evidence

Although the evidence from the four interviews provides a valuable source of learning, it is worth noting that the insights shared come from a small number of individuals, and that there may be additional and/or differing views that would be surfaced in a larger stakeholder consultation. However, the key insights derived are based on triangulation across interviewees (to the degree that they were able to comment on comparable issues) and resonate with learning gained from other stakeholder interviews conducted as part of this rapid review, as well as with insights shared during subsequent workshops, which served as an additional source of triangulation.

Limitations on the evidence collated

The insights obtained seek to shed light on important learning points and implications for the future. Core findings are presented as they relate to the research landscape and to the innovation landscape. The analysis and reflection on the insights gained should be seen as informing rather than making recommendations. The implications for the future that are discussed serve to highlight potential areas for action going forward. Further work could assess their feasibility, acceptability and sustainability.

What matters for a resilient and effective clinical research landscape: lessons for the UK in light of an international perspective



- Permissive regulation has enabled new models of trial delivery, but the lack of international regulatory harmonisation can hinder large scale research collaboration in the future.



- Clear communications about regulatory provisions have helped raise awareness about what is possible.



- Mitigating under-representation and tackling inequalities in access to research opportunities needs to be central to strategies for embedding research into the NHS. Scaling up patient and public participation also requires scaling up NHS staff engagement.



- Further coordination of the research landscape and collaboration can mitigate duplication and improve patient recruitment.



- Restarting non COVID-19 research (and sustaining it) is a key priority internationally. This requires more than just restarting funding – it is a systemic challenge.



- There is a need for a strategic approach and roadmap for international embeddedness in research (historical context and path dependencies influence current practices).



- A research landscape that balances between focus on clinical and non-clinical health research is needed (e.g. social and economic determinants of health, multi-disciplinarity).



- Managing the scale and pace of research requires innovative evidence synthesis bodies and ensuring quality through improved standards and processes.

Learning from international perspectives: Research



WHAT MATTERS: Permissive regulation; clear communication about regulatory provisions; mitigating inequalities and under-representation in clinical trials

Core insights

- Permissive regulation has enabled innovative ways of delivering clinical trials, for example through remote delivery of medicines to a trial participant's home and remote consultations using digital technology. In the UK, this was achieved without the need for major amendments to regulation. Internationally, the work of the International Coalition of Medical Regulatory Authorities has been key in creating permissive regulation in a timely fashion (e.g. by rapidly pulling together thinking about what is needed to meet regulatory requirements for trials for COVID-19). The Medicines and Healthcare products Regulatory Agency (MHRA) has been an international leader in supportive regulation for conducting trials remotely.
- In the UK, raising awareness about existing regulatory flexibilities within the research community has been key to the adoption of innovative trial delivery approaches. Some regulatory provisions related to remote ways of delivering trials were in place pre COVID-19, but awareness about them amongst the research community was low. Inertia can also be a challenge to changing established ways of doing things, but the sense of urgency related to COVID-19 provided stimulus to engage with remote medicine delivery and remote consultations with participants in trials. Communication between regulatory bodies and trade associations has helped raise awareness.

Implications for the future

- Addressing the need for regulatory alignment is an important policy issue going forward, if some of the innovative practices related to delivering trials are to be sustained. Not all international jurisdictions follow the same regulation and this can be a challenge for international collaboration. Not all countries have the same provisions as the MHRA which could impede multicentre trials that the UK would be involved with.
- Clear communication between regulatory bodies and the research community in the public and private sector is important for sustaining innovative practices going forward, for developing resilience and for preparedness for future shocks. Conversations between industry and the MHRA are taking place, to understand how to ensure resilience in the health research system, in terms of potential future disruptions. For example, the ABPI worked with MHRA on a survey for companies about the flexibilities that have been put in place, in order to understand what has been useful and used and what less so. These types of conversations are also relevant for public sector bodies.
- Sustaining the potential for remote ways of delivering trials is important but may not be appropriate in all circumstances. Inequalities in access to research participation opportunities must be avoided. Unintended consequences need to be mitigated so that specific populations (e.g. those who cannot engage remotely) are not inadvertently excluded from participation opportunities and under-represented.

Learning from international perspectives: Research



WHAT MATTERS: Coordination of the research landscape; restarting non- COVID research; scaling up patient and public participation in research

Core insights

- Research and innovation pathways have changed during COVID, supporting non-linear approaches. For example, tasks that used to be done sequentially (e.g. R&D and then manufacturing) were done in parallel and 'at risk', by some organisations. This enabled speed and efficiency gains, because R&D was being done at the same time as the scaling up manufacturing capacity.
- Despite many clinical trials working well, there have been challenges at some sites, in relation to running multiple studies that compete for the same patients in terms of recruitment. This can inadvertently hamper the efforts of any single study to achieve patient recruitment needs. Learning from the COVID-19 experience has also highlighted the importance of mitigating against unnecessary duplication of research effort.
- Internationally and in the UK, non COVID-19 research has suffered, as resources and staff capacity have been diverted to the pandemic response. This comes at a risk to scientific progress and to patient benefit in other disease areas. From existing evidence, it is not clear how the UK compares with other countries in terms of extent to which non-COVID research was stopped and in the pace of restarting it. This merits further investigation and international learning. Disruption of current research and research funding in non-COVID areas is a key challenge, especially for those on fixed term contracts.

Implications for the future

- There is a need to understand the types of conditions and criteria associated with a public health threat that could justify parallel working at risk in the future. For example, might other types of research and health priorities justify a similar response? Does this only apply in the context of an emergency or can it support research efforts that seek to prevent emergencies in the first place?
- Sustaining a well-coordinated clinical trials landscape is key to an efficient health research system going forward and there is scope for some improvement in this regard: The UK has for a long time invested in building a good clinical trials infrastructure but there are some areas where further improvements could be realised (e.g. coordinated approaches to patient recruitment within research active sites, coordination of funding to avoid unnecessary duplication).
- Restarting non COVID-19 research and ensuring resilience of the clinical research system is a priority internationally. It is challenging to do as it requires restarting an entire system (i.e. requires more than just restarting funding for non COVID-19 research). The UK needs to make sure that non COVID-19 research is not neglected, so that we do not inadvertently end up with a disbalance of staff skills and capacity which can have long-term effects.
- Further embedding research activity into the NHS: All healthcare professionals should be trained and supported to easily inform patients about research participation opportunities and to enrol patients into studies. This requires NHS staff to have easy access to information and to a user-friendly patient recruitment infrastructure, but also tackling wider challenges (e.g. demands on staff time, cultural issues, morale).

Learning from international perspectives: Research



WHAT MATTERS: Historical context; international embeddedness; balancing focus on clinical research and other types of research (e.g. on the social and economic consequences and determinants of health)

Core insights

- A number of initiatives that predated the pandemic influenced how the response unfolded. Some of these prior developments enabled a nimble response in terms of clinical trials. For example, the WHO Blueprint 2016 and the Coalition for Epidemic Preparedness Initiative (CEPI) started working on candidate vaccines for other coronaviruses, SARS and MERS, and developed ready to go protocols which served as the foundation for the COVID Solidarity trial approach. In the UK, NIHR's investments in clinical trial capacity, infrastructure and networks over many years supported NHS preparedness for COVID-19 clinical trial activity (e.g. the Recovery trial). By contrast, in the areas of epidemiology and test ordering as some examples, there has been less coordination and more fragmented activity.
- The pandemic response has put the spotlight on the importance of international collaboration and of embeddedness in international research landscapes. However, whereas researchers have historically tended to follow developments in their field internationally, there does not seem to be an overarching national strategy for how the UK approaches embeddedness in international research.
- Evidence synthesis are key to bringing information to decisionmakers. At present, there appears to be more focus on evidence syntheses that consider the clinical consequences of COVID-19 and public health research, than on evidence syntheses looking at social and economic consequences. This is in part due to how research was prioritised in the short-term response to the pandemic.

Implications for the future

- The pandemic has shown that coordination of research activity in the health system varies by different types of research. There may be a need to identify which aspects of the UK research landscape are in need of more coordinated research efforts. For example, there may be a need to consider how policy and funding can support more coordinated, networked and collaborative research in areas such as epidemiology or research on the social and economic determinants of health.
- Further consideration of how the UK approaches embeddedness in the international research may help support a more strategic approach by the research community. It could help towards establishing roadmaps for how the UK research community stays up to date with international developments, shares learning and knowledge, and pursues coordinated collaborations.
- A key challenge for policy and the research community relates to producing and synthesising evidence on how to address social and economic consequences of the pandemic and how to tackle inequalities. This is key for long term recovery, resilience and preparedness for future pandemic shocks. It is likely to require research which considers the interdependencies between different types of inequalities.

Learning from international perspectives: Research



WHAT MATTERS: Managing the scale and pace of research activity while ensuring quality controls

Core insights

- The ‘explosion’ in the scale and pace of COVID-19 research, coupled with open access policies, the use of preprints and fast dissemination came with benefits in relation to speed of knowledge generation and speed of access to knowledge. Initiatives such as the COVID-END international network of evidence synthesis organisations are seeking to synthesise available evidence and ‘filter through the noise’. In the systematic review space, a large number of groups are doing systematic reviews pivoted towards COVID-19 (e.g. Cochrane, Campbell Collaboration), and are working with international organisations such as the WHO. COVID-END has been working with WHO Evidence Collaborative COVID-19 on a position paper arguing for a need for a much more substantive global infrastructure for syntheses than is currently available. In comparison to primary research, relatively little research funding goes to evidence synthesis.
- However, risks to ensuring the quality of evidence on which decisions are made have also been accentuated by the pace and scale of activity. Many smaller, in-country groups have also been producing very rapid reviews in response to local jurisdiction needs. The quality of these reviews has been variable, with insufficient coordination and harmonisation of standards and insufficient quality controls.



Implications for the future

- There is a need for innovative evidence syntheses bodies in the global research landscape and for innovative approaches to conducting, coordinating and quality assuring evidence syntheses activity. Innovative ways of conducting systematic reviews are being considered by evidence syntheses experts. Some examples relate to the use of ‘living’ systematic reviews (i.e. those which are continually updated), the use of artificial intelligence, machine learning, natural language processing, the automation of technical aspects of syntheses and the better tagging of data. The COVID-19 Knowledge Accelerator (COKA) is looking at developing standard taxonomies to help facilitate machine readability and usability of COVID-19 research and there is scope to explore transferability of standardised approaches to other areas of research. There is also scope for involving larger teams in conducting systematic reviews to facilitate pace and efficiency, although this may accentuate coordination needs. The research and research funding community could explore the potential for networked initiatives (akin to the COVID-END model) to serve as coordinating bodies for evidence syntheses outside of the COVID-19 context.
- A key challenge for the research community is to identify quality standards and innovative quality assurance processes for research that is produced at pace in response to public health emergencies. Excessive acceleration of research activity without careful quality control can lead to harmful and uninformed decision-making or to the support of ineffective interventions.

What matters for innovation: lessons for the UK in light of an international perspective



- The adoption of new technologies needs to consider impacts on the whole care pathway.
- Sustaining new care pathways established during COVID-19 may require a programme of disinvestment from prior ways of working.



- Sustaining innovation will require a mix of bottom up and top down strategies. COVID-19 has accentuated the importance of local action but clear national priorities and resource allocation.



- Agility and trust are key for effective responses to pandemic shocks and to a nimble and responsive health and care system:



- The pandemic has demonstrated a high level of agility in how healthcare service provision is managed and delivered. Clarity of purpose and few priorities helped make this possible.
- From an international perspective, organisations which had pre-existing high levels of trust (internally, with workforce, with local communities, with other organisations) could respond more flexibly.



- We now have a cadre of health and care leaders who have learned from rapid innovation. There is an opportunity to spread learning to continue to deliver change in collaboration with communities.



Learning from international perspectives: Innovation

WHAT MATTERS: Working across multiple levels in the health and care system; organisational and system agility; a new cadre of leadership; consolidating new care pathways

Core insights

- Innovation in delivering care requires working across several levels from local to regional to national and supranational. By strengthening local voices, regional and national approaches to innovation can be focussed more effectively on what matters most. Many innovations that matter most to patients and service users are achieved at the local level. Equally, national and regional leadership matter in setting priorities and allocating resources but should avoid adopting an overly centralised approach.
- The pandemic has demonstrated a (possibly latent) high level of agility in how service provision is managed and delivered. Cross organisational collaborations have sprung up and health organisations have re-purposed existing relationships with communities or created new ones. Having clear and few priorities are said to have helped make this possible.
- Non conventional leaders have stepped forward to allow innovation to take place. We now have a cadre of health and care leaders who have participated in, and learned from, rapid innovation in how care is delivered. New styles of leadership (including patient leadership) and patient engagement have arisen and – in a crisis at least – have facilitated innovation (e.g. how to personalise care when in full PPE, using badges, reaching out to faith groups to build community links).



Implications for the future

- Innovation in the context of COVID-19 has highlighted ways of combining bottom-up and top-down strategies. This learning can help improve how innovation is embedded into the healthcare system in the future. We now have a better understanding of how this works – at least under conditions of a pandemic. It is doubtful whether any one model or national example provides a template for all circumstances but many promising approaches to innovation involve not only a national framework for allocating resources and ensuring effective governance, but also organising responses that are close to communities and to patients. It will be important to consider, post-COVID-19, which approaches support sustainable innovation and which revert to the status quo ante.
- There is an opportunity for consolidating and spreading learning to support a generation of leaders that can continue to deliver innovation in service delivery, in collaboration with communities and other organisations. Returning health and care leaders to the previous way of working would be a lost opportunity. The challenge for decision-makers is to create governance arrangements and enabling environments for agile as well as safe innovation in the health and care sectors. This includes a supportive environment for coordination across different parts of the health and care system, for community engagement and for embedding proven technological innovations at scale.
- Sustaining useful innovations may require a programme of disinvestment from prior ways of working. New care pathways, where they add value, should be consolidated and resourced if we are not to revert to business as usual after COVID-19.

Learning from international perspectives: Innovation

WHAT MATTERS: Nurturing trust within organisations and between health and care providers and communities; ensuring that health and care systems prioritise efforts to tackle inequalities

Core insights

- Innovating in service delivery has highlighted the importance of trust as an enabler of innovation. Trust is linked to strengthening internal relationships within the healthcare workforce, establishing new ways of working with communities, and supporting cross-organisational collaboration. From an international perspective, organisations which had pre-existing high levels of trust (internally, with workforce, with local communities, with other organisations) could respond more flexibly.
- Often, the changes identified in terms of how the healthcare system responded to COVID-19 have been enabled by technological change: collective buy-in and embracing technological change has been facilitated by trust to a degree, as well as by necessity. Surveillance, triage, treatment and discharge approaches have been modified or significantly changed as a result of COVID-19.
- However, not all segments of the population are able to equally benefit from such changes. As one example, in a UK context, there has been very limited innovation in how older people are cared for. Focus has been on sequestration and control within the existing models of provision. This has put considerable strain on the organisations delivering care for the elderly and had damaging consequences for older people and their families. Similarly, not all segments of the population are able to engage with remote healthcare.
- Routine services have been significantly affected by the pandemic across many countries with care pathways restricted and patients disengaging with some aspects of routine care. Restarting routine services and ensuring their resilience is a key priority.

Implications for the future

- Trust has a hard practical value and understanding how organisations can be worthy of the trust of groups who carry the greatest burdens arising from inequalities is an important policy area. Innovation needs to be conducted in the context of mitigating inequalities and addressing them.
- It will be important to invest in building trust in new ways of working and new care pathways across different parts of the health and care system. Trust is also important in the context of trust in technology. Coupled with investment in building and nurturing trust is a need to build more intelligent forms of accountability in order to create more agile and more effective use of new technologies.
- The difficulties associated with responding creatively to COVID-19 in the care offered for older people create an opportunity to understand longer term questions regarding why the sector (in many countries) struggles to innovate. Some of the challenges may relate to overall budgets for the sector and to fixed investments in buildings and systems that would be expensive to disinvest from but that may be unsustainable. Further research into this area is needed to inform policy decisions.

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Core findings for innovation were derived from the evidence and tested with stakeholders in a series of workshops



Unifying around a national priority

The common national priority of COVID-19 provided a focus for action which brought together health and care professionals, industry, people with lived experience and communities, and the wider health ecosystem to rapidly find solutions and address challenges. The pandemic response has further highlighted the importance of international collaboration and the value of UK embeddedness in international research landscapes.



Supportive national and local leadership

Frontline teams had more power to implement change for the benefit of patients, carers and wider communities. This was enabled by greater local agency for frontline staff and streamlining administrative processes where appropriate.



Virtual workspace for professionals

Virtual working allowed barriers to collaboration to be broken down by saving time and the need to travel to meetings. This allowed health and social care professionals to get together more rapidly, and work together towards integrated solutions.



Data Sharing Agreements

The ability to share data in a timely way was important for facilitating integrated care and safe access to relevant clinical and care records for those that need it.



Adaptation and scaling-up of previously tried solutions

Accelerated deployment of digital solutions (specifically remote triage and remote monitoring) delivered benefits to the system and to many people – but not all. For some people this exacerbated exclusion. Training for online / remote service providers and people receiving them is essential to maintain empathy, flexibility and quality of care.



Person-empowerment and self-care

The wide-scale shift to online communication and remote monitoring enabled some people to have more control over their self-care – but the shift to online was not appropriate or accessible for some people and risks exclusion.



Bespoke engagement necessary alongside digital

Blended service delivery is essential, offering people bespoke options so that their needs can be met. The provision of multiple channels of care allows diverse populations and individuals to access care on the basis of their needs and preferences.

Core findings for research were derived from the evidence and tested with stakeholders in a series of workshops



Unifying around a national priority

The common national priority of COVID-19 provided a focus for action which meant that clinical trials could be designed, approved, set up and implemented much more rapidly than standard processes. Accelerated deployment of research findings was also supported with rapidly generated evidence, efficiently developed guidelines and system-wide communication.



Awareness of research

Wide-scale awareness and acceptance of the need for more and better knowledge about COVID-19 (including its impacts, treatments and infection control) across professionals and the wider public helped to quickly attract and recruit volunteers to be part of the clinical trials.



Lack of diversity in trial recruitment

COVID-19 highlighted how people are affected differently by the virus. However, some groups particularly vulnerable to adverse impacts of the virus were potentially under-represented in some clinical trials.



Innovative trial delivery processes

Innovative changes to the way particular clinical trials were identified as a priority and subsequently approved led to faster delivery of those trials and deployment of the findings. Innovative ways to collect data from participants also proved to be effective in some trials.



Perception of research

Perceptions of research as an “academic” activity can act as a barrier to people wanting to learn more about research or be involved, and as a barrier for professionals to see it as an inherent part of their role in delivering better care.



Open publishing and pre-peer review

The shift further towards “Open Access” publishing (open to all) and publishing findings before formal peer review allowed information to be shared earlier – but this raises risks of misinterpretation or misuse that need to be managed.



Remote and on-line working

Remote and online working proved invaluable for Committees and collaborations to be set up and operate in a more flexible way. This led to a speeding up decision making and approval processes.

Core findings for collaborations and partnerships were derived from the evidence and tested with stakeholders in a series of workshops



Nationally and locally coordinated place-based collaboration

Public health needs in relation to COVID-19 varied across individuals and places. Local and national collaborations delivered place-based support to meet those needs, including addressing the social determinants of health.



Collaborating to find solutions quickly

The nationally recognised challenges in relation to COVID-19 brought the public sector, industry, regulators and the voluntary sector together to quickly find solutions across therapeutics; testing; diagnostics equipment; and protecting the vulnerable.



Access to skills and capacity

Partnerships brought together the skills and capacity needed to quickly meet particular clinical or social needs. Industry, the military, local authorities, voluntary organisations and communities were able to provide skills and resources to deliver outcomes that may not otherwise have been feasible, or only at a much slower pace.



Co-production of training and learning materials

The fast uptake and use of remote monitoring by some people was helped by partners (including the health and care professionals, industry and people with lived experiences) co-producing training and education materials, using the strengths of each partner.



Flexibility of existing partnerships

Existing partnerships were flexible to provide support to vulnerable groups and meet people's needs, at both a national and local place-based level. Not all new service delivery required new partnerships where existing partnerships could be repurposed to respond to COVID-19.



Clear communications using several methods

Consistent and clear communication is vital. Communication needs to be adapted to meet different needs (such as materials in different languages; engaging via faith groups or community groups; blending digital with non-digital): there is not a one size fits all option.



Importance of volunteers, charities and community groups

Individual volunteers, charities and the wider community groups have played a vital role in delivering a place-based response to COVID-19. However, pressure on funding sources poses a risk to the resilience of this service.

The insights from innovation, collaboration and research from this rapid review have been synthesised into six core findings across the areas

The core findings from the rapid review were analysed and presented at engagement events, inviting a wide group of stakeholders to discuss, consider and respond to the analysis. The findings are presented below.

Core finding

Clarity of purpose

A system-wide shared understanding of the need for action mobilises partners quickly and breaks down barriers to collaboration.

Leadership and agency

Beneficial change is accelerated by leadership that supports appropriate agency across organisational levels, and supports innovation and collaboration.

Inclusion and personalisation

Addressing health inequalities requires greater inclusion and involvement of diverse perspectives, and the better personalisation of services to different populations.

Skills and capability

Change was enabled by those who had appropriate skills to solve problems, then adapt to new ways of working.

Data and technology infrastructure

Critical enablers of rapid change included the safe and timely sharing of data, and appropriate and resilient technology infrastructure.

Evidence-based decision making

For impacts over time to be fully understood, there is a need for robust evaluation evidence to understand what works, for whom and under what circumstances.



AAC website: <https://www.england.nhs.uk/aac/>

AAC twitter: <https://twitter.com/aacinnovation>

BCN website: <https://www.england.nhs.uk/beneficial-changes-network/>

BCN twitter hashtag: #beneficialchanges

NHS Futures collaboration website: <https://future.nhs.uk/>

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