The AHSN Network

Perspective on Digital and Data Innovation

Prepared for the Hewitt review

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Purpose of this document:

Since 2013 the 15 Academic Health Science Networks (AHSNs), that form the AHSN Network, have been commissioned by the NHS to support and scale innovation across health and care. AHSNs have focused on developing evidence of what works in practice; key factors for success; and on designing and running programmes to apply these findings. Over this period, the AHSNs have worked with more than 2500 innovators and hundreds of teams implementing innovation. This document synthesises perspectives of key stakeholders across the AHSN Network with experience in digital innovation and data. This document is intended to provide input to the Hewitt Review to support accelerating innovation which improves patient care and staff experience and provides examples which are typical but not intended to be exhaustive. The document has links to web-documents available to provide more information. We have sought to address the following topics:

- What types of innovation require digital or data support and how can these be supported locally and nationally?
- What approaches are best to select and deploy technologies and how best can national and local teams support these?
- How can data analytics and operational research play in improvement?
- What scale is best for engagement on digital issues?
- How could we improve the capacity of the NHS and social care to identify and adopt technology which benefits patients and staff?

Key findings and recommendations:

What types of innovation require digital or data support?

Our experience highlights that most innovations require an element of digital change, so we define innovation broadly. Such change ranges from entirely new digital products, through reconfiguration of existing digital systems (e.g., electronic health records) to data generated or used in a different way. We typically see four types of innovation which are ready for spread and adoption which relate to:

- Digital therapeutics, self-management apps and web-based services;
- Sensor technologies and remote monitoring;
- Digital tools to improve efficiency;
- AI tools (many of which support the technologies above).

Firstly, there are many digital therapeutics and self-management apps, already available to provide elements of care. Although it is relatively easy to develop a new app or web-based service, the barriers to adoption have been high. Very few products simply slot into an existing pathway. Hence, AHSNs are approached by multiple innovators who believe that they have a product that is

'ready for adoption' but which require considerable focus to redesign pathways to incorporate them. These innovators also approach individual providers and ICSs, and this generates a large amount of work to review products and we are of the view that this work is best done once. National/central support to clarify data governance requirements, technical requirements and defining interchange standards (e.g., Digital Technology Assessment Criteria - DTAC) has been welcome and national support in these areas is useful.

However, as implementation locally often involves changing pathways of care and working across organisations, successful deployment of technology often requires careful analysis to understand and quantify benefits during pilots and careful management to fully realise benefits when rolling out these technologies. Relatively few of these have been fully evaluated but the National Institute for Health and Care Excellence (NICE) has recently approved Sleepio (MTG Guidance 70 - May 2022), a digital CBT program focused on improving people's sleep, and plans to conduct further reviews of classes of technologies via an Early Value Assessment approach which may make local implementation easier, which paves the way for local teams to implement them. There is also an opportunity to share learning from deployment of technology. Our experience is that this is best done with independent support rather than by vendors. Such support can be provided at local or regional levels (such as the Book-and-learn platform which combines products from four innovators support to develop a platform to deliver culturally-sensitive long-term condition management tools to reduce health inequity, delivered by the Health Innovation Network - HIN) where there is a need to tailor the products to pathways or where the product(s) is/are immature. Alternatively, support can be offered at a national level (such as NHS England's Global Digital Exemplar/Fast Follower programmes) which, in our opinion, work best where products are relatively well developed, but implementation is complex.

Secondly, many new sensor technologies and monitoring platforms are becoming available. These have a well-defined regulatory pathway to establish safety but less clear approaches to establishing value in a real-world setting. They have been the focus of recent funding as they clearly offer an opportunity to enable care at home or in lower-intensity settings of care where people are stable, but there is a benefit to identifying any deterioration early. The applicability of such sensors depends on the pathways of care used and this means that reviewing the market regularly with specific use cases in mind is helpful. This can be done at an ICS level, but it is often beneficial to share findings across ICSs. An example of this type of work is a review of "Home ambient temperature monitoring solutions for respiratory patient care" which was by the conducted by the Innovation Agency to support work to set up virtual wards in Cheshire and Merseyside ICS. Although this work is currently pre-publication, the approach and key insights have already been shared across the Network. Our experience is that this type of work must be tailored locally to the care pathways and

models of care. Some of these devices are subject to medical device regulation (e.g., pulse oximeters) but others fall outside these regulations (e.g., ambient air temperature sensors for use to support respiratory patients). All AHSNs have been supporting remote monitoring as part of their local work and other examples include work by Eastern AHSN on Technology-enabled care pathway transformation or work by Yorkshire and Humber AHSN to select 3 remote monitoring solutions to support homecare (included on p12-13 of their impact report). The work has been supported across the country through a National Learning Collaborative delivered by the AHSN network and funded and supported by NHSX, and since its merger with NHS England, the Transformation Directorate.

Where products are applied in practice, often a review of the sensors/remote monitoring in practice is required and this Real-World Evidence (RWE) generation to inform business cases is vital. The Health Innovation Network (the south London AHSN) has recently conducted a London-wide review of the use of six different remote monitoring solutions to identify deterioration in care homes to support section of which are/is the best approach. This type of work is often applicable across ICSs with a similar population base or environment. In this case the analysis was across five ICSs making up the NHSE London region, but comparable work could be conducted across rural ICSs in non-contiguous geographies. Further information is available on the HIN website and in social care press (Digital Social Care).

Thirdly, there are a range of digital tools to improve efficiency. Within this area we see systems which improve:

- Staff rostering and helping identify staff with specific skills (e.g., Lantum which was on the AHSN operated National Innovation Accelerator run by UCLP).
- Process automation including robotic process automation (RPA) and intelligent automation which have been applied in many industries to reduce administrative costs. There are several centres in England focused on applying this to healthcare but so far, the findings have been hard to scale as processes vary across provider organisations and require significant additional work at each site to implement these technologies. The AHSNs are supporting several companies to implement automation solutions for example:
- Kent, Surrey, Sussex (KSS) AHSN has worked with companies such as GP automate and Jiff Jaff to develop automation solutions
- The Health Innovation Network (HIN) has worked with NHSE and Digital First to run a grants programme to develop primary care automation technologies
- West of England AHSN has produced a report highlighting 7 local case studies where they have provided support to implement RPA

- Waiting list management (e.g., Vantage Health (now part of NEC Software Solutions) which supports referral management and waiting-list management which has been part of the AHSN DigitalHealth.London accelerator programme).
- Remote consultation software which can be applied to improve efficiency in a pathway. AHSNs are supporting analysis of multiple areas to identify which types of appointment are more efficient because of being performed online such as the work by the HIN to review Mental health consultations online.

Fourthly, several digital products are applying or beginning to use AI technology. Those which are most close to widespread adoption are often focused on narrow application of AI to develop algorithms to apply as part of the innovations above or on use of AI to interpret language and to provide insight where unstructured data is available. Although few of these are ready for widespread adoption at this time, Kent Surrey Sussex (KSS) AHSN has provided a roadmap and structured review of these technologies. Further national policy work is needed on the approach to regulating these products but as they require implementation and adapting within existing pathways.

The AI Roadmap, commissioned by Health Education England, and produced by Unity Insights (Formerly KSS AHSN Insights) identified the current presence of AI and data driven technologies in the NHS, their taxonomies, their spread and the workforce impact of these technologies. This built on the findings of the State of the Nation survey, on the use of AI in healthcare, led by KSS AHSN. This overview can be helpful in allowing ICSs to measure their own maturity in AI and data driven technologies among providers, and also help them look to other regions when thinking about adoption and spread of technologies in this area. We consider this a good example of how national teams can support local efforts to develop less mature technologies.
AI Roadmap Methodology and findings report (hee.nhs.uk)
HEE AI Roadmap Dashboard | Tableau Public

What approaches are best to select and deploy technologies:

The AHSNs work with innovators in many stages of development. In general, we see that the more developed the products or market for an innovation, the more useful national support is in selection, procurement and deployment of solutions. Historically, NHS England has selected and supported a number of products in this way through the Accelerated Access Collaborative (AAC) programmes and NHSX/NHS Digital programmes such as Global Digital Exemplar/Fast Follower programmes. We understand that NHS England commercial functions are currently seeking ways to improve procurement at a national level and the AHSNs are engaging with them to do this.

Where health and care services are seeking to solve a problem in a less developed market, we recommend conducting a needs assessment and market scan to identify what services are available. As digital technologies develop quickly this may need to be repeated periodically. To accelerate this all 15 AHSNs input together into a single pipeline of innovative companies (maintained at Health Innovation Manchester) which can be used to conduct market scans. Innovators can contact their local AHSN or the NHS Innovation Service to seek advice. Those innovators seeking advice are added to the pipeline. All 15 AHSNs have capabilities to deliver market scans and typically we encourage NHS organisations to share them. Examples of recent market scans can be provided if helpful (subject to approval from those who commissioned the review).

There are two areas where AHSNs are frequently approached by local providers and ICSs for support:

Firstly, where the market is less mature or products are less developed, as we see benefits in developing partnerships between innovators and health and care providers to develop new solutions. These are often local but benefit from early engagement with other regions to ensure that later spread and adoption is possible. Examples of approaches here have been AHSN support for virtual wards where different models have been developed by ICSs and providers across the country.

Secondly, where the market contains many different products which are difficult to compare in terms of effectiveness and what local training or pathway changes would be needed to implement them. An example area where AHSNs have been approached by multiple overlapping technologies are in apps to provide Cognitive Behavioural Therapy (CBT) many of which target specific conditions (e.g., Mahana which provides CBT for patients with Irritable Bowel Syndrome), or seek to provide CBT in a different way (e.g., Nerva) or provide more traditional CBT through a different medium (e.g., IESO). The products in this space evolve rapidly and our experience is that applicability to a local clinical need is best reviewed at the time the programme is developed but should build on previous work and hence naturally falls at the provider/ICS level but benefits from regional input on data standards, data exchange requirements and national support on technical requirements and data governance.

We have seen successful collaboration across ICSs spanning NHS England regional boundaries such as work by Yorkshire and Humber AHSN with Interweave Digital, which delivers the shared care record across five ICSs and is a good example of digital transformation that operates at different scales, from individual places through to multiple ICSs.

How can Data Analytics and Operational Research support digital innovation?

The use of data analytics, real-world evidence and operational research to support innovation and improvement is an area of opportunity for coming years. Although it is often highlighted that the NHS could make better use of data than most systems, due to the fact it is a nationally coordinated system with universal membership, we consider that the current data assets are not yet accessible enough to local systems and innovators. Due to the flows of patients across ICS/regional boundaries, collaborations between ICSs and across regions have been helpful and offer an opportunity for system improvement and as an appropriately managed resource to test innovation and establish the effectiveness of new products. Hence, we consider the efforts in this area related to:

A) The development of multi-modal data assets.
B) The development of capabilities and capacity to use the data assets to drive innovation and improvement.

Firstly, developing multi-modal linked data assets that are accessible, trustworthy and transparent, and made available in secure research environments that protect the privacy of individuals is an immediate priority being addressed nationally and regionally through the NHS England national Federated Data Platform (FDP) and regionally through the Sub-national Secure Data Environments for research (SDEs). AHSNs have played prominent roles in the delivery of several HDR UK Data Research Hubs, DARE UK sprint projects and are currently actively involved in the development of Sub-National Secure Data Environments (SNSDEs) as part of the NHSE Data for R&D programme. Examples of this include London, Manchester and the South West.

- London: three AHSNs (Imperial College Health Partners (ICHP), UCLPartners (UCLP) and the Health Innovation Network (HIN)) are working with five ICSs and the NHS England regional team to develop an SDE for use by research communities and (under strict governance) by innovators in the future in a programme spearheaded by ICHP.
- Manchester: Health Innovation Manchester (HinM) is supporting a wide range of digital initiatives including the development of the Greater Manchester shared care record and developing the SDE across the Manchester region.
- South West: the South West AHSN is part of a regional partnership which is developing the business case for a Great Western SDE across six ICSs (engaging numerous partners ranging across ICBs, universities, and research networks) – the platform would serve 5+ million people and support analysis to reduce health inequalities.

In each case the aim is for the SDE to harness the power of data to answer key research questions about regional health and care which cannot currently be answered through existing data platforms. Analysis of this data offers the

opportunity to address health inequalities and to understand the impact of innovation in the real-world. The AHSN Network is supporting spread of learning across regions to ensure that 'further out' regions can develop and use SDEs.

The development of national frameworks for FDP and SDE have been helpful in developing the infrastructure, but local implementation will require the development of research capabilities and capacity.

Secondly, AHSNs are supporting the development of an active data, business intelligence and research community. This community is needed to draw insight from the data. The mechanism to do this varies by region based on the higher education and research partners for each AHSN. Examples include a collaboration by HIN, ICHP and UCLP to support the OneLondon programme and the 4 clinical pathfinder projects being run across the capital. More information can be provided if helpful. Use-cases for SDE data identified at an ICS level include:

- Minimising re-admission and speeding patient return to independence by improving decision making in hospital;
- Developing, testing, and evaluating tools for assessing health risks of individuals in the population that can be deployed by ICSs;
- Evaluating locally-deployed, early-stage interventions designed to promote health and prevent disease, to guide future commissioning and intervention design;
- Assessing treatment efficacy and the personal factors that may influence treatment recommendations; Improving the methodological approaches for using linked patient record data to support improvements to research and care.

Although the questions asked tend to be local, there is opportunity to spread lessons learned across ICS footprints either regionally or in geographically non-contiguous footprints e.g., across ICSs with predominantly rural populations, or across ICSs with operationally challenged / 'SOF4' rated providers. AHSNs have typically done this through communities of practice and learning collaborative approaches.

What scale is best for engagement on digital issues?

Across the AHSN Network we consider digital and data as enablers for innovation which support transforming patient pathways with a focus on improving outcomes. Hence engagement with local populations on what the priorities for improvement are and what data can be used for is critical. This local engagement can build on and add to national priorities such as Core20PLUS5.

Most AHSNs have supported local public and patient involvement across innovations. Examples include:

- Eastern AHSN: supported programmes such as "Gut Reaction" HDR Hub for Inflammatory Bowel Disease and won the HDR UK Award for excellence in PPIE and where all 10 Healthwatch organisations in the East of England are part of the Secure Data Environments (SDE) programme.
- South West AHSN: led work to learn from patient and public voices relating to emerging digital technologies, such as through a collaboration with Engaging Communities South West on the impact of video consultations on digitally excluded people (report here). SWAHSN is also developing a pilot approach to identifying specific challenges and applying learning to 'nearest neighbour'. This is a way of matching sites, for example within coastal and rural communities, with other localities with similar conditions and challenges to exchange insights which support adoption and spread of innovation. In partnership with ICSs, we are now building on discovery work at primary care level to explore wider sharing of learning with 'nearest neighbours' at a national level.

How could we improve the capacity of the NHS and social care to identify and adopt technology which benefits patients and staff?

The discussion so far has highlighted challenges in adopting innovation. However, there are many successful examples of innovation and spread from which to learn lessons.

Firstly, many NHS organisations have teams focused on the spread and adoption of innovation. These teams typically employ a variety of techniques including QSIR and IHI model for improvement implemented using PRINCE 2 and Agile project management techniques. Our experience is that use of flexible implementation techniques together with clarity about benefits to be achieved and metrics to measure them have been key. The flexibility enables tailoring to local circumstances and the use of common metrics supports comparison across regions and targeting support where benefits have not been easy to achieve. AHSNs are often able to support the design of programmes and the evaluation of benefits realisation using academic partnerships and in-house evaluation teams across the Network. We consider that regional or national support is best employed defining benefits to be achieved and selecting consistent metrics to measure.

Secondly, adoption within a region is often driven by passionate clinicians who are able to influence their peers. The AHSNs provide several capability building programmes to support intrapreneurs who will take products and develop them in pathways (such as the DH.L Digital Pioneers programme which supports clinicians to understand innovation and engage IT and finance leaders to develop robust business cases and implementation plans). These short courses and ongoing mentoring/support complement longer national programmes such as the national Clinical Entrepreneurs Programme or the Digital Academy.

Thirdly, national payment mechanisms which accelerate adoption are easier to deploy; for example, the Accelerated Access Collaborative (AAC) programmes (with Innovation and Technology Payment (ITP) products, which were reimbursed), were easier to deploy than later programmes such as Rapid Uptake Products (RUP) or Med Tech Funding Mandate (MTFM) which were not reimbursed. Further programmes could use national contingent reimbursement mechanisms or draw from national funding routes. Our experience suggests that nationally mandating capturing data on use, effectiveness and outcomes as part of funding supports adoption and real-world evidence development, but having independent local partners with academic, research and evaluation capabilities is essential to success. AHSNs have supported local organisations with bids for such funds and in performing evaluations.

Fourthly, where little local tailoring is required to adopt an innovation, we have seen great value in blueprinting deployments and sharing these (which can be performed at local, regional or national level). However, where local tailoring is needed project by project support is often local and sharing learning through communities of practice or learning collaboratives (such as the Patient Safety Collaborative) have been useful approaches. The Health Foundation has commissioned the Health Innovation Network (HIN) to build capacity to lead Communities of Practice to build capacity to spread innovation across geographies. Additional information is available from the HIN website.

Although an individual ICS could develop an effective research and innovation strategy, coordinating with others around research footprints that offer an opportunity to make use of existing infrastructure (e.g., around the NIHR Applied Research Collaborative footprints). In other areas, where research infrastructure is less developed, AHSNs have been able to support development of research and innovation strategies. For example, South West AHSN is facilitating the development of a Regional Innovation Strategy (RIS) on behalf of regional ICBs, university and research network partners to catalyse inward investment around 3-5 focus priorities. This builds on regional work led by South West AHSN since 2018 (more information is available on the South West AHSN website) to systematise innovation and improvement and addresses distinctive local challenges in our rural and coastal communities.

Conclusion

Through our discussions with experts across the AHSN Network we believe the below 12 key points from our four discussion points are vital for the future landscape of digital and data innovation in the UK health and social care sector.

What types of innovation require digital or data support and how can these be supported locally and nationally?

1. There are many digital therapeutics already available to provide elements of care but the barriers to adoption have been high as very few products simply slot into an existing pathway. As implementation locally often involves changing pathways of care and working across organisations, successful deployment of technology often requires careful analysis to understand and quantify benefits during pilots which is where AHSNs can help.
2. Many new sensor technologies and monitoring platforms are becoming available but their applicability depends on the pathways of care used and so reviewing the market regularly with specific use cases in mind is helpful. Where products are applied in practice, often a review of the sensors/remote monitoring in practice is required and this Real-World Evidence (RWE) generation to inform business cases is vital.
3. There are a range of digital tools to improve efficiency in areas including staff rostering, process automation, waiting list management and remote consultations.
4. Several digital products are applying or beginning to use AI technology. Those which are most close to widespread adoption are often focused on narrow application of AI to develop algorithms to apply as part of the innovations above or on use of AI to interpret language and to provide insight where unstructured data is available.

What approaches are best to select and deploy technologies and how best can national and local teams support these?

There are two areas where AHSNs are frequently approached by local providers and ICSs for support:

5. Where the market is less mature or products are less developed, as we see benefits in developing partnerships between innovators and health and care providers to develop new solutions.
6. Secondly, where the market contains many different products which are difficult to compare in terms of effectiveness and what local training or pathway changes would be needed to implement them.

How can data analytics and operational research play in improvement?

The use of data analytics, real-world evidence and operational research to support innovation and improvement is an area of opportunity for coming years.

We consider that the current data assets are not yet accessible enough to local systems and innovators. Hence, we consider the efforts in this area related to:

7. Developing multi-modal linked data assets that are accessible, trustworthy and transparent, and made available in secure research environments that protect the privacy of individuals is an immediate priority being addressed nationally and regionally through the NHSE national Federated Data Platform (FDP) and regionally through the Sub-national Secure Data Environments for research (SDEs). The aim is for the SDE to harness the power of data to answer research questions about regional health and care which cannot be answered through existing data platforms. Analysis of this data offers the opportunity to address health inequalities and to understand the impact of innovation in the real-world.

8. AHSNs are supporting the data and research community needed to draw insight from the data. The mechanism to do this varies by region based on the higher education and research partners for each AHSN.

What scale is best for engagement on digital issues?

Across the AHSN Network we consider digital and data as enablers for innovation which support transforming patient pathways with a focus on improving outcomes. Hence engagement with local populations on what the priorities for improvement are and what data can be used for is critical. This local engagement can build on and add to national priorities such as Core20PLUS5.

How could we improve the capacity of the NHS and social care to identify and adopt technology which benefits patients and staff?

9. Many NHS organisations have teams focused on the spread of adoption of innovation, typically employing improvement and project management techniques. Our experience shows flexible implementation techniques enables tailoring to local circumstances and the use of common metrics supports targeting support. AHSNs are often able to support the design of programmes and the evaluation of benefits realisation using academic partnerships and in-house evaluation teams across the Network. We consider that regional or national support is best employed defining benefits to be achieved and selecting consistent metrics to measure.
10. Adoption within a region is often driven by passionate clinicians who are able to influence their peers. The AHSNs provide several capability building programmes to support intrapreneurs who will take products and develop them in pathways.

11. National payment mechanisms which accelerate adoption are easier to deploy. Our experience suggests nationally mandating capturing data on use, effectiveness and outcomes as part of funding, supports adoption and real-world evidence development, but having independent local partners with academic, research and evaluation capabilities is essential to success. AHSNs have supported local organisations with bids and in performing evaluations.
12. Where minimal local tailoring is required to adopt an innovation, there is great value in blueprinting deployments and sharing these. However, where local tailoring is needed project-by-project support is often local and sharing learning through communities of practice or learning collaboratives (such as the Patient Safety Collaborative) have been useful. Similarly, although individual ICSs could develop an effective research and innovation strategy, coordinating with others around research footprints offers an opportunity to make use of existing infrastructure (e.g., around the NIHR Applied Research Collaborative footprints).

Focusing on these 12 points will ensure the UK remains at the forefront of creative technical solutions which drive proven benefits for patients and staff.

Contributors:

- **Dr. Rishi Das-Gupta** – Chief Executive, Health Innovation Network (AHSN Network digital lead)
- **Dr. Hatim Abdelhussein** – Clinical Director, Kent Surrey and Sussex AHSN and National Clinical lead (AI and Digital Medical Workforce) HEE
- **Mark Avery** – Director of Health Informatics, Eastern AHSN and Cambridge University Health Partners
- **Dave Belshaw** – Digital Transformation Director, AHSN North East and North Cumbria
- **Maja Jorgensen** – Programme manager, South West AHSN
- **David Kryl** – Director of Insights, Wessex AHSN
- **Thomas Llewellyn** – West Midlands AHSN
- **Tracey Marriott** – Innovation Adoption Director, Oxford AHSN
- **Melissa Ream** – AI Adviser, Kent Surrey Sussex AHSN
- **Laura Rooney** – Director of Strategy, Health Innovation Manchester
- **Darragh Twomey** – Programme Manager Digital Transformation and Technology, Health Innovation Network
- **Michael Watson** – Digital lead, East Midlands AHSN
- **Phil Waywell** – Director of Digital Partnerships, Yorkshire and Humber AHSN
- **Jenni West –** Associate Director for Digital, Innovation Agency AHSN