Service Transformation through Digital:

a Strategy 2020-2025

September 2020

@Digicare4North

Aberdeen City Health & Social Care Partnership
A caring partnership

Aberdeenshire Health & Social Care Partnership

HEALTH & SOCIAL CARE MORAY

NHS Grampian

"As a citizen I have access to the digital information, tools and services I need to help maintain and improve my health and wellbeing. I expect my health and social care information to be captured electronically, integrated and shared securely to assist service staff and carers that need to see it…"[1]
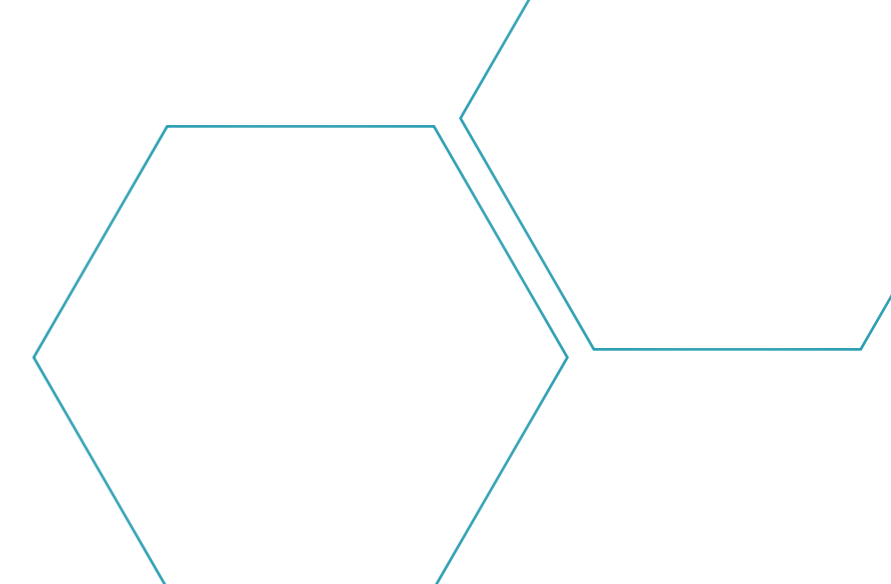
"As a member of staff I have access to the digital information, tools and services that I need to fulfil my work, wherever that may be. Access to these resources helps me provide great care for my patients and clients."

"As a member of the NHS Grampian board I am confident that, through the adoption of digital technology, we now provide the best quality health and care to our patients."

[1] The Vision. Scotland's Digital Health & Care Strategy. https://beta.gov.scot/publications/scotlands-digital-health-care-strategy-enabling-connecting-empowering/

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Foreword

Since starting the process of creating an integrated Digital Health and Care Strategy, I have been very impressed by the enthusiasm shown by the wide range of clinical, support staff, public and partner organisations in Grampian that have been actively involved in its co-creation.

This document describes how NHS Grampian and partners will exploit digital technology to improve health and care, to enable staff to work to the best of their abilities and to support financial sustainability.

This strategy is an evolving document and the intention is that it will keep pace with clinical need and digital technology advances; we will continually use the opportunities for innovation and transformation that digital technology offers.

The Digital Health and Care strategy sets out a roadmap for the next five years for how we will adopt new ways of working through the implementation of new technology. This will be challenging. However, digital technology plays a significant part in supporting the NHS Grampian Clinical Strategy and it will enable us to deliver high quality, safe, effective and person centred services.

The overall vision of this strategy is to enable and deliver a digital system wide approach across health and social care, that supports our workforce to become digitally confident in providing efficient care for everyone who needs it.

We will continue to engage and work closely with a wide range of stakeholders to ensure that we deliver solutions that are fit for purpose and enhance the experience by creating a digitally enabled health and care system.
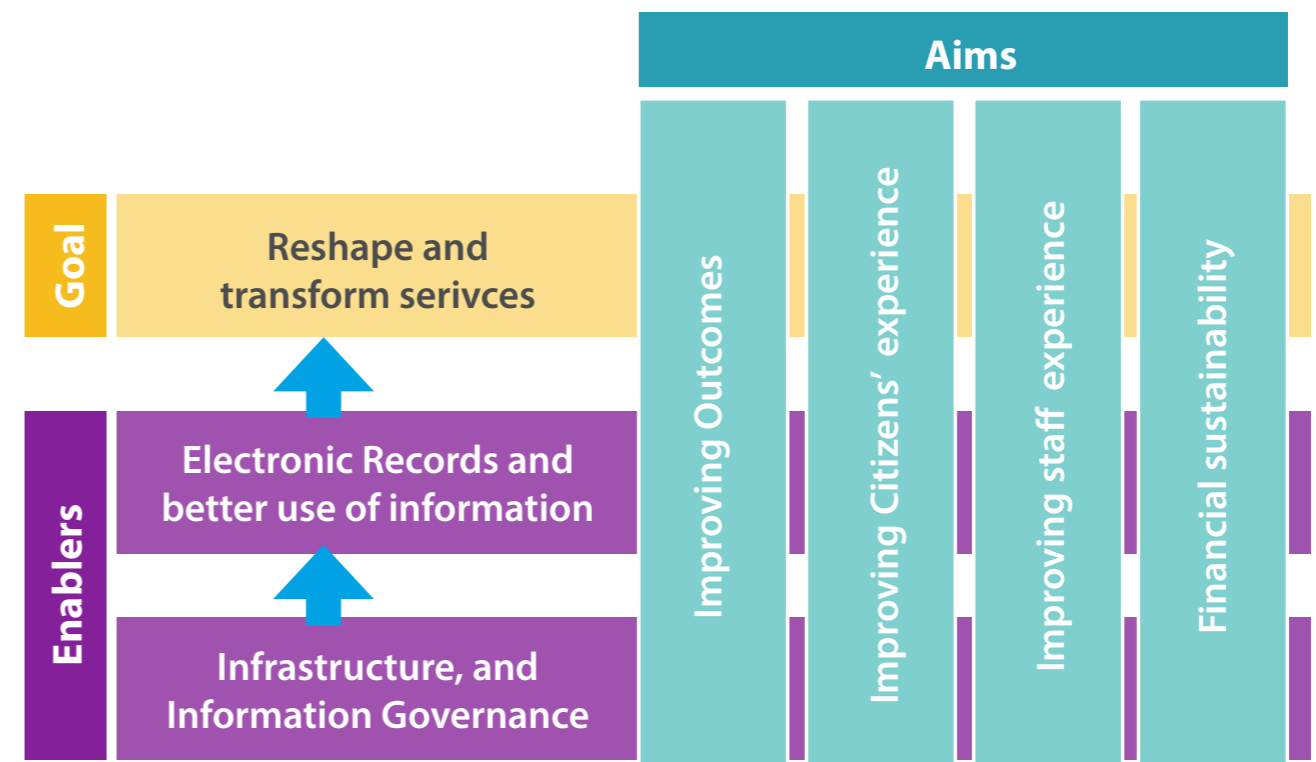
Paul Allen
Director of Facilities & eHealth

Summary – Strategy on a page

This strategy describes how NHS Grampian and partners will exploit digital technology to improve health and care, enable staff to work to the best of their abilities and support financial sustainability.

The goal is to modernise services. To do this will require universal adoption of electronic records and for relevant information to be accessible to all who need to see it – citizens, clinicians, care providers and analysts. In turn, those electronic systems need to be safe, secure, accessible and reliable.

Aims

Goal — Reshape and transform serivces	Improving Outcomes	Improving Citizens' experience	Improving staff experience	Financial sustainability
Enablers — Electronic Records and better use of information				
Infrastructure, and Information Governance				

Section 1 – setting the scene

Introduction

When the NHS was founded, 2020 was the distant future. As the millennium dawned, the year became a useful optometry pun for documents setting out a confident strategic vision. Now that the year has arrived and we're in the midst of the coronavirus pandemic, the future is no clearer than it was in the 1940s; but we know the immediate challenges we have to deal with.

The **National** and Grampian Clinical Strategies describe the demographic changes that are increasing demands on the health and care sectors: people living longer independent lives but also living with multiple chronic conditions, a shrinking workforce relative to the rising demand, and budgets that barely keep up with inflation. And, in the short-medium term we have the requirements for managing the pandemic.

The clinical strategies and the strategic plans of Grampian's Health & Social Care Partnerships agree on the fundamental principle that people should be supported to remain active and well and to manage their own health and care issues much more so than at present; thus maintaining their independence and quality of life. Where possible, unscheduled care should shift to planned care, planned care should shift to self-management and self-management should shift to prevention.
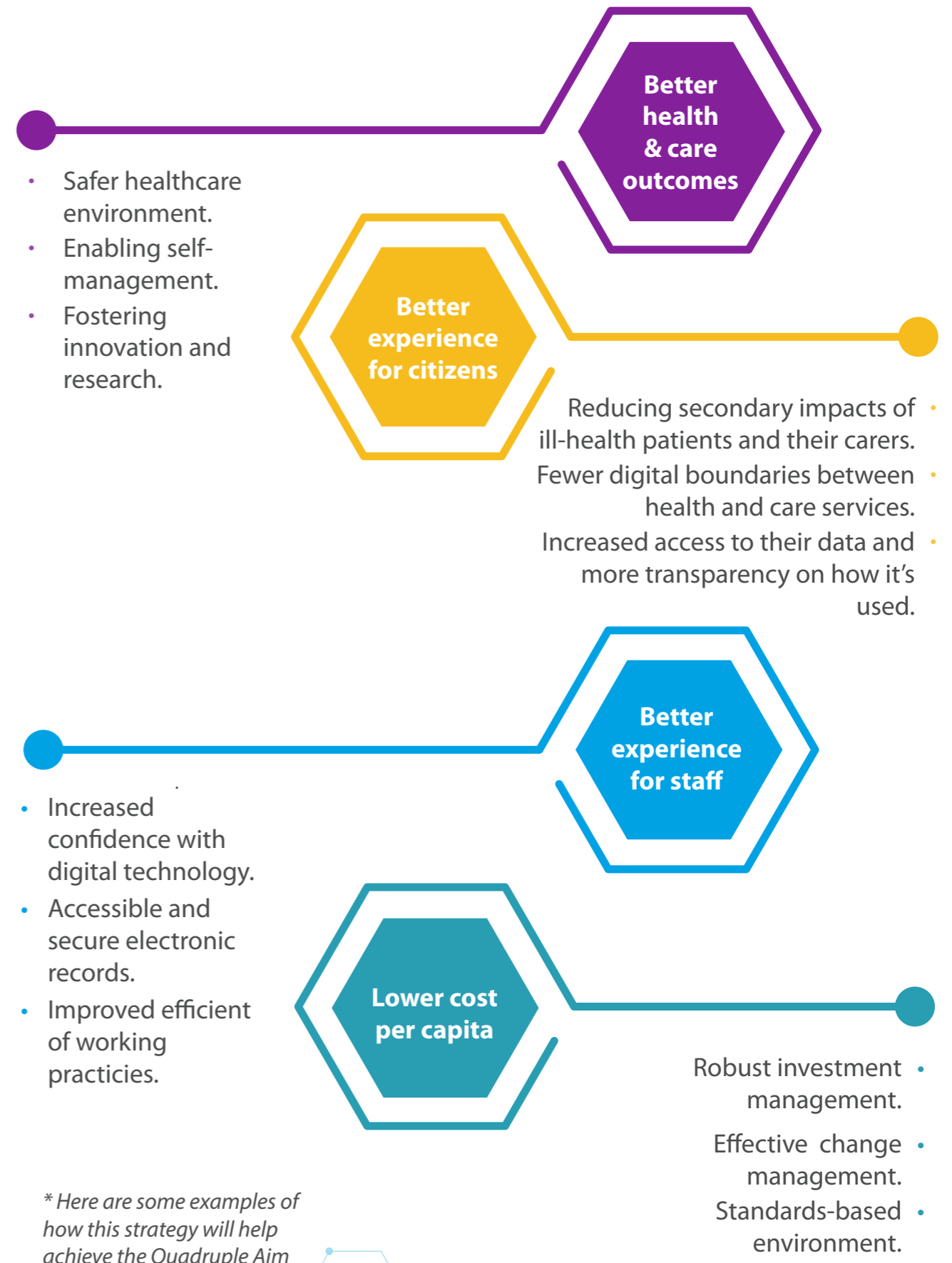
The purpose of this change in emphasis can be summarised using the **Quadruple Aim** - the requirement for organisations to simultaneously achieve:

1. Better health and social care outcomes – longer, healthier, more contented lives.
2. A better experience of health and social care for citizens – less stress, easier interactions.
3. A better experience for staff – supporting people to work to the best of their abilities
4. Affordable health and care services – sustainable long-term financial planning

The clinical strategies and strategic plans make it clear that the necessary shifts in care, self-management and prevention can only come about through the better use of digital technology. Which needs to change from being a bonus add-on for someone else to deal with to being the essential, normal enabler of care delivery, self-management and prevention in every setting.

This strategy outlines how, over the next five years, digital technology will enable the success of the clinical strategies and strategic plans and allow us to work towards the Quadruple Aim.

Quadruple Aim

Better health & care outcomes

- Safer healthcare environment.
- Enabling self-management.
- Fostering innovation and research.

Better experience for citizens

- Reducing secondary impacts of ill-health patients and their carers.
- Fewer digital boundaries between health and care services.
- Increased access to their data and more transparency on how it's used.

Better experience for staff

- Increased confidence with digital technology.
- Accessible and secure electronic records.
- Improved efficient of working practicies.

Lower cost per capita

- Robust investment management.
- Effective change management.
- Standards-based environment.

* Here are some examples of how this strategy will help achieve the Quadruple Aim

Case studies

A citizen's experience in 2020 and in 2025

Angus' experience in early 2020

Angus is 79 years old and lives with his husband in Crathes. He has Chronic Obstructive Pulmonary Disease (COPD), Ischaemic Heart Disease and Type 2 Diabetes. His GP manages these conditions, his pharmacist in Ballater dispenses the medication and he sees his optometrist and ophthalmologist as needed due to his Diabetic eye disease.

Angus and his husband go on a relaxing minibreak to Forres but Angus forgets to pack some of his pills. He goes to a pharmacy in the town to get a new supply but can't remember everything he's taking and the pharmacist can't look up his GP's medication list as she has no direct access to the Emergency Care Summary. As it's a Saturday, Angus is advised to call his GP on Monday to get an updated medication list to bring in to the pharmacy.

On the Monday morning Angus accidentally walks into the trouser press in their hotel room and realises that he's lost some vision in one eye. He goes to the local optometrist who asks what eye problems he has. Angus can't give a lot of detail and the optometrist has no access to previous retinal imaging or letters from ophthalmology so the optometrist's assessment is inconclusive. The optometrist refers Angus urgently to Dr Gray's Hospital where he's admitted with a suspected stroke. The admitting team can see the GP's medication list via TrakCare but no more of the GP's record. They need to obtain a problem list from Angus's husband Michael as Angus is now having difficulty speaking. The CT scan is a little inconclusive and Angus isn't thrombolysed.

Angus's symptoms stabilise after a couple of days and he's discharged home with follow up arranged at the stroke service in 1 month. He has some difficulties washing so has once daily home care arranged.

Angus is restricted from driving after his stroke so gets the bus to Aberdeen for his follow up appointment where the scan results and other investigations are discussed. He then gets the bus home. In the meantime the carer has visited, was unable to gain access and has called the police, concerned that Angus has been incapacitated by another stroke.

Angus' experience in early 2025

Angus is 79 years old and lives with his husband in Crathes. He has Chronic Obstructive Pulmonary Disease (COPD), Ischaemic Heart Disease and Type 2 Diabetes. His GP manages these conditions, his pharmacist in Ballater dispenses the medication and he sees his optometrist and ophthalmologist as needed due to his Diabetic eye disease. Angus and his husband use My Health & Care, the national citizen portal, to look up their test results, read clinic letters and medication lists and manage appointments. They can use NHS Messaging to send questions to their various care providers. Angus can complete symptom questionnaires in advance of appointments and blood sugars are automatically loaded to the platform from his glucometer.

Angus can review any anticipatory care plans that have been drafted for him, leave comments and make changes. My Health & Care supports Angus to manage his conditions and stay well.

Angus and his husband go on a relaxing Christmas minibreak to Forres but Angus forgets to pack some of his pills. He goes to a pharmacy in the town and accesses My Health & Care on his phone to tell the pharmacist what he's forgotten to bring. The pharmacist can access Angus' National Medication Record that allows her to confirm and dispense the forgotten medication. This dispensing information is automatically updated in Angus' My Health & Care Record.

After a few pleasant days, Angus and his husband drive home.

A staff member's experience in 2020 and 2025

Agnieska's experience in early 2020

Agnieska is a homecare practitioner in Fraserburgh. One dark, windy February morning she visits her client Mary but gets no response at the door despite knocking repeatedly and then phoning. She can see that a light is on in the lounge. She goes back to her car and calls the Care Management Office to see if they know what the situation is. The Care Manager hasn't heard of any problems with Mary and asks Agnieska to wait while they check with the hospital. Agnieska realises that she's going to be late for her next client Bob. She fills in some paperwork and wonders if she should just phone the police and ask them to investigate – perhaps Mary has collapsed in the house?

Agnieska's Care Manager calls back. Mary was admitted to ARI last night with a chest infection and she's likely to be in hospital for a few days.

Agnieska carries on with her visits. Now that she's running late she's not going to have much of a lunch break.

Agnieska's experience in early 2025

Agnieska is a homecare practitioner in Fraserburgh. One dark, windy February morning she is preparing to set out on her visits and checks her tablet to run through the morning's clients. She sees that Mary was admitted to Fraserburgh hospital last night and that her client visit list has been rearranged for the day. Mary's predicted length of stay is two days and Agnieska can see that Mary will be getting an intensified support package for the few days after she gets home. Agnieska knows that Mary's son David, who lives in Plymouth and has health power of attorney, will be able to see his mum's care plan when he logs in to the My Health & Care system via proxy access.

Agnieska heads out on her visits. The technology she uses now means that she has slightly more time to spend with her clients and is more likely to get a lunch break herself.

Other differences in 2025

- When Angus visits his optometrist she can, with Angus' consent, see imaging and correspondence from any ophthalmology department in Scotland.

  Clinical updates the optometrist contributes will then be accessible to Angus' ophthalmologist. Angus, of course, will be able to see much of this data when he looks at My Health & Care.

- Hospital-based clinicians can see much more background information about Angus – GP summaries, vaccinations, problem lists and details of any care package he might have. The hospital team can also access the What Matters to Me information that Angus has added.

- Radiology imaging – X-rays etc, is now enhanced by augmented intelligence. If Angus needs a CT scan of his head, software will speed the reporting process - highlighting areas that need a closer look by a human and identifying other scans as probably normal.

- When NHS Messaging isn't sufficient, people will still need a consultation with their health or care professional. These are now conducted by phone or video by default; 'Reducing the Burden of Care' is embedded in the culture and this includes avoiding unnecessary travel.

- When the hospital specialist advises a blood test, she can arrange to have the sample taken close to where Angus lives, rather than him having to come in to hospital. The result then gets pushed back to her.

- Angus uses connected medical devices such as a Blood Pressure monitor and glucometer that send data to his record. This information will can be viewed in real time by clinicians if required, for example during a call to the out-of-hours service.

- Mary is admitted to Fraserburgh Hospital instead of ARI when her chest infection is too bad to be managed at home. Point of care blood tests and vital signs automatically loaded to her electronic record are used to monitor progress. The specialist nurse in Aberdeen can see how she's getting on and has a video call with her and her son in Plymouth to help plan her discharge.

  Enabling Mary to be managed at their community hospital supports the local economy and makes it easier for her friends to visit.

- The National Vaccination Record, created in response to the coronavirus pandemic, has allowed all information on vaccines to be stored in one place – reducing the chance of a missed dose or unnecessary injections for Angus and Mary.

What are the drivers for increasing the use of IT in health and care?

The success of our clinical strategies and strategic plans rely on the greater adoption of digital technology. However, there are multiple other drivers covering areas such as law, economics and the environment. These are summarised here, with a fuller assessment to be found in the appendix.

Political
National and local government policies, existing organisational, regional and national strategies; often with digital as an enabler.

Economic
Shifting the balance of the local economy away from oil and gas and towards life sciences and digital technologies.

Social
Increasing assumptions that the health and social care sector should adopt the digital technologies used elsewhere.

Technology
Increasing capability of technology to meet our needs, and its increasing accessibility to staff and citizens.

Legal
The need to comply with new legislation on data protection and network security, while enabling appropriate access.

Environmental
The need to reduce the carbon footprint of health and social care.

Section 2 – delivering the strategy

Introduction

"Health and care organisations, and those in charge of running health care systems, such as those within the National Health Services in the UK, need to understand that it is no longer appropriate to treat information technology as something separate from their core business."

Dr Mark Wardle, Chair, NHS Wales Technical Standards Board. 2018

"There isn't a single part of our health and social care system that doesn't rely on some form of technology to deliver excellent care. It's transforming it every day."

Caroline Lamb, Director of Digital Reform & Service Development, Scottish Government. 2020
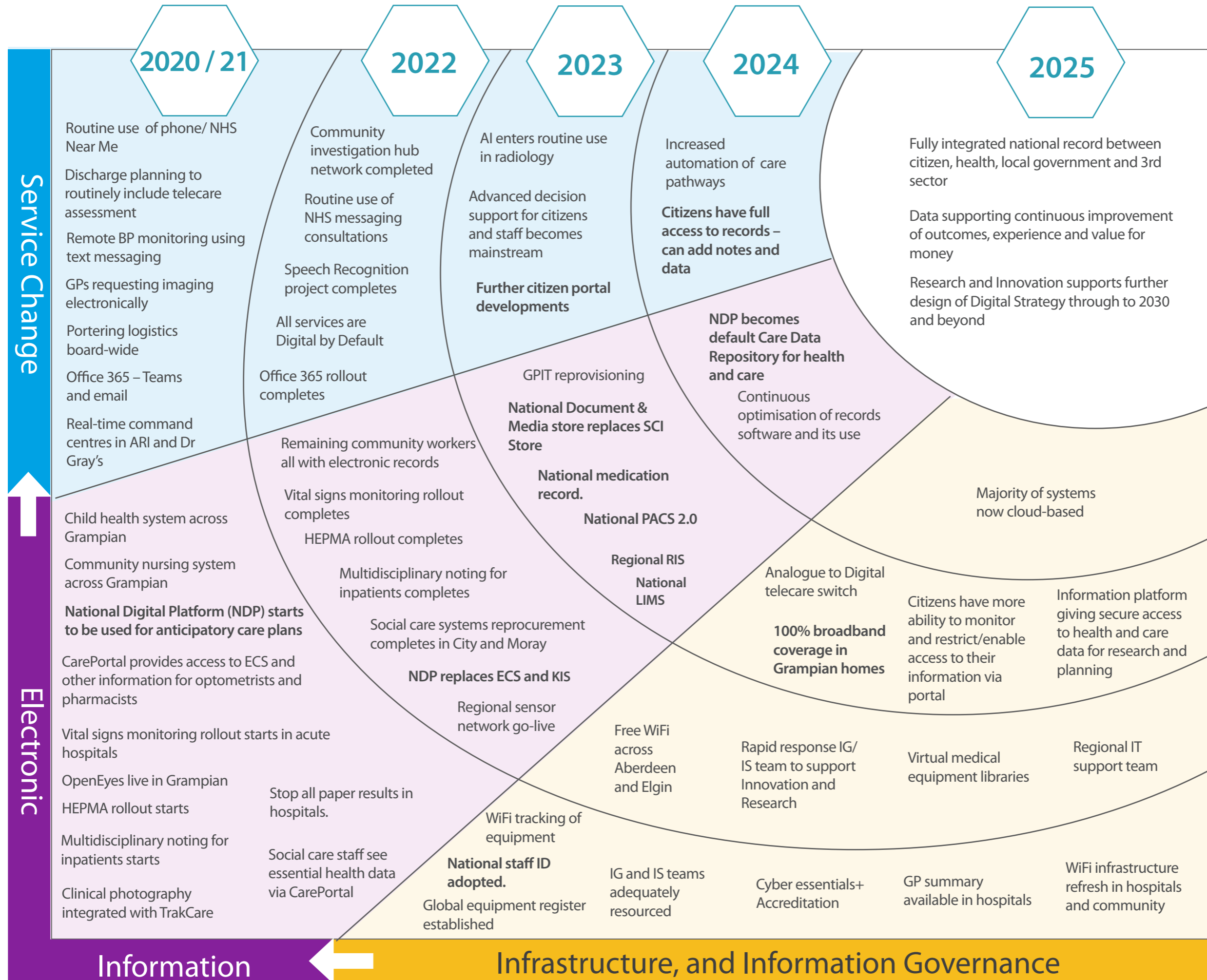
Our aim is to transform health and care services through increased use of digital technology. The first part of this section gives examples of how services could be transformed and how this could improve the lives of staff and citizens.

Transforming services requires us to improve the way we work with data and information, ensuring that all staff and citizens have access to the information they need and can access it where they need to. Data arising from health and care encounters will need to be learned from – to improve the quality and efficiency of care. The second part of this section gives examples of how we will improve the ways we work with data and information.

And if we are to make increased use of electronic records and other digital tools then they will need to be well supported, run on reliable infrastructure and be compliant with all necessary cybersecurity and data protection legislation. The final part of this section gives some examples of how we will achieve that.

Strategy Roadmap 2020-2025

Service Change → **Electronic** → **Information** → **Infrastructure, and Information Governance**

2020 / 21

- Routine use of phone/ NHS Near Me
- Discharge planning to routinely include telecare assessment
- Remote BP monitoring using text messaging
- GPs requesting imaging electronically
- Portering logistics board-wide
- Office 365 – Teams and email
- Real-time command centres in ARI and Dr Gray's

- Child health system across Grampian
- Community nursing system across Grampian
- **National Digital Platform (NDP) starts to be used for anticipatory care plans**
- CarePortal provides access to ECS and other information for optometrists and pharmacists
- Vital signs monitoring rollout starts in acute hospitals
- OpenEyes live in Grampian
- HEPMA rollout starts
- Multidisciplinary noting for inpatients starts
- Clinical photography integrated with TrakCare

2022

- Community investigation hub network completed
- Routine use of NHS messaging consultations
- Speech Recognition project completes
- All services are Digital by Default
- Office 365 rollout completes

- Remaining community workers all with electronic records
- Vital signs monitoring rollout completes
- HEPMA rollout completes
- Multidisciplinary noting for inpatients completes
- Social care systems reprocurement completes in City and Moray
- **NDP replaces ECS and KIS**
- Regional sensor network go-live

- Stop all paper results in hospitals.
- Social care staff see essential health data via CarePortal
- WiFi tracking of equipment
- **National staff ID adopted.**
- Global equipment register established

2023

- AI enters routine use in radiology
- Advanced decision support for citizens and staff becomes mainstream
- **Further citizen portal developments**

- GPIT reprovisioning
- **National Document & Media store replaces SCI Store**
- **National medication record.**
- **National PACS 2.0**
- **Regional RIS**
- **National LIMS**

- Free WiFi across Aberdeen and Elgin
- IG and IS teams adequately resourced

2024

- Increased automation of care pathways
- **Citizens have full access to records – can add notes and data**

- **NDP becomes default Care Data Repository for health and care**
- Continuous optimisation of records software and its use

- Analogue to Digital telecare switch
- **100% broadband coverage in Grampian homes**
- Rapid response IG/IS team to support Innovation and Research
- Cyber essentials+ Accreditation

- Citizens have more ability to monitor and restrict/enable access to their information via portal
- Virtual medical equipment libraries
- GP summary available in hospitals

2025

- Fully integrated national record between citizen, health, local government and 3rd sector
- Data supporting continuous improvement of outcomes, experience and value for money
- Research and Innovation supports further design of Digital Strategy through to 2030 and beyond

- Majority of systems now cloud-based

- Information platform giving secure access to health and care data for research and planning
- Regional IT support team
- WiFi infrastructure refresh in hospitals and community

Grampian Digital Health & Care Strategy 2020-2025

GPIT	General Practice IT systems
HEPMA	Hospital Electronic Prescribing and Medicines Administration
NDP	National Digital Platform
ECS	Emergency Care Summary
KIS	Key Information Summary
PACS	Picture Archive and Communications System
IG/IS	Information Governance and Information Security
LIMS	Laboratory Information Management System
RIS	Radiology Information System
SCI Store	Scottish Care Information Store
AI	Artificial/Augmented Intelligence

Bold items are particularly dependent on national developments

1. Co-designed Service Transformation

The Modern Outpatient Programme, The Access Collaborative, the Clinical Strategies and the Elective Care programme all imagine health and care being delivered in new ways – more convenient for the patient, more effectively using staff time and more efficiently using resources.

The Scottish Approach to Service Design mandates us to involve people who will use a service in its design – staff, patients and other service users.

An imperative is to build in digital technology from the earliest planning stages of a new service and use this to maximise efficiency and quality. The data arising from the service should then be used to drive research and continuous service improvement.

Fairer Scotland Duty: Socio- economic deprivation

The Fairer Scotland Duty requires public bodies such as NHS Grampian and Health and Social Care Partnerships, when making strategic decisions, to take account of the need to improve equity of health and social care outcomes for areas of multiple deprivation.

Some patients in socio-economically deprived areas may not be able to afford the hardware or revenue costs to access the new services and data. This could make the gap in health and social care outcomes much wider for patients in these areas.

To overcome this issue, additional staffing resources and support will be provided in areas of socio-economic deprivation. Staff will be trained not to assume that every patient has a smart phone or internet access. In addition, computers will be available in GP Practices and clinics accessible to the public where patients can access on-line health and social care services and check their results, free of charge.

Supporting Self-management

We need flexible ways of providing education and other support for people with chronic diseases.

Changes to expect include:

- Improving Digital Literacy - more partnership working with libraries and third-sector organisations to support patients to adopt digital technology.
- We will embed proven support technologies such as Florence and Inhealthcare in to routine care. This means that patients can get feedback on their health condition, such as when their blood pressure or weight is outside an acceptable range.
- We will be an early adopter of NHS Messaging technologies. Sometimes referred to as Asynchronous Consulting, these provide ways for patients to securely write and ask for advice from their care providers, perhaps sending in photos for review. This means that some of clinicians' time will need to be allocated to dealing with these queries instead of seeing patients.
- We will support trials of other innovative products that facilitate self-management, including appointment management.
- Where patient information videos have already been created by NHS Grampian, these will be made available on accessible platforms such as YouTube

Telehealth and telecare

Telehealth is the provision of healthcare at a distance. This includes a range of techniques such as home and mobile health monitoring, teleconsultations by phone or video and even the use of remote controlled carts to do ward rounds and consultations in a distant hospital or care home.

Telehealth can reduce inconvenience to patients, save time for staff, reduce the carbon footprint of healthcare and reduce the spread of respiratory infections. Its use during the coronavirus pandemic has increased significantly.

Telecare enables a person to remain in a homelike setting, maintaining independence through remote monitoring and support. This includes a wide range of services such as sensors for monitoring the environment, fall detectors and community alarms.

Examples

Building on our long history of leading in the area of video-conferencing, NHS Grampian was the first health board in Scotland to use the NHS Near Me (Attend Anywhere) videoconsulting platform. The coronavirus pandemic further scaled up our adoption of telemedicine and it now represents a large proportion of consultations.

The coronavirus pandemic has led to widespread adoption of Virtual Visiting. Allowing hospitalised patients and people in care homes to keep in touch with their loved ones.

Each Health and Social Care Partnership within Grampian has a long tradition of operating a telecare and community alarm service. These provide a range of sensor-based tools that can help services in the assessment of the abilities and risks of people to live independently at home, support safe and timely discharge home from hospital, and give ongoing support and reassurance to individuals and their carers to enable people to remain in a homely environment.

The needs of non-English speaking patients and patients with a sensory impairment

To assist staff to communicate with non-English speaking patients and their families and carers, the "Language Line" telephone interpretation service is available. By prior arrangement, "face to face" interpreters are also available. If the patient and their family members and carers have a communication disability, appropriate communication support such as British Sign Language (BSL) interpretation can be provided. Information in other formats can also be made available.

During the recent coronavirus crisis, the use of Near Me in conjunction with the "Language Line" telephone interpretation service and "face to face" language or British Sign Language (BSL) interpreters has been a great success. Staff have also used "Language Line" to "Call Out" to non-English speaking patients. Our increased use of BSL videos on social media has also proved popular with BSL users and will be further expanded.

We will continue to be innovative but are aware that digital communication and information is not suitable for all patients in all circumstances.

Our strategy is to introduce telehealth and care wherever it offers benefits. Our unique Grampian geography and regional expertise puts us in a good position to lead on the piloting and evaluation of new models of remote care.

- We will move to a stepped consultation model. The default mode of consultation will be NHS Messaging using a range of platforms, stepping up to a phone call when required, then a video consultation. Face-to-face consultations will only be used when essential.
- Telehealth and care, including remote monitoring, will be routinely used in care pathways to support independent living, prevent admissions and to expedite discharge.
- Discharge planning will routinely include an assessment of whether home telecare could benefit the citizen.
- The shift to teleconsulting will be supported by expanding the network of community investigation hubs and community treatment and care services.

Workforce development

In order to exploit digital technology, staff need to be trained and supported. Although digital systems are in widespread use, there are still alternative paper systems in use in a number of areas. As the use of IT increases it will no longer be possible for people to get by using paper alternatives and some staff will need additional support to adapt and become suitably skilledImproving Digital Literacy.

Scotland's National Digital Health & Care Strategy has workforce development as a distinct theme and the **Topol Review** recommended that employers and universities adapt their curricula and professional development opportunities to ensure that clinical professions are prepared for the new world.

Staff have some opportunities to develop informatics skills and take on leadership roles in this area. However, there is a particular gap in the area of social care informaticians.

Examples

Some Grampian clinicians have received specialist training in the areas of informatics and digital health. Aberdeen was one of the first universities to have an eHealth medical education lead.

In 2020, University of Aberdeen launched an MSc and CPD modules for Health Data Science for health professionals

Our strategy is to deliver a digitally competent workforce in Grampian, working with NES, COSLA and other partners.

- We will promote digital skills through the learning management system and ensure that staff can access the development relevant to their role.
- We will work with partner universities and colleges to embed digital health into the available education, including undergraduate curricula.

Research and Innovation

Our Grampian patient population have a right to equality of opportunity to participate in research and shape innovation. A culture of research and innovation raises the profile of our organisations and is an important driver for care improvement. A research culture supports the recruitment and retention of staff and can make service transformation easier as staff are already used to trying new ways of doing things.

Examples

Aberdeen Children of the 1950s, a study of all children born in the 1950s and at school in Aberdeen, are now in their 6th decade and continue to participate in health care research, linking their digital health records to research data to understand, for example, the impact of education on later health, supporting early diagnostics discovery for dementia and describing the impact of technology on their health and lives.

In 2019, the Centre for Health Data Science opened as a centre of excellence. The centre brings together the people and expertise from academics with clinical colleagues, patients and industry to establish a vibrant, multidisciplinary research environment to address the heath challenges of our local community, and population health nationally and internationally.

Aberdeen has a proud history of research and innovation and in 2019 NHS Grampian published its latest Research Strategy. Life science research is seen as a way of diversifying the local economy away from a reliance on oil and gas. Our Scottish Government accredited and ISO27001 certified secure data research facility, the Grampian Data Safe Haven is a core enabler providing the infrastructure and skilled workforce to safely enable our patients, NHS staff, academics and, where appropriate, industry partners to work together using health and care data to understand health and disease, evaluate and redesign care pathways and develop new methods to support disease diagnosis.

The University of Aberdeen brings internationally leading researchers in health data science, artificial intelligence and health service research.   Robert Gordon University computer science department brings leading-edge applied research with a high societal impact and a track record in health digital technology and artificial intelligence.

State of the art, high quality, widely available information technology structures and systems would be key enablers of research and innovation activity. They would act as a welcoming shop front to potential collaborators from academia, industry and sister health boards, facilitate access to significant external funding streams, and be a catalyst for improvement, innovation and research projects that otherwise would not be possible.

Our strategy is to make Grampian a welcoming location for health data science and to support trials of innovative technology.

- With our partners we will develop an information platform to securely collect and link all aspects of health and social care data.
- To enable competitive response times and maximise our ability to engage in research and innovation opportunities, we will invest resource in key digital health posts such as information governance, cybersecurity, business analysis and technical support.
- Pursue opportunities for investment and support from Scottish Government awarded via innovation funds.

Medical equipment as an enabler of service transformation

NHS Grampian has over 20,000 items of medical equipment. Making best use of this investment is essential to minimise waste and maximise benefits. Tracking technology based of RFID (Radio Frequency Identification Technology) tags is being deployed in large hospital sites. Once tracking technology matures virtual equipment libraries will be implemented so staff can find the nearest unused item of equipment.

A new generation of connected medical devices are being deployed in acute settings. These devices, such as ECG machines and vital signs monitors, can upload health data into the patient record, saving staff time and improving care. Other devices, such as infusion pumps, can also provide enhanced patient safety features such as drug libraries.

Radiotherapy planning and delivery will increasingly rely on automated "intelligent" systems. Such systems will aid in delivering effective, timely treatment.

Our strategy is to maximise patient benefits that medical equipment can bring.

- The organisation will build on the device tracking system with additional technological approaches with the aim of tracking equipment across the region.
- We will complete the rollout of connected ECG machines and monitors.
- We will embrace advanced radiotherapy technology, seeking to validate, adopt and enhance it.
- We will aim to invest in devices that will connect to and integrate with existing digital systems to enrich the content of electronic information.

2.   Doing more with Electronic Information

An increasing amount of health and care information is managed electronically. However, at the coal face of delivery, many clinical and social care practitioners remain reliant on paper, or IT systems that don't talk to one another. This is particularly a problem for community clinicians such as nurses and AHPs. This hampers service transformation and quality improvement.

Citizens have very little access to digital information about the care that's provided to them; they are thus at a disadvantage when it comes to being able to manage their health and staying well.

Even when data is available we don't always make best use of it. Information on the flow of patients through our hospitals has generally been static and usually not available real-time to those that need to see it. This has begun to change as part of our response to due to the pandemic.

A goal of the Regional Delivery Plan was to create a Learning Healthcare System. However, without creating intuitive digital solutions for frontline clinicians we will never have the data to feed such a system, and thus we limit our learning potential.

Electronic records

The ambition of the National Digital Health & Care Strategy is that the National Digital Platform (NDP) will become a single record of truth for diagnoses, problems, medication and other key data. The timescales for this are unclear so integrating Grampian with the Platform will need to be an evolving process.

The international benchmark for electronic health records is the HIMSS EMRAM[2] which grades electronic records according to how comprehensively they replace paper methods. The highest stage on the HIMSS maturity model is level 7 and such systems include clinical noting, image stores, electronic prescribing & drug administration, vital signs capture, decision support and access to shared records from other sectors.

There is no equivalent benchmark for social care records.

Across Scotland a national benchmarking exercise took place in 2019 and the results for NHS Grampian were broadly positive.

Our strategy is to advance our electronic records in health and social care with the goal of maximising citizen and staff benefits.

- We will support GPs in the re-provisioning of primary care IT and the development of these clinical systems thereafter.

- We will progress all records across health and social care towards HIMSS EMRAM level 7 or equivalent, ensuring they are intuitive and simple to use.

- When procuring new solutions we will follow the 'Once for Scotland' principle wherever possible. This will mean collaborating with other boards to design national systems and initiatives, e.g. a national Laboratory Information Management System. As part of the pandemic response, Grampian will be the first health board to adopt OpenEyes – the new national eyecare system.

  - Regional systems will be prioritised where national solution is not available e.g. the hospital electronic prescribing and medicines administration HEPMA and the north of Scotland CarePortal.

  - We will only pursue a local approach when no viable alternatives are available.

- We will connect to the NDP when practicable. Initially this is most likely to be for a new way of recording anticipatory care plans.

- When procuring new systems we will prioritise usability and compatibility with the NDP, regional systems and relevant local systems

[2] https://www.himss-uk.org/analytics/emram

Analytics

Health and Care organisations generate vast amounts of data on a daily basis. Although some of this is used, for example for national reporting, we have barely scratched the surface of the possibilities. Much data is still recorded in ways which make it hard to analyse and where data is analysed it is rarely on a real-time basis.

If we can increase the amount of data that is available for study then this will increase our ability to improve health outcomes.

Examples

NHS Grampian and the University of Aberdeen lead some of the first UK evaluations of real time eAlerts for detection of Acute Kidney Injury and now are developing predictive analytics to identify patients at risk of deterioration after discharge.

As part of the coronavirus pandemic response we introduced displays showing real-time data on patient movements and ventilator use. These displays are used by operational teams for planning and to support care quality.

Our strategy is to exploit data to provide benefits to patients and staff.
- We will introduce real-time analytics, pulling data from electronic records and logistics systems as required. Some of this data will be accessed from Real Time Command Centres - physical locations displaying real-time data on patient flows and activity.
- We will develop and implement greater use of predictive analytics, which can identify patients at risk of deterioration; enabling early intervention and preventing harm.

Automation and Augmented Intelligence

The rise in demand with no increase in the health and care workforce means that we will have to automate processes wherever possible. Software will make it easier for clinicians to make the right decisions, allowing faster and more accurate processing of test results and imaging.

An example

NHS Grampian and University of Aberdeen are partners in iCAIRD – the Industrial Centre for Artificial Intelligence Research in Digital Diagnostics. This aims to accelerate the diagnosis of a range of conditions, supporting a local innovation culture and enabling partnership between patients, clinical staff, academia and industry to drive the critical step change in diagnostics

Our strategy is to gain benefits for patients and staff from increased adoption of AI and Clinical Decision Support (CDS).
- We will adopt the recommendations of the national review of CDS. This is likely to involve the creation of decision support systems linked to the National Digital Platform and other electronic records.

Workforce and business systems

A wide range of business processes support the smooth running of health and care activities. These include workforce systems such as rostering, Human Resources (eESS), Occupational Health Services, payroll, Job Planning, revalidation, recruitment, learning and appraisal.

Logistics systems ensure the right person or object is in the right place at the right time.

Example

NHS Grampian has introduced a task management system for porters, allowing staff to work more effectively.

Our strategy is to modernise workforce and business systems to optimise the support they can provide to staff. Some of these systems are now being developed and /or procured on a national basis e.g. eRostering
- Logistics systems will be adopted for all staff who need them, whether clinical, support or administrative.
- Use of productivity and collaboration tools such as Office 365 will facilitate easier data sharing within and across organisations, allow non-clinical and clinical teams to organise in new ways – improving the visibility of projects and breaking down barriers.
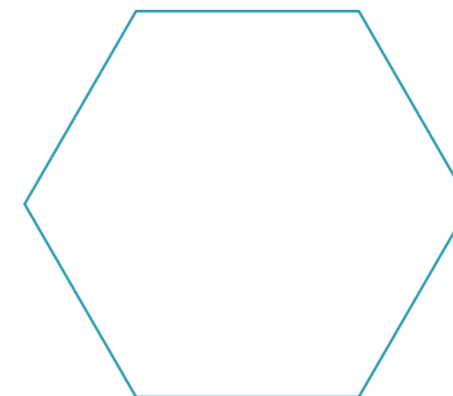
3. Infrastructure, Cybersecurity and Information Governance

Electronic information systems need to be underpinned by reliable hardware, network infrastructure and Information Governance. Data also needs to be accessible to all who have a legitimate reason to see it.

Analogue data can be hard to protect – paper notes can be viewed without an audit trail, record stores get flooded, letters get delivered to the wrong address and transitory paper documents like handover notes can be disposed of insecurely. Organisations thus carry considerable risk if they delay adopting the improved assurance that digital technology can bring.

Information Governance

The national Digital Health & Care Strategy states that "…inconsistencies in decision making about appropriate sharing of information, and misunderstandings and myths around existing legislation … can impede the effective delivery of care, [and] also the timely introduction of new models of care, research and innovation."

There is a need to balance our statutory requirement to protect data with the imperative of using data to improve health and care. When we have the technical capability to provide clinicians and practitioners with access to data that could improve care quality but still fail to provide it we carry a clinical risk that needs to be accepted or mitigated.

Collaborating with partners and national organisations to adopt standard national and regional approaches will improve our efficiency and capacity.

These changes will improve care quality, reduce frustration among patients and staff and support appropriate investigation and management, thus reducing costs.

In time, the patient portal will reduce the number of Subject Access Requests, allowing Information Governance staff time to work on areas such as data protection assessments.

The Information Governance team needs to be sufficiently resourced and supported so that lack of capacity doesn't hinder high quality care.

The key requirements are supporting self-management of Information Governance issues and ensuring sufficient capacity to deal with processes such as Data Protection Impact Assessments and Data Processing Agreements in a timely manner.

Work in this area will include
- We will help create and then adopt standard national and regional approaches wherever possible.
- We will establish a new process to ensure that the requirements for data protection and data sharing are balanced and carefully documented.
- We will create an easier way for people making Subject Access Requests to receive their data.

Clinical Safety in IT implementations

The goal of IT implementations is to improve the quality of care and safety. However, this does not happen automatically and there is a risk that IT can inadvertently reduce safety and introduce new risks. In England the NHS Digital Clinical Safety Standards cover the process of implementing and upgrading clinical software. These standards are not applicable in Scotland but are increasingly regarded as best practice. NHS Grampian will make an assessment of when will be the best time to introduce these standards.
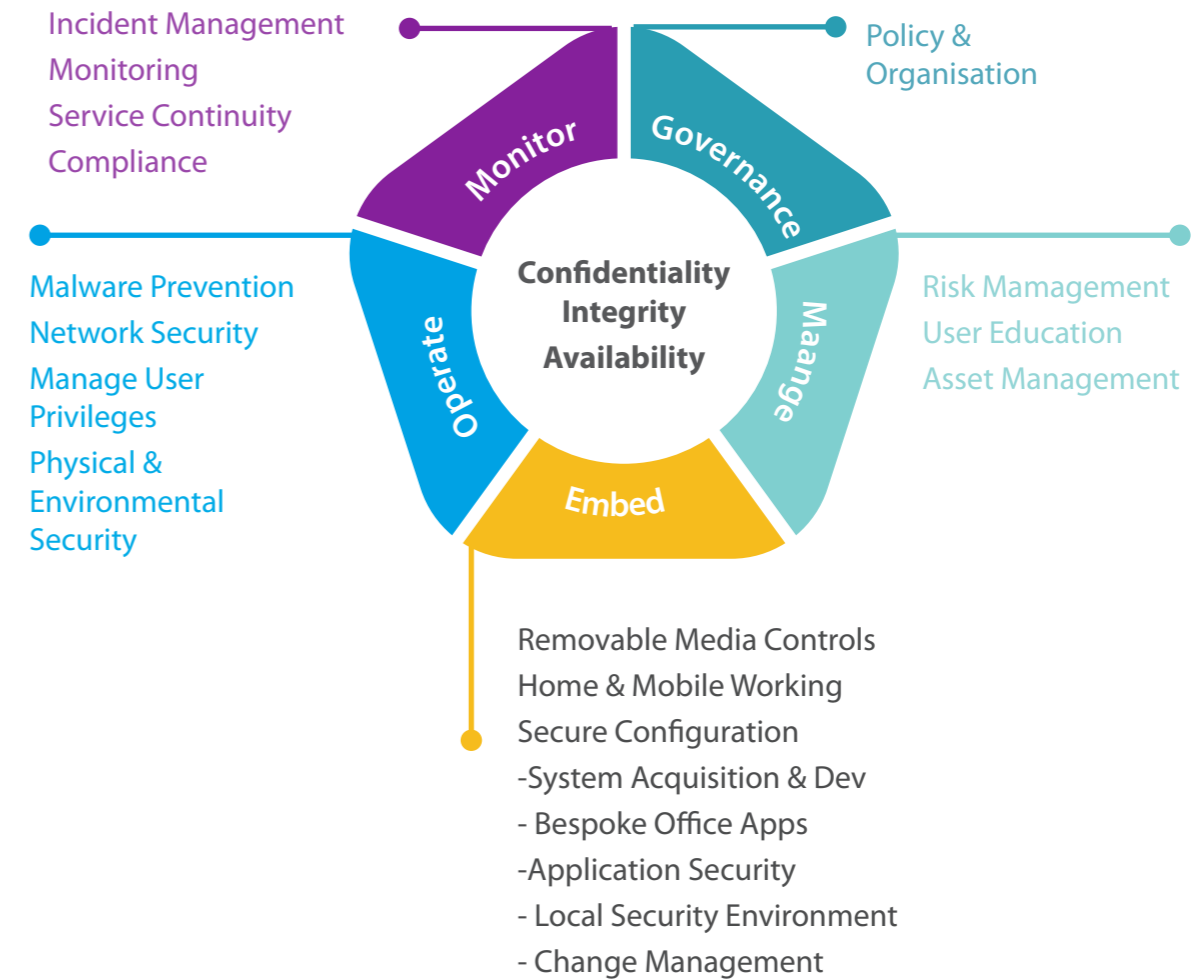
Cybersecurity

As health and care is increasingly digitised we need to ensure we have technology and processes in place to mitigate cybersecurity risks that arise internally or externally. A risk that becomes an incident can prevent access to information, cause reputational damage, lead to financial penalties and make future information sharing projects less likely to be approved.

Our strategy is that through the establishment of a Cybersecurity Framework we will embed Information Security into our organisation and reduce risk.

- We will align policy to industry standard bodies, such as ISO 27001/2, the NIST Cyber Security Framework, Network & Information Systems (NIS) Directive and GDPR.

- We will ensure that all products or services adhere to IT Security Policy and Technical standards.

- We will inventory and patch all IT hardware and software with latest versions to address high risk vulnerabilities.

- We will perform proactive Threat Intelligence to update all IT operational defensive measures.

- We will ensure that IT security is at the core of all investment choices protecting both our infrastructure, business and clinical data by adhering to standards in the areas of data protection and cyber security.

- We will maintain an inventory of all network connected devices. This extends to medical devices, including the associated cyber security risk profile gathered as part of the global equipment register initiative.

- We will provide training, education and raise awareness of cybersecurity across the workforce – promote a culture of cybersecurity and safety.

The following diagram represents the NHS Grampian Cybersecurity Framework.

Incident Management
Monitoring
Service Continuity
Compliance

Monitor

Governance

Policy & Organisation

Confidentiality Integrity Availability

Malware Prevention
Network Security
Manage User Privileges
Physical & Environmental Security

Operate

Maange

Risk Mamagement
User Education
Asset Management

Embed

Removable Media Controls
Home & Mobile Working
Secure Configuration
-System Acquisition & Dev
- Bespoke Office Apps
-Application Security
- Local Security Environment
- Change Management

Information availability and durability

Whether or not a citizen or member of staff can access the information they require depends on a number of factors including training, completion of the necessary IG and cybersecurity processes, device availability (e.g. tablet/laptop), network access and software support.
For information governance we need to make sure that all of these are covered.

Our strategy is that staff will have access to the information they need to provide the best care to their patients/clients. This applies whether they are a hospital clinician, a social care practitioner or a non-GP contractor, such as an optometrist. We will ensure that citizens have access to the information they need in an appropriate format, for example via NHS Inform or via a future citizen portal.

- Appropriate levels of support will be available at times and places that health and social care staff work. This may involve increasing support for business-critical systems at nights and weekends, which might require a change to existing arrangements.
- Digital solution design will aim to maximise availability and, incorporate business continuity requirements.
  - In scenarios where the local network is down, access to core electronic record functions will be enabled where it is technically achievable. For example, a copy of prescribing and drug administration data can be stored on a local computer in case of disruption causing no access to the cloud based HEPMA solution.
  - This does not replace the need for the completion, review and testing of business continuity plans for each service area. Service area plans may need to include reliance on paper based systems for short periods until solutions for electronic alternatives are available.
- Sufficient hardware will be provided for health and social care staff to access records wherever administration is undertaken or care is delivered – wards, clinics and community. Additional funding will be required for this in many cases.
- A remote access solution has been implemented as part of the coronavirus response – enabling secure system access from a staff member's personal laptop/PC. This will be extended to those that require it.
- Self-service support will be established and increased where possible – e.g. for password resets; account lockouts; greater access to online help and training.
- We will explore opportunities for regional collaboration with support staff in other boards.

Underpinning infrastructure

NHS Grampian operates a secure and resilient IT infrastructure split between two data centres built with business continuity and disaster recovery in mind. This infrastructure provides services to 18,000 employees using 17,000 devices in 120 locations across hospital and primary care. This comprises 7 Acute hospitals, 11 community hospitals, 72 independent GP practices and numerous other contractors including Dental, Optometry and Pharmacy.

As digital technology supports an increasing range of services, the importance of our IT infrastructure will only increase.

We anticipate a cloud-first approach to the deployment of infrastructure to support local, regional and national initiatives. This will include the north of Scotland HEPMA, Office 365, GP IT and the National Digital Platform.

A cloud-first approach offers a number of advantages relating to Efficiency, Security, Flexibility, Mobility, Increased Collaboration, Disaster Recovery and Control. Procuring and using Application, Platform and Infrastructure as a service will enable transition away from on-premise based systems located within NHSG data centres. A hybrid mix of on premise data centre and cloud computing will persist in the medium term.

Digital Estate - NHS Grampian is working towards supporting the creation of a modern and digitised healthcare estate with a golden thread of information stretching across the entire portfolio of built assets.

This includes the adoption of a Building Information Modelling (BIM) strategy in refurbishment and new build projects which will help create a smarter built environment that will support the delivery of patient services through more efficient ways of working and the use of data analytics to enhance the ongoing operational effectiveness of facilities.

Our strategy supports the national technology delivery plan and we will seek to:
- Transition to a single national identity for all employees/users and ease inter-working across regional and national boundaries.
- Help develop a sustainable workforce by delivering a mobile device strategy covering a range of devices, improving both the user experience and patient care.
- Ensure continued resilience is factored into the core infrastructure and able to meet critical business continuity and disaster recovery requirements.

4. Resourcing the Strategy

Successful implementation of this strategy will require new investment.

Some digitally-enabled service transformation projects will involve entirely new systems and major change programmes. Examples include hospital ePrescribing (HEPMA), vital signs tracking and the move to NHS Messaging systems. Other projects will involve gaining more value from existing investments. Examples of this include the wider use of NHS Near Me and Florence and connecting new information sources to TrakCare and CarePortal.

The level of investment required will therefore vary significantly between projects in the different programme areas. In all cases it will be essential to adequately resource the non-technical aspects of implementation, such as training and support, as these are key determinants of success of failure.

Where investment is required, funding options at a local, regional, or national level can be evaluated.

The business case for each project will include a description of the strategic, clinical and financial case. Each business case will also include an indication of the metrics by which any potentially realisable benefits could be measured.

Financial savings arising from redesigned services can be re-invested to support further digitally-enabled service transformation.

Risks

Implementing this strategy will require collaborations that bridge normal departmental and sector boundaries; that is almost inevitable when services are being redesigned. The bulk of the work involved is likely to be change management rather than the development of new technologies, it is vital that this area is not neglected.

Departments will need to allocate time to service redesign. Without this, the provision of new technology will not necessarily result in improved services.

While new technologies are introduced, existing ones will continue to need support until they are superseded. Without corresponding expansion of support services, there's a risk of loss of service availability.

Laying the foundations for a digital future

NHS Grampian will adopt a nimble approach to implementing new technology by:

1. Adopting a Digital by Design principle when developing or transforming services.
2. Building capacity to manage technology projects smoothly
3. Ensuring appropriate organisational prioritisation
4. Resourcing project management
5. Adopting a risk-based approach to Information Governance and cyber security
6. Enabling cost effective access to IT infrastructure.

Section 3 – evaluating the implementation of the strategy

Evaluation

When implemented, this strategy will see the investment of millions of pounds and will alter the lives of 500,000 citizens and members of staff. It is a strategy designed to evolve and adapt to a changing world and to support a culture of learning and improvement.

Embedding evaluation, as a core strand in the digital health care strategy, will support safe, efficient and effective change in a complex system.

Effective evaluation would be a formative and iterative process, creating a culture of a learning health digital strategy, and would need to draw upon the full range of approaches to support:

- Communication and engagement
- Co-design
- Implementation
- Impact monitoring
- Creating a learning culture
- Measuring quality of improvements and outcomes
- Benefits Realisation

As well as identifying and mitigating risk in areas of uncertainty where further research is required.

To ensure the expertise and focus, and to provide a level of 'independence' for the Board, this would most effectively be achieved through partnership with academic partners to establish a Digital Health Care evaluation hub. By creating a partnership and participatory approach to the evaluation, we will enable cycles of learning to feedback into the strategy and to develop and draw upon appropriate expertise and resources as the strategy progresses.

In the first instance, we would propose to engage with academic partners to scope and design a framework for the evaluation process, map and engage key stakeholders and agree core outcomes.
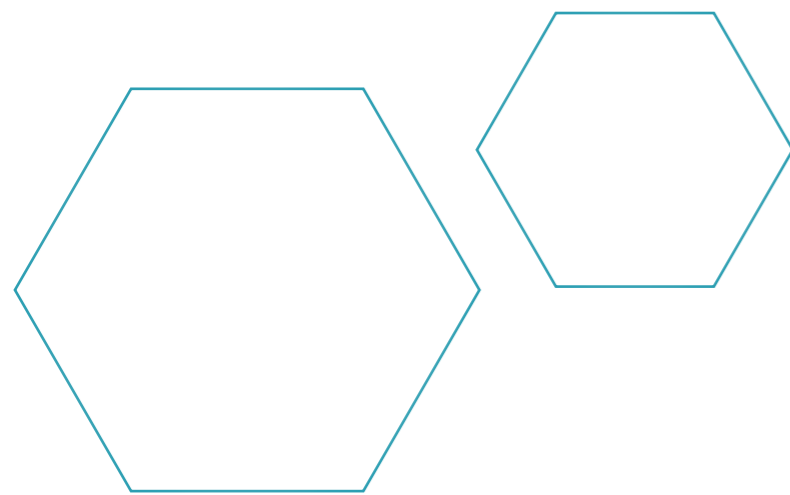
Section 4 – the consultation process

This strategy has been developed by a Digital Health & Care Strategy Group, comprising a group of senior leaders, clinicians, management and citizens.

Membership of the Digital Health & Care Strategy Group
Chaired by Mr Paul Allen (Director of Facilities & eHealth, NHS Grampian)

SLT/Executive Lead	HSCP Chief Officers	Head of Health Intelligence
Director of Modernisation	Local Authority Digital Leads	Clinical Leads for Innovation
Non-Executive Board Member	Acute Medical Director	Primary Care GP Sub Representatives
Deputy Director of Modernisation	Senior Information Risk Owner	Deputy Director of Finance
Executive Nurse Director	Deputy Medical Director	Head of Workforce & Development
General Manager of eHealth	Employee Director	Clinical Director Medical Physics
Clinical Director of eHealth	Head of Information Governance	Director of Pharmacy
Clinical Lead for the TrakCare programme	Head of Mental Health & Learning Disabilities	Patient Public Representatives

Consultation on the draft has included many individuals and groups. The strategy development team is very grateful for everyone who took time to contribute.

- The Equality and Diversity team
- Patient involvement on the strategy development group.
- A stall at the Health & Social Care Alliance 'Discover Digital' event in Aberdeen, October 2019
- Presenting to the advisory structure of NHS Grampian:
  - GP sub-committee – October 2019
  - Consultants sub-committee – October 2019
  - Grampian Area Partnership Forum – February 2020
  - The Area Clinical Forum – January 2020
  - Board Seminar – March 2020
- Presenting to the Aberdeen City Health & Social Care Digital event, October 2019
- An electronic survey seeking feedback from citizens which was run during October 2019.
- A workshop with Police Youth Volunteers in Elgin - March 2020

Appendix

Political, Economic, Social, Technological, Legal and Environmental drivers for change
There are many factors driving increased adoption of digital technology in health and care.

1. Political factors

The overarching policy document is the 2016 Health and Social Care Delivery Plan. This describes a future where people will be supported to be active and independent in their communities. Digital Health is described as a cross-cutting enabler: "Digital technology is key to transforming health and social care services so that care can become more person-centred." Plus "Everyone will have online access to a summary of their Electronic Patient Record and digital technology will underpin and transform the delivery of services across the health and social care system."

Other political or organisational drivers
Scotland's Digital Health & Care Strategy 2018-2023 proposed collaborative work across six domains to maximise the benefits that digital could bring to health and care.

NHS Grampian's Clinical Strategy 2016-2021 highlighted four connected themes: Prevention, Self-Management, Planned Care and Unscheduled Care. The strategy identified a number of enablers that would create a conducive environment in which these themes could be developed.

The **Strategic Plan** of each Health and Social Care Partnership in Grampian identifies digital technology as a key enabler of service transformation and effective resource use.

The Aberdeen City HSCP Strategic Plan says "We aspire to reach a point when digital services are an integral part of everything we do and have become not only the first point of contact with health and care services for many people but also how they will choose to continue to engage with us."
The table shows some of the overlap between these aspirations.

National Digital Health & Care Strategy	Regional or National Collaborative Priorities	Grampian Clinical Strategy Enablers	HSCP Strategic Priorities
National Direction and Leadership A new national decision making board including NHS, Scottish government, local authority, Industry and Academia representation. Doing things once for Scotland wherever possible.	Collaboration with national boards – SAS, NES, NHS24		
Information Governance and CyberSecurity A "simplified and consistent national approach for Information Governance"	Information Governance Cybersecurity	Information Sharing across the system	
Service Transformation "A clear national approach to supporting… co-designed service transformation." To achieve benefits for people and staff.	Telehealth & Care Digitally-assisted self-management. Radiology Transformation. Rural broadband availability.	Promoting staff health and wellbeing. Developing our Workforce. Collaborative working and networking. Shifting from unscheduled to planned to self-managed to prevented.	Spread and adoption at scale of proven digital Technology Enabled Care: • Home and Mobile Health monitoring • Phone and video Consultation Capture service redesign opportunities offered by digital telecare
National Digital Platform Making real time data from health and care records available to those who need it.	Electronic health & care records		
Transition Process An assessment of digital maturity across the country. Working with eHealth, NSS and COSLA to manage the transition to a new technical environment that's compatible with the National Digital Platform.	Business Systems workstream – digital as usual.	Continuous improvement	Transition from analogue to digital telecare Assess and monitor our digital maturity as part of a national process

2. Economic factors

There is a need to shift the economic balance of North East Scotland away from Oil & Gas related industries. Lifesciences, including health data science, have been highlighted as an area of development.

The National Digital Health & Care Strategy includes the vision "digital technology and data will be used appropriately and innovatively to enable research and economic development"

3. Social factors

Citizens

People are increasingly using digital technology to complete everyday transactions, enrich their lives and increase their autonomy. Access to information and services around the clock are things that are taken for granted in many industrial sectors such as finance, retail, entertainment and travel.

Although generic information on health and care is widely accessible, the information that a citizen can access about their own health and care situation remains limited. The ability to transact with the sector (e.g. request or manage services such as prescriptions, consultations, investigations) is at a very immature stage compared to other industries.

Increasingly citizens expect that businesses will offer digital access to information and services and some become frustrated that this is often not possible from public health and care organisations.

Facilitating access to information can support self-management, increase autonomy and potentially improve outcomes, with additional benefits for healthcare staff and organisations.

The workforce environment and the expectations of staff

Workforce development is a major challenge for Scottish Health & Care organisations, particularly those in the north of Scotland. Many vacancies remain unfilled and clinical staff are under greater pressure as the needs of patients become ever more complex. Access to information and digital tools can potentially help to improve the working lives of staff by reducing frustration and increasing efficiency.

During the coronavirus pandemic digital technology can play an important role in reducing the risk that staff acquire or transmit the virus through their interactions with other staff members or with patients.

While digital technology has made some tasks easier for staff, there remains much frustration and many missed opportunities. For example, although the community is the default place for care to be delivered and is the centre of our health strategy, non-GP community workers, whether NHS or other contractors often have the lowest level of access to computers, electronic records or basic digital technology such as mobile phones.

The policy of creating new Community Treatment and Care Services and Community Investigation Hubs will require novel care pathways for investigations and results which will only be possible through the use of digital technology.

More generally, despite some advances, information often remains in silos and inaccessible to those that need it. The basic, essential technology, such as label printing software, is unsupported at the times that we expect our staff to be working.

4. Technological factors

The cost of state-of-the-art Information technology remains relatively constant while its capabilities continue to increase. The pace of development is rapid and it is hard to predict what technologies will be in common usage in the mid 2020s. However, current trends suggest that citizens will have access to an increasing number of digital technologies to support their self-management of long-term conditions.

Networks of environmental sensors, point-of-care testing and genetic analysis will capture ever more data about citizens and our world; with cloud storage as its most likely home. Augmented intelligence will play a greater role in the delivery and support of healthcare through machine learning and the use of autonomous devices; perhaps for phlebotomy and transport.

5. Legal factors

The main themes here are compliance with data protection and cyber security legislation. The General Data Protection Regulation needs to become embedded in our practice, as will the EU Regulation on Medical Devices and the EU Directive on the Security of Networks and Information Systems. This will require:

- Development of relevant policies and service management processes
- Managed by appropriate levels of Information Governance and Cybersecurity staffing
- With focus on our culture to promote good practice to minimise events such as privacy breaches or cybersecurity incidents.

These drivers need to be balanced with the key Caldicott principle; that information should be appropriately shared for the direct care of citizens.

6. Environmental factors

The Scottish Government placed climate change at the centre of its Programme for Government for 2019-20. Digital Health & Care has a major role to play here – reducing travel through telemedicine and cloud computing, reducing the size of buildings by removing paper record stores, and even heating buildings using the waste heat from data centres.