eHealth and Care Strategy

FOR NORTHERN IRELAND

Improving health and wealth through the use of information
and communication technology.

HSC Health and Social
Care Board

Contents

HSC Health and Social Care Board

Minister's foreword

In recent years the digital revolution has made a tremendous impact on our lives. It is clear that innovative technologies could revolutionise the way we deliver health and care.

In Northern Ireland we have already taken bold steps to adopt new technologies. Our approach has given care professionals better access to patient information, improving safety and efficiency, and has enabled many people to monitor their long-term conditions at home, making hospital visits less frequent. But as mobile technologies and 'big data' open up new possibilities, we can and should go much further.

Technology now enables us to engage with and empower citizens at every stage of their health experience – maintaining health, receiving care and managing long-term conditions. For the individual patient, this can make treatment and care more personalised, and mean they can move out of hospital and be closer to home. For the population as a whole, it can equip us to predict and manage health problems better. Ultimately, using technology creatively can help us towards a health and care system that will be safer, more efficient and more sustainable for current and future generations.

This eHealth and Care Strategy sets out our plans for fulfilling this potential through a wide range of eHealth initiatives. Six broad objectives form the framework for the strategy and are the main focus of our activity between now and 2020.

As well as helping the public to use online services, such as booking GP appointments and ordering repeat prescriptions, the strategy sets out our longer-term vision for improving the flow of information across our health and social care system by implementing a fully integrated Electronic Health and Care Record and creating a fully mobile workforce through remote working.

These measures will reduce administration and duplication, improve patients' experience by making services more accessible, and give care professionals more time to focus on patient care and provide more joined-up services.

Implementing this strategy is an important step in ensuring we provide the world-class health and care services our people deserve.

Simon Hamilton,
Minister of Health,
**Social Services and Public Safety**

Executive summary

'eHealth and Social Care' is about using information in ways that can lead to better decisions on prevention, treatment and care.

This includes:
- information from service users and their carers,
- information held within our systems,
- information from self-monitoring devices and sensors, and
- information needed for management and administration.
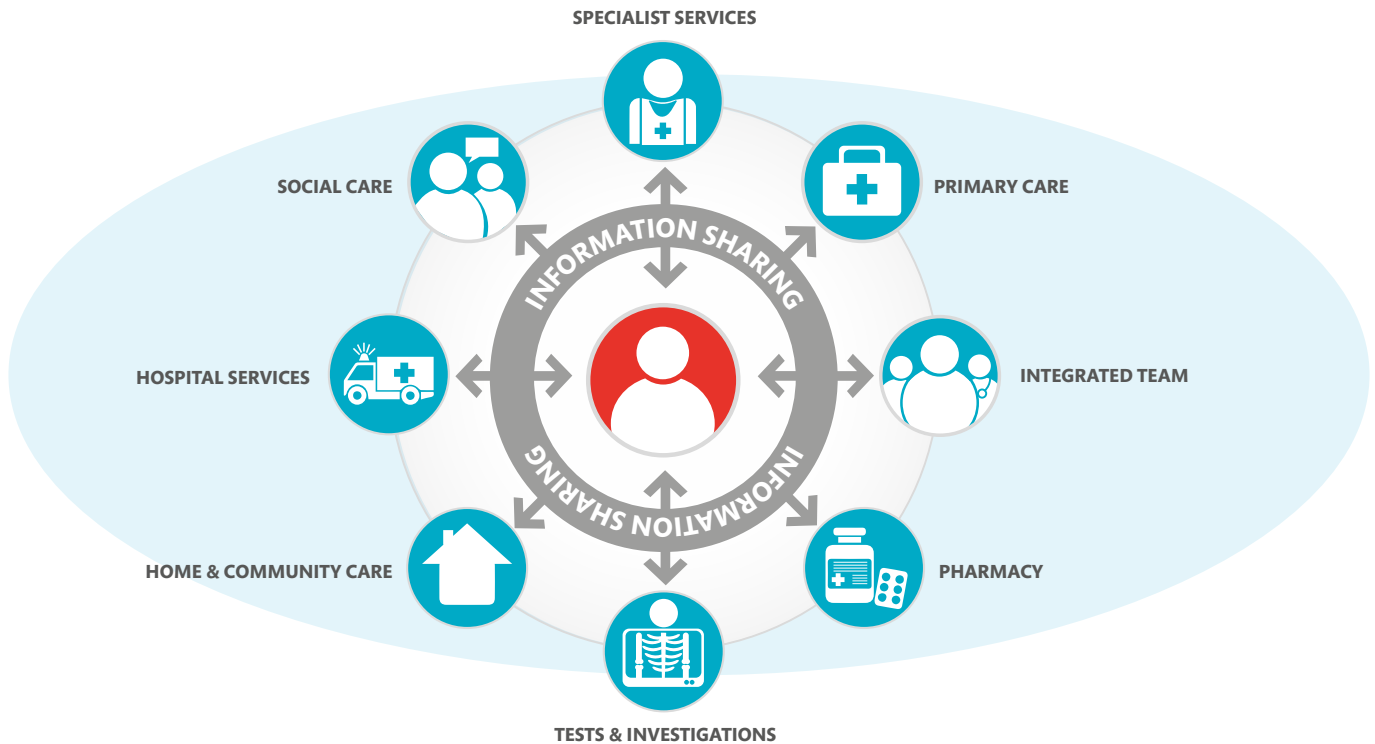
This strategy outlines how eHealth will support people and services and help information to flow around the system to improve decision making for better care. It describes how eHealth will support the changes that must be made to improve health and wellbeing in Northern Ireland.

We know we will need to overcome several difficulties to make eHealth work in the HSC:

- It often takes too long for the good ideas that support new models of health and care delivery to become mainstream practice. We need to encourage and support the adoption of successful innovations.

- eHealth can change relationships and working practices for the public, patients, clients, their carers and HSC staff. Most people are naturally resistant to change, so we need to make sure we are bringing real benefits to the people affected.

- Paper records are still widely used. Information on paper is difficult to share, and the use of paper is embedded in many HSC staff members' working practices.

- We need more standardisation and structured data if we are to make best use of the information collected.

- Some of HSC's older ICT systems cannot link to other systems.

- The public and HSC staff are concerned about maintaining patient and client confidentiality. Some people feel that sharing information digitally may be less secure and put them at greater risk of having their confidentiality breached.

- Not everybody has access to the internet or digital technology. This might include access difficulties for some people with a disability, older people and people from a minority ethnic background, particularly those for whom English is not a first language or who have other communication needs.

- It is not always easy to prove the benefits of eHealth to the public and HSC decision makers. We need to be able to justify using scarce HSC resources in this way if we are to allow eHealth systems to support innovative ways of providing services.

We want to build on the good foundations that Northern Ireland already has. Our health and social care system is staffed by skilled and committed professionals who wish to use technology to support better care. We have strong universities and colleges that provide first-class research and education and a growing local technology sector that can support eHealth innovation. Citizens, patients, clients and carers have told us they want to use eHealth information and systems to support their health, wellbeing and independence. In our public consultation, people across Northern Ireland confirmed they wanted to use eHealth. Over the last ten years, the HSC has invested in improved eHealth, leading to a dramatic improvement in access to, and the quality of care.

This includes:

- a Health and Care number for everyone, allowing consistent identification of people across systems and organisations, which helps to improve safety,

- a world-class electronic care record, providing care staff with an up-to-date record that avoids duplication in tests and information gathering,

- the regional X-ray system, NIPACS, allowing all X-rays to be viewed and reported electronically, which speeds up patient care,

- computerisation, networking and the introduction of two-way electronic communication for all GP practices, saving GPs time that they can reinvest in patient care, and

- major improvements to networks, data centres and other major eHealth infrastructure to help improve the delivery of care.

Strategy vision

Through eHealth, we will empower people to be more active in their own care and support health and social care staff in delivering the best possible health and wellbeing for everyone.

Principles

Five key principles underpin the strategy:

- Citizen centred: supporting the health and wellbeing of the population of Northern Ireland

- Connectivity: across Northern Ireland, making information available in the right place, at the right time to support the best care, with the right safeguards in place.

- Consistency: proven technologies, the way they are used and their roll-out should happen in one way across Northern Ireland.

- Creativity: driving innovation and promoting best practice.

- Cost effectiveness: investment must add value and support efficiency.

These principles have directed the development of objectives for the strategy and will guide plans to implement it.

Our objectives are set out in the table below, along with 'deliverables', which outline how we propose to achieve them. More detail on the objectives, and on the work we will do to achieve them, is set out in the chapters of the strategy that follow this executive summary. We will further develop the deliverables in an implementation plan that we will review regularly. The level of available resources will affect the pace of implementation.

How we'll achieve the objectives
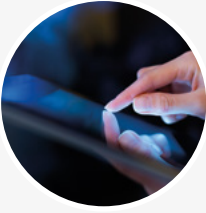
Supporting people

Provide eHealth services, supporting electronic access for everyone. This will include electronic information services, electronic records access, online support and care services, appointment booking and remote care.

- We will help people to self-care by developing a web portal with NIdirect that will provide trusted advice, self-care information, information on HSC services, and secure access to online services and to their own health records. The portal will also allow people to enter information into the right place in their health record, including through the use of telemonitoring and other devices. The web-portal will be delivered through the *HSC on-line* project. Its first phase will give people trusted advice, self-care information and information on HSC services.

- We will develop ways of allowing citizens to interact with the HSC electronically, e.g. prescription ordering and online booking. Patients in NI will be able to book GP appointments and order repeat prescriptions online.

- We will encourage the development and use of mobile health apps to support care delivery and access to services.

- We will use technology to enable people to live independently at home. We will support the use of telemonitoring, telecare and electronic assistive technology (eAT), working effectively with a range of partners such as housing, councils, and the community and voluntary sectors to deliver better care. Work to review the existing Telemonitoring NI Service is already underway. It will feed into the *HSC Connected Caring Communities* project.

Sharing information

Give care professionals appropriate access to information to improve the speed and quality of their care decisions.

- We will explore the potential for a fully integrated electronic health and care record (EHCR) system to be implemented across the HSC. Such a system, alongside continuing to use current technology in the NIECR to connect more specialist systems, will enable care professionals to get appropriate, role-based information about their patients and clients. A detailed case for an EHCR will be developed; this will set out the investment needed to move to the next stage of supporting staff, patients and clients to achieve improved health and wellbeing.

- All community-based staff will have mobile access to HSC systems. We will ensure that staff in hospitals and other clinical settings have appropriate access to HSC systems.

- We will ensure that community pharmacists, dentists, opticians and independent health and social care providers (such as nursing homes) have secure and suitable access to NIECR/EHCR information. We will develop this further to allow them to contribute directly to a person's health and care record.

- We will develop an approach to enable millions of historical electronic documents to be retrieved right across the HSC.

Objectives

How we'll achieve the objectives
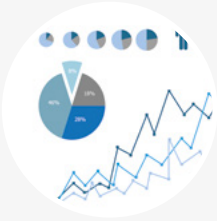
Using information and analytics

Develop ways of transforming data and information into knowledge (informatics) that supports care, from being able to suggest personalised preventative care through to supporting population-level health and care planning.

We will:

- make information more accessible to people, professionals, planners and researchers,

- improve the quality and reliability of information by mandating clear regional standards for data structure and document content,

- ensure that our information processes continue to comply with legislative requirements and with appropriate national and international standards,

- improve the availability and exploitation of management information,

- use real-time analytics and further develop the use of risk stratification to improve individual and population health,

- encourage staff to develop their skills in handling information to improve their confidence and effectiveness in using it.

Fostering innovation

HSC will work with businesses colleges and universities, community and voluntary organisations, other government departments and international partners to develop uses of eHealth to help improve health and wellbeing, prosperity and job creation.

- We will work with local eHealth industry to develop and use innovative products and systems that can be sold worldwide, supporting the local economy and increasing local employment.

- We will develop our own capacity to innovate, using local and international partnerships to access the expertise needed to develop solutions to problems affecting our patients.

- We will establish an HSC eHealth & Care Innovations Network that will become a 'go-to' place for innovation and ideas. The network will run an e-Health Innovation fund and seek to co-ordinate and prioritise our participation in relevant EC programmes.

- We will continue to develop our partnerships outside Northern Ireland and build on our success in developing and delivering EU programmes, drawing funding, ideas and expertise into Northern Ireland.

- We will ensure that best practice in Northern Ireland is identified and deployed across the HSC system.

How we'll achieve the objectives

Modernising our eHealth infrastructure

Maintain a modern, reliable eHealth infrastructure, including investment in supporting, modernising and replacing key systems and HSC networks and hardware as needed.

- We will develop a comprehensive Infrastructure Modernisation and Consolidation Plan to include the following:
  - » Review the feasibility of creating a HSC ICT Shared Service and review any requirement for consolidating existing and future HSC Data Centres including the migration of regionally hosted services into these facilities.
  - » Provide network and log-on services to enable HSC care workers to gain access to clinical applications and information stores using any trusted device that has authorised access to the HSC network.

- We will develop an Application Modernisation and Consolidation Plan that will set out the future development and replacement pathway for HSC care and business support applications. The plan will:
  - » identify which care support applications are to be delivered by implementing an EHCR system,
  - » provide a new HSC laboratory solution that will replace the current aging solutions and support the Laboratory Reform Programme,
  - » implement an Electronic Prescribing & Medicines Administration (EPMA) solution in all relevant acute locations to improve patient safety, outcomes and efficiency,
  - » replace all the current acute Patient Administration Systems with a modern system.

- We will digitise manual processes and paper records to allow information to be shared and re-used more safely and efficiently.

Ensuring good governance

Make thinking about eHealth central to planning any changes to health and care services. This is to ensure we are making the most of technical opportunities and the potential for better information flows to support improvements.

- We will put in place a new leadership and governance structure, with care professionals promoting and directing the use of eHealth to support care delivery. All HSC organisations have identified specific care professionals who will lead professional input into the eHealth agenda. Care professional leadership will be further developed to enable EHCR's design and implementation.

- We will support staff development to allow them to best use eHealth technologies through training and support, and working with professional bodies and existing training providers.

- We will strengthen our engagement with the public and other stakeholders to ensure that their views continue to inform the development of the eHealth programme. This engagement will focus particularly on three main projects – developing the EHCR, *HSC online*, and HSC Connected Caring Communities.

Supporting people

Objective: Provide eHealth services, supporting electronic access for everyone. This will include electronic information services, electronic records access, online support and care services, appointment booking and remote care.

Where are we now?

Currently, eHealth services for the public in Northern Ireland are limited. At present, we do not make it easy for people to find information for themselves or make decisions about their own health and wellbeing.

Where do we want to go?

Supporting healthy citizens

eHealth has a role in promoting, protecting and improving health. Using ICT well to provide quality information services is very important to this.

People said they would like to use eHealth technologies to add to traditional ways of contacting and using health and care services. Trusted online health portals can provide access to a variety of health information and signposting services. Setting up well-moderated support communities that give accurate information

can provide valuable help in enabling people to stay independent.

Online booking can be used to make appointments. Mobile apps can be developed to help monitor health conditions and to supplement patient-held records.

Alice is a new mum who is well supported by her health visitor but wants to get some more information about healthy eating and exercise after pregnancy. Alice logs on to the HSC web portal and follows the signposts to information and links for recipes and fitness guides. She also finds a list of groups in her area where she could go to meet other new mums.

A personal health portal could let people store information such as healthy-eating advice and self-recorded data that they might have gathered by using health and lifestyle apps on their mobile phones. The portal would use the wide range of fitness trackers and applications on phones, along with online tracking, to encourage people to take ownership of their own health. This is particularly important for people with complex health problems who find it tough to maintain their physical health.

When needed, they may share some of this data with their care team to help take more informed decisions together. This can reduce illness and help people become empowered and supported in their care.

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Bronagh is a fit and healthy 30-year-old who enjoys looking after her health. She has recently bought a fitness tracker and keeps an online record of all her fitness activity and diet. At a recent visit to a physiotherapist for a minor sports injury, Bronagh was able to share her recorded data through a patient portal and jointly make a decision about a new fitness plan.

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e-Learning programmes and podcasts can offer a new way for people to learn about health and lifestyle and get condition-specific information. For example, someone with diabetes will be able to supplement face-to-face patient education with online sessions.

Supporting communication

Many people are increasingly comfortable with self-service models as they use them every day to shop and book holidays, for example. Traditional ways of contacting the HSC will still be available for people who prefer these but there will be a range of digital services, for example:

- online appointment booking,
- online self-referral,
- text-message reminders,
- emails,
- social media, and
- video calls.

Having some access to their own electronic care records would help people keep track of their own hospital letters, appointments and test results. People could also add information to their records and help make sure what we hold is accurate.
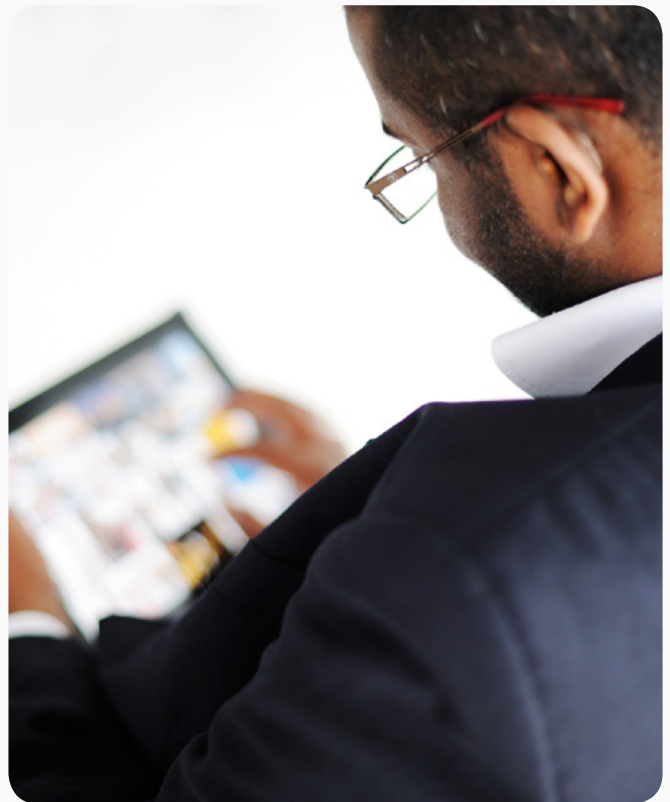
Supporting independence

Helping people stay independent is important to older people; to those with long-term conditions, mental health problems or a learning disability; to carers and to everyone wanting to look after their own health and wellbeing.

- **Telemonitoring technologies** can be effective support tools for people with long-term conditions. They can help them live independently at home with an improved quality of life. Remote telemonitoring is becoming more widely used and embedded into health care. It can benefit patients who have monitoring needs such as high blood pressure, heart rate and blood sugar. Those with potential maternity complications such as gestational diabetes and people wanting to monitor their weight can also benefit.

- **Telecare** is a tool that supports people – particularly the elderly or those with physical or mental health conditions or a learning disability – to live at home for as long as they want. Sensors in the home or worn by the individual inform the care team about certain key information. For example, if a person has had a fall or another safety issue, they can be visited when needed.

Susan is a family carer who looks after her elderly parents. From time to time she feels overwhelmed with the physical, emotional and financial challenges she faces. The social worker suggests Susan considers telecare for her parents, which would allow her to have a break during the day knowing that her parents are still safe even if she is away from them. Telecare devices for falls and to give exit alerts are installed in Susan's parents' home after a discussion with them to explain the benefits. Susan can now leave them for periods during the day knowing that if alerts are raised, someone will call her immediately.

Telecare can also be used to send messages to the individual, such as prompts to take medications. Virtual coaching through video technology could also help keep older people fit and active both physically and mentally.

- **Electronic assistive technologies** (eAT) are increasingly available to help support or improve daily living for people with physical, sensory or cognitive impairment. eAT includes a broad range of technologies, from 'low-tech' to 'high tech'. For older people and others with limited mobility who may be housebound and living away from their family and friends, it is easy to lose touch and become isolated and lonely. Using eHealth could enhance the quality of life and social wellbeing of these people in their own homes through the use of smart technology such as TVs, phones and computers including hand-held devices. Communication can be improved by creating online 'clubs' or social networks as well as allowing these people to stay in touch with family and friends. For care professionals, these technologies can also allow them to contact isolated patients and clients.

eAT includes devices that help control the physical environment, such as opening doors and curtains and adjusting heating, lighting and entertainment at the click of a button. Intelligent use of home technology can take care of the little tasks and make a big difference to daily life.

eAT provides a wealth of opportunity to support independence and help people maintain their health and wellbeing. To fully exploit it, new arrangements for funding will need to be set up across a range of agencies. People may be able to pay for some things themselves.

How are we going to get there?

- We will help people to self-care by developing a web portal with NIdirect that will provide trusted advice, self-care information, information on HSC services, and secure access to online services and to their own health records. The portal will also allow people to enter information into the right place in their health record, including through the use of telemonitoring and other devices. The web-portal will be delivered through the *HSC on-line* project. Its first phase will give people trusted advice, self-care information and information on HSC services.

- We will develop ways of allowing citizens to interact with the HSC electronically, e.g. prescription ordering and online booking. Patients in NI will be able to book GP appointments and order repeat prescriptions online.

- We will encourage the development and use of mobile health apps to support care delivery and access to services.

- We will use technology to enable people to live independently at home. We will support the use of telemonitoring, telecare and electronic assistive technology (eAT), working effectively with a range of partners such as housing, councils and the community and voluntary sectors to deliver better care. Work to review the existing Telemonitoring NI Service is already underway. It will feed into the HSC Connected Caring Communities project.

Sharing information

Objective: Give care professionals appropriate access to information to improve the speed and quality of the care decisions they make, and the outcomes for the individual.

Where are we now?

It is important that information is shared between members of the care team involved in your care to make sure they have what they need to make decisions with you. It also means you should not have to repeat your information to every carer you meet.

The HSC still generates a large number of paper records, which are difficult to share quickly and securely. They often duplicate what we have in our computer systems in GP surgeries and hospitals. But our computer systems do not talk to each other, even for sharing basic details such as your name and address, date of birth, and GP practice.

We put in place the Northern Ireland Electronic Care Record (NIECR) in 2013 and this has been successfully adopted across HSC. NIECR links core information systems from hospitals and clinics throughout NI and includes lab tests, x-rays, appointments, discharge and clinic letters, and details of any drugs prescribed and allergies recorded from your GP's system.

With NIECR in place, Northern Ireland is strongly placed to further develop digital records.

NIECR is adding more information to benefit the shared record as it becomes electronically available, building links with old and new HSC systems and technologies. This is improving care coordination, reducing delays to treatment and decision making caused by information not being available, and improving patient safety. NIECR is reducing unnecessary duplication across the HSC, meaning less staff and patient time wasted and less inconvenience.

The Electronic Northern Ireland Single Assessment Tool (eNISAT) is another example of information being collected electronically and consistently across the HSC. eNISAT allows care professionals to contribute to a single assessment of a patient or client in the community sector. This helps to avoid duplication and improve the co-ordination of a person's care across different HSC services.

The benefits of NIECR and eNISAT are considerable. But they remain limited by the difficulties of some HSC staff in getting basic access to a secure HSC PC, laptop or mobile device and a reliable network connection that gives them access to these systems.

Jean is a 79-year-old woman who lives alone in her own house. She suffers from osteoarthritis, diabetes, bronchitis and heart disease. Several times, Jean has been assessed by professionals including a social worker, physiotherapist, occupational therapist, and a specialist diabetes nurse. She is seeing consultants in two hospitals. Jean found it frustrating that she had to provide the same information each time she was assessed. Using the Northern Ireland Electronic Care Record (NIECR), all the care professionals involved in looking after Jean can now share information and coordinate her care. Jean doesn't have to repeat 'her story' to everyone. She's having fewer blood tests as recent results are available to all the care team. And, if there's a crisis, the Out of Hours or Emergency Department team have enough information to let them make the best possible decisions about Jean's care.

Where do we want to go?

eHealth will enable electronic communication between care professionals. Expanding the use of mobile technologies and moving towards fully integrated electronic records will help make this happen across HSC.

In developing electronic records we will ensure the following things:

- We will digitally record information that is useful to the citizen and those caring for them.

- We will identify and tackle information 'blockages', such as when a patient moves from one care setting to another. Information will flow electronically with the patient.

- Electronic records will be easy to use, and will help HSC staff spend more time doing their jobs.

- We will set up suitable security measures, the ability to check how the system is being used and confidentiality safeguards to make sure electronic records are used and viewed correctly.

- We will keep the public and patients informed about how their digital information is used and shared. Sharing a person's identifiable information for any reason other than their direct care will require explicit, informed consent. Exceptions will be rare but include the cancer registry's use of information to improve the quality of care.

- We will invest in mobile technology pilot schemes to improve how staff access shared information and to increase the potential benefits of these systems.

Throughout the discussions on sharing information, people told us they needed a balance between sharing their information and keeping it secure. We will explore this balance in the information and analytics delivery plan.

Annette is in the nursing team on a busy medical ward. She is concerned about the time she and other team members spend away from the patients' bedsides completing paperwork, and worries that this could harm patient care. The nursing team agrees to use handheld devices to record information at the bedside. The digital form is already filled in with key information pulled in from NIECR for Annette to check with the patient. She is able to add and update new or changed information using predictive lists, often only needing to type the first few letters. Annette captures valuable information on weight, mobility, cognitive function and risk scores. Instead of holding this information on paper, when patients are discharged

home or to another ward it will travel electronically with them. This will allow the wider care team to understand how the patient's health has been recently.

Sean is a social worker in West Belfast. He is currently involved with a family and has to assess their needs for extra support with their children. Sean has always been frustrated that he has had to complete the paperwork when he is in his clients' home and then type out the information again when he gets back to the office and his laptop computer. Since mobile working came in, Sean has been able to use his laptop when sitting with the family and complete the documents immediately. Using an internet connection, he is also able to help the family find online information and services that they can look at after he leaves.

How are we going to get there?

- We will continue to use current technology in the NIECR to connect specialist systems. Alongside this, we will explore the potential to implement a fully integrated electronic health and care record (EHCR) system across the HSC. It will enable care professionals to get appropriate, role-based information about their patients and clients. We will develop a detailed case for an EHCR; it will set out the investment needed to move to the next stage of supporting staff, patients and clients to achieve improved health and wellbeing.

- All community-based staff will have mobile access to HSC systems. We will ensure that staff in hospitals and other clinical settings have appropriate access to HSC systems.

- We will ensure that community pharmacists, dentists, opticians, and independent health and social care providers (such as nursing homes) have secure and appropriate access to NIECR/EHCR information. We will develop this to allow them to contribute directly to a person's health and care record.

- We will develop an approach that will enable millions of historical electronic documents to be retrieved right across the HSC.

Use of information and analytics

Objective: Develop ways to transform data and information into knowledge (informatics) that supports care, from being able to suggest personalised preventative care through to supporting population-level health and care planning.

Where are we now?

Information about you and your care is gathered electronically in many parts of the HSC but some is still collected on paper. Some electronic information such as attendance at hospital, drugs prescribed by your GP and visits from community nurses is collected to help the HSC to support research, audit, service development and performance management. The information goes to a central database (the HSC Data Warehouse) where it is held securely and is pseudonymised or anonymised before use.

Information held electronically is used to an extent in planning and monitoring the delivery of health and social care services. This data is also used in better understanding the trends and patterns in the supply of and demand for these services over time. And the data is used, under strict rules, to support research and development. However, the HSC knows it could use such data much better to transform services.

The use of information and analytics in the HSC will require engagement with the public. In the DHSSPS(NI) consultation – 'Caring for Your Information' – a change to the law was discussed to allow data sharing. The results of this discussion and the recommendations of Sir Liam Donaldson's 'The Right Time, The Right Place' review will shape our Information and Analytics delivery plan.

Where do we want to go?

In future we will collect more information electronically. Health analytics is about making best use of this information to benefit the wider population in the following ways:

Improving health outcomes – using data to develop the quality, safety and patient experience:

- Better inform individuals and caregivers to support personal and professional decision making.
- Provide more streamlined health and social care processes.
- Improve the timeliness and effectiveness of care including the reporting of quality outcomes.
- Support the advance of knowledge and improve early diagnosis and disease prevention.

Promoting greater innovation – Advances in technology and improvements in the standardisation and quality of health and social care data will enable better:

- disease prediction (biomedical informatics),
- personal health management systems,
- public health surveillance and biomedical research.

Delivering a more efficient health and care system – the analysis of health and social care data to deliver increased time and cost-efficiency through:

- making sure the services we provide are equitable and high quality,
- improved productivity,
- avoiding waste,
- less duplication of effort,
- better forecasting of needs and trends.

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Pavel has managed his diabetes successfully over the last few years and he feels fine, keeping busy at work and at home. As he feels so well, Pavel does not attend the diabetic clinic as often as he should. Information on the care of people with diabetes in his GP practice area is analysed. It picks up a group of people at risk of diabetic complications, including Pavel. The data links information about his blood-sugar levels and his non-attendance at clinics. Next time Pavel asks for his repeat prescription, he's asked to make an appointment with his GP who notices a small red mark on the sole of his foot, which could be the start of an ulcer. The GP refers Pavel electronically to the podiatrist for foot care and Pavel books electronically at a time he can attend. Seeing the podiatrist means the ulcer does not develop.

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For this to work, HSC needs information standards so that the right information is collected in the right way and is correctly entered into information systems. This means information can be linked across HSC.

We need information systems that work well with each other so there are no blockages in the flow of information. All the work we will do involving the use of information about you will comply with data protection policy, our other obligations and relevant codes of practice.

How are we going to get there?

We will:

- make information more accessible to people, professionals, planners and researchers,

- improve the quality and reliability of information by mandating clear regional standards for data structure and document content,

- ensure that our information processes continue to comply with laws, regulations and appropriate national and international standards,

- improve the availability and exploitation of management information,

- use real-time analytics and further develop the use of risk stratification to improve individual and population health,

- encourage development of information skills among staff to improve -their confidence and effectiveness in using information.

Implementing an EHCR system will greatly improve our ability to capture, store and analyse data for information and analytics purposes.

Electronic communication, such as video-conferencing, e-learning and electronic requests for advice between primary and secondary care, will support better patient care and reduce travel time for patients and staff.

An example of the way this technology can be used is Project ECHO. This uses video-conferencing technology to link GPs with hospital care teams to help manage the care of patients who have complex needs, bringing specialist expertise into primary care.

Dr Geeves, a GP in Fermanagh, wants to learn more about how to look after his patients with complex conditions so he joins Project ECHO. The project brings together a number of specialist doctors and nurses as well as the GPs and community teams via video meetings. Over a series of meetings the GP and community teams learn from the specialists. The specialist teams also learn from them about what is needed to allow patients' care to improve outside hospital. Together, the specialist and primary care teams work to ensure that patients with complex conditions get the care they need, closer to home, and with less travelling to hospital for planned or emergency care.

Fostering innovation

Objective: **HSC will work with businesses, colleges and universities, community and voluntary organisations, other government departments and international partners to develop uses of eHealth and help improve health, wellbeing, prosperity and job creation.**

Where are we now?

In Northern Ireland we have dynamic businesses, internationally recognised universities and strong community and voluntary organisations. HSC has worked with these partners for many years, bringing innovation into health and social care which benefits patients, clients and public health.

In 2011 a Memorandum of Understanding (MOU) on Connected Health and Prosperity was agreed between Northern Ireland's Health and Enterprise Ministers. The agreement sets out how the DHSSPS and DETI will work together in developing connected health solutions that will improve the wellbeing of patients and help support the NI economy. After MOU was agreed, the Northern Ireland Connected Health Ecosystem was established. Also, the NI Executive's 'Economy and Jobs Initiative' looked at what health contributes to the economy. More recently the DHSSPS and DETI have taken forward recommendations coming from the Matrix Life and Health Sciences Report, which looked at our key strengths in NI. Today, DETI and DHSSPS are planning a Health Innovation Life Sciences Hub (HILS), which will coordinate and drive projects and programmes.

We are also working with the health community in other European regions and the US. Northern Ireland has been given 3* Reference Site status through the European Commission's European Innovation Partnership on Active and Healthy Ageing (EIP-AHA) initiative. We are working on a number of EIP-AHA projects to develop new technologies and innovative approaches to improve patient care.

DHSSPS has established an EIP-AHA Reference Site Collaborative Network. It brings together all European Reference Sites to exchange and share best practice in developing health and care strategies, policies and service delivery models.

DHSSPS has eHealth MOUs with several European regions and the New York State Health Department. Others are being developed.

These partnerships mean we can benefit from sharing ideas and best practice. They also mean Northern Ireland is best placed to maximise support from Europe that will help us take forward more research and projects.

Where do we want to go?

We want Northern Ireland to be a global centre of excellence in the field of eHealth with:

- improved access to information for the public and HSC staff,

- models of health and care that focus on patients' needs,

- patients and clinicians better able to monitor and manage health conditions,

- improved outcomes for the public,

- more support for innovative businesses and social entrepreneurs who want to work with us in developing innovative eHealth solutions,

- better opportunities for businesses, universities and community and voluntary organisations bringing new jobs to Northern Ireland,

- NI becoming a European leader in using technology to support better healthcare by 2020.

How are we going to get there?

- We will work with local eHealth industry to develop and use innovative products and systems that can be sold worldwide, supporting the local economy and increasing local employment.

- We will develop our own capacity to innovate, using local and international partnerships to access the expertise needed to develop solutions to problems affecting our patients.

- We will establish an HSC eHealth & Care Innovations Network that will become a 'go-to' place for innovation and ideas. The network will run an e-Health innovation fund and will seek to co-ordinate and prioritise HSC engagement in relevant EC programmes.

- We will continue to develop our partnerships outside Northern Ireland and build on our success in developing and delivering EU programmes, drawing funding, ideas and expertise into Northern Ireland.

- We will ensure that best practice in Northern Ireland is identified and deployed across the HSC system.

Modernising our eHealth infrastructure

Objective: **Maintain a modern, reliable eHealth infrastructure through investment, support, modernisation and replacement of key HSC systems, networks and hardware as required.**

Where are we now?

Over the last 10 years we have developed a strong ICT foundation for eHealth which has allowed us to improve the flow of information around the HSC and change the way we deliver care. Such developments include:

- A Health and Care Number (HCN). This enables everyone in NI to be uniquely identified. It means health and social care information about them can be accurate, up to date and safely linked.

- Northern Ireland Electronic Care Record (NIECR). This is a summary care record that draws key clinical information from a range of existing hospital, GP and community-care information systems.

- New systems that aid the digital storage and use of information at the point of care, such as:

  » Community Information Systems (CIS),

  » electronic Northern Ireland Single Assessment Tool (eNISAT),

  » Northern Ireland Picture Archiving and Communications System (NIPACS),

  » Theatre Management System (TMS),

  » Electronic Clinical Noting systems (aimed at replacing paper-based inpatient care records),

  » Cancer Patient Pathways System (CaPPS),

  » Electronic Prescribing and Eligibility System (EPES),

  » Telemonitoring N.I. (to support patients with long-term conditions to self-monitor and better manage their condition with care-professional support),

  » computerisation of all GP practices.

- New approaches to how we share digital information. These include:
  - » electronic patient check-in at outpatient departments, where patients can use a touch-screen to let staff know they have arrived,
  - » bed management systems – interactive electronic 'whiteboards' on hospital wards that allow staff to deal with admissions, transfers to others wards and discharges,
  - » using mobile technology to help staff who move about hospitals or work in the community,
  - » electronic discharge correspondence, where information needed by GPs, nurses and other care professionals in the community can be sent electronically,
  - » systems required by a modern ambulance service, including Call Line Identification (CLI), a pilot of an Electronic Patient Report Form system (EPRF) using digital-pen technology, and Electronic Patient Monitoring to send clinical information to the Emergency Department before the ambulance and patient arrives,
  - » GP connections to the secure HSC network, allowing results of tests to be received and referrals to be sent electronically. Patients' drugs and allergies are shared with the NIECR.
- Pharmacists, dentists and opticians have also invested in ICT to support their services.
- Key partners in the community and voluntary sector are making good use of the internet to provide information. They often lead the way in developing apps that support people to stay healthy.

Where do we want to go?

We will need significant investment of time and money to operate the eHealth and Care's underlying infrastructure and systems in a way that fully supports an advanced eHealth economy. We will also need to renew or upgrade parts of this eHealth foundation during 2015-2020. Our principles will guide investment in the maintenance and renewals process, delivering consistently efficient services across Northern Ireland.

Where possible, services will use single systems, data structures and technologies to reduce complexity and cost. We plan to complete two technical plans to help with implementation – an Infrastructure Modernisation Plan and an Application Modernisation Plan. These will examine the existing infrastructure and systems, creating a clear picture of the current position and linking it to the implementation plan.

How are we going to get there?

- We will develop a comprehensive Infrastructure Modernisation and Consolidation Plan. This will include:
  - » reviewing the feasibility of creating a HSC ICT Shared Service,
  - » reviewing any requirement to consolidate existing and future HSC Data Centres – this may include migrating regionally hosted services into these centres,
  - » providing network and log-on services to enable HSC care workers to gain access to clinical applications and information stores using any trusted device that has authorised access to the HSC network.

- We will develop an Application Modernisation and Consolidation Plan. This will set out the future development and replacement pathway for HSC care and business support applications. So it will:
  - » identify which care-support applications are to be delivered by the HSC implementing an EHCR system,
  - » provide a new HSC laboratory solution that will replace the current aging solutions and support the Laboratory Reform Programme,
  - » implement an Electronic Prescribing & Medicines Administration (EPMA) in all relevant acute locations to improve patient safety, outcomes and efficiency,
  - » replace all the current acute Patient Administration Systems.

- We will digitise manual processes and paper records to allow information to be shared and re-used more safely and efficiently.

Ensuring good governance

Objective: We want to make eHealth central to planning any changes to health and care services. This will ensure we are making the most of technical opportunities and the potential for better information flows to support improvements.

Where are we now?

HSC Trusts and staff are already using technology to help them transform their services for patients and clients. However, some areas have limited access to eHealth systems that could better support their daily work.

Too often, the technology needed to support changes has not been included in improvement plans. In the past, ICT has been seen as a field for technical specialists. This view is changing: our staff who deliver and manage frontline patient and client care are increasingly being active in using technology to help them.

An HSC ICT Programme Board has been governing the last 10 years of progress. Now there is an opportunity to refresh and re-align its technical focus with more input from care professionals.

Where do we want to go?

We need effective leadership and a shared governance structure across the HSC organisations. An ehealth and Care Strategic Board has replaced the HSC ICT Programme Board. It will:

- involve the public in setting the direction of the eHealth and Care programme,

- put care professionals at the heart of decision making, focusing on the effect of eHealth on health and wellbeing,

- ensure consistency and equity in access to eHealth services across HSC, delivering eHealth on the basis of 'Once for NI',

- use the excellent technical knowledge and experience in the HSC,

- involve business, academic, and community and voluntary sectors,

- deliver projects that support transformational change, service improvements and benefits to patients and clients,

- minimise waste, duplication and divergence from best practice,

- create space for innovation and support the roll-out of successes across HSC, and

- identify policy changes that may be needed to help bring in this strategy.

Using eHealth may mean changing traditional roles and how some HSC staff work. Some may need training and support to make best use of the technology and information. Adaptations may be needed to support staff whose lack of computer skills may hinder their use of eHealth technology. All care staff work within recognised professional codes of conduct and competency frameworks. They also need support from training and adequate clinical supervision. To help identify and meet the training and skill needs of staff, this strategy recommends setting up and coordinating activities with relevant professional bodies and education providers.

We regard the use of technology to support patient safety as vital in achieving change. This was also raised in the report 'The Right Time, The Right Place' as part of the process of improving patient care across the HSC.

How are we going to get there?

- We will put in place a new leadership and governance structure, with care professionals driving and directing the use of eHealth to support care delivery. All HSC organisations have identified specific care professionals who will lead professional input into the eHealth agenda. Care professional leadership will be further developed to enable EHCR to be designed and implemented.

- We will help staff to develop by enabling them to better use eHealth technologies. This will happen through training and support, working with professional bodies and existing training providers.

- We will strengthen our engagement with the public and other stakeholders to ensure their views continue to inform the eHealth programme's development. This work will mainly focus on three projects – the development of the EHCR, *HSC online*, and HSC Connected Caring Communities.

Glossary

Acute	Care for acute health conditions, usually short-term treatment for a severe injury or episode of illness, an urgent medical condition, or during recovery from surgery in a hospital setting
AHA	Active and Healthy Ageing. A stream of work funded by the European Union to allow countries to work together to transform services.
Analytics	The use of techniques and predictive models to gain knowledge from data.
Big data	Big data is an evolving term that describes a large amount of structured, semi-structured and unstructured data that has the potential to be mined for information.
CaPPS	Cancer Access and Patient Pathways System
CCIO	Chief Clinical Information Officer
CHIP	Connected Health Integration Platform, which can link digital records to other applications.
CIO	Chief Information Officer
CLI	Call Line Identification for emergency calls.
DETI	Department of Enterprise, Trade and Investment
DHSSPS	Department of Health, Social Services and Public Safety
eAT	Electronic Assistive Technology
eNISAT	(Electronic) Northern Ireland Single Assessment Tool
EPES	Electronic Prescribing and Eligibility System
EPRF	Electronic Patient Report Form used for the handover from ambulance staff to other care staff.
EIP	European Innovation Partnership. EIPs are a new approach to EU research and innovation that help bring together countries working in particular areas to transform services.
HCN	Health & Care Number
HSCB	Health and Social Care Board
HSC	Health and Social Care in Northern Ireland
ICT	Information and Communication Technology
IHAC	International Health Analytics Centre
MoU	Memorandum of Understanding is an agreement between countries to work together and benefit from the collaboration.
NIAS	Northern Ireland Ambulance Service
NICH	Northern Ireland Connected Health
NICS	Northern Ireland Civil Service
NIECR	Northern Ireland Electronic Care Record
NIPACS	Northern Ireland Picture Archiving and Communications System
PHA	Public Health Agency
TMS	Theatre Management System
TYC	Transforming Your Care is the strategy that outlines the plans for making changes in health and social services from 2012-2017.

care pathways	Also known as clinical pathways, critical pathways, integrated care pathways, or care maps, these are one of the main tools used to manage quality in health and social care. Their use reduces the variability in clinical practice and improves outcomes. Pathways promote organised and efficient patient care, based on evidence-based practice in the hospital or community care setting.
care professional	An individual health and/or social care provider in a professional group, e.g. medicine, nursing, allied health professional, social work, dentistry, pharmacy. The work of care professionals is overseen by regulatory bodies.
citizen	Broadly, an individual living in Northern Ireland.
design authority	This is a care professional-led group in the strategy's governance structure, which will give momentum and guidance to the various projects that help implement the strategy.
equality impact assessment	An assessment of the impact of a strategy or policy on specific groups of people who may be affected.
informatics	The use of information science, computer science, and health care. It deals with the resources, devices, and ways to improve the gathering, storage, retrieval, and use of information in health and biomedicine. Health informatics tools include computers, clinical guidelines, formal medical terminologies, and information and communication systems.
IT infrastructure	Information technology infrastructure is the framework needed to support the flow and processing of information.
innovation	New ideas which have the potential to change and improve ways of working and develop new technologies to enable health and social care delivery
legislative requirements	Obligations which must be met due to law
migration of services	The moving of local IT services to a more central system
mobile working	The use of 'smart' devices such as phones, iPads and tablets.
network coverage	Refers to the strength of the mobile 'signal' in a particular geographical area.
paper-light	An organisation that will rely less on paper would be called paper-light.
risk stratification	A process that helps care professionals to manage your health needs. By using selected information from health records, a secure computer system will look at the data and predict the likelihood of a possible deterioration in health. The care professional will use the information to help get early care and treatment where it is needed.
telemonitoring	Remotely monitoring patients who are not at the same location as the health care provider. A patient has a number of monitoring devices at home, the results of these devices will be sent via telephone to the health care provider.
web portal	A specially designed website that brings together information from different sources so that it can be easily accessed e.g. a website giving information about health and social care services in Northern Ireland.

Appendix 1

Steering group

The steering group provided the overall direction for developing the eHealth and Care strategy and demonstrated the HSC's commitment to it.

Mr John Compton	Chief Executive HSCB (retired 31/03/14) (Chair)
Mr Eddie Rooney	Chief Executive PHA
Mrs Julie Thompson	Deputy Secretary DHSSPS(NI)
Mrs Catherine Daly	Deputy Secretary DHSSPS(NI)
Mr Hugh McCaughey	Chief Executive South East HSCT
Mrs Mairead McAlinden	Chief Executive Southern HSCT
Mr Liam McIvor	Chief Executive Northern Ireland Ambulance Service
Mr Sean Donaghy	Director of eHealth and External Collaboration – HSCB
Mr Eddie Ritson	Programme Director – CCHSC PHA
Mr David Bingham	Chief Executive Business Services Organisation

Expert advisory group

The external reference group provided advice and challenge to the project team and the steering group.

Mr Paul Wickens	Chief Executive NICS Enterprise Shared Services Centre
Mr Gwyn Thomas	Ex CIO Wales and UKCHIP Chair
Dr Charles Gutteridge	CCIO Barts Health NHS Trust
Mr Bill McCluggage	Ex CIO Ireland

References

DHSSPS (2015) 'The Right Time, the Right Place', an expert examination of the application of Health and Social Care governance for ensuring the quality of care provision in Northern Ireland. Available at http://www.dhsspsni.gov.uk/ldreport270115.htm

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