Office of the CIO

National Electronic Health Record

Strategic Business Case Appendices
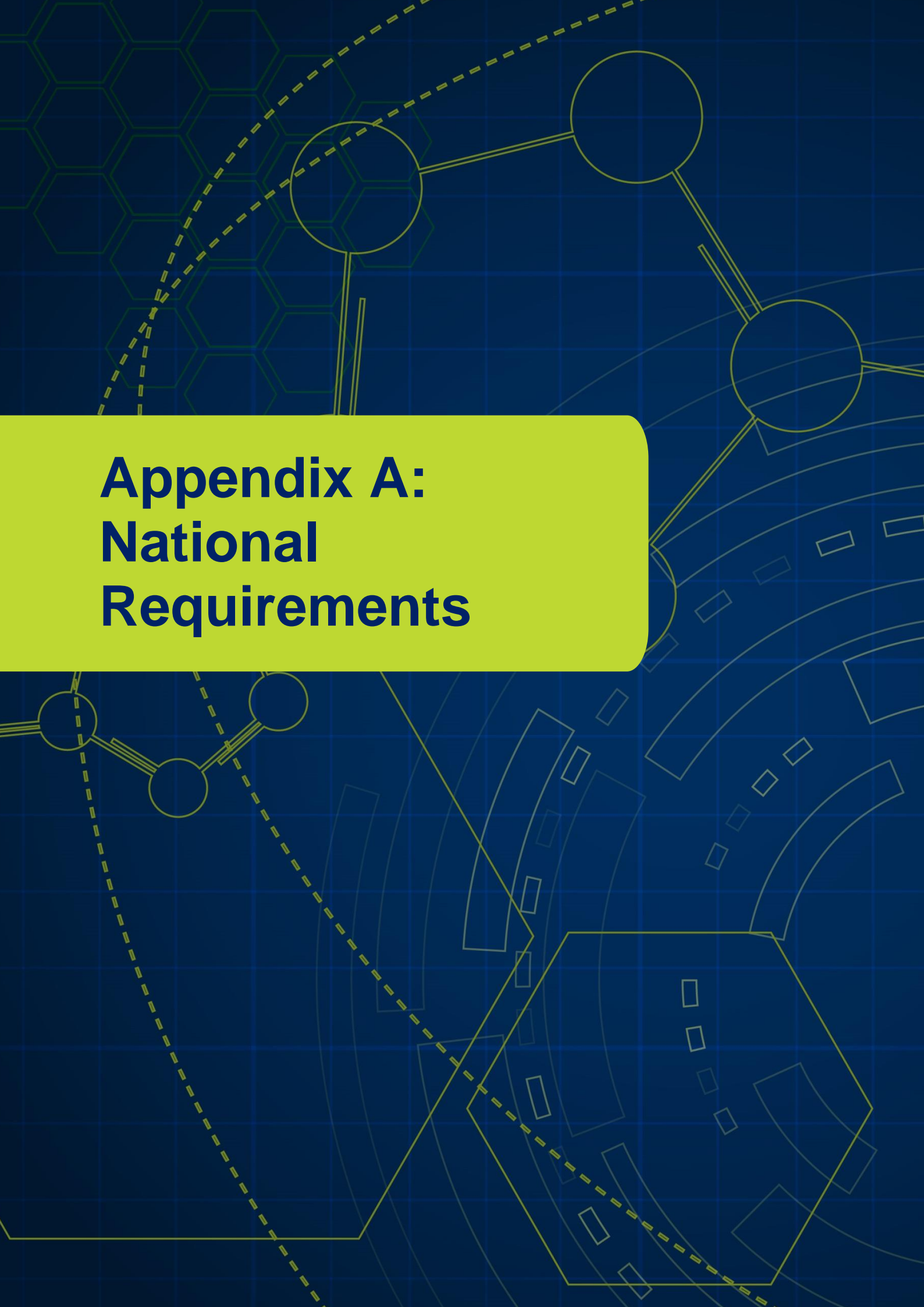
May 2016

Version 1.0

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Introduction

This document presents a series of Appendices that supplement the overall National Electronic Health Record Strategic Business Case. It provides additional detail on the key workshops conducted with stakeholders to illustrate how particular decisions were arrived at and the overall strategy defined.

The Appendices also outline an initial overview of the Readiness Assessment required as part of the next stage of implementation and a detailed presentation of the estimated programme resources and costs.

Further information is available in the following documents:

- National Electronic Health Record Strategic Business Case – Executive Summary
- National Electronic Health Record Strategic Business Case

Appendix A: National Requirements

The following appendix presents an outline of the components that constitute the National EHR. To deliver the National EHR, national requirements will also be needed. These requirements will ensure that all components can interact in a meaningful way in order to create a consolidated National EHR. The key national requirements identified in conjunction with workshop participants and key stakeholders across care settings are also presented in this appendix.

The National EHR Components

Four primary components have been identified that constitute the National EHR for Ireland. These are:

- National Shared Record,
- Community Operational Systems,
- Acute Operational Systems,
- Integration Capability.
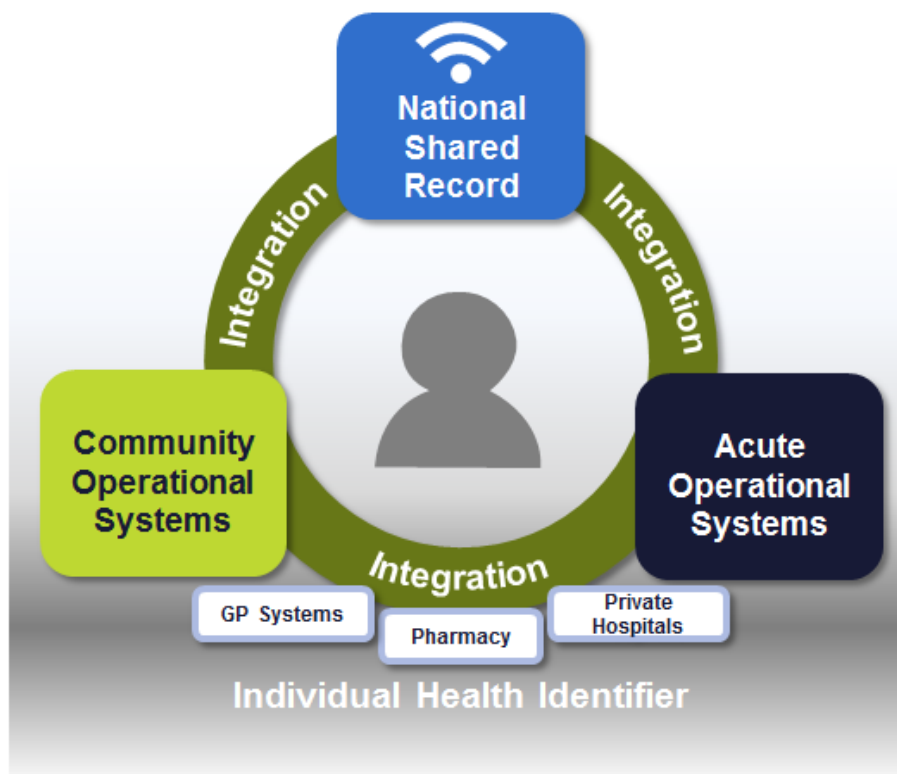
The Individual Health Identifier, delivered under a separate programme, will also be a key enabler of the National EHR.

This high level architecture has been drawn from the initial eHealth blueprint that was shared and validated with the eHealth industry and in consultation with a wide range of stakeholders. A number of key factors were identified during this engagement that have driven the overall configuration including:

- The need to allow flexibility for different operational areas across Ireland's health system to progress in a semi-independent manner and at differing speeds,
- Facilitating a modular approach that delivers benefits within specific care settings and does so without the need to implement on a "big-bang", all or nothing, basis,
- Enabling change to take hold at local level and gradually building on that change incrementally,
- Responding to current market structure – currently, there is no mature solution available that would meet the needs and requirements of the entire National EHR vision which spans the entire health service.

The four primary components are described below:

National Shared Record: A National Shared Record delivered through a national portal will contain key patient data drawn from the various operational solutions within the health service, e.g. from systems in hospitals, community services and broader population health information. It will aim to provide a longitudinal view of the patient's care and enable collaboration among clinicians and care givers. It will support them in making better informed clinical decisions through a more comprehensive understanding of the patient. The portal is the key means of providing access to specific records to user groups such as patients, carers and healthcare providers. Clinical need will largely determine which user groups have access to relevant and appropriate information in a secure manner and respecting privacy concerns.

Community Care EHR Operational Systems: Across the care areas within the Community setting (Primary Care, Mental Health, Health and Social Care Professional Services, Older Persons Services and Disability Services), an EHR is necessary to enable the delivery of efficient and effective care through the provision of supporting technology. Core capabilities include:

- Patient Administration and Scheduling that contains key patient demographics and care information, allows appointments to be managed with greater efficiency, and enables referral management,
- Clinical Notes that provide facilities for care givers to record structured patient care information are required in order to be able to create a record of care across disparate services,
- Test results that enable care givers to view the outcomes of investigations conducted in different locations,
- Population Health Management that facilitates screening and surveillance of patient cohorts to provide more proactive management of care,
- Referral Management to allow care givers to securely and quickly refer patients along the continuum of care,
- Mobile Clinical Management that facilitates the connectivity for remote working recognising that care is often given in different locations in the community, including in the patient's home.

Key information must also be made available from these solutions into the National Shared Record in order to facilitate collaboration along the continuum of care.

Acute Care EHR Operational Systems: Within the acute hospital setting, dedicated ICT solutions are required to manage the delivery of care. These operational systems include core components such as:

- Patient Administration that contains key patient demographics and care information that facilitates scheduling and referral management,
- Order/Communications that enable materials/tests/diagnostics to be requested and results received,
- Clinical Notes that provide facilities for care givers to record structured patient care information,
- Medicines management that enables the tracking of all medications administered to the patient.

The availability of consistent, relevant patient information is necessary across the acute hospital system in order to be able to realise the objectives of the Hospital Groups to form effective care networks. Key information must also be made available from these acute solutions into the National Shared Record in order to facilitate collaboration along the continuum of care.

Integration Capability: From a technical perspective, a mechanism must exist that communicates patient data between the various healthcare service providers, enabling the delivery of comprehensive national shared records, while maintaining the integrity and security of that information. The integration capability provides the glue that binds the system together and ensures the security of the information being transmitted. It also enables integrated care pathways to be realised across care settings through information sharing and communication. The IHI will be a critical pre-requisite for effective integration.

Through the use of analytic tools, the data that will be captured and shared via a National EHR can aid population health planning, patient risk stratification and clinical research. Operationally, the systems will support areas such as; National Screening, Immunisation, Child Health, Sexual Health, and Health Promotion

and Improvement. The rich information available will be of benefit to overall research efforts and can be aligned to the overall research approach that will emerge across the entire health service.

Other healthcare providers such as General Practitioners, Pharmacies and Private Hospitals can access and contribute to the National Shared Record. This will be achieved through the Integration Capability that will link systems and information with the portal solution for the National Shared Record.

National Requirements

In order to ensure that all the key components work together to deliver an overall National EHR, there are a number of key national requirements that must be defined and underpin all components.

Performance Reporting

Data and information requirements as part of overall performance management reporting and governance processes. This would also include financial information needed as part of the Activity Based Funding dataset requirements

Portal Integration

The technical requirements for integrating with the national portal to access and interact with the National Shared Record. This would also include the information requirements for provision of information to the portal. These standards would be applicable and available for private healthcare providers so that they can interact with the National Shared Record

National Systems Integration

The integration and interoperability requirements for interacting with existing and planned national solutions such as NIMIS, MedLIS, ePharmacy, MN-CMS and the Acute and Community Care EHR Operational Systems

External Device/ Service Integration

The integration and interoperability requirements to interact with telehealth/telecare solutions and other external devices or services

Clinical Protocols

Requirements, protocols and catalogues developed through the Clinical Programmes must be accommodated as part of the components of the National EHR. These may be required across different care settings so it is essential that requirements are met across all relevant components

Research

The National EHR will be a source of rich information about health trends. This information will be of benefit to overall research efforts and can be aligned to the overall research approach that will emerge across the entire health service. To support research across the care settings, requirements around common datasets will need to be defined

The activities required to define these requirements and standards have been included in the EHR Programme Next Steps in Section 9 of the Strategic Business Case.

Appendix B: Community Care EHR Operational System

The following appendix presents the outputs of consultations with Community Care stakeholders in terms of:

- Solution approach,
- Core capabilities,
- Implementation approach.

Introduction

The systems currently deployed in Community Care are limited in scope and implementation and there is therefore limited legacy to consider or build from. Part of the overall ambition in establishing CHOs is to achieve greater consistency in operating models across the sector and this is also reflected through discussions with key stakeholders from this area of the health system. Finally, the engagement with a range of vendors suggests that there are solutions in the market that support the range of requirements suitable for initial deployment of core capabilities in the CHO areas.

Key objectives identified by stakeholders that the end-state should support include:

- Integrating the work between people,

- Managing Community resources,

- Streamlining patient care,

- Providing swift and appropriate access to information,

- Supporting Population Health Management,

- Patients managing their own health,

- Enabling risk stratification,

- Supporting proactive Chronic Disease Management,

- Interacting with multiple agencies outside the health system that deliver services, such as TUSLA.

Community Care EHR Operational Systems Representatives

The following representatives formed part of the working group on Community Care:

- Emma Benton – Portfolio Manager and Therapy Professions,

- Tony Canavan – Chief Officer CHO Area 2,

- Kevin Conlon – Principal Officer, Department of Health,

- Robert Cooke – IT Delivery Director for Community Health,

- Richard Corbridge – CIO, HSE,

- Pat Dunne – Assistant National Director, Primary Care,

- Gemma Garvan – Head of Healthlink,

- Dr. David Hanlon – Clinical Advisor and Group Lead,

- Fergal Marrinan – EHR Programme Manager,

- Dr. Stephanie O'Keeffe – National Director Health and Wellbeing,

- Joe Ryan – Acting Head of System Reform Group,

- Niall Sinnott - IT Delivery Director for Primary Care,

- Fran Thompson – Programme Director for the Strategic e-Health Programme for the Office of the CIO.

The key questions that the representatives helped to address during workshops were:

1 Should we pursue a single solution/vendor or a multiple vendor approach for the overall CHO landscape?
2 What are the minimum set of capabilities that should be deployed across a CHO?
3 What overall approach to implementation should be adopted?

Solution Approach

A key question for the delivery of Community Care capabilities considered by representatives is whether there should be one or multiple solutions and vendors involved in providing that capability.

There are a number of pros and cons associated with both approaches:

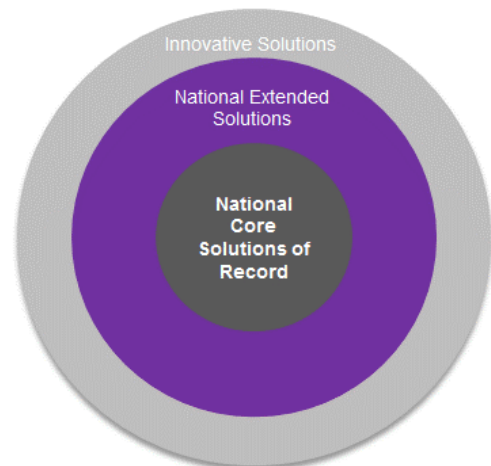|	**One Solution**	**Multiple Solutions**
Pros	- Easier to ensure national requirements are implemented and adhered to - Drives uniformity across the health system from a technology and subsequent process perspective - Minimises overall integration effort and cost - Easier training efforts	- Fosters choice and competition Provides more capacity on supplier side to handle more than one implementation at once - Fosters innovation between framework members to remain competitive - Greater ability to meet diverse needs
Cons	- Overly reliant on one supplier maintaining performance levels - One supplier unlikely to have the capacity to carry out multiple implementations – increases the deployment timeframe - Less likely to drive innovation - Too rigid – one size fits all approach	- Requires greater supplier management - Introduces variation in technology and supporting processes into the overall health system - Greater integration effort and cost - May fragment the market to the point where it is unattractive for some suppliers

> The consensus view from representatives is that there is a core set of capabilities applicable across all disciplines in Community Care. As a result, it is desirable to have a single solution providing those capabilities across all disciplines.

This view helped define the overall National EHR strategy where there are core solutions, extended solutions and innovative solutions as presented below.

National Core Solutions of Record: This represents a set of *core functions*, based on single vendor solution, that serve as the minimum viable functionality for each care setting. The deployment of these core functions, such as patient scheduling, would allow the health system to achieve a common capability at an operational level and underpin a national shared record of considerable value to stakeholders. The core solutions of record in the community would be deployed at a CHO level.

National Extended Solutions: These solutions provide enhanced capability, as provided by the current national imaging solution, that may be deployed on a gradual basis and at a pace that reflects local needs and implementation capability. The default position, in line with the overall single solution strategy, would be to adopt extended solutions from the vendor providing the core solutions. However, in some exceptional circumstances a best of breed approach may be considered and adopted based on specific local criteria.

Innovative / Emerging Solutions: The market for solutions that support clinical environments is vibrant and dynamic with new solutions emerging on a continued basis that are focused on specific / niche areas, for example an app to support diabetes patients. This includes solutions from within the Irish market. The overall National EHR environment must support the adoption of these solutions as a means of extending capability across the health system.

The benefits of this overall implementation approach include:

- *Standardisation of Core Processes:* The core solutions support the critical processes within the health setting. Transitioning to a single solution for the Core helps to promote standardisation of processes and the ability for staff to work across different locations,

- *Controlled Flexibility:* Separating Extended Solutions from the capabilities in the Core provides a degree of flexibility to progress solutions in these areas to meet diverse needs over different timescales. Where the existing core solution vendor has a solution that meets the needs, that solution should be leveraged, thus reducing integration efforts. Where a new provider is introduced for an extended solution it must be considered for adoption as a national solution to limit the creation of an overly disparate IT landscape. NIMIS is an example of such an extended solution currently in use nationally,

- *Fostering Innovation:* Innovative, condition specific solutions often emerge from niche providers in a market that is dynamic and maturing. The potential for these solutions to be incorporated without impacting on the main capabilities of the overall EHR landscape is an added benefit.
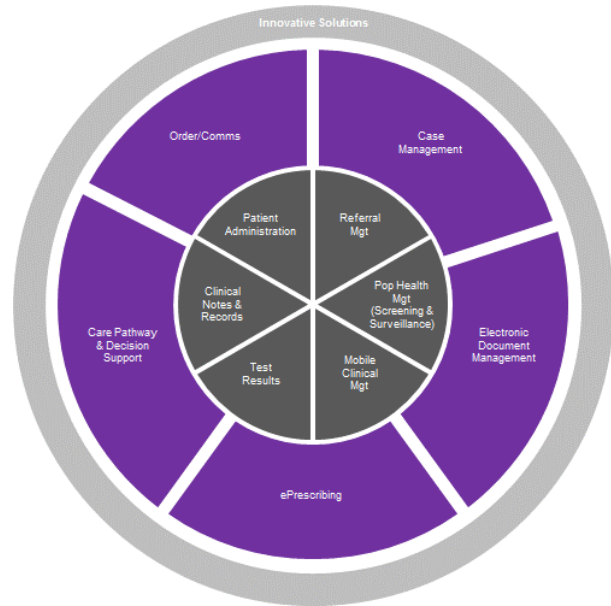
Community Care Core Capabilities

The Community Care EHR Operational System is agnostic to the differing care settings present in the Community area, for example Mental Health and Primary Care. The capabilities it describes are required across the entire care setting.

There is a core set of capability to be deployed as an initial step to provide functionality that would be of benefit to both clinicians and patients.

The core community capabilities of; Patient Administration, Referral Management, Population Health Management, Mobile Clinical Management, Test Results and Clinical Notes & Records will be deployed at a CHO level.

The IHI is a key enabler that will underpin the Community Care EHR Operational System.

An overview of the Core Solutions of Record in the Community Care EHR Operational System along with commentary on the current provision within the public health system in Ireland is set out below:

Capability	Description	Current Provision within the Public Health System
Patient Administration	The ability to record the patient's demographics (e.g. name, home address, date of birth) and details all patient contact. Scheduling resources (staff, materials) and patients to optimise flow and throughput including individual and group working and managing case load. Workflows and processes to support clinic administration and management.	Limited disciplinary and/or local solutions not extended nationally
Referral Management	Receipt of electronic referrals and integration with scheduling to effectively manage appointments and resources while providing real time feedback to the originating source Creation and sending electronic referrals to other services with integration to receive scheduling updates	Limited functionality from Community to Acute through eReferrals

| Capability	Description	Current Provision within the Public Health System
Population Health Management (Screening and Surveillance)	Provision of coded information to enable population health management across the health system	Available across the Community Setting
Mobile Clinical Management	The ability to use EHR functions remotely and on mobile devices	Not currently provided
Test Results	Provision of notifications of the completion of orders and flagging of any key results/outcomes. Allow view of discrete data for each patient from Labs, Pharmacy and DI Systems as a snapshot, including but not limited to: laboratory tests, diagnostic tests and reports, medications, allergies, problem lists	Some results available across the Community Setting
Clinical Notes and Records	Core process support for clinical notes and assessments summarising interactions that occur between patients and care providers	Limited disciplinary and/or local solutions not extended nationally

Implementation Approach

Three potential deployment approaches for the Community Care setting were proposed and reviewed by representatives and stakeholders. These were:

- Approach 1: Deploy all Core Capabilities for all disciplines within each CHO at the same time,
- Approach 2: Deploy all Capabilities in one CHO area before moving on to the next CHO area,
- Approach 3: Deploy core Capabilities for specific disciplines across all CHO's areas before moving on to the next discipline.

There are a number of pros and cons associated with each approach.

Approach 1: Deploy all Core Capabilities for all disciplines within each CHO at the same time
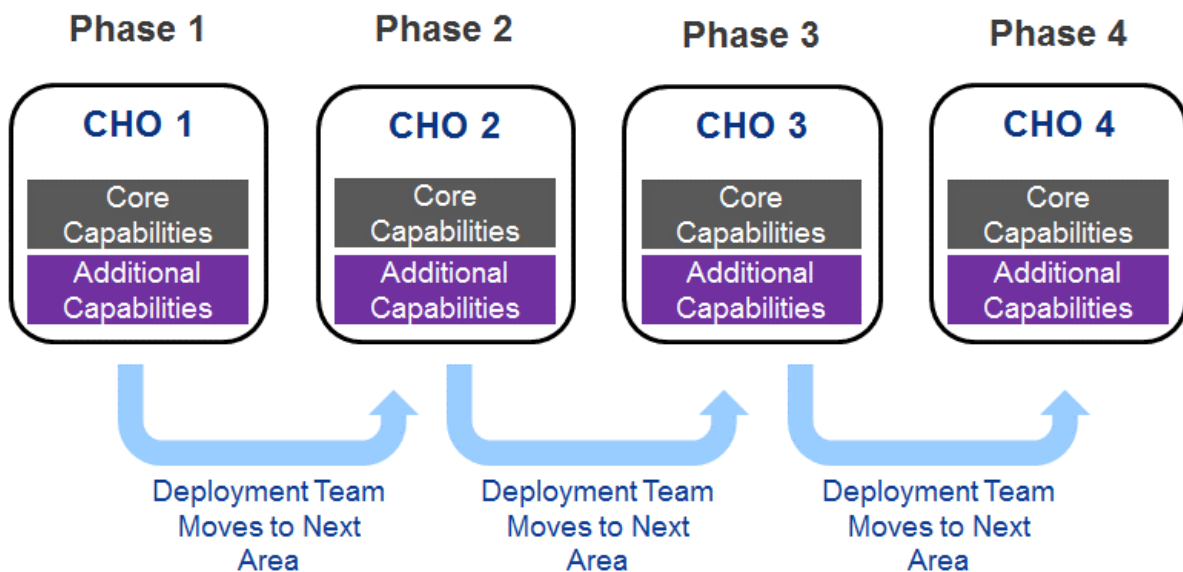

Note: 4 CHOs shown as an example
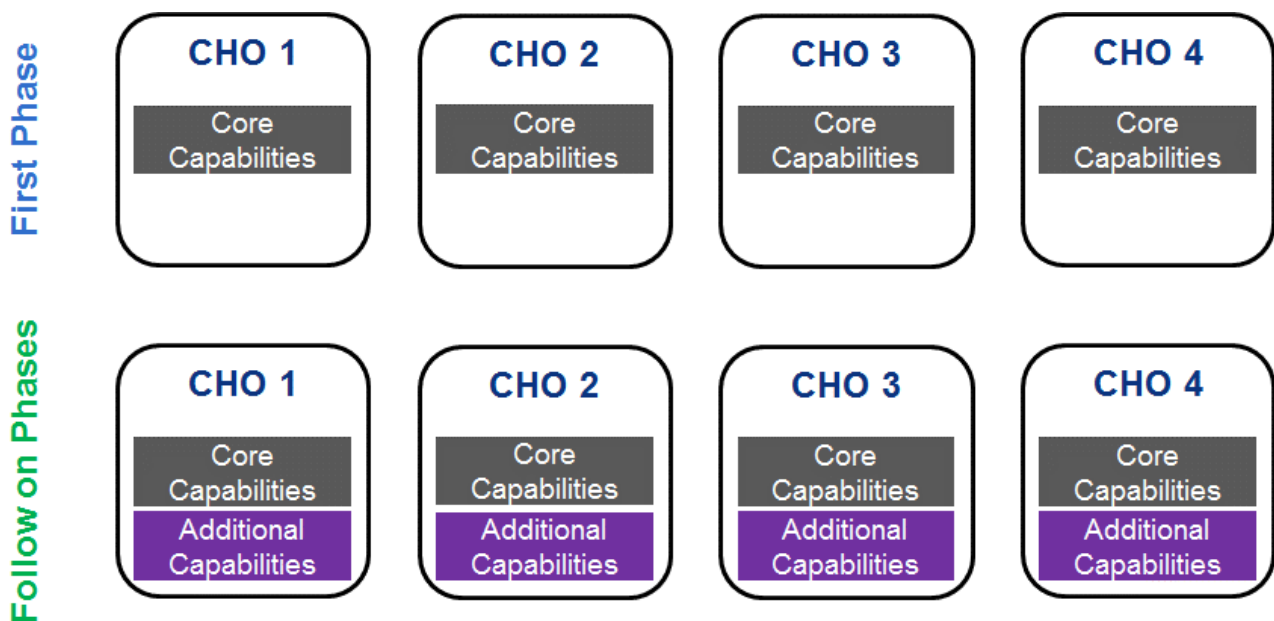
Pros	Cons
▪ Provide a broader range of standardised capabilities across the group in a quicker timeframe	▪ Requires greater resources from CHO areas to provide support at the same time
▪ Provide the National Portal with information from more CHO areas in a quicker timeframe	▪ Core Capabilities are so broad that it may impact on Supplier capacity to support successful implementation
▪ All patients across the area have the same level of EHR support	▪ More challenging programme management from a coordination point of view

Approach 2: Deploy all Capabilities in one CHO area before moving on to the next CHO area

Phase 1	Phase 2	Phase 3	Phase 4
CHO 1	**CHO 2**	**CHO 3**	**CHO 4**
Core Capabilities	Core Capabilities	Core Capabilities	Core Capabilities
Additional Capabilities	Additional Capabilities	Additional Capabilities	Additional Capabilities

Deployment Team Moves to Next Area

Deployment Team Moves to Next Area

Deployment Team Moves to Next Area

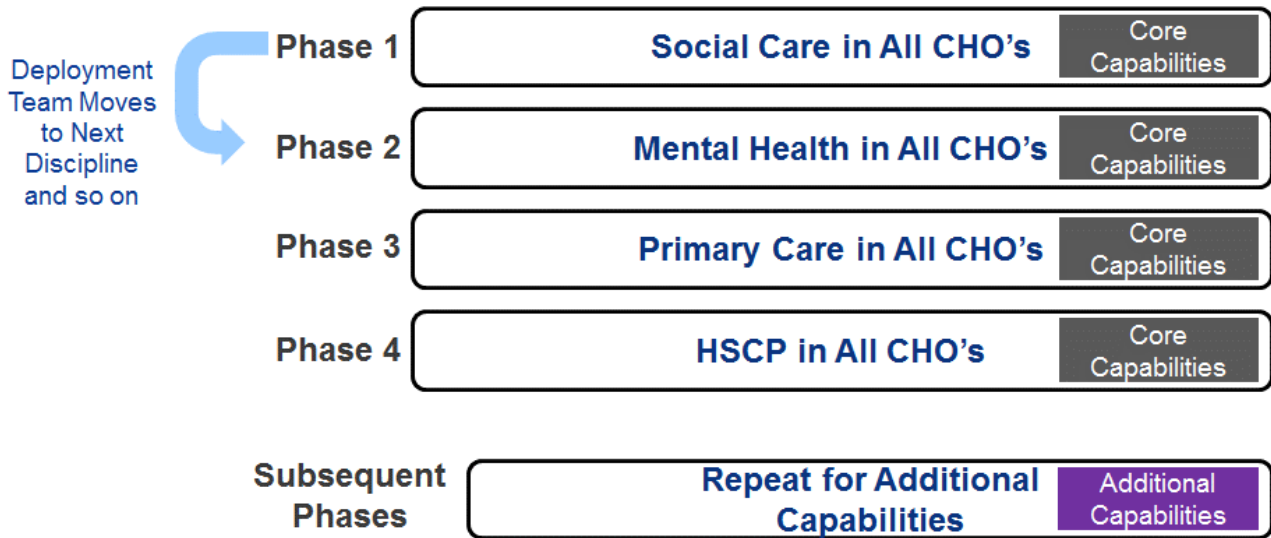Note: 4 CHOs shown as an example

Pros

- Has a more limited supporting resource requirement for both CHO's and the supplier
- Easier to manage the implementation

Cons

- Much longer roll-out timeframe across the CHO's
- Will impact on quality of information provided to the National Portal from the CHO's as not all CHOs will have capabilities in place at the same time
- Geographical inequalities in technology support for cohorts of patients would develop as some CHOs would receive new capabilities significantly in advance of others

Approach 3: Deploy core Capabilities for specific disciplines across all CHO's areas before moving on to the next discipline

Pros

- Has a more limited supporting resource requirement for both CHO's and the supplier
- Easier to manage the implementation

Cons

- Much longer roll-out timeframe across the CHO's
- Will impact on quality of information provided to the National Portal from the CHO's as not all disciplines will have capabilities in place at the same time
- Inequalities in technology support for cohorts of patients would develop based on their health condition as some disciplines would receive new capabilities in advance of others

Chosen Approach Assumed for Programme Costing Purposes

Based on the feedback from key stakeholders, workshop and working group participants, and the desired solution approach of one system being implemented to provide the core capabilities, the approach used as part of programme planning is a combination of approaches 1 and 2.

The full set of core capabilities would be deployed in each CHO during implementation but the roll-out to CHOs would be staggered. The assumed deployment approach is as follows:

Subsequent extended capabilities could then be deployed but these have not been included within programme plans or costs.

Appendix C: Acute EHR Operational System

The following appendix presents the outputs of consultations with Acute Care representatives and stakeholders in terms of:

- Solution approach,
- Core capabilities,
- Implementation approach, including considerations identified by representatives.

Introduction

The acute sector is complex in that various systems of significant importance in the EHR landscape already exist in the hospitals and/or are currently being deployed. In addition there are ongoing requirements that may need to be addressed urgently in advance of any national EHR deployment. It is not felt that a single solution can be deployed in a "top-down" manner but that we must evolve towards a single solution. The realisation of a true single EHR solution within all hospitals in Ireland will take many years and over the course of this journey a multi-vendor EHR environment will exist as it does for various components today, and need to be managed. All new investments will be made in line with the solution strategy and any decision to deviate from the strategy will be taken on an exception basis.

Acute Care EHR Operational Systems Representatives

The following representatives formed part of the working group on Acute Care:
- Noel Carberry – Programme Manager, Children's Hospital Group,
- Dr. Áine Carroll – National Director for Clinical Strategy and Programmes,
- Kevin Conlon – Principal Officer, Department of Health,
- Richard Corbridge – CIO, HSE,
- Mary Fitzsimons – CCIO and Head of Department of Neurophysics at Beaumont Hospital,
- Gemma Garvan – Head of Healthlink,
- Dr. David Hanlon – Clinical Advisor and Group Lead,
- Joyce Healy – CCIO,
- Fergal Marrinan – EHR Programme Manager,
- Frank McGuinness – Head of IT, Children's Hospital Group,
- Dr. Brendan Murphy – Consultant Neonatologist,
- Neil O'Hare – Director of Informatics , St. James's Hospital,
- Professor Owen Smith – Consultant Paediatric Haematologist,
- Fran Thompson – Programme Director for the Strategic e-Health Programme for the Office of the CIO,
- David Wall – Head of IT, Tallaght.

The key questions that the representatives helped to address during workshops were:

1 Should we pursue a single solution/vendor or a multiple vendor approach for the overall Acute landscape?

2 What are the minimum set of capabilities that should be deployed in the Acute setting?

3 What overall approach to implementation should be adopted?

Solution Approach

A key question for the delivery of Acute capabilities is whether there should be one or multiple solutions and vendors involved in providing that capability.

There are a number of pros and cons associated with both approaches:

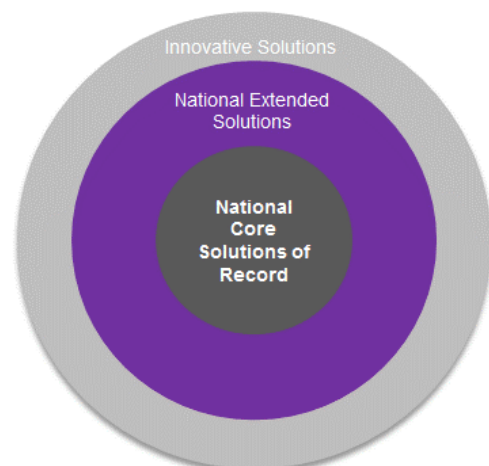|	**One Solution**	**Multiple Solutions**
Pros	▪ Easier to ensure national requirements are implemented and adhered to ▪ Drives uniformity across the health system from a technology and subsequent process perspective ▪ Minimises overall integration effort and cost ▪ Easier training efforts	▪ Fosters choice and competition for subsequent call-offs ▪ Provides more capacity on supplier side to handle more than one implementation at once ▪ Fosters innovation between suppliers to remain competitive ▪ Greater ability to meet diverse needs
Cons	▪ Overly reliant on one supplier maintaining performance levels ▪ One supplier unlikely to have the capacity to carry out multiple implementations – increases the deployment timeframe ▪ Less likely to drive innovation ▪ Too rigid – one size fits all approach	▪ Requires greater supplier management ▪ Introduces variation in technology and supporting processes into the overall health system ▪ Greater integration effort and cost ▪ May fragment the market to the point where it is unattractive for some suppliers

> ! The consensus view from representatives is that that a single supplier is desirable as the overall end state – it minimises the integration effort required, it enables care givers to move across different settings and different hospitals without the need to learn new systems and it promotes standardisation of processes across the acute sector.

This view helped define the overall National EHR strategy where there are core solutions, extended solutions and innovative solutions as presented below.

National Core Solutions of Record: This represents a set of *core functions*, based on single vendor solution, that serve as the minimum viable functionality for each care setting. The deployment of these core functions, such as patient scheduling, would allow the health system to achieve a common capability at an operational level and underpin a national shared record of considerable value to stakeholders. The core solutions of record in the acute sector would be deployed at a Hospital Group level on a hospital by hospital basis.

National Extended Solutions: These solutions provide enhanced capability, as provided by the current national imaging solution, that may be deployed on a gradual basis and at a pace that reflects local needs and implementation capability. The default position, in line with the overall single solution strategy, would be to adopt extended solutions from the vendor providing the core solutions.

However, in some exceptional circumstances a best of breed approach may be considered and adopted based on specific local criteria.

Innovative / Emerging Solutions: The market for solutions that support clinical environments is vibrant and dynamic with new solutions emerging on a continued basis that are focused on specific / niche areas, for example an app to support diabetes patients. This includes solutions from within the Irish market. The overall National EHR environment must support the adoption of these solutions as a means of extending capability across the health system.

The benefits of this overall implementation approach include:

- _Standardisation of Core Processes:_ The core solutions support the critical processes within the health setting. Transitioning to a single solution for the Core helps to promote standardisation of processes and the ability for staff to work across different locations,

- _Controlled Flexibility:_ Separating Extended Solutions from the capabilities in the Core provides a degree of flexibility to progress solutions in these areas to meet diverse needs over different timescales. Where the existing core solution vendor has a solution that meets the needs, that solution should be leveraged, thus reducing integration efforts. Where a new provider is introduced for an extended solution it must be considered for adoption as a national solution to limit the creation of an overly disparate IT landscape. NIMIS is an example of such an extended solution currently in use nationally,

- _Fostering Innovation:_ Innovative, condition specific solutions often emerge from niche providers in a market that is dynamic and maturing. The potential for these solutions to be incorporated without impacting on the main capabilities of the overall EHR landscape is an added benefit.

Acute Care Core Capabilities

The core components of Hospital Patient Administration, Order/Comms, Clinical Note & Records and Medications Management will be deployed at a Hospital Group level on a hospital by hospital basis.

New hospital builds such as the New Children's Hospital may require extended solution capabilities in addition to the core.
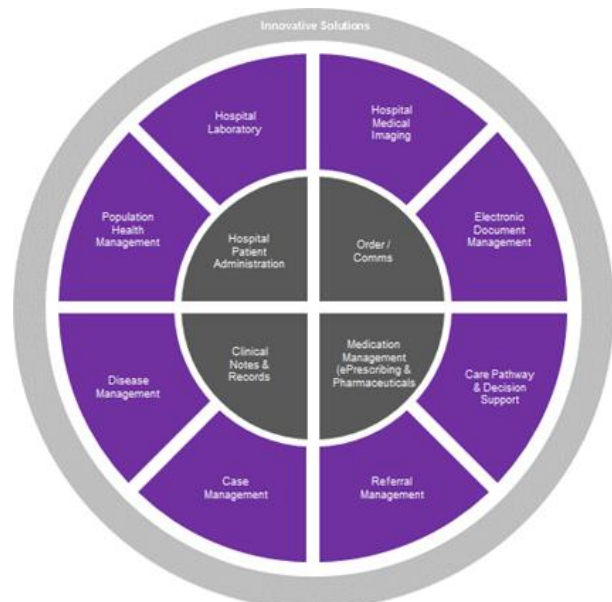
An overview of the Core Solutions of Record in the Acute Care EHR Operational System along with commentary on the current provision within the public health system in Ireland is set out below:

| Capability	Description	Current Provision within the Public Health System
Hospital Patient Administration (PAS)	The ability to record the patient's demographics (e.g. name, home address, date of birth) and details all patient contact with the hospital, both outpatient and inpatient. Gathering and presenting real time bed status information including estimated dates of discharge to drive flow and prediction models. Scheduling resources (staff, materials, theatres) and patients to optimise flow and throughput. Workflows and processes to support departmental activities such as: • Workflows and processes to support A&E administration including payment capability • Workflows and processes to support Theatre administration	All hospitals have PAS basic functionality however some hospitals use technology that is no longer fit for purpose or is no longer in support
Order/Comms	The ability to create electronic orders, and forward as appropriate, for a variety of clinical activities including: laboratory tests, diagnostic imaging tests, referrals for specialists, and other health care services. Receiving notifications of the completion of orders and flagging of any key results/outcomes	Only 4 of hospitals have closed loop Order/Comms capabilities
Medications Management (ePrescribing and Pharmaceuticals)	The ability to create, store, maintain and display prescription or other medication orders with sufficient information for correct filling and administration by a pharmacy. The ability to check for potential interactions between medications to be prescribed and current medications and alert the user at time of prescribing if potential interactions or allergies exist	Only 1 hospital has a medications management capability
Clinical Notes and Records	The ability to record structured clinical notes summarising interactions that occur between patients and healthcare providers with specific departmental supports such as: • Specific support for A&E processes / workflow • Specific views and data input methods suitable for theatres	No hospital in Ireland has clinical notes and records capability

Implementation Approach

Two potential deployment approaches were presented and considered for the Acute Care setting by representatives and stakeholders. These were:

- Approach 1: Deploy all Core Capabilities in each hospital within the Group at the same time first,
- Approach 2: Deploy all Capabilities in one hospital before moving on to the next hospital,

There are a number of pros and cons associated with each approach.

Approach 1: Deploy all Core Capabilities in each hospital within the Group at the same time first
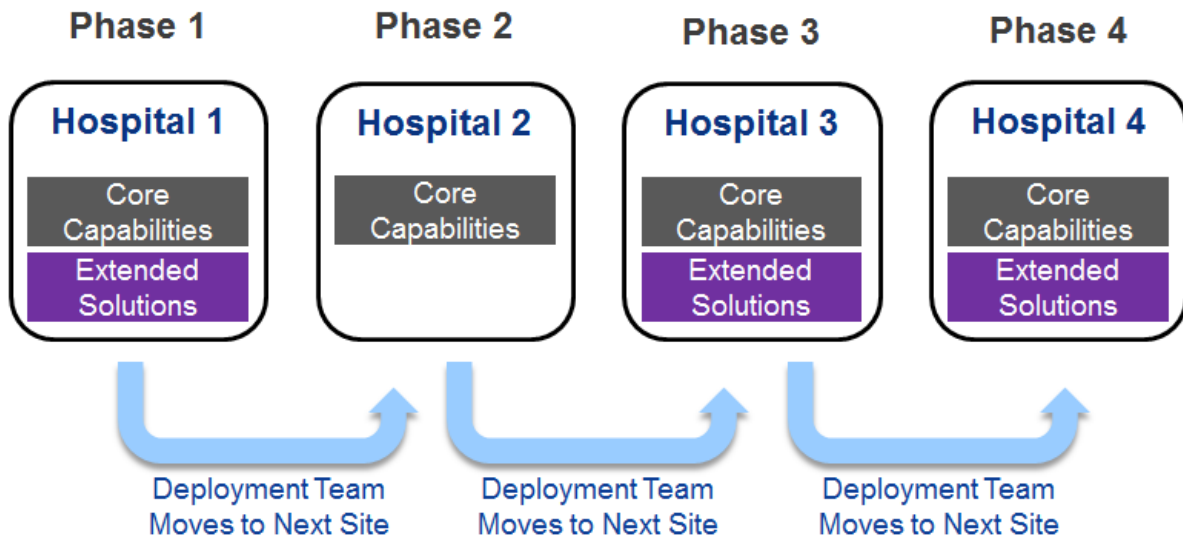

Note: 4 hospitals shown as an example
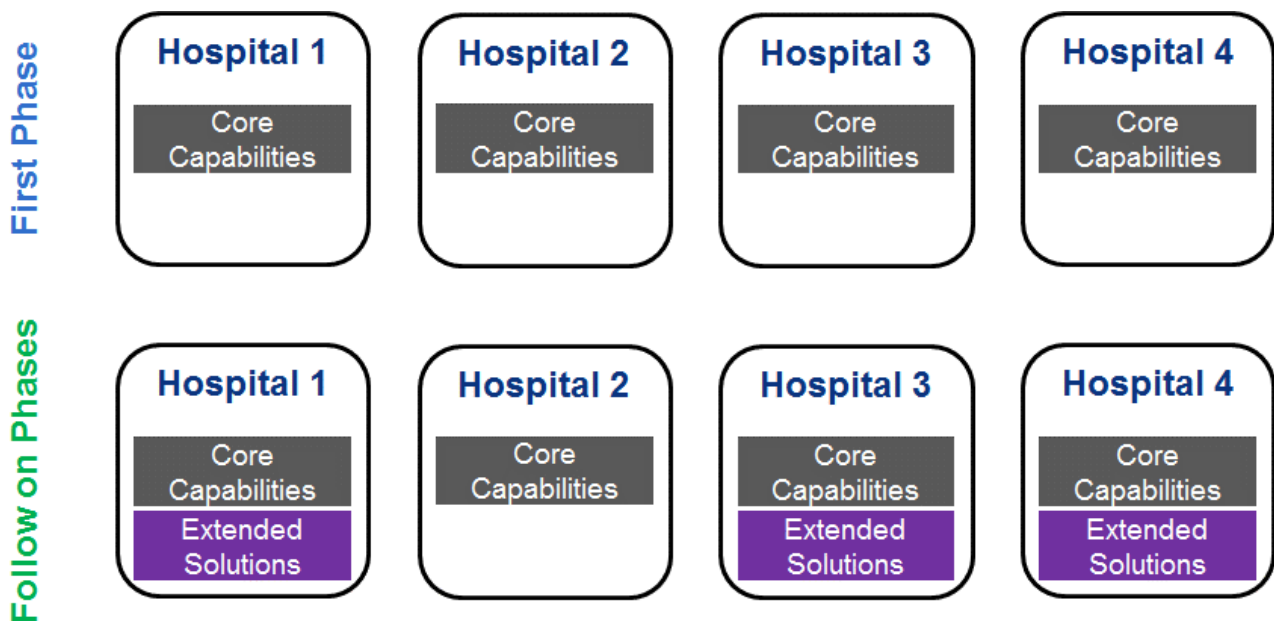
Pros	Cons
▪ Provide a broader range of standardised capabilities across the group in a quicker timeframe	▪ Requires greater resources from within all hospitals in the Group to provide support at the same time
▪ Provide the National Portal with information from more hospitals in a quicker timeframe	▪ Core Capabilities are so broad that it may impact on Supplier capacity to support successful implementation
▪ All patients across the Group have the same level of Acute EHR support	▪ More challenging programme management from a coordination point of view

Approach 2: Deploy all Capabilities in one hospital before moving on to the next hospital

Note: 4 hospitals shown as an example

Pros

- Has a more limited supporting resource requirement for both hospitals and the supplier
- Easier to manage the implementation

Cons

- Much longer roll-out timeframe across the Group
- Will impact on quality of information provided to the National Portal from as not all hospitals will have capabilities in place at the same time
- Geographical inequalities in technology support for cohorts of patients would develop as some hospitals would receive new capabilities significantly in advance of others

Chosen Approach Assumed for Programme Costing Purposes

Based on the feedback from key stakeholders, workshop participants and the desired solution approach of one system being implemented to provide the core capabilities, the approach used as part of programme planning is a variant of approach 2.

The full set of core capabilities would be deployed in each Hospital Group (on a hospital by hospital basis) during implementation but the roll-out to Hospital Groups would be staggered. For the purpose of identifying the indicative timeframes, costs and resources, we have modelled the delivery based on two different deployment scenarios:

- 5 Year Deployment – where the acute core capabilities are deployed on a phased basis over a five year period

Indicative Delivery Timeframe – 5 Year Deployment Scenario

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
	Acute HG 1 - CHG			Acute HG 4						
	Acute HG 2			Acute HG 5						
	Acute HG 3			Acute HG 6						
				Acute HG 7						

- 9 Year Deployment – where the acute core capabilities are deployed on a phased basis over a nine year period:

Indicative Delivery Timeframe – 9 Year Deployment Scenario

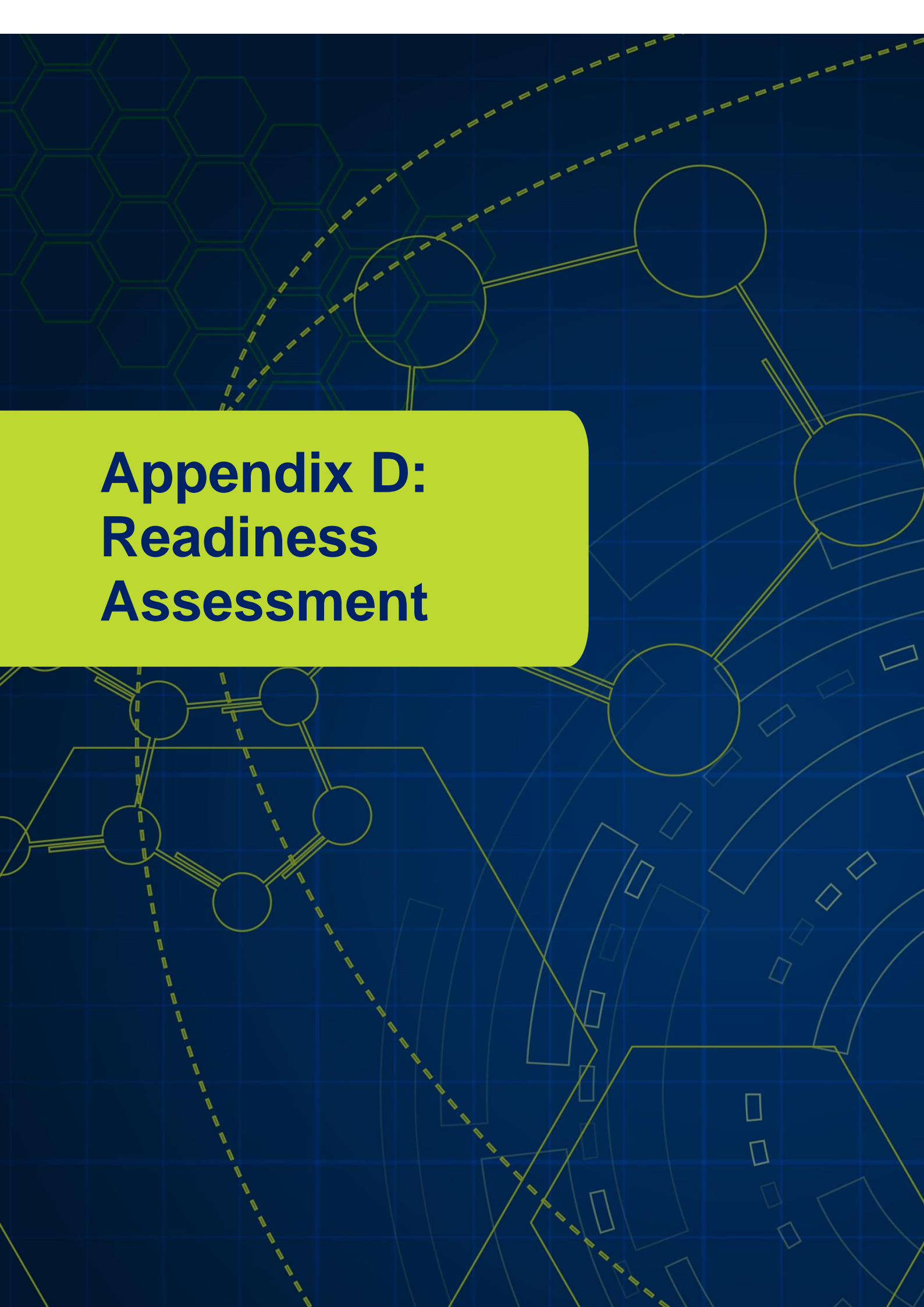| Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
	Acute HG 1 - CHG									
		Acute HG 2			Acute HG 4			Acute HG 6		
		Acute HG 3			Acute HG 5			Acute HG 7		

In both scenarios, the Children's Hospital Group have been assumed to be part of the initial deployment given the need to provide capabilities as part of the New Children's Hospital.

Implementation Considerations

As part of the deployment of the acute capabilities, the representatives and stakeholders identified a number of considerations that must be taken into account as part of detailed implementation planning. These include:

- There will not be a single solution across both Acute and Community but interaction will be required,

- There must be integration or interfacing with current and planned national solutions:
  - Rolled Out: NIMIS,
  - In Deployment: MedLIS, eReferral, Maternal & Newborn Clinical Management System, Medical Oncology Clinical Information Solution,
  - In Design:, ePharmacy, Child Health Immunisation System, Chronic Disease Management,

- The Acute EHR Operational System must be an integrated solution overall – a distinction will have to be made between integration and interfacing with other components and systems (e.g. NIMIS). The distinction between integration and interfacing will need to be made on a system by system basis,

- There must be integration or interfacing with specialist departmental EPR's where relevant (e.g. Epilepsy),

- Don't remove existing capabilities that are in place and working well – add to it from a single supplier and gradually build up the landscape where the component parts are provided by a single supplier,

- Phasing is key for deployment. Different hospitals within Hospital Groups will have different existing core capabilities. This will have to be taken into account during implementation planning,

- There is a need to use a change readiness assessment to identify if/when hospitals are ready and able to commence – staffing constraints will need to be understood and addressed,

- Start to embed change now such as improving change governance, documentation, data quality etc,

- Interim benefits will need to be identified. Benefits from a clinician point of view will have to revolve around quality of outcomes.

Appendix D: Readiness Assessment

A key principle underpinning the progression of the National EHR within the Community and Acute care settings is that deployment of the Community Care and Acute Care EHR Operational Systems should not commence until stakeholders are ready to begin the implementation process. This is to help maximise the chance of successful deployments and ensure the programme maintains the required momentum.

To support this principle, a Readiness Assessment will be conducted for each Hospital Group and each Community Healthcare Organisation. This will be an independent assessment with the HGs and CHOs working with the assessors to reach a view on readiness. Any remedial actions will be identified, agreed and progressed to ensure that the each entity is working towards being ready to commence implementation.

As part of considering the approaches for deploying the EHR operational systems in the Community and Acute care settings, a number of change readiness parameters were identified.

Change Readiness Parameters

	Clinical	Leadership	Technical	Commercial/Financial
Change Focus Area				
Key Stakeholder	CMO	CEO/CO	CIO/Head of IT	CFO
Assessment Parameters	• Level of involvement in Clinical Change Programmes • Level of MDT operations • Degree of consistency/ standardisation of processes within the HG/CHO • Required staffing levels providing the capacity to support change • Plans for deepening integration within the HG/CHO agreed • Receptiveness to use of new systems/technology	• Commitment levels to the transformation programme involved • HG/CHO Clinical Governance established – for design decisions • Executive support at CHO, HG and Hospital level in place • National, CHO and HG governance arrangements in place	• Infrastructure in place within CHOs and hospitals including current, or provision for electronic devices in clinical settings • Connectivity in place across CHOs and hospitals • IHI seeded in systems • Local integration capability, resources and capacity in place • Current systems stabilised	• Funding allocated to drive change and adoption programmes • Existing contractual arrangements for ICT services understood and exit approaches understood and quantified

These parameters would form part of an objective, structured and independent Readiness Assessment conducted in a CHO or HG.

The activities required to complete the Readiness Assessments and carry out any actions as part of deployment preparations have been included in the EHR Programme Next Steps in Section 9 of the Strategic Business Case.

Appendix E: Programme Costs

Deleted Section

Detailed Programme and Cost Modelling – 5 Year Deployment Scenario

The following section presents the key resource and cost elements for the National EHR Programme under the 5 Year Deployment scenario.

The modelling is structured as follows:

- **Overall National Programme Team** – the central team who will execute the overall National EHR programme delivery and provide high level ongoing leadership
- **Portal Programme:**
  - *Portal National Programme Team* – the central national team who will be focused on the deployment of the National Shared Record
  - *Portal National Ongoing Team* – the central national team who will provide ongoing operational support for the National Shared Record
  - *Portal Roll-Out Costs* – the costs associated with rolling out various portal implementations
- **Integration Programme:**
  - *Integration National Programme Team* – the central national team who will be focused on the integration capability
  - *Integration National Ongoing Team* – the central national team who will provide ongoing operational support for the integration capability
  - *Integration Roll-Out and Ongoing Costs* – the costs associated with rolling out various integration implementations and ongoing annual costs
- **Community Programme:**
  - *Community National Programme Team* – the central national team who will be focused on the deployment of the Community Care EHR Operational System
  - *Community National Ongoing Team* – the central national team who will provide ongoing operational support for the Community Care EHR Operational System
  - *Community Roll-Out Team* – the team who will deliver the solution in each CHO
  - *Community CHO Running Costs* – the team and costs associated with ongoing post-deployment operations in each CHO
- **Acute Programme:**
  - *Acute National Programme Team* – the central national team who will be focused on the deployment of the Acute Care EHR Operational System
  - *Acute National Ongoing Team* – the central national team who will provide ongoing operational support for the Acute Care EHR Operational System
  - *Acute Roll-Out Team* – the team who will deliver the solution in each Hospital Group (HG)
  - *Acute HG Running Costs* – the team and costs associated with ongoing post-deployment support in each HG