



**Northern Ireland
Confederation**
for Health and Social Care



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Health and Wealth in Northern Ireland: Capitalising on the Opportunities

An independent report by MFCL on the development of a world-class ecosystem for health and care innovation, adoption and spread in Northern Ireland

September 2022

About us

About NICON

The Northern Ireland Confederation for Health and Social Care (NICON) is the voice of the organisations working across Northern Ireland's integrated health and social care system (HSC). Part of the UK-wide NHS Confederation, it is the only membership body for all HSC organisations.

NICON's membership comprises all six HSC trusts (including the Northern Ireland Ambulance Service); the 'regional' organisations (the Public Health Agency and the Business Services Organisation); as well as the eight smaller HSC bodies.

www.nhsconfed.org/NICON

About HIRANI

The Health Innovation Research Alliance Northern Ireland (HIRANI) was established to strengthen the Life & Health Sciences ecosystem by maintaining a clear vision and strategic direction, and to act as a single voice for the sector with a focus on promoting Life and Health sciences capabilities in Northern Ireland.

www.hira-ni.com

About the author

Mike Farrar CBE, FRCGP, FRCP, Dip.H.Ed, BA Hons

Mike is a highly respected management consultant with 13 years of CEO experience in the NHS. Mike is a senior advisor to the PwC Public Sector Health practice on healthcare leadership. He also leads a successful independent consultancy, working with global, corporate and public sector clients.

He remains a prominent thought leader on healthcare internationally and in the UK, supporting system leaders, including those in Greater Manchester and London. His work crosses sectors into the pharmaceuticals, medical technology and digital industries where his clients rank amongst the largest in the world alongside local innovative start-ups.

Mike was the CEO of the NHS Confederation, North West Strategic Health Authority and Head of Primary Care at the Department of Health, where he successfully negotiated the radical GP contract. He also served as the Chair of the first ever NHS Innovation in Life Sciences Delivery Board that laid the foundation for the 'Innovation Health and Wealth Report' and the consequent establishment of AHSNs.

He also works in the charitable sector and in sport, where he has held roles including Chair and Interim Chair of Sport England, Swim England, and as National Tsar for Sport and Health. He was awarded the CBE in 2005 for services to the NHS and is an Honorary Fellow of the Royal College of GPs and of the Royal College of Physicians. Mike was recently appointed as the Pro Chancellor and Chair of Keele University in England and as the chair of ukactive, the national body for the UK leisure, fitness and physical activity industry

During the COVID-19 Crisis and Recovery, Mike worked between March and July 2020 on a pro bono basis as the Acting Deputy CEO at King's College Hospital NHS Foundation Trust in London.

Contents

Foreword	5
1. Background	8
2. Methodology	9
3. Framing the question: Defining the characteristics of a world-class system	10
4. A high-level summary of the current situation: Understanding the operating context	13
5. Why does this matter?	23
6. Moving forward – Key findings	25
7. Recommendations for action	34
8. References	38

Foreword

Building on increasingly robust evidence that health innovation has significant potential to reduce inequalities, deliver better health outcomes and drive economic growth, leaders across these Islands and beyond are deepening their investment in the health and economy agenda. Successful transformation in this space is built on a foundation of commitment, collaboration, and inspiring leadership, in an enabling environment.

To ensure that we in Northern Ireland keep pace and respond in our own unique way, NICON and HIRANI, with the support of the Association of the British Pharmaceutical Industry (ABPI), are delighted to publish this report, setting out the potential for a revitalised approach to invest in our own health and economy partnership. While not a short-term challenge, there is major potential to build on our existing areas of excellence to fully realise the benefits for our population.

We have strong foundations:

- Northern Ireland already has an internationally recognised health and life sciences sector, leading the way in fields such as diagnostics, clinical trials, social prescribing and remote care
- Our university sector is world-class; if combined, the research impact of QUB and UU in life sciences would rival that of Oxford
- We can harness the skills and expertise of an excellent array of organisations and individuals in Northern Ireland who have for many years been pioneering this approach to support and deliver innovation
- We have a strong policy context, defined in the 2011 Ministerial commitment to develop a connected health economy¹

¹ 'Connected Health and Prosperity' Memorandum of Understanding Between the Department of Health, Social Services and Public Safety, and Invest NI (2011)

But there are significant opportunities for progress:

- Northern Ireland can capitalise on its unique position and relationships between the UK as the third most successful life science cluster and Ireland as the seventh largest Medtech cluster in the world
- By securing better access to research grants and financial support packages, increasing our current share of the UK pot from less than 1% to a more proportionate 3%²
- To strengthen and retain our indigenous life science innovators and increase private investment
- Through gaining a reputation for innovation, which will serve to attract and retain world-class talent and build skills to support transformation
- Our scale and already integrated system are perfectly placed to provide a readymade, real-world test bed for adoption and innovation
- A unified strategic policy approach would support the delivery of the '10x' economic vision,³ healthcare transformation⁴; and the wider Programme for Government, ultimately delivering better healthcare outcomes for our citizens

This report therefore sets out how, with the right collective leadership, strategy, investment and clear metrics, we can align to coordinate health innovation and transform outcomes. In short, we have the potential to move from “good in parts” to “a highly innovative system” to ensure we can deliver for our citizens and play a leading role, alongside other world-class systems.

² 'Independent review of UK Research and Innovation (UKRI): final report and recommendations', Department for Business, Energy and Industrial Strategy (July 2022)

³ '10x Economy - an economic vision for a decade of innovation', Department for the Economy (2021)

⁴ 'Systems Not Structures', Rafael Bengoa, Department of Health (October 2016); 'Health and Wellbeing 2026: Delivering Together', Department of Health NI (May 2017); 'Matrix Life and Health Sciences Northern Ireland' (February 2015)

In closing, we extend our thanks to Mike Farrar, who was uniquely placed to lead this work and did so by truly listening to our stakeholders to reflect the unique circumstances in Northern Ireland. We also wish to thank all our colleagues who offered their insights as part of the engagement process.

We are delighted to present this report and trust that it will be both informative for policy-making purposes and provide a new impetus to invest in our health-economy partnership for the future.



Heather Moorhead
Director, NICON



Joann Rhodes
Chief Executive, HIRANI

1. Background

1.1 Northern Ireland has built an ecosystem⁵ of organisations and collaborations designed to promote the development, adoption and spread of health and care innovations (including strong partnerships with academic and commercial organisations). This ecosystem has the potential to improve the health and wealth of the population as a consequence of creating jobs in the sector and delivering rapid deployment of the most effective healthcare treatments and technologies. The ecosystem has been effective in many ways but there is a general sense that more could be done to make this world class. Were this to be achieved, it would provide a major stimulus for economic growth, inward investment and improved health outcomes.

1.2 Additionally, in the emerging post-COVID period, NI's Health and Social Care Trust leaders, working in partnership through NICON, have been developing their proposals for how the health and care system can meet the major challenges ahead. These include: tackling the increasing demand for care; reducing waiting times; improving population health; reducing health inequalities; addressing workforce shortages; and living within the financial envelope. Central to their proposals is the more rapid adoption of health and care innovations at pace and scale.

1.3 As such, ecosystem leaders have commissioned an independent review of the current approach to innovation adoption and spread in NI as it looks forward to the next 5-10 years. The review is designed to provide a high-level diagnostic of the current operating context and ecosystem and to make recommendations as to how the current approach could be improved to address the health related, academic, economic, and social challenges ahead whilst also capitalising on any emerging opportunities.

⁵ Throughout this report I have used the term 'ecosystem' to describe the full range of organisations and partners that contribute to the process of innovation adoption and spread. An ecosystem is defined in general use as 'a complex network or interconnected systems' (Oxford Languages). I have differentiated this from the health and care 'system' which I have used to define the NHS and HSC services in NI.

2. Methodology

2.1 I, Mike Farrar, former NHS Confederation CEO, Northwest SHA CEO and chairman of the first ever NHS and Life Sciences Innovation Delivery Board, was commissioned by NICON/HIRANI to undertake this review. In order to do so, I have:

- undertaken a process of member and stakeholder engagement including a series of interviews with key leaders in the NI health, care and academic ecosystem
- participated in an initial workshop, with Neville Young (Yorkshire and Humber Academic Health Sciences Network) and Professor John Higgins (Health Innovation Hub Ireland). This was attended by leaders and stakeholders in the current health and care innovation NI ecosystem
- drawn on work undertaken with senior UK leaders from pharmaceutical, medical technology and digital industries to identify their criteria for supporting commercial partnerships and inward investment into UK cities and regions (as part of my review of Liverpool Health Partners)
- drawn on my experience of working with AHSNs, AAC, NHS England, Academic Health Partnerships, and integrated health systems across the world. This involved the development and application of effective innovation and spread techniques in health and care settings
- produced a high-level report based on the information gathered which sets out key observations on the current ecosystem and makes recommendations for its strengthening.

3. Framing the question: Defining the characteristics of a world-class system

3.1 One of the key challenges for this work is the absence, both in the literature and through discussions with current NI leaders, of an agreed definition of what a world-class health and care innovation adoption and spread ecosystem looks like.

3.2 For some sectors with simple business models, and/or a small or defined range of specific products or services, this may be straightforward (Disney, for example, are often cited as having one of the best approaches to innovation with a highly standardised set of processes and a systematic approach to implementing change, but this is managed by one organisation rather than a complex system). But in health and care, the problem is greater due to the complexity of the sector and the wide-ranging nature of the ecosystem's 'component parts' (all with different organisational and professional accountabilities, financial incentives, cultures and behaviours etc).

3.3 As a consequence of this complexity and breadth, it has been hard in NI to elicit a shared understanding and definition of a world leading innovation adoption and spread ecosystem. This has made it harder to assess the current position and make recommendations for improvement.

3.4 As a consequence I have developed a high-level set of **10 characteristics of a world-class ecosystem**. I have drawn these from the NI seminar discussion, the interviews with NI leaders and observations of approaches elsewhere in the world to frame my findings. These are by no means perfect or underpinned by specific hard evidence, but they do provide the basis on which the current NI ecosystem can be assessed, and recommendations can be made for its future.

3.5 However, it is essential that the characteristics of the ideal ecosystem for NI are based on the history and culture of the locality and as such I propose, in the second of my recommendations (set out in para 7.1), that the leaders across the NI ecosystem should agree a clear set of characteristics themselves that would guide the next stages of its development, but potentially taking this set as a starting point.

- 1 The ecosystem is subject to *coherent cross-government policy and ownership* with a shared set of mindsets and outcomes at the highest political and executive levels.
- 2 The ecosystem whilst binding numerous agencies and organisations through a core common purpose would also have clear dedicated leadership with an ability to operate with a single focal point when needed.
- 3 The ecosystem offers an *'end to end'* approach from discovery, through appropriate levels of testing, to early adoption, comprehensive deployment and continuous evaluation review (embracing the best of traditional R&D systems but also offering wider approaches to innovation and technological change).
- 4 The ecosystem operates *holistically* with an ability to encompass innovation in pharmaceutical, medical technology, digital technology, human change management and recognises the interrelationships between them.
- 5 The ecosystem operates *proactively* by creating the best conditions for locally derived innovation but *also reactively with pace and scale* when adopting proven innovations from elsewhere or generated by suppliers.
- 6 The ecosystem has *a clear process for priority setting* based on securing and spreading innovation that offer the best value (i.e. - health outcomes and social/economic impact when set against the inputs and costs and management effort).
- 7 The ecosystem achieves the most *effective balance between centralised functions and distributed responsibility* in this case creating a coherent

operating model between NI level organisations and local delivery organisations such as Health and Social Care Trusts, Local Government, the emerging Area Integrated Partnership Boards (AIPBs) etc.

- 8** The ecosystem is based on *a consistent operating model including a clear innovation pathway) that provides clarity of roles and responsibilities* to those who work within it and to those external parties that need to work through it, along with an ability to consciously and transparently flex the model when conditions dictate (e.g., when it requires greater agility and speed in response to a further wave of the pandemic).
- 9** The ecosystem has *a series of core shared cultural and behavioural features* such that each component shares an overall common mission and purpose; and pursues this purpose through a series of aligned incentives, shared risks and benefits and benefits from coherent, mutually beneficial exchanges and interfaces.
- 10** The ecosystem undertakes *continuous monitoring against measurable objectives, self-assessment and learning* to keep pace with the emergence of new problems and advances in solutions.

3.5 It is clear from my work with ecosystem leaders that, whilst they recognise some of these characteristics are in place, there is a way to go to develop this in NI. However, their analysis also suggests that the way forward is to build on the current set of organisations with some smart improvements and investment rather than undertake a full root and branch overhaul of the current infrastructure. *As a consequence, I have focused in this report on those areas where reform or improvement is most needed.*

4. A high-level summary of the current situation: Understanding the operating context

4.1 Any consideration of how the current ecosystem could be improved needs to recognise the challenges in its wider operating context. This context provides the basis for acceleration of the case for change and highlights the factors that might hamper the implementation of change.

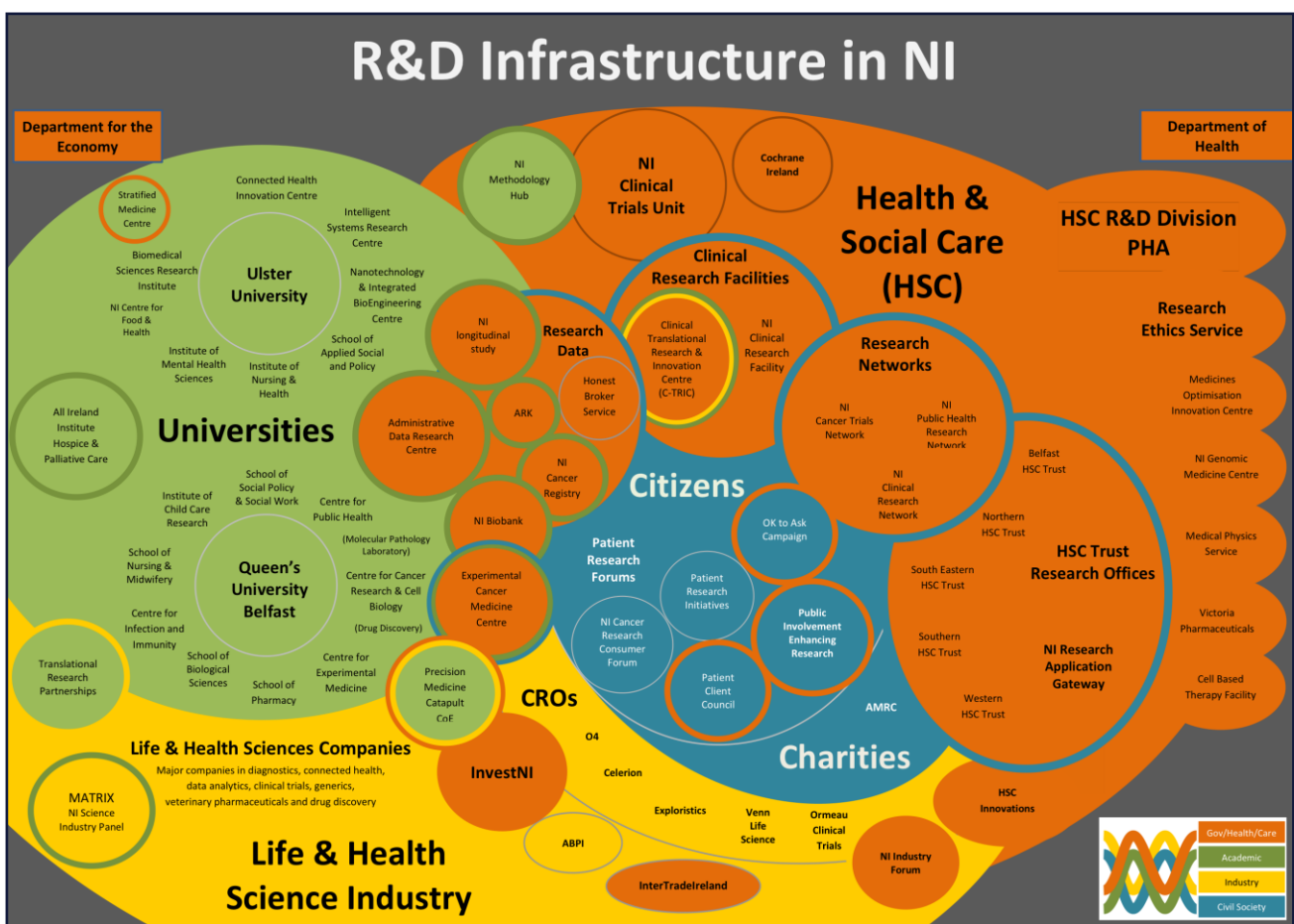
4.2 In order to analyse the current situation I have considered three main sources of information, (broadly attempting to assess the current situation in NI against the high-level characteristics):

- a desktop analysis of the current approach to innovation adoption and spread, including the R&D infrastructure and its relationship with the NHS health and care delivery system
- feedback from the seminars and interviews that offers insights and reflections from leaders operating within the current system
- generic feedback from industry partners about what they look for in a national health and care system when considering investments and product focus

The R&D system⁶

4.3 Northern Ireland has a well-developed system of R&D in health and care overseen by the Department of Health but with a significant number of component organisations, programmes, collaborations and partners (as depicted in figure 1 - from 2018).

Figure 1: R&D infrastructure in NI⁷



⁶ I have tried to reflect in this report that leaders differentiate between the 'R&D system', which is viewed as a narrower more traditional entity than the whole innovation ecosystem whose scope is seen as being wider, but which includes R&D, innovation, testing for proof of concept, adoption, spread and evaluation.

⁷ 'R&D Infrastructure in NI', HSC R&D Division NI (2018)

4.4 In structural terms, this, in itself, is a complex system in which its effectiveness relies on **each component** being: fully committed to the overall NI R&D strategy as it's expression of **an overall common mission and purpose**; and operating with **aligned incentives, shared risks and benefits and coherent, mutually beneficial exchanges and interfaces**. **As is set out in paras 4.18 and 4.19, feedback from leaders is that there is work to be done to achieve these important qualities.**

4.5 Equally important to note is that for many of the component organisations, R&D is only one element of their overall organisational responsibilities, and for some it represents a small 'minority' element. This can make alignment of the whole system around a core mission and purpose difficult when set against other organisational challenges (e.g., the NHS component organisations' main goal is the delivery of health care; academia focuses on education and teaching as well as research for example).

4.6 Aligning around a shared core purpose at the highest strategic level is also more challenging as the R&D system spans multiple Government departments (Health, Economy, Education etc) that often have a different point of emphasis and set of short-term objectives

4.7 It is also true that many leaders assess the current scope of the NI R&D system as only providing one core element of the overall ecosystem for innovation (which also requires greater emphasis on translational research processes and an enhanced, dedicated system for adoption and spread into practice). Many leaders in the current system see these latter aspects of innovation as the weak links in the ecosystem and believe that action is needed to develop this.

The health and care delivery system

4.8 To add further challenge to the current situation, the health and care delivery system is under massive pressure as it continues to manage the ongoing impact of COVID-19 and tries to recover from the pandemic's impact on waiting times,

to reduce health inequalities and to respond to a high level of urgent care demand for both primary and secondary care.

4.9 The work to address these challenges is further hampered by a shortage of workforce, financial pressures and a reduction of the bandwidth in general management and clinical teams to embrace and adopt innovation and change

4.10 This in turn increases the drive and focus of Health and Social Care Trusts onto immediate service delivery and away from a longer-term transformation underpinned by more innovative programmes.

4.11 However on the positive side, the pressure and the lack of resource can also act as a catalyst for a greater degree of ‘pull’ in the system for productivity enhancing technologies and solutions. This is evident in the greater degree of digital and virtual service adoption through the recent pandemic. For many leaders there are lessons here that can be applied into an upgrading of the current innovation adoption and spread approach.

The academic system

4.12 It should also be noted that there is significant pressure in the academic system with universities facing a significant reduction in income from the loss of international student income during the pandemic, along with similar workforce challenges to the health and care system.

4.13 Queen’s University and Ulster University continue to improve performance (placing in the top 5 overall in the health-related Research Excellence Framework)⁸ and this offers a great platform for NI going forwards.

4.14 There is a platform of clinical academic development and spin outs of innovative developments (approximately 50% of current university initiated spin

⁸ Research Excellence Framework (2021)

out companies operate in the broader life sciences sector)⁹ from the universities upon which further investment and development could be built.

The economic and political landscape

4.15 COVID-19 has impacted on the regional economies within the UK and whilst the furlough arrangements were widely welcomed as a means to maintain employment throughout this period, it is clear that the pandemic, coupled with the impact on supply chain and energy prices from the war in Ukraine, are having a significantly detrimental impact on the cost of living and job markets in the immediate term.

4.16 Equally, the current suspension of devolved government in NI and the impact of Brexit are also making it more difficult for clear political direction and leadership to emerge. This is impacting on the ecosystem's ability to develop and implement an improved approach to R&D, innovation adoption and spread at the present time.

The industry landscape

4.17 The impact of recent economic pressures, adapting post Brexit and operating within the constraints of the available labour market are also impacting on business and industry. Economic modelling by Fraser of Allender commissioned by the ABPI show NI is lagging behind other regions – where in the South East – 1 Life science job creates 2.5 additional jobs in across sectors, but in NI this drops to 1.5 additional jobs.¹⁰ However, the ABPI, ABHI, HIRANI and Invest NI all see great opportunities and need for companies developing and deploying their innovative products and services in NI. This commitment can capitalise on a number of existing NI based businesses that have tended to trade elsewhere due to the complexity of the existing ecosystem and the easier access

⁹ 'Spotlight on Spinouts UK academic spinout trends' Royal Academy of Engineering (April 2022)

¹⁰ 'Contribution of the Pharmaceutical Sector to Northern Ireland's Economy' University of Strathclyde Fraser of Allender Institute (October 2020)

to markets. It is essential that the work following this report seeks to address those issues, by aligning a reinvigorated health and care R&D innovation adoption and spread strategy with a wider industrial and skills development strategy for NI.

In summary

4.17 In summary, almost all of the component parts of the ecosystem for health and care innovation adoption and spread are experiencing some level of service, operational, financial or political pressure and disruption. This might be seen by some as an argument for the status quo and focusing management effort on the immediate problems, but I would argue that the opposite is true and ***these challenges actually hasten the need for an improved approach to R&D, innovation adoption and spread.***

4.18 It is clear in my view that a successful reform and supercharging of the ecosystem would allow NI to catch up with and potentially leapfrog other similar ecosystems elsewhere in Europe and would consequently reap the benefits of:

- inward investment from innovation partnerships, commercial trials and product launches
- better health outcomes for the population
- improvements in productivity
- increased job creation, skills development, opportunity for social mobility and economic uplift
- improved job recruitment, retention and satisfaction in health and care.

Feedback from senior leaders

4.19 Most leaders interviewed believe that the current ecosystem in NI has a number of areas of excellence as witnessed by strengths, achievements and emerging programmes and structures in the last 5-10 years, and the coming period:

- Life Sciences strengths in precision diagnostics (oncology, CVD, MH and Ophthalmology), nano particle technology, Pharmacy, smart tumour destruction, digital health, wearables, wellbeing and social prescribing
- Medicines Optimisation and Innovation Centre (MOIC) - an effective 'AHSN' for medicines
- Clinical Translational Research and Innovation Centre (CTRIC)
- City and Growth Deals - crucial to demonstrating the benefit of cross departmental programmes and benefits, including:
 - Centre for Digital Healthcare Technology (CDHT)
 - Institute for Research Excellence in Advanced Clinical Healthcare (iREACH)
 - Transformation for Healthcare Research Innovation and Value Based Ecosystem (THRIVE)
 - Homes for Healthy Ageing
 - Enhancing Carers Well-being (eCareWell)
 - NHS Clinical Entrepreneurs Programme
 - NI Vaccine Delivery Programme

4.20 They also believe however that the current ecosystem overall could and should be improved. In summary they cite the following problems or weaknesses as general areas for potential improvement:

- fragmentation within the ecosystem making it difficult to have a standard consistent innovation pathway(s) and hard for external suppliers, innovators and partners to navigate
- lack of a single leadership point within government that sets out the common mission and purpose
- lack of a coherent overall policy framework and narrative that connects health and wealth
- disconnection between the R&D system and the delivery system for health and social care
- need to encourage a greater appetite for research within the workforce
- poor signalling of health and care system problems to enable innovators and corporates to target their efforts directly on the areas in which innovation is needed
- frustration at the inability to attract the level of major inward investment that they believe possible
- absence of dedicated time to support R&D and innovation in the health and care workforce
- absence of the resource and capability to produce credible bids for funding even when the ecosystem has the research and/or service capacity to deliver.

Feedback from industry colleagues about the attractiveness of systems for their investment and commitment

4.21 It is also illuminating therefore to compare the assessment of the current ecosystem by its leaders (both its strengths and weaknesses) with the feedback from industry leaders about the characteristics they look for in health and care systems across the world when looking to make investments in R&D, product launches, and innovation partnerships.

4.22 To be attractive for investment any system, and NI in particular, would need to demonstrate a number of conditions¹¹:

- have a clearly articulated set of system problems that industry could help to solve
- be able to provide speed and consistency of research activity that is coordinated across the system
- provide access to C-suite such that there is a commitment to demonstrate on the ground alignment with system priorities, an ability to address barriers should they arise and there is a show real demonstration of intent to develop a relationship with industry
- demonstrate an ability to convene diverse partners from within their own system (to create scale) and to bring together diverse partners from within adjacent industries to create broad capability (e.g., Pharma and digital)
- offer genuine long-term partnership rather than a short transactional relationship

¹¹ Extracted insights from a session run by MFCL with potential industry partners to understand the criteria they apply for selecting commercial partnerships and making investment decisions.

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- facilitate entry to the research ecosystem through effective signposting and navigation
 - possess real reputation and reach through organisations and researchers - offering potential flagships and shop windows
 - have global academic and clinical credibility and expertise
 - show and deliver a commitment to co-design methodologies as an effective approach to partnering with them
 - demonstrate ambition and passion in all that you do
 - possess and act with a clear understanding of industry drivers, cultures, and commercial constraints with a recognition of the ultimate need for ROI).

4.23 Setting the leaders feedback against these characteristics reveals a distinct mismatch in a number of the aspects of the current ecosystem but equally it offers hope that with some reform, improvement and smart small-scale investment, NI could indeed be attractive for leading industry bodies and their potential inward investment.

5. Why does this matter?

5.1 The NI ecosystem offers scale and a defined boundary that is attractive on the world stage. This coupled with the global regard for the NHS, and the integrated Health and Social Care Trusts, and emerging AIPB structures within NI, creates enormous potential for inward investment in clinical research and trials, early-stage market entry for new products and ongoing innovation partnerships between the HSC and industry (whether digital, med tech or Pharma). ***Yet this opportunity is not being grasped at present and as a consequence, significant sums of money, new jobs and better health outcomes are being lost.***

5.2 It is clear that resources are extremely tight but without investment in an ecosystem to deliver innovation and pace and scale, the health and care system will maintain the status quo with its inefficiencies and current productivity level.

5.3 Based on work undertaken by PwC and BMS,¹² the benefit to the NHS across the UK of increasing the number of people on clinical trials to 1.5m trial participants by 2030 could generate £7.2billion in efficiencies through £4.4billion additional income (of which the NI share would represent 3-5%) and saving over £2.8billion on existing NHS funded drug costs. (This relates to drug costs in trials being funded by industry partners).

5.4 Additionally across the NHS it would generate a further £2.1billion productivity gains from increased labour participation of trial participants

5.5 They also calculated that £4.4billion could be added to the UK economy by 2030 if we invested more in healthcare R&D.

¹² 'Reimagining the Future of Life Sciences 2030' PwC and Bristol Myers Squibb (November 2021)

5.6 Finally, they specifically calculated that in terms of cancer alone, the UK would gain:

- £1.6 billion through earlier detection of lung, colon, oesophageal and breast cancers
- 58,000 more QALYs from catching lung cancer earlier
- £115m and 34,000 QALYs from increasing the use of immunotherapies to treat lung cancer.

5.7 Turning to the UK Life Sciences Vision published in June 2021, ‘that in 2019/20, the Advanced Access Collaborative helped over 700,000 patients access proven health and care innovations resulting in patients spending 125,000 fewer days in hospital with over £50m savings for the NHS’.¹³ This has created capacity for the NHS in England to begin to reduce the significant waiting lists built up as a consequence of the COVID-19 pandemic.

¹³Life Sciences Vision – Build Back Better: Our Plan for growth’ Department for Business, Energy and Industrial Strategy (2021)

6. Moving forward – Key findings

10 ‘deficits’ in the current ecosystem that should be addressed to secure an improved ecosystem

6.1 Bringing the evidence together from the desk top review, interviews, and seminars, and comparing this with the 10 optimal characteristics and feedback from industry leaders, I believe that there are a number of issues that require action if the current NI ecosystem is to become world class. I have set these issues out below with an outline description of their features, and what might need to be addressed (highlighting, where available, evidence from elsewhere that might be helpful to NI in moving forwards).

1 There is a need for a clear narrative and mindset in senior leadership (political and executive) that sees general spending on health, and specific **spending on health and care R&D, innovation adoption and spread as an investment** rather than solely a cost.

- Targeted spending on health and care can have a direct impact on the availability of an active and capable workforce while simultaneously reducing expenditure on welfare benefits.
- Deliberately creating a more coherent end to end ecosystem for R&D, innovation adoption and spread is highly likely to attract inward commercial investment along with a higher calibre medical workforce.
- Work by PwC with BMS estimates a return in investment in this area as being approximately 8:1 when assessed across the whole economy and health/wealth benefits.

2 There is an opportunity for government in NI to strengthen the ecosystem by developing more coherent cross departmental policy and oversight that **spans health, wealth and education** - setting a collective strategy with a small number of high-level shared goals and priorities. This might be best achieved through the establishment of a Joint Committee, and/or in the absence of the NI Assembly, a standing cross departmental executive forum to coordinate and direct the ecosystem. This could also be supported through agreement on a more focal single point of executive leadership.

- In order to supercharge the current system, there is a need to have a joined-up policy environment that links the Departments of health and social care, the economy and education.
- Effective cross-departmental working often requires dedicated machinery and governance structures to achieve its potential outcomes.
- Providing a focal point for shared policy along with vesting responsibility for policy implementation in key individual(s) would create clear leadership of the ecosystem.
- The Health Innovation Hub Ireland (HIHI) and Advanced Access Collaborative structure in the English NHS provide a forum of this kind, and whilst I do not believe their models can, or should be, lifted and dropped into NI, it may have learning that the NI ecosystem could benefit from.
- There is an opportunity to build this up from the current R&D strategic advisory group but widen its brief and membership.
- There is a clear role here for the more aligned policy approach to begin to consider *regulatory reform* (operating within the scope of any final post Brexit arrangements, but with a clear aim to reduce bureaucracy and regulation safely but to accelerate the ability of industry to prove concept and secure engagement from the health and care system swiftly in trialling, testing and adoption of innovative medicines, technologies and digital developments.

3 Alongside a more coherent cross departmental policy position, the ecosystem also requires **better practical coordination** – NI has some excellent jigsaw pieces but not a coherent jigsaw picture.

- A number of the current elements of the ecosystem are highly regarded and perform at a very high level (e.g., MOIC, CTRIC) but their impact overall is weakened as a consequence of other elements of an effective system either being absent or operating sub optimally.
- There is a need for a core binding shared mission and purpose that frames and enables each element in the system: to understand its specific role in its delivery; to adopt of a system of mutual accountability; to set shared, ambitious and measurable outcomes; and to improve the efficiency and impact of current resources.
- This would be supported by an aligned series of NI level structures that provide the centralised core functions for a reformed ecosystem (see 7) below.

4 There is an opportunity to build on the strengths in the academic and R&D system - at present it's good but it would benefit from **stronger alignment with current service problems** and a greater focus on applying its findings in practice and at scale. Enhancing the R&D system provides opportunities for greater skills development and by seeing itself in its wider cross departmental context it may also begin to provide solutions to the current workforce problems (access to education, enhancing social mobility, skills development, increasing the attractiveness of NI health and care jobs etc).

- There is an opportunity to connect the R&D (and innovation) priorities, capacity and capability more directly to the nature of the immediate presenting problems for the health and care delivery system (including supporting the management of the workforce crisis).

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- Areas for immediate attention might include innovations aimed at reducing waiting times, improving surgical and diagnostic productivity, developing digital service offers, and improving mental health outcomes especially for young people.
 - Too often at the translational stage, initial research is applied in the system through pilots or small-scale demonstrations. These are frequently able to provide further proof of concept, but the benefits fall down due to lack of an agreed approach for systemic adoption at pace and scale across the whole system. Greater alignment with innovations and urgent service delivery problems would create a stronger pull factor for adoption of proven initiatives.

5 The ecosystem would benefit from developing a **stronger approach to innovation priority setting** including placing greater emphasis on **cross-cutting research priorities** – i.e., developing more research *breadth* as opposed to solely focusing on *depth* in specialist areas (this could differentiate NI by offering more ability to understand and respond to population health, health inequalities, chronic disease management, multiple morbidity, women’s health, etc).

- It is clear that having an ad hoc open process for innovation priorities is likely to lead to confusion, a failure to adopt and spread and a disconnection with service improvement. The ability of the managers, clinicians and practitioners to deal with the volume of innovations is highly constrained and the ecosystem needs to develop a clearly understood and evaluated process for setting innovation priorities.
- There is a chance to differentiate NI from other countries and regions by developing a different calibration in the research portfolio between the ‘depth’ of biomedical single disease areas’ with the ‘breadth’ of multiple morbidity, tackling health inequalities, taking a life course approach.
- Developing more holistic research spanning mental physical and social health may be more rewarding in terms of future research funding (public and commercial) - for example in linking respiratory disease with fuel poverty and improving housing standards.

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- More breadth in the priority areas would play strongly to the role and responsibilities of the emerging AIPBs as they develop their multi sectoral collaborations to improve population health and place-based working.

6 The health and care system needs to be better at **signalling its problems and priorities to potential suppliers and innovators**

- The health and care system is typically poor at identifying and signalling its priorities and problems that require innovative solutions. As a consequence, it places additional risk on innovators and investors that their developments may be misaligned to market need. This fundamentally hampers innovators but, if turned around, could differentiate NI from competing locations by encouraging innovators to base themselves and secure proof of concept, knowing there is an accessible market need for their new innovative products and services.

7 The ecosystem would benefit from the investment in and further development of **effectively delivered underlying enabling centralised functions and production of a standardised innovation pathway(s) – e.g., horizon scanning, innovation pipeline/portal management, joint research service, procurement, data collection and analysis. This should build this on the current R&D centralised infrastructure and digital strategy but also develop further the capacity for wider pathways focused on innovation adoption and spread.**

- A world-class ecosystem requires an underlying platform of core key functions that can be delivered centrally. NI has a number of these structures, programmes and initiatives, supported, for example, by the Clinical Research Recovery and Resilience Task Force (CRRRTG) but these would benefit from embedded systematic coordination.
- These include an effective system for collecting and analysing data at scale, which would be a core component of a fully integrated digital system connecting health boards and the DHSC; this work is well underway (through

the THRIVE programme) but will need to be embedded in practice and not run in parallel to other systems.

- As is the case for a number of academic health partnerships across the UK and across the world there would be real value in developing a joint research service that undertakes core standardised functions (pricing, sponsorship, etc). Many of the current Academic Health Partnerships have adopted such a standardised approach to support all partners. This has led to reduced research costs and improved research outcomes through the concentration of expertise.
- The system would also benefit from developing a standardised set of innovation processes or pathways similar to those set out in Republic of Ireland by HIHI. It is interesting to note however, that despite almost ten years of AHSNs in the NHS in England that there is still to be an explicit commitment and agreement of a standard operating model and pathway covering all of the country and this has been deemed an urgent area for action by senior leaders in the system.
- The system needs a coherent, effective and aligned system of procurement and partnering agreements in order to secure value for money and to enact innovation and spread swiftly once new products and services have been identified.

8 There is a need to **engage the general and clinical managers in the health and care delivery system more directly in innovation spread and adoption** – at present the system is under major operational pressure and managers are focusing on short term problems. There needs to be a greater recognition amongst managers of the power of innovation to fuel recovery and service improvement in the short term and then service transformation over a longer period of time. This should be built into the personal job plans and objectives of senior staff.

- The operational pressures in the current health and care system are clearly impacting on the ability of its leaders to take a more medium to longer term

view but also to have the space to identify immediate opportunities for innovation to alleviate their immediate problems.

- It is understandable that the workforce is focused on delivering care, it is essential to signal the need for staff to engage in R&D and the adoption of innovation if the health and care system is to find ways of delivering improved outcomes and productivity within its current available resource (finance and workforce).
- It should also be acknowledged however that this situation was also generally true prior to the current ramping up of pressures due to an underlying inertia and leadership mindset within the health and care system (publicly funded health and care system are notorious for slow adoption and spread of innovation). Shifts in the fundamental mindsets here are needed and this could be enhanced through recruitment of people with broader experience of industry and innovation to both senior executive and non-executive roles.
- Enabling and recruiting more staff to undertake research or adopt innovative technologies requires senior management to build this into job plans and to value its contribution to improving productivity and outcomes. Too often, R&D and innovation are seen as a second order priority to providing treatments, which is understandable at one level, yet risks the workforce 'being so busy, being busy, that they can't find out how they can be less busy by changing practices and adopting proven innovative approaches'.
- The development of a new structure of AIPBs that begin to create a platform for better out of hospital population management offers a new opportunity to engage wider health and care partners in R&D, innovation adoption and spread (in particular in primary care, social care, VCSE and with Local Government). These will provide key areas of development for broader based research in the future and align with worldwide trends in future research funding.

9 There is an imperative to ensure that not just the managers of the system but the boards of the Health and Social Care Trusts and the emerging AIPBs own and prioritise R&D, innovation adoption and spread including developing strategy, assurance and culture that supports R&D and innovation as part of their **governance responsibilities**. This would serve to assert the role and responsibilities that Trusts and AIPBs have on innovation and embrace the need for and delivery of distributed leadership approach in this arena.

- Boards have a huge role to play if the ecosystem is to be credible in claiming to have an end-to-end ability from discovery, innovation, proof of concept and adoption. Currently the adoption and spread element is perceived by many as the weakest element of the ecosystem.
- Making progress here would see Health and Social Care Trusts and AIPBs commit fully to supporting clinical trials, workforce release, working collaboratively where scale is necessary, 'pulling' innovations, ensuring faster adoption of evaluated proven new practice, creating an innovation culture, developing and recruiting leaders for innovation, and encouraging board membership with experience of the sectors.
- There is a tendency to vest the responsibility for R&D and innovation in the larger teaching and academic hospitals, Trusts and Boards. Whilst this has advantages for the depth and concentration of research expertise it can also create problems in terms of the lack of engagement and prioritisation of innovation adoption and spread across the wider system. It should be noted that some of the NHS world leading examples of innovation have been from local, 'less research active' services (e.g., Charnley hip replacement joint from Wigan; In vitro fertilisation from Oldham).
- The commercial opportunities of local discovery and innovation should be subject to centralised support on the protection of IP such that the health and care system can benefit in the longer term. Boards can ensure that IP protection is considered. This service is available currently through HSC innovations and could be managed alongside the wider centralised R&D/innovation functions, but any benefits of this should flow back into the

health and care system locally if the incentives for local innovation are to be increased.

- There is a role here for local Trust Boards in supporting local suppliers and innovative companies, including those spinning out from universities, as a key part of their role as significant anchor institutions within their communities.

10 There is a need to increase the **marketing and promotion** of NI's commitment to life sciences innovation adoption and spread. (This would build on and develop the role of the HIRANI, the Industry Engagement Unit, the ABPI and NICON). The enhanced capability here would be 'industry facing' and be aimed at creating transparency, a navigation service and a shared understanding of what the NI ecosystem has to 'offer' them. The ecosystem should however expect commitment in return from suppliers to build genuine long term innovation partnership.

- It is important to ensure that suppliers and innovators are aware of the new commitment of the NI health and care system to early adoption and spread at pace and scale
- Development of marketing and promotional capability should include an effective communication strategy and clear narrative which is understood and espoused by all leaders within the system
- Suppliers and innovators need also to commit to realistic but competitive pricing in return for longer term deals. Alongside this, they might also be expected to provide further resource and assistance to the implementation of new technologies and innovations plus an agreement on use of data to target innovative technologies/medicines to those with greatest need and ability to benefit.

7. Recommendations for action

7.1 Based on these findings, I am making a number of recommendations to ecosystem leaders that, if implemented over the next six months, would enable NI to become a world-class health and care system for innovation, adoption and spread over the course of the next three years:

Recommendation 1

The need for an aligned policy mindset is compelling and urgent. I recommend that this report is considered collectively by Departmental leaders at the highest level through a series of interdepartmental meetings or shared policy discussions, rather than separately in individual departments or solely by DHNI.

Recommendation 2

I recommend that at the earliest stage in these discussions, leaders agree and develop their shared vision, mission and purpose of the ecosystem including agreement of its defining operational characteristics (these could be based on the set I produced for the purposes of this report in paragraph 3.4).

Recommendation 3

I recommend the establishment of a Joint Committee, and/or a standing cross-departmental forum for R&D, health and care innovation adoption and spread that includes all the key government departments and also the chairs of each of the Health Board Innovation and Technology Sub Committees (see recommendation 5). This forum would be served by recognised and accountable executive leadership with absolute clarity on roles and responsibilities. The forum would be tasked with establishing an effective process of priority setting,

investment and would have the responsibility for overall strategy (including considering regulatory reform), assurance of delivery and setting/role modelling the appropriate collaborative culture and behaviours.

Recommendation 4

To inform the work of the standing forum I recommend the development of a cross-cutting, key innovation metrics dashboard that provides data to the forum on issues for example such as: numbers of patients engaged in clinical trials, speed of establishing trials, roll out of specific priority innovations, interoperability of data, development of clinical academies roles, jobs associated with new innovations, university-based spin out companies etc. The dashboard would be informed by a local version that covers each health trust to reveal variability across Trusts and help to spread best practice in adoption and spread.

Recommendation 5

Having created the positive mindset to embrace innovation as the key means to transform care and deliver added value for every pound spent, it is important to improve the coherence and efficiency of the current central operating capability. I recommend supercharging and refocusing the current centralised R&D support but adding to its central support for innovation adoption and spread including the requirement for the development of standardised pathway(s). This should be coordinated through a single senior leadership team/group at NI level.

Recommendation 6

There is a fundamental requirement to base the new approach on shared and appropriate access to data and analytics. I recommend that the digital strategy for NI explicitly sets out and embraces how it directly supports R&D, innovation adoption and spread, and delivers that functionality for all component parts such that there is a single version of the truth available and an ability to set shared

measurable objectives. This should also serve to speed up the ability to attract and deliver clinical trials and innovation pilots, which in turn can fuel the recruitment of more higher quality clinicians and researchers (as evidenced by the NW SHA initiative to speed up the establishment and delivery of clinical trials).

Recommendation 7

It is imperative that Health and Social Care Trusts and AIPBs are connected more directly to health and care innovation adoption and spread. I recommend that every Trust Board is asked to set up a Health and Care Innovation and Technology Sub Committee that oversees the activity of the organisation in these areas (Nat West Bank have such a committee and the terms of reference for the committee are appended). The sub committees would be responsible for the production and oversight of their local key innovation metrics dashboard. They would also serve to align digital strategies with service innovation, improvement and transformation.

Recommendation 8

It is essential that this area is given a higher priority for leaders within the Health and Care system, so I recommend that R&D and innovation adoption and spread is built into the objectives of senior general and clinical managers in the Trusts (and AIPB chairs); and that Health Trusts and AIPBs seek to recruit executive and non-executive leaders/members with wider industry and innovation experience.

Recommendation 9

It is clear that resources are limited and required to fund diagnostic interventions and treatments, however the targeting of a small amount of resource in this area will have a high return on investment through improved productivity, potential job growth, and inward investment (e.g., in clinical trials and clinical academic posts).

I recommend that a cross departmental, development budget be identified to support the implementation of this report and its recommendations, should they be accepted. Once agreed, I believe that its value should be evaluated by setting goals for a return on investment being delivered within an agreed timeframe. If successful, as I believe it would be, this will build confidence to invest further on a permanent basis.

Recommendation 10

In order to move swiftly, I recommend that ecosystem leaders set out an organisational development programme that initially draws on external advice (Yorkshire and Humber AHSN have already engaged informally in this process) and commit to building this new ecosystem with a learning culture, focused on continuous improvement.

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NICON
HSC Leadership Centre
12 Hampton Manor Drive
Belfast
BT7 3EN

02895 361765
www.nhsconfed.org/NICON
@NHSC_NI

If you require further information, please email
megan.fitzsimons@niconfedhss.org

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