

# Buying All-Island in Healthcare— North and South

All-Island Medtech SMEs Framework of Recommendations for  
Healthcare Innovation Procurement across the island of Ireland.

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A cross-border initiative to address barriers to procurement in healthcare for SMEs on the Island of Ireland, delivered through Health Innovation Hub Ireland (HIHI) and Health Innovation Research Alliance Northern Ireland (HIRANI), supported by InterTradeIreland.

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# Information Note

This report is the result of a cross-border procurement initiative by Health Innovation Hub Ireland and Health Innovation Research Alliance Northern Ireland, supported by InterTradeIreland's SYNERGY programme. It is based on data analysis, workshops among stakeholders, advisory group feedback and desk research. Eimear Galvin (HIHI) authored the report with review and input from Dr Tanya Mulcahy, Dr Siobhan McGrath (HIRANI) (NI specific additions), Prof Joann Rhodes (HIRANI), Professor Ciara Heavin (University College Cork) and the members of the AIMS Advisory Committee. Participation from all of the stakeholders in the workshops and the advisory group sessions is gratefully acknowledged.

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“The recommendations outlined herein have the potential to reshape the healthcare industry by embracing innovation, empowering SMEs, and ensuring that cutting-edge solutions reach the patients and providers who need them most.”

## Foreword

### Prof Ciara Heavin

Professor in Business Information Systems at  
Cork University Business School, University College Cork



In today's dynamic landscape of healthcare technology, small and medium-sized enterprises (SMEs) play a pivotal role in driving innovation and providing tailored solutions that can transform healthcare delivery on the island of Ireland. I am delighted to introduce this report, which outlines a set of strategic recommendations for innovative procurement strategies targeting medtech SMEs. This report represents a comprehensive effort to bridge the gap between the ever-evolving healthcare industry and the potential of SMEs. These recommendations aim to foster an environment of collaboration and support, ultimately catalysing the growth and success of SMEs in this critical sector.

The recommendations presented within this report are the culmination of rigorous research, analysis, and insights from experts, stakeholders, and practitioners at the forefront of the health innovation landscape in Ireland-North and South. They delve into diverse facets of procurement strategies, from leveraging dynamic pricing systems to streamlining procurement processes, to promoting inclusivity and diversity within and across the supplier ecosystem. The goal is to empower health systems and SMEs alike with a strategic blueprint for fostering innovation, reducing costs, supporting

healthcare professionals, and improving patient outcomes. This report serves as a testament to the transformative potential of innovation within the healthcare procurement domain.

In conclusion, I commend Health Innovation Hub Ireland (HIHI) and Health Innovation Research Alliance Northern Ireland (HIRANI), supported by funding from InterTradeIreland, for their dedication to advancing the field of medtech and digital health procurement through the All-Island Medtech SMEs' (AIMS) Framework of Recommendations for Innovation Procurement. The recommendations outlined herein have the potential to reshape the healthcare industry by embracing innovation, empowering SMEs, and ensuring that cutting-edge solutions reach the patients and providers who need them most. It is my sincere hope that these insights will serve as a stimulus for meaningful change, inspiring stakeholders across the healthcare spectrum to embrace innovative procurement strategies that will shape the future of health technology for the benefit of all.

“It champions the need for dedicated innovation procurement frameworks, echoing practices from other leading European nations. By fostering collaboration between SMEs, start-ups, policymakers, healthcare providers and procurement professionals, the report envisions a future where innovation thrives and local economies flourish.”

## Foreword

### Prof John R. Higgins

Professor of Obstetrics and Gynaecology,  
Chief Executive Officer, South / South West Hospital Group,  
National Principal Investigator, Health Innovation Hub Ireland.



Innovation is the cornerstone of progress, particularly within the complex landscape of healthcare. To support this progress, small and medium-sized enterprises (SMEs) and start-ups play a pivotal role, offering agile innovative solutions and pushing the boundaries of what is possible. These innovators often face daunting challenges when attempting to navigate the procurement processes of healthcare systems. ‘Buying all-Island in Healthcare—North and South’ is a testament to the collaborative efforts of the All-Island Medtech SMEs (AIMS) initiative.

Through a partnership between Health Innovation Hub Ireland (HIHI) and Health Innovation Research Alliance Northern Ireland (HIRANI), supported by InterTrade Ireland, this initiative delves deep into the procurement challenges faced by SMEs and start-ups in both Northern Ireland (NI) and the Republic of Ireland (ROI) and proposes solutions.

The report sheds light on the gap between the innovative potential of local enterprises and their ability to have their products available in our healthcare systems. It is a call to action, urging stakeholders to rethink existing paradigms and forge pathways that enable SMEs and start-ups to thrive in

domestic markets. This report contains insights from extensive secondary research, European benchmarking, key stakeholder workshops, expert advisory session and cross-border collaboration

‘Buying All-Island in Healthcare—North and South’ advocates for a more inclusive and supportive local ecosystem for local innovators in healthcare. It champions the need for dedicated innovation procurement frameworks, echoing practices from other leading European nations. By fostering collaboration between SMEs, start-ups, policymakers, healthcare providers and procurement professionals, the report envisions a future where innovation thrives and local economies flourish.

As you consider these recommendations, I encourage you to reflect on the transformative power of innovation and the pivotal role that SME’s and start-ups play in shaping the future of healthcare.

“This report highlights the stark dissonance between the availability of innovative healthcare solutions in local MedTech SMEs and their absence from our local healthcare systems.”

## Foreword

**Hakim Yadi**

HIRANI Chair



Northern Ireland has a burgeoning MedTech cluster with over 250 R&D intensive, high-growth potential life sciences SMES with specialisms in precision medicine, biomarkers and diagnostics. Despite this huge potential, SME innovators in Northern Ireland face unique and overwhelming challenges when attempting to navigate the procurement processes of healthcare systems, particularly in their domestic market.

This project ‘Buying All-Island in Healthcare—North and South’, driven by a partnership between Health Innovation Hub Ireland (HIHI) and Health Innovation Research Alliance Northern Ireland (HIRANI), and supported by InterTrade Ireland, has convened key stakeholders from SMEs, start-ups, policy makers, healthcare providers and procurement professionals (North and South). It has given a voice to all stakeholders on barriers, perceived or real, to procurement from local MedTech SMEs, enabled knowledge exchange, helped build trust, and offered a constructive way forward in the form of a framework to enable progress and change.

The UK Life Sciences Vision 2021 aspires to make its national healthcare systems the UK’s most powerful driver of innovation and has identified that building trust between stakeholders across the Life Sciences ecosystem (health service, universities and businesses) is key. It also identifies that providing incentives and structure for Health and Life Sciences businesses including SMEs is critical in the delivery of innovation to the health systems.

This report highlights the stark dissonance between the availability of innovative healthcare solutions in local MedTech SMEs and their absence from our local healthcare systems. It calls for investment in resources to develop clear tools and pathways to enable local innovators support local healthcare, thereby increasing health and wealth to the island of Ireland. It has benchmarked examples of success from other countries.

The project recommendations are both ambitious and practical including an appeal for the creation of a protected healthcare budget allocation for innovation procurement to the co-development of educational tools for SMEs navigating healthcare procurement.

If healthcare systems on the island of Ireland are to be supported to meet the immense challenges of health inequalities, Net Zero, the digital age, addressing an aging population and transforming care, they must seize innovation opportunities available on their doorstep and work in a collaboration with innovation stakeholders across their local health and life sciences ecosystems.

A handwritten signature in black ink, appearing to read 'Hakim Yadi', written in a cursive style.

# Executive Summary

The *Buying All-Island Healthcare— North and South* report publishes the findings and recommendations of the All-Island Medtech SMEs (AIMS) initiative, delivered through a unique cross-border partnership of Health Innovation Hub Ireland (HIHI) and Health Innovation Research Alliance Northern Ireland (HIRANI). The initiative was supported by InterTradeIreland and was delivered over eight months in 2023. HIHI in the Republic of Ireland (ROI) and HIRANI in Northern Ireland (NI), support the development of innovation from enterprise within their respective jurisdictions. While many of the SMEs supported by both organisations are successfully selling in international markets, there is a far lower rate of successful procurement within the Health Service Executive (HSE) in ROI and Health and Social Care (HSC) in NI health systems (Galvin 2020; IMSTA, 2019). The objective of the AIMS initiative was to

**Collaborate with cross-border SMEs and healthcare stakeholders to identify procurement barriers and solutions. Consider these within a European innovation procurement context and develop a framework to support procurement of innovative healthcare start-ups and SMEs in Ireland and Northern Ireland, fostering all-island socio-economic benefits.**

There are an estimated 550 companies in medtech and digital health operating in the ROI, collectively employing 84,000 people directly. The life science sectors have exports of an estimated €105 billion (MedTech Association, 2022). In NI, it is estimated that around 250 companies in the life and health sciences sector support 10,000+ jobs (Invest NI, 2022), outperforming the rest of the UK. However, success in export markets is not mirrored in domestic sales. In completing the AIMS initiative it was concerning to discover that although in the ROI, the HSE has recently published HSE Purchase Order Payments above €100k from 2001 to Q1 2023, neither health system publishes a record of healthcare domestic purchase and import data within any threshold or vendor size.

Healthcare procurement processes can be complex, involving extensive documentation, compliance requirements and evaluation criteria. Smaller suppliers, particularly those with limited resources, find it challenging to navigate processes and

meet qualification criteria such as scale and liquidity, leading to exclusion from procurement opportunities. Highly risk-averse, healthcare organisations tend to prioritise established suppliers or larger companies (Galvin, 2020). This is despite the fact that the benefit to the ROI/NI health systems of smaller domestic suppliers was proven during Covid when these companies solved multiple healthcare problems using innovative technology solutions to manage patient care. Yet, new and smaller suppliers below the qualification thresholds for public procurement are still not positioned to compete with established vendors for healthcare tenders.

The European Commission encourages public buyers to utilise innovation procurement mechanisms to provide vital opportunities to SMEs and new innovative companies (COM, 2021, 267/2). While there are government recommendations (DPER Circular, 2023) in ROI to encourage SME participation, there are no dedicated innovation procurement policy frameworks that benefit smaller vendors in ROI or NI. This is in stark contrast to common European practice. Austria, Belgium, Finland, and the Netherlands have adopted a dedicated action plan for innovation procurement. Denmark, Germany, Estonia, Greece, France and Sweden include specific objectives on innovation procurement in wider national strategies, often with a dedicated budget and with a clear commitment of key stakeholders (COM, 2021, 267/2).

AIMS recognises that significant challenges exist for SMEs and start-ups in secondary care procurement within the ROI/NI markets and seeks to address them. Some of the key challenges identified by the AIMS project work include – financial thresholds excluding SMEs, outdated assessments for software products, lack of innovation procurement and funding for its mechanisms, limited use of dynamic purchasing systems across North and South, HSC Trusts in NI working in silos, and purchasing standards that vary across sites in ROI. Challenges relating to Fast Healthcare Interoperability Resources (FHIR - standard developed by Health Level Seven International) and interoperability standards are found to be prohibitive across the island.



The 'AIMS Framework of Recommendations for Innovation Procurement' was developed by creating a network of health stakeholders – SMEs and start-ups, procurement, digital, policy, clinical, academic, state agency – North and South, capturing common procurement challenges and identifying solutions. A significant body of work during the eight month AIMS project, informed and underpins the recommendations, including landscape assessments and horizon scanning, European benchmarking, two workshops with NI and ROI companies and with a wider group of key stakeholders from procurement; policy; state agency; clinical; academia in addition to advisory

group meetings with health and procurement leaders. The holistic approach through AIMS stakeholder workshops and expert advisory group sessions informed the proposed solutions contained in the framework of recommendations.

The 'AIMS framework of recommendations for Innovation Procurement' identifies four key areas to deliver system-wide impact that will open up the procurement process for innovative products across the healthcare sector on the island of Ireland, increasing opportunities for SMEs and start-ups to compete with larger suppliers.

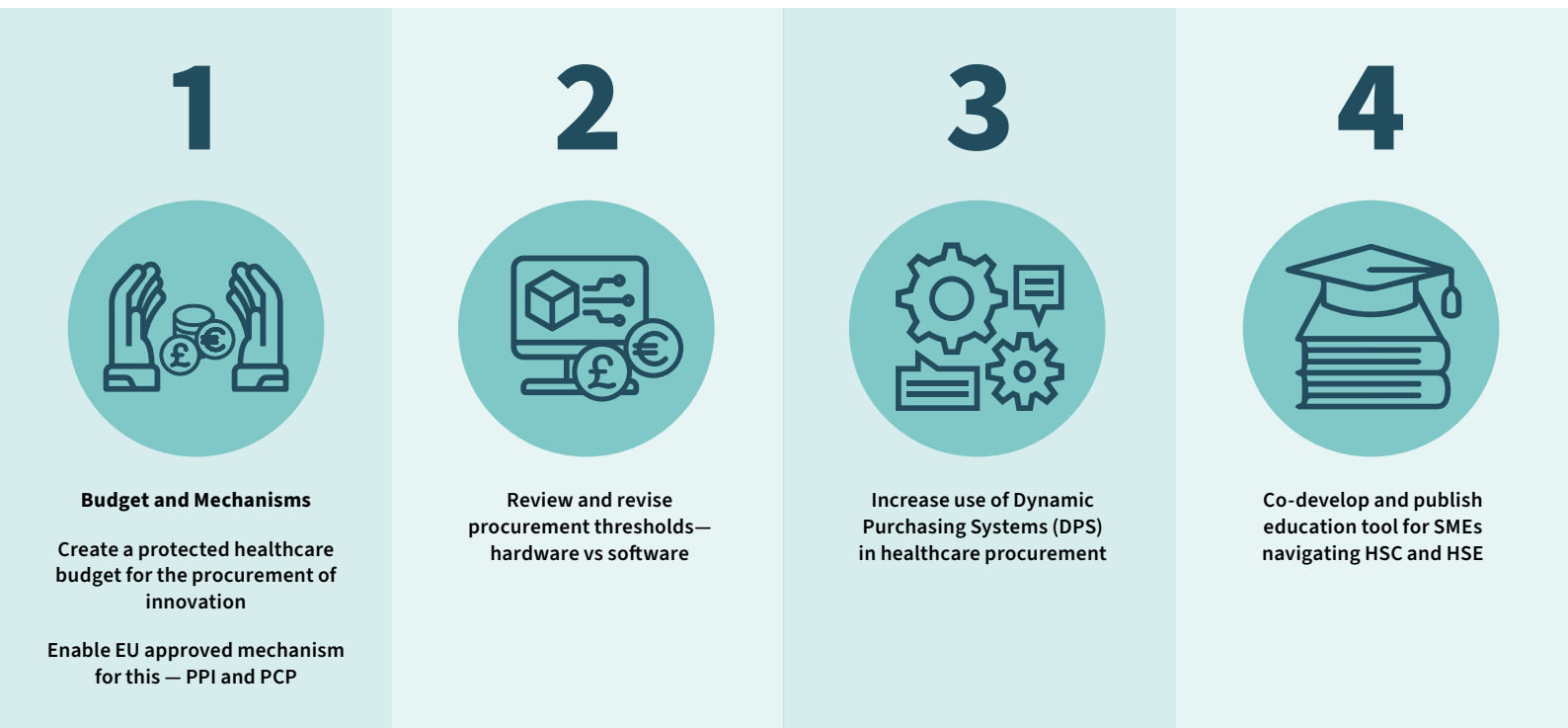


Fig 1: AIMS Framework of Recommendations for Innovation Procurement



# All-Island Medtech SMEs Framework of Recommendations for Healthcare Innovation Procurement

## Recommendation 1

### Create a protected healthcare budget allocation for innovation procurement.

To boost innovation procurement, allocate a portion of the public budget for it, replicating successful European exemplars. Allocation of specific funds for innovation procurement signals that the system values and prioritises advancements in healthcare. It encourages the exploration of cutting-edge technologies and solutions. The EU approved Public Procurement of Innovation (PPI) model is suggested as one mechanism to reduce risk while supporting innovation procurement. In lieu of relevant policy framework, this recommendation suggests a stakeholder group of government departments to support and fund a Public Procurement of Innovative (PPI) solutions pilot. PPI targets specific challenges in the public sector by seeking innovative solutions, and through a testing phase, reduces risks commonly associated with smaller vendors. Start with several innovative solutions in one pilot, allowing multiple sites to test and find the best fit. PPI fosters innovation cooperation and partnership in the innovation ecosystem.

## Recommendation 2

### Review and revise procurement thresholds—hardware vs software.

Tender requirements often demand high turnovers, a relic of old hardware focused companies. This excludes smaller, innovative firms. Unlike hardware, software does not rely on costly supply chains; its main costs are licenses and setup. Software procurement should prioritise features, capabilities, and fit with needs over financial liquidity. Vendor qualifications, technical evaluations and flexible contracts matter more than historical revenue thresholds.

## Recommendation 3

### Increase adoption of Dynamic Purchasing Systems in healthcare procurement.

A Dynamic Purchasing System (DPS) is a digital tool used by the public sector to buy everyday goods and services. Qualified suppliers can join anytime to compete for contracts, unlike tender frameworks, which usually last four years. Thus precluding vendors not on the framework from consideration for related contracts. DPS helps small businesses access more public contracts, simplifying the process by cutting out repetitive bids. For healthcare, a DPS connecting HSC Trusts in Northern Ireland and Regional health Authorities (RHAs) in ROI could efficiently engage pre-qualified suppliers as all-island healthcare needs arise.

## Recommendation 4

### Co-develop and publish educational tool for SMEs navigating healthcare procurement.

Developing an educational tool for SMEs and start-ups navigating secondary care procurement will benefit small entities understanding of a multi-faceted complex process and support opportunities for success. The online tool will be co-developed in partnership with healthcare procurement experts from NI and ROI healthcare systems, and will be, user-friendly, accessible and regularly updated to reflect any changes in regulations or best practices. Smaller vendors can gain a deeper understanding of the procurement processes, enhance competitiveness and potentially improve their chances of securing contracts.

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## Tracking healthcare procurement data

*'AIMS Framework of Recommendations for Innovation Procurement'* advocates for a revised approach to procurement to help prioritise and cultivate healthcare start-ups and SMEs in ROI/NI. This will increase health system access to innovative solutions from suppliers of all sizes and support economic development across the island. The foundation of this revised approach must be tracking healthcare purchase data— import, domestic and vendor size. While there is some recently

published data in the HSE (HSE Purchase Order Payments above €100k from 2001 to Q1 2023), size and location of purchase source are not included. In NI, similar data exists but is not currently published. Figures that detail vendor location and size must be recorded and published. Tracking and publishing healthcare procurement data results in a transparent, accountable and efficient process.

# 1 – Introduction

The indigenous medtech and digital health sectors have the potential to drive both ROI and NI economies forward. As a small open economy, the island of Ireland is integrated into the global market and the positive impact of foreign direct investment (FDI) is indisputable. However, maintaining a balance between imports and domestic production is essential to ensure a robust and sustainable economy. One third of Irish corporation tax income comes from three multinational firms (Irish Fiscal Advisory Council, 2023). Over-reliance on imports can have several economic and social implications – decline in local industry, loss of jobs, loss of skills and expertise, reduced tax revenue and increased carbon emissions through transportation. The extensive benefit to the ROI/NI health systems of local suppliers was proven during Covid when indigenous companies solved local healthcare problems with innovative tech solutions to manage patient care. Yet, in the ROI/NI healthcare systems, there remains a low level of purchase from domestic SMEs and start-ups. Overwhelming anecdotal evidence from both health buyers, SMEs, start-ups and some ROI specific research demonstrate the inaccessibility of healthcare systems North and South to smaller vendors (OECD, 2021; Galvin, 2020; IMSTA, 2019).

**Despite European Commission efforts to improve public procurement practices, there are no innovation procurement policy frameworks in NI or ROI that drive public healthcare buyer engagement with smaller vendors. This is in stark contrast to European practice. Since 2012, the French government has given priority to the development of procurement for innovation with two per cent of the volume of public procurement awarded to innovative SMEs by 2020.**

**The main objective of the French framework for innovation procurement is to support the growth of innovative SMEs by funding the development of their innovations, providing them with access to new markets and quality reference sites. Since 2014, the Department of State Procurement (Service des Achats de l'Etat - SAE) has included an innovation indicator in its procurement performance measurement system. The indicator relies on two ratios: total amount of procurement for innovation contracts awarded by the department and total amount of procurement for innovation contracts**

**awarded by the department for SMEs (EU, 2015). Similarly, Germany has rolled-out a comprehensive policy framework for innovation procurement. Public sector investment through Public Procurement of Innovation (PPI) in healthcare and social services is at 18 percent (European Commission, 2020).**

A perception that SMEs and start-ups are less capable of meeting requirements, particularly for critical healthcare products or services can create barriers to entry and has led to a dominance of large suppliers (Galvin, 2020). This limits opportunities for smaller vendors to enter the market and compete effectively, equally limiting diversity and innovation within healthcare. Conversely, buying from SMEs and start-ups in the domestic market offers many economic and health system advantages. Healthcare organisations stimulate economic activity; generate employment opportunities, contributing to the overall development of the domestic economy. Procuring from local smaller suppliers encourages sustainability, development and growth of the local supply chain. It encourages competition and diversifies the supplier base, leading to innovation, improved quality and often cost-effectiveness in healthcare products and services.

In an eight-month partnership in 2023, HIHI and HIRANI, supported by InterTradeIreland, examined the current public procurement systems to aid innovative start-ups and SMEs, aiming to enhance socio-economic benefits across the island of Ireland. Through the following sections, this report reflects the work and outcomes of the partnership. First, the AIMS project and its industry specific area is explained, and the partner organisations introduced. Section 2 defines innovation procurement and presents innovation procurement exemplars from the broader European market using healthcare specific examples where available. The third section examines the current healthcare procurement landscape North and South, identifying key stakeholders and health sector specific challenges. The AIMS project process and methodology are detailed in section 4 followed by the results, recommendations and next steps. delete the current text after section 4. Following this, section 5 presents findings and section 6 details the four recommendations. The report concludes in section 8 with next steps outlined in section 9.

## 2 — All-Island MedTech SMEs

The All-Island Medtech SMEs (AIMS) initiative was delivered through a cross-border partnership of Health Innovation Hub Ireland (HIHI) and the Health Innovation Research Alliance Northern Ireland (HIRANI). AIMS was supported by the cross-border trade and business development body InterTradeIreland's Synergy programme, which aims to boost cross-border collaboration among SMEs and other groups such as universities, third sector organisations and government agencies. Additional funding was provided by University College Cork.

AIMS assembled a wide group including SMEs and start-ups, academics, and healthcare procurement experts, to capture procurement barriers encountered by medtech and digital health SMEs and start-ups in the NI/ROI public healthcare systems (Health and Social Care (HSC) and Health Service Executive (HSE), respectively). By involving all stakeholders, AIMS focussed on developing a framework to support innovation procurement and improve indigenous medtech and digital health adoption in secondary care across both healthcare systems.

### Terminology: medtech and digital health

Medtech Europe Industry Associations defines medtech as “products, services or solutions used to save and improve people’s lives”. This broad definition reflects the convergence of health industries, and so the ‘AIMS’ initiative covers both medtech and digital health as below (Irish Medtech Association, 2022).

**Medtech:** Medical devices, digital health, in vitro diagnostics (IVD), and products that share key commercial, regulatory, and/or clinical pathways with medical devices and sold into healthcare market segments.

**Digital health:** Software as a Medical Device (SaMD), mobile health, healthcare information technology (IT) and Electronic Health Records (EHR), wireless medical devices, medical device data and software, systems interoperability, and telemedicine.

### Partners

#### Health Innovation Hub Ireland

The ambition in the ROI's 2013 'Action Plan for Jobs' was to establish a world-renowned health innovation hub and in doing so position Ireland as a leading location for start-ups

and growing medtech and healthcare companies. A UCC-based demonstrator hub provided a scalable and clinically credible environment in which to launch HIHI in 2016. A joint government initiative of the Department of Health (DoH) and the Department of Enterprise Trade and Employment (DETE), HIHI is delivered through an Enterprise Ireland (EI) and HSE partnership, across four academic centres. University College Cork (UCC) is the lead institution with Munster Technological University (MTU), Trinity College Dublin (TCD), University of Galway. HIHI provides a vital bridge between the health service and Irish innovators – understanding the evolving needs of the health system and the journey to market for enterprise. HIHI drives collaboration between the health service and enterprise, leading to the development of new healthcare technologies. HIHI enables frontline piloting and testing, resulting in improved design or the validation to take a product to the next stage of development and commercialisation. From 2016 to 2023, HIHI has engaged with 1,666 companies, supported 865 innovations and delivered 233 projects in secondary care sites across ROI.

#### Health Innovation Research Alliance Northern Ireland

HIRANI was established to strengthen the life and health sciences ecosystem. HIRANI acts as a single voice for the sector with a focus on promoting life and health sciences capabilities in NI, supported by partners including: Invest Northern Ireland (Invest NI); Ulster University (UU); Queen's University Belfast (QUB); Public Health Agency (PHA); HSC Research & Development Division (HSC R&D); the Department of Health (DOH) and Department for the Economy (DfE).

As an alliance of universities, health organisations and other industry bodies, it provides a collective voice, enabling the sector to promote and strategically position itself nationally and internationally. HIRANI provides a ‘front door’ to NI's life and health sciences sector and offers simple access to the resources and expertise of the region. In addition, HIRANI has developed the case for a health and economy partnership with government in NI, including legislation to unlock health data for commercial use. This will realise the potential of NI industry and NHS professionals to streamline and accelerate development of new health technologies, improve patient outcomes, and grow NI's economic prosperity (Farrar, 2022).

HIRANI engages with strategic stakeholders across the UK, ROI and globally to influence and forge valuable connections for NI Life and Health Sciences SMEs and start-ups, highlighting NI capabilities, strengths, and opportunities. Through regular communications and events to support, HIRANI is unlocking innovation in the NI Life and Health Sciences ecosystem.

# AIMS Cross-border Project Team



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**Noel Murphy**  
HIHI Clinical Liaison and HSE Biomedical Engineer, Cork University Hospital



**Barry Henderson**  
Senior Industry Liaison Manager, HSC PHA R&D Division

# 3 — Current secondary care healthcare procurement system in Ireland: North and South.

Section 3 details the current secondary care procurement processes and policy in ROI and NI separately, acknowledging individual jurisdictions. The landscape across both for SMEs and start-ups is also considered and key stakeholders involved in healthcare procurement in ROI and NI are identified.

## 3.1 Northern Ireland

Northern Ireland is part of the United Kingdom (UK) but shares a land border with the EU (Republic of Ireland). Following the UK's exit from the EU, agreements made between both jurisdictions through the Withdrawal Agreement (Northern Ireland Protocol and Windsor Framework) mean Northern Ireland enjoys full market access to both GB and the EU. This puts Northern Ireland in the highly advantageous position of being the only region in the world able to trade goods freely with both GB and EU markets (Invest NI, 2023).

A recent report sets out the opportunity for government in NI to strengthen the health and life sciences ecosystem by developing a more coherent cross departmental policy to enhance the NI health and life sciences ecosystem which spans SMEs, the HSC and the academic sectors (Farrar, 2022).

### Health and Social Care Procurement and secondary care procurement

In Northern Ireland healthcare is largely delivered through the HSC. The Procurement and Logistics Service (PaLS) within the Business Services Organisation (BSO) manages the procurement of clinical and non-clinical goods and services, ICT goods and services and social care services, on behalf of the family of HSC Organisations in NI Health and Social Care.

BSO PaLS are required to comply with the Public Contract Regulations 2015 for contracts over a designated threshold. PaLS is also committed to the NI Public Procurement Policy and implements the Procurement Guidance Notes (PGNs) and Procurement Policy Notes (PPNs) developed by the Procurement Policy Unit in Department of Finance (DoF) and Construction Procurement Delivery (CPD). A new Procurement Bill brought before UK parliament in December 2022 to repeal prior law post EU exit will apply in Northern Ireland and to the HSC in 2024.



Fig 2: BSO PaLS- Vision (2022-27)

In 2022, in order to help close the procurement and innovation gap, a new Innovation and Market Development Unit (IMDU) was set up within BSO PaLS. This Unit links with suppliers and key stakeholders within the HSC to encourage innovation. Mechanism such as 'Meet the buyers' events engage with SMEs and start-ups. Currently in NI, some contracts are broken down into lots to increase SME opportunity. Northern Ireland has also used Pre-Commercial Procurement (PCP), to initiate healthcare research and solution development since 2014.

There are plans across the HSC to develop innovation pathways, including a digital innovation hub (Dept. of Health, 2022) to navigate this complex market. However, it will be some time before these are in place. The recommendations of the Accelerated Access Review to the UK Government to increase access for NHS patients to innovative medicines, medical technologies, diagnostics and digital products, through health system support in designing, developing and deploying innovations has not yet been applied in NI (UK Gov, 2016).

### Landscape overview – SMEs and start ups

As of 2022 the Northern Ireland Life and Health Sciences Sector has grown from £1bn sales in 2019 to nearly £2bn in 2022 with external sales reaching £1.7bn and export sales of £1.1bn. Employment has increased from 9,596 to 10,291. The sector is represented by indigenous SME companies who have grown organically and employ skilled individuals. Both NI universities have a track record in spin out activity with 75% of spin outs focused on Life and Health Sciences (Invest NI, 2022).



## Stakeholders

### Health and Social Care —

BSO ITS  
BSO PaLS  
BSO PaLS (IMDU)  
MOIC  
PHA R&D Division  
DHCNI  
NICON  
HSC Trusts

**Policy** — Department of Health Northern Ireland, Department for the Economy Northern Ireland, Department of Finance Northern Ireland, Northern Ireland Civil Service (NICS).

**Universities** — Ulster University, Queen's University Belfast.

**SMEs** — NI Life Science SMEs.

**State Agency** — Invest NI.

**Other** — General Public, media.

Fig 3. NI stakeholders

## 3.2 Republic of Ireland

The ROI adheres to EU public procurement rules that ensure fair competition and equal treatment among suppliers from all member states, including domestic SMEs. Public procurement rules and practices may vary between EU member states, as long as they comply with the overarching principles of EU directives.

### HSE and secondary care procurement

In ROI, public healthcare is fragmented across care settings and largely funded by the State, accounting for 78.3 per cent of total health expenditures in 2021 (OECD, 2022).

The HSE's Performance Accountability Framework, introduced in 2015 and enhanced in 2016, sets out the means by which the HSE and in particular the National Divisions, Hospital Groups and Community Healthcare Organisations, are held to account for their performance. The performance indicators against which Divisional performance is monitored are set out in the Balanced Scorecards grouped under: access; quality; finance; people (HSE, 2021). However, a recent OECD report concluded that monitoring the Irish health system is hindered by its complexity, lack of adequate information, fragmented data governance and underdeveloped digital infrastructure (OECD, 2022).

The Office of Government Procurement (OGP) commenced operations in 2014 and, together with four key sectors (health, defence, education, and local government), has responsibility for sourcing all goods and services on behalf of the public service. However, the OGP does not have statutory or regulatory status. The government procurement model promotes a single integrated procurement approach for the health sector, incorporating the HSE and all healthcare agencies and institutions, which are in receipt of government funding. The existing Hospital Groups and CHOs are currently being brought in line with the new Health Region boundaries (HSE, 2023). By the end of 2024, the existing Hospital Group and CHO structures will be stood down as the six new Regional Health Authorities are fully established.

The HSE and the OGP collaborate extensively around the procurement of framework and contract arrangements for common categories of expenditure that the OGP coordinate. The HSE leads on the procurement for health sector specific categories as outlined in Figure 4 including 'Digital Health and Innovation (HSE corporate plan, 2022-2024).

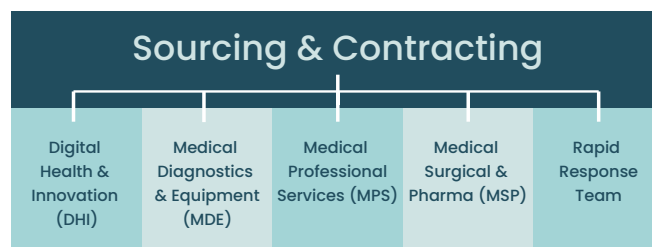


Fig 4. HSE leads procurement for health sector specific categories

The HSE uses EU Open Tender, a platform that offers tender data from 35 jurisdictions for tendering requirements and establishing frameworks. A HSE framework, once established commonly lasts four years, precluding vendors not on the framework from consideration for related contracts. There is an ambition within the HSE to replace the vast majority of frameworks with Dynamic Purchasing Systems (DPS) in the coming years. DPS is a digital tool used by the public sector to buy everyday goods and services. Qualified suppliers can join anytime to compete for contracts. The HSE Corporate Plan 2022-2024 also identifies areas of strategic change and HIHI as innovation partner. The HSE Corporate Plan 2022-2024 committed to a multi-annual procurement plan (MAPP). HSE Procurement Overview of Upcoming Tenders for 2023 is available online detailing opportunities in advance of tender publication.

The procurement process can differ between HSE (statutory) hospitals and voluntary hospitals. HSE statutory hospitals are owned and funded by the HSE. Voluntary hospitals receive some HSE funding and are owned by private bodies, such as religious orders. As a result, voluntary hospitals have more autonomy as the HSE procurement processes do not bind them, though the thresholds are the same. Private hospitals do not receive any HSE funding and can execute individual bespoke procurement processes (Galvin, 2020). The creation of six new



regional health areas is set to support more decentralised decision-making, including budgetary autonomy. The success of Regional Health Areas will depend on a suitable funding system and data availability.

### Landscape overview – SMEs and start ups

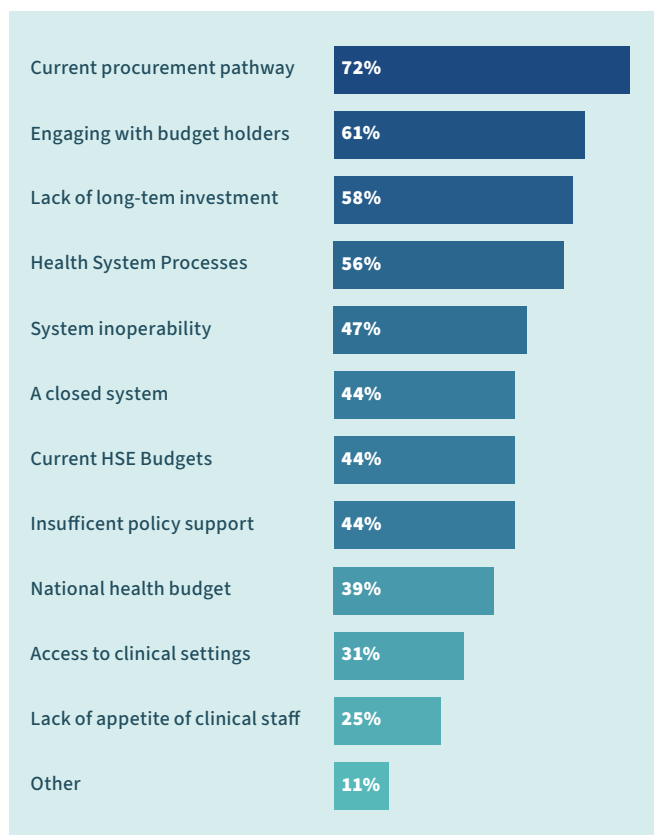


Fig 5: Challenges to commercialisation in the ROI health system (Galvin2020)

Despite ROI SMEs displaying the third-highest share of new-to-market production innovation in OECD economies, levels of SME productivity growth are low. SME productivity is essentially a technical term, a ratio of outputs such as sales, which corresponds to efficiency of economic activity. (OECD, 2021). Recent research revealed that the current procurement pathway is the primary challenge perceived by ROI health tech SMEs and start-ups (Galvin, 2020).

Findings revealed that for these ROI start-ups and SMEs the process of engagement from ‘procurement’ through to ‘use’ took on average 12-24 months (Galvin, 2020). The effects of this are multi-layered. It means that some statutory healthcare sites endure a wait of two years before a need identified is met by the product required. This lag negatively affects revenue streams for SMEs and start-ups. Restricted revenue streams restrict ability to create employment and may lead to discontinuation of the business, affecting GDP. An economic impact analysis for Ireland estimates that a national digital health strategy,

leading to the development of commercial and export-oriented opportunities, can add between 2 and 2.9 per cent to national GDP and contribute a significant number of highly skilled jobs to the economy (IMSTA, 2019).

There is a recognition at policy level in ROI that procurement reform must take place. The ‘Programme for Government – Our Shared Future’ identified the role public procurement can play as an instrument to support innovation and allow greater access for SMEs to public procurement. The Government recognises that creative ideas for new and innovative solutions and products often come from SMEs and the award of a public contract can act as a springboard for emerging SMEs to expand and export (DPER, 2023). The Department of Public Expenditure and Reform (DPER) is leading the ‘Procurement Reform Programme’ to enable effective, sustainable and compliant procurement across the public service (DPER, 2022).

### Stakeholders

**Health** — HSE, Hospital groups/RHAs, Irish hospital consultants Association, Private hospital association, Irish Platform for Patient Organisations, Science and Industry (IPPOSI), HMI, Ehealth Irl, OCIO, Health Information and Quality Authority (HQIA) HRA, Office of nursing services, community healthcare orgs, nursing homes Ireland.

**Industry** — Medtech Ireland, Irish Business and Employers Confederation (Ibec), Scale Ireland, Health tech Ireland, SMEs, Start-ups, Small Firms Association (SFA), Chambers Ireland and the Irish Small and Medium Enterprises Association (ISME).

**Policy** — DPER, DoH, DETE, OGP, Small and medium-sized enterprises Advisory Group (SME AG).

**Academic** — UCC, MTU, TCD, NUIG.

**State agency** — Health Research Board (HRB), Industrial Development Agency (IDA), Enterprise Ireland, Local Enterprise Offices (LEOs), Science Foundation Ireland (SFI), InterTradeIreland (ITI), the Competition and Consumer Protection Commission (CCPC).

**Incubators** — NDRC, Portershed, Republic of Work and others.

**Other** — general public, media.

Fig 6: ROI stakeholders

# 4 — Innovation procurement

Detailing the healthcare procurement systems North and South, in the previous section, offers a comparative basis upon which to consider innovation procurement. Section 4 now examines innovation procurement through definition, processes and European exemplar cases as benchmarks for success.

## What is innovation procurement?

Health systems must constantly innovate. In care delivery: responding to current, chronic and emerging disease burdens and rapidly ageing populations. In technology: use of emerging tools for diagnosis, treatment, management of previously fatal conditions. In new models of care: clinical, management, communications, data. Innovation is essential to shift the complex healthcare delivery system forward.

According to the European Commission, European Union (EU) public procurement accounts for over 14 per cent of Gross Domestic Product (GDP) and could create a large market for innovative products and services (European Commission, 2021). The European Commission aims to improve public procurement practices, promote the demand of innovative goods and services, and foster the uptake of innovation across Europe. It advocates that public buyers encourage innovation among established market players, but also provide vital opportunities to SMEs and new innovative companies who may have solutions to unmet needs, but face difficulties in bringing them to the market. (European Commission, 2021). ‘Innovation procurement’ refers to any procurement that has one or both of the following aspects in Figure 7:

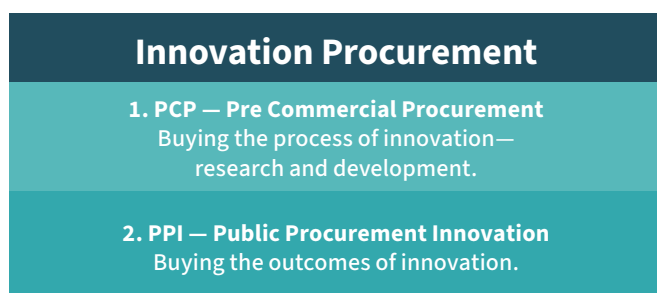


Fig 7: Innovation procurement aspects

With Pre-Commercial Procurement (PCP), public authorities initiate research and development (R&D) sharing risks and benefits. Using Public Procurement Innovation (PPI), public authorities act as the early adopter of innovative goods or services, which are not yet available on a large-scale commercial basis (EAFIPa, 2016). These innovative solutions do require R&D and the public authorities contribute to the distribution of the innovative solutions.

PPI shortens the route to market, releases the potential of early adopters to implement an innovation and enables public procurers to access innovative products. Figure 8 details innovation procurement inclusion:



Fig 8: Innovation procurement inclusion

The benefits of innovation procurement in healthcare are many. Supporting start up and SMEs to grow can solve health problems and meet needs with solutions not currently or widely available on the market. This can improve public service effectiveness and efficiency shown in Figure 9 (European Commission, 2021; Innovation Procurement Platform, n.d).

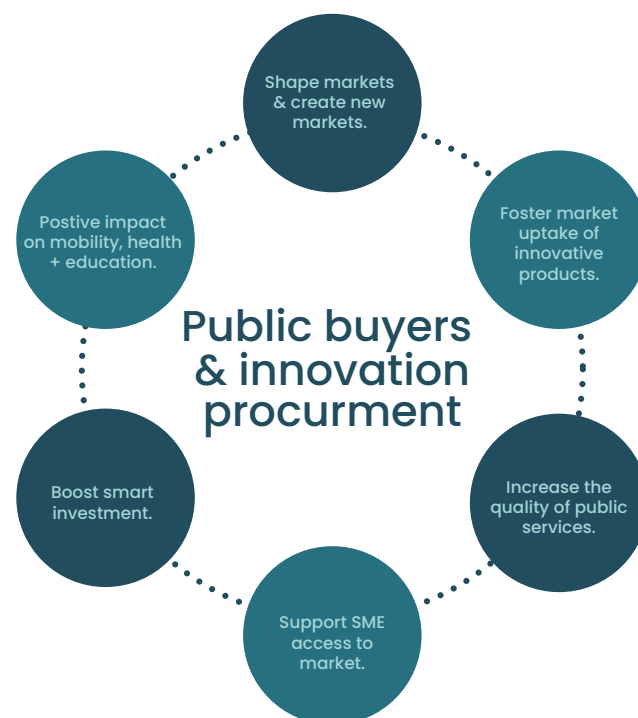


Fig 9: Public service effectiveness and efficiency: public buyers and procurement of innovation

Countries that are at the forefront of innovation generally have a policy framework for innovation procurement (COM, 2021, 267/2). Europe-wide benchmarking of national innovation procurement policy frameworks in Figure 9 shows that the ROI is well below the national average by country. Although the UK is above average, the figure is not broken down to represent NI.

Recognised as leaders, Finland’s innovative procurement program has already supported over 70 innovation procurements. The Italian region of Lombardy has included PCP and PPI as a political objective in its regional law and allocated funding to organise regular calls gathering innovation needs from public buyers in the region. (COM, 2021, 267/2).



Fig 10: Europe wide benchmarking of national innovation procurement policy frameworks

## 4.1 How does innovation procurement work?

The EU public procurement rules in 2014 enabled public buyers to design procedures that are adapted not only to large companies but also to smaller innovative suppliers. Prior to this due diligence for public buyers required proof of financial viability to carry out a contract - annual accounts and turnover levels (COM, 2021, 267). The required minimum turnover level is often several times higher than the value of the contract. This excludes all potential tenderers with lower turnover, even though they have the capacity and a better solution. Under the new rules, public buyers can no longer require turnover more than twice the estimated contract value, unless duly justified by specific circumstances (Article 58(3) second indent of Directive 2014/24/EU). This assists start-ups and SMEs that are new to the market and have a relatively low turnover.

Illustrated in the benchmarking study (Fig 10), Austria, Belgium, Finland, and the Netherlands have adopted a dedicated action plan for innovation procurement. Denmark, Germany, Estonia, Greece, France, and Sweden include specific objectives on innovation procurement in wider national strategies or programmes, often with a dedicated budget and with a clear commitment of keys stakeholders. These countries successfully leverage ecosystems of innovation – engaging networks, resources, and processes. Governments, industry leaders, innovation brokers and policymakers collaborate to address challenges related to funding, access to markets and share risk. This fosters an ecosystem that drives sustainable innovation. The following case studies detail some of the successes of this approach.

## 4.2 Innovation procurement exemplars

(Source all: COM, 2021, 267)

### Reframing the requirements: Innovation helps implement environmental and health policies

#### Challenge:

Climate change has made heat waves more common in Poland. The hospital in Sucha Beskidzka was one of many Polish hospitals in which the impact of high room temperatures on staff and patients' well-being as well as medical equipment was of increasing concern.

The Ministry of Public Health responded by requiring all healthcare providers to install sun-blocking equipment in patients' rooms. Air-conditioning patients' rooms in the summer months strained the budget of the Sucha Beskidzka hospital.

#### Innovation procurement:

Rather than buying more of the same, the hospital reframed its requirements by asking the market for available solutions within a technical dialogue. Using functional criteria (temperature reduction of 2°C) instead of prescribing a specific solution in an open procedure, it procured a healthier and more sustainable solution. The building's facade was equipped with solar panels, providing shade without darkening the rooms. Using a whole-lifecycle-costing model was crucial for the procurement outcome that benefited the hospital patients, staff, and management.

#### Solution:

The temperature inside the hospital dropped by 10 per cent even as the outside temperatures increased by 20 per cent. The solar panels also supply five percent of the hospital's electricity needs, compensating for the initial investment.

### Prior Information Notice: A proactive approach to procurement of Intensive Care Unit (ICU) telemedicine

#### Challenge:

Hospitals in the Netherlands, Spain, Belgium and Finland sought the development of a highly interoperable telemedicine platform for tele-detection and tele-care of Intensive Care Unit (ICU) patients at increased risk of dying from sepsis.

#### Innovation procurement:

The hospitals published a Prior Information Notice (PIN) and by collecting data from potential bidders through a

preliminary market consultation of physical meetings and an online questionnaire. This approach confirmed that the proposed budget was adequate and revealed necessary additional information. Promotion for the procurement started via the THALEA (funded by the European Union as part of the Seventh framework programme) website and via posts on other health, IT and innovation procurement websites, newsletters.

#### Solution:

The PIN attracted bids not only from large companies but also from smaller innovators, including start-ups. Two start-ups and one large player successfully delivered novel algorithms and improved risk-detection solutions, resulting in a 25 per cent reduction in sepsis mortality and shortened the lengths of hospital stays up to 50 per cent.

The hospitals have enlarged the buyers group for a follow-up procurement to deploy these type of innovative solutions more widely across Europe. THALEA II was the first follow-up PPI in healthcare for ICUs. Using the PPI-funding instrument, procuring entities and ICU experts will be able to buy the advanced THALEA solution developed.

### Creating opportunities for SMEs: Drones and personal protective equipment for forest firefighting

#### Challenge:

Public buyers realised that although innovative SMEs can deliver good quality solutions, the public buyers the procurement process is not always accessible to them.

#### Innovation procurement:

Instead of replacing outdated equipment or renewing expired service contracts, the public buyer carried out a functional analysis of the needs of the organisation and its partners/users, identifying problems or areas for improvement.

The required minimum turnover under the financial capacity criteria had to exceed the value of their offer. The buyers also divided the contract into lots – the total contract value divided into lots – vehicle, drone and protective equipment – the financial capacity requirement was achievable for SMEs.

#### Solution:

This approach enabled SMEs to win the contracts for innovative equipment.

## Implementing a holistic view of the procurement process: Purchasing incontinence diapers

### **Challenge:**

The principal costs in incontinence care was not the diaper – the product price – but all the extra costs in diaper care. The time the nurses use to change a diaper and all the expenses incurred if they use the wrong diaper for the patient, etc. Instead of replacing the existing product or republishing the old tender one Danish hospital applied a holistic approach.

### **Innovation Procurement:**

The public buyer created a tender using a holistic view. The following award criteria were used: Economy Product price, Total costs Quality, Education/consultancy, Economic follow-up.

### **Solution:**

Using a holistic view to consider the entire process cost. Not simply product purchase opened up the process to more innovative solutions.

Successes of neighbouring European countries highlight innovation procurement solutions that have worked well. Some of the barriers in the Irish systems are those which other countries have also encountered and solved through innovation procurement based on policy support. Considering these exemplars, it is clear that new support structures are required to leverage innovative procurement in Irish healthcare. From systems, to standards, to buying.

# 5 – AIMS Methodology

Section 3 outlined the current approach to secondary care procurement in both NI and ROI. European innovation procurement exemplars in Section 4 provided a basis of comparison to draw upon as themes emerged through the data collection process. This section details the AIMS project specific work and processes. This comprised a series of workshops and advisory group sessions, with a collective 38 stakeholders to identify common procurement challenges and proposed solutions. The AIMS advisory group, chaired by Prof

Ciara Heavin, UCC, reviewed the outputs of each workshop. Membership of the AIMS advisory group comprised a core stakeholder group of innovation, healthcare and procurement providers and experts drawn from across the healthcare landscape. All stakeholders involved in the workshops and the advisory group are contained in Appendix 2. Figure 11 contains the timeline of planning and the collaborative work that followed, engaging with users and stakeholders.

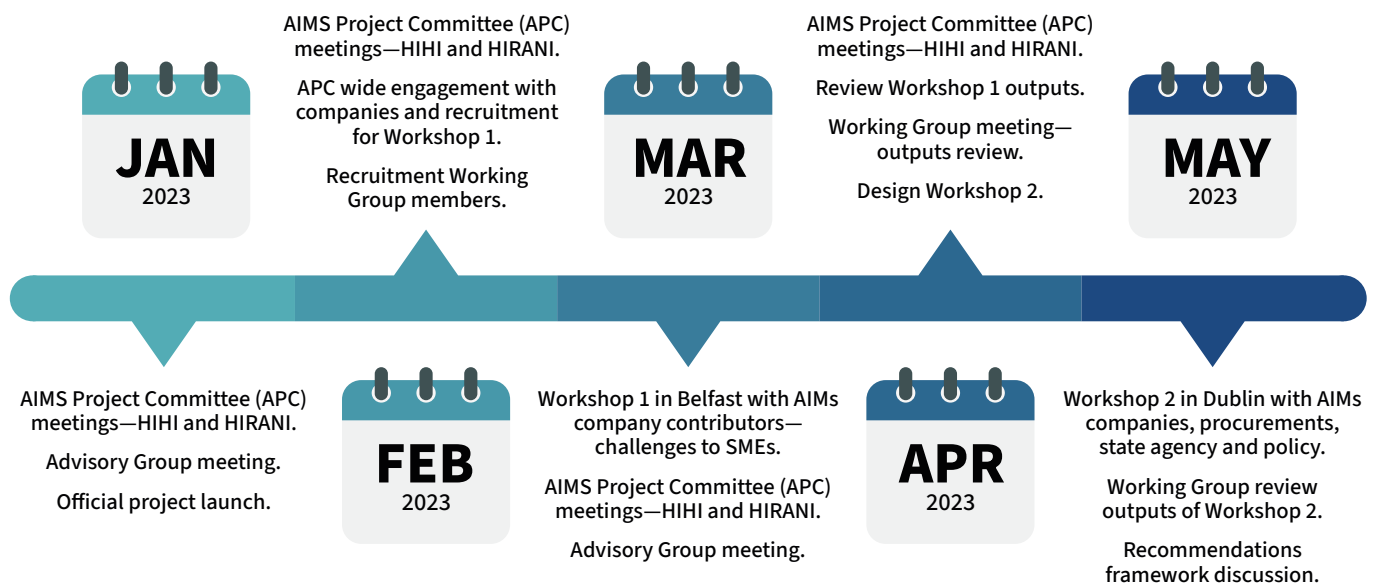


Fig 11: AIMS collaboration

## Workshops

Independently facilitated workshop 1 included ROI and NI SMEs and start-ups focussing on their challenges in health procurement, North and South. All of the companies detailed in appendix 4 had experience of the procurement process. Workshop 2, also independently facilitated and involving both the SMEs and key stakeholders from the ROI/NI healthcare procurement systems, focussed on solutions. Opening the workshop, HSC and HSE procurement both presented on ‘SME innovation procurement’. The remainder of the workshop comprised breakout sessions on recommended themes which arose in workshop 1 and were approved by the advisory group. The workshops generated valuable insights on procurement challenges and potential solutions through structured discussion and breakout sessions.

## Advisory group sessions

Data collected from both workshops was processed and evaluated by HIHI, HIRANI and experts in the advisory group. Following workshop 1, the AIMS advisory group, chaired by Prof Ciara Heavin, met to discuss the outputs report from workshop 1 and recommend themes to be examined by the wider stakeholder group at workshop 2. Subsequent to workshop 2, the advisory group reviewed and evaluated the outputs and discussed points for the AIMS framework.

## 6 – AIMS findings and discussion

The outputs of workshop 1, representing the views and perceptions of SMEs and start-ups outlined in Table 1, were compiled in a brief report for dissemination to the AIMS advisory group for discussion.

Challenges identified:	Solutions suggested:
<b>The system is dominated by an economies of scale mentality from policy and decision makers</b>	Fix the issues at a policy level and/or look at other countries as examples of how their policies work.
<b>The system looks for price first above all else</b>	Local sourcing – procurement designate a percentage to local SMEs. Certain portion of national spend on local sourcing.
<b>Procurement varies in requirements, lack of clarity, some communication gaps.</b>	Standardise requirements across the board. Consider current SME rules of engagement. Clarity is key.
<b>Confusing tenders, different systems, priorities and budgets – no standardisation. No collaboration between trusts in N.I.</b>	A platform where hospitals can buy with trust. Hospitals submit requirements. Companies submit solutions.
<b>Turnover thresholds in place exclude SMEs.</b>	Thresholds that protect SMEs.

Table 1: AIMS workshop 1 (companies) outputs

There were parallels between the advisory group guidance contained in Table 2 below - and the outputs from workshop 1 in Table 1 above. Challenges around thresholds for SMEs were acknowledged, as was the lack of tender standardisation - suitability for med tech products, and interoperability

issues across sites. However ‘price first’ as a system approach perceived by SMEs, was rejected based on the groups buying experience. Key observations captured by the advisory group are outlined in Table 2 and formed part of the basis for design of workshop 2.



## AIMS Advisory Group guidance

<b>Supplier education:</b>	<ul style="list-style-type: none"> <li>• Supplier education is key - there is a lack of responsibility around clarity from the bidder. There is a skill to filling out the tender documents.</li> <li>• Price volatility is a key area and there is a need to understand cost drivers.</li> <li>• Companies tend to fall at the compliance hurdle.</li> </ul>
<b>Tender documents:</b>	<ul style="list-style-type: none"> <li>• Open and transparent conversations are vital as digital moves so quickly that the tender may not be fit for purpose.</li> <li>• Companies are not well prepared and the quality of the tender process is not very good.</li> <li>• More support for SMEs and start-ups required with the tender documents.</li> </ul>
<b>SME innovation fund:</b>	<ul style="list-style-type: none"> <li>• Beneficial to have an SME innovation procurement fund - difficult to expect HSE/HSC to fund this - requires external funding or a ring-fenced public budget.</li> <li>• A ring-fenced budget to support pilot projects in NI (HIHI is funded to provide such support in ROI). There is no equivalent budget mechanism in place for NI.</li> </ul>
<b>Partnerships:</b>	<ul style="list-style-type: none"> <li>• A procurement group would be beneficial which includes companies who have done this before.</li> <li>• Partnerships with business, academia, and health.</li> </ul>
<b>Price:</b>	<ul style="list-style-type: none"> <li>• Do not agree that procurement looks at price first.</li> <li>• Turnover threshold is challenging for start-ups.</li> <li>• The Trusts operate in their own silos and there is a need for systems to work across all (NI specific).</li> </ul>
<b>Systems:</b>	<ul style="list-style-type: none"> <li>• Systems solution tailored to the needs of local areas.</li> <li>• With digital health, there is involvement with IT that means there is a growth in resources, people, and expertise available.</li> <li>• Challenges relating to FHIR standards and interoperability.</li> </ul>
<b>Silos:</b>	<ul style="list-style-type: none"> <li>• Challenge in relation to the cost of doing business with HSC and HSE</li> <li>• Purchasing varies significantly in ROI secondary care from site to site.</li> </ul>

Table 2: AIMS advisory group guidance for workshop 2

Workshop 2 comprised breakout sessions brainstorming solutions, focussing on the five themes in table 3:

### Workshop 2 themes:

- External funding – innovation procurement. A fund dedicated to SME procurement.
- Innovation procurement – what are the risks and how to mitigate them.
- A suite of education tools for smaller suppliers.
- Tender documents for health tech and understanding individual site/Trust capabilities.
- If in procurement price, is second, what is first when considering health technology purchase?

Table 3: Workshop 2 themes

During workshop 2, HSE procurement identified challenges in its own procurement practice of technology related products (AIMS workshop 2, HSE presentation). There is only one template HSE Information and Communication Technology (ICT) contract available – ‘HSE Standard Terms for ICT Supplies and Services’. One template cannot adequately address the unique requirements, complexities, or nuances of different ICT projects. These projects often require adaptability and scalability. A single template lacks the flexibility to accommodate evolving technology trends, changes in scope and emerging risk (Bousdekis et al, 2020; Mettler et al, 2009). Additionally, relying on one template contract restricts the ability to incorporate innovative provisions or adopt industry standards and best

practice. The HSE is also without a Cloud/Software as a Service (SaaS) agreement in place, lacking the necessary contractual protections and provisions specific to cloud-based services - data security, privacy, compliance, service levels, support, liability, intellectual property rights, termination clauses and dispute resolution mechanisms. The absence of a formal agreement risks exposure to potential disputes and uncertainties regarding the responsibilities and obligations of both supplier and purchaser.

The outputs of workshop 2 compiled in a brief report for dissemination to the AIMS advisory group for discussion, are collated in Table 4.

Themes:	Ideas:
<b>External funding or ring fenced – innovation procurement. A fund dedicated to SME procurement.</b>	<ul style="list-style-type: none"> <li>• Central government funding.</li> <li>• Support structures must be available (education mechanisms).</li> <li>• Percentage of tenders designated to SMEs by tender winner, avoiding dominant environment.</li> </ul>
<b>Innovation procurement – what are the risks and how to mitigate them.</b>	<ul style="list-style-type: none"> <li>• A proof-of-concept process to de-risk. Ring-fence funded for NI system.</li> <li>• ROI lacks a G Cloud – (framework where supplier cloud-based solutions are made available through a front-end Catalogue called the Public Procurement Gateway (PPG)).</li> <li>• SME participation in market soundings and consultation</li> </ul>
<b>If in procurement price, is second, what is first when considering health technology purchase?</b>	<ul style="list-style-type: none"> <li>• Quality – tech requirements, functional requirements, implementation plans, capacity.</li> <li>• Link social value to stimulating economy, social value clause for SMEs - local market job growth, wealth creation.</li> </ul>
<b>Meeting thresholds and criteria</b>	<ul style="list-style-type: none"> <li>• Revenue requirements – hardware Vs software – not the same purchase.</li> <li>• Framework to subcontract – conglomerate style.</li> </ul>
<b>Education tools</b>	<ul style="list-style-type: none"> <li>• Navigating different vernaculars of tenders</li> <li>• Site maps for various sites/trusts</li> <li>• Compliance.</li> <li>• Partnerships.</li> </ul>

Table 4: AIMS workshop two outputs

Both the workshops and the advisory group agreed that protected budget for innovation procurement would be impactful. This is in line with successful innovation procurement practice across the European market. There was concurrence around the need to review the ‘wider picture’ when procuring digital health solutions, the long-term benefits, thresholds and total cost of ownership. A consideration that proved fruitful for many of the EU exemplars in the report. It was also agreed that

a G Cloud system used regularly in the UK — a framework of supplier cloud-based solutions made available through a front-end catalogue — could benefit ROI SMEs. While in NI, improved communication and education is required to encourage SME participation. Widespread consensus recommended an SME and start-up specific guide to HSE/HSC procurement. The AIMS advisory group discussion points on workshop 2 are captured in Table 5.

## AIMS Advisory Group guidance

<b>Funding for SME procurement:</b>	Create a dedicated fund to support SMEs in innovation procurement. Funding is a critical barrier to innovation, and clear policy support is needed.
<b>Supplier education tools:</b>	Develop a set of educational resources for smaller suppliers. This includes helping suppliers understand how to engage with buyers, navigate procurement thresholds, and register on platforms like eTenders, providing a dedicated resource to support tender documentation completion. Initiatives like InterTradeIreland’s Go-2-Tender program can provide sector specific guidance and support through workshops and mentoring.
<b>Health technology purchase:</b>	When considering the purchase of health technology, prioritize factors beyond price. Focus on efficiency, Key Performance Indicators (KPIs), total cost of ownership (including updates, integration and training), and the broader benefits the product or service brings to alleviate pressure on healthcare systems.
<b>Mitigating risks in innovation procurement</b>	Establish an innovation framework where companies can seek advice from clinical experts. Ensure a clear route for identifying and working with the best contacts within healthcare Trusts. Create funding opportunities, especially for pilot projects, to mitigate risks associated with innovation procurement.
<b>Streamlined tender documents and system compatibility:</b>	Simplify the complex processes involved in procurement. Identify ways for different systems to work together, enabling collaboration between larger and smaller companies. HSE to consider adopting systems like the G Cloud system, which has been successful in the Health and Social Care sector (HSC) and could benefit SMEs in both ROI and NI. Improve communication to encourage NI SMEs to use it more effectively.

Table 5: AIMS advisory group discussion points on AIMS workshop 2

The AIMS project team presented preliminary areas that the framework could focus on, under the key headings in Table 6. The AIMS advisory group supported the proposed areas and offered guidance and context on each to the AIMS project team.

<b>Preliminary framework points:</b>	
<ul style="list-style-type: none"> <li>• Central government funding - pathway for SMEs to provide proof of concept (shared risk), develop and ultimately procure.</li> <li>• Software versus hardware procurement</li> </ul>	<ul style="list-style-type: none"> <li>• Dynamic purchasing systems and G cloud framework?</li> <li>• Suite of education tools for SMEs navigating HSC and HSE.</li> </ul>

Table 6: Preliminary framework points

# 7 — Recommendations

The genesis of the ‘AIMS Framework of Recommendations for Innovation Procurement’ is a recognition that debilitating challenges exist to SMEs in secondary care procurement within the indigenous markets. By launching the AIMS project and bringing together users: SMEs, start-ups, and key stakeholders from industry, clinical, academia, policy, state agency and procurement; challenges within the Irish and Northern Irish

markets were crystallised. AIMS workshops 1 and 2 and the advisory group informed the proposed solutions contained in the below framework of recommendations. In developing the framework, a concise risk and mitigation analysis was undertaken. Risks were assessed through the typology of risks as defined by the European Commission’s risk management in innovation procurement and is contained in Appendix 1.

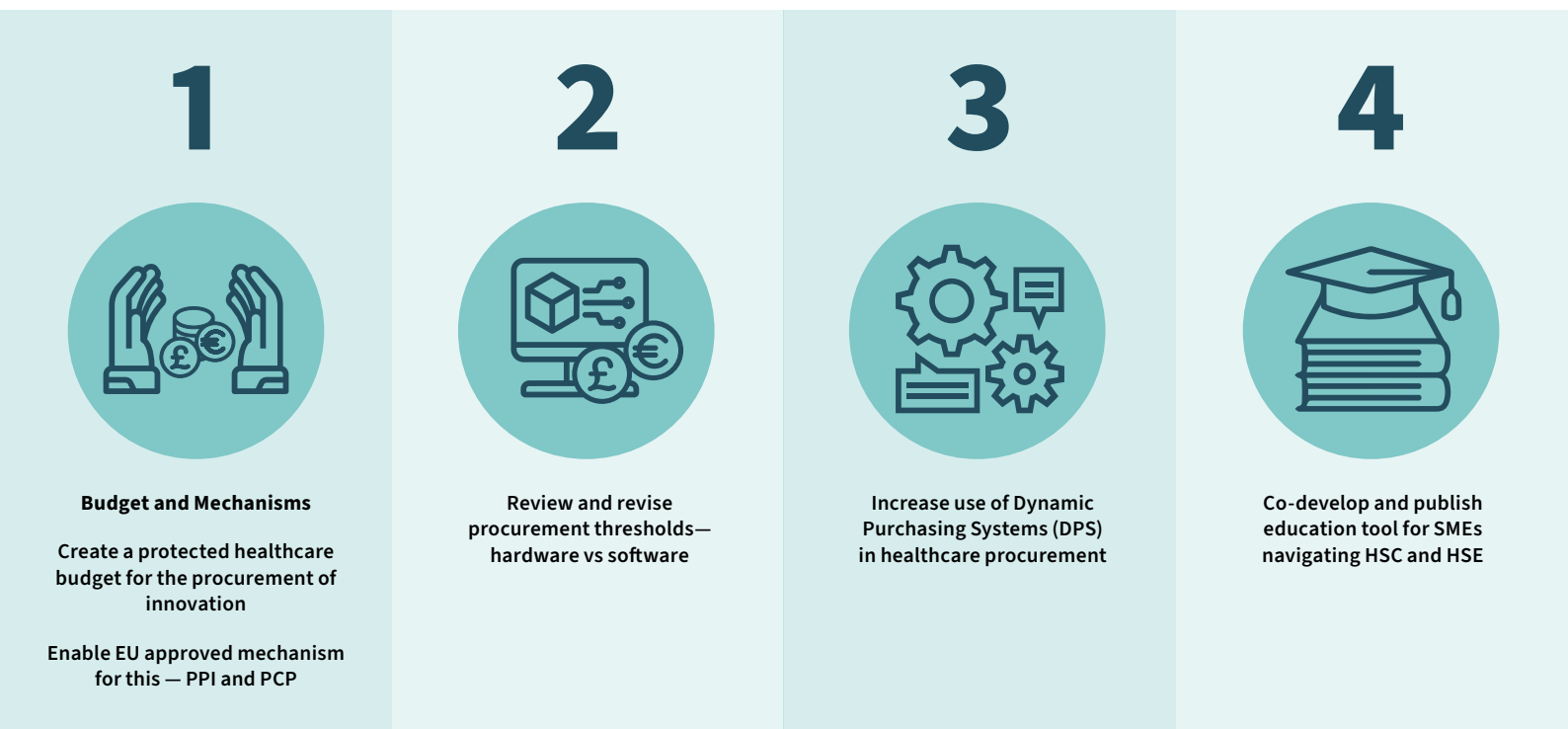


Fig 1: AIMS Framework of Recommendations for Innovation Procurement

## 7.1 Recommendation one: Create a protected healthcare budget allocation for innovation procurement

<b>Recommendation</b>	<b>Create a protected healthcare budget for the procurement of innovation. Enable EU approved mechanism for this – PPI and PCP.</b>
<b>Overview</b>	Reserving a healthcare budget can encourage SMEs and start-ups to offer innovative solutions for specific healthcare challenges. To promote innovation procurement allocate a percentage of public spending, as seen in successful European models. Establish a policy framework for strategic adoption. In the absence of existing policy, this recommendation suggests a stakeholder group of key government policymakers in ROI and NI engage in a two-phased, multi-supplier pilot of PPI (Public Procurement of Innovative) solutions, led locally by HIHI, ROI and HIRANI, NI
<b>Why it works</b>	<p>By allocating specific funds for innovation procurement there is a clear signal that the system values and prioritises advancements in healthcare. This encourages the exploration of cutting-edge technologies, treatments, and solutions. Ring-fenced budgets will allow healthcare organisations to focus on addressing unmet medical needs that traditional budget cannot facilitate.</p> <p>PPI is suggested as one mechanism to reduce health system risks by testing innovative solutions. The recommendation begins with testing multiple innovative solutions in one pilot, making it easier to find the right fit for each system. PPI leverages the innovation ecosystems in NI and ROI through collaboration. The testing phase also benefits SME competitiveness.</p>
<b>Implementation</b>	<ul style="list-style-type: none"> <li>• Need identified and funding committed for all phases of PPI.</li> <li>• Identify pilot secondary care site(s) – create implementation team.</li> <li>• Engage the market in an open consultation using a PIN.</li> <li>• Prepare tender documents and specifications to begin PPI process to establish a multi-supplier framework.</li> <li>• Framework agreement implemented over two phases, Deployment and Testing (Phase 1) – development of the innovative solutions.</li> <li>• Operational Validation and Scale-up (Phase 2) – opens up the solutions from Phase 1 to a wider group for purchase competition.</li> <li>• Full review and evaluation of pilot.</li> </ul>
<b>Socio-economic benefit</b>	<ul style="list-style-type: none"> <li>• Economic growth and job creation, increasing tax revenue and strengthening the economy.</li> <li>• Encourages knowledge transfer and collaboration between the public and private sectors.</li> <li>• More efficient and effective public health services.</li> <li>• More positive environment for inward investment.</li> <li>• Could support sustainable procurement targets.</li> </ul>
<b>Key stakeholders ROI</b>	HIHI, HSE Clinical, HSE procurement, OGP, DoH, DETE, DPER, secondary care sites, hospital groups/RHAs, eHealth Ireland, clinical.
<b>Key stakeholders NI</b>	HIRANI, BSO ITS; BSO PaLS; BSO PaLS (IMDU); MOIC; PHA R&D Division; DHCNI; NICON; HSC Trusts; Department of Health Northern Ireland; Department for the Economy Northern Ireland; Department of Finance Northern Ireland, Northern Ireland Civil Service (NICS); Ulster University; Queen’s University Belfast; NI Life Science SMEs; Invest NI; general public; media.

Table 7: Recommendation one

## 7.2 Recommendation two: Review financial thresholds requirements for software purchase

<b>Recommendation</b>	<b>Review and revise procurement thresholds— hardware vs software.</b>
<b>Overview</b>	<p>Tender requirements often demand high turnovers, a relic of old hardware focussed procurement. This excludes smaller, innovative firms. Unlike hardware, software does not rely on costly supply chains; its main costs are licenses and setup. Software procurement should prioritise features, capabilities, and fit with needs over financial size. Vendor qualifications, technical evaluations and flexible contracts matter more than historical revenue thresholds.</p> <p>An important lesson from the AIMS process for ROI stakeholders was the successful use of G-Cloud by the UK government for cloud computing services. G-Cloud acts as a digital marketplace where pre-approved suppliers, including small businesses, offer cloud-based software and services. Public sector organisations can easily access and choose the services they need from the available suppliers</p>
<b>Why it works</b>	<p>Focussing on vendor ability to deliver the software and provide ongoing support differentiates from traditional hardware focus. Technical evaluation through pilot studies can validate the option prior to purchase. Ensuring contractual flexibility through bespoke agreements.</p> <p>The G-Cloud framework offers equal opportunities for all suppliers, regardless of size. For public sector buyers, it offers a quick route to compliant vendors. Reducing many of the usual barriers faced by smaller suppliers, G-Cloud simplifies the procurement process, reduces administrative burdens and lowers the cost of participation. It increases visibility for pre-qualified smaller entities to the public sector and offers the buyer access to new and emerging technology solutions.</p>
<b>Implementation</b>	<ul style="list-style-type: none"> <li>• <b>Vendor Qualifications:</b> Look beyond financial figures to assess the vendor’s experience in delivering software solutions, references from previous clients, qualifications, expertise in the specific technology stack.</li> <li>• <b>Technical Evaluations:</b> Use the local Innovation Broker for proof-of-concept and pilot projects, to validate performance, compatibility, security, scalability and integration.</li> <li>• <b>Contractual Flexibility:</b> Software procurement often involves licensing and maintenance agreements. To adapt traditional procurement, ensure contracts have provisions for software updates, upgrades, and support services.</li> <li>• <b>Library of contracts:</b> Developing a library of contract templates or variations that reflect variance of ICT projects.</li> </ul> <p><b>G-Cloud benefits for ROI:</b></p> <ul style="list-style-type: none"> <li>• Pre-negotiated terms, clear pricing, and simplified procurement.</li> <li>• Pre-approved suppliers allow ‘pay-as-you-go’ services without separate competitive processes.</li> <li>• Public sector organisations set their specific requirements, including Cloud/SaaS agreements, SLAs, and pricing, separate from the G-Cloud framework.</li> </ul>

Table 8: Recommendation two

Continued →

## 7.2 Recommendation two: Review financial thresholds requirements for software purchase

<b>Socio-economic benefit</b>	<ul style="list-style-type: none"> <li>• Agile and innovative smaller vendors can participate resulting in a diverse and competitive market.</li> <li>• More flexible, innovative cost-effective solutions will benefit healthcare access.</li> </ul>
<b>Key stakeholders ROI</b>	<p>HIHI, HSE Clinical, HSE procurement, OGP, DoH, DETE, DPER, secondary care sites, hospital groups/RHAs, eHealth Ireland, ICT secondary care sites.</p>
<b>Key stakeholders NI</b>	<p>HIRANI, BSO ITS; BSO PaLS; BSO PaLS (IMDU); MOIC; PHA R&amp;D Division; DHCNI; NICON; HSC Trusts; Department of Health Northern Ireland; Department for the Economy Northern Ireland; Department of Finance Northern Ireland, Northern Ireland Civil Service (NICS); Ulster University; Queen’s University Belfast; NI Life Science SMEs; Invest NI; general public; media.</p>

Table 8: Recommendation two (continued)



## 7.3 Recommendation three: Increase adoption and use of Dynamic Purchasing Systems (DPS) in healthcare procurement and create accredited suppliers

<b>Recommendation</b>	<b>Increase adoption and use of DPS in healthcare procurement and create accredited suppliers</b>
<b>Overview</b>	<p>DPS is a digital procurement tool used by public sector organisations to procure commonly used goods and services. It allows qualified suppliers to join at any time and compete for individual contracts. A DPS can support SME procurement through increased access to public sector contracts and opportunities. DPS streamlines the procurement process by eliminating repetitive tendering.</p> <p>A healthcare focussed DPS developed to connect HSC Trusts in NI and hospital groups/RHAs in ROI would streamline procurement processes, engaging a pool of pre-qualified suppliers more efficiently as common needs arise. This dedicated DPS would enable hospital groups and Trusts to procure digital health and medtech (up to relevant thresholds) through a more flexible and responsive approach. There is an upfront public investment required to establish the DPS. However once in operation cost is limited to maintenance.</p> <p>Identify and publish the standards required for digital health solutions, create a mechanism for HSE/HSC compliance assessment and approval, resulting in accredited suppliers submitting tenders.</p>
<b>Why it works</b>	<p>DPS allows qualified suppliers to join at any time, providing healthcare organisations with access to a wide range of products from multiple suppliers. Simplified documentation and standardised evaluation criteria enables a more efficient and competitive procurement process creating boundless efficiencies for secondary care. The DPS facilitates collaboration among hospitals within a group by providing a centralised platform for sharing information, pooling resources, and coordinating procurement efforts to address shared national priority needs.</p> <p>Maintain a registry of accredited suppliers that have successfully met the compliance criteria. This registry will serve as a resource for potential buyers looking for compliant digital health solutions.</p>
<b>Implementation</b>	<ul style="list-style-type: none"> <li>• A national needs report identifies specific shared needs and objectives.</li> <li>• The DPS is designed to support the trust/group’s strategic goals, such as promoting local suppliers, innovation, or cost efficiency.</li> <li>• Establish robust qualification criteria for suppliers.</li> <li>• Ensure effective monitoring of supplier performance, adherence to contractual terms, and resolution of any disputes or issues that may arise during the procurement process.</li> <li>• System induction and training for secondary care staff — using the system, evaluating bids, and contract management.</li> <li>• Compliance and governance: Hospital groups/RHAs/Trusts must adhere to relevant procurement regulations, policies, and governance frameworks when implementing a DPS.</li> </ul> <p>Creating an effective mechanism for digital health compliance assessment, accreditation, and tender submission requires collaboration among regulatory bodies, industry experts, and relevant stakeholders.</p>

Table 9: Recommendation three

Continued →

### 7.3 Recommendation three: Increase adoption and use of Dynamic Purchasing Systems (DPS) in healthcare procurement and create accredited suppliers

<b>Socio-economic benefit</b>	<ul style="list-style-type: none"> <li>• Motivates suppliers to continuously update offerings, public sector can access latest technologies and approaches, driving innovation within the sector.</li> <li>• In rapidly evolving situations, DPS allows public sector to quickly engage suppliers and procure critical goods or services to address emerging needs.</li> </ul>
<b>Key stakeholders ROI</b>	<p>HIHI, HSE Clinical, HSE procurement, OGP, DoH, DETE, DPER, secondary care sites, hospital groups/RHAs, eHealth Ireland, ICT secondary care sites, clinical.</p>
<b>Key stakeholders NI</b>	<p>HIRANI, BSO ITS; BSO PaLS; BSO PaLS (IMDU); MOIC; PHA R&amp;D Division; DHCNI; NICON; HSC Trusts; Department of Health Northern Ireland; Department for the Economy Northern Ireland; Department of Finance Northern Ireland, Northern Ireland Civil Service (NICS); Ulster University; Queen’s University Belfast; NI Life Science SMEs; Invest NI; general public; media.</p>

Table 9: Recommendation three (continued)

## 7.4 Recommendation four: Co-develop and publish an education tool for SMEs navigating HSC and HSE

<b>Recommendation</b>	<b>Co-develop and publish an education tool for SMEs navigating HSC and HSE</b>
<b>Overview</b>	Developing an educational tool for SMEs and start-ups navigating secondary care procurement benefits small entities' understanding of a multi-faceted complex process and supports opportunities for success. Each guide could also contain a short section that offers advice to frontline healthcare in terms of the internal process to secure a solution for an identified need. The online tool will be co-developed, user-friendly, accessible and regularly updated to reflect any changes in regulations or best practices.
<b>Why it works</b>	<p>By developing an educational tool, SMEs and start-ups can gain a deeper understanding of the procurement processes, enhance competitiveness and potentially improve their chances of securing contracts.</p> <p>Including a roadmap of internal requirements to secure solutions, illuminates the process for clinical teams who often spot the need and are the first point of engagement for a solution.</p>
<b>Implementation</b>	<p>Local innovation broker convenes and manages the co-design and development of the guide, engaging all stakeholders. Potential inclusion:</p> <ul style="list-style-type: none"> <li>• Procurement process overview: concise overview of secondary care procurement process, including stages, key stakeholders, documentation required.</li> <li>• Regulatory and compliance: relevant standards — healthcare, data privacy regulations and licensing requirements.</li> <li>• Procurement methods: commonly used — tenders, Request For Proposals (RFPs).</li> <li>• Responding to a tender: advice on developing and structuring a compelling proposal.</li> <li>• Supplier qualification: selection assessment criteria.</li> <li>• Internal process: roadmap for clinical personnel</li> </ul>
<b>Socio-economic benefit</b>	<ul style="list-style-type: none"> <li>• Involves collaboration of multiple stakeholders — industry and healthcare providers building relationships.</li> <li>• Nurturing SME and start-up participation and innovation in healthcare creates a sustainable and resilient healthcare ecosystem.</li> </ul>
<b>Key stakeholders ROI</b>	HIHI, HSE Clinical, HSE procurement, Users (companies), secondary care sites, clinical.
<b>Key stakeholders NI</b>	HIRANI, BSO ITS; BSO PaLS; BSO PaLS (IMDU); MOIC; PHA R&D Division; DHCNI; NICON; HSC Trusts; Department of Health Northern Ireland; Department for the Economy Northern Ireland; Department of Finance Northern Ireland, Northern Ireland Civil Service (NICS); Ulster University; Queen's University Belfast; NI Life Science SMEs; Invest NI; general public; media.

Table 10: Recommendation four

## 8 — Conclusion

The overall goal of the AIMS project was to develop a framework to support innovation procurement - increasing procurement opportunities for medtech and digital health indigenous SMEs and start-ups, in healthcare across ROI and NI. An eight-month cross-border collaboration between HIHI and HIRANI delivered this. Largely mirrored in both jurisdictions were challenges within the health systems for both vendors and suppliers. Similarly, solutions to these challenges can be applied broadly across both, as reflected in the framework of recommendations. In some instances, with regulatory support, there could be joint delivery of recommendations such as an all-island DPS, although it is recognised that differing legislative frameworks existing in NI and ROI makes this challenging. Other recommendations, such as protected budget for innovation procurement, will depend on individual state policies. Additionally, the principles of competition North and South must be applied. The HSE and HSC have previously supported cross-border initiatives in healthcare such as Co-operation and Working Together (CAWT) to improve the health and well being of the border populations.

A push centrally through policy systems in both ROI and NI for protected innovation spend in annual allocated healthcare budgets, either nationally or per secondary care site, is the impetus required to move both health systems towards innovation procurement. This report contains multiple examples of European policy systems that allocate and protect budget for innovation procurement and the successes achieved therein. PPI can address key health system aversions through testing thereby minimising perceived SME and start-up engagement risk. By providing a testbed for multiple sites through one pilot, it facilitates purchase of the most suitable solution per system. PPI taps into the potential of the innovation ecosystem in both NI and ROI through co-operation and partnership. In ROI, measuring secondary care providers on innovation procurement, as part of the 'HSE balanced scorecard' performance measure, could track success.

Using procurement strategically to encourage innovation will lead to multiple socio-economic benefits. These benefits can also be realised by reviewing financial threshold requirements for software purchase. Software procurement requires a different focus from traditional procurement, to evaluate features, capabilities and needs' alignment. This will result in access to more flexible, innovative and cost-effective solutions, benefiting health systems, vendors and patients. Equally, DPS offers many advantages that create more efficient, innovative and socially beneficial procurement practices for both the public sector and suppliers. A co-developed education tool that supports SME participation and innovation in the healthcare sector contributes to the development of a sustainable and

resilient healthcare ecosystem. It will inform and fortify approach for vendors that do not have dedicated teams to manage procurement processes.

A vastly different policy landscape in NI and ROI will influence implementation of the recommendations. Support for domestic healthcare SMEs and start-ups in the ROI system will need to be mindful of EU procurement competition rules. The six new Regional Health Authorities present an opportunity to assess the recommendations and consider suitability per region. The HSE is making changes to its procurement processes and has specifically identified working with HIHI in its Corporate Plan 2022-2024. The recommendations of the AIMS report suggest priorities on which to collaborate. HIHI has a well-established national secondary care network in which it is publicly funded to test and develop innovative solutions. However, in NI a ring-fenced public budget is required to mirror this activity. Until this occurs, NI is at a disadvantage in an all-island context. The current policy landscape in NI means that a fragmented ecosystem that could play a crucial role in driving advancements and addressing challenges in healthcare, is unable to flourish. This report will add to a growing body of work in NI to change this.

Changes in UK procurement law, applicable in NI from November 2024, will add a further layer of regulatory divergence between the jurisdictions North and South. An alarming fact common to both NI and ROI is the lack of procurement data that details vendor location and size. This must be comprehensively recorded and published for a complete overview of national healthcare purchase habits. Tracking and publishing healthcare procurement data results in a transparent, accountable and efficient process.

It was beyond the scope of this report to include all of the recommendations made throughout the AIMS project. For instance, there is clearly closer review required of tender writing for innovative products in the medtech and digital health space in ROI - drafting specifications in a way that allows all to compete. Also, interoperability issues and challenges posed by legacy systems remain in both HSE and HSC. Rather, this AIMS report distilled all of the data gathered, the user experiences, the shared challenges of SMEs and start-ups, the solutions proposed from key stakeholder groups and makes four recommendations that offer the most benefit for both supplier and vendor in secondary care procurement across NI and ROI. HIHI and HIRANI will engage with key stakeholders to drive forward the 'All-Island Medtech SMEs Framework of Recommendations for Healthcare Innovation Procurement' to support All-Island medtech and digital health start-ups and SMEs to thrive in their domestic markets.

# 9 — Next Steps

Following publication of this report, next steps in Figure 12 and 13 for HIHI and HIRANI will diverge as dictated by individual jurisdictions. It is expected that the HSC in NI and HSE in ROI will be key enablers of the ‘All-Island Medtech SMEs Framework of Recommendations for Healthcare Innovation Procurement’.

## ROI—

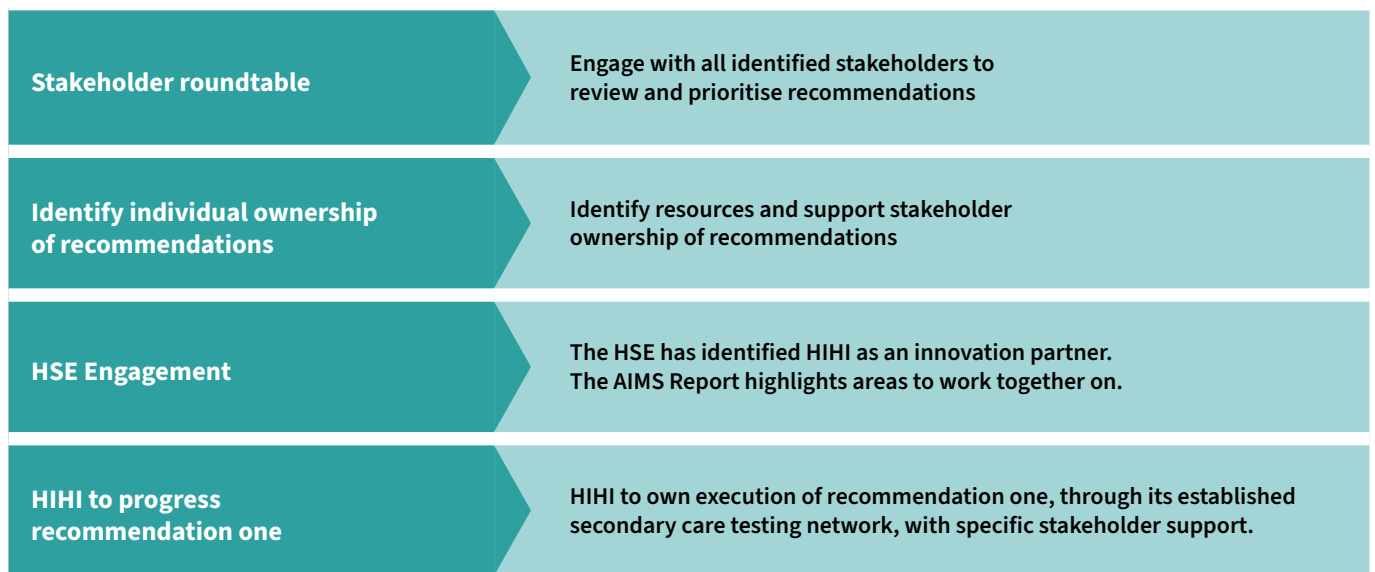


Figure 12: Next steps ROI

## NI—



Figure 13: Next steps NI

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# Appendices

## Appendix one

### Risk assessment

Risk type	Description
<b>1. Technological</b>	Non-completion, under-performance or false performance of the procured good and service.
<b>2. Organisational and societal</b>	Organisational risks are those risks of the procurement failing or under-delivering for organisational reasons. Societal risks are those related to a lack of acceptance and uptake within society.
<b>3. Market</b>	Demand and supply. Demand occurs when innovations in public procurement are also intended for private markets and those markets are not large or responsive enough to justify capacity investment. Supply are those that potentially disrupt or delay operations such as political instability and volatile labour market; potential threats that a competitor will take over a supplier and potentially lock out supplies, risks related to delays and insufficient quality.
<b>4. Financial</b>	Uncertainty in meeting target costs and the ability to secure the funds needed.
<b>5. Turbulence</b>	Difficult to predict and measure, associated with large scale-projects and emerge from a range of unforeseen events that lead various actors in the whole process to reassess their priorities or change their expectations.

(European Commission, 2010)

## Recommendation one: Adopt Public Procurement of Innovative (PPI) Solutions using a two phased multi-supplier framework - risk table

Risk	Mitigation	Likelihood of harm <small>Remote, possible or probable</small>	Severity of harm <small>Minimal, significant or severe</small>	Overall Risk <small>Low, medium or high</small>
<b>1. Technological</b>	With PPI potential supplier shares risk with the public organisation and the procuring body. The PPI phased approach means solutions are deployed and tested prior to purchase.	Possible	Significant	Low
<b>2. Organisational and societal</b>	Identify and mitigate through two-way discussion with relevant stakeholders.	Possible	Minimal	Low
<b>3. Market</b>	Intelligence gathering through supply chain and potential users of new applications. Engage Innovation Broker to assess market and opportunities, what is currently on offer and what the market could deliver for the public buyer	Remote	Minimal	Low
<b>4. Financial</b>	Address through internal cost calculations, volatility and potential cost overruns in a secured budget. The PPI phased approach means solutions are deployed and tested prior to purchase.	Remote	Significant	Low
<b>5. Turbulence</b>	Apply brainstorming or analysis tools to identify and monitor.	Remote	Minimal	Low

## Recommendation two: Review and modify traditional procurement requirements for software purchase - risk table

Risk	Mitigation	Likelihood of harm Remote, possible or probable	Severity of harm Minimal, significant or severe	Overall Risk Low, medium or high
<b>1. Technological</b>	Focus on vendor due diligence, cybersecurity measures, data protection, regulatory compliance and usage rights.	Possible	Significant	Low
<b>2. Organisational and societal</b>	Include users and experts in user acceptance testing.	Possible	Minimal	Low
<b>3. Market</b>	Partner with innovation broker for market assessment and/or pilot	Remote	Minimal	Low
<b>4. Financial</b>	<p>Considering factors such as functionality, scalability, compatibility, and vendor reputation.</p> <p>Cost-benefit analysis - upfront costs, ongoing expenses, and potential returns.</p> <p>Contract terms - pricing, support, and maintenance fees, as well as exit clauses and warranties.</p> <p>Engage innovation broker for pilots to evaluate the software's suitability before committing to a full purchase.</p>	Remote	Significant	Low
<b>5. Turbulence</b>	Apply brainstorming or analysis tools to identify and monitor.	Remote	Minimal	Low

## Recommendation three: Evaluate and increase use of Dynamic Purchasing Systems - risk table

Risk	Mitigation	Likelihood of harm Remote, possible or probable	Severity of harm Minimal, significant or severe	Overall Risk Low, medium or high
<b>1. Technological</b>	Complete assessment of the DPS technical specifications, security measures, compatibility and reliability before implementation. Implement strong cybersecurity measures, such as data encryption, access controls, regular vulnerability assessments and staff awareness training.	Possible	Severe	Medium
<b>2. Organisational and societal</b>	Engaging a wide group from procurement officers, clinicians, IT teams, and finance departments, to ensure that a system aligns with their needs and addresses any concerns or challenges they may have.	Remote	Significant	Low
<b>3. Market</b>	Monitor and evaluate the performance and outcomes of DPS implementation in healthcare. Collect feedback from both buyers and suppliers.	Remote	Significant	Low
<b>4. Financial</b>	Consider both upfront and ongoing costs. Implement effective supplier performance monitoring. Conduct regular market assessments to ensure an adequate pool of qualified suppliers. Regular group review of system performance.	Remote	Minimal	Low
<b>5. Turbulence</b>	Apply brainstorming or analysis tools to identify and monitor.	Remote	Minimal	Low

## Recommendation four: Co-develop an education tool for SMEs navigating HSC and HSE - risk table

Risk	Mitigation	Likelihood of harm <small>Remote, possible or probable</small>	Severity of harm <small>Minimal, significant or severe</small>	Overall Risk <small>Low, medium or high</small>
<b>1. Technological</b>	Ensure content is up to date.	Remote	Minimal	Low
<b>2. Organisational and societal</b>	Engage users to co-develop.	Remote	Minimal	Low
<b>3. Market</b>	Collect feedback form stakeholders in annual review.	Remote	Minimal	Low
<b>4. Financial</b>	Upfront design cost. Maintenance managed by innovation broker.	Remote	Minimal	Low
<b>5. Turbulence</b>	Apply brainstorming or analysis tools to identify and monitor.	Remote	Minimal	Low

## Appendix two

### Advisory group members

Organisation	Representative
<b>Belfast HSC Trust PHA R&amp;D Division</b>	Julie McCullough Barry Henderson
<b>Health Service Executive (HSE) Procurement</b>	Peter McGowan
<b>eHealth Ireland</b>	Alexander Mason
<b>Business Services Organisation (BSO) Procurement and Logistics Services (PaLS)</b>	Angela McCormick
<b>Belfast HSC Trust</b>	David Jennings
<b>ROI clinical</b>	Noel Murphy
<b>BSO Information Technology Services (ITS)</b>	Stephen Beattie
<b>Digital Health and Care Northern Ireland (DHCNI)</b>	Dr Austin Tanney
<b>InterTradelreland</b>	Grant Gilmore

## Appendix three

### Companies— Workshops one and two

Organisation	Representative
<b>Informed Minds App</b>	Sinead Welsh
<b>Digital Care Systems</b>	Dr Alexander Davey
<b>Trimedika Ltd</b>	Julie Brien
<b>Connected Health</b>	Rachel Brammer
<b>PILLPACPLUS Ltd</b>	Gillian Gracey Stephen Burns
<b>NorthWest Medical</b>	Ciaran Doherty
<b>Kinsetu Ltd</b>	Joanne O'Doherty Ken Moran
<b>Cirdan Ltd</b>	John McCaffrey
<b>Clonallon Laboratories Ltd</b>	Dermot Dempster
<b>Respiratory Analytics Ltd</b>	Dr Susan Kelly
<b>MedModus</b>	Déaglán MagFhloinn
<b>Syncrophi Systems Ltd</b>	David Toohey
<b>Zendra Health</b>	Thomas Coleman David Coleman
<b>Wellola</b>	Sonia Neary
<b>Isaac Care</b>	Lauren Byrne John Joy
<b>Halocare Group</b>	Paula Trainor
<b>Yellow Schedule</b>	Martina Skelly
<b>xWave Technology</b>	Mitchell O'Gorman



## Appendix four

### Stakeholder organisations – Workshop two

Organisation	Sector	Representative
<b>HIRANI</b>	Life and health sciences	Dr Siobhan McGrath Rebecca Smyth
<b>HIHI</b>	Life and health sciences	Eimear Galvin Jonathan Moran
<b>DETE</b>	Policy	Alan Kelly
<b>InterTradeIreland</b>	Business development	Joanne McEvoy Leona Kinahan
<b>Enterprise Ireland</b>	Investment	Gavin O'Connell
<b>Health Service Executive</b>	Healthcare procurement	Grace Cooney
<b>Health and Social Care BSO PaLS</b>	Innovation	Rachael Adams
<b>Medicines Optimisation Innovation Centre (MOIC)</b>	Medicines optimisation	Dr Glenda Fleming

# Appendix five

## Abbreviations

All-Island Medtech Small and medium-sized enterprises (AIMS)	Irish Platform for Patient Organisations, Science and Industry (IPPOSI)
Business in the Community (BIC)	In Vitro Diagnostics (IVD)
Business Services Organisation Procurement and Logistics Services (BSO PaLS)	Key Performance Indicators (KPIs)
BSO Information Technology Services (BSO ITS)	Local Enterprise Offices (LEOs)
Community Health Organisations (CHOs)	Medicines Optimisation Innovation Centre (MOIC)
Construction Procurement Delivery (CPD)	Munster Technological University (MTU)
Department for the Economy (DfE)	National Health Service (NHS)
Department of Enterprise, Trade and Employment (DETE)	National University of Ireland, Galway (NUIG)
Department of Finance (DoF)	Northern Ireland (NI)
Department of Health (DoH)	Northern Ireland Civil Service (NICS)
Department of Public Expenditure and Reform (DPER)	Northern Ireland Confederation of Health and Social Care (NICON)
Digital Health and Care Northern Ireland (DHCNI)	Office Chief Clinical Information Officer (OCIO)
Dynamic Purchasing Systems (DPS)	Office of Government Procurement (OGP)
Electronic Health Records (EHR)	Pre-Commercial Procurement (PCP)
Enterprise Ireland (EI)	Procurement Guidance Notes (PGNs)
European Union (EU)	Prior Information Notice (PIN)
Gross Domestic Product (GDP)	Public Health Agency (PHA)
Health and Social Care (HSC)	Public Procurement Gateway (PPG)
Health Information and Quality Authority (HQIA)	Public Procurement Innovation (PPI)
Health Innovation Hub Ireland (HIHI)	Public Procurement of Innovative (PPI) solutions
Health Innovation Procurement (HIP)	Queen's University Belfast (QUB)
Health Innovation Research Alliance Northern Ireland (HIRANI)	Regional Health Authority (RHA)
Health Research Board (HSB)	Republic of Ireland (ROI)
Health Service Executive (HSE)	Request For Proposals (RFP)
Health Management Institute (HMI)	Research and Development (R&D)
Health Regulatory Authority (HRA)	Science Foundation Ireland (SFI)
HSC Research & Development Division (HSC R&D)	Service Level Agreements (SLAs)
Irish Medical Surgical & Trade Association (IMSTA)	Small and medium-sized enterprises (SMEs)
The Innovation and Market Development Unit (IMDU)	Small and medium-sized enterprises Advisory Group (SME AG)
Industrial Development Agency (IDA)	Software as a Medical Device (SaaSMD)
Information and Communication Technology (ICT)	Software as a Service (SaaS)
Information Technology (IT)	Trinity College Dublin (TCD)
Intensive Care Units (ICU)	United Kingdom (UK)
Internet of Things (IoT)	Ulster University (UU)
InterTradeIreland (ITL)	University College Cork (UCC)
Invest Northern Ireland (Invest NI)	
Irish Business and Employers Confederation (IBEC)	