

Department of Health

Input to considerations for a new Strategy for Science, Technology & Innovation (SST&I)

This document reflects and expands on input already provided by the Department to the SST&I consultation documentation and inputs and presentations at IDC meetings.

1 Introduction

The Department of Health's role is to provide leadership and policy direction for the health sector to improve health outcomes; deliver governance and performance oversight to ensure accountable and high quality services; collaborate to achieve health priorities and contribute to wider social and economic goals; and to support an organisational environment where high performance is achieved and the knowledge and skills of staff are developed.

To appreciate what the health system's requirements of Science, Technology & Innovation (ST&I) are and how the health system and its work can contribute to the wider ST&I agenda, it is important to note the many reforms and initiatives underway in the system and the challenges (and opportunities) facing the system and people's health. The *Future Health* strategic framework¹ and the Minister's announced priorities for 2015-2017² are key in this regard.

Challenges for the health and social care system include Ireland's high birth rate, an ageing population, increases in chronic disease and unhealthy lifestyle factors including tobacco, alcohol and obesity. There is also greater demand for access to high quality healthcare due to the many positive aspects of living in an advanced society – citizens are living longer, they are more educated with more information available than ever before and they have, therefore, greater expectations with regard to access to modern advances in health products and services. This is a challenge for the health system in terms of the level of resources required to maintain and improve patient health. This impacts on the state's resources where currently health is 25% of overall voted current exchequer spending.

The mandate of the Department of Health shapes the research and innovation that it needs and supports. The Department recognises that there is significant potential for collaboration on issues that can bring benefit to health as well as to other sectors (including enterprise) by virtue of this support. For example, industry is increasingly looking to the health system to test the effectiveness of new products and to purchase goods and services; the health system can look to industry to find potential solutions for problems it faces. Where collaboration is already underway or indeed where there's potential it has been highlighted in the following sections of this document.

The Department of Health welcomes the opportunity, with the IDC, to consider the scope and vision for a new Strategy. It considers that the new national strategy for science, technology and innovation must set an ambition into the future (not just the medium term) which supports a whole-of-society and therefore a whole-of-government approach. It is imperative that Ireland examines and facilitates the multifaceted and yet inter-related issues concerning modern society. It is acknowledged that the needs of enterprise are important given that they produce much-needed jobs to generate economic growth and prosperity. They must be considered alongside other societal challenges including education, housing, environment, food quality and security, health etc. and what these issues require in terms of science, technology and innovation. This is

¹ <http://health.gov.ie/blog/publications/future-health-a-strategic-framework-for-reform-of-the-health-service-2012-2015/>

² <http://health.gov.ie/blog/press-release/varadkar-lynch-publish-health-priorities-for-2015/>

not, however, to diminish the requirement for excellent, relevant and responsible research and innovation - it is clear that in all strands of ST&I investment these aspects must be to the fore.

The Department of Health recently proposed to the IDC a vision for “*an ST&I system that nurtures and harnesses excellent research to benefit Irish society – economically and socially*”.

2. Investing in Health – and in health research

National and international evidence shows that health is an economic good in its own right and is a key factor in employment, earnings, productivity, economic development and growth. The health status of individuals strongly influences their labour market participation. Early labour market exit is often the result of health-related problems; certain medical conditions and unhealthy lifestyle factors are associated with reduced on-the-job productivity; poor health leads to absenteeism.³ It is possible to boost economic growth by improving the health status of the population and enabling people to remain active and in better health for longer. Access to quality health care is a constituent part of the maintenance of a productive workforce and an integral part of the flexicurity setup⁴.

The health service is a significant contributor to the economy through employment, both directly and indirectly. It is a significant purchase of goods and services. It is, however, a demand-led sector, one from which every citizen expects the highest level of service and care. The reforms underway and the challenges facing citizens’ health clearly point to the health research and innovation areas needed by the Irish health system. The quality of healthcare is also important in terms of considerations in attracting the best and brightest to work in Ireland. Healthcare (availability and quality) is one of the main categories considered in liveability rankings.

Health Research

Knowledge derived from research is paramount in providing the evidence-base for better health policies and systems; systems that underpin effective and efficient health service provision. Such evidence will be a key input to the creation of the fairer, more efficient health system.

Health research spans the spectrum of activity from biomedical research, life sciences and emerging technologies, through clinical research and on to population health sciences and health services research. Health research involves many actors including academic researchers, healthcare professionals, the education sector, industry and charitable groups, among others.

The improved health of Ireland’s citizens is at the heart of what it is that the Department of Health wishes to achieve through research and innovation. While health research is conducted throughout the health system with engagement from various stakeholders, the HRB is the statutory body under the aegis of the Department with responsibility for supporting and funding health research. It is acknowledged too that other Government funding agencies also play an important role in the wider health research and innovation agenda.

The Health Research Action Plan and the Health Research Board’s Strategic Plan 2010 – 2014 continue to guide actions in health research in recent years. The Department is committed to further progressing this agenda and is planning to strengthen its links with academic and enterprise sectors for health and economic outcomes.

³ See http://ec.europa.eu/health/strategy/docs/swd_investing_in_health.pdf ‘Investing in Health’, an EU Commission staff working document published as part of the Social Investment package for growth and cohesion (2013)

⁴ See Towards a job rich recovery, COM (2012) 173 final, notably “Open, dynamic and inclusive labour markets”, SWD(2012) 97 final referenced in ‘Investing in Health’

3 Key Strategies and Initiatives underway – that inform research and innovation requirements

Future Health

In 2012 the Government published *Future Health* outlining how it would reform the health system across 4 strands – health and wellbeing, structural reform, services reform, and financial reform. The aim is to achieve a sustainable health and social care system that ensures access to high quality services based on need, not income. Arising from *Future Health* the Department is progressing an ambitious reform programme. The programme involves moving towards a health service that provides access to care based on need rather than income, underpinned by a constant focus on health and well-being, a stronger primary care sector, a restructured health sector, and a more integrated social care sector, as well as a more transparent money follows the patient system of funding (activity based funding) supported ultimately by universal health insurance.

Minister's Priorities

In February 2015 the Minister for Health published a list of priorities for the period 2015-2017. The priorities provide a clear direction for the development of health services and health policy, identifying clear priorities and a targeted plan against which progress can be measured. The priorities focus on six main areas –

- drive the healthy Ireland agenda,
- deliver improved patient outcomes,
- reform operational systems to deliver better outcomes,
- implement agreed steps towards universal healthcare,
- introduce innovative funding models,
- modernise health facilities and ICT infrastructure.

The Minister's priorities point to some of the health research and innovation needs in terms of policy and /or practice. They are indicative of the areas which will either require support from or contribute to the ST&I agenda and include -

- Health and Wellbeing – 'Healthy Ireland' is the Government's national framework for action to improve the health and wellbeing of the people of Ireland. This initiative encompasses many strands and policies which require evidence-based strategies. A research, data and innovation workstream and an outcomes framework to monitor progress is part of the approach being taken.
- Improved Patient Outcomes – The HSE has identified five key priority areas against which Integrated Care Programmes will be developed – older persons, children's health, maternal health, chronic disease and patient flow – with the aim of improving outcomes for patients and providing access to better, more integrated care outside the hospital setting. In addition, there are over 30 National Clinical Programmes aimed at improving processes, while reducing mortality and morbidity. National Clinical Guidelines (concerned with patient safety and clinical effectiveness) will be quality assured by the National Clinical Effectiveness Committee. Clinical effectiveness uses research evidence to improve clinical decision making and reduce variation in practice.
- Modernise health facilities and ICT infrastructure – a key initiative in this regard is the Department's eHealth Strategy, the implementation of which will be a critical enabler of best practice health systems and optimum healthcare delivery. A new Chief Information Officer has now been appointed in the HSE and will drive this ICT initiative forward. This agenda will have research, data and innovation needs which have the potential to provide significant enterprise opportunity. A critical enabler in the implementation of the eHealth Strategy will be the establishment of an eHealth Ireland Board and an Irish eHealth ecosystem to promote the agenda. The publication and enactment of the Health

Information Bill is also an action under this priority (see 4B below).

- Reform Operational Systems – this includes the establishment of Hospital Groups and the reorganisation of community services into Community Health Organisations. A key aspect of the structure of the Hospital Groups is that each has a primary academic partner to integrate and embed education, training, research and innovation in the acute hospital service.

The HRB, through its various research funding programmes, is supporting patient oriented research, population health research and health services research. It also manages five national health information systems and supports the Department in conducting certain evidence reviews to support policy making in areas identified by the Department (thus progressing some of the initiatives outlined above).

The HRB produces an annual summary of the outcomes and impacts of its research (Picture of Health) and a biannual analysis report on its outputs, outcomes and impacts (both publication types are available on the HRB website www.hrb.ie). It should be noted that the HRB is currently preparing its next Strategic Plan for the period 2015-2020.

4. Shaping a Successor to the SST&I 2006-2013

Advanced countries increasingly use their RD&I base to progress their economic, health, educational, agricultural, environmental and related objectives. A broad-based national RD&I policy is required in order for Ireland to develop as a 21st century knowledge-based society, one where innovation is successfully adopted. The Department of Health would like to ensure that any new national strategy for science, technology and innovation is one which supports a whole of society, whole of government approach. It is clear that for many of the challenges facing Irish society multi-disciplinary and multi-sectoral approaches are needed.

The Department of Health considers that the five themes/objectives would provide a balanced approach to the economic and social agendas:

- A. Investment in excellent research
- B. An enabling environment for research
 - i. Building capacity and leadership
 - ii. Creating and sustaining the infrastructure to support research
- C. Supporting Government objectives and challenges – jobs, enterprise, health, education, agriculture, environment, etc.
- D. Generate new knowledge / innovate to address society's needs (economic and social)
- E. Learn and collaborate in an international research environment.

4A *Investment in excellent research*

This objective relates to the rationale for investment, and investment in excellent research. It must, however, take a holistic approach with economic and societal benefits being supported. The Department of Health would like to see a balanced research portfolio across the sectors – for short, medium, and long-term returns. Health research may not necessarily result in direct economic dividend in the short term but its health and economic impacts are well documented.

The identification of research needs must take place across the breadth of Government activity and must support a holistic ST&I ecosystem. Given the economic crisis that Ireland underwent in recent years it is understandable that jobs and enterprise received specific attention. While the report of the Research Prioritisation Steering Group recognised the critical importance of

research for policy and research for knowledge, it clarified that it deliberately focused on the portion of investment that was concerned with research oriented to the Irish enterprise base.⁵ The Department of Health's response was to identify areas of work it or its agencies supported in research and innovation that interfaced with the enterprise agenda for inclusion in the resulting action plans for the 14 priority areas e.g. the Health Identifiers Act, the Health Information Bill, eHealth (including the eHealth Strategy), developing the network of CRFs, a national biobanking structure, the Health Innovation Hub. While these initiatives are pursued by the Department of Health primarily for health purposes it is recognised that they also provide certain supports and services to the enterprise and jobs agendas.

An analysis of HRB-funded research outputs and outcomes (guided by the Buxton-Hanney Payback framework for health research) highlights the breadth of impact across the health and wider economic system⁶. The key output statistics for grants ending in 2012/2013 are set out in the table below.

Key output statistics for grants ending in 2012/2013

IMPACT CATEGORY*	2012/2013 (N=134 grants)
Value of investment	€44 million
1. Knowledge production outputs	
No. peer-reviewed journal publications	584
% papers in high impact journals	N/A
No. scientific presentations reported	940
2. Research capacity-building outputs	
No. of research-related posts created	422
No. health professionals trained	136
No. PhDs registered	135
No. new research collaborations formed	287
No. new research materials/methods developed	112
3. Informing policy, practice and public	
% grants reporting policy/practice outputs	38 %
No. policy/practice outputs and activities	127
% grants that disseminated to public	50 %
4. Health sector innovations	
% grants reporting healthcare innovations	24.6 %
No. healthcare innovations in development	43
5. Economic and commercial activity	
No. research grants leveraged	149
Value of leveraged funding	€39.5 million
Amount leveraged per Euro of HRB investment	€0.89
No. patents filed or pending	16
No. technologies licenced	5
No. start-up companies incorporated or pending	2
No. industrial collaborations established	88

While the results of the independent review of the NRPE are yet to be finalised, the Department of Health understands from the presentation made by DJEI to PAG on its view of the initial findings emerging from the international panel that certain recommendations may be made pertaining to areas of research and innovation that fall outside the 14 priority areas (which were

⁵ Report of the Research Prioritisation Steering Group 2011 (page 13)

⁶ Outputs and outcomes of HRB awards completed in 2012 and 2013; MHiney and BCurran, 2014

not part of the international panels terms of reference). The Department of Health looks forward to receiving the report for detailed consideration and response.

4B *An enabling environment for research.*

It is clear that different sectors may offer or alternatively require different supports with regard to ST&I. These supports range from incentives to business, IP and tax frameworks, support for inter-sectoral collaborations, etc.

Human capital is central to Ireland's ST&I efforts; people are the engine of the Irish research ecosystem. Health research needs the talent and expertise of a wide range of professionals (clinicians and non-clinicians) and at many different levels, from PhD students through post-doctoral fellows, investigators and research leaders. We need to support research in academic, policy and clinical environments, investing in training and career development which ensures that research is integrated into practice and policy, thus improving healthcare decision making and health outcomes. Health research needs clinical investigators, health professionals, scientists, methodologists, epidemiologists, biostatisticians, health economists, health-related social scientists and many other disciplines. The scale and the range of skills and expertise required put the development of human capital for health research beyond the scope of any one agency. In practice, training and career development in health research is a shared responsibility between all relevant stakeholders and requires input from the higher education system, the HSE and relevant professional training bodies.

Building human capital in the health sphere is not just about creating jobs, or making graduates enterprise ready, it is also about creating absorptive capacity to translate research knowledge for health system improvement. Therefore a fundamental driver for HRB investment is to create skilled people capable of generating, understanding and applying research evidence to address the service delivery and policy needs of the Irish health system. The HRB invests at all stages of the career pathway in a broad range of health and social scientists (including laboratory sciences, management sciences, behavioural sciences, economics, mathematics and statistics, informatics, geography, ethnology) and health care professionals (doctors, dentists, nurses and allied health professionals). Research partnerships brokered between healthcare companies and healthcare providers can assist the health system in accelerating progress in key areas such as health/business intelligence, ICT and e-health, process improvement and resources management.

The HRB, supported by the Department of Health, is also establishing clinical research facilities and providing a collaborative framework to link them. The aim is to speed up the translation of scientific advances into benefits for healthcare and the economy. Situated on the campuses of academic hospitals, they position health research centrally within the patient care environment. It is envisaged that the network, an integral element of a vibrant health research system, will support an increased number of high quality patient-oriented studies and trials (commercial and investigator-led). Another important initiative is the development of a biobanking system, an initiative which enterprise agencies had requested be prioritised (it is now an APJ Action and is included in relevant Research Prioritisation Action Plans).

The Department of Health continues to work with DJEI to progress the development of the National Health Innovation Hub. The aim is to a) facilitate enterprise develop and commercialise new healthcare technologies, products and services by giving them appropriate access to the health service to validate and refine products; b) facilitate the health system to find efficiencies and improvements by engaging with innovative companies creating solutions to problems (reducing cost, increasing service efficiency, improving patient outcomes, etc.); and c) support innovative developments emerging from within the health system.

Another aspect of ST&I infrastructure that cannot be overlooked is the significance of the regulatory and legislative environment in which various sectors operate. There are, for example,

a number of important legislative dossiers progressed by the Department of Health which have health matters as their primary focus but which either provide opportunities for, or supports to, the ST&I agenda. These include work that is ongoing with regard to EU legislation in the area of clinical trials and medical devices. The Health Identifiers Act 2014 provides for unique health identifiers for (a) individuals and (b) health practitioners and health organisations. The identifiers project is not only a patient safety initiative; it's also an essential underpinning of the eHealth agenda (an agenda which provides significant potential for industry). The Health Information Bill is being developed to include provision for a new streamlined national research ethics framework for health research (other than health research already governed by national or EU legislation). The new framework will also allow for a data protection consent exemption in certain defined cases.

4C *Supporting Government objectives and challenges*

This theme addresses the many different requirements that might be placed on an ST&I ecosystem by the different sectors i.e. jobs and enterprise, health, education, agriculture, environment, housing, etc.

The objectives and challenges of the health system and the Department of Health in particular are articulated earlier in this document.

Health research provides the evidence to address key challenges in society such as increasing chronic disease, the ageing population, and lifestyle risk factors. The Irish healthcare system has a growing need for timely and relevant, high quality research, information and evidence to inform health delivery, public health policy and clinical decision making. Such research programmes are concerned with evaluating the effectiveness, equity and appropriateness of healthcare interventions in real world settings. It is also about developing the knowledge base needed to adopt and implement evidence-informed interventions, policies, technologies and guidelines for optimal impact. There is a national imperative to support not just evaluative research but also *implementation science* and quality improvement research where scientific methods are used to adapt, adopt and integrate evidence based knowledge into the Irish health system.

4D *Generate new knowledge / innovate to address society's needs (economic and social)*

Important innovations and creating new knowledge that advance our understanding of societal challenges come about through the passion for discovery by high functioning research teams and individuals. Innovative, internationally competitive research provides us with the knowledge needed to address these challenges. It helps Ireland and Irish researchers to become recognised as world leaders in specific areas of research.

In health it helps us to understand better how to maintain and promote health and well-being, how to prevent or treat illness and how best to organise our health system. Research is needed to understand the link between health and environment, to address the increasing incidence of chronic and infectious diseases, and to deal with the impact on society and individuals of an aging population and lifestyle risk factors. In utilising research-led preventative strategies and deployment of services, bringing the latest treatments to patients, developing new models of care, and improving the efficiency and effectiveness of health care delivery, health research can improve the quality of our health services and the quality of life of many in our society. Health research will be central to achieving the reform of the Irish health system over the coming years, since transformation of the way in which healthcare is delivered, managed and financed will require high quality clinical, population health and health services research.

Innovative health research brings with it a proportionate economic potential. Advances in biomedical and clinical sciences have made substantial contributions to the healthcare industry worldwide. They offer unprecedented opportunities to develop new tools, prototypes, and marketable products, processes, and services for the healthcare system. Healthcare is one of the most sophisticated and challenging service industries. Research partnerships brokered between healthcare companies and healthcare providers can assist the health system in accelerating progress in key areas such as health/business intelligence, ICT and e-health, process improvement and resources management.

4E Learn and collaborate in an international research environment.

Irish research exists in both a national and international context. The Government is committed to promoting international collaboration and supporting the priorities of the European Research Area. In addition, Horizon 2020 (H2020) and other EU funding programmes offer opportunities for the health research community in Ireland to work with peers in other Member States and derive the benefits of collaborative research.

In the area of health, many of the challenges are global, and the scale of these challenges will require collaboration of researchers across disciplines and borders. The H2020 Programme is itself taking a challenge-based approach (health, demographic change and wellbeing being one of the challenge areas identified).

As stated in the ST&I consultation documentation Ireland has been very successful in the area of Health in FP7 with above average success rates for EU member States (between 2007 and 2013 €80m was awarded to Irish health researchers involved in 111 EU projects).

Opportunities for ST&I collaboration could be explored with NI and the UK with support from appropriate EU instruments (for example INTERREG).

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