



HEALTH RESEARCH BOARD

**Submission to the Interdepartmental Committee on
Science, Technology and Innovation**

**On as successor to the Strategy for Science, Technology and
Innovation**

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Table of Contents

Executive summary	3
1. The basis of a research system in Ireland	4
1.1 The SST&I should support broader government agendas	4
1.2 The SST&I should be linked to European research agendas	4
2. Ambitions of a successor SST&I	5
3. The importance of health research within the broader ST&I Strategy	5
3.1 Health research is a good example of a field that is relevant to both Irish society and its economy	5
Delivering economic benefit to the exchequer	6
Translating research evidence into innovative products and clinical practices.....	6
Creating a healthy Irish society	6
Supporting delivery of the Programme for Government.....	7
3.2 Health research is an enabler of health system reform	7
3.3 Human capital is a key component of the health research system	8
3.4 Health research requires a coherent research infrastructure to thrive.....	8
4. Conclusion.....	8

Executive summary

This submission represents the Health Research Board's views on the development of a successor to the Strategy for Science, Technology and Innovation in Ireland. These views are based on our knowledge of health research in Ireland; its linkage to the strategic needs for transformation of the Irish health and social care system; and the advancement of the health of the Irish population.

We welcome the timely development of this strategy. All comments below are designed to contribute in a constructive manner to ensuring that the successor ST&I Strategy has real utility and value for Ireland and its citizens, and can provide the health research community with a robust framework within which to focus their efforts.

The key points for consideration in our submission are:

1. Ireland needs to take a holistic approach to building a strong research, development and innovation (RD&I) ecosystem over the coming years. In line with OECD thinking on System Innovation, the Strategy should include not just STEM areas but recognise the importance of humanities and social sciences research within this ecosystem.
2. The Strategy needs to support a balanced portfolio of research activity, from basic research right across the spectrum to implementation, thereby ensuring both *translation for now* of existing innovations as well as *translation for the future* of new and emerging ideas, so that innovation gaps do not develop.
3. As an enabler of a national RD&I system the Strategy must support the differing mandates of all Irish Government Departments. As currently set out, the Background Consultation Paper does not give enough weight to the important non-enterprise related policy and practice goals of many departments. There needs to be explicit acknowledgement of the important societal benefits of this type of research and more substantive support for policy and practice goals, not just as they relate to enterprise.
4. The Strategy must recognise, support and measure the societal impacts of research as well as its enterprise impacts, in evaluating whether the successor ST&I is working for society and the economy.
5. Meeting Ireland's health needs will require substantially increased innovation in clinical and population health practices, and health service design and delivery, underpinned by broad-based RD&I that results in better health outcomes for everyone.
6. It is vital that the Strategy supports and sustains the development of human capital, across all stages of the career path, since it is not possible to have a national system of innovation without the people to support it.
7. The Strategy should look to retain, sustain and further develop the enabling research infrastructures we have built up over the past 10 years, including: networking of clinical research facilities, technologies and personnel; a supportive environment for clinical researchers; a co-coordinated approach to study development and portfolios; and an increased number of high quality patient-oriented interventions and trials.
8. The Strategy should facilitate whole-of-Government, joined-up, cross-sectoral, multidisciplinary approaches to research, with connectivity across industry and between primary, secondary and tertiary healthcare, as well as other sectors.
9. The Strategy should clearly support better connection of Ireland's RD&I system with the European agenda. This will increase Ireland's international visibility as a centre for RD&I, make greater use of instruments, initiatives and platforms of cross-border cooperation in the European Research Area, facilitate access to research infrastructures and encourage greater mobility of people.

1. The basis of a research system in Ireland

Ireland has, over the last 15 years built a solid research base across the medical and life sciences, engineering and technology, and the humanities and social sciences, based primarily in the higher education sector. Many sectors of importance to Irish society are now benefiting from this effort, including enterprise, health, environment, education, agriculture and the marine.

Evaluation of the outcomes and impacts of HRB-funded research across its funding portfolio, going back to 2000, demonstrates clearly that some metrics of scientific ‘productivity’, e.g. high impact peer reviewed publications and commercialisation outputs, are more numerous in the basic and applied biomedical sciences and clinical sciences than in other areas. This suggests that an unbalanced national research portfolio that is more biased towards application than creation of ideas may directly impact not just the pipeline of innovation for future translation, but somewhat ironically, decrease the level of key metrics that will be used to measure the success of a successor ST&I strategy.

All innovations, be they technological or societal, arise from a strong research base. Therefore, the components of a strong research system in Ireland comprise:

- i. Skilled people capable of generating and applying new knowledge, in the academic, clinical, enterprise and other sectors
- ii. Research funding support across the full range of scientific activity from the most basic to the most applied. As shown by RD&I leading countries such as Sweden, Denmark, Germany and Finland, any country serious about a science strategy openly and unapologetically provides some support for basic science as part of the pipeline for more applied research.
- iii. Appropriate research infrastructures (facilities, equipment, IP management, research governance, technical support and so on) to enable existing and future needs for supporting/enabling infrastructure across all mandates (economic, health, education, environment, agriculture etc.)

1.1 The ST&I Strategy should support broader government agendas

A successor ST&I Strategy should aim to capitalise on what we have built up and look to retain, sustain and further develop the whole national research ecosystem for the benefit of all Irish citizens. Therefore, it is vital that a successor ST&I Strategy supports the differing objectives of all Irish Government Departments and their funding agencies. To this end a balance must be sought between the needs of research that addresses societal and regulatory challenges (which in some cases have wider economic impacts such as a healthier workforce), and research that directly addresses economic challenges. As currently set out, the Background Consultation Paper does not give enough weight to the important non-enterprise related policy and practice goals of many departments and agencies. There needs to be explicit acknowledgement of the important societal benefits of research in health and social care, education and environment, and more substantive support for these objectives, not just as they relate to enterprise.

1.2 The ST&I Strategy should be linked to European research agendas

It will be important that the successor SST&I supports Ireland’s strategy for international engagement and how we might balance EU level priorities and national priorities. In view of the limits to national public funding and capacity, international cooperation and coordination of research is vitally important to Ireland particularly when it comes to tackling major societal challenges such as health, wellbeing and demographic change. No single nation can master these challenges on its own.

Ireland has had great success under the EU Research Framework 7 Programme 2007-2013 (FP7), particularly in Health where €80 million funding was awarded to Irish researchers. Horizon 2020 is an opportunity to further deepen our engagement in collaborative European and international research. A goal of the new strategy should be to better connect Ireland's RD&I system within the EU. This should serve to increase Ireland's international visibility as a centre for RD&I, to make greater use of instruments, initiatives and platforms of cross-border cooperation in the European Research Area, to facilitate access to research infrastructures and to encourage greater mobility of people.

2. Ambitions of a successor SST&I

As written, the Background Consultation Paper describes an overly narrow scope for a national RD&I system, excessively weighted towards economic objectives within STEM disciplines. Advanced countries increasingly use their RD&I base to progress their economic, health, educational, agricultural, environmental and related objectives. Restricting the ambition of a successor ST&I Strategy would prevent Ireland from achieving its national objectives across all sectors.

In line with OECD thinking on System Innovation, the Strategy should include not just STEM areas with an enterprise focus but recognise the important contribution of the humanities and social sciences (HSS) to developing a 21st century Knowledge-based Society, tackling significant societal challenges in health, the environment, education and so on. For example, many evidence-based products/services designed to meet healthcare needs have less impact than anticipated due to issues such as relevance, usability, accessibility, feasibility, timeliness, quality, behaviours, compliance, skill-mix and cost/financing. Embedding HSS disciplines in the continuum of public and private health research investment ensures that new products, services and technologies get adopted and implemented in a manner where they create public value as well as private gain.

3. The importance of health research within the broader ST&I Strategy

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.

3.1 Health research is a good example of a field that is relevant to both Irish society and its economy

Investment in health research has many impacts, be they economic, societal and/or enterprise-related. This investment creates opportunities for engagement with Irish and international private enterprises in areas such as services science, e-health and assisted living technologies. It delivers economic benefits to the exchequer through direct and indirect savings and reallocation of resources within the health system. It underpins economic growth through a healthier workforce and by providing hi-tech employment opportunities. It creates an attractive environment for R&D investment by pharmaceutical, medical devices and biotechnology industries. Internationally, macroeconomic analyses have found very high returns on investment in health research (see for example^{1,2}).

¹ Glover M, Buxton M, Guthrie S, Hanney S, Pollitt A and Grant J (2014) *Estimating the returns to UK publicly funded cancer-related research in terms of the net value of improved health outcomes*. BMC Medicine Open Access Journal <http://www.biomedcentral.com/1741-7015/12/99>

Delivering economic benefit to the exchequer

The increasing complexity and scale of our health system, on which we spend €13+ billion annually, and the widening gap between healthcare demands and availability of resources, both create significant challenges for the Irish exchequer and healthcare providers. Meeting Ireland's health and social care needs will require substantially increased innovation in clinical practice and health service design and delivery. The direct and indirect economic benefits that can accrue from investing in health research across the spectrum include:

- Direct cost savings and/or reallocations
- Capital cost avoidance (e.g. a decision not to extend a facility or add beds)
- Improved cost effectiveness and comparative effectiveness of services
- Evidence base for disinvestment strategies
- Increased productivity through improved human capital (e.g. decreased absenteeism)
- Indirect saving through reduced pension and welfare payments
- Better health outcomes for individual groups, communities or populations
- Concrete and objective information on access, quality, cost and outcomes
- Evidence showing potential versus actual impacts of new products/services/ interventions
- Quality assurance and quality improvement studies
- Evidence that problems are being addressed through trend and/or longitudinal analysis
- Innovative models for delivery and financing of healthcare
- Implementation and evaluations of new interventions and technologies

Translating research evidence into innovative products and clinical practices

From an enterprise perspective, the Irish healthcare sector is the biggest employer in Ireland, with 99,959 HSE employees and many more in the private sector, from GPs and physiotherapists, to pharmacies and other health professionals. Between these actors there are several million customer contacts per annum. This provides an immense opportunity for the uptake of RD&I, to improve health outcomes for individual patients and to organise provision of clinical care more efficiently. This brings with it a proportionate economic potential for the development of products and services.

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. These need to be verified in 'real life' situations as part of their development process. Clinical trials are needed for medicinal products and medical devices to assess safety, tolerability, and pharmacokinetics. Diagnostics equally need rigorous testing and comparisons before they are approved for marketing.

Creating a healthy Irish society

While creating and retaining jobs is an important component of a healthier Irish society, it is by no means the only component needed to achieve this vital objective. The importance of health is particularly apparent for people who have lost it temporarily or permanently. Almost everybody has been, or will be, a patient at some stage of their lives, and will want to be treated by a skilled professional according to evidence-based practices in a well-working healthcare system. This affects not only their personal quality of life, but also their ability to contribute to Irish society.

Health research provides us with the evidence to address key challenges in our society. Radical demographic change, an ageing population, increases in the number of people living with chronic

² Buxton M, Hanney S and Jones T (2004) *Estimating the economic value to societies of the impact of health research: a critical review.* *Bull World Health Organ*, **82**:733-739
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2623029/?tool=pubmed>

disease, the spiralling cost of providing healthcare facilities and medication, greater demand from citizens for higher quality and more personalised care and greater needs for shifting investment from acute to primary, community and self-managed care are just some of the social challenges facing the Government. 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.

Supporting delivery of the Programme for Government

Investment in health and social care research is not just critical to delivering the evidence base for policy and practice priorities of the Department of Health and HSE, but is necessary to deliver the many stated Whole of Government priorities referenced in the Programme for Government, including:

- Mental health and disability
- Primary care reform
- Care of older people and community care
- Integrated care
- Cost control and getting better value for money
- Drugs and addiction
- Tackling poverty and homelessness
- Health and wellbeing

3.2 Health research is an enabler of health system reform

The Irish health system is subject to changes in technology, demography, consumer expectations and considerable growth in patterns of chronic illness. Ireland now spends approximately €13+ billion annually on healthcare against a fall in tax revenue since 2008 i.e. demand is rising while resources are falling.

In response, the Ireland has been engaged in a major health system reform process since 2003. The reform agenda's ambitions of a modern, high performing, integrated, quality-based and patient-centred health system are founded on three related goals of:

- (i) **Promotion and prevention** – based on the premise that prevention is better than cure and a focus on keeping people healthy rather than treating them when they get ill. This pillar is underpinned by the whole-of-government strategy *Healthy Ireland Framework 2013-2015* (2013), that aims to involve every part of Irish society in improving our health and wellbeing.
- (ii) **Health system transformation** - which requires that we look at our health system in a more coordinated, integrated way. For example, how we move from a hospital-centric model of care to a single-tier model of integrated care, treating patients as early and as close to home as possible. This transformation is underpinned by *Future Health: A Strategic Framework for Reform of the Health Services 2012-2015* (2012).
- (iii) **New models of patient care** - a key driver for the development of over 30 *Clinical Care Programmes* to improve quality, access and value for patients. Each programme is tasked with standardising patient care throughout the health system for its particular group of diseases/conditions, by developing clinical care pathways and national practice guidelines based on international best practice. Patient safety is at the core of each programme.

The reform agenda's goals of prevention and health promotion as the first line of defence, followed by a functioning system of acute and primary care cannot be achieved without a strong evidence base. It

will require high quality clinical, population health and health services research to understand better how services and care models impact on the quality of outcomes for patients as well as providing the evidence to inform policy decisions. The practice of research needs to be embedded within the healthcare system, such that we can engage in a meaningful way, at a system level, with all stakeholders, including patients, patient organisations, healthcare staff and industry.

3.3 Human capital is a key component of the health research system

There is an urgent need to develop broad-based human capital in health research, from student through post doc to research leaders in both the academic and clinical environments. A flexible economy and a diverse society require skill-sets and expertise that can only be found across the widest spectrum of disciplines, and many of the health challenges that face contemporary Irish society demand responses that are interdisciplinary in approach. Because of the range of skills and expertise required, development of human capital for health research cannot be achieved by one agency alone, and will rely heavily on a vibrant and well-resourced higher education sector that can train its people across all disciplines, in a research-led environment that ensures exposure of students to the cutting edge. The Background Consultation Document does not sufficiently emphasise this critical piece of the ST&I jigsaw.

3.4 Health research requires a coherent research infrastructure to thrive

In order to effectively translate health research into societal and economic benefits Ireland needs a fully functioning and coherent health research system. Such a system includes strategic coordination of all aspects of biomedical, clinical, health services and population health research including: networking of clinical research facilities, technologies and personnel; a supportive environment for clinician scientists and researchers; a co-coordinated approach to study development and portfolios; an increased number of high quality patient-oriented studies and trials (commercial and investigator-led); and an increased profile internationally.

The HRB is building a coherent and integrated clinical research infrastructure nationally (buildings, equipment, coordination, technical support, networks etc), coupled with increased capacity for high quality clinical, population health and health services research. In the coming years, other pieces of this jigsaw will need to be put in place, such as a national biobanking framework and a framework for the management of research data (archiving, data access and linkage etc.). In addition, initiatives such as the Health Innovation Hub supported by EI will provide other mechanisms for industry to engage with the healthcare system for product development in real life settings.

4. Conclusion

Ireland needs to build a broad-based ST&I system over the coming years, with the breadth of skills and knowledge to enable the “system effect” required to improve health outcomes and health care provision. This needs to be underpinned by an agreed level of national investment in basic research to enable the national research ecosystem. There needs to be explicit recognition that the ST&I requirements and opportunities of our health system go well beyond the economic agenda. The vision must be to move to an integrated and focused health research system that includes all actors, be they academic, clinical or industry focused. That is the only way to maximise the practical health, social and economic benefits that health research offers.