Technology and Innovation in the NHS
Highlands and Islands Enterprise

Introduction

Highlands and Islands Enterprise (HIE) welcomes the opportunity to respond to the Committee’s call for views. We recognise the potential of innovation and the use of technology in health and social care to transform service delivery and to create significant economic opportunities for Scotland’s life sciences and technology businesses.

HIE are committed to working with our partners in the NHS, industry and academia to support the aspirations of the draft Digital Health and Social Care Strategy 2017-2020, with our focus being the creation of new technology and commercial outputs to drive growth of the life science sector economy.

Who are we?

Highlands and Islands Enterprise (HIE) is the Scottish Government’s economic and community development agency for the north and west of the country. Our region comprises over half the Scottish land mass (including 94 inhabited islands) and is home to around 470,000 people.

HIE’s role is to lead regional growth and development in line with Scotland’s Economic Strategy (SES), improving competitiveness and building a fairer society across the Highlands and Islands.

HIE’s approach to regional development is closely aligned to the national priorities described in SES: Investment, Innovation, Internationalisation and Inclusive Growth. We help build successful businesses, social enterprises and resilient communities; support the growth of industry sectors, and invest in the strategic interventions which create the conditions for a competitive region. Our current priorities, planned activities and budget information can be found in our Operating Plan 2017-18.

Health and Social Care innovation in the Highlands and Islands

The growing number of people with complex health and social care needs, together with continuing tight finances, means that current models of care are unsustainable. Over the next 20 years, if new models of delivery are not introduced, existing UK public expenditure for health and social care systems will have to increase by 70% to meet the demand for equity of services. In the workforce, the ratio of four active to one inactive is expected to reduce to 2 to 1 and in rural environments the often older population will continue to be challenged by a lack of healthcare professionals and infrastructure.
In the Highlands and Islands communities face unique circumstances due to distance from health resources, compounded by challenges in digital connectivity and transport limitations. NHS Highland comprises the largest and most sparsely populated part of the UK with 41% of Scotland’s landmass, presenting an ideal environment for the development and deployment of new health and social care technology solutions. Technology has the potential to provide such communities with access to health and social care from home or local health centre, saving considerable costs in travel and time and providing equitable healthcare and a social return on investment. New solutions will encourage greater prevention, patient autonomy, self-monitoring and active and fulfilling lifestyles. With big data, artificial intelligence, gamification, the internet of things, the cloud, wearables, and social media, the digital transformation of health systems presents significant opportunity. It is our opinion that such solutions have the potential to drive growth in the economy while shifting the way communities access, interact and use healthcare and wellbeing services.

**Call for views**

HIE’s strategic focus is to lead regional growth and economic development across the Highlands and Islands. On this basis we have provided views and information in relation to questions 5 and 7.

**Q 5. What key opportunities exist for the use of technology in health and social care over the next 10 years?**

HIE’s aspiration is to deliver a regional test-bed in the Highlands and Islands for the deployment of new innovations, technologies and models for the provision of health and wellbeing. Shaped in collaboration with regional and national stakeholders, we will build commercial opportunities for SMEs, social and community enterprises. Our aim is for the Highlands and Islands to be a leader in the development and delivery of digital health and social care solutions where demand-led market dynamics can be matched by the effective application of industry-led innovation.

**Highlands and Islands Case Study**

- **Highland and Islands satellite enabled e-Health**

In 2016-17 HIE collaborated with Innovate UK and the Satellite Applications Catapult to work with industry to deliver new health and care solutions in the Highlands and Islands. This project built on previous extensive research undertaken by Manchester Metropolitan University’s School of Architecture and an existing strong relationship with the Satellite Applications Catapult. The University research undertook mapping of factors impacting on the health of dispersed communities and indicated that certain areas within the Highlands and Islands are largely isolated from any major
medical facilities, heavily dependent on general practices and typically suffer from poor health and chronic illness.

The project developed two new care pathways and technology solutions for the remote diagnosis and treatment of patients with diabetes and gastro conditions such as Inflammatory Bowel Disease (IBD). The project used satellite technology to connect Raigmore Hospital with rural health care centres in Ullapool and Broadford, enabling Clinicians and GPs to collaborate within a digitally enabled health environment. The project was delivered as two discrete trials, the first for IBD used HI-CAP (Highlands and Islands Capsule Endoscopy) technology and the second using high definition video links to monitor diabetic foot ulceration, RAPID (Reducing Amputations in Diabetes).

HI-CAP technology was delivered in partnership with international company CorporateHealth International. This engagement and trial within NHS Highland contributed towards establishment of the company’s first UK arm in Inverness, with a forecast of 30 new jobs across the Highlands and Islands. Health economics are in development, but initial calculations suggest the cost of capsule endoscopy to be half of the cost of traditional colonoscopy. To date, outputs from the trial demonstrate the technology to be successful and the acceptance from patients and staff has been very positive. One patient stated, “The best thing was not having to go to Inverness. Compared to driving down to the hospital, relating to new people, being in unfamiliar and seldom comfortable surroundings, having the test at home was just child’s play. It was great to be able to make sensible arrangements at home and to be attended by people with whom one felt absolutely at ease. We are lucky the years we live in!”

The RAPID trial sought to improve treatment of diabetes-related foot ulceration, a major cause of preventable morbidity with both direct and indirect associated costs. In Scotland it is estimated over £60million is spent on foot ulcers and amputations every year. The project provided remote access from community podiatrists within the home setting to the wider multi-disciplinary foot team based at Raigmore Hospital. Improved communication channels were provided by Omni-Hub technology in conjunction with tablet devises. The outcome was a reduction in patient travel, more timely and improved care and ultimately a potential reduction in amputation.

In addition to addressing the unsustainable demands on current health and social care provision, the above initiatives delivered in the Highlands and Islands stimulated economic growth and created employment by facilitating the design, development, evaluation and adoption of new products and services.

A short film of the projects is available https://youtu.be/KNK2I7f_B_Y

Q 7. What are the barriers to innovation in health and social care?
Evidence to date demonstrates a low level of large scale innovative technology deployment and commercial return within the NHS. It is generally accepted that technology is widely available and is not a barrier. The challenge is to provide better access and progression for SMEs through the commercial, procurement, health economics and ehealth phases to enable scalable deployment within the NHS.

Highlands and Islands Case Study

- **Scotland Can Do Innovation, Health and Wellbeing pilot**

In January 2017 the Scottish Government announced £1m for three technology development projects. The Scotland Can Do Innovation Health and Wellbeing pilot was established, led by Highlands and Islands Enterprise and the NHS Innovation Partnership Board and chaired by Ken Sutherland, CEO of Toshiba Medical Visualisations Systems. Funding of £400,000 was allocated to develop the pilot and to focus on the rapid prototyping and adoption of solutions with an initial focus on inflammatory bowel disease.

To date the group has established a collaborative governance board with representation from industry, National Services Scotland, Scottish Government, NHS Scotland and Highlands and Islands Enterprise. Scotland’s first Small Business Research Initiative (SBRI) is underway, aimed at stimulating innovative technologies that can enable personalised care, better education and remote monitoring for people living with inflammatory bowel disease (IBD). The competition is unique in comprising three distinct phases: technical feasibility; prototype development and testing; and pre-commercial testing in at least one northern health board, NHS Highland or NHS Grampian.

The work of the Health and Wellbeing pilot group has identified four parallel themes to maximise the opportunities for widespread rollout of healthcare innovation in Scotland:

1. Technology maturity
2. Business maturity and NHS engagement
3. Optimised procurement (e.g. suitable for new SMEs)
4. NHS culture and adoption of new technology

The Scotland Can Do Innovation Health and Wellbeing pilot will seek to address these challenges with the following priorities:

- deep collaboration between industry and the NHS leading to increased exports and productivity gains,
- a business accelerator where SMEs effectively and efficiently engage with the NHS to bring new innovations to market,
team Scotland’s capacity and capability accelerating innovation in the Highlands and Islands from the new innovation hub in Inverness,

businesses responding to NHS Open Innovation challenges and in Scotland’s first three-stage SBRI with a built in adoption phase;

Highlands and Islands providing an agile, business focused location for SMEs to design and test health and wellbeing products and services and act as a best practice exemplar for Scotland.

Conclusion

Activities led by HIE in collaboration with strategic partners are supporting the ambitions of the draft Digital Health and Social Care Strategy 2017-2020. Principally to develop digital ecosystems around the individual, home and place; and to foster a fertile environment for innovation and economic growth.

The Highlands and Islands region is well placed in Scotland to harness our indigenous industry talent to drive growth in the economy while shifting the way communities access, interact and use healthcare and wellbeing services. The potential for innovative businesses to contribute to the development and delivery of health and social care solutions should be maximised where market demand is evident.

HIE would be pleased to host a visit to the Highlands and Islands to see first-hand the work and projects underway with our clients and partners to grow this important sector.

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