

Creation of a Learning Health System

1. Actions Recommended

This paper is presented to the NHS Grampian Board to raise awareness about the Learning Health System and the potential benefits to delivering the ambitions of our Clinical Strategy.

The Board is asked to:

1. Note the developments in creating a Learning Health System, the scale of ambition across public sector organisations and to consider opportunities to strengthen public sector partnerships and attract inward investment
2. Acknowledge these developments as a key strand of our efforts to improve Performance, Assurance, Improvement and Risk (PAIR)
3. Support this vision and the incremental approach to implementation

2. Strategic Context

This paper outlines our vision for health intelligence in Grampian and the North of Scotland, making more use of our health system data to drive improvement and innovation. Learning from exemplars nationally and internationally, where data is seen as one of the main building blocks for success, our aim is to derive smarter insights, connected thinking and to support new approaches for greater impact in health care and health equality. This development is much more than providing static data – our ambition involves harnessing the power of ever increasing amounts of health data to engender ongoing cycles of knowledge generation. The use of timely, actionable knowledge will support improvements that can be implemented quickly into standard practice and in so doing, we expect continuous improvement to become a way of life.

Our aim therefore is to develop a 'Learning Health System' that will allow us to provide:

- Clinical and predictive informatics to drive system effectiveness and support service improvement
- Modern public health surveillance
- Research and innovation

There is a clear case for change driving this development. The NHS has a huge amount of routine, structured data collected at patient level which is used to varying degrees by Boards. This data also feeds national statistics to support population health planning and service performance. However there is wide acknowledgement that there is untapped potential in the use of this data, particularly if augmented with wider health system data in local authorities and other agencies.

Availability of a skilled and specialist workforce also plays a big part, and addressing this issue for the benefit of the North of Scotland region is central to this development.

Health intelligence is described as a building block and key enabler in our Clinical Strategy. Implementing this vision will help to support change in health and well-being in communities, in Boards and across the region.

3. Key matters relevant to recommendation

3.1 Using 'Big Data' to drive improvement in health and care

Traditionally epidemiology uses data from field investigators, surveys and hospital records. Data mining takes time and is always in catch-up mode. Using big data from multiple sources helps to provide deeper insights to health surveillance, and working with different partners enables fresh and connected thinking. More novel data sources such as school records, social media and transportation patterns contain limited information by themselves, however when combined they can yield a more reliable and actionable picture of a community's health than is possible from clinical data alone. Our public sector partners have a mutual interest in making this work, and we can each of us benefit by working collaboratively, making good use of our combined skills, knowledge and expertise.

3.2 Creating the infrastructure to support continuous improvement

Underpinning our 'Learning Health System' is the creation of a data infrastructure that will benefit data sharing economies across the region, involving the integration of data from public sector organisations (e.g. health, social care, education, criminal justice, transport, biobank). In doing so, we provide an infrastructure which will allow planning and performance information to be generated more efficiently, and importantly, provides an efficient infrastructure for continuous improvement.

We have support and commitment from North of Scotland Health Boards, University of Aberdeen and the Information Services Division at National Services Scotland. We have had initial positive discussions with University of Dundee and Aberdeen City Council. Our aim is to develop our mutual interests with all Local Authorities and Universities across the North of Scotland.

We are already 'data ready' in some aspects of this with an existing prototype used in NHS Grampian and the Aberdeen Centre for Health Data Science. Our '*People and Places of the North*' data platform, will be the start of a new analytical infrastructure to meet the health and well-being needs of our population. It provides the building blocks for major change and is consistent with our ambitions for digital health.

3.3 Reasons for doing this regionally

Consideration was given to whether the development of a data platform was best done as a national endeavour. Our ambition is to be highly responsive to local needs, particularly given our ambitious change agenda and particular remote and rural context. There are three main reasons for developing at a regional level. Firstly, the breadth of intelligence we envisage and working with partners to increase the richness and possibilities for regional innovation. Secondly, strengthening the

analytical skills base in Grampian and across the North of Scotland, which is an important aspect of health care sustainability. Thirdly, the involvement of local people in shaping our data needs and how it is used. The driving ethos behind our approach is that we can and must build on existing strengths within the *local public sector system* to transform health intelligence. Our regional approach also allows:

- Local influence and ownership
- More flexibility and responsiveness to needs for improvement
- Help for people to use intelligence for improvement and change, involving the use of improvement analysts
- Creation of a broader, richer dataset with Partners through consent and common purpose
- Access and use of highly sought after skills such as data science in Universities
- Academic links with health service partners using non transactional data for research and improvement (e.g. Health Services Research Unit, Health Economics Research Unit)
- Links and emerging partnerships with industry for innovation
- Changes in the way we obtain consent to share data with local buy in from people/patients
- Long term gain – developing and embedding skills in local and regional areas for sustainability

Colleagues from National Services Scotland are involved in our development group and are supportive of our plans. We are keeping close to national developments and will remain flexible to changes as they evolve.

3.4 Developing public sector specialist workforce capacity in Grampian and the North of Scotland

There is no shortage of external consultants who offer to use our data, provide rich insights and stimulate change. However, at the core of this regional development is the development of our public sector capacity and the continued development of a technical, analytical and improvement focused workforce. We have a good foundation of skilled and experienced staff, well established partnerships with local Universities, Local Authorities and communities, and new partnerships emerging with industry. With shared principles of systems thinking, partnership and learning, our aims for the organisation of health intelligence are to:

- Grow public sector capacity to meet the scale, scope and complexity of our ambitions and plans
- Build on existing collaborations to establish a regional intelligence alliance, with local management of teams operating within a regional framework
- Establish complementary arrangements to national information systems and operate as a northern intelligence ‘pipeline’ where possible

3.5 Benefits

The transformation of intelligence and the way we progressive way we propose to do this brings many benefits, all of which ultimately are aimed at improving health outcomes and population health. They include:

Changes in the way we develop and use intelligence:

- Combination of data from multiple agencies and sources that provide a more reliable and actionable picture of a community's health than is possible from clinical data alone – developing evidence about the wider determinants of health
- A data infrastructure that is continuously extending, allowing improvement work to be conducted with greater efficiency
- The use of new techniques and tools to develop predictive analytics and improve health system planning
- The alignment of science, informatics and improvement functions to support continuous learning and change in clinical practice, surveillance and the organisation of care

Workforce development and sustainability:

- Recruitment and retention of specialist staff for the benefit of the North of Scotland through critical mass, career structure and wider links with public sector organisations
- Deployment of staff in an agile way, supporting local systems and working regionally
- New opportunities for learning and cross organisational working

Regional economic development

- Maintaining and developing new skills and employment for the benefit of the local and regional economies
- Enabling health system leadership and intelligence to influence decisions affecting the local economy
- Developing the potential of health research at a greater scale and depth
- Developing links with industry using intelligence to stimulate innovation

Culture

- Closer working, with tangible benefits and common purpose will help to remove many cultural benefits that exist between organisations
- Development of a public sector asset and legacy for the future

3.6 Implementing this vision

These plans represent a step change in the way we manage data, information and intelligence. They also represent significant change in the way we use intelligence to improve health, care and innovation. We are under no illusion that this is easy or

that our vision be achieved overnight. The technical, cultural and governance aspects of this work will all take time to resolve.

Our approach to implementation is to work incrementally using demonstrator projects which help us address a particular issue whilst helping to grow the Learning Health System infrastructure. For example, a demonstrator project to improve our knowledge about child neglect and opportunities for early intervention will allow us to harvest data from health, social care, education and police. Working in this way allows us to address an important challenge, tests our technical solutions and helps strengthen our partnership relationships. It also allows us to develop at a pace consistent with investment. Our plans involve augmenting technical and analytical capacity and there has been some initial funding made regionally to get things started.

Realising our full ambition at scale will require major investment but also yield significant benefits to the population, health systems and local economies. Our future business model includes contributions to staff costs from research grants but also hints at the potential investment from industry over time as we provide intelligence that leads to commercial innovation. As we build, retain and attract a critical mass of public sector skills and experience that we can be proud of, we can support sustainable health care and leading research and innovation in the North of Scotland.

4. Risk Mitigation

This collaborative arrangement supports analytical resilience in our public sector systems and helps local teams to flourish whilst growing a regional resource with a unique remote and rural perspective that is sufficiently equipped to become a 'world class' centre of excellence. The advantages of building this formal workforce alliance and the risks that it mitigates include:

- New partners can come on board without destabilising existing systems and enables access to specialist skills that may not have been feasible before
- Providing opportunities for professional development and progression to attract and retain analytical talent across Grampian and the North of Scotland
- Creating an environment for innovation, operating as a specialist centre on analytical methods which can be applied for health and care developments
- Formal links with academic disciplines, bringing fresh perspectives to issues and solutions

5. Responsible Executive Director and contact for further information

If you require any further information in advance of the Board meeting please contact:

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Additional supporting information

YouTube video: The Learning Health System

<https://www.youtube.com/watch?v=J5TlkyZrwG0>

Article in healthandcare.scot – Learning Health System, Health Data Science and Artificial Intelligence

<https://healthandcare.scot/default.asp?page=story&story=212>