Paper 8 – LPHRIAE Revised Final Report
Public Health Reform, Programme Board 2nd May 2019

Public Health Reform Programme

Leadership for Public Health Research, Innovation & Applied Evidence

Deliverable Three

March 2019 V2.0

Key Points

- Following a wide and inclusive evidence gathering and stakeholder engagement process, the Short Life Working Group of the Leadership for Public Health Research, Innovation and Applied Evidence Commission has completed the work informing this final deliverable (Sections 1 and 2).

- A vision for Public Health Scotland collaborative leadership is presented. This covers its role as a provider of quality research, innovation in public health policy development and practice, evidence creation and use, and the development of its own and the wider public health workforce (Section 3).

- To achieve this vision, the Short Life Working Group proposes the creation of a specific research innovation and evidence hub: Scottish Public Health Evidence, Research and Innovation for Action (SPHERIA). Organisationally located within Public Health Scotland, and working alongside the new research and innovation service and knowledge service for the organisation, SPHERIA will be a dedicated, shared resource to create and sustain public health system-wide leadership, support, and collaboration (Section 4).

- From Day 1 of Public Health Scotland, it will need Director level leadership for its research and innovation and its knowledge services. Between now and vesting day, existing research services and knowledge services within Public health and Intelligence and Health Scotland should be brought together to create initial Day 1 services from which wider services can be developed. All existing services to support research programmes and research collaboration will remain available as part of the Day 1 services (Section 5).

- The Commission has identified the future functions for the new research and innovation service. The Director and the research and innovation service should be charged with creating specific development plans for the service within the first six to nine months of Public Health Scotland becoming operational. These plans must articulate the ways in which the work of the RIS will contribute to SPHERIA (Section 6.1).

- The Commission has identified the future functions for the new knowledge service. The Director and the knowledge service should be charged with creating specific development plans for the service within the first six to nine months of Public Health Scotland becoming operational. These plans must articulate the ways in which the work of the service will support knowledge into action activities across the public health system, how it will contribute to the work of SPHERIA, and how it could develop a Knowledge Implementation Support Team (KIST) approach as part of knowledge into action activities (Section 6.2).

- Building on the proposals in this Commission for an ambitious approach to workforce development, the Director, working with the research and innovation and knowledge services, and with the workforce function of Public Health Scotland should create specific development plans to enhance research and knowledge capabilities for Public Health Scotland's staff and for the workforce across the public health system (Section 6.3).

- The Director should be required to develop a strategic vision for Public Health Scotland relating to research and innovation and applied evidence and knowledge. They should be required to report to the Board on the delivery of this strategic vision and the impact that the organisation is having in influencing the public health system in Scotland, the UK and internationally against this vision (Section 6.4).

- The Commission proposes that Public Health Scotland develop new IT systems to support the work of the research and innovation and knowledge services, with the Director responsible for the creation of specific development plans over a six to nine month period following PHS becoming operational. Implementation of all IT systems should be a key component of the PHS Corporate IT plan (Section 6.5)

- The Commission also proposes the Director and IT functions create a specific development plan to create a single, digital portal for the organisation's SPHERIA functions to support leadership and collaboration for research and innovation and knowledge mobilisation across the public health system in Scotland (Section 6.5)

- Building on all the proposals made by the Commission's Short Life Working Group, the Director should be charged with creating a specific development and implementation plan for the SPHERIA hub (Section 7).

The Commission's Short Life Working Group considers that by creating SPHERIA and implementing the proposals set out in this report which establish services that can support and sustain its operation, PHS will be an organisation that successfully fulfils these elements of the Public Health Reform Blueprint, creating new and ambitious leadership for public health research, innovation and applied evidence.

Glossary

Term	Abbreviation
electronic Data Research and Innovation Service	eDRIS
Clinical Trials Units	CTU
Health Scotland	HS
Information Governance	IG
Knowledge into Action	K2A
Knowledge Implementation Support Team	KIST
Knowledge Service	KS
Leadership for Public Health Research, Innovation & Applied Evidence Commission	LPHRIAE
National Services Scotland: Public Health and Intelligence	PHI
Public Health Reform Team	PHRT
Public Health Scotland	PHS
Research and innovation	R&I
Research and Innovation Office	RIO
Research and Innovation Services	RIS
Scottish Public Health Evidence, Research and Innovation for Action	SPHERIA
Scottish Public Health Network	ScotPHN
Short Life Working Group	SLWG
Strengths, Weaknesses, Opportunities and Threats	SWOT
World Health Organisation	WHO

Contents

1   Background

1.1   The Commission

The Public Health Reform Programme's Leadership for Public Health Research, Innovation & Applied Evidence Commission (LPHRIAE) required that the Scottish Public Health Network (ScotPHN) identify and work with a short-life working group (SLWG) that engaged with as wide a range of stakeholders as it thought necessary to describe the ways in which Public Health Scotland (PHS) will address the challenges facing, and seize the opportunities available to, the new organisation in order to:

- achieve co-ordination of academic public health in Scotland (and is well connected to, and has an influential voice in, the wider UK public health research and evidence system and able to connect internationally when valuable to do so);
- respond to technological developments;
- put knowledge creation and mobilisation at the heart of what it does, fostering an environment for exchange of information, expertise and (potentially) training and resources between organisations;
- foster an environment for exchange of information, expertise and (potentially) training and resources between organisations; and
- make it a priority to ensure that public health policy and practice is wherever possible underpinned by research and evidence, and that the research and intelligence functions in public health are focussed on being policy and practice-relevant.

The membership of the SLWG was agreed with the Public Health Reform Team (PHRT), having sought external advice from international experts regarding the choice of independent chair, preferably someone who provided significant international experience in the external appraisal of national public health systems. In addition, members were sought who could gather, interpret and provide expert knowledge and advice. Membership of the SLWG is set out in Appendix 1.

1.2   The Definitions used by LPHRIAE

In advance of the first meeting of the SLWG, ScotPHN was required to set out the definitions of 'research', 'innovation' and 'applied evidence'. The definitions agreed for use by LPHRIAE are set out below.

- ***Research*** – Public Health Research was defined:

 "Health of the public research is transdisciplinary: it works across traditional discipline boundaries, integrating aspects of natural, social and health sciences, as well as the arts and humanities, which directly or indirectly influence the health of the public."

In this context the term '*transdisciplinary'* is taken to mean that it is: *"A 'holistic' approach; integrates the natural, social and health sciences in a humanities context, working across traditional discipline boundaries."*

This definition has been taken from the 2016 Academy of Royal Medical Colleges report 'Improving the Health of the Public 2040'[1]. It was selected as a broadly accepted UK-wide definition, from an authoritative body, that is inclusive in its scope of what research can and should underpin the new public health system in Scotland. This breadth of scope also complements the vision for evidence and knowledge application set out by the Scottish Government in 'Scotland's Digital Health and Care Strategy'.[2]

- *Innovation* – was defined as :

"The invention, development, production and use of approaches, interventions, technologies, and supporting services which create the opportunity to make major improvements to public health practice and delivery for health and care."

This definition was adapted from that used by the Scottish Health Innovations Ltd.[3] as there is no generally accepted definition of innovation in or for Public Health.

- *Applied Evidence* – for Public Health was defined as:

"An iterative sequence of activities and support which together bridge the gap between knowledge and practice, by converting knowledge into decisions and actions to deliver safer, more effective practice and delivery."

As with Innovation, there is no universally agreed definition of applied evidence in Public Health. The definition used was adapted from the definition of Knowledge into Action used within NHS Education Scotland's Knowledge Network[4]. In this regard it also provides an effective link to the elements of Scotland's Digital Health and Care Strategy concerned with effective knowledge mobilisation.

1.3   LPHRIAE's Objectives

One of the clear requirements of the Commission was that it should set out how PHS should:

- provide, commission, co-ordinate, and participate as appropriate within the wider public health system, and in particular between policy, practice and academia;
- support national coordination of research, knowledge exchange and provide a collaboration function, working with the wider system;
- identify any other aspects of research that should be considered within the new body in order to support improvements in health, health protection, and reductions in health

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[1] Academy of Medical Sciences (2016) Improving the health of the public by 2040.
[2] Scottish Government (2018) Scotland's Digital Health and Care Strategy.
[3] Scottish Health Innovations (2017). What is Innovation.
[4] NES: Knowledge Network (ND). Building Capacity.

inequalities – including (but not limited to) the work of PHS in providing (or commissioning):

- o research, and knowledge mobilisation activities; and
- o support for building public health capacity and training in research and applied evidence.

In considering how these objectives could be met – and aware of the further requirement placed on LPHRIAE to be mindful of wider policy requirements – the SLWG identified and adopted three policy documents which served as "fixed points" to guide the Commission. They are:

  i. The Academy of Medical Sciences research strategy document: 'Improving the health of the public by 2040';[1]
 ii. The 'WHO European Action Plan for Strengthening Public Health Capacities and Services';[5] and the
iii. Scottish Government's 'Scotland's Digital Health and Care Strategy'.[2]

These 'fixed points" were used to set out an initial framework to assist the Commission's stakeholders in articulating a vision for PHS's approach to research, innovation, and applied evidence.

2   Stakeholder Engagement

2.1   Wider Stakeholder Engagement

The Commission undertook a process of engagement with the wider LPHRIAE Stakeholder Group following the approach agreed with the Public Health Reform Team.[6] Three formal stakeholder events were organised to help develop the vision and ambition for PHS and the wider public health system in Scotland in relation to research, innovation and applied evidence.

The first stakeholder event in Glasgow (21/08/2018) started the process of engagement by exploring a vision for PHS's approach to research, innovation, and applied evidence using an initial framework set out by the three "fixed point" documents listed above. On the basis of the engagement event in Glasgow, a series of propositions emerged that explored how PHS might deliver its functions:

1. what it *did* as an organisation;

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2. how it would ***support and collaborate*** with others involved in the creation and application of research, innovation and knowledge; and
3. how it might be a ***strong influencer*** in providing leadership for population health in Scotland, the UK and internationally.

These functions were further explored at the second engagement event in Perth (24/10/2018). The propositions were considered against a strengths, weaknesses, opportunities and threats (SWOT) framework. This event also helped to identify areas for further consideration in developing operational approaches to deliver for the new organisation.

Following the Glasgow and Perth events online engagement surveys were used to widen participation amongst stakeholders. Whilst there were very few comments from these surveys, they were used to inform the event's final outputs. All the documentation relating to the Glasgow and Perth events has been made available online on the Commission's webpage.[7] The outputs from these events were also considered in two specific engagement meetings with staff from both Public Health and Intelligence (PHI) and Health Scotland (HS). The outputs from these meetings with PHI and HS staff were also used to inform the LPHRIAE Interim Report[8] which was submitted to the Public Health Reform Team in December 2018.

Finally, a further major stakeholder event, using the Interim Report to explore the implications of the Commission's work for research and applied evidence "end-users" took place in Edinburgh (30/01/2019). A formal report is being finalised; however the stakeholders present confirmed that the overall functions described were both necessary and important. What was also helpful was the identification of key qualities and principles that PHS should endeavour to adopt in fulfilling these roles. These may be summarised as providing:

- ***leadership*** for, and facilitation of, the wider Public Health system,
- an ***independence of voice*** from national and local government in its activities in this field;
- evidence-based ***challenge*** to inform effective and equitable policy development and service delivery, reduce ineffective ways of working; support investment and disinvestment decisions; and reduce unnecessary duplication;
- approaches to using policy to ***influence*** the creation of research and real world evidence, and the application of the such evidence to develop informed policy and practice;
- support to the wider public sector and third sector agencies in the ***application*** of research, innovation and knowledge in improving quality and delivery;

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[7] See: https://www.scotphn.net/projects/public-health-reform/commissions-lphriae/
[8] ScotPHN (2018). Leadership for Public Health Research, Innovation, & Applied Evidence: Interim Report – December 2018.

- support for service development and delivery in ***innovative*** ways, using evidence from implementation research, especially in delivering positive change at scale across Scotland;
- encouragement for ***transdisciplinary and trans-sectoral*** research and its application, ***sharing expertise*** to understand key research and knowledge gaps (e.g. in relation to evaluation research);
- support for ***ongoing engagement*** with public, professionals and service users in all aspects of research, innovation and knowledge application;
- ways of ***generating greater flows*** of knowledge, projects, and people across diverse organisations within the broader public health system[9]; and
- developing public health careers in which research and its implementation are valued.

In proposing these principles, there was recognition that it could not all be turned into actionable objectives for Day 1. The organisation will, however, be expected as its top priority to articulate a clear direction of travel and timeline for the transition to these new ways of working across the Scottish public health system.

2.2   Engagement with Stakeholders in other Commissions

As part of its ongoing approach to stakeholder engagement, themes from LPHRIAE which had a bearing on the other Public Health Reform Commissions were fed directly to the appropriate leads. Similarly, implications from LPHRIAE for Corporate projects – notably the Corporate IT project and the Data Science and Innovation project – were shared with project leads. With the completion of the Improving Health, Protecting Health, Population Integrated Care, and Underpinning Data and Intelligence Commissions, a rapid assessment of the implications of their findings for those of LPHRIAE has been undertaken by ScotPHN. These assessments were sense checked by members of the SLWG and – where appropriate – others involved in developing the final reports from the Commissions. The outputs from these rapid assessments are contained in Appendix 2.

It is very clear that all these commissions see a key role of PHS to be in the business of contributing to, and collaborating in, the development and creation of research evidence. Being innovative in practice and policy development is a shared ambition. The requirement for PHS to be an organisation that is evidence-informed and supports the capacity for, and application of, knowledge-based public health delivery across Scotland is also well articulated.

Generally speaking the SLWG consider that the proposals set out below, based on the work developed for, and explored by, the wider stakeholder events (See Section 4ff) are consistent with the outputs from the four public-health domain specific Commissions.

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[9] Specific examples of these were identified by stakeholders, notably at the Perth Stakeholder Event. These are considered the event report, Stakeholder Engagement October Event- Assessing Functional Propositions

2.3   Engagement with the Transdisciplinary Academic Community

In adopting the definition of research in the 'Improving the health of the public by 2040' strategy[1] there is a clear ambition for PHS to be both an enabler and encourager of transdisciplinary research. As a further strand of its engagement, LPHRAIE approached two broad groups of academics to assess:

- what contribution your research discipline is already making to the health of the public;
- what opportunities are there for greater contributions through transdisciplinary research activities;
- what would facilitate such transdisciplinary contributions; and
- what would be the one clear "ask" they would have of PHS?

In addition, the academics were asked to provide any examples of such research contributions.

In total 77 invitations were sent to academics across the UK. Of these 33 were to academics with specific public health research roles in Scotland, and 44 were from across the UK, representing the broad range of disciplines set out in 'Improving the health of the public by 2040'. As at 27/03/2019, this call produced 13 responses, of which 8 responses were from 9 Scottish academics. Of those who responded, 4 had previously attended one of the three stakeholder events. A synthesis of the individual responses (where permission was given to share the detail) is available on the ScotPHN website and will be updated over the summer to present to the new organisation as full a picture as possible of transdisciplinary academic aspirations.

The responses received to date do suggest there is interest amongst Scottish and UK academic stakeholders to engage with the new organisation, notably in collaborative research. However, it is also clear that there is a need for developing and strengthening robust engagement with the broad academic community to achieve the ambition for PHS to be an organisation that provides leadership for the creation and mobilisation of transdisciplinary research.

3   The Leadership Vision

Overall, the wider group of stakeholders who have supported the work of LPHRIAE see the potential for PHS to provide collaborative leadership for the public health system in Scotland. This leadership requirement emphasises that public health research is needed across all three domains of public health and the data and intelligence functions which underpin them.

A second key theme, one which also runs through the other commissions, is the call to recognise a wider conception of the determinants of population health and the broad

scope of the research and knowledge needed by the public health system to address them. Stakeholders were clear that the research, innovation and applied evidence leadership envisaged for PHS could not be too narrowly focussed on traditional "health" function(s). Its work programme needs to reflect the wide range of social, economic, environmental, cultural, commercial, political and organisational determinants of health, equity and effective health and social care, challenging sectional and vested interest where required. The need for such a focus is now widely acknowledged among policy analysts and academic researchers together with research funders via recent initiatives, including the UK Prevention Research Partnership.

The engagement with PHI and HS staff confirms a real ambition for the new organisation to undertake and sustain research and generate evidence, as well as support system-wide knowledge mobilisation. This will require that the organisation has an in-house research and innovation function and a knowledge service together with staff possessing the skills to support these. However, PHS also needs to recognise that its national functions must be participative and not simply be the responsibility of a "siloed" or "badged" function. This will require transformational change to create the appropriate, organisational culture.

Building on the international WHO framework for public health capabilities in research and knowledge services, [5] the vision for PHS is that it becomes an organisation that undertakes, facilitates, and enables:

- quality research:
  - as a provider and commissioner of research activities;
  - as a source of high quality data for public health research;
  - as the proper statistical function for health and care/wellbeing research
  - as a reporter/identifier of pressing Public Health research questions / priorities;
  - as an influencer of research agenda of funding organisations and the research community;
  - as a research facilitator, building relationships that sustain research collaborations; and
  - as a subject for research into how its own ways of working translate evidence into action;

- innovation in public health:
  - as a leader and facilitator for innovation in public health practice and the application of emerging technology to population health;
  - as a facilitator in converting evidence into actionable products that are used in practice across the system;
  - as a developer of skills and capabilities across the public health system for research and knowledge mobilisation; and
  - as a builder of trust, communication and learning about how innovative approaches can be harnessed and used for the benefit of all.

- evidence creation and use:
  - as a champion for, and provider of, practice-based evidence as a source of knowledge in its own right and evidence from the lived experience of people and communities;
  - as an active proponent of evidence of practical value, including that, generated from real world data obtained from routine practice;
  - as a trusted creator and repository for evidence and its application in policy and practice;
  - as a learning organisation that is continually testing the quality, effectiveness, efficiency and equity of what it and the wider PH system is doing;
  - as an agency that encourages sharing of knowledge, and is able to sustain a culture of learning about not just "what works", but "how to make it work" locally;
  - as a focus for creating internationally recognised source of expertise in knowledge generation and mobilisation, in evaluating policy and practice for public health benefit; and
  - as an independent, evidence-informed voice that helps shape national, regional, and local debates about policy, investment, and service delivery;

- workforce development:
  - as an enabler for the wider public health workforce to develop and strengthen skills and competencies in undertaking research and evaluation, developing knowledge and applying evidence for policy and practice in public health;
  - as an enabler of its own staff to be active in research, innovation and evidence dissemination and application activities;
  - as a training venue for specialist trainees in public health and other professional trainees;
  - as a partner in educating public health research professionals and an agency that can provide a base in which funded research and innovation placements (such as PhD studentships) can be undertaken; and
  - as a place in which public health academics and professionals can develop their skills and competencies through collaboration.

These functions must be underpinned by effective public health research, information and knowledge governance approaches and dynamic leadership which facilitate collaboration and ensure delivery.

4 Delivering Leadership – the Scottish Public Health Evidence, Research and Innovation for Action (SPHERIA) Hub

Stakeholders to the LPHRIAE Commission were explicit in their wish to see PHS create and maintain the type of research hub described in the Academy of Medical Sciences

'Improving the Health of the Public 2040' report.[1] Working as part of a system of UK-wide hubs of engagement, such hubs are seen as brokers, connectors of people and expertise, evidence sifters, influencers, advisors, and commissioners. They bring together professionals, practitioners and researchers to integrate health of the public research into the full range of public health, health care and social care policy and practice by:

- improving mutual understanding and building long-term relationships between researchers, policy-makers, and practitioners across sectors and organisations;
- assisting in the identification of research priorities relevant to practitioners and policy-makers;
- championing the joint delivery of research, policy and practice evaluation, and implementation research;
- obtain and maintaining knowledge / evidence;
- supporting the evaluation of existing and innovative practice; and
- encouraging opportunities for transdisciplinary working and training.

The LPHRIAE stakeholders also recognised the importance of using such an approach to help build stronger relationships between professionals, practitioners, researchers and policymakers, especially across local authorities and third sector organisations to create a collaborative culture for translating evidence into local policy and practice.

Drawing on these views, and supported by the international evidence base, the SLWG considers that it is essential to the working of PHS as a leader for public health research, innovation, and applied evidence that these strands of research and innovation and of applied evidence and knowledge mobilisation are brought together as a single hub: the Scottish Public Health Evidence, Research and Innovation for Action (SPHERIA) hub.

SPHERIA is imagined as being a gateway into, and the single national point of contact for, the widest range of organisations and practitioners across all sectors of the public health system. Rather than being organised to fit internal PHS domains and functions, the PHS Knowledge Service (KS) would be tasked with working with PHS colleagues to set, collate and curate the knowledge and evidence created by PHS and ensure that this has maximum visibility and accessibility to all across the system. At the same time, the RIS would be able to use the hub as an essential means of developing and coordinating research-related activity within the new organisation and supporting research collaboration across and beyond Scotland. More broadly SPHERIA will provide a single point for engagement, support and networking for all stakeholders across the public health system, thus creating a focus for increasing integration and reducing organisational isolation.

Much of the hub's impact would be achieved through joint working on shared priorities, increasing communication, collaboration and quality within the wider system, maximising relevance, impact and translation of research addressing public health challenges and minimising isolation, duplication, inefficiency. By coordinating and utilising the wider research system and connecting it to policy makers and practitioners, SPHERIA should

provide substantial return on investment for Scotland by helping to efficiently generate research, innovation and knowledge to address the important priorities for PHS and the wider public health system in Scotland.

Over time, SPHERIA would provide the focus through which PHS would:

- provide a single **point of access** to knowledge services, data and research support functions;
- **identify topics where knowledge is required** by decision-makers, but which has not yet been synthesised, and broker teams to collaborate on rapid or scoping reviews;
- identify policies, programmes, and other innovation where **evaluability assessment** (EA) is needed to support the planning and design of evaluations, and convene teams to conduct these assessments;
- identify and **help fulfil PHS national statistical functions** as a statistical produce research ready datasets, drawing on open data resources as well as PHS's own data, in priority areas;
- support partners to **identify opportunities and priorities for research;**
- undertake **horizon scanning and interpretation**;
- **facilitate transdisciplinary, multi-sectoral research development groups** linked with a research design service within RIS;
- **commission and manage** public health research and evaluation projects;
- **identify opportunities to influence** (e.g. by identifying stakeholders' views, conducting rapid reviews, horizon-scanning) the research priorities of Scottish researchers research infrastructure funders;
- co-ordinate a Scottish voice to **influence UK and international priorities** and funding for public health research, research infrastructure, capacity and capability building, and research governance systems;
- **identify research-related capacity development and training** needs within the public health research workforce, and provide or broker training, secondments and other development opportunities;
- **support networking, including methodological networks** (e.g. health impact assessment networks, health economics) and topic networks – both new and existing as well as facilitating transdisciplinary collaboration;
- **support topic networks** in running events to: (i) disseminate knowledge, (ii) facilitate connections between organisations, professionals, and other stakeholders, and (iii) identify opportunities and priorities for co-produced research;
- **support placements and secondments** across public health system organisations, including the NHS, academia, third sector, local and national government; and
- **collaborate with other UK Hubs of Engagement**.

Given its national remit, scope and activities, SPHERIA should be viewed as a core function of, and organisationally located within, PHS. Figure 1 attempts to illustrate the

functional arrangements for SPHERIA. Though it should be noted that this reflects the arrangements at a conceptual level, and more detailed work will be needed to specify the final configuration of SPHERIA.

Figure 1: The Scottish Public Health Evidence, Research and Innovation for Action Hub
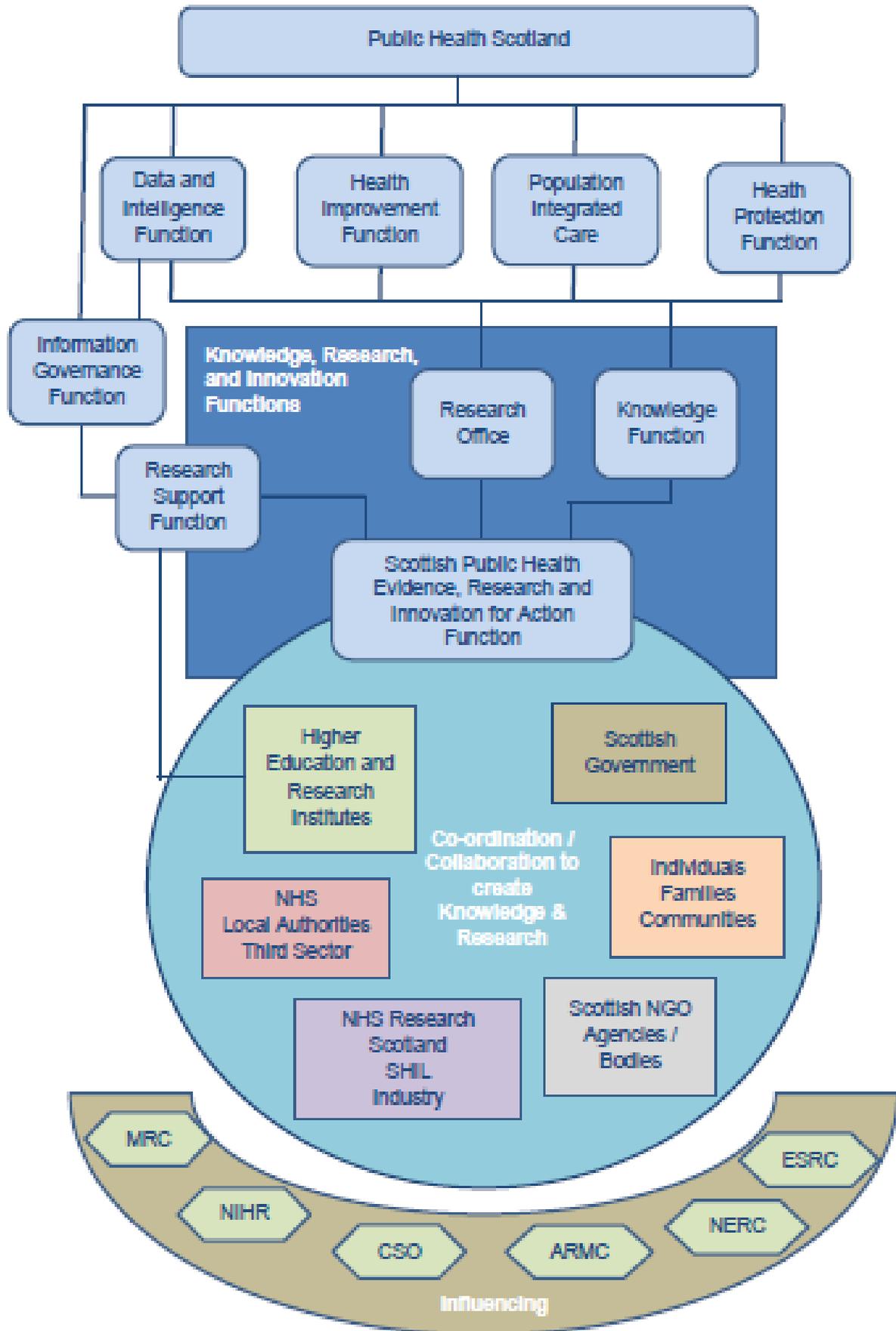
SPHERIA will require strong and well-connected leadership and staff. However, for the hub to work effectively it will need dedicated staff and financial resources, additional to the existing Research and Innovation Services (RIS) and Knowledge Services (KS) staff and resource, charged with maintaining SPHERIA and curating its contents on behalf of the wider PHS workforce.

In addition to the core of staff located centrally with PHS, other SPHERIA posts should be dispersed and located in national, local and multi-sectoral partners with clearly designated hub-specific roles. This move will build on existing local engagement and formal and informal networks, enhancing the benefits from wider engagement and ownership. SPHERIA should explore the potential opportunities to collaborate with distinct capabilities in academic and other research facilities on longer-term programmatic work. At all sites, co-location of research, policy and practice staff should be strongly encouraged.

This will mean that, in addition to investing in SPHERIA within PHS, the hub should also have a budget to enable it to commission evidence syntheses, evaluability assessments, capacity building activities, and so on, and to incentivise collaboration among its partners.

Responsibility for SPHERIA will lie with the Director responsible for RIS and KS. The SLWG considers that an external advisory group, including among its membership representatives of stakeholders, could be created to support its strategic management and ensure its credibility.

SLWG Proposal

The SLWG proposes that PHS should develop a specific research innovation and evidence hub: Scottish Public Health Evidence, Research and Innovation for Action (SPHERIA) hub.

Organisationally located within PHS, and working alongside the new research and innovation service and knowledge service for the organisation, SPHERIA will be a dedicated resource to create and sustain public health system-wide leadership, support, and collaboration.

Managing and maintaining such a hub will require additional development planning and the commitment of financial and staff resources to maintain its functions as a key part of the PHS leadership for the public health system in Scotland.

In addition to its core PHS based staff, SPHERIA will also sustain relationships with a wider body of external staff located in national, local, and multi-sectoral stakeholder organisations. This will also require appropriate resourcing to facilitate such relationships.

5 Public Health Scotland on Day 1: Research, Innovation and Knowledge Services

Creating SPHERIA is not something that can happen on Day 1 of the new organisation: it will need to be developed so that the bold ambition behind it can be realised. Rather the expectation is that from Day 1, there should be a research and knowledge function in place that can support the transition of existing functions into the new organisation and appropriate leadership in place to drive forward rapid development of the public health leadership role and functions of PHS and help nurture, at an early stage, the knowledge into action culture that will be needed to support the developing functions of PHS.

Building on the existing RIS and KS, these functions can be developed further to enhance these services alongside the development of the hub. This means that we need to understand what would be a Day 1 service, and what such service enhancements would need to be.

5.1 The Research and Innovation Service

There is general agreement among stakeholders that PHS will be an organisation that actively leads, supports and participates in a range of research activities relating to public health. This will require it to have a specific Research and Innovation Service (RIS) providing:

1 Research commissioning: research procurement; and support for external funding;
2 Research mobilisation and impact monitoring;
3 Innovation and Horizon Scanning for public health delivery;
4 Research governance: formalising a research governance framework and monitoring research activity; and
5 Research ethics and review arrangements.

At present the existing research service arrangements between PHI and HS complement each other and could be brought together to provide the basis for this function within Public Health Scotland on Day 1. This would cover:

- research commissioning and procurement;
- research governance and (parts of) research activity monitoring;
- research ethics advice and internal review; and
- eDRIS services.

All existing services provided by PHI and HS to support research programmes and research collaboration will remain available as part of the Day 1 services.

A synthesis of these research functions for PHS research, set in the context of wider UK Public Health organisational approaches, was undertaken in support of this Commission.

This explores the five functions in greater depth, highlighting current activity in PHI and HS (See Appendix 3).   However, what is not covered in this document is the gap in the capacity of PHI and HS to make the most of the statistical and informatics expertise among staff or the existing methodological capacity and research experience they should be contributing to the work of PHS.

To address the full range of functions set out here, and to support the wider contributions possible across PHS, the service would need to quickly develop by creating a Research and Innovation Office (RIO) to support and administer the range of activities. Creating a RIO within PHS will allow the organisation and its workforce to develop and use their research and innovation skills and expertise. It would also be central to maintaining the necessary separation of functions associated with research creation and collaboration, research approvals, and the research and information governance arrangements through a consolidated PHS Research Governance Framework. Where possible, this framework needs to be aligned to those frameworks in place with PHS's academic collaborators and partners.

Creating a RIO within PHS would bring the new organisation into line with research arrangements for other NHS Boards (territorial) and provide the necessary base from which to build the ambitious interfaces between the various elements of the wider public health system, notably local government, the third sector, and academic institutions. It will also help support the leadership of PHS, as Scotland's national strategic, collaborating and coordinating centre for public health research and innovation. The RIO would provide a focus for developing the requisite approach to engaging with academic and other research institutions to shape the research agenda and an active participant in transdisciplinary research and – as noted below – support the translation of such research evidence into public health action to improve the health and wellbeing of the people of Scotland.

It is anticipated that existing PHI and HS staff involved in research functions would form the core of the RIO staff, building on their existing knowledge, skills and expertise in the area. However, it is unlikely that the existing staffing resource would be sufficient to take on the full range of functions without additional investment, especially in relation to the wider aspirations set out in section 6 below.

Leadership for the RIS/RIO will require Director level responsibility. PHS will need to agree the desired skill set required of such a post-holder to ensure the necessary leadership is in place for PHS and the wider public health system in Scotland, the UK and internationally.

SLWG Proposal

> **To support Day 1 research and innovation functions, it is proposed that a Corporate Service Work stream to establish the Research and Innovation Service in advance of vesting day, is created.**
>
> **This work stream should build on existing best practice and service models to bring together the existing functions within PHI and HS together and specify the Day 1 service. It should also draw on the existing documentation and proposals made by HS and PHI to identify the additional resources needed to implement fully the RIO as part of the Service.**
>
> **From Day 1, the RIO/RIS will need Director level leadership for PHS and the wider public health system in Scotland, the UK and internationally.**

5.2   The Knowledge Service

Given the gap which has been identified, there is a widespread stakeholder requirement to more actively support the implementation of evidence and knowledge into action, especially across the wider public health system. This is presumed to be based on an active knowledge function that provides a specialist public health knowledge service and supports access to the wider public health evidence and knowledge base.

At present the knowledge service arrangements between PHI and HS complement each other, reflecting health improvement, health protection, and health and social care management functions. The also, as part of the Knowledge Net arrangements have existing, collaborative links across knowledge services across Scotland.

From Day 1, subject to the establishment of effective IT systems to support the existing Knowledge Services (KS), it is anticipated that these would be able to continue to provide existing support for PHS. Such a service would encompass:

- Knowledge mobilisation services:
  - evidence search from scoping search to evidence summary;
  - current awareness, media monitoring and knowledge horizon scanning; and
  - knowledge, evidence, and information skills training.

- Knowledge resources and systems:
  - lending and document supply;
  - supporting public health archive arrangements;
  - knowledge and information management (advice and guidance (incl. copyright and advice about the peer-research and grey literature publishing);
  - knowledge governance advice and guidance;
  - knowledge document repository management.
  - bibliographic databases;

o print and electronic journals;
o books and e-books;
o reference management software;
o evidence review management software;
o the Discovery platform and library management system (Primo);
o OpenAthens administration system.

However, work undertaken as part of the LPHRAIE evidence gathering and stakeholder consultation suggests that a more ambitious, outward-facing service should be developed and its implementation could begin from Day 1. This would provide a service that was broader in its:

- ***coverage of subject areas***: health improvement; (health) inequalities; protecting human and planetary health; data science; service improvement and practice innovation; public health policy development and management; research methods and practice; and workforce development;

- *c**ollaboration within the wider Knowledge/Library Services in Scotland***: librarians with a remit for public health across NHS Scotland; librarians across the wider knowledge into action (K2A) network; librarians in public libraries; UK counterparts in Public Health England and Public Health Wales; and workforce training and development colleagues in PHS and across NHS Scotland;

- ***outreach to the public health workforce supporting the use knowledge:*** including the specialist public health workforce; the wider public health workforce, especially in the third sector, local government, and Integrated Joint Boards; researchers and practitioners in stakeholder organisations and via networks such as the Public Health Evidence Network; and

- ***support for capturing and sharing experiential knowledge:*** from the public, third sector organisations, practitioners, professionals, and managers.

The Day 1 service must also include a focus on building collaborative ways of working with the RIS to help lay foundations for SPHERIA.

In addition to these services in support of the wider Scottish public health system, from Day 1 the KS will also take its place in the wider networks that support knowledge services collaborations between health and social care agencies and professionals, the third sector and the wider public, alongside university academics and professional teaching staff. As part of this, the KS should be expected to develop appropriate collaborative arrangements with key organisations where mutual support and minimising unnecessary duplication can help sustain a "Once for Scotland" approach. Key to this would be relationships with knowledge service colleagues in agencies such as Healthcare Improvement Scotland's Directorate of Evidence, and the Improvement Services' Knowledge Hub, as well as

across national organisations, that can help create a national/local collaborative service that is not limited by organisational boundaries.

The SLWG envisages that the structure and management for the KS should be seen as part of a professional service that supports the work of PHS and the wider public health system. It is anticipated that existing PHI and HS staff involved in knowledge service functions would form the core of the KS staff, building on their existing knowledge, skills and expertise in the area. We would anticipate that the day-to-day operation of the KS would be managed by a senior knowledge services professional leading a team of qualified knowledge service professionals.

Given the close relationship between research, innovation and applied evidence, the SLWG considers that the overall leadership for the KS should come under the same Director responsible for leading the RIS.

SLWG Proposal

To support Day 1 knowledge service functions, it is recommended that a Corporate Service work stream to create the Knowledge Service is established in advance of vesting day to bring the existing functions of PHI and HS together and begin specifying the outward-focused Day 1 service.

Overall leadership within PHS for the KS should be provided by the same Director responsible for leading the RIS

This work stream should also draw on the existing documentation and proposals made by HS and PHI to identify the additional resources needed to implement the more ambitious Knowledge Service fully.

5.3   Information Governance

The requirement for a Day 1 Information Governance (IG) function has already been articulated in the Underpinning Data and Intelligence Commission.[10] Given the different roles that PHI and HS have had, it is unsurprising that there has been differential development in IG teams.

The legal basis for information governance (IG) applicable to PHS is set out in statute and may be subject to further amendment in through the legislation establishing the organisation. However, in creating an effective IG function for the organisation, there is also a need to ensure that it is able to support several of the activities provided by the RIS in supporting research and innovation. These will include, but not be limited to:

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[10] Final Report awaiting publication. For availability contact https://publichealthreform.scot/contact-us

- Caldicott Guardian functions;
- Child Health Index Guardian and oversight of national unique identifier functions;
- the operation of the Public Benefit and Privacy Panel;
- data protection functions (including data controller responsibilities);
- Authorisation and management of data sharing and data use protocols;
- Inquiries Act responsibility;
- Authorised person for accessing primary care contractor data;
- Authorised person for accessing National Records of Scotland and NHS Central Register data;
- Freedom of Information requirements;
- Access to records;
- Oversight of data vault and archiving functions; and
- Oversight of data access for regulatory functions.

The establishment of PHS presents an opportunity to develop a Caldicott and IG function that will enable and facilitate intelligence-led public health and support the ambitions of Scotland's Digital Health and Care Strategy.[2] The final organisational structure and relationships need to facilitate alignment between the work of the Directors and their teams. There should be sufficient joint training and working to ensure effective alignment to the work of the RIS without compromising the separation of functions between IG and the RIS (e.g. in the operation and oversight of eDRIS).

> **SLWG Proposal**
>
> **To support Day 1 RIS / RIO functions, it is recommended that any development of IG functions is undertaken in a manner that provides essential continuity of services.**
>
> **Future developments need to ensure that IG functions remain closely aligned to the RIS, without compromising the essential separation between research activities and research and information governance.**
>
> **As an organisation that is innovative, PHS should be a leader, and seek opportunities, for public health collaboration with the leads of Scotland's Digital Health and Care Strategy.**

6 Future Leadership for Research, Innovation and Applied Evidence

The vision for PHS in regard to leadership for public health research, innovation and applied evidence was outlined in section 3. In responding to this vision, the SLWG has proposed the development of the creation of SPHERIA in section 4. To deliver this

essential leadership function, the SLWG acknowledges that there will be a need to put in place a series of necessary 'must do' developments in regard to the Day 1 services in RIS and KA, alongside a number of organisational developments that will all feed into SPHERIA.

Leadership for the development of these plans and the creation of SPHERIA needs to be made the responsibility of the Director responsible for these services. The SLWG considers that the development of these plans should be undertaken within the first six to nine months of PHS becoming operational, allowing for implementation of the additional functions within 2019/20 where there are no revenue implications, and from 2020/21 where new financial resources require agreement and allocation.

In particular, there is a need for:

1   the further development of RIS/RIO to support the wider public health system more fully;
2   the further development of KS to support the wider public health system more fully;
3   developing the research and knowledge capabilities of the public health workforce;
4   exerting strategic influence for public health research, innovation and applied evidence;
5   developing and implementing the digital delivery platforms for PHS in research and innovation and knowledge services; and
6   implementing SPHERIA.

6.1   Developing the Research and Innovation Service in PHS

As noted above (see section 5.1), it is not expected that the RIS and its RIO will be able to provide the full range of services necessary to achieve the ambitious stakeholder vision for leadership in research and innovation.

To achieve this vision, the SLWG had already identified that the RIS (and the RIO which supports it) should be a key function of PHS and needs to be led by a Director at the PHS Board and made accountable to them for the delivery of SPHERIA and its supporting services.

The Director and the RIS shall be tasked with creating a plan that identifies the ways in which PHS will:

- develop **PHS as a research and innovation organisation** – PHS is expected by its stakeholders to be an organisation that is active in research. Such activities should encompass, but not be limited to, the national public health priorities and the WHO essential public health research operations;
- create a **PHS Research and Innovation Strategic Action Plan**, extending the work of former PHI (Information and Services Division and Health Protection Scotland) and HS research and innovation activities and developing visible PHS leadership, **building collaborations and partnerships** with key stakeholders including: academia, the

NHS; local authorities; the third sector; Scottish Government (including Chief Scientist Office); health research funders; and industry across the UK and internationally;

- develop approaches to ***engaging the public in public health research*** and encouraging the public understanding of public health;
- ***enhance the work of the RIO*** to:
    - support research and innovation (R&I) activities within PHS;
    - widen project monitoring and research governance for R&I activities;
    - assess the impact of R&I activities by PHS and of its staff working in R&I collaborations;
    - support SPHERIA by:
        - mapping R&I networks and collaborators/potential collaborators across Scotland and beyond;
        - identifying R&I funding calls/deadlines/collaboration opportunities; and
        - enhancing access to PHS R&I evidence and research outputs by maintaining the PHS knowledge repository;
    - horizon scanning for R&I;
- develop an approach, building on HS's ***research commissioning work for PHS*** to be a funder of R&I activities that augment existing research funding by governmental and third sector bodies, especially where PHS research funding could be used to leverage partnerships with academic/industrial stakeholders (e.g. via matched funding models); and
- ***develop research support functions*** by:
    - enhancing PHS research collaboration support alongside eDRIS infrastructure support;
    - exploring the future of the PHI led Scottish Clinical Trials Research Unit in the context of the wider capacity of other four Clinical Trials Units (CTU) in Scotland to ensure that the RIS facilitates a more co-ordinated approach between CTUs in developing and delivering public health trials and evaluations that add value and avoid duplication;
    - developing R&I support for undertaking complex and realistic evaluation studies for public health and policy evaluation using routine and linked datasets;
    - developing R&I capacity for undertaking population health surveys; and
    - consolidating expertise in supporting register- based epidemiological research

In developing these plans, the Director and the RIS must be clear how this work will create a research design service, delivered as part of SPHERIA that would include both research design and brokerage of research partnerships for a wide range of organisations and academic units to undertake focussed public health research.

> **SLWG Proposal**
>
> **The Director and the RIS should be charged with creating specific development plans for the RIS within the first six to nine months of PHS becoming operational.**

These plans must articulate the ways in which the work of the RIS will contribute to SPHERIA.

Implementation of this plan should be started in 2019/20 and – subject to necessary funding – completed in 2020/21.

6.2   Developing the Knowledge Service in PHS

As with the RIS, the responsible Director and the KS should be charged, over a six to nine month period, with creating a specific development plan for the KS to sustain the PHS contribution to, and wider leadership for, knowledge mobilisation for public health in Scotland.

LPHRIAE stakeholders explicitly required PHS to become a major focus for creating and supplying high quality public health evidence that could underpin Knowledge into Action (K2A) processes. The KS should provide the means by which PHS can bring together and manage evidence and knowledge for application, including knowledge from data, from research, and from real world experiences. The KS must support active knowledge mobilisation, facilitating the availability of evidence that can be translated into the types of knowledge that supporting decisions and actions for public health benefit across Scotland. The scope of the work to support K2A activities should be fully cross-sectoral and transdisciplinary in nature, supporting translation of knowledge into action for citizens and staff beyond the NHS into local authority, wider public and third sector and community settings.

As a creator of evidence, key activities of PHS which can inform K2A activities will be sources across PHS. This will require the KS to develop plans that harness all this activity and allow them to manage and collate such evidence for mobilisation. This will include:

- *Knowledge from data* – created and curated by PHS data and intelligence functions to:
  - identify, link, anonymise and publish datasets;
  - assure data quality;
  - assure adherence to information governance and information security standards;
  - deploy data processing tools to generate insights and intelligence from data. This includes classic statistical methodologies as well as newer methods such as machine learning, neural networks and Natural Language Processing;
  - using the power of new technology to capture and analyse real-world data. This includes new evidence generated from clinical practice data, administrative data, patient-generated/reported data, and emerging data sources including social media, and complements traditional clinical trial knowledge; and
  - analyse, interpret, summarise and present data to support decision-makers in all sectors.

- ***Knowledge from research*** – created by PHS itself and in collaboration with others, curated by the RIS function to**:**
  - collaborate with partners to identify the research priorities that will deliver maximum impact on Scotland's public health and wellbeing, including where possible influencing the priorities of major research funders;
  - facilitate and support delivery of population health research, by PHS staff and by partners in academia, health, local authorities, third sector, and the wider community;
  - commission and manage delivery of research in population health, including a focus on applying new data science methodologies;
  - promote use of robust evaluation methodologies among partners, to continuously build the evidence base for real-life impact of public health activity; and
  - facilitate development of research and evaluation networks involving partners from across sectors who are (a) delivering research on shared priorities, and (b) developing new qualitative and quantitative research methodologies.

- ***Knowledge from real world practice and experience*** – created and curated by PHS itself and in collaboration with other national and local agencies to harness experiential knowledge from citizens, from practitioners and managers to:
  - promote and support methods that capture and exchange personal and tacit knowledge. These often involve facilitating new connections among people – including between practitioners and service users, and between users and generators of research. Potential methods include communities of practice, educational detailing, storytelling, case studies, health literacy techniques; and
  - facilitate support for PHS itself and public health professionals and practitioners generally to develop expertise in combining different types of knowledge (from research, from evaluation, from lived experience and from practice experience) to create and embed a culture leading to greater understanding and better action.

These will require that the KS, working in partnership with colleagues across the Scottish public health system, develops the plans for, and capacity to, deliver a range of activities including:

- library and information science methods for organising public health knowledge for easy retrieval. This should include delivery through a public health digital knowledge portal;
- collation and organisation of peer review published and grey literature produced by PHS in a shared organisational repository, to capture knowledge generated from research and innovation, evaluation, and experience of PHS staff and citizens;
- building trust in, and methods for, the capture and transfer of experiential knowledge from members of the public, practitioners and managers from all sectors. This will include working with the RIS to engage stakeholders from the earliest stages of prioritisation and design of new research to delivery and post-implementation;

- design and deliver actionable knowledge products that synthesise and summarise relevant knowledge and communicate it in a format that supports decision-makers to quickly grasp the salient points and decide on the course of action; and
- developing strong skills in identifying, using and sharing knowledge and building the skills of others to ensure effective knowledge into action.

An essential outcome for the development plans will be the clear articulation of how these functions will support the overall work of SPHERIA as the hub of engagement for knowledge and applied evidence.

The Commission's stakeholders were clear that PHS needed to develop processes to sustain proactive outreach and support for K2A work with Integration Joint Boards, local authorities, third sector, NHS Boards and other public sector bodies. Developing over time a Knowledge Implementation Support Team (KIST) approach, supported by the KS and, in due course, SPHERIA, would include training or other support to public-health decision-makers (public and third sector) to build skills in using actionable knowledge to make decisions, develop policy, enhance practice, and to improve health outcomes. In proposing the development of KIST, the SLWG is aware of the need to ensure that the support they offer effectively balances the strategic aims of PHS in regard of research, innovation and applied evidence with meeting local K2A needs.

SLWG Proposal

Drawing on the work of the LPHRIAE Commission, the Director and the KS should be charged with creating specific development plans for the KS within the first six to nine months of PHS becoming operational. These plans must articulate the ways in which the work of the KS will support K2A activities across the public health system and how these will contribute to the work of SPHERIA.

Consideration should be given to developing a Knowledge Implementation Support Team (KIST) approach as part of knowledge into action activities.

Implementation of this plan should be started in 2019/20 and – subject to necessary funding – completed in 2020/21.

6.3 Developing the research and knowledge capabilities of the public health workforce

All of the stakeholder events recognised that the public health system required increased research and knowledge literacy and that PHS should support the necessary capacity building for staff within and beyond PHS. Clearly, this is being covered more fully in the Public Health Reform Commissions on the Specialist Workforce and the Wider Workforce; however, it is appropriate to rehearse the key themes for developing the research and knowledge skills and competencies here.

Ensuring that PHS develops a culture that embeds research, evaluation, and the application of evidence throughout the organisation's activities, and therefore supports research capacity and competence across the public health system, will be central. To do this, it is clear that PHS staff should be encouraged and supported to undertake and collaborate in such activities as part of their continuing professional development. Managing such joint working in a strategic and co-ordinated way that helps deliver on public health priorities and any future strategic plan for research/innovation/applied evidence will be needed and should be supported by the RIO to:

- ensure that time for research, evaluation, and applied evidence is an integral **part of job planning** for PHS staff;
- **support secondments, joint posts, and joint PhD studentships** between PHS and wider partners, which are open to a range of staff groups across the public health system;
- facilitate shorter-term, 'immersive' links such as **shadowing and 'embedding'**, to promote exchange of ideas, insights and skills between partners across the public health system;
- **create, sustain and retain** a workforce with skills in public health research, evaluation, and applied evidence (including collaboration, co-production, and knowledge exchange); and
- **develop and support specific career pathways** for those who wish to pursue a focus on public health research, evaluation, and applied evidence, particularly where there are capacity gaps in the public health science workforce (such as evaluation, knowledge synthesis, informatics, and the mobilisation and use of evidence to inform policy and practice).

In addition to career development for its own staff, PHS should be a provider of training for research and knowledge competences across the public health system. In developing this strand of work, PHS will need to:

- undertake **training needs assessments** and using the results of these to inform the development, **provision, funding and/or specific commissioning of training** in particular methodological or topic areas, with a particular focus on ensuring attendance from across the public health system;
- **building links with existing processes/organisations** for professional development and education throughout the public health system, in order to identify training needs and support capacity-building. This includes **working with institutes of further/higher education (FE/HE)** to integrate public health learning opportunities into a broad range of disciplines relevant to the health of the public;
- developing **and delivering research and K2A literacy and training for professionals, practitioners, and policy makers across the wider public health system**, tailored to their existing capacities/strengths and to their needs;

- developing further the current *"communities of interest" approaches* to knowledge sharing for public health; and
- *contributing to SPHERIA* as a means of providing access to training and support services that build capacity on a shared basis (e.g. evaluability assessment, public health economics, complex systems thinking).

As noted above, one of the areas for RIS development is the need to create approaches to the Public Understanding of Public Health. Linked to this is the notion that PHS should be keen to develop, over time, an approach to greater public involvement in its research and knowledge activities and the use of citizen science as part of its work. The SLWG felt this was an area to which serious consideration be given as establishing a programme would mean that PHS had:

- access to additional local expertise and perspectives, helping to empower local communities;
- help in building a greater insight and understanding into the needs of the public, particularly for people who are members of currently underserved groups;
- increased knowledge and understanding of what affects population health and how it can be improved; and
- mechanisms to provide people with a greater say in the setting of research priorities, the nature of the questions asked and the range of methods used.

There is an important read-across to the Workforce Domain of the Digital Health and Care Strategy, which includes developing workforce skills in using new technologies to access, understand and apply knowledge from data, research and experience. It also has a focus on developing specialist skills in a range of areas for application in public health practice, including improvement science, individual and organisational behavioural science, and data science.

SLWG Proposal

The Director, the RIS and KS, working with the workforce function in PHS, should be charged with creating specific development plans to enhance research and knowledge capabilities across the public health system. These should build on existing Day 1 functions, and clearly state the way in which such activities will contribute to the SPHERIA hub.

The plans also need to be developed in the first six to nine months of PHS becoming operational, with Implementation starting in 2019/20 and – subject to necessary funding – completed in 2020/21.

6.4 Exerting strategic influence for public health research, innovation and applied evidence

All of the Commission's stakeholders expressed the view that PHS should be a strategic influencer and advocate for public health research, innovation and applied evidence. This was echoed in discussions between the SLWG, representatives from the UK National Institutes of Health Research Public Health Programme, and from the UK Strategic Coordinating Body for Health of the Public Research which was set up to implement the Health of the Public 2040 strategy.

The SLWG considers that to be a strategic influencer, PHS will need to have its own clearly articulated strategic vision for research and innovation and for knowledge mobilisation. This should be a core responsibility for the Director of RIS and KS.

A strategic vision would include, but not be limited to, how the organisation will exercise strategic influence on public health research and knowledge application by:

- **building on existing work with the Chief Scientist's Office** to become an authoritative source of advice on public health research for action;
- **working with the wide range of institutions** involved in the delivery of public health, and with the public to identify and prioritise research needs;
- providing a description of, and projections for, the need for public health research capacity and capability building and options for **meeting those needs for organisations involved in education, training and career development** (including PHS);
- developing a strongly evidenced case to research funders and the research community for **identified research priorities based on the importance**, need and potential impact on public health policy and practice of research in specific topic areas;
- **working with Scottish academic funding organisations and the Scottish representatives on research funders' advisory boards,** or having direct representation on those boards to support the case for research in specific topic areas;
- **developing research-ready accessible datasets** or other infrastructure that can support research in areas of research need;
- helping **shape and actively participating in a UK network of public health research hubs** of engagement;
- **working with researchers and through public, patient and professional involvement approaches to help design and create research** grant applications in areas of identified need and to deliver successful research awards, maximising the utility and translation of the findings; and
- drawing together and synthesising separate research studies and other data and analyses in order to **provide authoritative and useable conclusions and interpretations that can inform and guide public health policy and practice and the future research agenda.**

Developing such strategic influence requires that PHS maintains an independence of voice in its interpretation of evidence and how it should be applied. This is critical and was

clearly articulated by the Commission's stakeholders as a necessary basis for the evidential authority, credibility and influence that they wanted from PHS.

SLWG Proposal

Scottish stakeholders expect PHS to exercise strong, strategic influence in the creation of research and evidence for application. Across the UK there is a genuine keenness for PHS to provide UK-wide leadership in developing research collaborations and influencing research programmes.

The Director responsible for the RIS and KS should be required develop a strategic vision for PHS relating to research, innovation and applied evidence within the first six months of the organisation becoming operational.

The Director responsible for the RIS and KS should be required to report to the PHS Board on the delivery of its strategic vision and the impact that the organisation is having across the public health system in Scotland, the UK and internationally.

6.5 Developing and implementing digital delivery platforms for PHS research and innovation and knowledge functions

Digital delivery is changing the way in which research evidence and knowledge for implementation is managed and disseminated. It also facilitates a coherent approach to deploying technology across all aspects of getting knowledge into action for policy development and practice chance. Developing a "digital first" approach to sustain these activities will maximise synergies between the PHS approach and key elements of the Digital Health and Care Strategy – including the National Digital Platform to improve access to and re-use of high quality healthcare data; information assurance; knowledge mobilisation and decision support.

Innovation in research and applied evidence to support public health practice has also been identified as essential by wider LPHRIAE stakeholders. A digital delivery platform to support work relating to research and evidence application was seen as a major requirement for PHS. Existing work within the overall corporate development projects has focussed on Data Science, though this work recognises that innovation in technological application for data and intelligence is not the only form of innovation which is required.

The SLWG proposes that PHS takes the lead in establishing IT systems that can support the work of the RIS and KS. More ambitiously, PHS should create a new digital delivery platform to support the work of SPHERIA and provide it with a digital presence for Scotland, the UK, and internationally.

SLWG Proposal

The SLWG proposes that PHS develop new IT systems to support the work of the RIS and KS. Specific development plans should be created over a six to nine month period following PHS becoming operational.

To support the SPHERIA hub, it is also proposed that the Director and IT functions develop a specific development plan to create a single, digital portal through which PHS supports research and innovation and knowledge mobilisation across the public health system in Scotland. The development of this plan should be initiated in 2019/10, but is likely to de dependent on the creation of the SPHERIA hub.

Implementation of all IT systems should be a key component of the PHS Corporate IT plan.

6.6 Implementing SPHERIA

At the heart of these proposals, as noted in section 4, is the concept of SPHERIA as a hub that supports and sustains research and innovation activities and provides K2A support for all PHS stakeholders. The Commission's stakeholders recognised the importance of using such an approach to establish links across the broad range of sectors to help build new relationships between researchers and policymakers, especially in local authorities and the third sector, to create a culture for effectively translating evidence into local policy and practice.

The Director responsible for the RIS and KS must be charged with creating a development and implementation plan for SPHERIA. This plan must build on the Day 1 RIS and KS functions, the enhanced research and innovation functions and knowledge mobilisation functions; and on the new opportunities created for workforce training and competency building, to identify the additional resources needed to staff and run the new Hub.

Alongside this, the SLWG expects that as SPHERIA is implemented, work on finalising the digital delivery platform to support its work will also be put into the PHS IT development plans.

SLWG Proposal

The Director should be charged with creating a specific development and implementation plan for SPHERIA. This will build on all the earlier proposals made by the SLWG and identify the necessary additional resources to make SPHERIA operational.
This plan should be created over a six to nine month period following PHS becoming operational and take into account the other development plans identified for supporting RIS, KS and workforce functions.

Implementation of SPHERIA should completed by the end of 2020/21.

7   Conclusion

The LPHRIAE Commission was set the task of developing proposals that would allow the development of a public health system in Scotland that is fit for purpose and where:

- actions and interventions (national, regional and local) are informed by the best possible public health intelligence with strong connections into the research and evidence functions;
- health is improved as decisions move to preventative measures based on strong research evidence and data;
- collaboration is strengthened between multiple academic disciplines, practitioners, and policy-makers across the NHS, local government and the public, whose diversity of knowledge, experience, and perspectives maximise the potential for scientific and translational innovation and impact.

The SLWG considers that by creating SPHERIA and implementing the proposals set out in this report which create services that can support and sustain its operation, PHS will be an organisation that successfully fulfils these elements of the Public Health Reform Blueprint, creating new and ambitious leadership for public health research, innovation and applied evidence in order to meet the complex challenges confronting health systems in the 21st century.

8 Appendices

Appendix 1: Membership of SLWG

David Hunter	Independent Chair	
Alison McCallum	Director of Public Health	NHS Lothian
Andrew Fraser	Director of Public Health Science, Chair Scottish Directors of Public Health	NHS Health Scotland
Ann Conacher	ScotPHN Manager	ScotPHN
Ann Wales	Programme Manager, Knowledge and Decision Support	Scottish Government
Emily Tweed	Clinical Lecturer in Public Health, StR in Public Health nominee	University of Glasgow
Gerard McCormack	Interim Head of Change & Partnership Delivery	Improvement Service
Harry Campbell	Usher Institute of Population health Sciences & Informatics	University of Edinburgh
Laurence Moore	MRC/CSO Social and Public Health Sciences Unit	University of Glasgow
Mahmood Adil	Medical Director, Public Health & Intelligence	NHS National Services Scotland
Penni Rocks	Governance and Technical Assurance Lead	Scottish Government
Phil Mackie	Head of Knowledge & Research Services, Lead Consultant in Public Health	NHS Health Scotland, ScotPHN
Steven Marwick	Director	Evaluation Support Scotland
Tom Barlow	Senior Research Manager, Chief Scientist Office	Scottish Government

Appendix 2:

Key Messages from the Public Health Reform 'Design' Commissions

**Improving Health Commission –
The Future State of Improving Health**

Commission Aspiration	Implications for LPHRIAE
"The data and evidence that underpins our understanding of the SEE determinants of health and multi-level interventions must be improved and developed… The approach to knowledge generation also needs to develop. For example, research needs to be conducted in a way that local partners own the findings. It needs to include a focus on creating a shared understanding of what needs to be done by respective partners, including the community and voluntary sector." (Pg. 6)	• Need for a Knowledge Service to support a shared understanding amongst a wide range of partners. • Need for a mechanism to generate research evidence which is owned (and applied) by others • Need for a mechanism that encourages/supports engagement of evidence users in research generation • Need for mechanisms that influence research strategy and delivery towards the determinants of health
"The greatest challenges that local systems face in tackling health challenges appear to be a lack of evidence of what works in terms of prevention and the constraints (both in system and in skill) in working collaboratively in order to focus efforts to achieve that prevention." (Pg. 10)	• Local decision makers need easier access to evidence of what works • Need for providing easily accessible evidence for action/actionable knowledge which is specific to partners • Need processes and resources that support collaboration, and training in collaborative skills
"We need to develop an approach that allows people to engage in meaningful health and health inequalities impact assessment for all governmental policy decisions liable to impact on health, gender and other socioeconomic inequalities and other social determinants of health." (Pg. 11)	• Across the widest group of stakeholders, meaningful health and health inequalities assessments need to be supported systemically.
"There are three aims or outcomes we are seeking to achieve: • *We all prioritise health as a human right* • *We take a Health in All Policies approach* • *We prioritise prevention and build community capacity." (Pg. 12)*	• Need for research and evidence that supports delivery in all three aims for: policy development and evaluation; innovation in practice and implementation; mobilisation of knowledge for specific application. • Need to directly support and influence the development of a research and knowledge system that can fulfil these aims. • Need for mechanisms that can support

	• PHS and partner evaluation of impact (outcome assessment)
• *"Identify actions (both policy/ legislation and practice and national/local) that are most likely to be effective (including cost effective) in improving health and reducing health inequalities in a Scottish context." (Pg. 13)*	• This requires evaluation of what is implemented in Scotland, currently as well as new innovation, as well as literature based. It related to evidence on intervention/policy effectiveness rather than data
Taking this approach also means we can evaluate the impact of policies and services in order to continuously improve the evidence for our decisions. *The role of the Improving Health domain in this regard should include:* • *Identify the policy areas that will have the greatest impact on the social, economic and environmental determinants of health.* • *Provide public policy makers with the tools and support to systematically consider the positive and negative health impacts of their policy (including policy in housing, education, employment, social support, environment and so on)* • *Identify actions (both policy/ legislation and practice and national/local) that are most likely to be effective (including cost effective) in improving health and reducing health inequalities in a Scottish context.* • *Monitor and evaluate the impacts of policies and services in order to continuously improve the evidence for decisions. (Pg. 13)*	• Need for an ongoing process to identify key priorities, assess current practice as well as innovation, identify most promising approaches from wider evidence base
"The role of the Improving Health domain in this regard should include: • *Demonstrate through modelling, data and intelligence, the long term benefits (both financial and health) of a preventive approach. (Pg.14)*	• PHS or wider system needs to develop modelling capability and to demonstrate to wider stakeholders the value of investing in upstream action to improve health and reduce inequality
"Broadly speaking, our proposition is that the Improving Health domain operates at the 'Into Action' end of the Knowledge into Action model of public health. We believe	• Need for a Knowledge Service to support PHS staff involved in the "into action" elements of Improving Health. • Need for research and evidence that

this implies that research, data and evidence analysis is supplied by the Underpinning Data and Intelligence Domain or related functions (5.2.2). The interdependence between domains is critical, for example, to ensure that sufficient priority and resource is given to generating the most useful evidence in the most useful and timely way. It also implies a level of cross-over of staff between the domains, for example, when the 'Into Action' delivery of knowledge is best carried out by a person or persons who has been involved in the generation of that knowledge." (Pg. 15)	supports delivery in all there aims for: policy development and evaluation; innovation in practice and implementation; mobilisation of knowledge for specific application. • Need for providing easily accessible evidence for action / actionable knowledge which is specific to partners • Need for work to support the development of skills necessary for PHS delivery and for collaboration • Need to co-ordinate and work across these two domains to bridge potential gap
Prioritising, Evaluation and Impact (5.2.4): This is described in Appendix 1 as *"a single clearing-house for prioritising and decision-making on what work is to be done. We propose that this is core and central to all the domains of Public Health Scotland and drives the coordinated delivery of work to achieve the Public Health Priorities, by providing a mechanism that holds partners across the whole system to account for their actions to improve health and reduce health inequalities." (Pg. 15)*	• Need for a whole system clearing house to prioritise actions based on Public Health Priorities and evidence of effectiveness/impact. • If such a body had 'power', then it would be critical in providing leadership in evidence/research based practice across system • The critical function of evaluation, synthesis and identifying priority actions and policies to be implemented across system is needed, yet may not be covered by IH and DI domains
"Lead and support the delivery of actions to influence policy/practice at an international, national, regional and local level." (Pg. 16)	• Need for a Knowledge Service to support the application of: *"Evidence on and knowledge of:* o *Housing* o *Education (lifelong learning)* o *Transport* o *Income & access to fair work* o *Environment, climate change and sustainability agenda* o *Planning & access to facilities e.g. quality open space* o *Licensing (e.g. food, alcohol, gambling)* o *The right to health* o *International health policy* *Skills in:* o *Knowledge management & translation" (Pg. 16)*
"Identify effective/ ineffective practice and promote shared learning" (Pg. 17)	• Need for Research and Knowledge Services to support the acquisition,

	maintenance and application of research and knowledge: *"Skills in:* • *Knowledge translation* • *Effective knowledge management system – national and local- access to stakeholders as well as public health system* • *Evaluation skills" (Pg. 17)*
"Identify and share ways for the health improvement system to continually improve… Understand and keep up to date with emerging quality improvement literature" (Pg. 17)	• Need for a Knowledge Service to support such activities in a consistent manner. • Need for ongoing evaluation and evaluability assessment to be built into innovation
"Identify the causes of poor health and health inequalities o *Access and appraise evidence and knowledge gained through systematic methods and through engagement with the wider research community, practitioners and service users* o *Critique published and unpublished research, synthesise the evidence and knowledge and draw appropriate conclusions* o *Design, conduct and commission research based on current best practice." (Pg. 18)* *"Measure, monitor and report population health and wellbeing and the causes of poor health and inequalities." (Pg. 18)*	• Need for a Knowledge Service to support such activities in a consistent manner. • Or is it that a Knowledge Service needs to deliver these activities, if the IH domain isn't doing this? • Need for a Research Office and a knowledge service to support: Skills in: o *"Research commissioning* o *Evidence for action" (Pg. 18)* • Need to provide research governance and knowledge governance arrangements
"Identify actions (both policy/ legislation and practice and national/local) that are most likely to be effective (including cost effective) in improving health and reducing health inequalities in a Scottish context. o *Access and appraise evidence and knowledge gained through systematic methods and through engagement with the wider research community, practitioners and service users* o *Critique published and unpublished research, synthesise the evidence and knowledge and draw appropriate conclusions* o *Design, conduct and commission*	• Need for Research and Knowledge Services to deliver / support the acquisition, maintenance and application of research and knowledge: *"Skills in:* o *Knowledge management* o *Research commissioning* o *Evidence for action" (Pg. 19)*

research based on current best practice." (Pg. 19)	

"Identify gaps in understanding and commission relevant research.
 	
This requires both quantitative and qualitative methods using a range of different study designs and needs close collaboration with research and academia.
○ *Identify evidence and knowledge gaps that could be addressed through relevant research*
○ *Design, conduct, commission and manage public health research based on current best practice." (Pg. 20)*
	• Need for the proposed research and innovation "hub of engagement"
	• Need for PHS to be co-producing and influencing Scottish and UK research strategy.
	• Need for Research and Knowledge services to support the acquisition, maintenance and application of research and knowledge: *"Skills in:*
	  • *Knowledge management*
	  • *Research commissioning*
	  • *Evidence for action*
	  • *etc." (Pg. 20)*

"Public Health Scotland needs to have the authority and mechanisms to support partners across the whole system to hold each other to account for the effective implementation of policy that works to tackle the determinants of health and the disinvestment from what does not work. It requires a function that keeps the whole organisation and the whole system focused on its mission and focused on the Public Health Priorities. We propose a central unit of some sort which, through evaluation and impact, maintains a focus on how policies and systems in Scotland are working at national and local level and how decisions are impacting on health gain. The 'unit' would connect closely with the Innovation Cycle proposed by Brendan Faulds and it would be closely linked to the organisation's governance structures. 'Membership' of the 'team' should extend beyond the organisational boundaries of Public Health Scotland, as a very direct way of bringing in whole system knowledge and accountability." (Pg.22)	• Need for joint membership of partners across the system and can therefore hold system members to account. • Need for a hub of engagement as a more co-productive way of introducing explicit co-working across partners in the system
"Main functions, tasks, skills and knowledge required for health improvement (drawing from the Public Health Skills and Knowledge Framework)" (Pg. 29)	• Need to recognise that **all** the research and knowledge requirements set out in this functional statement presume there is an effective research, innovation and knowledge function in place to support and sustain delivery.
Not included	• Need to include research, innovation

	and applied evidence functions are essential, transitional requirements (c.f. Appendix 2) • Need for PHS to become transformational in its activities. • Need to acknowledge the wider public health landscape in improving health activities and how they can support research and knowledge generation.

Improving Services Commission –
Ensuring appropriate, effective & high quality health and social care services:
Current and future state

Commission Aspiration	Implications for LPHRIAE
"Stakeholder discussions suggested that better co-ordination is needed between organisations and structures developing and providing data, evidence and intelligence relevant to service improvement. This should focus on a Once for Scotland approach where possible, and ensure all types of evidence and expertise are accessible and relevant for maximizing population benefits of services." (Pg. 7)	• Need for a Knowledge Service to support a shared understanding amongst a wide range of partners. • Need for mechanisms that influence research strategy and delivery towards population service improvement. • Need for providing easily accessible evidence for action/actionable knowledge which is specific to partners • Need for work to support the development of skills necessary for application and collaboration. • Need better links/partnerships (if that's possible) with academic sector in order not to duplicate well established resource functions in academic sector.
"Public health roles in service improvement include drawing together evidence from a wide range of sources, setting up collaborations to interpret the evidence for a specific service and population context and agreeing recommendations for prioritisation and service design. There was a need expressed for more system support for disinvestment where evidence is clear." (Pg. 8)	• Need for Research and Knowledge Services to support the acquisition, maintenance and application of research and knowledge skills in: knowledge translation and application; effective knowledge management system – national and local – available to stakeholders across the public health system; improvement and evaluation skills, health economic skills.
"Knowledge sources for population integrated care to achieve system and service change include data and intelligence (including evidence from research), service user experiences and preferences, expert opinion and theory-based approaches. The application of population science to improving services is described in health and social care delivery plan as population-based planning, and in Realistic Medicine as a value-based population healthcare approach. " (Pg. 12)	• Need for a Knowledge Service to support PHS and wider staff involved in PIC approach. • Need for wider research and evidence that supports delivery in all there aims for: policy development and evaluation; innovation in practice; participatory research methods; user-led design and implementation; and mobilisation of knowledge for specific application. • Need for providing easily accessible evidence for action/actionable knowledge which is specific to partners.
"Capacity and skills o *Capacity created for PIC to map*	Need for Research and Knowledge services to support the acquisition,

sources of evidence relevant to population health gain through integrated care planning, and address duplications of provision and gaps in the evidence base o *Support for skills development where gaps are identified, including research and data analysis, economic analysis, innovation, user-led service design and partnership development* o *Greater focus on capacity and capability for translating knowledge into recommendations for action."* *(Pg. 13)*	maintenance and application of research and knowledge capacity and skills: o Knowledge management o Research and analytical skills o Knowledge/Evidence for action in policy and practice development etc.
"The main functions [of a PIC unit] would include: • *Delivering data and evidence analysis for national, regional and local population integrated health and social care initiatives* • *Providing research and knowledge services for support and co-ordination of access to a wide range of evidence sources* • *Providing capacity for stakeholder engagement and network development and facilitation* • *Supporting local specialists and practitioners to lead and deliver local integrated care planning projects and to collaborate on regional and national projects when required* • *Establishing partnerships and collaborations with other national bodies to collaborate on service improvement including HIS, NSS, Improvement Service, COSLA, NHS 24, NES and others. (Pg. 16)*	• Need to recognise that delivering these elements of the main functions presume that there are Research and Knowledge Services in place to support and sustain delivery. • Need for work to support the development of skills necessary for PHS to sustain PIC delivery via collaboration. • Need to include Knowledge and Research Services into partnerships and collaborations (in line with expectations from the Digital Health and Care Strategy for delivering Realistic Medicine and system improvement).
Not included	• Need to include research, innovation and applied evidence functions are essential, transitional requirements (Need for PHS to become transformational in its activities). • Need to acknowledge the wider public health landscape in PIC related work and PHS support staff in IJBs to be more research and knowledge literate

	and how they can then support research and knowledge generation.

Protecting Health Commission –
The current and proposed future state for the Protecting Health function

Commission Aspiration	Implications for LPHRIAE
"HPS and the SHPN have strong links across the Health Protection community, reaching well outside the health sector and intersecting with other Scottish organisations including academic bodies, UK and international agencies." (Pg. 4)	• Need to ensure PHS sustains and strengthens existing academic links between PHS staff and academic and other knowledge organizations.
"The Directorate will develop and advocate for Information Systems (IS) & Information Technology (IT) that helps to deliver an integrated Health Protection service across Scotland, compatible with systems within Scotland, in ways that are reportable nationally and internationally. It will work with experts in other areas, including other public health functions, communications specialists, digital enterprises and interests, academic centres to ensure applications and proper evaluation of new technologies and communication methods to Health Protection." (Pg. 5) *"The Health Protection function… will sustain strong linkages with NHS colleagues, research and public service collaborators, services that are vital supports to the public health system; and develop links in new areas of interest and joint purpose." (Pg. 5)*	• Need to ensure that mechanisms are in place to support Protecting Health engagement/collaboration on through research and innovation activities with academic institutions • Need for the proposed research and innovation "hub of engagement" • Need to ensure access to an effective data service; capacity of data modelling, capacity to maintain existing strong. international research and evidence links through individuals and via networks
"[The function will be] • *Open to horizon scanning and the need for change and evolution in the professional world…* • *Open to widening access to public health skills development." (Pg. 6)*	• Need for research and evidence culture that supports innovation in practice delivery as part of professional development for individuals and the workforce more generally across the PH Community. • Need for Research and Knowledge services to support the acquisition, maintenance and application of research and knowledge skills
"The health protection directorate of PHScotland should have clear and close	• Need to recognise that all the research and knowledge requirements set out in

links with the wider protecting health agenda. Key linkages should be made or strengthened with other domains or support services in PHScotland… The following functional areas will be important (not exhaustive) – international, research and innovation." (Pg. 7)	this functional statement presume there is an effective research, innovation and knowledge function in place to support and sustain delivery across sectors.
"The protecting health function of PHScotland supported by the health protection directorate should have clear and close links across the whole public health system. Key linkages should be made or strengthened with… academic institutions (various functions to include teaching, research, data science and innovation). " (Pg. 7)	• Need for close links/better integration with the proposed research and innovation "hub of engagement. • Need for work to support the development of skills necessary for PHS delivery and for collaboration.
"The recommendation for the structure is based on the need for a distinct health protection function… There will be a distinct HP Research and Innovation stream working in collaboration with organisation wide research endeavours."(Pg. 9)	• Need for close links with the Research Office to provide organisation wide co-ordination and collaboration. • Need to provide research governance and knowledge governance arrangements.
Not included	• Need for a Knowledge Service to support and maintain evidence practice within the protecting health function. • Need to include research, innovation and applied evidence functions are essential, transitional requirements (Need for PHS to become transformational in its activities. • Need to acknowledge the wider public health landscape in improving health activities and how they can support research and knowledge generation. • Need for clear links with Information Governance, data standards and protocols etc. • Need for clear MOUs with close partner organizations.

**Underpinning Data and Intelligence Commission –
Deliverable 5**

Commission Aspiration	Implications for LPHRIAE
"The ambition is for Scotland to be a world leader in improving the public's health. Public health reform will create a culture for health in Scotland that recognises the social and economic issues that affect health and creates environments that drive, enable and sustain healthy behaviours in our communities, supporting individuals take ownership of their own health where possible. The innovative use of knowledge, data and intelligence will be a key tool in achieving this." (Pg. 3) *"We have defined data as: the management and development of data to enable the production of facts and figures which are critical to evaluating public health outcomes. Linkage of fit for purpose data with metadata, using the whole range of public health information and evidence (including health, social care, education, housing data, etc.) enables decision making on a universal basis."* (Pg. 4) *"We have defined intelligence as: the surveillance and monitoring of population health and the determinants of health and wellbeing; support for evidence-based practice (or best available evidence if we don't have good quality published research); and assessment of the effectiveness of policies, programmes and services. All used to influence policy and practice or plan and target resources, and ultimately equitably improve the health of the people living in Scotland."* (Pg. 4)	• Need to recognise that all the data and intelligence/research and knowledge requirements set out in this functional statement presume there is an effective research, innovation and knowledge function place to support and sustain delivery and collaboration across the system. • Need for research and evidence that supports delivery in all there aims for: policy development and evaluation; innovation in practice and implementation; mobilisation of knowledge for specific application. • Need for providing easily accessible evidence for action/actionable knowledge which is specific to partners • Need for work to support the development of skills necessary for PHS delivery and for collaboration.
"Intended outcomes… key aspects: • *Information governance that ensures or allows data from across the whole system is used to maximum public benefit, whilst ensuring individual privacy is protected* • *Statistical governance that supports,*	• Need for both a Research Office and a Knowledge Service to support such activities in a consistent manner. • Need to provide integrated information governance, research governance and knowledge governance arrangements. • Need for research and evidence that

enables and promotes the credibility of PHS • *Health in All Policies (HiAP) in Scotland and interpretation of data and synthesis of evidence brought together.* • *Consistent application of effectiveness evidence within robust public health methods to inform policy and practice at all levels* • *Any innovation in policy or practice has evaluation built in at the design phase such that we can learn what works, for whom, and in what circumstances; leading to better informed policy and practice in the long-run and an evaluation culture in policymaking and amongst the public health workforce.* • *Research and innovation at the core of what PHS does." (Pg.5)*	supports delivery in all there aims for: policy development and evaluation; innovation in practice and implementation; mobilisation of knowledge for specific application.
"The key points from our current and future state functions document are: • *Being at the forefront of a data science approach using value added innovative approaches to data and intelligence* • *Enhanced training, skills and capability for the PHS workforce with cross-organisation sharing of knowledge and experience* • *Consistent application of knowledge into action (including identifying needs, effectiveness evidence, evaluation, shared learning) using robust public health methods to inform policy and practice at all levels." (Pg. 9)*	• Need to recognise that all the data and intelligence/research and knowledge requirements set out in this functional statement presume there is an effective research, innovation and knowledge function place to support and sustain delivery and collaboration across the system. • Need for Research and Knowledge Services to be in place to support delivery in all there aims for: policy development and evaluation; innovation in practice and implementation; mobilisation of knowledge for specific application. • Need for providing easily accessible evidence for action/actionable knowledge which is specific to partners • Need for work to support the development of skills necessary for PHS delivery and for collaboration.
"Further work will be required to fully define an outcomes based structure but the UDI commission is confident that the current (and aspired) work of ISD, HPS and Health Scotland can fit into this structure. The structure will encourage cross-directorate working (to prevent silo working) and focus the organisation on the primary vision of	• Need to recognise that **all** the research and knowledge requirements set out in this functional statement presume there is an effective research, innovation and knowledge function place to support and sustain delivery. • Need to recognise that the outcomes focussed approach may integrate PHS

public health reform." (Pg. 13)	working, it also has the potential to exclude wider stakeholder expectations in relation to supporting system-wide research collaboration and knowledge mobilisation.
Not included	• Need for a Research Service and a Knowledge Service to support and maintain evidence practice within the UDI function. • Need to describe better how knowledge mobilisation regionally and locally will be delivered (main stakeholder request). • Need to include research, innovation and applied evidence functions are essential, transitional requirements (Need for PHS to become transformational in its activities. • Need to acknowledge the wider public health landscape in public health activities and how they can support research and knowledge generation. • Need to ensure that that research and innovation is spread across the organisation (with a lead to push it forward and make links), and should not sit away in team on its own.

Appendix 3: Research and Innovation in Public Health Scotland: Scoping paper

This appendix can be viewed on the ScotPHN website.

Appendix 3: Research and Innovation in Public Health Scotland: Scoping paper