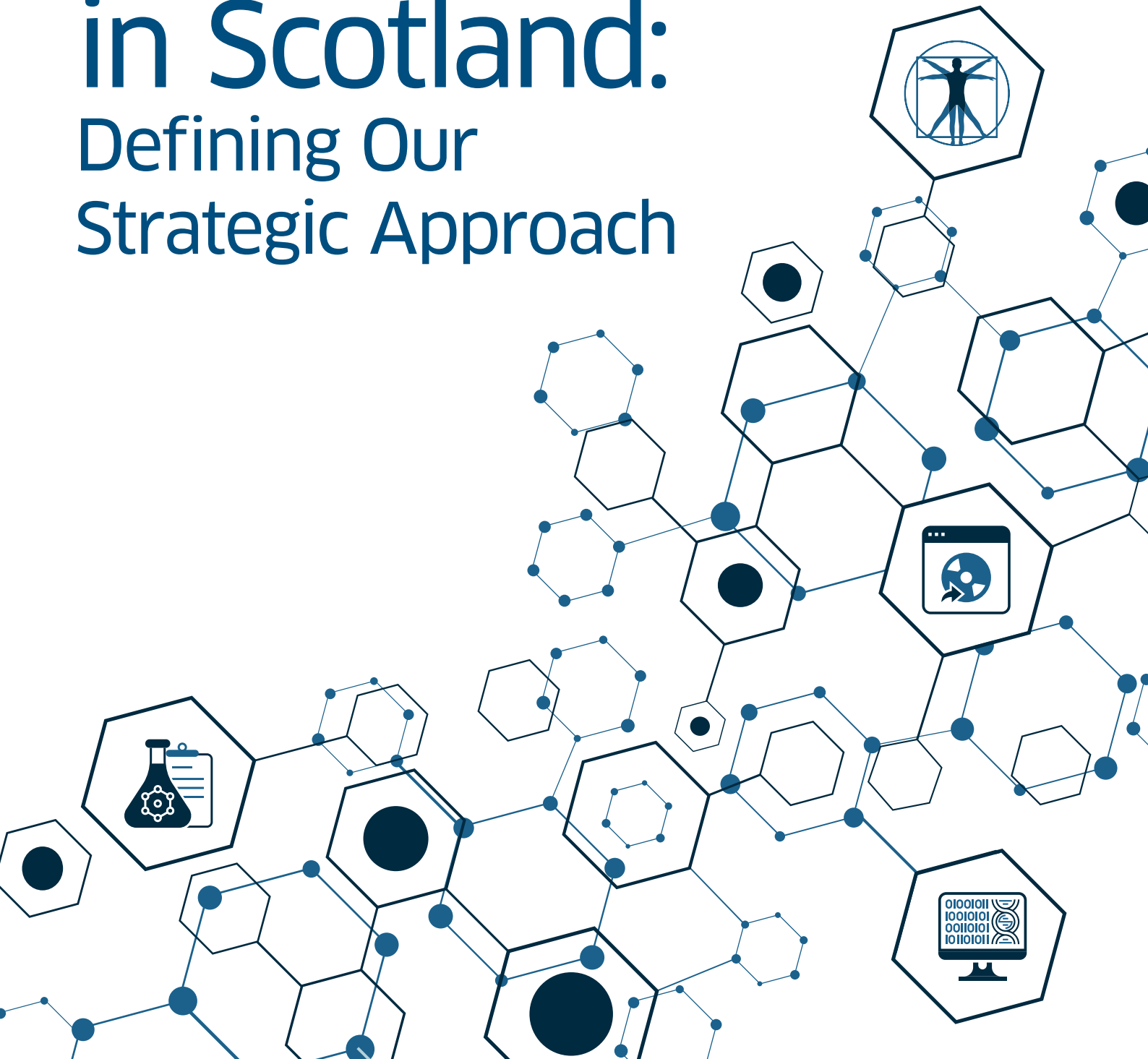


# Healthcare Science in Scotland: Defining Our Strategic Approach



# Ministerial Foreword



The Scottish Government absolutely recognises the critical role of healthcare scientists in the delivery of healthcare services in Scotland. This professional group offers unique contributions to help improve outcomes for patients across almost every area of our NHS.

This first paper in the '*Healthcare Science in Scotland*' series, sets out the strategic approach we will take to develop healthcare science in Scotland, which will help ensure that the profession is best placed to respond to the population health needs of the people of Scotland now and in the future.

Despite operating within an extremely difficult fiscal landscape, I am clear that the delivery of safe and effective healthcare is an absolute priority, and it is important that we do everything we can to ensure everyone in Scotland has equitable access to services which meet their needs.

It is important that we are ambitious in how we seek to improve and transform our public services to meet changing needs and demand. By fully realising and utilising the potential of healthcare science we have that opportunity to be that ambitious, and make meaningful change for the future.

A handwritten signature in blue ink that reads "Jenni Minto". The signature is written in a cursive style with a large initial 'J'.

**Jenni Minto MSP**  
Minister for Public Health and Women's Health

# The Chief Scientific Officer for Scotland



Science and the scientific workforce are critical to the delivery of an effective healthcare service. In Scotland, our scientific workforce is uniquely placed to use their skills across a range of areas to ensure the best possible outcomes for patients.

I am delighted to see the publication of this paper, which will act as the anchor to all of our future work within healthcare science in Scotland.

The strategic approach set out in this paper has been shaped by our workforce, and I would like to take the opportunity to thank colleagues across the country who took the time to share their views about healthcare science in Scotland.

Central to our future work will be supporting the development of the profession, whilst improving the visibility of the healthcare science workforce and more clearly articulating the valuable contribution they can make to the planning and delivery of services.

This work will position us to best meet the challenges of a complex financial landscape, alongside an increasing demand for services and difficulties in recruitment. Against such a background, it is absolutely critical to take this opportunity to realise the potential of healthcare science as we look at how we re-shape our NHS in Scotland so that it is fit for the future.

A handwritten signature in black ink that reads "Catherine Ross". The script is fluid and cursive.

**Professor Catherine Ross**  
Chief Scientific Officer – Scottish Government

# Introduction

## Defining Healthcare Science

Healthcare science is a distinct profession that utilises scientific, engineering and technological skills to improve the quality of care and health outcomes of patients across Scotland.

The healthcare scientists working in our NHS are clinical and scientific experts. In Scotland they are the fourth largest professional group working in the NHS and they lead clinical services in 54 distinct specialisms which fall under four broad streams; Life Sciences, Physiological Science, Physical Sciences and Clinical Engineering, and Bioinformatics and Data Science (figure 1 and figure 2).

These specialisms cover all areas of the patient pathway – from primary prevention through to rehabilitation services – with the workforce having an impact on 75% of the clinical decisions made throughout the patient journey and contributing to over 80% of all diagnostics.

Healthcare science is fundamental to the effective and safe delivery of healthcare and improved outcomes for patients. It is continually evolving and will continue to be critical to the delivery of health services in the future, as Scotland, and the rest of the world, responds to the need to reshape the way in which patient care is delivered.

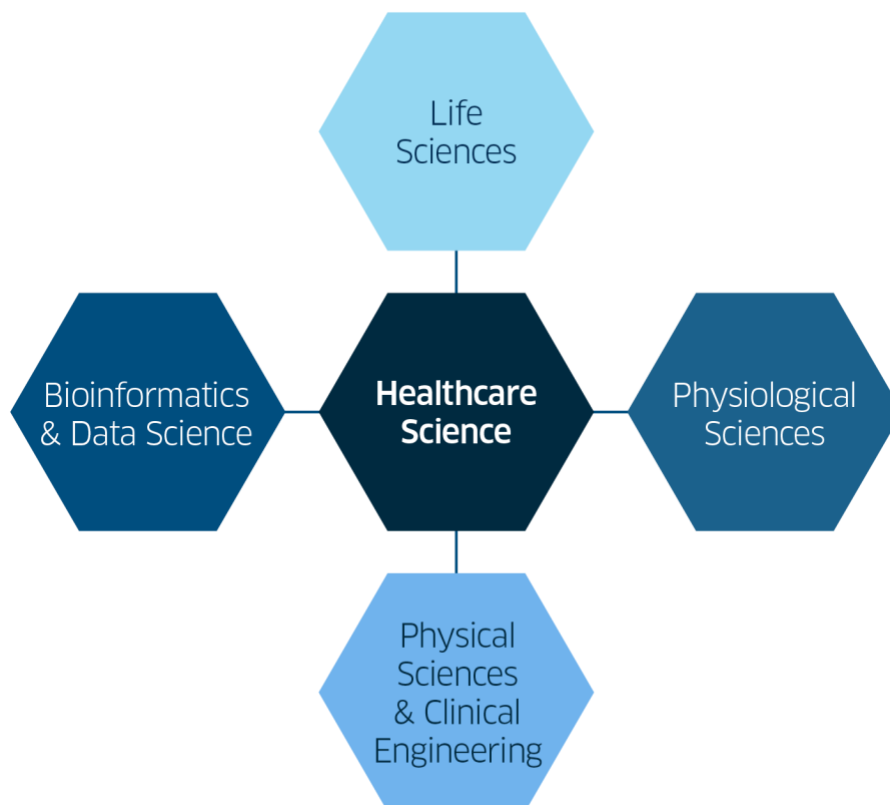
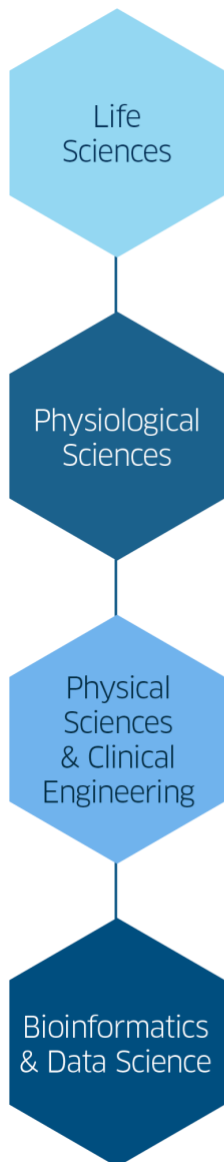


Figure 1



Healthcare scientists that work within life science specialties mainly include those specialisms based in laboratory environments within NHS Scotland undertaking a range of roles including carrying out investigations to assist in the diagnosis or treatment of patients.

Decontamination Science also forms part of life sciences. Staff working in these services are responsible for the cleaning, sterilisation and packaging of reusable medical devices that are used in surgery and operating theatres across a range of healthcare settings in Scotland.

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Those working within a physiology related area will have direct interaction with patients and will use highly complex equipment to investigate the different biological systems within the body. Healthcare scientists working in this area may also be involved in helping the patient manage their disease or be involved in the continual monitoring of a patient's condition.

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Healthcare scientists within the physical sciences will provide scientific advice and guidance to a range of people. They are responsible for the development of new techniques and technology to measure what is happening in the body and to diagnose and treat disease.

Clinical engineers undertake a range of roles including procurement, maintenance and operation of medical equipment.

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Clinical scientists working in this area of healthcare science are responsible for the development and improvement of methods for acquiring, storing, organising and analysing biological data.

Figure 2

## Healthcare Science in Scotland

In Scotland, approximately 7000 healthcare scientists working within the NHS are professionally led by the Chief Scientific Officer for Scotland, who is responsible for the strategic direction for healthcare science across the country.

At Health Board level in Scotland there are currently a limited number of Executive Scientific Directors for Healthcare Science, particularly within territorial Boards. Therefore, those working in the scientific specialisms generally fall under the overall clinical responsibility of either the Executive Medical Director or in some instances the Executive Nursing Director. This approach differs from other UK nations, who have dedicated Executive Directors, or their equivalents, representing healthcare science at the most senior level of decision making within Health Boards.

It is recognised that without dedicated scientific leadership within Health Boards there is an increased risk that the unique contribution that the scientific workforce can make is not considered to the extent it could be, during the planning and delivery of services.

Scotland, alongside countries worldwide, faces significant challenges in respect of the delivery of healthcare services both now and in the future. The recovery from the COVID-19 pandemic, increased service demand and a shrinking workforce are well known issues, and all sit within the context of an extremely difficult fiscal outlook.

There is an opportunity now, to build on previous work and harness the potential of healthcare science to help address these challenges, supporting the improvement of services across the NHS in Scotland and improving patient outcomes.

### Previous Work in Scotland:

The Scottish Government published its first healthcare science action plan in 2007. [\*Safe, Accurate and Effective: An action plan for healthcare science\*](#) focussed on raising the visibility of healthcare science by highlighting the contribution of the profession to improved patient outcomes.

The 2007 action plan set out recommendations to develop a foundation from which the profession could establish itself and to enable NHS Scotland to better utilise the scientific skills and knowledge of this part of the wider health workforce.

*Safe, Accurate and Effective* enabled healthcare science to establish itself as a profession in Scotland, and led to the development of healthcare science forums within Health Boards. Engagement at this level resulted in the increased awareness of the profession, with some evidence of collaboration and engagement with service providers and the development of patient care pathways.

As a direct output of *Safe, Accurate and Effective*, NHS Education for Scotland (NES) established a dedicated team to drive forward the development of leadership opportunities and support the development of healthcare science education. This resulted in activity such as the development of a quality assurance system to monitor

postgraduate education and the establishment of 'Practice Educators', who could be described as the first step towards more visible leaders in healthcare science within Boards.

In 2014, the [National Delivery Plan](#), built on the work of *Safe, Accurate and Effective* by introducing a series of deliverables and improvement programmes relevant to the three streams of healthcare science recognised at the time.

The *National Delivery Plan* progressed a series of service improvement programmes focussed on the delivery of patient care to enhance healthcare delivery. Programmes included the development of a physiologist-led 3D echo service; the implementation of Radio Frequency Identification tagging of medical equipment and the introduction of next generation sequencing of lymphoid malignancies in Scotland using a custom designed panel.

The ['Final Report' for the National Delivery Plan](#) outlined a range of actions to be considered in future, including education and workforce; workforce data and research, development and innovation.

A number of these actions have been incorporated into other workstreams within the Scottish Government and NES, and in October 2021, directed by the Chief Scientific Officer for Scotland, an education and workforce review was launched.

### Education and Workforce Review

The [National Workforce Strategy for Health and Social Care in Scotland](#) was published in March 2022. In this strategy, the Scottish Government committed to undertaking a healthcare science education scoping review.

Subsequently, the [Healthcare science - education and training provision: baseline review](#) was published in October 2022. This led to further engagement with stakeholders across Scotland, resulting in calls for a wider-reaching healthcare science strategy for Scotland.

### Strategic Connections

The unique characteristics of the healthcare science profession, and the breadth of specialties which sit as part of it, provide an opportunity to make connections across the health landscape and beyond in order to support future development and improvement in service delivery.

There are clear links with work happening in diagnostics and genomics for example, and there is a need to think creatively about enhancements in digital capabilities to align to work underneath [Scotland's digital health and care strategy](#), our [Health and social care data strategy](#), and our [Artificial intelligence strategy](#).

There is also a need for clearer demonstration of the positive economic impact of healthcare science on service delivery and patient outcomes.

# A Renewed Vision for Healthcare Science in Scotland

As previously described, work has been undertaken in the past to raise the visibility and understanding of the healthcare science profession in Scotland. This has led to successes, but it is recognised that more can be done to capitalise on the unique contribution that the scientific workforce can make to positive outcomes for patients across Scotland.

The impact of the scientific workforce was distinctly clear during the COVID-19 pandemic. Healthcare science specialisms adapted and led the delivery of essential services to support Scotland's response. For example, Clinical Scientists and Biomedical Scientists were critical in increasing the capacity for COVID-19 testing; clinical engineers were crucial in the roll out of critical care equipment, ensuring it was fit for purpose; clinical physiologists adapted to assist ward and ITU staff ventilating patients, and public health scientists were pivotal in the understanding of the virus.

The COVID-19 pandemic has underlined, more than ever before, the undeniable need for scientific skill and knowledge to be utilised more effectively in the planning and delivery of health services. Therefore, it is essential to set out a clear and robust vision for healthcare science in Scotland – which makes clear the importance of the profession, and its' role within a modern, future facing and science backed NHS Scotland.

*To ensure that the contribution of the healthcare science workforce to the health of the population is maximised and that the workforce is fully recognised and valued.*

**2024–2034 vision for healthcare science in Scotland**

This vision demonstrates the clear ambition to improve the outcomes of patients in Scotland, whilst addressing the central issue of ensuring that people know what healthcare science is, and understand the positive impacts the scientific workforce can make.

The vision also articulates the defining message that the Scottish Government wants to see healthcare science, and the scientific workforce, recognised within service planning to enable the NHS in Scotland to be more resilient and responsive to the changing needs around the delivery of services.

Despite the current financial context, which is extremely challenging, there is now an opportunity to maximise the potential of healthcare science in Scotland.



# Strategic Ambitions for Healthcare Science in Scotland

Four strategic ambitions have been set out as part of this strategic approach to healthcare science in Scotland. The ambitions represent the changes that people have told us they want to see within healthcare science, and the wider system.

As such, they will be used to guide future activity – with any work to be undertaken as part of the Strategic Approach to Healthcare Science in Scotland contributing to the achievement of one or more of the ambitions.

This approach will help to prioritise activity, in recognition that collective working to a small number of goals will help make improvements which will have a more substantial impact on the NHS and patient outcomes.

The ambitions can be applied to the healthcare science profession as a whole, as well as to individual specialties. They will act as high level indicators of success, and whilst they are not measured in a data sense it is expected that the work happening underneath each ambition is measurable – therefore allowing us to demonstrate progress against each over time.

Achievement of the ambitions will subsequently help us to achieve the long term vision which has been set out in this paper.

People working in and interacting with the health system understand what healthcare science is and how the scientific workforce can improve patient outcomes.

Patient outcomes are improved as the healthcare science workforce is fully considered and utilised in service planning, development, and delivery.

Healthcare science contributes to the sustainability of the NHS workforce in the future as it attracts and retains a diverse range of people to careers, at all levels, which are appealing and support delivery of healthcare to meet the needs of the population.

Healthcare scientists are leaders in the NHS, and spearhead innovation into the future whilst championing delivery of safe and quality services in line with scientific best practice.

# Strategic Themes for Healthcare Science in Scotland

Five key themes will be used as a basis to explore the healthcare science landscape more thoroughly which will help provide a better understanding of what is required in specific areas, to support improvements to the NHS in Scotland.

Each of the strategic themes set out will be the focus of a future paper in the 'Healthcare Science in Scotland' series (figure 3). Each paper will detail the exploration carried out in respect of that theme, as well as showcasing work which has taken place or will take place in the future to support achieving our ambitions and ultimately the vision.

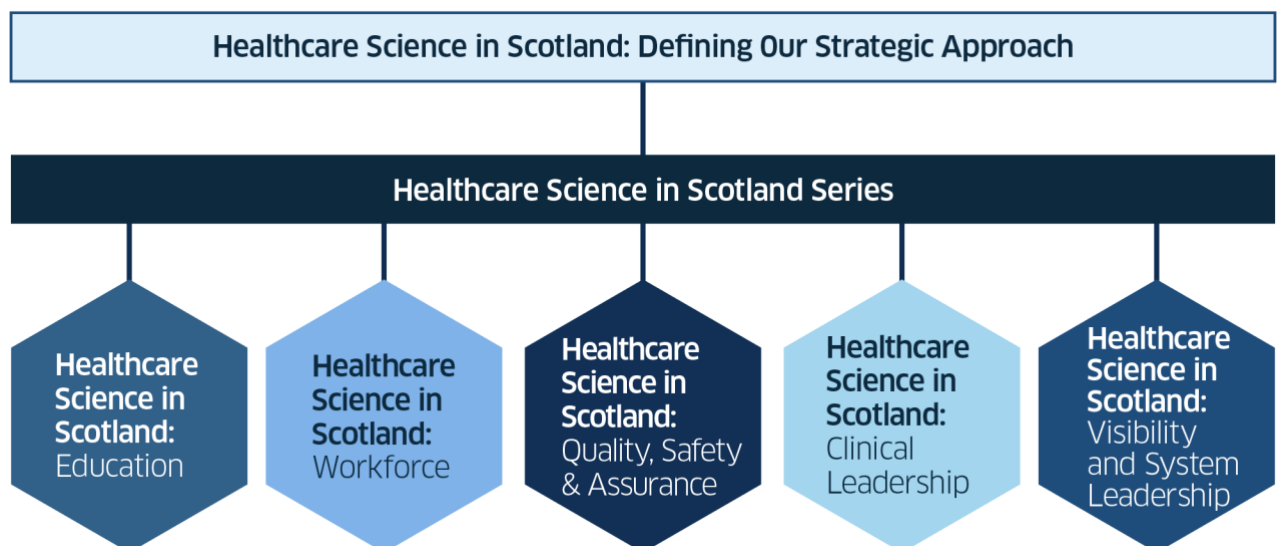


Figure 3

## Strategic Themes in Detail:

Detail on how work under each theme will be carried out is described in the '*Delivering Our Strategic Approach*' section of this document.

The table below describes in further detail the rationale for these strategic themes and specific areas which may be considered in future papers. Any work carried out under these themes must align with the strategic ambitions set out in the '*Strategic Ambitions for Healthcare Science in Scotland*' section of this paper.

Strategic Theme	Summary
Education	<p>Education is one of the pillars which will support our development of a sustainable workforce for the future. It provides the basis of scientific knowledge and understanding across the healthcare science specialties.</p> <p>Work under this theme could consider:</p> <ul style="list-style-type: none"> <li>▪ The development of an education framework which seeks to widen access across the profession</li> <li>▪ The personal and professional development opportunities for our workforce.</li> </ul>
Workforce	<p>Our workforce is at the heart of the delivery of health services across the country, and healthcare scientists make up the fourth largest professional group working in NHS Scotland.</p> <p>However, we need to understand more about our scientific workforce to better ensure healthcare science is included as an integral part of the delivery of other national strategies such as the <a href="#">NHS Recovery Plan</a> and the <a href="#">National Workforce Strategy for Health and Social Care in Scotland</a>.</p> <p>The Health and Care (Staffing) (Scotland) Act 2019, will go some way in supporting development of that understanding, but there is more that could be explored. For example:</p> <ul style="list-style-type: none"> <li>▪ Increasing the understanding of how to enter the healthcare science profession, at any stage of the career spectrum and navigating progression from that point – ultimately supporting the sustainability of our workforce</li> <li>▪ Understanding and mapping emerging careers within the profession, and the specialties/sub-specialties, to support planning for the future in respect of the changing shape of the wider workforce to support future delivery, workforce numbers and the educational needs of the workforce.</li> </ul>
Quality, Safety and Assurance	<p>Quality services which are delivered in a safe and effective way is an absolutely fundamental principle within the delivery of NHS services in Scotland.</p> <p>Learning must be shared across specialisms where areas for improvement have been identified – for example from recommendations made as part of the Independent Review of Audiology Services in Scotland.</p> <p>It is vital that robust governance and assurance is in place across healthcare science specialisms, so work under this theme may seek to consider the following:</p>

	<ul style="list-style-type: none"> <li>▪ Mandatory regulation of professionals, where not already in place</li> <li>▪ Requirement for professional or quality standards across specialisms.</li> </ul>
Clinical Leadership	<p>We recognise that there is a lack of wider system understanding – including from other professional groups - about the contribution of the scientific workforce to clinical service delivery and how the knowledge and expertise of professionals in healthcare science can be utilised more effectively.</p> <p>Work under this theme could consider:</p> <ul style="list-style-type: none"> <li>▪ Exploration of emerging research and technologies and how this could be applied to the NHS in Scotland to help improve patient outcomes</li> <li>▪ Opportunities to expand the scope of practice of those working in healthcare science specialisms</li> <li>▪ Changing the shape of the future workforce through expansion of healthcare science consultant level roles and practice within NHS Scotland.</li> </ul>
Visibility and System Leadership	<p>Increasing the visibility and understanding of healthcare science within the health system, and outwith, is absolutely essential to support improvements to patient outcomes in the longer term.</p> <p>Healthcare science must be represented at senior levels in terms of service planning and decision making, so that the unique contribution of the scientific workforce is fully considered in improving population health and patient outcomes.</p> <p>Work under this theme could consider:</p> <ul style="list-style-type: none"> <li>▪ Exploration of leadership opportunities open to those working in the healthcare science profession</li> <li>▪ Representation at Board level and targeted awareness raising with Board leadership about the impact of healthcare science specialisms</li> <li>▪ Raising the visibility of healthcare science to be an attractive career option at any age or with any level of qualification.</li> </ul>

# Delivering Our Strategic Approach

To support progression of future work, and improve the way in which healthcare science becomes an integral part of service planning and delivery at a national and local level, there is a need to establish a structure which will drive improvements within the service, leading ultimately to improvements in patient care.

A *'Healthcare Science in Scotland: Strategic Oversight Board'* (Strategic Oversight Board) will be established to set the direction for work happening in the system. It will consider ministerial priorities in doing so, ensuring that any improvement work being undertaken relates to the delivery of national priorities and is fully embedded across Government programmes and linked in to associated policy areas.

The Strategic Oversight Board will also have a responsibility to relay information coming from the system, back to the Scottish Government more widely. This will support shaping the direction of travel for healthcare science in Scotland at a national level and will provide an opportunity to demonstrate how effective healthcare science can be in delivering improved services and patient outcomes on a national platform.

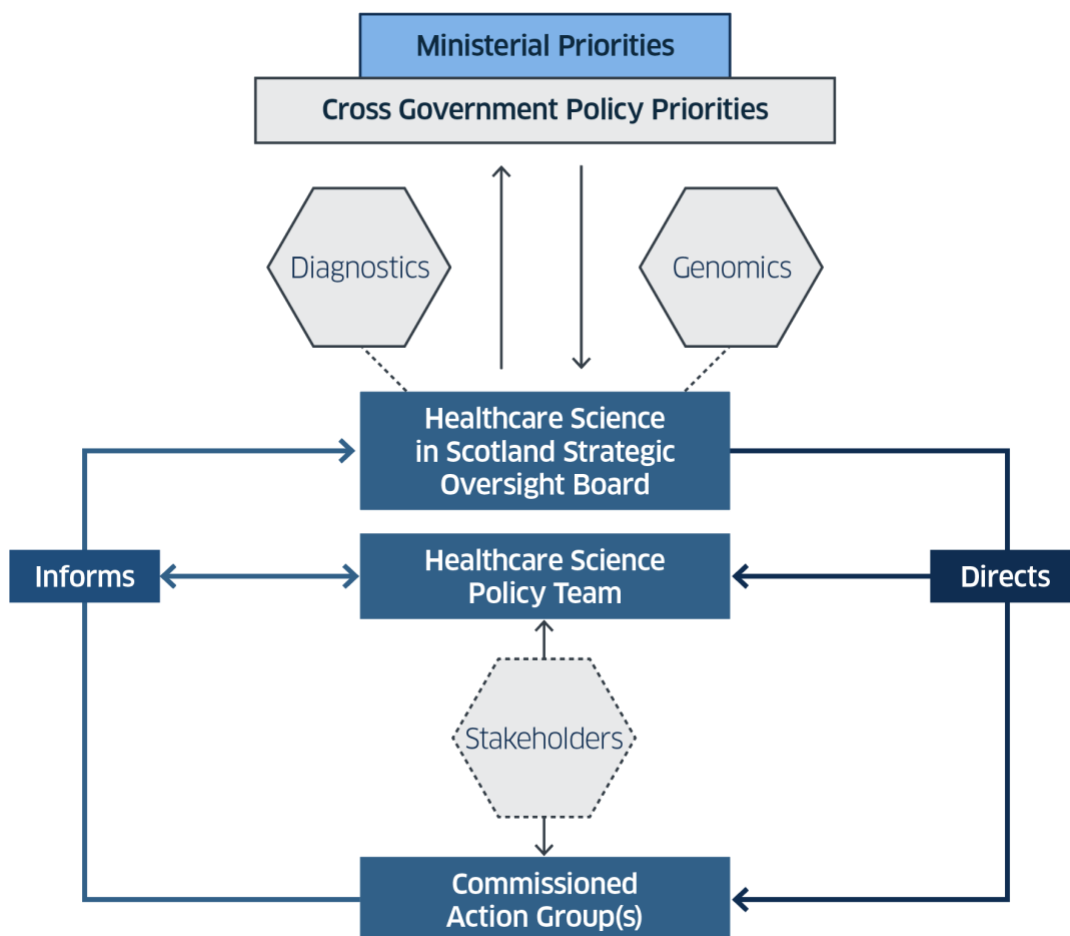


Figure 4

The Strategic Oversight Board will commission 'Action Groups' to undertake work under the strategic themes described earlier in this paper. Members of these groups will be tasked to look at either further exploration of the landscape under a specific theme, or an improvement-focussed test of change. All work must align to achieving at least one of the strategic ambitions.

A focus on continuous improvement is at the centre of our strategic approach to healthcare science in Scotland as it is what will help improve patient outcomes and improve the health system overall. Figure 5 shows the cyclical nature of how work will be carried out through the delivery structure that has been described earlier in this section.



Figure 5

Details of the operational elements of this process will be published as part of the Terms of Reference, which will be in place for both the Strategic Oversight Board and any associated Action Groups as they are established.



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