

Radiology Target Operating Model (TOM)

Scottish
Radiology
Transformation
Programme

Vision and Target Operating Model Project

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Statements of endorsement

A number of organisations and groups have discussed, reviewed and subsequently endorsed the radiology Target Operating Model. Alongside the below endorsements, the Target Operating Model is also being shared with the Royal College of Radiologists (RCR), the Scottish Association of Medical Directors (SAMD), the Directorate for Digital Health & Care and the Centre for Sustainable Delivery.

- **Imaging Executive Board (IEB)**

Approved on the 15th of April

- **Diagnostics in Scotland Strategic Group (DiSSG)**

Endorsed on the 26th of May

- **Scottish Access Collaborative / Modernising Patient Pathway Programme (SAC / MPPP)**

On behalf of the Access Collaborative and Modernising Patient Pathways Programme Board, I am pleased to endorse the Target Operating Model (TOM) for Radiology services in Scotland. The work of the SRTP and colleagues in developing the TOM was really welcomed by the Programme Board. It is clear that this work will bring significant improvements across the patient pathway whilst making Radiology in Scotland a truly attractive career choice. We also have much to learn from the approach taken by the SRTP and see the potential transferability of the model to other areas in health.

- **Society and College of Radiographers (SCoR)**

It is excellent to see the Target Operating Model published. It is the result of a lot of detailed and visionary work by the Scottish Radiological Transformation Programme and motivated by genuine passion to see the best diagnostic imaging services for the people of Scotland. The Society of Radiographers is proud to have been able to support this work, grateful for the opportunity and committed to continuing to work with partners in Scotland. Our members are at the heart of every clinical imaging service in Scotland and have demonstrated our ability as a profession to innovate and work in partnership in the interests of patients and others.

- **Scottish Clinical Imaging Network (SCIN)**

The Scottish Clinical Imaging Network (SCIN) acknowledges the inclusivity, quality of the document and live nature of the Target Operating Model developed by the Scottish Radiology Transformation Programme (SRTP). As such the SCIN recognises that there may be a need for changes during the lifetime of the TOM and endorses the current version agreed at the Imaging Executive Board. The SCIN is pleased to offer its future support to the SRTP in taking the content of the TOM forward, as the national roadmap develops.

Executive summary

While good progress has been made to address the significant demand and capacity issues facing the radiology service in Scotland, the situation remains precarious and the need for national and regional collaboration and coordination has become increasingly urgent as a result of the COVID-19 crisis.

To help achieve a sustainable and resilient radiology service, work to develop a shared vision and Target Operating Model was approved by NHSScotland's Chief Executives Group on 4 August 2020.

The Imaging Executive Board (IEB) asked the Scottish Radiology Transformation Programme (SRTP) to support this work. The vision and Target Operating Model has been developed in collaboration with a wide spectrum of stakeholders and draws on their input to describe how the service should look in the future. It is owned by the radiology community and informed by the experiences of patients, carers and referrers.

Our vision of ***“a world class, person-centred sustainable radiology service that continually improves the health & wellbeing of the people of Scotland”*** can be achieved by implementing the collective recommendations outlined in this model, to address the on-going challenges faced whilst delivering a patient-centred service.

Executive summary

Workforce, Demand and Culture

- Resilient, sustainable and flexible workforce
- Radiology vacancies are marketed widely
- Rural hospital posts provide equal career opportunities to large hospital posts
- Rural posts are supported by communities of practice with enhanced multi professional teams
- All departments can access appropriate equipment housed within appropriate estate
- Nationally coordinated approach to maintenance and procurement of radiology equipment

Digital Technology

- Fully integrated IT systems
- National picture archiving communication system
- Functionally national radiology information system
- Appropriate IT support for 24/7 working
- Radiology requesting using order communications supported by clinical decision support software
- Artificial intelligence to enable enhanced working
- Patient access to book their own appointment slot for agreed imaging
- Remote access to radiology expertise if unavailable locally

Business Information and Data

- Nationally standardised data sets
- Transparent business information
- Access to all radiology data across the Scottish radiology service
- National quality standards based on patient feedback, workforce data and service improvement goals

Organisation of Radiology Services

- Locally managed services with regional and national links
- Regional and national services where required
- Border free patient services
- Sufficient funding to support services
- Regional workforce planning with national oversight
- Subspecialty delivery commissioned nationally and provided locally

Education and Training

- Clearly defined training pathways
- Adapted apprenticeship methodology delivering appropriate skills across the radiology team
- Urban and rural placements
- Specialisation within the radiology team
- Attractive and rewarding career paths
- Blended education using virtual, 'on the job' and formal training routes

Processes

- Radiology services will employ 'Realistic Radiology principles'
- Standardised protocols for imaging of common conditions
- National image reporting available where required
- IT equipment and infrastructure to support home based working including radiology reporting where appropriate
- Non-medical prescribing to improve efficiency
- Nationally agreed guidelines to support MDTs and other collaborative working
- Radiology is a recognised core component of all clinical service developments

Introduction and context



Engagement

In order to define the future state of radiology services for Scotland, it was vital to engage with a wide spectrum of stakeholders using a variety of methods. This holistic engagement approach allowed everyone the opportunity to provide feedback and influence how the service should look.

Activities were developed using insights from previous engagement



Wider radiology community

Over **300** different staff members within radiology teams from all health boards have actively played a part in the creation, development and review of our vision and principles, Current Operating Model (COM) and Target Operating Model (TOM) through a number of events including workshops ([Appendix B](#)).



Primary and secondary care referrers

Clinicians referring into the service from both primary and secondary care were invited to participate in surveys and workshops, with an additional **11 structured interviews** conducted, focusing on their current experience of referring into radiology services ([Appendix D](#)).



Patients and carers

Patients and carers took part in a radiology survey with over **470 responses**, leading on to a set of structured interviews and extended to focus groups to understand what their views are on how the future service should look ([Appendix E](#)).

Radiology vision and principles

Following a review of the outputs from previous engagement, a survey was developed and shared to find out the wider radiology community's and referrer views on the proposed vision statement and principles.

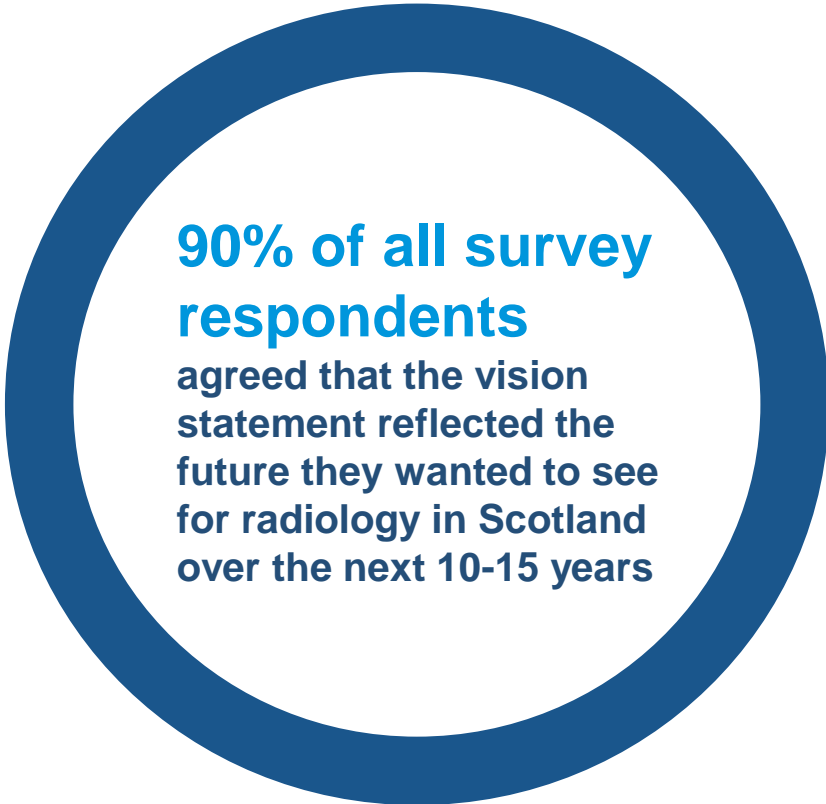
The aim was to ensure they reflected a future radiology service in Scotland that is realistic and will help to achieve our goal of becoming more sustainable and resilient.

➡ **Over 278** survey responses from all health boards throughout Scotland were received from a wide range of professionals ([Appendix B](#))

➡ **8 out of the 10 principles developed had over 95% agreement** from all respondents, with all principles having over **80% agreement**

➡ Feedback from the survey was incorporated in to a final radiology [vision statement and principles](#) which were discussed and approved by the IEB on the 10th of December 2020

➡ The vision and principles were used to help guide and develop thinking in building both the Current Operating Model and Target Operating Model collective recommendations



90% of all survey respondents agreed that the vision statement reflected the future they wanted to see for radiology in Scotland over the next 10-15 years

Radiology vision statement and principles


1. Examinations that **add value** to the patient journey with no detriment.
(Realistic Radiology)

2. **Equitable access to imaging services** including **expert opinion available**.

3. Image acquisition as **close to home** as practically possible.

10. **Investment in our people** to ensure they have the skills to deliver the needs of the service.

A world class, person-centred sustainable Radiology service that continually improves the health & wellbeing of the people of Scotland



4. **Timely access** to investigations and their results.

9. A **great place to work** where the team is valued, motivated and multi-disciplinary.

5. **Information to patients** to make sure they are clear about their journey, options and results.

8. An **innovative** service that continually strives to improve, and benefits from emerging technologies and learning from similar services across the world.

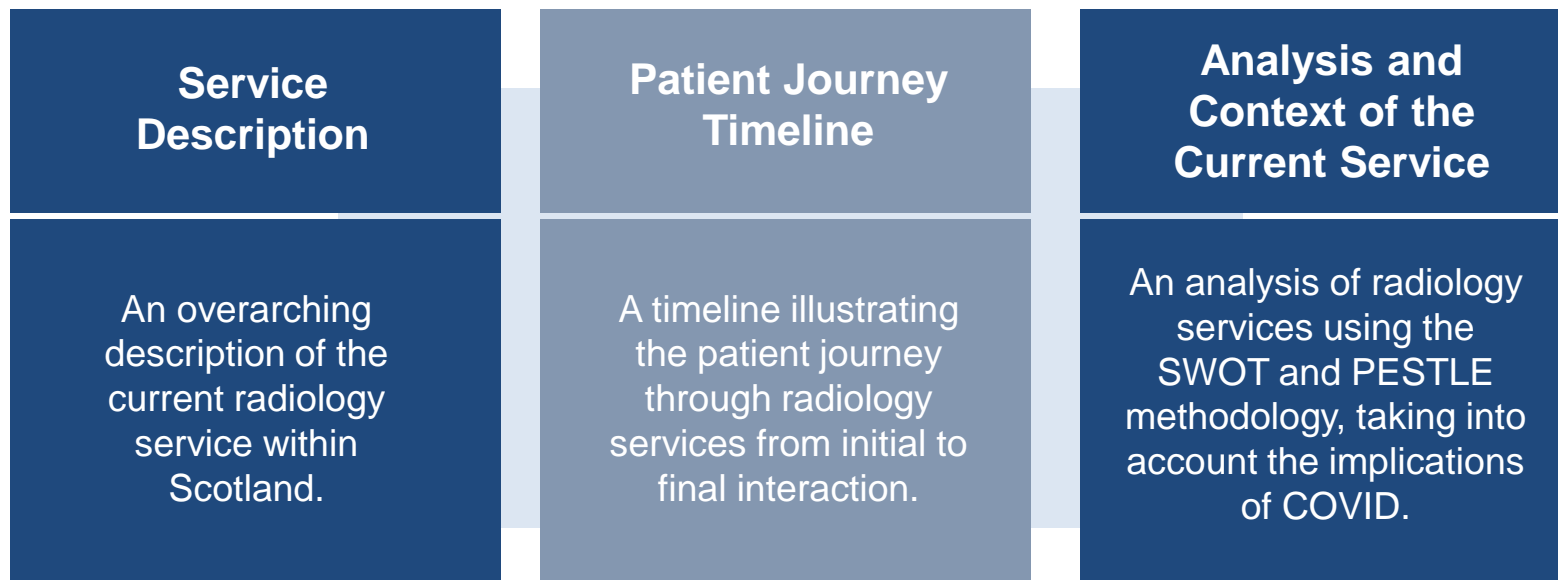
7. A **locally delivered** service, informed by local needs, supported by **regional and national coordination and collaboration** where this adds value, resilience and sustainability.

6. **Patient-centred** services using fully **integrated data and technology** to deliver the right test at the right time.

Current Operating Model

The purpose of defining the Current Operating Model was to understand and set a baseline for how radiology services within Scotland currently operate and to help inform decision making in building the future Target Operating Model. Once developed, reviewed (by both a targeted focus group of subject matter experts and the wider radiology community) and approved by the Imaging Executive Board on the 11th of February, all documents were shared in advance of the virtual Target Operating Model workshops, to help inform thinking. The Current Operating Model package was made up of three distinct documents as detailed below. All of these documents together aim to inform the reader of the current position for radiology in Scotland outlining both challenges and opportunities.

The structure used within the Current Operating Model service description, to breakdown the key areas and detail, was also used in the Target Operating Model collective recommendations to provide a direct comparison between the current and the desired future state.



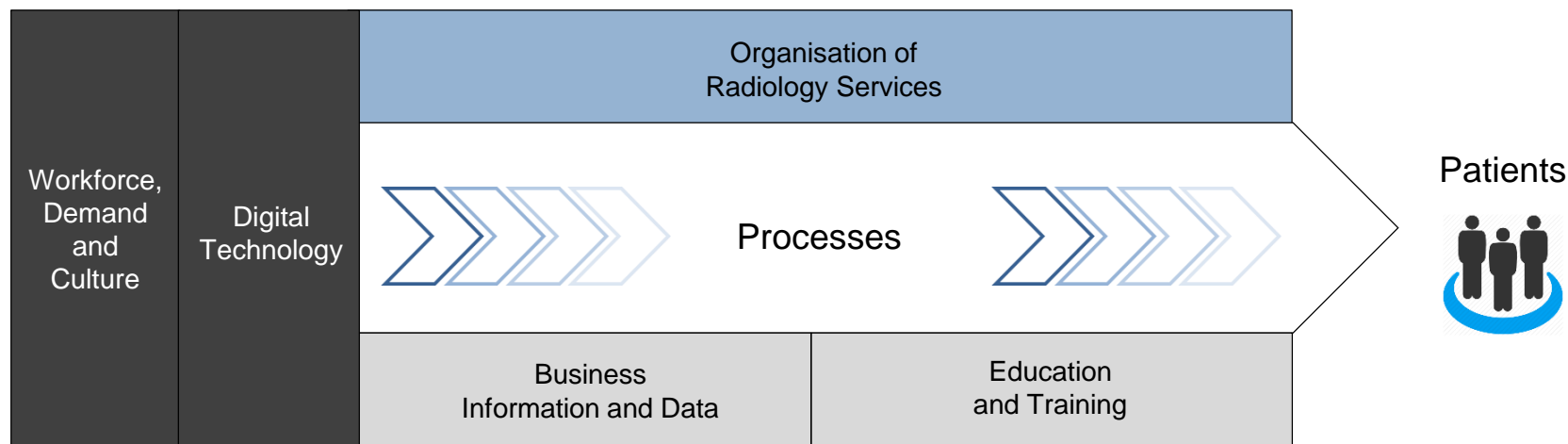
Model overview



Target Operating Model framework

In line with the Current Operating Model service description, the Target Operating Model mirrors the key areas of the structure below. These include: Workforce, Demand and Culture, Digital Technology, Organisation of Radiology Services, Business Information and Data, Education and Training and Processes.

The Target Operating Model document details the collective recommendations on what the future of radiology service in Scotland should look like. Each collective recommendation has been linked to the radiology principles it will deliver and the most common themes highlighted through all engagement events ([Appendix C](#)).



Workforce, demand and culture

The workforce solutions, equipment and culture required to meet rising demand.

Collective Recommendation	Link to Common Themes *	Link to Radiology Principles
WF1. Resilient and sustainable workforce to ensure that radiology services are appropriately staffed to meet demand and address the current deficits.	1	<i>Principle 2</i> <i>Principle 7</i> <i>Principle 10</i>
WF2. Building a positive radiology culture, a great place to work where the team is valued, motivated and multi-disciplinary.	2	<i>Principle 9</i>
WF3. Radiology workforce model inclusive of flexible working.	3	<i>Principle 1</i> <i>Principle 2</i> <i>Principle 10</i>
WF4. Workforce planning in place, which has the flexibility to take into account development, research, leadership, training, learning and rural placements.	5 12	<i>Principle 9</i> <i>Principle 10</i>
WF5. Contracts that allow cross-boundary working to meet radiology service demands.	11	<i>Principle 2</i> <i>Principle 3</i> <i>Principle 7</i>
WF6. Local, regional, national and international recruitment models which actively recruit to all local radiology vacancies.	4 8	<i>Principle 7</i> <i>Principle 9</i>

*Link to Common themes in Appendix C - The lower the number and darker the colour, the more frequently the theme was highlighted.

Workforce, demand and culture

The workforce solutions, equipment and culture required to meet rising demand.

Collective Recommendation	Link to Common Themes *	Link to Radiology Principles
WF7. Vacant rural posts are structured to have the same appeal as more central locations.	6	<i>Principle 2</i> <i>Principle 9</i> <i>Principle 10</i>
WF8. Communities of practice allowing specialist expertise to distributed across health boards.	9	<i>Principle 7</i> <i>Principle 9</i>
WF9. Enhanced multi professional teams throughout all health boards.	10	<i>Principle 7</i> <i>Principle 9</i> <i>Principle 10</i>
WF10. Every health board has the appropriate imaging equipment and appropriate estate to meet service demand.	7 13	<i>Principle 2</i> <i>Principle 3</i>
WF11. Nationally coordinated approach to maintenance and procurement of radiology equipment.	7 13	<i>Principle 2</i> <i>Principle 3</i>
WF12. Nationally coordinated approach to the additional resources required by community diagnostic hubs.	7 13	<i>Principle 2</i> <i>Principle 3</i>

*Link to Common themes in Appendix C - The lower the number and darker the colour, the more frequently the theme was highlighted.

Digital technology

The key digital technology (systems, tools and structures) that underpin the delivery of radiology services within Scotland.

Collective Recommendation	Link to Common Themes *	Link to Radiology Principles
DT1. A national Picture Archiving and Communications System (PACS) for radiology services within Scotland.	1	Principle 2 Principle 6 Principle 8
DT2. A functionally national Radiology Information System (RIS) for radiology services within Scotland.	1	Principle 2 Principle 6 Principle 8
DT3. All radiology IT is fully integrated with related healthcare IT products aligning with the national radiology IT strategy.	2 4 5	Principle 6 Principle 8
DT4. National IT support structures enabling maximum uptime and 24/7 working where required.	6	Principle 6
DT5. Order Communications the standard method for imaging requests from primary care and secondary care.	5 9 11	Principle 2 Principle 4 Principle 6
DT6. Clinical Decision Support information/software supporting electronic ordering for radiology tests on a national basis.	9 11	Principle 6 Principle 8

*Link to Common themes in Appendix C - The lower the number and darker the colour, the more frequently the theme was highlighted.

Digital technology

The key digital technology (systems, tools and structures) that underpin the delivery of radiology services within Scotland.

Collective Recommendation	Link to Common Themes *	Link to Radiology Principles
DT7. Safe and effective use of Artificial Intelligence to enable enhanced working as part of the professional toolkit.	3	<i>Principle 8</i>
DT8. Patients directly booking their own appointment date and time for an agreed examination.	7	<i>Principle 1 Principle 4 Principle 5</i>
DT9. Patients can view and track their progress through the radiology pathway.	8 10	<i>Principle 4 Principle 5 Principle 6</i>
DT10. Radiology departments can make onward specialist referral.	8 10	<i>Principle 4 Principle 5 Principle 6</i>
DT11. Rural radiology locations have remote access to radiology expertise when required.	12	<i>Principle 2 Principle 3</i>

*Link to Common themes in Appendix C - The lower the number and darker the colour, the more frequently the theme was highlighted.

Organisation of radiology services

The framework by which services are coordinated and managed nationally, regionally and locally with Scotland

Collective Recommendation	Link to Common Themes *	Link to Radiology Principles
OR1. Radiology services are sufficiently and timeously funded in order to meet the demand on the service.	1	<i>Principle 7</i>
OR2. Radiology services are local with regional and national links providing a borderless experience for patients.	2 4 5	<i>Principle 2</i> <i>Principle 3</i> <i>Principle 7</i>
OR3. Linked local, regional and national workforce planning based on projected service demands.	3	<i>Principle 2</i> <i>Principle 6</i> <i>Principle 7</i>
OR4. Low patient volume subspecialty services planned and commissioned at a national level, utilising expertise distributed across different health boards.	6	<i>Principle 4</i> <i>Principle 7</i>

*Link to Common themes in Appendix C - The lower the number and darker the colour, the more frequently the theme was highlighted.

Business information and data

The information and data that reflects the demand, activity and performance of radiology services in Scotland.

Collective Recommendation	Link to Common Themes *	Link to Radiology Principles
<p>BI1. National radiology data dashboard viewing standardised data from all health boards and national standardised coded datasets.</p>	<p>1 5 7</p>	<p><i>Principle 6</i> <i>Principle 8</i></p>
<p>BI2. National quality standards informed by clinical guidelines and audit for quality assurance; acting on patient experience and satisfaction measures and for service improvement goals.</p>	<p>2 3</p>	<p><i>Principle 6</i></p>
<p>BI3. Workforce information and clinical activity data available on a 'real-time' basis.</p>	<p>4</p>	<p><i>Principle 6</i></p>
<p>BI4. A culture of transparent business information and data, driving collaboration, service improvement and supporting education.</p>	<p>6</p>	<p><i>Principle 6</i></p>

*Link to Common themes in Appendix C - The lower the number and darker the colour, the more frequently the theme was highlighted.

Education and training

The training and recruitment links to higher education for radiologists and radiographers and the wider radiology team.

Collective Recommendation	Link to Common Themes *	Link to Radiology Principles
<p>ED1. Training system encompassing appropriate and varied ‘on the job’ training (including rural placements where possible) balanced with corresponding on-line learning and formal training routes.</p>	<p>1 4 10</p>	<p><i>Principle 9</i> <i>Principle 10</i></p>
<p>ED2. Nationally planned and coordinated training approach to meet service needs for all radiology staff utilising current professional training standards.</p>	<p>2</p>	<p><i>Principle 6</i> <i>Principle 7</i></p>
<p>ED3. National training strategy with clearly defined career pathways, developing skills to meet the needs of the service for all roles within the wider radiology team.</p>	<p>5 6</p>	<p><i>Principle 9</i> <i>Principle 10</i></p>
<p>ED4. All radiology staff can undertake appropriate training whilst sufficient service cover is provided.</p>	<p>7</p>	<p><i>Principle 9</i> <i>Principle 10</i></p>

*Link to Common themes in Appendix C - The lower the number and darker the colour, the more frequently the theme was highlighted.

Education and training

The training and recruitment links to higher education for radiologists and radiographers and the wider radiology team.

Collective Recommendation	Link to Common Themes *	Link to Radiology Principles
ED5. A flexible apprenticeship model which meets the needs of all students.	8	Principle 9 Principle 10
ED6. The ability to specialise and develop through mentorships and fellowships within the wider radiology team.	9	Principle 9 Principle 10
ED7. Radiology and radiography recognised as attractive and rewarding career paths for secondary and tertiary education students.	3	Principle 10

*Link to Common themes in Appendix C - The lower the number and darker the colour, the more frequently the theme was highlighted.

Processes

Some of the key processes that occur within radiology services including; patient pathways, the way in which in we report and patient access to information.

Collective Recommendation	Link to Common Themes *	Link to Radiology Principles
PR1. Patients educated and empowered to make informed decisions with referring clinicians on whether imaging is required.	<div style="display: flex; gap: 10px;"> <div style="background-color: #8B4513; color: white; padding: 5px; border-radius: 3px;">1</div> <div style="background-color: #D2691E; color: white; padding: 5px; border-radius: 3px;">11</div> </div>	<i>Principle 1</i> <i>Principle 2</i> <i>Principle 5</i>
PR2. National patient pathways with standardised protocols for imaging of common conditions with local variation to allow for targeted management of specific conditions.	<div style="display: flex; gap: 10px;"> <div style="background-color: #8B4513; color: white; padding: 5px; border-radius: 3px;">2</div> <div style="background-color: #8B4513; color: white; padding: 5px; border-radius: 3px;">3</div> </div>	<i>Principle 2</i> <i>Principle 3</i> <i>Principle 4</i> <i>Principle 7</i>
PR3. Nationwide reporting service built upon the SNRRS model with standardised competencies, access and interoperability.	<div style="display: flex; flex-wrap: wrap; gap: 10px;"> <div style="background-color: #8B4513; color: white; padding: 5px; border-radius: 3px;">4</div> <div style="background-color: #D2691E; color: white; padding: 5px; border-radius: 3px;">6</div> <div style="background-color: #D2691E; color: white; padding: 5px; border-radius: 3px;">9</div> <div style="background-color: #D2691E; color: white; padding: 5px; border-radius: 3px;">8</div> </div>	<i>Principle 3</i> <i>Principle 4</i>
PR4. Safe, consistent and verifiable method of delivering results that contain urgent and emergency clinical findings.	<div style="display: flex; flex-wrap: wrap; gap: 10px;"> <div style="background-color: #8B4513; color: white; padding: 5px; border-radius: 3px;">2</div> <div style="background-color: #8B4513; color: white; padding: 5px; border-radius: 3px;">4</div> <div style="background-color: #8B4513; color: white; padding: 5px; border-radius: 3px;">6</div> <div style="background-color: #D2691E; color: white; padding: 5px; border-radius: 3px;">7</div> <div style="background-color: #D2691E; color: white; padding: 5px; border-radius: 3px;">8</div> <div style="background-color: #D2691E; color: white; padding: 5px; border-radius: 3px;">13</div> </div>	<i>Principle 2</i> <i>Principle 3</i> <i>Principle 4</i> <i>Principle 5</i>
PR5. Equipment available for home-reporting for all appropriate radiology staff.	<div style="display: flex; gap: 10px;"> <div style="background-color: #D2691E; color: white; padding: 5px; border-radius: 3px;">8</div> </div>	<i>Principle 4</i> <i>Principle 10</i>

*Link to Common themes in Appendix C - The lower the number and darker the colour, the more frequently the theme was highlighted.

Processes

Some of the key processes that occur within radiology service including; patient pathways, the way in which in we report and patient access to information.

Collective Recommendation	Link to Common Themes *	Link to Radiology Principles
PR6. Technology and HR practices are in place to enable cross-boundary (health board) working.	5	<i>Principle 2</i> <i>Principle 3</i>
PR7. Non-medical prescribing by diagnostic radiographers and nurses for improved imaging efficiency.	10	<i>Principle 2</i> <i>Principle 3</i> <i>Principle 4</i> <i>Principle 7</i> <i>Principle 10</i>
PR8. Adherence to recognised national radiology operating guidelines for MDTs.	12	<i>Principle 2</i> <i>Principle 4</i> <i>Principle 7</i> <i>Principle 9</i>
PR9. Established collaboration and communication methods between radiology departments and referring clinicians to provide a better service experience for patients.	7	<i>Principle 2</i> <i>Principle 6</i> <i>Principle 7</i> <i>Principle 9</i>
PR10 .Radiology recognised as a core component of all clinical service developments. Such clinical service developments trigger allocation of appropriate resource for additional radiology activity.	13	<i>Principle 2</i> <i>Principle 3</i> <i>Principle 4</i> <i>Principle 8</i>

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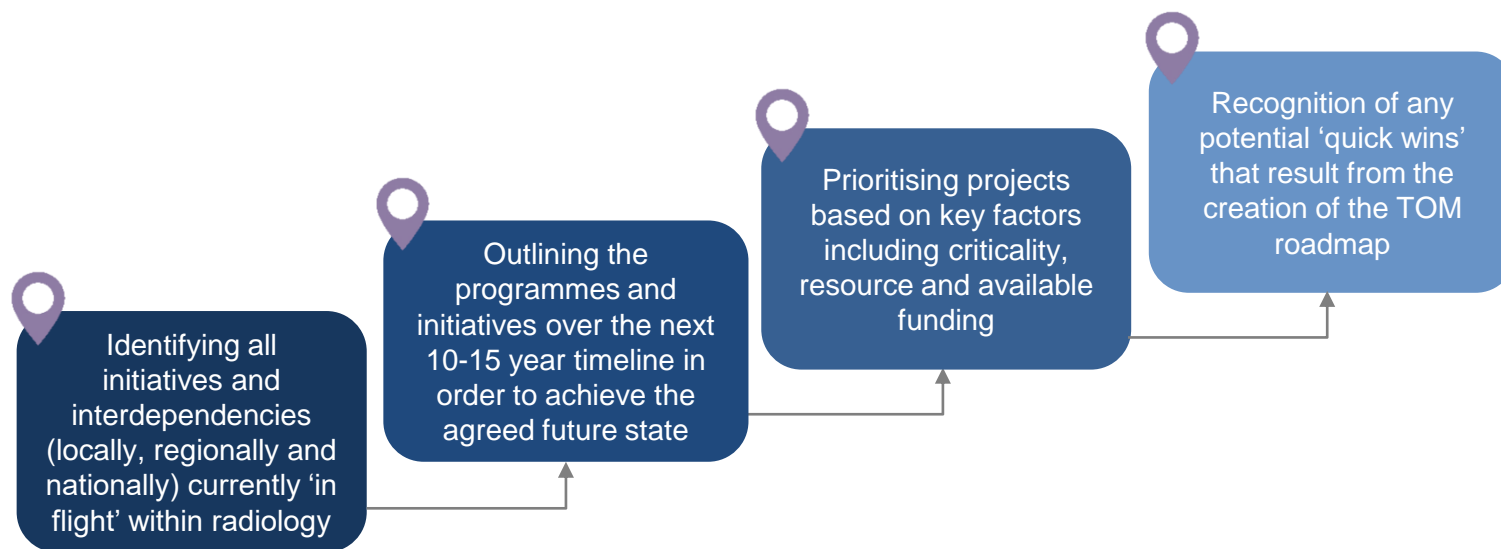
Next steps



Target Operating Model roadmap

We have ensured that we understand the Current Operating Model for radiology. This allows us to determine the direction of travel and a roadmap towards a future Target Operating Model. The Target Operating Model provides a description of the expected radiology service for Scotland for up to 10-15 years.

A roadmap will take us from our current position to the future position through:

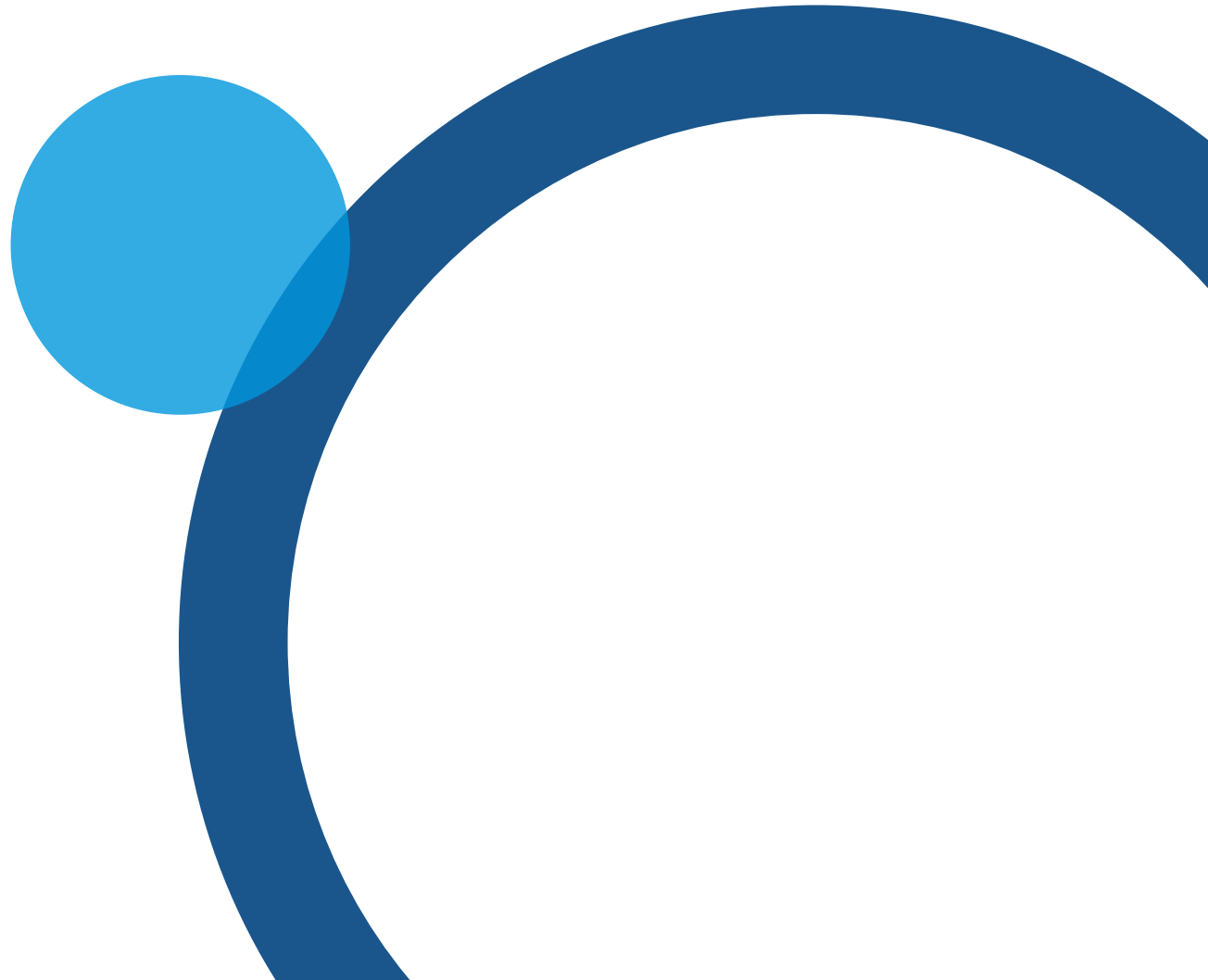


The roadmap will be a **live document** that requires ongoing review and update, to ensure planned future radiology services continue to meet the needs of patients throughout Scotland.

Appendices



Appendix A – Approach

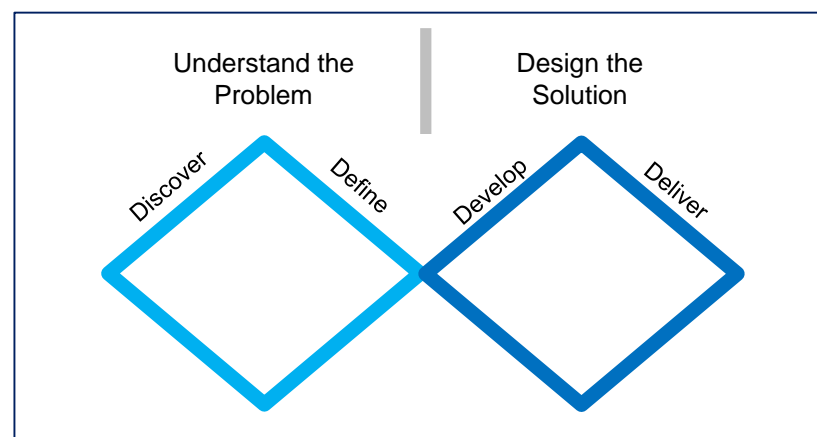


Service design approach

This design of the Target Operating Model is being delivered in accordance with the Scottish Approach to Service Design, a framework to guide how we design user-centred public services developed by the Scottish Government

The Scottish Approach to Service Design (SAtdS) is that service users are supported and empowered to actively participate in the definition, design and delivery of services. The SAtdS approach aims to ensure that we don't just design services in the right ways, but that we design the right services. The approach has a set of founding principles:

- 1 We explore and define the problem before we design the solution.
- 2 We design service journeys around people and not around how the public sector is organised.
- 3 We seek users participation in our projects from day one.
- 4 We use inclusive and accessible research and design methods so users can participate fully and meaningfully.
- 5 We use the core set of tools and methods of the Scottish Approach to Service Design.
- 6 We share and reuse user research insights, service patterns, and components wherever possible.
- 7 We contribute to continually building the Scottish Approach to Service Design methods, tools, and community.



The Design Council's Double Diamond model is a visual diagram (above) and outlines the design stages. Each diamond shape illustrates the process of creating or exploring many possible ideas before refining these to the best idea.

So far within the vision and Target Operating Model project the first three stages of the approach have been completed. Work on the roadmap will lead into the deliver stage through a number of projects and programmes of work.

Appendix B – Who we spoke to



Vision and principles survey

The vision and principles survey was distributed for a two week period during November 2020.

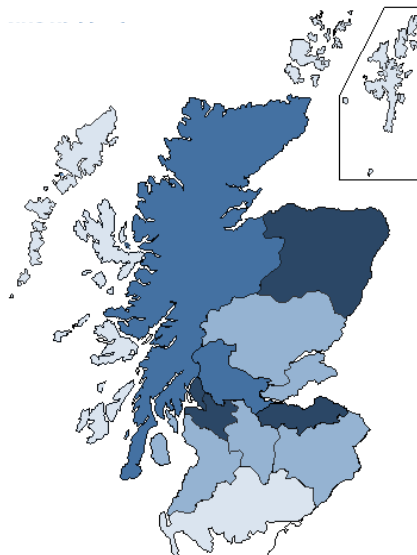
Who the survey went to

Responses to the survey came from a widespread number of stakeholders, including:

- Radiologists
- Radiographers
- Radiology Clinical Directors
- Radiology Service Managers
- Advanced Practitioners
- Directors of Imaging
- Clinical Leads
- General Practitioners
- Nurses (Radiology and wider)
- Sonographers
- PACS and RIS Managers
- Consultant - Surgeons, cardiologists, urologists, radiographers, oncologists, orthotists, dermatologists
- Wider Radiology Team
- AHP
- Regional planners
- CEOs

Where they are based

The map below outlines the split in board of who was engaged through the **278 responses** to the survey. As well as health boards, other areas including universities and representatives from the Scottish Government responded.



NHS Lothian	57
NHS Greater Glasgow & Clyde	46
NHS Grampian	30
NHS Highland	23
NHS Forth Valley	19
NHS Fife	18
NHS Borders	16
NHS Ayrshire & Arran	15
NHS Tayside	12
NHS Lanarkshire	11
NHS Dumfries & Galloway	8
NHS Western Isles	6
NHS Orkney	3
NHS Shetland	1

Continuing further engagement

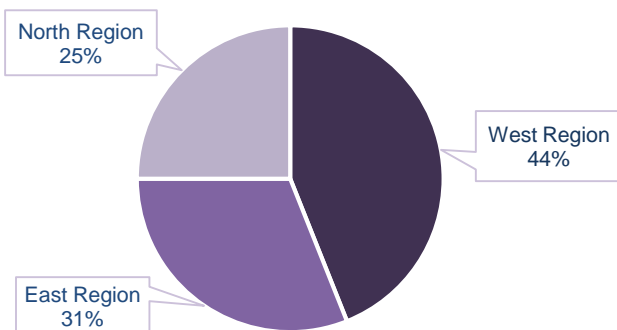
Over 100 respondents left their contact details which in turn were utilised within the future engagement events in building a Target Operating Model.

Target Operating Model virtual workshops

Eight virtual workshops to understand the future Target Operating Model for radiology services in Scotland were held in the last week of February 2021.

Where they are based

Alongside the regional health board split illustrated below (% of total attendees), there were representatives from a number of other organisations. This included; Universities, Scottish Government, other NHS departments and professional radiology institutions.



Who attended the virtual workshops

From the 190 attendees who signed up to virtual workshops, **over 160 stakeholders** throughout the radiology community attended one of eight virtual workshops over three days. Those who attended included:

- Radiologists
- Radiographers
- Radiology Clinical Directors
- Radiology Service Managers
- Advanced Practitioners
- Directors of Imaging
- Clinical Leads
- General Practitioners
- Nurses (Radiology and wider)
- Sonographers
- PACS and RIS Managers
- Clinical Scientists
- Clinical Technologists
- Consultant - Cardiologists, Radiographers, Mammographers, Oncologists, Dermatologists, Neuroradiologists
- Student radiography trainees
- University Lecturers
- Allied Health Professionals
- NHS Scotland Regional Directors
- Regional Planners
- NHS Scotland Programme Directors
- Radiology Systems Specialists

Analysis, review and further comment

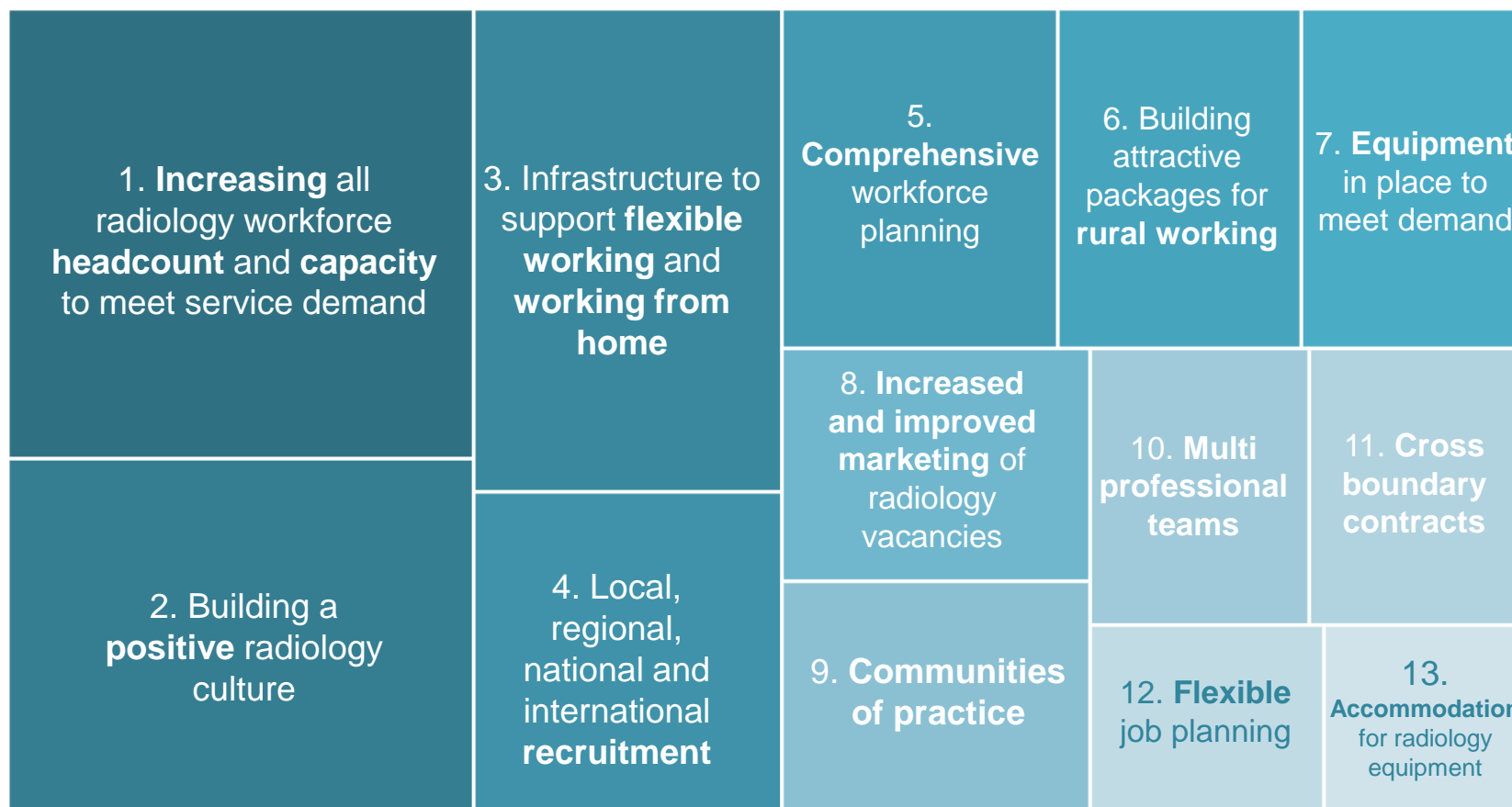
Almost 1,000 comments were collated within the Menti platform from all virtual workshops. All discussions and comments from all workshops were taken and developed in conjunction with primary and secondary referrer and patient and carer insights to develop a draft Target Operating Model. The draft Target Operating Model was sent back out for review and feedback to all within the radiology community at the end of March 2021.

Appendix C – Target Operating Model research insights



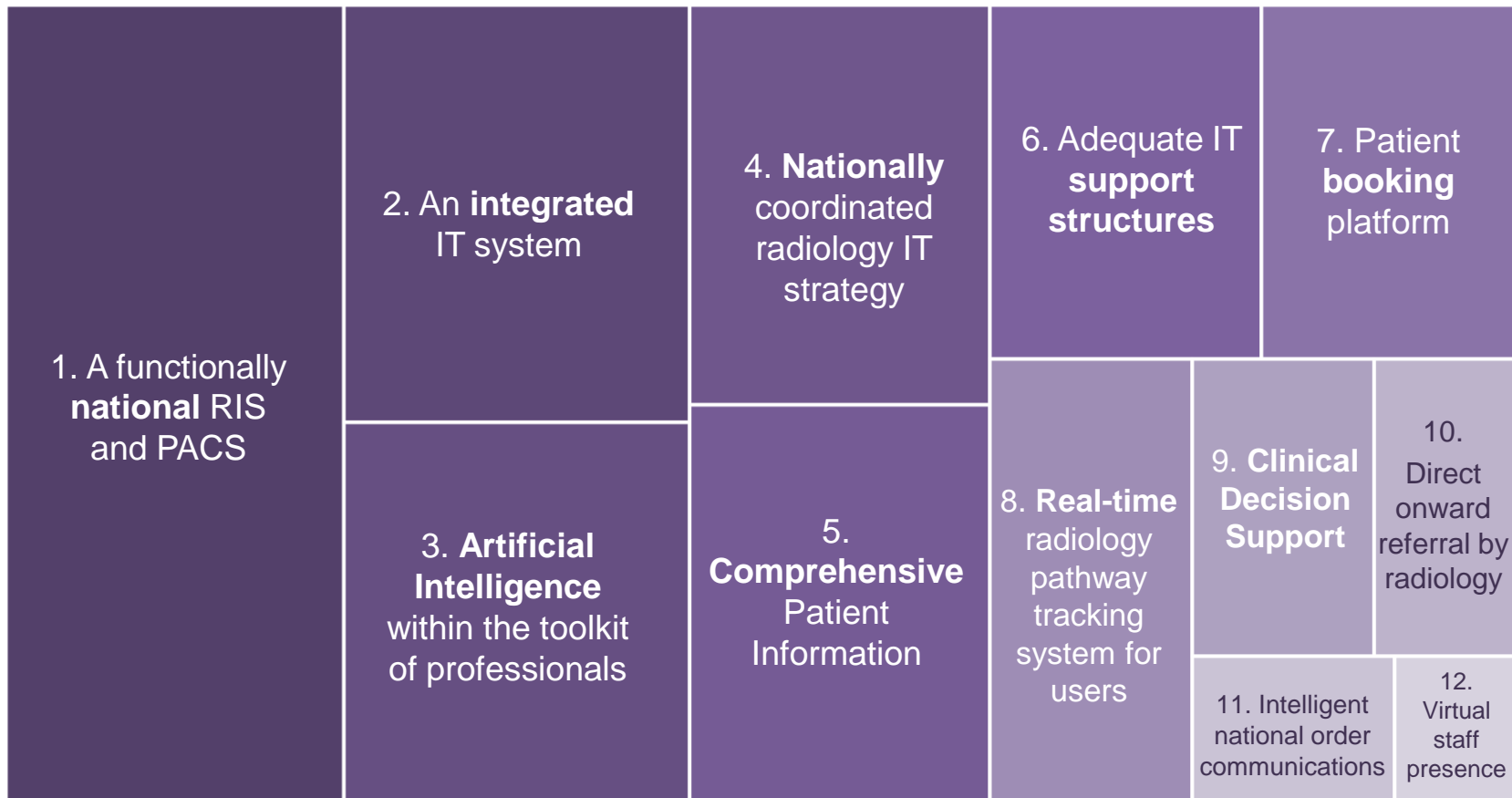
Workforce, demand and culture

The diagram below outlines the most common themes fed back on what the future service within radiology in Scotland should look like for workforce, demand and culture. The larger the area and darker the colour in the diagram, the more frequently the theme was highlighted.



Digital technology

The diagram below outlines the most common themes fed back on what the future service within radiology in Scotland should look like for digital technology. The larger the area and darker the colour in the diagram, the more frequently the theme was highlighted.



Organisation of radiology services

The diagram below outlines the most common themes fed back on what the future service within radiology in Scotland should look like for the way in which radiology services should be organised. The larger the area and darker the colour in the diagram, the more frequently the theme was highlighted.



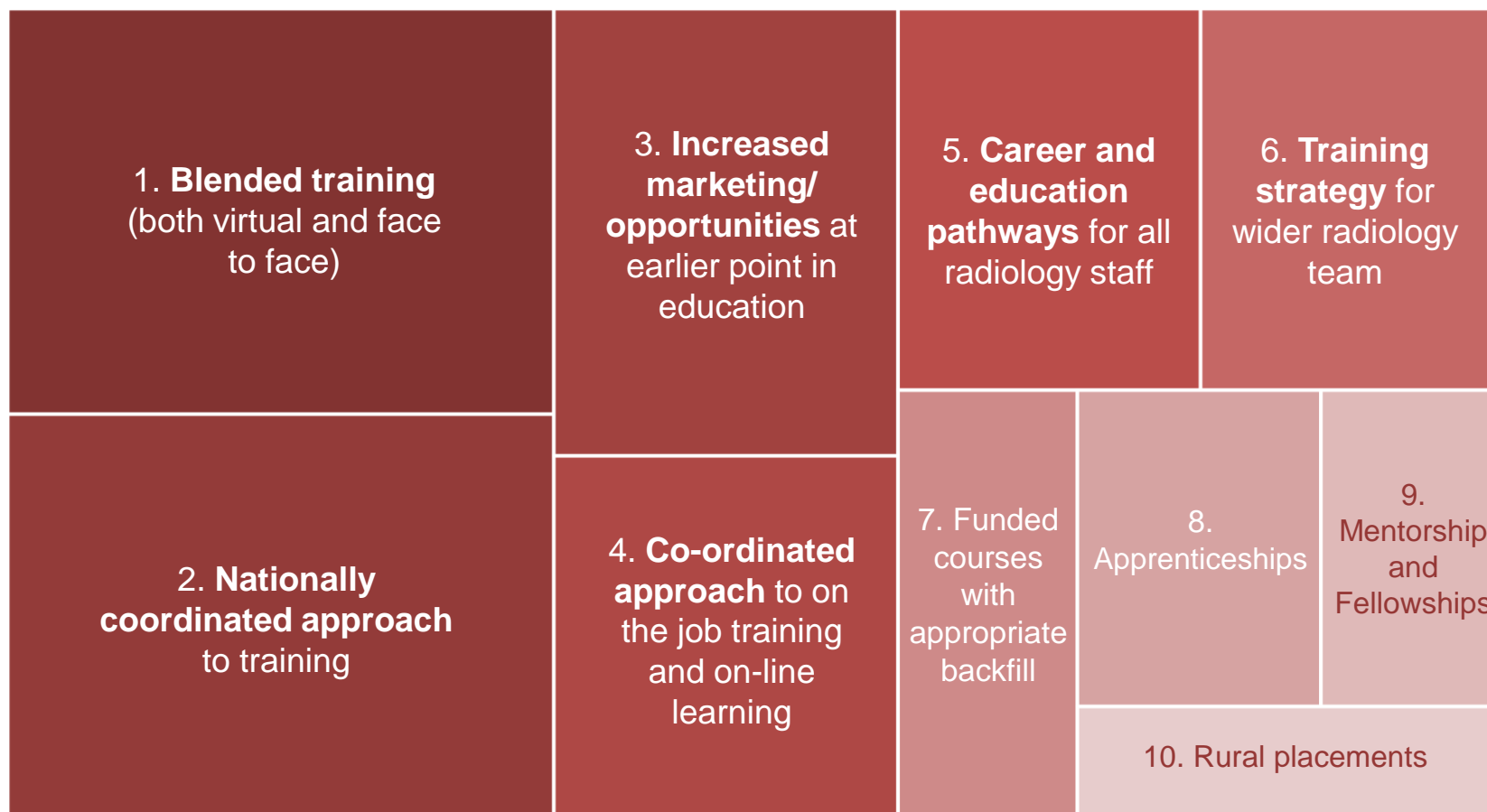
Business information and data

The diagram below outlines the most common themes fed back on what the future service within radiology in Scotland should look like for business information and data. The larger the area and darker the colour in the diagram, the more frequently the theme was highlighted.



Education and training

The diagram below outlines the most common themes fed back on what the future service within radiology in Scotland should look like for education and training. Most of the discussion in recent engagement sessions focused on non-medical training arrangements. The larger the area and darker the colour in the diagram, the more frequently the theme was highlighted.

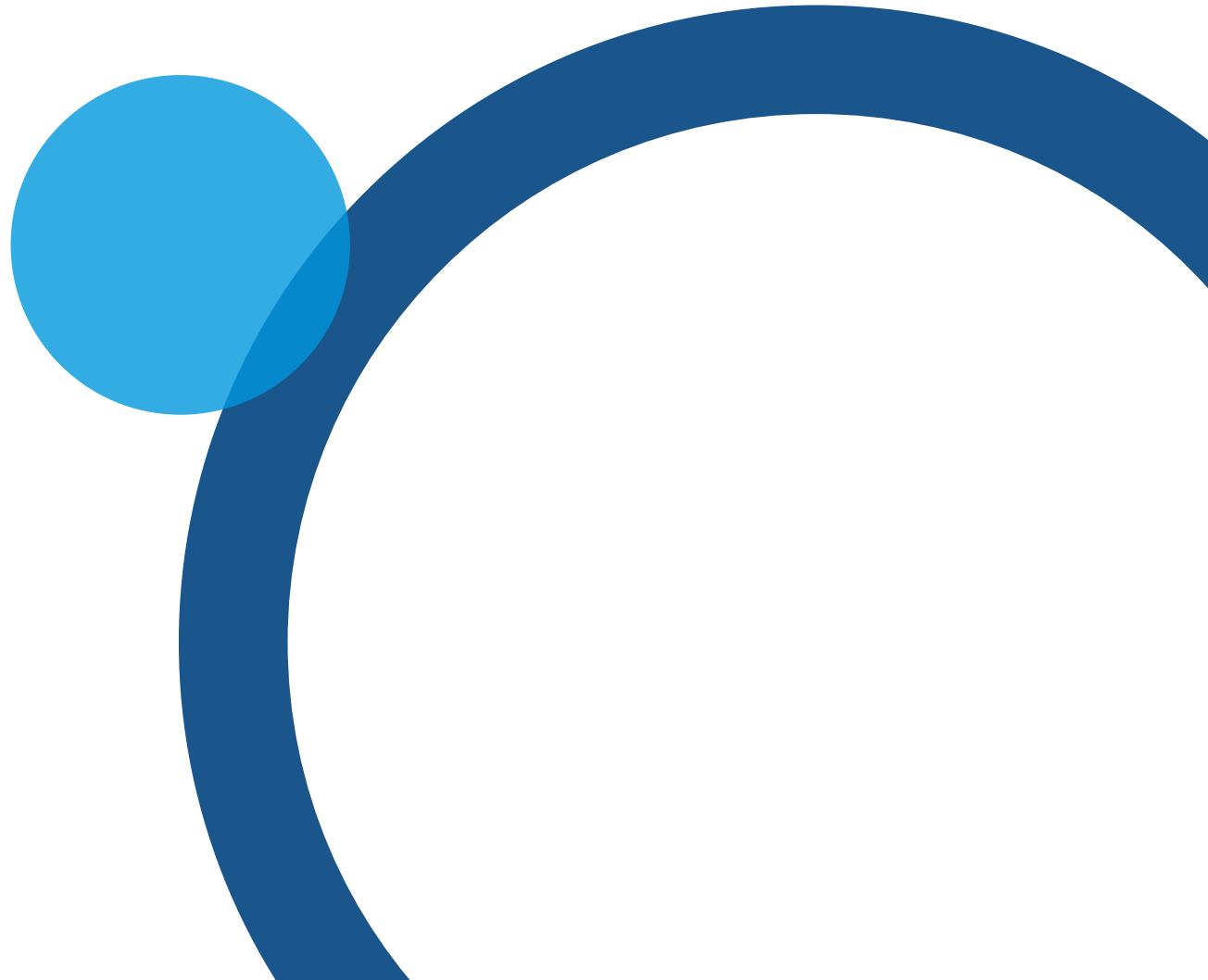


Processes

The diagram below outlines the most common themes fed back on what the future service within radiology in Scotland should look like for a number of key processes within the radiology service. The larger the area and darker the colour in the diagram, the more frequently the theme was highlighted.

<p>1. Greater public/patient education</p>	<p>3. Standardised imaging sequences/ protocols</p>	<p>5. Cross boundary working</p>	<p>7. Greater collaboration and communication with referring clinicians</p>	<p>8. Enabling home reporting</p>
<p>2. Definitive national patient pathways with local variation</p>	<p>4. Standardised national reporting capability</p>	<p>6. National insourcing model Inc. OOH</p>	<p>9. Outsourcing of reporting as a last resort</p>	<p>11. Realistic medicine</p>
			<p>10. Radiographer and nurse prescribing</p>	<p>12. Review of MDTs</p>
				<p>13. Greater collaboration with other services</p>

Appendix D – Referrer research insights



Primary and secondary care referrer insights

Eleven structured interviews were held at the end of January 2021 with both primary and secondary care clinicians based throughout Scotland. The aim of the structured interviews was to understand the views of those who refer into radiology services on their current interaction with radiology services and their views on what you would like to see from a future service. Key insights summarised from all interviews have been outlined in the table below.

The information gathered was fed into the overall analysis ([Appendix C](#)) that was used to develop a set of collective recommendations.

Topic	Current Experience	How the future should look
Radiology Systems	Referrers outlined patients having to continually call in to the practice to either book appointments or enquire about results. Furthermore it was highlighted that there is currently no notification of when results come back on the system and this creates a problem where information is getting missed or lost	<ul style="list-style-type: none"> ▪ Real-time radiology tracking system for refers to be able to view the progress of a scan ▪ Notification of results and next steps for patients at the earliest convenience available online ▪ Onward referral by the radiology department where required with notification to referrer
Patient Communication (appointment and results)	Referrers reported that patients at times can feel anxious not knowing how long they will be waiting for their examination or appointment and are nervous and uncertain about what it will mean for them.	<ul style="list-style-type: none"> ▪ Clear expectation and consistent standard around when results will be ready known to the referrer ▪ Appointment confirmed on the same day in an accessible way (noting for varying IT literacy and access) ▪ Providing patients with clear instructions on who to speak to about results ▪ Consistent timelines on referral so a clinician can speak with greater clarity
Patient Experience	The patient also isn't aware of the choices they have and the implications that a scan may have The patient has little understanding of how a hospital is structured or the parts within, asking them to ring or move between different diagnostic modalities might confuse and cause more anxiety.	<ul style="list-style-type: none"> ▪ Greater patient education on the risk due to repeated exposure of modalities like x-ray ▪ Clear understanding from the patient of the different modalities, what they are looking for and what procedure will be ▪ Diagnostic bundle rather than a series of tests after another with await in-between

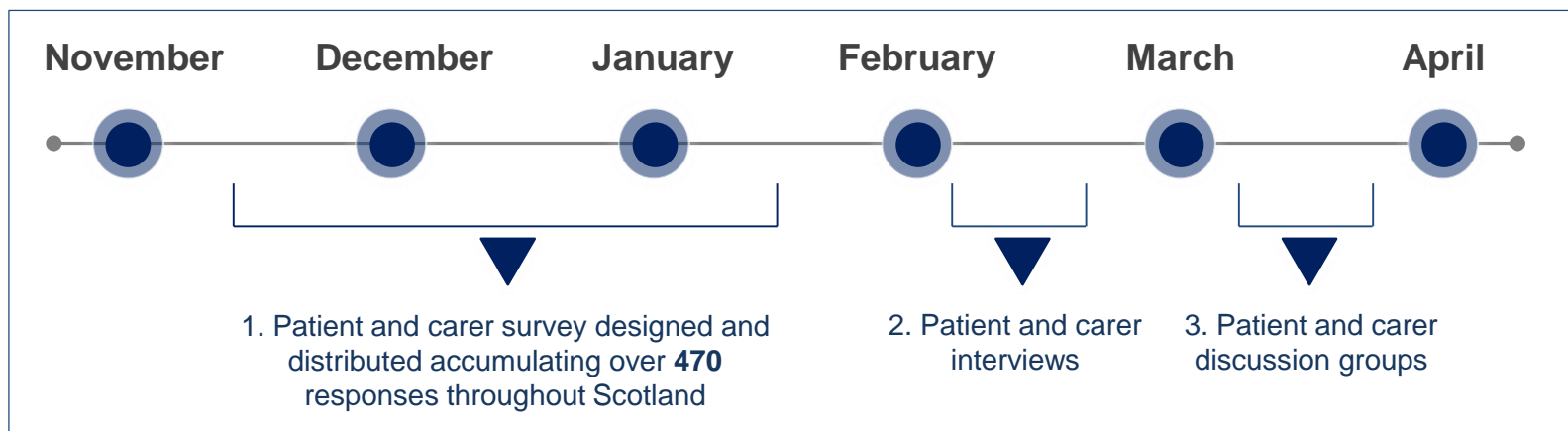
Appendix E – Patient and carer research insights



Patient and carer engagement

The views of patients and carers who utilise radiology services have been captured through the following engagements:

1. The first step of this engagement was the development of a patient and carer survey that was distributed through a number of platforms nationally from the beginning of December over a five week period. The 'Radiology Services in Scotland Patient and Carer Survey' infographic outlines the analysis of the key results of current service views from patients and carers
2. Six patient and carer interviews conducted in early February 2021 built upon the initial insight and delved into single patient experiences from a range of locations and modalities. Insights from interviews helped to shape discussion groups focusing on how the future radiology service should look
3. Three patient and carer discussion groups were held with eleven patients and carers. This enabled greater understanding of the areas most important to patients and carers to be built, identified from the survey that also formulated how future radiology services should look



Patient and carer insights

Patients and carers addressed key areas in describing what they would like to see in future radiology services. A number of topics were discussed with the most common detailed below:

Realistic medicine and referral process

- ❖ Understanding and explanation of exam
- ❖ The importance of a diagnosis
- ❖ Questions after initial appointment/ before exam

"I think it's important to understand why the radiology part of the service is being offered. So what might that find out as opposed to something else?"

"We're all patients at some point in our lives, and there's an expectation that we will manage our conditions. In order to do that, we need to know an appropriate level of information"

"I think it would be really good to have a mechanism to contact someone and say now that I've had a chance to think about the information you told me, here's some questions I had"

Results and communication

- ❖ Explanation of how results will be received / role of GP/ delays
- ❖ Receiving results direct / written results

"I think it would be good to know that the result has gone to your GP so that you know that, because you can rely on them, and then they have to make an appointment."

"Sometimes negative is good as well, just knowing that there's nothing happening."

"I think it would be good to have a summary to take away. Sometimes questions come up afterwards and you're just relying on memory if it's been a verbal conversation"

Changing roles

- ❖ Staff roles
- ❖ Artificial Intelligence

"I think you would assume that the people in the room have got the relevant training whether they were referred to as a doctor or a nurse or any other profession."

"artificial intelligence might be interesting in terms of it makes the process faster, like interpreting results and also communicating them to the patient"

"One GP might put something through as urgent and another GP wouldn't. Having an algorithm which has a set way of working through rather than deciding priority I would be comfortable with that."

Radiology Services in Scotland Patient and Carer Survey

The Radiology Services in Scotland Patient and Carer Survey was distributed across Scotland (via posters in radiology departments and through social media channels) for response over a four week period from December 2020 to January 2021. The aim of the patient and carer survey was to ensure that user experiences and views are understood to help inform the future of radiology services in Scotland. The survey was aimed at patients who have had a radiology service appointment in the last 12 months only. Anyone who had not had an appointment or was still on the waiting list was redirected at the beginning of the survey. The responses subsequently gathered and analysed below will help to define what is currently working well and where we can make improvements. For information, the survey did not include experiences of radiotherapy or routine breast screening services.

Survey response rate

470 Survey responses in total from patients (87%) and carers (13%).

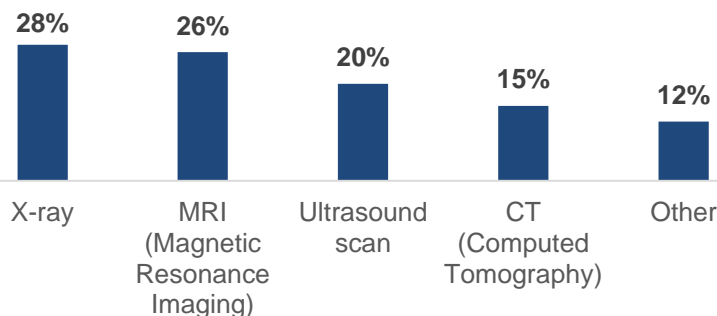
Source of referral

The majority of referrals (85%) came from appointments via either a hospital doctor (48%) or a GP (37%). The remaining 15% of patients were referred by another health professional at the hospital (11%) or at the GP surgery (4%).



What examinations did patients experience?

The type of radiology examination respondents experienced was shared between the following modalities.



Insights into the radiology service experience

Patients and carers had the opportunity to leave further comments on what they felt went well and what could have been improved during their experience. Comments were analysed into recurring themes and have been highlighted below.

What went well... 45% of comments focused on the friendliness and helpfulness of staff being the key factor behind patient and carer experiences going well. Other important themes highlighted included the speed and efficiency of how long the appointment was (15%) and how comprehensive the full process was from start to finish (10%).

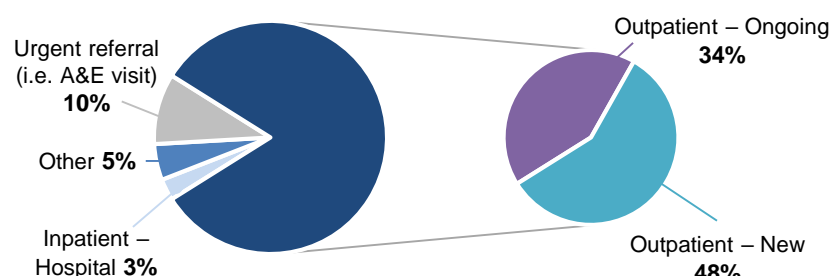


What could be improved... comments focused on getting clearer communication on what the next steps were after the examination (19%) and the process and speed in obtaining results (18%) as the areas requiring most improvement. A number of themes followed these with the opportunity to book appointments via e-mail (9%) being the most common.



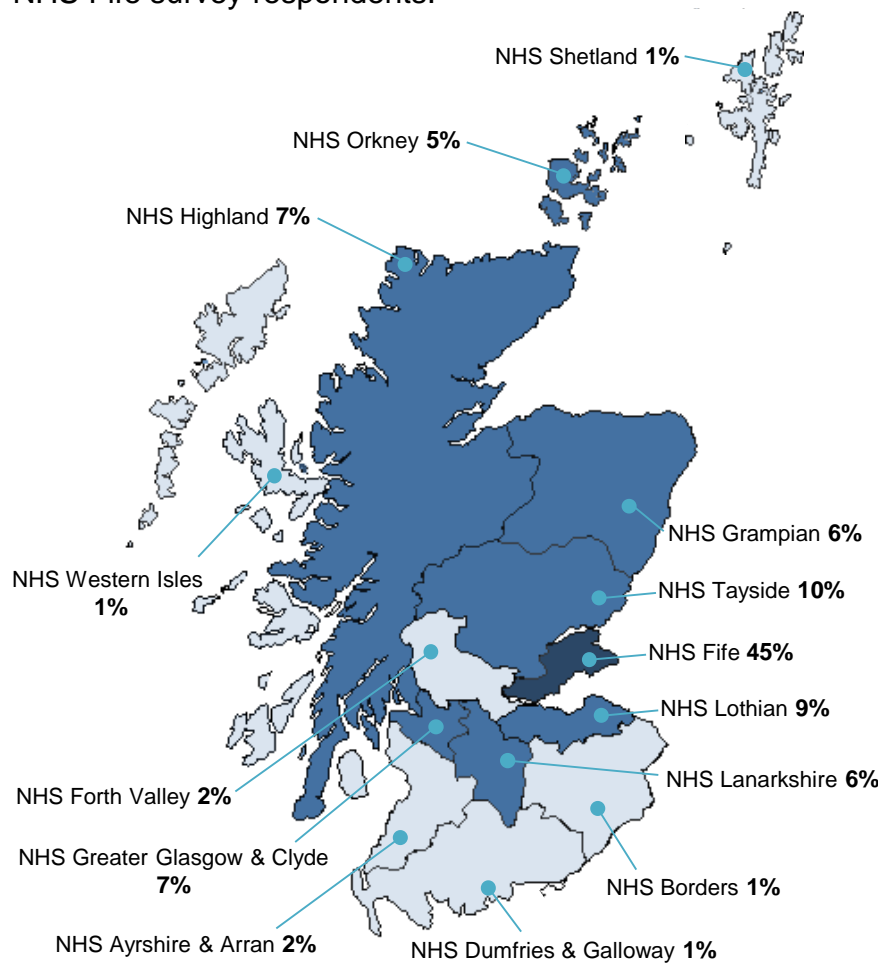
Purpose of examination

82% of respondents' experiences were as an outpatient appointment for either a new or ongoing medical condition.



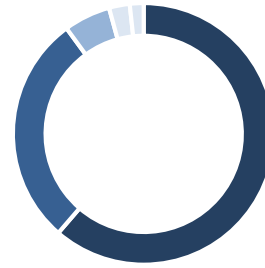
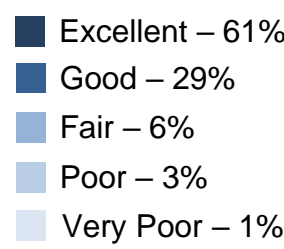
Where did patients and carers engage from?

Surveys were received from all NHS boards and from a variety of settings (both rural and urban). Although NHS Fife had over 200 surveys returned, with the majority following experiences at the Queen Margaret and Victoria Hospitals, the analysis outlined there was no bias to the survey results despite the larger proportion of NHS Fife survey respondents.



Opinion of overall radiology service experiences

90% of patients and carers highlighted that their experience of radiology services was either 'Excellent' or 'Good'.



Patient and Carer comments

“From getting the appointment to the results and having them explained to me, I felt confident in my doctor and why it needed done.”

“All the staff were very helpful and kind to my elderly mum. Only wait[ed] a few minutes and the facility was very well set up for COVID safety. We were very impressed.”

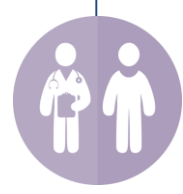
“The staff were lovely but it would be much clearer if I could have got information on how we will get results and how long this will take.”

Patient and Carer opinion before, during and after their experience

Statements were provided within the survey for patients and carers to rate a level of agreement (strongly agree to strongly disagree) on their experiences before, during and after their appointments. The level of agreements (strongly agree and agree) have been highlighted below for each statement. Analysis is in line with the comments made by respondents, where the lowest percentages focus on the wait for results (69%) and explanation of results (65%).



Before my appointment:



During my appointment:



After my appointment:

Statement	Percentage	Statement	Percentage	Statement	Percentage
I was happy with the time I waited for my appointment date to be confirmed	82%	Staff explained what was going to happen during the examination	93%	I was informed about how my results would be shared with me	83%
I received information to explain the examination e.g. patient leaflet	74%	I felt listened to by the radiology staff carrying out my examination	84%	I was happy with how long I waited for my results	69%
I received the information in a format that I needed	78%	I was able to ask questions about the examination if I wanted to	85%	My results were explained to me clearly	65%
I understood the information I received	81%	I did not feel rushed during my appointment	91%	I felt that the examination was worthwhile	86%

The most important aspects of radiology services according to patients and carers

The final question within the survey focused on understanding what the three most important aspects to radiology services were to patients and carers. Radiology staff having the right 'knowledge, skills and training' was the most common aspect (selected by 17% of respondents). It should be noted that all aspects outlined below are important, and this was reflected in the level of respondent selection.

