National Radiology Quality Improvement Programme

4th National Data Report
1 JAN - 31 DEC 2022

FACULTY *of*
RADIOLOGISTS
and RADIATION
ONCOLOGISTS
RCSI

HSE

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PHYSICIANS
OF IRELAND

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FOREWORD

This is the fourth national data report from the NRQI programme covering 2022.

This report represents aggregate quality improvement data collected from radiology departments in 48 participating public and voluntary hospitals.

The aim of this programme is to ensure a high-quality service nationally resulting in improved patient care through timely and accurate diagnoses.

The QI data collected allows accurate assessment of workload and scope of practice and is vital to ensure that best practice is followed, and that patient safety is at the forefront in all radiology departments. These data allow participating hospitals to compare their performance against national aggregate findings, highlighting areas for improvement.

The conclusions drawn from the findings in this report are based on the available data from participating hospitals. The data in this report is as complete as possible and allows for direct comparison with previous years.

Longstanding problems persist such as a lack of resources, lack of protected time, and poor buy in from hospital management. It is hoped that the ownership of a recommendation on protected time by HSE Acute Operations detailed in chapter 3 is the first step towards ensuring QI activities are integral to the departments work.

The NRQI working group would like to thank all the QI lead radiologists and QI radiography leads in each hospital for data collection, collation and quality improvement initiatives in their departments.

The commitment of the National Specialty QI Programme Steering Committee, the Faculty of Radiologists, the National Quality and Patient Safety team, the HSE and the Programme Management team in RCPI is always appreciated. Thank you for your ongoing support.

Dr Margot Brannigan
Chair, National Radiology QI Programme Working Group

GLOSSARY OF TERMS

Accession number	This is a number assigned to each case by the local information system.
Anonymisation	Anonymisation of data means that data are processed in such a way that identification of persons or other data subjects is prevented. When data are anonymised, it is not possible to link them back to an identified or identifiable natural person.
Case	A case refers to a single examination. One case can contain one image (e.g. plain film) or multiple images (e.g. magnetic resonance).
CT	Computed Tomography, utilises x-ray photons and digital image reconstruction to create a two- or three-dimensional image.
DXA	Dual-energy X-Ray Absorptiometry, also called bone densitometry.
ED	An emergency department in a hospital. In this report ED relates to patients referred to a radiology department from an emergency department.
Exam	A request to a radiology department to carry out diagnostic imaging, an interventional procedure or some other service for a patient. For the key quality indicators and purpose of this report an Exam will be classified as a case.
Ext	External Referral. When a patient is referred to a radiology department from another hospital/centre.
External Review	A review of a radiology procedure carried out by a third party.
FL	Fluoroscopy. This is an imaging modality that uses x-rays to allow real-time visualisation of bodily structures, often with the use of high-density contrast agents.
Focused Audit	A Focused Audit is a review carried out by a radiologist into an aspect of the radiology service.
GP	General Practitioner. In this report GP relates to patients referred to radiology department by a general practitioner.
HSE	Health Services Executive
ICT	Information and Communications Technology
IP	Inpatient. This is a patient referred to radiology department after they have been admitted to hospital.
IR	Interventional Radiology. This is a therapeutic and diagnostic specialty that includes a wide range of minimally invasive image guided therapeutic procedures, including minimally invasive diagnostic imaging.
KQI	Key Quality Indicator. These are standardised, evidence-based measures of health care quality e.g. report turnaround time.

MDM	Multidisciplinary Team Meeting. These meetings form an essential part of the clinical care of patients with cancer, suspected cancer or other clinical conditions and involve specialists in many areas coming together to agree on the best treatment options for individual patients.
MG	Mammography. This modality uses low energy x-rays specifically for imaging of breast tissue.
Modality	A term used in radiology to describe the form of imaging (e.g. computed tomography, ultrasound, magnetic resonance etc).
MR	Magnetic Resonance imaging. This is the use of magnetic fields and radio waves to visualise detailed internal structures, providing real time, three-dimensional image of body organs with good soft tissue contrast.
NIMIS	National Integrated Medical Imaging System. Public hospitals using NIMIS are connected on a single imaging platform to allow sharing of images between specialists.
NM	Nuclear Medicine. This involves use of radioactive tracers to visualise various organs. The radioactive tracer emits gamma radiation, which is then imaged using a gamma camera. The tracer can be injected, inhaled or inserted.
NQAIS	National Quality Assurance and Improvement System. A platform for the generation of local and aggregate national QI data activity reports. It is part of the Health Atlas Ireland platform https://www.healthatlasireland.ie/
NQAIS Site	Refers to the hospital(s) that are upload data to NQAIS-Radiology. Some smaller hospitals upload information under joint NQAIS-Radiology accounts with bigger, model 3 or 4 hospitals in their hospital group. Each NQAIS account is referred to as a NQAIS-Radiology site.
NRQI	The National Radiology Quality Improvement Programme
OP	Outpatient. This is a patient referred to a radiology department without hospital admission at the time of radiological exam.
OUS	Obstetric Ultrasound. This is performed to assess the foetus and related structures in pregnant women.
Outcome Meeting	An Outcome Meeting is a meeting between interventional radiologists to discuss interventional procedures.
PACS	Picture Archiving and Communication System. This is software used in radiology departments to store, review and report on radiology images across different modalities.
Patient Class	Describes the patient being examined based on referral source (i.e. General Practitioner referral, Inpatient referral).
PET	Positron Emission Tomography. This uses small amounts of radioactive materials called radiotracers or radiopharmaceuticals to evaluate organ and tissue functions. By identifying changes at the cellular level, this imaging method may help the early detection of a disease.

Pseudonymisation	Pseudonymisation of data takes place when any identifying characteristics of data are replaced with a pseudonym or a value which does not allow the data subject to be identified. Pseudonymised data can no longer be attributed to a specific data subject without the use of additional information.
QI Activity	A quality improvement task carried out on a case. It is described by multiple QICS records and linked by the original case ID. There will be one key QICS record that identifies the QI Activity; the remaining QICS records provide additional information on the QI Activity.
Radiology Department	The organisational structure within which a radiology service is provided. A radiology department can provide its service at one or more hospitals.
RCPI	Royal College of Physicians of Ireland
RCSI	Royal College of Surgeons in Ireland
Recommendation	Refers to suggestions for quality improvement put forward by the working group. They are based on the data presented in this report that should be implemented in each radiology department to support ongoing quality improvement activities.
RIS	Radiology Information System. The workflow engine supporting everyday activities of a radiology department in providing diagnostic imaging services to the hospital and patients.
RQI Meeting	Radiology Quality Improvement Meeting
NSQI Team	National Specialty Quality Improvement programme management team, based in RCPI.
TAT	Turnaround Time. This is the time between the moment an image is available for a radiologist to report on, to the time when the radiology report is finalised and authorised by the reporting radiologist.
TH	Surgical theatre
US	Ultrasound. This modality utilises high-frequency sound waves to provide cross-sectional images of the body.
VUS	Vascular Ultrasound. This is performed to assess the heart and vascular structures.
XR	X-Ray (radiography). Use of electromagnetic radiation with short wavelengths, to visualise the internal structures of a patient. Also called plain film.

4th NATIONAL DATA REPORT
KEY RECOMMENDATIONS

The following recommendation relating to protected time has seen the assignment of an owner.
Please see Appendix A for full recommendations

1 The NRQI Programme recommend that a protected time allocation of one hour per week for all local clinical leads, 1.5 hours per week for NRQI working group members and 2 hours per week for the working group chair are implemented to carry out the activities associated with these roles. In relation to public hospitals, this has been agreed in principle with HSE Acute Operations, who have emphasised the need to ensure QI is integral to workplans.

The additional recommendations remain local and are placed with individual radiology departments/ hospital management.

DATA QUALITY

2 The NRQI working group recommend that sites access reports in NQAIS-Radiology on a quarterly basis for the purposes of sharing with colleagues and senior hospital management. It is recommended that summary data be uploaded in conjunction with the preparation of the quarterly report, as outlined in the upload schedule.

See Chapter 2

WORKLOAD

3 Radiology departments require adequate resources to deal with the increasing demand for more complex imaging. There has been a year-on-year increase in the number of examinations performed requiring additional staffing. The NRQI working group recommend that additional resources including staffing and equipment, are put in place in an attempt to deliver an improved service in a timely manner.

See Chapter 3

TAT

4 The working group recommend that radiology departments review local processes and use suitable QI methodologies to explore the root cause of TAT delays and employ suitable QI methodologies to find solutions. To achieve improvements to patient care, departments must be supported by hospital management, with the appropriate time and resources made available.

See Chapter 4

PEER REVIEW

5 The NRQI working group recommend that all radiologists ensure they record the completion of a retrospective, assigned and prospective peer reviews in the local system. This is essential to ensure the data are captured and an accurate picture of QI activity can be both recorded and used to improve patient care.

See Chapter 5

RQI MEETINGS

6 The working group recommend that RQI meetings are used to encourage a culture of mutual respectful learning with emphasis on positive learning and feedback with "good pick up" cases forming a central role.

See Chapter 7

4th NATIONAL DATA REPORT
KEY FINDINGS AND OBSERVATIONS

CHAPTER 3: WORKLOAD

1. In 2022, over 3 million cases were recorded in 48 public and voluntary hospitals participating in the NRQI programme, which represents an 8.8% increase in comparison to 2021 records.

2. The biggest increase in the number of referred cases was recorded for GP referrals, 66,936 more in 2022 when compared with 2021, which translates into a 19.1% increase. This is the highest increase in GP referrals recorded over the last five years.

3. Over the previous 5-year period, calculated using the number of cases requiring reporting in participating hospitals, increased by 13.5%. More complex exams such as CT and MR saw a significant increase of 36.0% and 44.8% respectively. US cases increased by 35% over that period.

CHAPTER 4: REPORT TURNAROUND TIME

4. In 2022, 19 NQAIS sites out of 41 met or exceeded the recommended TAT target of 90%, this is one more site than in 2021 and three less than in 2020.

5. Findings for OP referrals for CT, MR and US have remained above the recommended target of 90%, while XR report authorisations remain well below the target, with 7% less reports authorised within the specified timeframe in 2022 than in 2021.

6. For GP referrals, findings reveal that between 2018 and 2022 sites have maintained a national aggregate of reports authorised within the recommended time of above 90% for CT, MR, US and for XR until 2021 where a drop just below 90% was seen to 89% and a further drop of 4% in 2022.

7. In 2022, the aggregate data reveal that CT, MR and US reached the recommended target of 90% cases authorised within the specified timeframe of 24 hours from IP referrals, at 96%, 92% and 90% respectively. The percentage of XR cases authorised from an IP referral did not reach the recommended target of 90% of reports authorised within 72 hours, dropping 3% from 2021 to 76% in 2022.

CHAPTER 5: PEER REVIEWS

8. The highest percentage of prospective peer reviews in 2022 was recorded for MR cases at 0.5% which was a 0.9% decrease from 2021. The remaining three modalities, CT, US and XR recorded a combined 0.1% of cases reviewed as part of the prospective review process. The majority of prospective reviews were recorded for MR, at 58.3% out of all prospective reviews recorded in 2022, which is 15.9% less than in 2021.

9. Data show a decrease in the percentage of cases where retrospective review was recorded, with the biggest change for CT, with 0.2% cases recorded in 2022 as retrospectively reviewed, down from 0.3% in 2021.

10. The 2022 data show that 66% of all retrospective peer reviews were in concurrence with the original report, this is 9% less than in 2021. The percentage of cases referred to an RQI meeting on peer review completion increased by 9% in 2022 to 25%, and minor discrepancy records remained similar to 2021 findings, at 9% of recorded retrospective peer reviews.

CHAPTER 6: RADIOLOGY ALERTS

11. The findings reveal that the overall number of alerts recorded in 2022 was higher across all referrals, when compared with 2021, with the most significant increase recorded for OP referrals, 10,459 in 2022, which translates to 6.5% more alerts recorded for this referral group in the previous year.

12. Data demonstrates an increase in the percentage of radiology alerts acknowledged within the set timeframe in 2022 when compared to 2021. The highest increase can be observed for OP referrals, 6.5% more than in the previous year.

CHAPTER 7: RADIOLOGY QUALITY IMPROVEMENT MEETINGS

13. In 2022 the biggest increase in the number of cases referred to RQI meeting was recorded for cases categorised as observation, at 33.7%, 10.5% more than in 2021. Information or educational feedback was recorded for 24.3%, a decrease of 9.6% from 2021. The category of technical was assigned to 17.4% of cases referred to RQI meetings, which is 6.5% less than in 2021. Cases categorised as compliment were recorded almost twice as frequently in 2022 as in 2021, increasing to 8.5% from 4.5% noted last year.

CHAPTER 1
INTRODUCTION TO THE PROGRAMME

1

Launched in 2009, the National Radiology Quality Improvement (NRQI) Programme provides a national framework, which can be used to establish routine reviews of performance, highlighting opportunities for improvement within quality activities, measured against national aggregate results, recommendations and agreed targets, in line with international best practice.

The NRQI Programme was launched by the Faculty of Radiologists, Royal College of Surgeons in Ireland (RCSI), in collaboration with the National Cancer Control Programme (NCCP). Created in response to findings of reports into cancer misdiagnoses at the time, it remains at the centre of quality improvement in radiology in Ireland.

The Faculty of Radiologists and Radiation Oncologists, RCSI, continue to lead the programme, while HSE National Quality and Patient Safety Directorate provides the necessary funding.

The programme is managed by the National Specialty Quality Improvement (NSQI) programme management team, Royal College of Physicians of Ireland (RCPI).

THE AIMS OF THE NATIONAL RADIOLOGY QI PROGRAMME ARE TO:	
●	Ensure a high quality, consistent and accurate radiology service nationally, providing the optimum patient experience with consistently high standards of quality care.
●	Improve patient safety and enhance patient care through timely, accurate and complete radiology diagnoses and reports.
●	Increase public confidence in diagnostic reporting by providing evidence-based assurance of the quality of the diagnostic service.
●	Enable individual departments to review their performance against national targets and drive decision making through the upload and analysis of real-time data using a national data repository.
●	Provide a safe space for learning and continuous improvement where QI activities are performed routinely by all.
●	Identify and share best practice between participating radiology departments, driving development of a standardised national quality improvement system for radiology.
●	Recognise and encourage opportunities for quality improvement locally, actively promoting a culture of quality improvement by engaging key hospital stakeholders.
●	Improve communication between participating sites.

THE BENEFITS OF PARTICIPATION IN THE NRQI PROGRAMME:	
●	Inclusion of aggregate data in the programme's annual national data reports.
●	A NQAIS account where the hospital can view their performance against the national aggregate, allowing them to identify if there are areas that require quality improvement or other areas in which they are excelling.
●	Ability to create quick to run, customisable PDF QI data reports in addition to snapshots of KQI related data in CSV format for local use.
●	Access to the NHQI Guidelines, which are a support tool in terms of how to run the programme locally.

PURPOSE OF THIS DATA REPORT

The data relating to selected key quality indicators are collected locally by participating hospitals and submitted to NQAIS-Radiology to be included in the national data report published by the programme annually. This report facilitates informed decision making on the future steps necessary to support ongoing quality improvement processes within the Irish radiology services.

The NRQI programme working group encourages radiologists to discuss their local performance against recommended targets and national averages with colleagues, local hospital management and quality and patient safety teams. Where findings suggest that there may be an area in need of improvement, these should be discussed locally using local hospital data extracted from NQAIS-Radiology. Where patient safety related concerns exist, they should be managed locally and escalated as appropriate in line with the relevant policies.

WHAT IS BEYOND THE SCOPE OF THIS REPORT

This report cannot and should not be used to produce league tables or compare hospitals, as no two hospitals will have the same patient profile. Different hospitals specialise in treating patients with different and sometimes much more complex care needs, making comparisons between hospitals invalid.

Some smaller hospitals upload information under joint NQAIS site accounts with larger hospitals in their hospital group due to varying resourcing levels. It must be taken into account that each NQAIS site listed in this report may represent a combination of two or more hospitals or a single hospital.

This report does not distinguish if the presented data were recorded in an on-call environment, during high holiday season, or within core working hours. It is important to remember that differing levels of support are available during these times.

OUTLIER MANAGEMENT

Participating hospitals are responsible for the management of outliers and resolving issues at a local level. The NRQI Programme does not engage with individual sites that could appear as outliers in this report.

Hospitals are requested to generate local QI data reports and to ensure that reports are shared by the radiology department and reviewed by quality and patient safety teams and at an appropriate management level, linking with relevant hospital governance structures and programme structures as set out in the programme guidelines and to take action as required.

All responsibility rests with participating sites to address any issues relating to their data and the potential to reach agreed targets or recommended standards. They are to ensure the necessary actions to improve quality are initiated and/or referred to the appropriate person / role locally.

LOCAL LEADERSHIP

The NRQI Programme plays an important role in maintaining and improving quality within radiology departments. Quality improvement should be woven into all systems of the department to achieve the best possible outcome. To support and coordinate quality improvement activities, it is imperative that local leadership and quality management systems be in place and the hospital management provide the support and resources required for successful quality improvement.

NATIONAL DATA REPORT APPROVAL PROCESS

This report has been developed by the working group of the NRQI Programme and the NSQI programme management team, RCPI.

It was approved by the working group on the 20 October 2023.

The report was then submitted to the Faculty of Radiologists and Radiation Oncologists, RCSI, for review and received approval on 31 October 2023.

The NSQI programmes steering committee approved the report on 8 November 2023.

The report was also submitted to the HSE National Centre for Clinical Audit Steering Group on the 9 November 2023 for review.

NRQI PROGRAMME HIGHLIGHTS

National Radiology Quality Improvement Programme
4th National Data Report
1 JAN - 31 DEC 2022

4th National Data Report

48
Public & Voluntary Hospitals Contributing Data
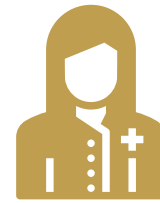
68
Clinicians involved locally
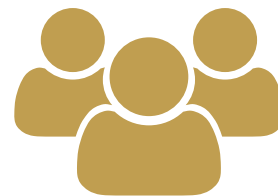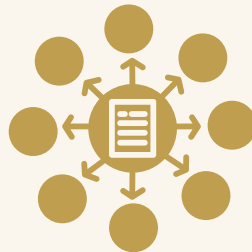(Consultant Radiologists and Diagnostic Radiographers)

2022 NRQI Annual Conference
"QUALITY AND SAFETY IN RADIOLOGY"

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PARTICIPANTS

Data Sharing
NRQI data requested by the Irish Cancer Society for work on detailed research on the impact of the COVID-19 pandemic on Irish cancer services.

3
New Working Group Members
Dr Margot Brannigan WG Chair

Dr Brian Gibney

Dr James Ryan

TAT Project
The Total Turnaround Time pilot project is in progress, with cross function project team from one of the participating radiology departments on board.

NEW NRQI PROGRAMME WEBPAGE LAUNCHED IN 2022
previous reports and other resources available for download

CLICK HERE

NQAIS-Radiology online training can be requested by contacting the Programme Manager.

DATA QUALITY

National QI data relating to the following key quality indicators (KQIs) were analysed in the preparation of this report:

- **REPORT TURNAROUND TIME**
- **PEER REVIEW**
- **RADIOLOGY ALERTS**
- **RADIOLOGY QUALITY IMPROVEMENT MEETINGS**

Data have been analysed across the key quality areas to permit comparison of sites individual findings between two years, and in some instances, where possible, to establish trends over multiple years. Data relating to the national radiology workload have also been supplied in Chapter 3.

DATA QUALITY

It is important that those who are collecting and using the QI data can have confidence in the quality of the data. The collected data must be reliable, accurate, relevant and timely, to facilitate decision making and associated quality improvements to provide safer higher quality care for patients.

Following HIQA recommendations on the use of data quality framework, the programme can assess the current data quality and necessary improvements using the following four tools.

1) Data quality strategy

2) Data quality assessment

3) Reporting on data quality and

4) A data quality improvement cycle.

Data Quality Statement

The following section provides details on the data source for this report, how the data are collected, data coverage across the country and a detailed overview of data quality under the five dimensions of data quality as outlined by HIQA[1].

The NRQI Programme acknowledges the continuous challenges relating to the quality of the data collected.

The majority of the QI data collection takes place via automatic nightly uploads, sign-off is not a part of that process currently. While automated data collection has its benefits such as efficiency and consistency of uploads, this process requires further improvements. The working group continue to encourage sites to engage with this report and the QI Guidelines to ensure participating departments are familiar with the data required for this and local reporting, both automated and manual uploads to NQAIS-Radiology.

[1.] Health Information and Quality Authority (2018) *"Guidance on a data quality framework for health and social care"*
https://www.hiqa.ie/sites/default/files/2018-10/Guidance-for-a-data-quality-framework.pdf

DATA SOURCE

The data source for this report is the National Quality Assurance and Improvement System (NQAIS) Radiology by Health Atlas Ireland.

NQAIS-Radiology is a central repository for quality improvement data. It provides participating sites with a tool to generate local reports, review their local data and compare findings to the national aggregate data. Data collected in NQAIS-Radiology allow the programme to produce national data reports on KQIs across all participating sites. NQAIS has been developed and validated by HSE eHealth and Disruptive Technologies (formerly OCIO), as the national database for QI data storage, analysis and report generation.

NQAIS is a dynamic database. New data can be added and existing data updated daily via summary data uploads and on the first day of each month via automated uploads. The dynamic nature of the database means that the timing of the extract is very important. If the extract is taken on a different day than when a user looks at the NQAIS-Radiology application, the data will not be identical, as the data are dynamic and not static.

While the local reports can be generated by participating sites directly from NQAIS-Radiology, the national data report is based on an aggregate national QI data extract acquired directly from the NQAIS provider. This report presents analysis of the data extracted on 15 August 2023.

DATA AND INFORMATION LIFECYCLE

Data relating to QI activities are collected through a local information system connected to Radiology Information Systems (RIS) and Picture Archiving Communication Systems (PACS) within hospitals, where radiologists and other members of radiology department team input information daily.
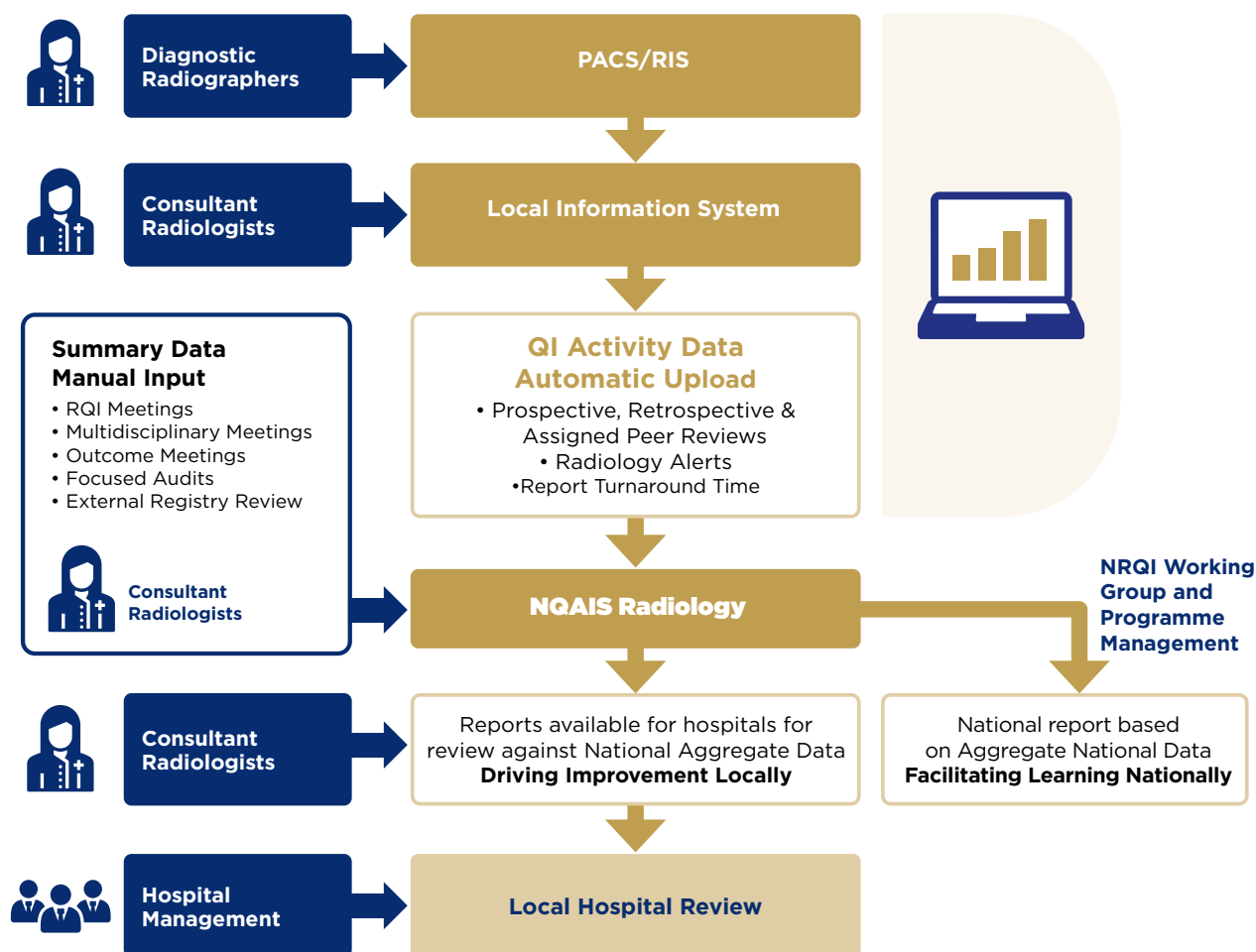
The QI data relating to the predefined KQIs listed above are collected in the local information systems, encrypted and automatically exported every night to a secure location on a HSE server and then submitted to NQAIS-Radiology.

A portion of QI activity relating to KQIs listed under Summary Data (Table 2.1) requires manual input into NQAIS-Radiology by a QI Lead Radiologist.

A data extract from NQAIS-Radiology is used by the NRQI programme management team for analysis for the annual national data report. The final report, once approved, is made available to all stakeholders, on the RCPI and the Faculty website, and through direct communication with participating hospitals.

How are QI Data collected?

Diagnostic Radiographers → **PACS/RIS**

Consultant Radiologists → **Local Information System**

Summary Data Manual Input
- RQI Meetings
- Multidisciplinary Meetings
- Outcome Meetings
- Focused Audits
- External Registry Review

Consultant Radiologists

QI Activity Data Automatic Upload
- Prospective, Retrospective & Assigned Peer Reviews
- Radiology Alerts
- Report Turnaround Time

NQAIS Radiology

NRQI Working Group and Programme Management

Consultant Radiologists → Reports available for hospitals for review against National Aggregate Data **Driving Improvement Locally**

National report based on Aggregate National Data **Facilitating Learning Nationally**

Hospital Management → **Local Hospital Review**

LOCAL REPORTING

Each of the participating radiology departments can access their data in NQAIS-Radiology and generate local reports, which can be configured using the filters available. Those reports facilitate not only review of the local records but also comparison against national aggregate data, targets and recommendations.

The programme recommends that those reports are reviewed regularly and used to identify areas for improvement, as well as to identify best practice and sustain the quality of work taking place in the context of the reports. The programme encourages the use of NQAIS-Radiology data in local quality improvement projects and initiatives.

The local QI lead radiologist is requested to communicate the local QI data reports to senior hospital management and clinical governance, quality and patient safety teams including the clinical director/consultant in administrative charge, on a quarterly basis at minimum. Detailed roles and responsibilities of all parties are outlined in the NRQI programme memorandum of understanding.

SCOPE OF THE REPORT

IN SCOPE:

This report does not distinguish between adult and paediatric cases, however workload and QI activity data presented in this report includes adult and paediatric exams.

Data presented in this report include case referral source and the report distinguishes four of possible sources: inpatient (IP)and outpatient (OP) cases as well as those referred from emergency department (ED), cases referred by general practitioners (GP) and those from sources external to the hospital in which the examination takes place.

OUT OF SCOPE:

Mammograms performed as part of the BreastCheck screening programme are not included in this report.

Presented data does not include all obstetric ultrasound cases completed in participating hospitals.

This report does not distinguish between data recorded within regular working hours, evenings and weekends, or in the high holiday season, where different levels of support may be available.

The summary data section in NQAIS-Radiology also includes outcome meetings and external review registry, however these KQIs are specific to interventional radiology (IR) and as not all sites perform IR examinations, as a result these two KQIs have been omitted from the first report. There are no data collected in relation to external registry review, which is also part of summary data section in NQAIS-Radiology.

DATA COLLECTION TIMELINE

The data contained in this report were collected between 1st January and 31st December 2022.

DATA COVERAGE

In 2022, 48 public and voluntary hospitals participated in the NRQI programme (See map on page 22), they are represented in this report under 39 NQAIS-sites or accounts.

TABLE 2.1. List of Public Hospitals participating in NRQI Programme and contributing to National Data Report 2022

Dublin Midlands Hospital Group	Saolta Hospital Group
Tallaght University Hospital	Letterkenny University Hospital
Coombe Women & Infants University Hospital	Mayo University Hospital
Midland Regional Hospital, Portlaoise	Portiuncula University Hospital
Midland Regional Hospital, Tullamore	Roscommon University Hospital
Naas General Hospital	Sligo University Hospital
St. James's Hospital	University Hospital Galway
St. Luke's Hospital, Rathgar	Merlin Park University Hospital
Ireland East Hospital Group	**South/South West Hospital Group**
Cappagh National Orthopaedic Hospital	Kilcreene Orthopaedic Hospital
Mater Misericordiae University Hospital	South Tipperary General Hospital
Our Lady's Hospital, Navan	University Hospital Kerry
Regional Hospital Mullingar	University Hospital Waterford
Royal Victoria Eye and Ear Hospital	South Infirmary Victoria University Hospital
St. Columcille's Hospital	Mercy University Hospital, Cork
St. Luke's General Hospital, Kilkenny	Cork University Hospital
Wexford General Hospital	Mallow General Hospital
RCSI Hospitals Group	Bantry General Hospital
Beaumont Hospital	**Children's Health Ireland (incl. TUH & CHB Paediatric RCSI Group)**
Cavan General Hospital	Children's Health Ireland at Temple Street
Connolly Hospital Blanchardstown	Children's Health Ireland at Crumlin
Louth County Hospital	**UL Hospital Group**
Monaghan General Hospital	University Hospital Limerick
Our Lady of Lourdes Hospital, Drogheda	University Maternity Hospital Limerick
Rotunda Hospital	Ennis Hospital
No Group	Nenagh Hospital
National Rehabilitation Hospital	Croom Hospital
St. Mary's Hospital, Dublin	St. John's Hospital

HOSPITALS WE WORK WITH
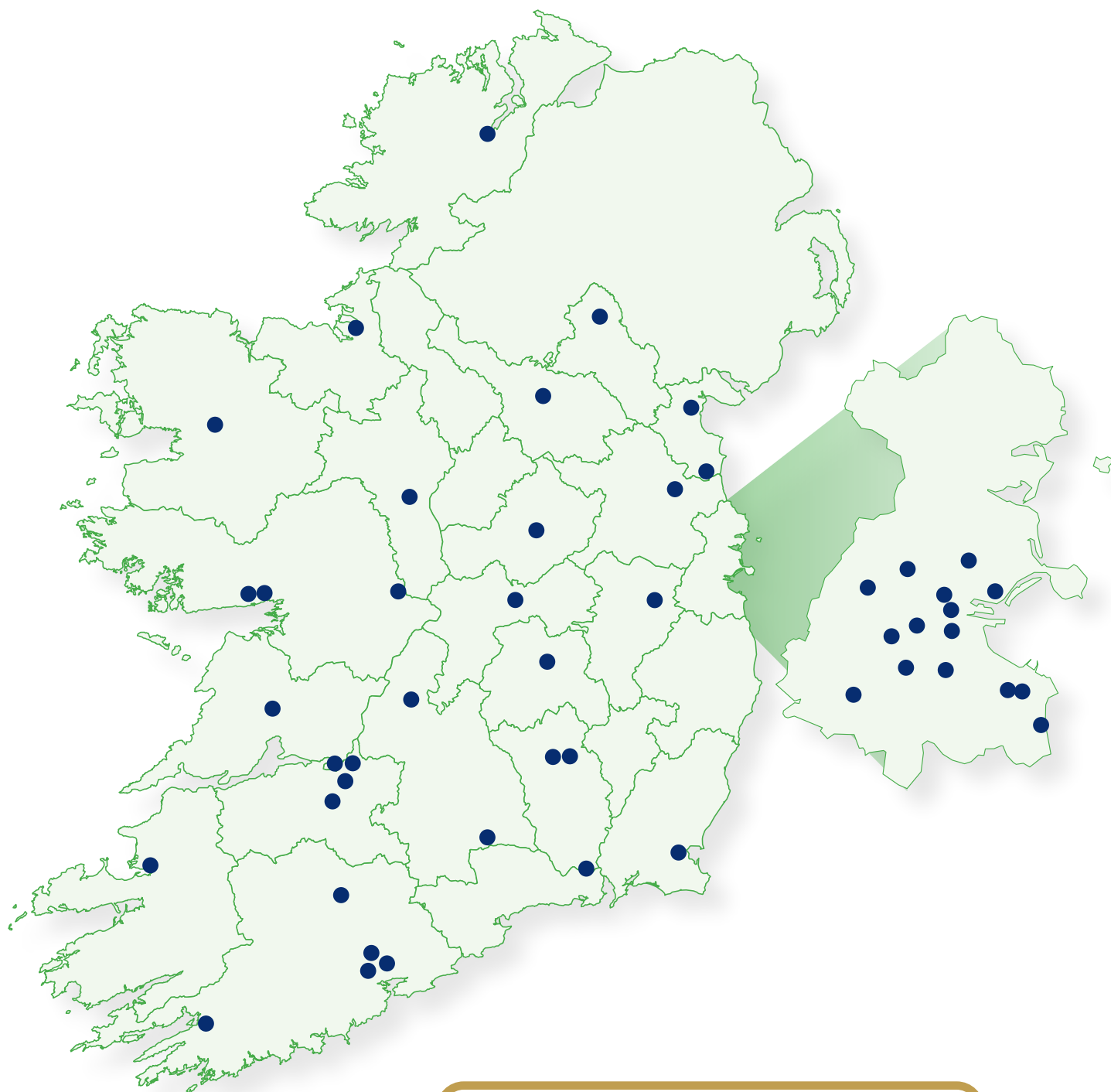
48 Public and Voluntary Hospitals* Contributed QI Data to this National Data Report 2022

The number of hospitals does not correlate with number of NQAIS sites as some hospitals upload data under joint NQAIS Account.

DATA PROTECTION

Each participating hospital owns its data and is therefore the data controller in relation to data collected there. This means that the hospital is responsible for the integrity of its data and can, among other related responsibilities authorise or deny access to data. This is performed under the direction and governance of local and hospital group management and in accordance with Data Protection Acts 1988 and 2003 and General Data Protection Regulation (GDPR).

The data collected and analysed in the radiology departments for the NRQI Programme do not contain patient identifiable information. It should also be noted that data collected by the NRQI Programme do not include information which could identify radiologists or other members of the radiology department.

Detailed information on the collection, processing, storing, accessing and reporting of QI data withing the programme are outlined in the NSQI Programmes Information Governance Policy.

DATA QUALITY ASSESSMENT

Data quality has been reviewed under the following five dimensions of quality[2]:

1. **Accuracy and Reliability**
2. **Timeliness and Punctuality**
3. **Coherence and Comparability**
4. **Accessibility and Clarity**
5. **Relevance**

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[2] Data Protection Commission (2019) "Guidance on Anonymisation and Pseudonymisation" https://www.dataprotection.ie/sites/default/files/uploads/2019-06/190614%20Anonymisation%20and%20Pseudonymisation.pdf

1. Accuracy and Reliability

The QI data collected for the NRQI Programme are designed to measure quality at both a local and national level in radiology departments. Trends are analysed on an annual basis for each KQI in the national data report and where possible, an overview of years 2018 to 2022 has been provided.

An automatic data upload system has been configured to include a data validation process, where only the most up to date version of each case is uploaded to NQAIS-Radiology from a local information system. This is to avoid creation of duplicate data entries.

The verbal feedback from departments is that QI activity is happening locally, owing to multiple reasons, the rate of recording QI activity remains at a low level in many sites in Irish hospitals. This means that the data in the report do not accurately reflect the volume of QI activity occurring nationally. Low participation in radiology QI, if real, carries a potential risk for patient safety.

Analysis of the 2022 data revealed a gap in the national dataset, which manifested as a period of decreased workload. This drew the attention of the programme management and the working group for review. A deep investigation of findings per site, on a monthly basis, revealed the absence of data entries for that period of time across two sites for both 2021 and 2022. The data gap discovered was caused by a system error, which had no impact on patient records or data input locally. However, it did impact the availability of full extract from NQAIS provided by the software vendor to the programme manager. The sites in question were informed at the time and action was initiated immediately.

This error was rectified within 4 weeks and the data entries were submitted through successful collaborative efforts between the programme management and the software vendors, for both years.

In this report, 2021 findings have been updated and detailed workload figures are presented in Table 3.1 (page 34). The volume of cases recovered from the aforementioned sites represented 3.9% of the total 2021 national caseload. The comparative analysis between 2021 and 2022 data presented in this report was performed using a new annual national data extract for both years, acquired by the programme management on the 15th of August 2023. Going forward readers will be requested to consult the 2022 report for accurate workload figures for 2021.

Completeness: The automatic data upload process ensures that vital data are included in the data extract used for the national data report, this results in almost a 100% data completeness level. However, for those data that require manual input, a very low level of data completeness is noted by the programme.

The data presented in this report are accurate at the time the dataset extract was created.

2. Timeliness and Punctuality

Data relating to the same suite of KQIs are automatically uploaded to NQAIS-Radiology on a nightly basis. Additional data must be entered manually by the QI clinical leads, ideally on a monthly basis.

Local uploading processes allow for some QI activity to be uploaded in the period between data extraction and publication of this report. Radiology departments are not formally requested to complete manual input for summary data by a certain date, as a result it is possible that some of those data are not included in this annual national data report.

Resulting from a recommendation made in last year's report in relation to the timeliness and completeness of summary data uploads locally, an upload schedule has been devised to assist sites.

Following on the key recommendation in the 3rd National Data Report, it is advised that summary data records are uploaded quarterly, prior to extraction of local quarterly reports.

This upload schedule will come into effect from Q4 of 2023, following publication of this report.

KEY RECOMMENDATION
FROM 3RD NATIONAL REPORT

1	The NRQI working group recommends that sites manually upload summary data in conjunction with the preparation of the quarterly report. Sites are reminded on a quarterly basis to access reports in NQAIS-Radiology for the purposes of sharing with colleagues and senior hospital management

The dates by which summary data should be uploaded are as follows:

SUMMARY DATA PERIOD
1 JANUARY – 31 MARCH **(Q1)** — DATA TO BE UPLOADED BY: **APRIL 30**

SUMMARY DATA PERIOD
1 APRIL – 30 JUNE **(Q2)** — DATA TO BE UPLOADED BY: **JULY 31**

SUMMARY DATA PERIOD
1 JULY – 30 SEPTEMBER **(Q3)** — DATA TO BE UPLOADED BY: **OCTOBER 31**

SUMMARY DATA PERIOD
1 OCTOBER - 31 DECEMBER **(Q4)** — DATA TO BE UPLOADED BY: **JANUARY 31**

DATA FOR THE PRECEDING YEAR THAT ARE NOT UPLOADED BY MARCH 30TH WILL NOT BE INCLUDED IN THE NATIONAL DATA REPORT.

NQAIS-Radiology can be accessed here: healthatlasireland.ie

Further information, including user manual,
can be found on the NRQI programme's website.

If you have any queries related to the above,
please contact programme manager at joannawolak@rcpi.ie

The annual national data report is launched within the 12 months after the reporting period.

3. Coherence and Comparability

A data dictionary is maintained by the programme manager, cataloguing and describing the structure and content of the data in a standardised format to maintain consistency and accuracy in data collection. Aggregated data, once entered into the national dataset are not compared with data from other sources. This is due to the pseudonymous nature of the data collected, no patient identifiers are present in the dataset.

Participating hospitals have assigned pseudo-identifiers under which they are presented in graphs in the national data report. Those pseudo-identifiers are known only to the hospitals themselves. As outlined in chapter 1 Introduction to the Programme, this report cannot be used to compare hospitals to one another as no two hospitals will have the same patient profile, a NQAIS site may represent a pairing of two or more hospitals or a single hospital.

The current dataset reported on by the NRQI Programme in this report facilitates quality improvements within radiology but cannot be linked with datasets provided by the other National QI Programmes in GI Endoscopy and Histopathology or with the HIPE database.

4. Accessibility and Clarity

All participating radiology departments can access their own data in NQAIS-Radiology providing the relevant staff have a NQAIS account and appropriate permissions have been assigned.

Training is provided by the programme management to aid the reliability of this process. Further training or any refreshing of specific elements can be requested from the programme manager.

Once the data are extracted from NQAIS-Radiology, the data analysis is performed consistently by the programme management team and presented graphically in the national data report.

Previous reports can be viewed here.

5. Relevancy

The NRQI Programme has set out seven KQIs (see Table 2.2); however, not all are included in this report. The KQIs that are not covered in this report include those where the data in NQAIS-Radiology may not be currently reliable due to a low level of data completion and data immaturity.

The working group review and assess the KQIs on an ongoing basis in terms of relevance and based on feedback from colleagues. Work is underway on the setting of evidence-based targets for some KQIs covered in the national data report.

The purpose of the data collected and reported on is to aid decision making on patient care in a busy radiology department.

REPORTING ON DATA QUALITY

Data quality is monitored by the programme management, with reports currently made to the working group and steering committee if issues arise.

CONTINUOUS IMPROVEMENT OF DATA QUALITY

Limitations are encountered in relation to the data captured by local systems in the form of gaps, leading to low levels of data completeness that are difficult to quantify. The NRQI programme working group are exploring ways to enhance current upload processes, ensuring they are not onerous on the radiology department, to try and increase data completeness.

Greater discussion between all parties will indicate if the data currently available meet the needs of radiology departments and on the use of local reports which will enable the programme to generate a more detailed picture on the use of the data for activities such as service planning.

The NRQI working group support implementation of further technical improvements to enhance automated uploading functionality. This would facilitate increased recording of radiology QI activities which may be happening in practice but which are not being captured.

KEY RECOMMENDATION

The NRQI working group recommend that sites access reports in NQAIS-Radiology on a quarterly basis for the purposes of sharing with colleagues and senior hospital management. It is recommended that summary data be uploaded in conjunction with the preparation of the quarterly report, as outlined in the upload schedule.

TABLE 2.2: NRQI Programme Key Quality Indicators, as outlined in "Guidelines for the Implementation of a National Radiology Quality Improvement Programme V 3".

KEY QUALITY INDICATORS	
Automatic Nightly Upload to NQAIS-Radiology	
PEER REVIEW	
Prospective Review	Number of accession numbers with prospective peer review (expressed for each modality and as a % of total accession numbers for each modality
Retrospective Review	Number of accession numbers reviewed (expressed for each modality and accession number type and as a % of total accession numbers for each modality)
Assigned Review	Number of accession numbers referred for consideration at Radiology Quality Improvement meetings (expressed as a % of total cases reviewed, by modality) (Apply to both Retrospective and Assigned Review.)
RADIOLOGY ALERTS	
Critical	Number of Radiology Alerts where the acknowledgement was received within the guideline acknowledgement time (expressed as a % of the number of Radiology Alerts)
Urgent	Number of Radiology Alerts for each urgency level (expressed as % of total workload)
Unexpected – Clinically Significant	Number of acknowledged communicated cases of unexpected and clinically significant radiological findings (expressed as % of total workload)
REPORT TURNAROUND TIME	
The % of cases with Report Turnaround Times within either 24hrs or 72hrs for all and by referral source and modality	
Summary Data - require manual input to NQAIS-Radiology by Consultant Radiologist	
RADIOLOGY QUALITY IMPROVEMENT (RQI) MEETINGS	
Attendance expressed as percentage of persons in attendance out of all invited. Number of accession numbers reviewed at RQI meeting (expressed as a percentage of total workload) Number of accession numbers reviewed at RQI meeting by source: Peer Review, MDM (to include Clinico-Radiological conferences) Number of accession numbers reviewed at RQI meeting by outcome: (expressed as a percentage of total workload)	
MULTIDISCIPLINARY MEETINGS (MDM) Not reported on currently in NDR	
Number of MDMs / Clinico-Radiological Meetings held Number of patients reviewed at these MDMs / Clinico-Radiological Meetings (expressed as a % of total patients) Number of patients referred to a Radiology Quality Improvement Meeting (expressed as a % of total patients reviewed at MDM / Clinico-Radiological Meeting)	
OUTCOME MEETINGS (Interventional Radiology) Not reported on currently in NDR	
Number of meetings held Number of patients reviewed (expressed as a percentage of total accession numbers) Number of patients for which learning points were listed or difficulties perceived (expressed as a percentage of total accession numbers).	

Detailed characteristics of each discussed Key Quality Indicator can be found in the respective chapters.

CHAPTER 3
WORKLOAD

Workload presented in this report refers to the number of radiology exams available for reporting within described timelines. Owing to digital capabilities, it is easy to extract data relating to number of exams, however those figures do not provide the full context or reveal the challenges that accompany reported workload, and they do not capture all the activities of the radiologist or the radiology department. The various QI activities that also take place on any given case are not recorded in this chapter; these are presented throughout this report.

While reports published in previous years presented only one year worth of workload data, this 4th national data report will present annual workload for 1st January to 31st December 2022, as well as review of changes over five-year period, 2018 to 2022.

In 2022, over 3 million cases were recorded in 48 public and voluntary hospitals participating in the NRQI programme, which represents an 8.8% increase in comparison to 2021 records (see , Workload - 2022).

2022 WORKLOAD

TOTAL CASES RECORDED
3,064,750

8.8% INCREASE FROM 2021

10.4%

COMPUTED TOMOGRAPHY (CT)
444,040

8.9%

ULTRASOUND (US)
380,513

38.1%

DUAL X-RAY ABSORPTIOMETRY (DXA)
24,975

8.4%

X-RAY
1,811,687

13.1%

MAGNETIC RESONANCE (MR)
206,976

-1.9%

NUCLEAR MEDICINE (NM)
18,646

11.4%

MAMMOGRAM (MG)
51,534

8.8%

THEATRE (TH)
35,229

5.9%

FLUOROSCOPY (FL)
10,933

2.2%

INTERVENTIONAL RADIOLOGY (IR)
26,124

-9.6%

VASCULAR ULTRASOUND (VUS)
41,617

10.0%

POSITRON EMISSION TOMOGRAPHY (PET)
4,672

FIGURE 3.1: Radiology Workload per NQAIS Site (2021 vs 2022)
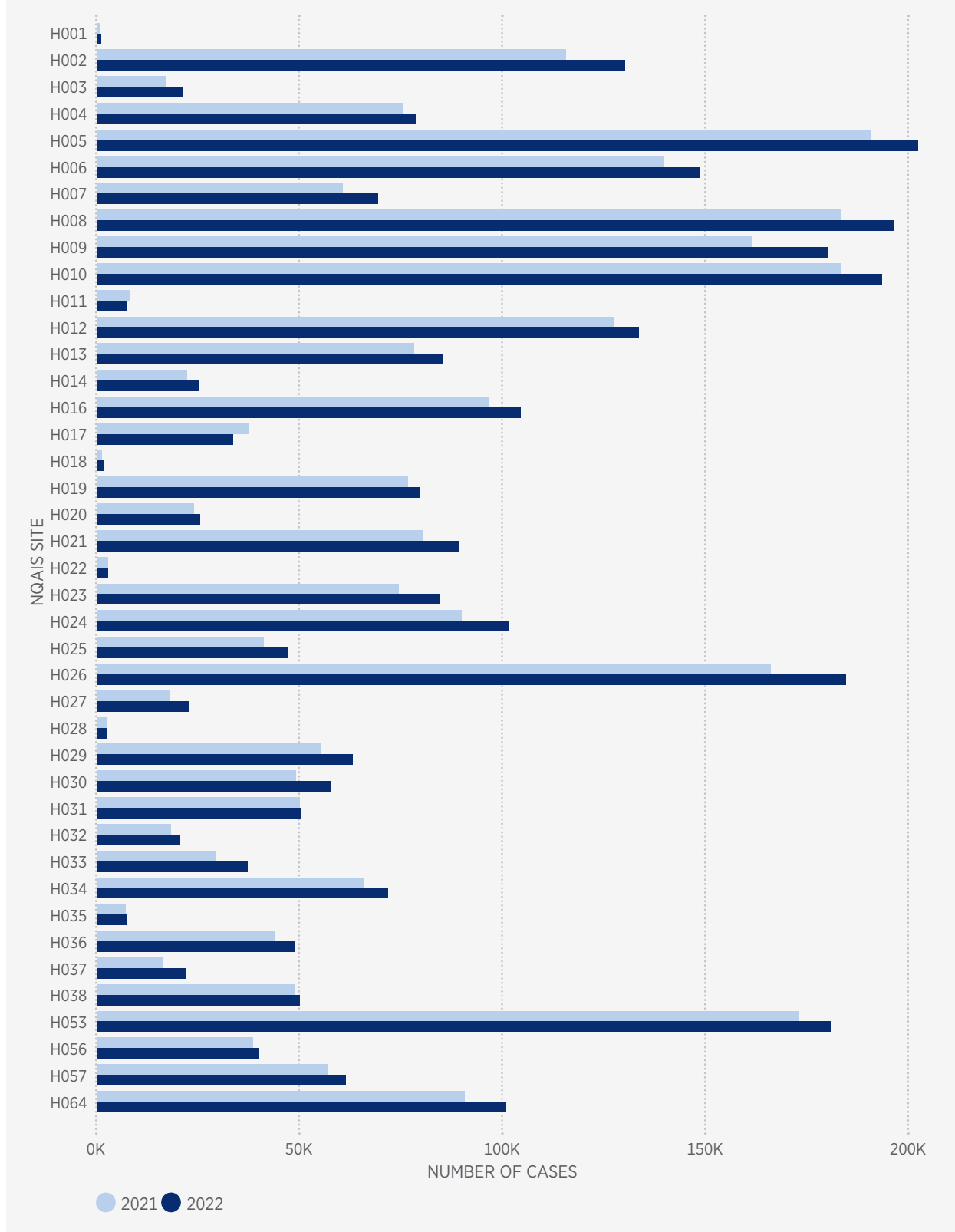
Similar to previous years, a workload increase was recorded for the majority of NQAIS sites in 2022 when compared to 2021 (Figure 3.1).

FIGURE 3.2: Number of Cases Recorded in 2021 vs 2022, by Patient Class (Referral Source)
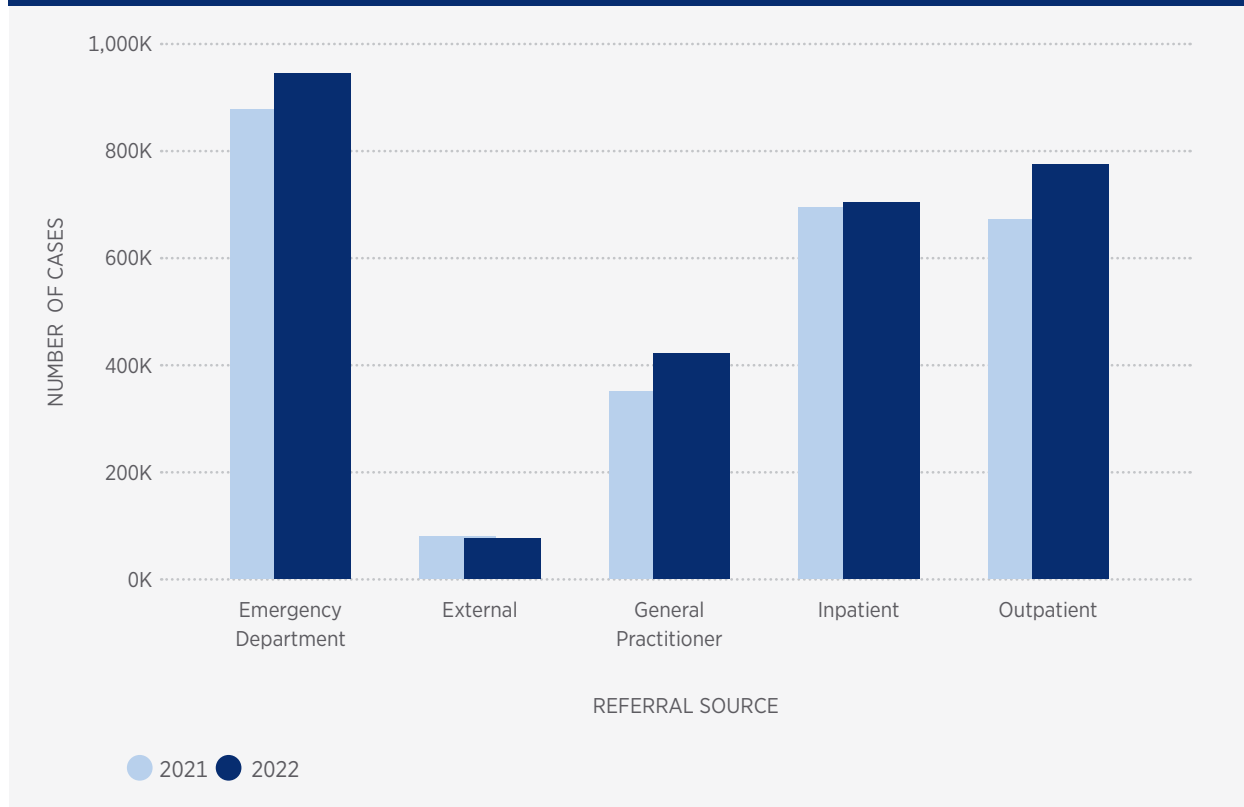
Figure 3.2 illustrates that the biggest increase in the number of referred cases was recorded for GP referrals, 66,936 more in 2022 than in 2021, which translates into 19.1% increase. This is the highest increase in GP referrals recorded over the five-year period. This could be attributed to the GP Access to Diagnostics initiative which was launched in January 2021[3].

Emergency department referrals saw a 7.2% increase with 62,896 more than in 2021 and outpatient cases increased by 15.3%, almost 102,372 more than the previous year, while both inpatient and externally referred cases remained at similar levels. This represents a corresponding pattern to that seen last year.

[3] "2023 Waiting List Action Plan" page22:
"GP Access to Diagnostics, The nationwide GP Access to Diagnostics initiative, which is aligned to the ECC Programme, began accepting referrals in January 2021 and facilitates direct referral of patients by GPs to diagnostics services. Limited access to diagnostics can result in patients being referred to hospital radiology outpatient departments for services; however, this initiative facilitates referrals of patients who can wait up to
four weeks for an urgent, or up to 12 weeks for a non-urgent, diagnostic test and avoids unnecessary referrals to acute hospitals to access these tests."
https://www.gov.ie/pdf/?file=https://assets.gov.ie/249526/8b203212-06b9-4ddc-96f7-9938b0707e19.pdf#page=null

5-YEAR WORKLOAD CHANGES
2018-2022

NUMBER OF CASES 13.5% INCREASE

INCREASED COMPLEXITY

Rising number of cases in modalities where large number of images produced require significantly higher investment of time for reporting and review.

CT
+36%

COMPUTED
TOMOGRAPHY (CT)
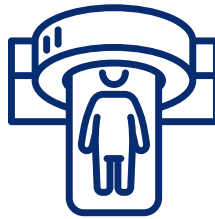
MR
+44.8%

MAGNETIC
RESONANCE (MR)

US
+35%

ULTRASOUND
(US)

DXA
+15.7%

DUAL X-RAY
ABSORPTIOMETRY (DXA)

PET
+16.3%

POSITRON EMISSION
TOMOGRAPHY (PET)
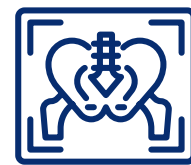
XRay
+4.6%

X-RAY

TABLE 3.1: Annual Aggregate National Workload by Modality, 2018 – 2022.

Modality	# Cases 2018	# Cases 2019	# Cases 2020	# Cases 2021	# Cases 2022	% Difference between 2018 & 2022
CT	326,584	365,164	360,813	402,096	444,040	36.0%
DXA	21,589	21,697	14,877	18,088	24,975	15.7%
FL	10,474	10,376	9,249	10,322	10,933	4.4%
IR	25,109	25,812	22,306	25,569	26,124	4.0%
MG*	42,268	44,788	42,381	46,256	51,534	21.9%
MR	142,945	153,681	142,965	182,995	206,976	44.8%
NM	19,165	20,401	18,147	19,011	18,646	-2.7%
OUS*	11,145	10,862	9,165	9,427	7,804	-30.0%
PET	4,016	4,140	4,210	4,247	4,672	16.3%
TH	31,258	31,591	29,188	32,389	35,229	12.7%
US	281,807	306,813	315,212	349,501	380,513	35.0%
VUS	51,730	51,291	40,818	46,050	41,617	-19.5%
XR	1,732,344	1,804,814	1,545,710	1,671,314	1,811,687	4.6%
Total	2,700,434	2,851,430	2,555,041	2,817,265	3,064,750	13.5%

* Please note that not all mammograms (MG) and obstetric ultrasounds (OUS) are included in the NRQI programme national dataset.
** Please note that these are updated 2021 workload findings. Please see Data Quality chapter (Page XX) for details.

Over the five-year period, 2018 - 2022, workload was calculated in terms of the number of cases requiring reporting. In participating hospitals workload increased by 13.5%, however this does not reflect the increased complexity of exams which significantly increases the amount of time required for review and reporting of additional cases.

While X-Ray examinations remained at nearly the same level throughout the years, recording a 4.6% increase from 2018 to 2022 data, more complex exams such as CT and MR saw a significant increase of 36% and 44.8% respectively between these years.

CT and MR imaging include a large number of images which all have to be carefully reviewed by the reporting radiologist and compared with any previous images available for diagnoses. This takes significantly more time than reporting on plain film images.

The data also show that the number of ultrasounds increased by 35% over the past five years. A steady increase can be seen for the number of PET exams over the previous five years and with the growing incidents of cancer in the population this figure can expected to continue rising.

FIGURE 3.3: Number of Radiology Reports Completed, National Aggregate, 2018 to 2022
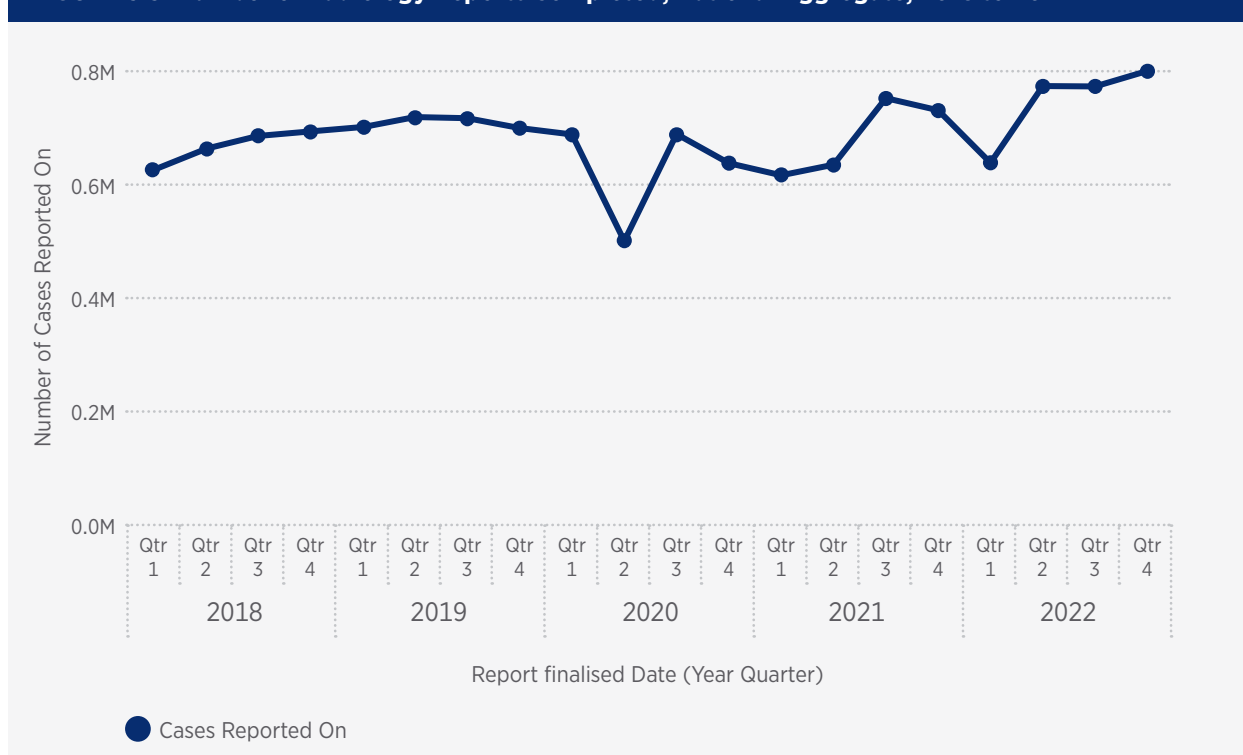
Figure 3.3 demonstrates changes in the number of reports completed each quarter from 2018 to 2022 (please note this is not necessarily the same as the number of cases available for reporting at those points in time). The dip, as expected can be seen in Q2 2020 with recovery to pre pandemic levels in Q3 2021, and as can be seen from Q4 2022 caseload continues to rise.

KEY RECOMMENDATIONS

Radiology departments require adequate resources to deal with the increasing demand for more complex imaging. There has been a year-on-year increase in the number of examinations performed requiring increased staffing. The NRQI working group recommend that additional resources including staffing and equipment, are put in place in an attempt to deliver an improved service in a timely manner.

The NRQI Programme recommend that a protected time allocation of one hour per week for all local clinical leads, 1.5 hours per week for NRQI working group members and 2 hours per week for the working group chair are implemented to carry out the activities associated with these roles. In relation to public hospitals, this has been agreed in principle with HSE Acute Operations, who have emphasised the need to ensure QI is integral to workplans.

Please see Appendix A for full recommendation.

CHAPTER 4
REPORT TURNAROUND TIME

4

The time from when the images from a completed examination are available to the radiologist for interpretation, until the time the report is authorised, is referred to as the report turnaround time (TAT).

KEY QUALITY INDICATOR

The % of cases with report TATs within defined timescales for all cases and by referral source and modality.

RECOMMENDED TARGET

The NRQI Programme working group encourage sites to achieve 90% reports completed within the set TAT. Work is ongoing to explore the suitability of this target.

Report TAT is an important metric to measure the efficiency of processes in a radiology department and while it does not indicate the accuracy or correctness of radiology reports, it can provide valuable information in relation to the timeliness of diagnoses and the quality of patient care.

The findings in this chapter can be viewed in parallel to the findings in Chapter 3 Workload, as the difficulties encountered in radiology departments in achieving consistently high report TATs can be linked to the available resources and the increasing volume and complexity of work.

Report TAT is impacted by a number of factors such as interventional caseload, multidisciplinary team meetings, administrative duties, quality improvement activities, teaching and research. However, radiologist availability, subspecialty expertise and complexity of exams have the biggest impact on report turnaround time.

TABLE 4.1: Report TAT maximum targets for each modality depending on patient class (referral source).

Patient Class (Referral Source)	CT	MRI	US	XR
Emergency Department	12 hours			48 hours
Inpatient	24 hours			72 hours
Outpatient	10 days			
General Practitioner	10 days			

Table 4.1 outlines the maximum targets for report TAT in the four main referral sources, emergency department (ED), inpatient (IP), outpatient (OP) and general practitioner (GP). These targets are outlined in the NRQI Programme QI Guidelines which also specify the recommended target time for report completion depending on referral source for the four modalities with the highest national aggregate cases count, Computer Tomography (CT), Magnetic Resonance (MR), Ultrasound (US) and X-Ray (XR).

FIGURE 4.1: Percentage of Cases Where Specified Report Turnaround Times Have Been Achieved, for MR, CT, US, XR Combined, for All Patient Classes, by NQAIS Site, 2021 vs 2022
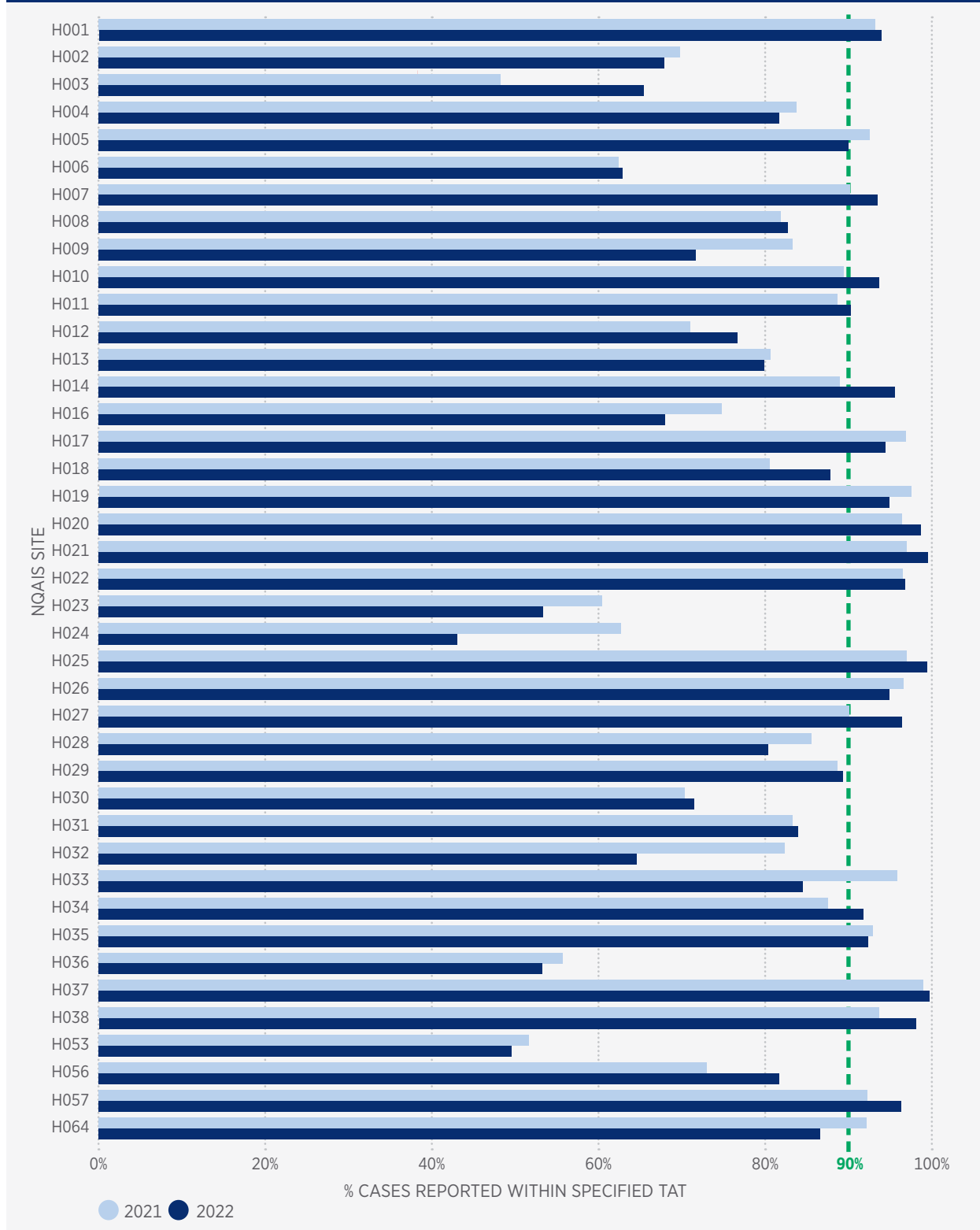
Figure 4.1 shows that in 2022, 19 NQAIS sites, out of 41 met or exceeded the recommended TAT target of 90%, this is two more sites than in 2021 and three less than in 2020.

In 2022, ten out of 41 sites authorised between 80% and 90% reports in the specified timeframes, which is three less than in 2021.

As indicated earlier in this chapter, report TAT cannot provide context in relation to the complexity and volume of workload, however when viewed in terms of the volume of cases per NQAIS site in Chapter 3, Workload (Figure 3.1), valuable insight is provided revealing that results for individual sites are heavily dependent on workload and available resources.

5-YEAR TAT REVIEW

In this section, the report will present not only changes in TAT between 2021 and 2022, but also an overview of TAT changes over the five-year period, of 2018-2022.

Outpatient Referrals 2018 - 2022

A decrease in the percentage of reports completed within 10 days for OP referrals for CT, MR, US and XR can be seen between findings reported for 2022 compared to 2021 (Figure 4.2). The most notable decrease is for XR with 7% less reports authorised within the specified timeframe in 2022. As in previous years for OP referrals, XR report authorisations remain well below the recommended target of 90%.

FIGURE 4.2: Percentage of Reports Completed Within 10 days for Outpatient Referrals, for CT, MR, US and XR, 2018 - 2022
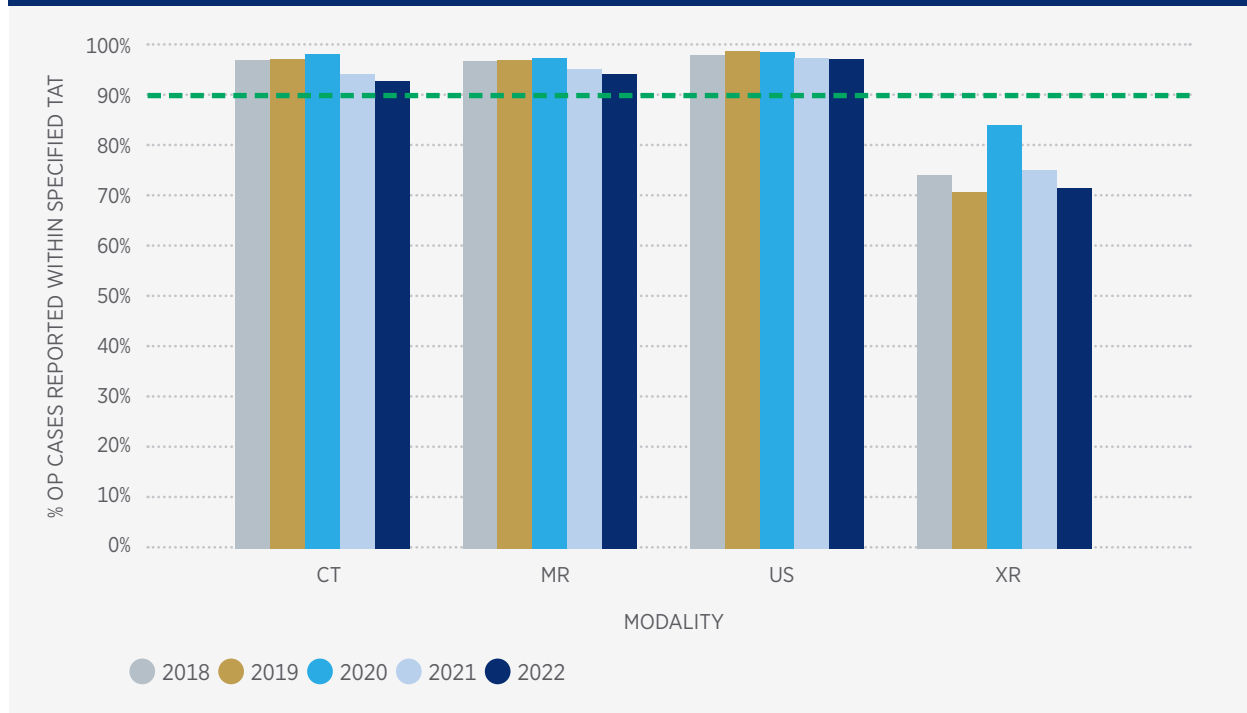
Figure 4.2 displays the 5-year trend from 2018-2022 for OP referrals in relation to CT, MR, US and XR. While findings for OP referrals for CT, MR and US have remained above the recommended target of 90%, a slight downward trend is clear. The authorisation of XR reports from OP referrals are routinely below the recommended target and have dropped significantly between 2020 and 2022.

This decrease may reflect the higher overall number of XR cases and a prioritisation of more complex exams performed for patients who require urgent or unscheduled care.

FIGURE 4.3: Percentage of Reports Completed Within 10 days for Outpatient Referrals, for All Modalities Without a Recommended TAT, 2018 - 2022
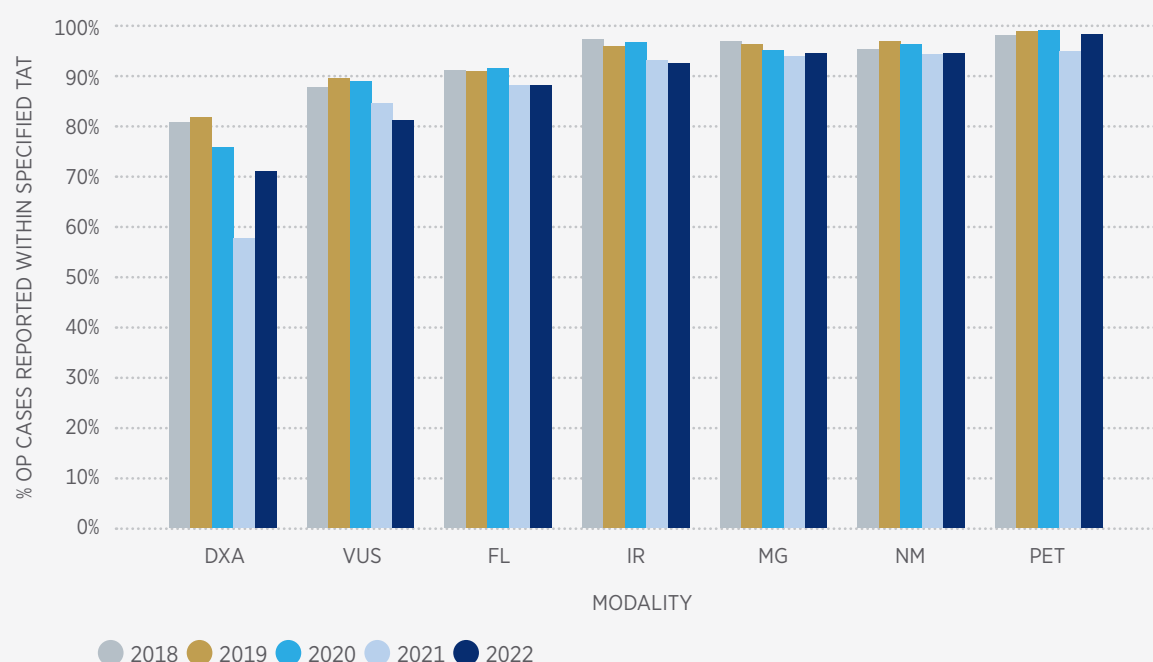
Figure 4.3 presents findings in relation to reports completed from OP referrals for the remaining seven modalities on which the programme gathers data, providing a comparison between 2021 and 2022. There is no recommended target associated with these modalities as the national aggregate case count is considerably less than for CT, MR, US and XR but a growing trend can be seen from 2018 to 2022 in terms of the number of OP referrals for these modalities.

General Practitioner Referrals 2018 - 2022

The findings for reports authorised from GP referrals in 2022 follow a similar pattern to those from OP referrals in that over 90% of CT, MR and US reports were authorised within the 10-day timeframe. A slight drop was seen in the percentage of XR reports authorised in 2022 at 4%, remaining below the 90% recommended target.

FIGURE 4.4: Percentage of Reports Completed Within 10 days for GP Referrals, for CT, MR, US and XR, 2018 - 2022
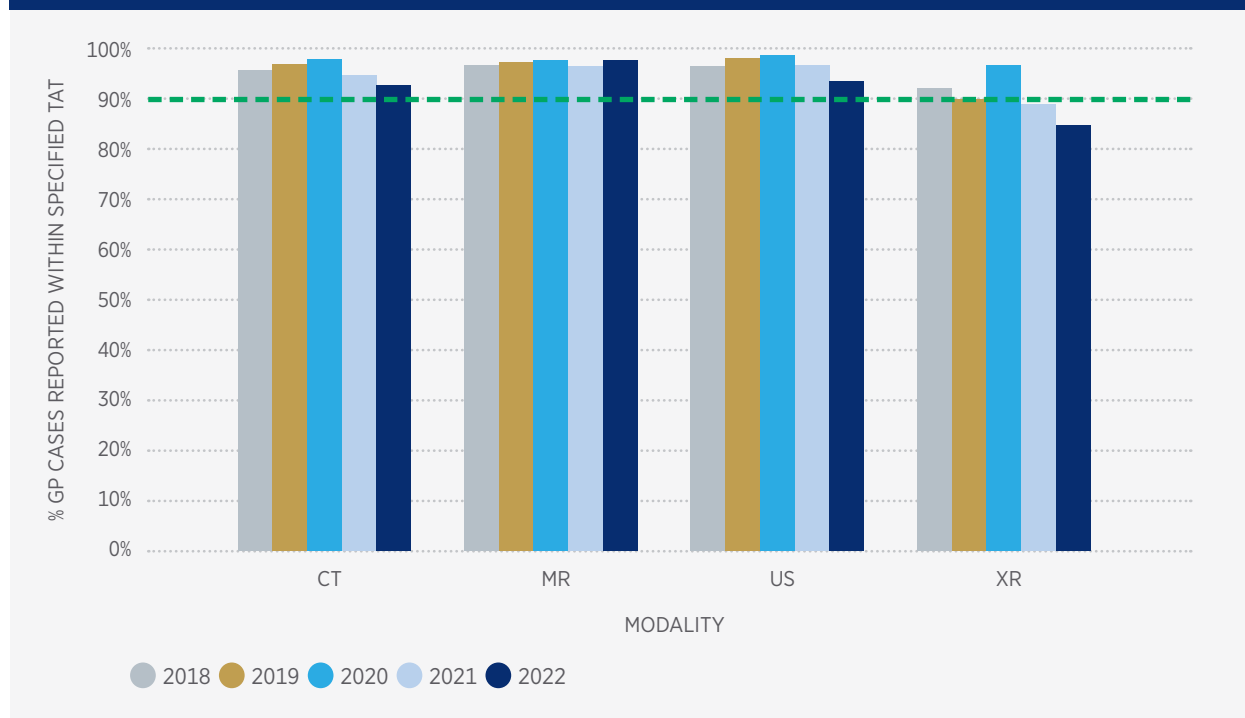
Figure 4.4 presents a 5-year analysis of the percentage of reports completed for CT, MR, US and XR from GP referrals within the specified 10-day timeframe. Findings reveal that between 2018 and 2022 sites have maintained a national aggregate above 90% for CT, MR, US and for XR until 2021 where a drop just below 90% was seen to 89% and a further drop of 4% in 2022 for XR.

The findings for the authorisation of XR cases for GP referrals are in contrast to those for OP referrals with a considerably higher achievement of the recommended target seen here in Figure 4.4.

FIGURE 4.5: Percentage of Reports Completed Within 10 days for GP Referrals, for Modalities Without a Recommended TAT, 2018 - 2022
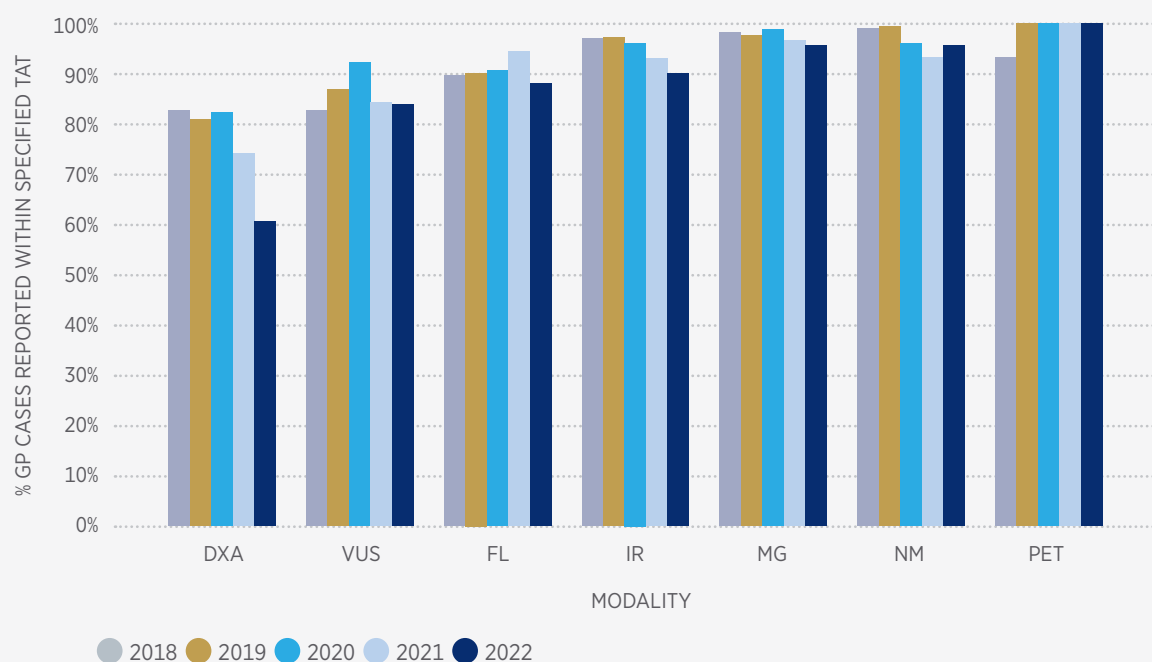
Figure 4.5 highlights the percentage of reports authorised for GP referrals within the 10-day timeframe has remained at 100% for PET scans from 2021 to 2022, which may be linked with a very low volume of those referrals.

Emergency Department Referrals 2018 - 2022

Table 4.1 outlines that the maximum timeframe for the authorisation of a report for CT, MR or US from an ED referral is 12 hours, the timeframe for an XR report is 48 hours. Figure 4.6 presents findings from 2022 in comparison to the previous years. This graph highlights that between 2022 and 2021, CT, MR and XR remained below the recommended target of 90% reports authorised within the specified timeframes. Aggregate findings for US reports reveal that 92% of these reports stemming from an ED referral were authorised in the 12-hour timeframe.

FIGURE 4.6: Percentage of Reports Completed Within Defined Timeframe for Emergency Department Cases: 12 hours for CT, MR, US and 48 hours for XR, 2018 - 2022
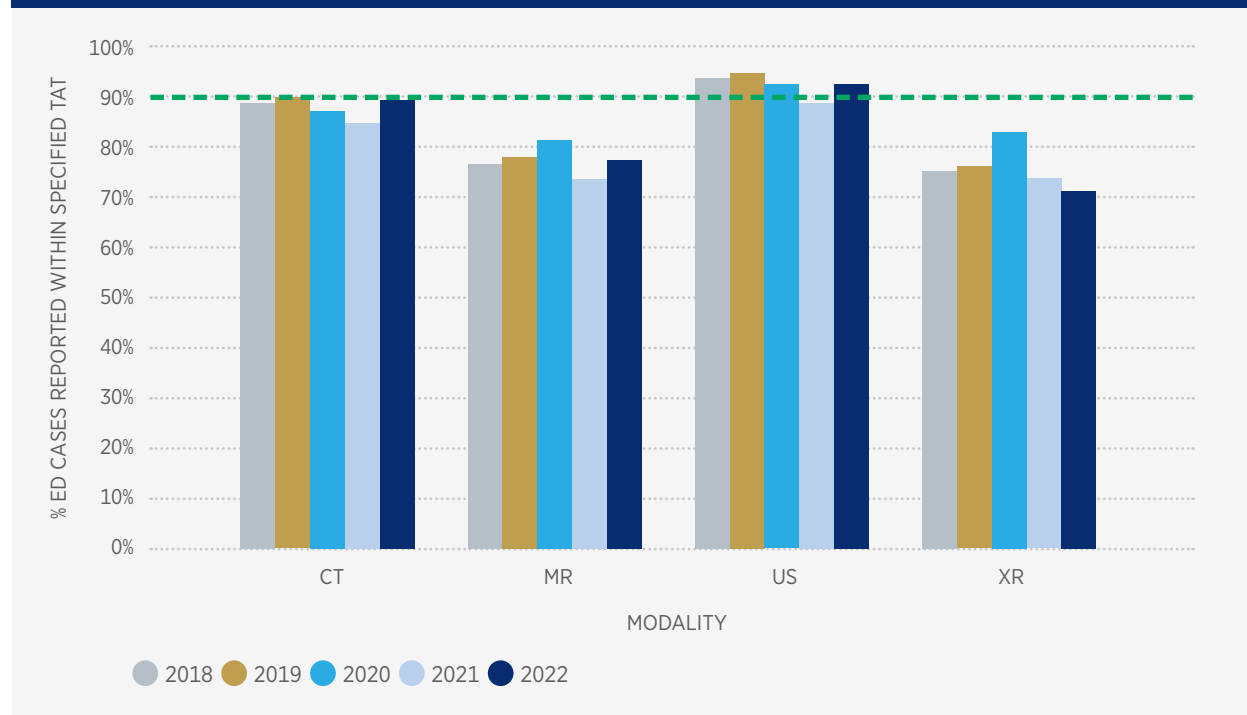
Figure 4.6 provides a comparative analysis of CT, MR, US and XR cases authorised within the specified timeframes from ED referrals in relation to the recommended 90% target. US is the only modality in which the authorisation of reports from an ED referral have exceeded the recommended target of 90%, dropping to 89% in 2021 only.

Findings reveal that the authorisation of XR reports in the ED setting was at its lowest in 2022 at 71%. Similar to findings for OP and GP referrals a sharp increase in the number of reports authorised for XR was seen in 2020, possibly coinciding with the recovery efforts at the start of the pandemic or the reliance on XR as an effective diagnostic modality for associated respiratory complications.

During the pandemic, there was a decrease in outpatient imaging which may have resulted in increased time to focus on XR reporting. The more recent lower percentages of reports authorised within recommended timeframes may be due to a return to pre-pandemic imaging volumes in other modalities, causing XR to fall back in priority.

Inpatient Referrals 2018 - 2022

In 2022, the aggregate data reveal that CT, MR and US reached the recommended target of 90% cases authorised within the specified timeframe of 24 hours from IP referrals, at 96%, 92% and 90% respectively. These findings represent an increase in the percentage of cases authorised for each of these modalities in comparison to 2021 figures (figure 4.7).

As with the other referral sources, the percentage of XR cases authorised from an IP referral did not reach the recommended target of 90% and in this case, within 72 hours. A slight drop was observed in these data for 2022, dropping from 3% to 76%.

FIGURE 4.7: Percentage of Reports Completed Within Defined Timeframe for Inpatient Cases: 24 hours for CT, MR, US and 72 hours for XR, 2018 - 2022
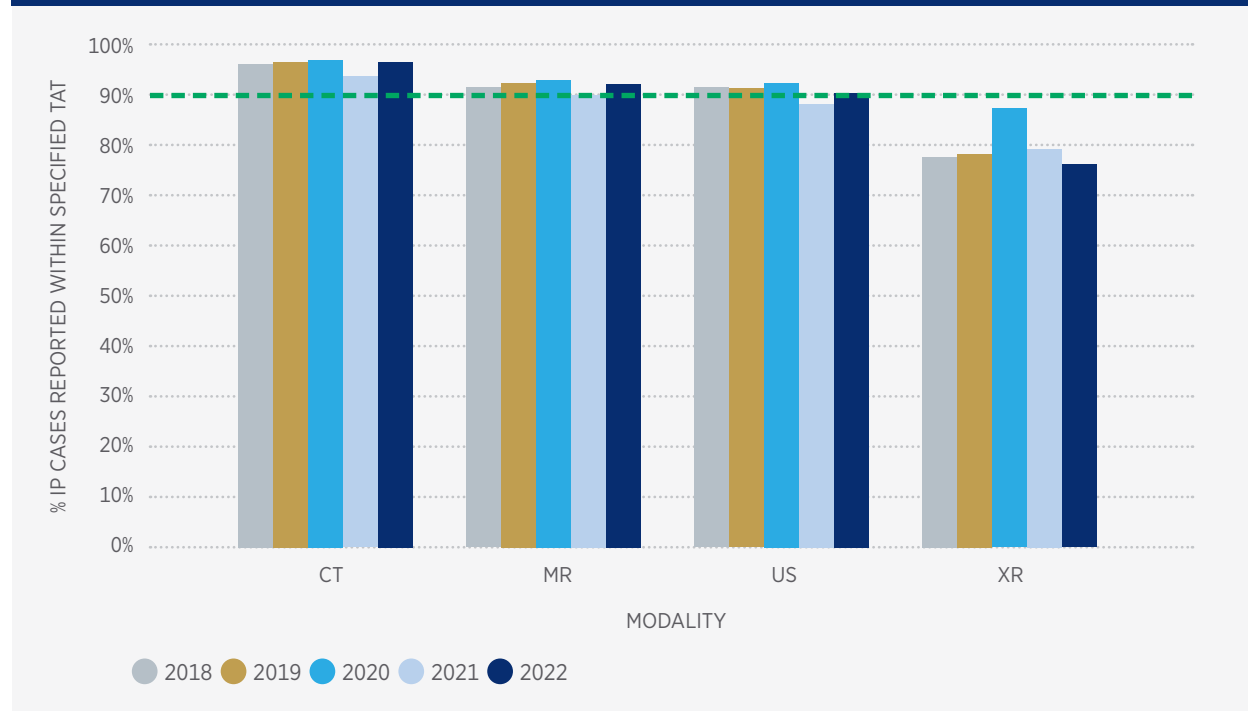
Figure 4.7 presents a 5-year analysis for CT, MR, US and XR reports authorised within the specified timeframes for IP referrals in relation to the recommended 90% target. The aggregate findings reveal that CT, MR and US have generally remained above the recommended 90% target, with US reports experiencing a slight drop to 88% in 2021. As was the case with the other referral sources listed in this chapter, OP, ED and IP, the percentage of XR reports authorised within the 72-hour timeframe specified for IP referrals, did not reach the recommended target of 90%. Aggregate findings reveal that the percentage was at the lowest in a 5-year period in 2022 at 76%.

SUMMARY

The data presented in this chapter do not provide any context in terms of the workload experienced. The significant decrease seen in the percentage of XR reports authorised within the specified timeframes for the four referral sources may reflect a higher overall number of XR cases in comparison to other modalities, and a prioritisation of the more complex cases performed for patients requiring urgent or unscheduled care.

These findings should be reviewed in parallel to the workload data presented in chapter 3, where an overall 8.8% increase in workload was recorded for 2022 in comparison to 2021 and an 13.5% overall increase from 2018 to 2022.

In order to achieve the recommended targets for report authorisation for the four modalities focussed on in this chapter, CT, MR, US and XR a clear view of the resourcing available and the impact of the increasing volume and complexity of cases on TAT process efficiency is necessary.

KEY RECOMMENDATION

The working group recommend that radiology departments review local processes and use suitable QI methodologies to explore the root cause of TAT delays and employ suitable QI methodologies to find solutions. To achieve this improvement to patient care, departments must be supported by hospital management, with the appropriate time and resources made available.

Spotlight: Future Targets

Over the last number of years, the NRQI programme has, owing to the efforts of local QI Leads and QI Tech Leads, built a sizeable dataset. Over time the accuracy and completeness of this dataset has improved, while still leaving room for more improvements in the area of summary data uploads. This presents an opportunity to explore target setting for certain key quality indicators. Targets can be set using analysis of the existing data, expert clinical opinion and in line with national and international best practice and research.

In August 2023, the Royal College of Radiologists (UK), and the Society of Radiographers published a detailed TAT guidance in collaboration with the NHS [ref]. This work was undertaken on the strength of recommendations from the Care Quality Commission review of NHS radiology services. Similar to assertions made by the NRQI Programme, a link between reporting delays experienced and faster progression to diagnosis and treatment was identified by this review. The guidance recommends increasing efficiencies through focus on subspecialty reporting, wider collaboration, ring fencing time for reporting to take place and ensuring digital connectivity is also prioritised.

The primary goal of the revised TAT is that no examination should take longer than four weeks to be reported on after the image is acquired, the longer-term goal is to reduce that timeframe to two weeks. Based on findings published by the NRQI Programme over the last three years, it is clear that while some participating hospitals are challenged in terms of meeting the maximum timeframes outlined for reporting, others are routinely achieving these targets. The aggregate data reveals that certain imaging modalities are frequently below recommended maximum targets, such as XR and MRI reports in the ED and inpatient XR reports.

FIGURE 4.8: Percentage of CT Reports Completed within 4 hours for ED referrals by NQAIS Site, 2021 & 2022
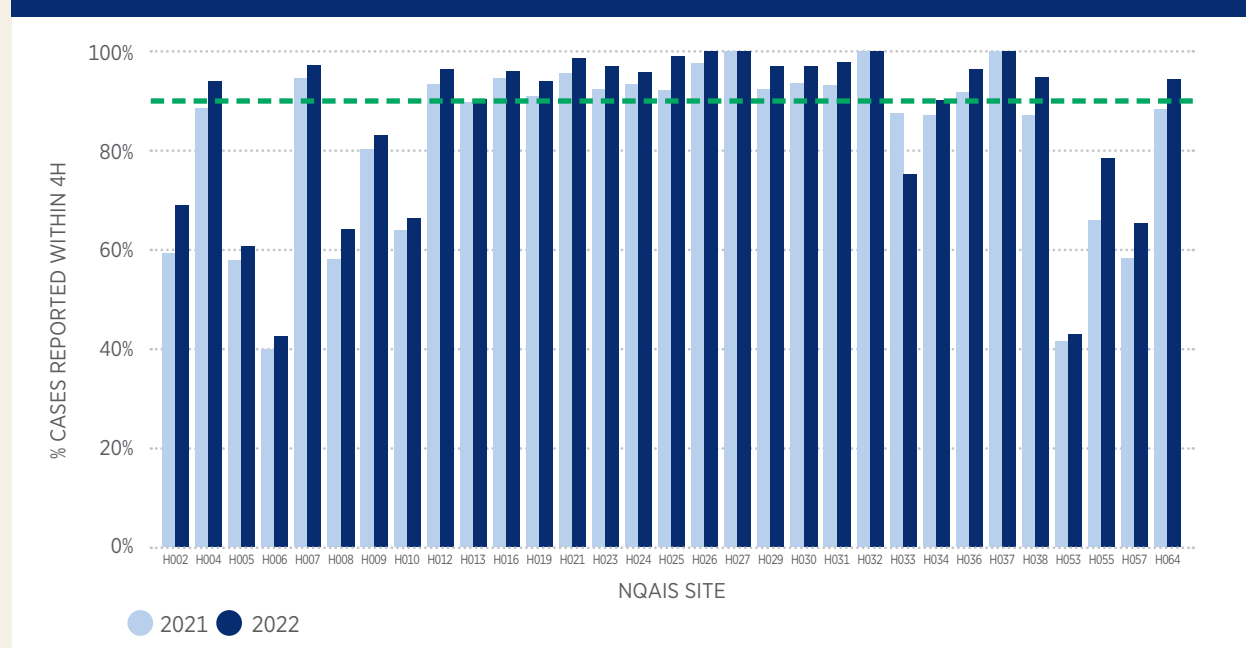
Figure 4.8 provides a snapshot of how sites would perform if a target of four hours or less was applied to the reporting of CT cases in the ED. This indicates that 20 out of 31 sites would meet a TAT of four hours or less, based on 2022 data, the 2021 data reveals 15 sites would have met this target for 90% or more of the reported cases. Current targets permit a TAT of 12 hours for CT reports in the ED.

The NRQI working group are exploring suitable TAT targets as this is key to ensure departments can aim for a specific goal or standard that has been carefully set, to focus on the delays experienced by patients and to indicate when process improvements are required to minimise these delays.

The current TAT pilot project being run collaboratively by the NRQI programme aims to investigate a wider turnaround time, taking into account the image acquisition time. This will result in a greater awareness of where the patients' journey is delayed and where improvements need to be instigated.

CHAPTER 5
PEER REVIEWS

During the peer review process, radiology reports on both current and past exams, are reviewed to assess their completeness and diagnostic accuracy.

The NRQI Programme promotes the process of peer review as a way of maintaining safe and high-quality patient care.

The NRQI "Guidelines for the Implementation of a National Radiology Quality Improvement Programme" outline three types of peer review:

✔ **PROSPECTIVE** – a review conducted on a report which has not yet been authorised.
✔ **RETROSPECTIVE** - the process of evaluating the diagnostic accuracy of a previously authorised report.
✔ **ASSIGNED** - a review performed on a previously authorised report where cases completed within the previous seven days are randomly assigned by a local information system on a weekly basis.

TABLE 5.1: Number of Cases Completed in 2022 by Modality

Modality	Number of Cases 2022
CT	444,040
DXA	24,975
FL	10,933
IR	26,124
MG*	51,534
MR	206,976
NM	18,646
OUS*	7,804
PET	4,672
TH	35,229
US	380,513
VUS	41,617
XR	1,811,687
TOTAL	3,064,750

* Please note that not all mammograms (MG) and obstetric ultrasounds (OUS) are included in the NRQI programme national dataset.

It is important to consider the findings presented in this chapter in the broader context of the overall workload for each modality (Table 5.1) as well as differences in complexity of cases, where many consist of multiple images requiring equal attention.

PROSPECTIVE PEER REVIEW

A prospective peer review takes place when a radiologist seeks a second opinion from another radiologist on a particular case prior to authorising a radiology report. This may be part of a consultation, or as a routine double read (such as mammography, nuclear medicine, CT colonography, or cardiac CT).

This KQI demonstrates the percentage of cases (accession numbers) that were completed within a defined timeframe and were also reviewed by an additional radiologist before completion of the radiology report.

KEY QUALITY INDICATOR

Number of accession numbers with Prospective Peer Review (expressed for each modality and as a % of total accession numbers for each modality)

The peer review process is an important element of continuous education and it is likely to improve quality of reporting and accuracy of future diagnosis, having a positive impact on patient care.

It is advised that a radiologist seeks a second opinion if they have any doubt regarding a reported diagnosis. In particular, when the consulted colleague has particular expertise relevant to the case or the relevant subspecialty training.

Participation in routine reporting and ad hoc prospective reviews are also considered a form of prospective review.

Involvement of other radiologists should be recorded, with their consent, by the reporting radiologist in the consulted radiology report.

FIGURE 5.1: Percentage of Cases Completed (National Aggregate) Where Prospective Review has been Recorded in the Local System for the Four Modalities with the Highest Number of Cases (CT, MR, US and XR), 2021 vs 2022
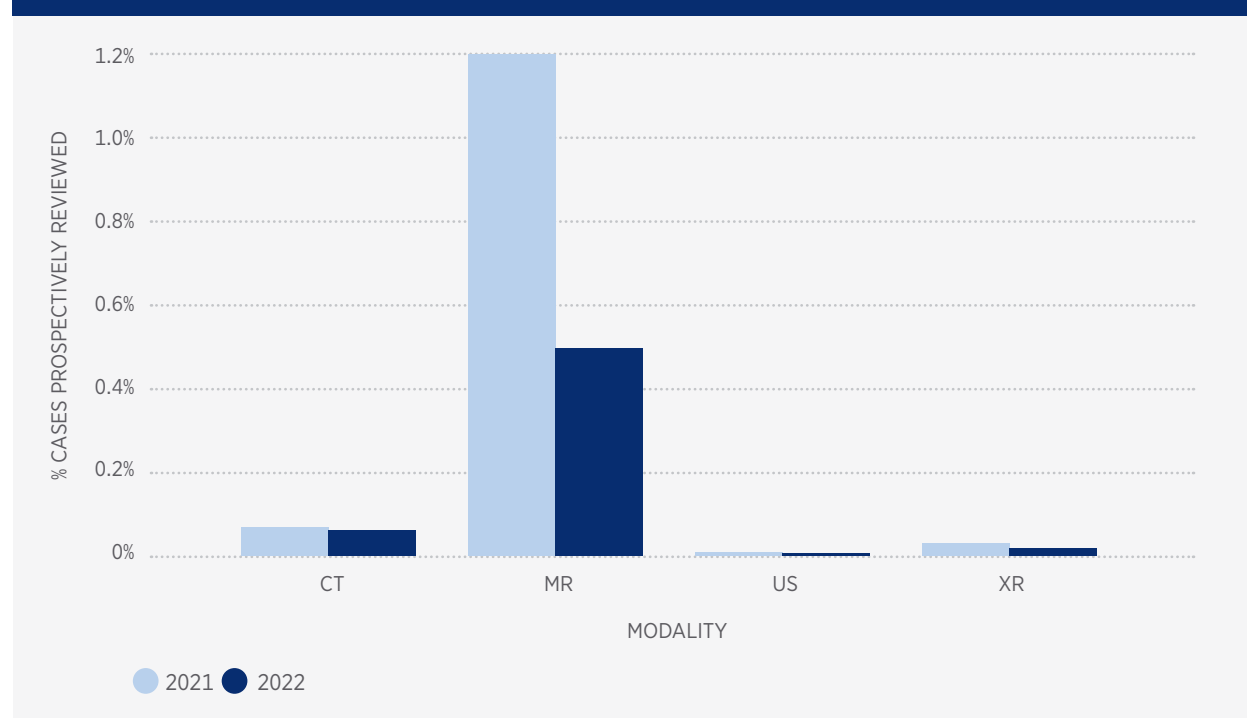
Figure 5.1 illustrates the percentage of cases where a report was reviewed prospectively, focusing on the four modalities with the highest case count. Similar to previous years, the highest percentage of prospective peer reviews in 2022 was recorded for MR cases at 0.5% which was a 0.9% decrease from 2021. The remaining three modalities, CT, US and XR recorded a combined 0.1% of cases reviewed as part of the prospective review process.

FIGURE 5.2: Percentage of All Cases Completed (National Aggregate) Where Prospective Review has been Recorded, for All Other Modalities, 2021 vs 2022
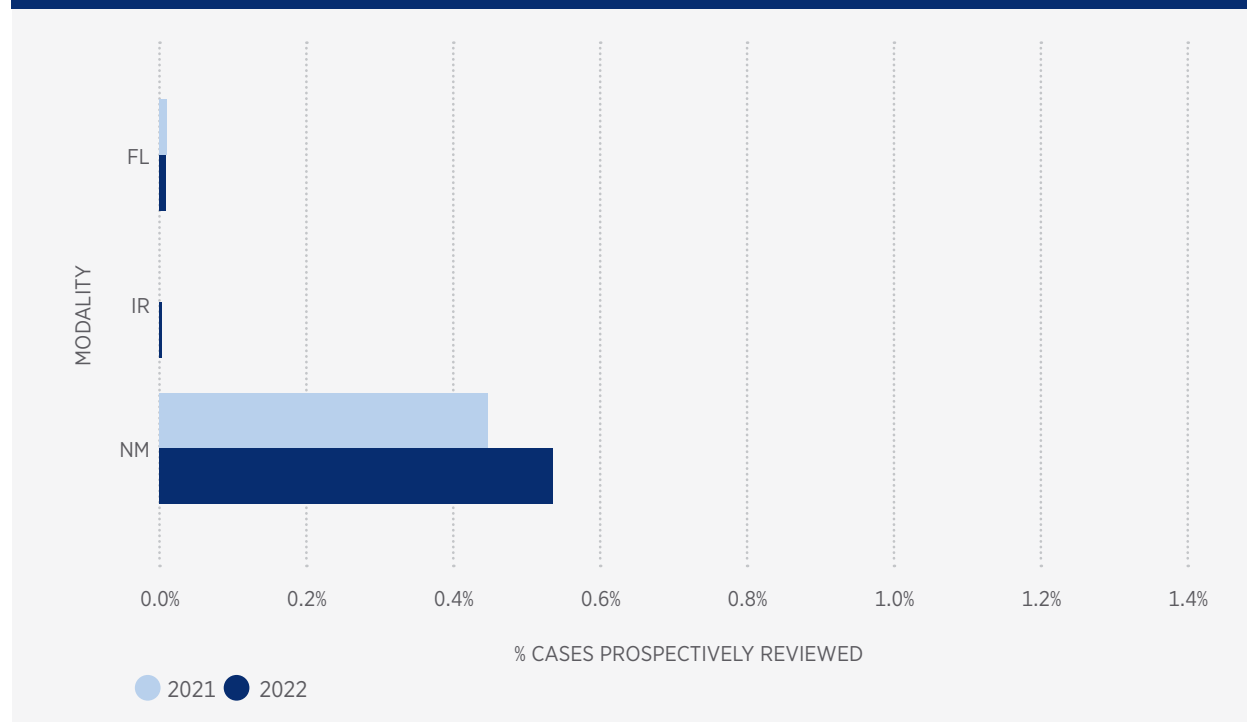
Among those modalities with a relatively lower case count in 2022, NM reports were the most frequently recorded as prospectively reviewed, at 0.6%, which is 0.1% more than in 2021 (Figure 5.2).

Prospective reviews recorded for other modalities were lower than 0.01% which may indicate that those reviews are not being consistently recorded in the local systems.

The NRQI working group have noted the low volume of prospective reviews recorded in the local systems.

Prospective reviews are most frequently performed in person / verbally, and failure to record is most likely to be technical, due to time and workflow issues relating to local processes. Interpretation and feedback, in cases of non-verbal interaction can be dictated into the preliminary draft report, or in the comment section of the consultation section.

Voice recognition cannot be used to dictate in the local information system workflow comment section, which can impact the entry of this information in a timely fashion.

Work is ongoing with the Faculty of Radiologists and Radiation Oncologists, the programme management and software suppliers to develop an improved method of recording prospective reviews.

FIGURE 5.3: Percentage of Prospective Reviews by Modality Expressed Against All Prospective Reviews Recorded for Cases Completed, 2021 vs 2022
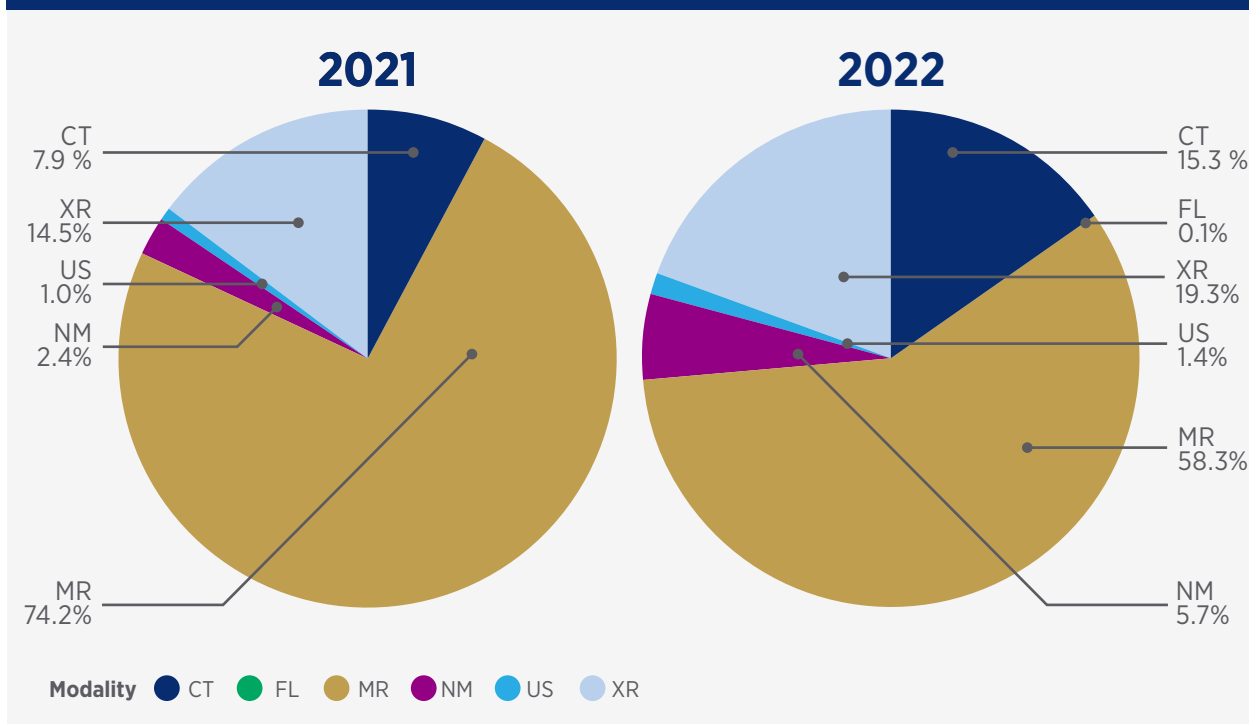
2021

CT 7.9 %
XR 14.5%
US 1.0%
NM 2.4%
MR 74.2%

2022

CT 15.3 %
FL 0.1%
XR 19.3%
US 1.4%
MR 58.3%
NM 5.7%

Modality ● CT ● FL ● MR ● NM ● US ● XR

The majority of prospective reviews were recorded for MR, at 58.3% out of all prospective reviews recorded in 2022, which is 15.9% less than in 2021 (Figure 5.3). This is reflected in an increase in the proportion of XR and CT reports recorded as reviewed before their authorisation in 2022, which accounts for 19.3% and 15.3% respectively.

RETROSPECTIVE PEER REVIEW

When a radiologist is required to review an original image and report on it during patient care, forming an opinion regarding the accuracy of that report, they should record a retrospective peer review in the local system.

In the instance where a potential quality issue arises, the details should be communicated to the original reporting radiologist and where possible the opportunity to engage in further discussion on the report should be afforded to them.

The level of agreement with the original reporting radiologist's report should be recorded by the reviewing radiologist, following the scale illustrated on Figure 5.6.

The retrospective peer review may be performed during:

✔ Routine review of prior images while interpreting a new image
✔ Routine preparation of exams for discussion at an MDT Meeting
✔ Review based on new clinical findings or information.
✔ Focused peer review of a specific set of exams

It is recommended that radiology departments should endeavour to perform a representative number of cases that are retrospectively peer reviewed across a range of modalities.

A focused peer review is an additional category of retrospective review but is commonly performed as radiology academic exercise that attempts to highlight best practice.

KEY QUALITY INDICATORS

Number of accession numbers retrospectively reviewed (expressed for each modality and accession number type and as a % of total accession numbers for each modality).

Number of accession numbers referred for consideration at Radiology Quality Improvement meetings as a result of retrospective review (expressed as a % of total cases reviewed, by modality).

While the NRQI programme working group are aware that peer reviews are routinely performed as a part of radiology reporting process, only a small portion of retrospective peer reviews are being recorded by participating sites.

As a result, this report presents only those retrospective reviews that were recorded in the local system via a dedicated tool. The total number of reviews that were completed locally cannot be accounted for owing to lack of appropriate recording practices.

The current process of recording peer reviews requires manual input into the local system, resulting in additional time spent on each report, however it is important that this activity is recorded as much as possible in order to ensure that recorded data reflect daily workload more accurately. The working group are aware that the time required to manually record these data inhibits workflow and efficiencies at department level.

FIGURE 5.4: Percentage of Cases Completed (National Aggregate) Where Retrospective Review Has Been Recorded, by Modality, 2021 vs 2022
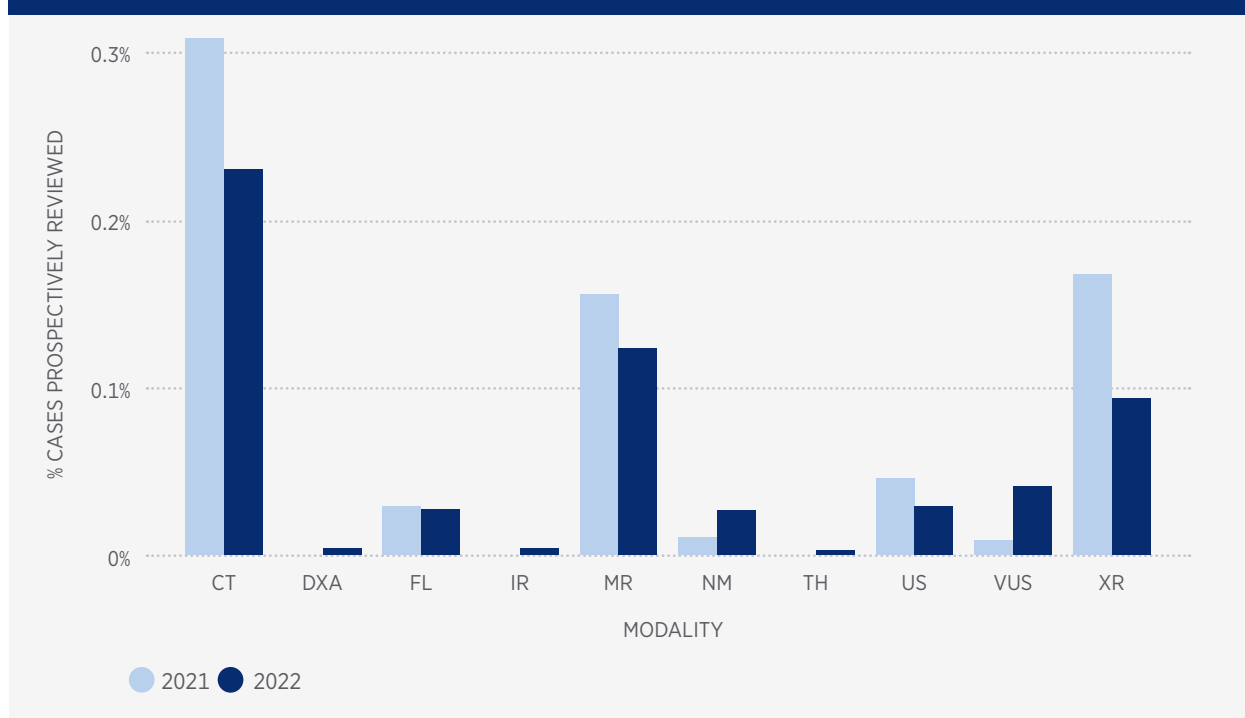
Data collected in 2022, show that the percentage of cases where retrospective review was recorded decreased for those modalities with a high case count (see Figure 5.4). The biggest change was recorded for CT, with 0.2% cases recorded in 2022 as retrospectively reviewed, down from 0.3% in 2021, while MR saw an insignificant change, remaining above 0.1%. Retrospective reviews of XR reports were recorded for less than 0.1% cases, which was also less than in 2021. Records for all other reported modalities show near 0% values, similar to 2021 and previous years.

Ongoing issues such as insufficient time and resources, delays in software upgrades have impacted radiologists' ability to complete the current data submission process. These factors accompanied by an ever-increasing workload and case complexity have likely contributed to the relatively low numbers of cases with peer review recorded. Other factors may include staff turnover and outsourcing of reporting activity.

The NRQI working group strongly recommend that training be delivered locally from existing QI leads or from the programme management to ensure locum radiologists know how to record QI activity in the local system. This should form part of routine activities and will contribute to greater oversight of both the local and national activity.

FIGURE 5.5: All Retrospective Peer Reviews Recorded for Cases Completed, by Modality, 2022

CT 32.8%
FL 0.1%
MR 8.2%
NM 0.2%
US 3.6%
VUS 0.6%
XR 54.5%

Legend: CT, FL, MR, NM, US, VUS, XR
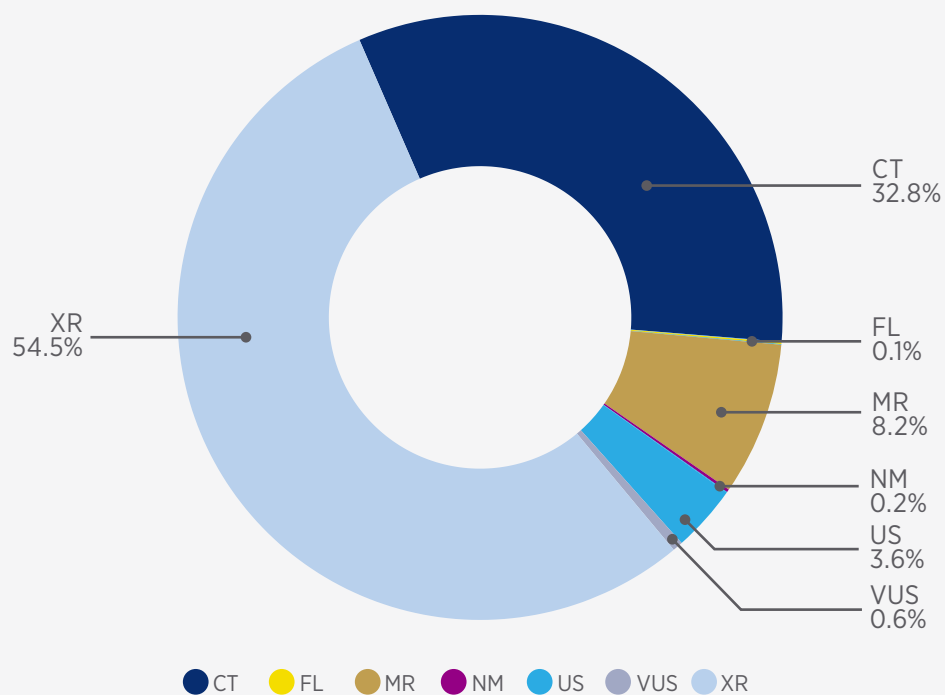
Figure 5.5. illustrates that, similar to previous years, the biggest percentage of retrospective reviews recorded in 2022, at 54.5%, was completed for XR cases. This is followed by 32.8% reviews recorded for CT reports, and 8.2% recorded for MR.

ASSIGNED PEER REVIEW

Assigned peer reviews are completed on contemporary reports, authorised within the previous seven days. Cases for review are randomly assigned each week to consultant radiologists through their local information system.

The assigned review process includes a spectrum of cases representative of various subspecialties. The reviewing radiologist can choose to reject the case and not complete that peer review if they do not practice the subspecialty in the assigned case.

Only cases where assigned review was recorded as completed are included in the dataset for analysis.

KEY QUALITY INDICATORS

Number of accession numbers reviewed as part of the assigned peer review process (expressed for each modality and accession number type and as a % of total accession numbers for each modality).

Number of accession numbers referred for consideration at radiology quality improvement meetings (expressed as a % of total cases reviewed, by modality).

The NRQI working group are cognisant of colleague's clinical workload and the difficulties faced in completing additional clinical audit and QI activities such as the KQIs outlined in this report. The collection of these data are, however, essential to build an accurate picture of the challenges facing radiology departments in terms of available resources.

A detailed recommendation is outlined in chapter four regarding the need for protected time to not only carry out the necessary data collection but to facilitate radiologists in identifying areas for improvement and outlining the changes required.

The NRQI programme is aware of technical difficulties within the existing local information systems, where cases are not being assigned for review in all sites and as a result the frequency of assignments can be inconsistent. This is being rectified by the local systems vendors in collaboration with the NIMIS team.

PEER REVIEW - OUTCOMES

When completing retrospective or assigned review, the reviewing radiologist is required to record the level of agreement with the report in question, by selecting one of three available options (Figure 5.6).

FIGURE 5.6: Possible Peer Review Outcomes Available for Selection in the Local System

Cases which are submitted for radiology quality improvement (RQI) meetings can be an example of best practice, opportunities for improvement, or both, and which presents educational opportunities.

Retrospective Peer Review – Outcomes

FIGURE 5.7: Retrospective Reviews by Outcome, as a Percentage of All Retrospective Reviews Recorded for Cases Completed in 2021 vs 2022
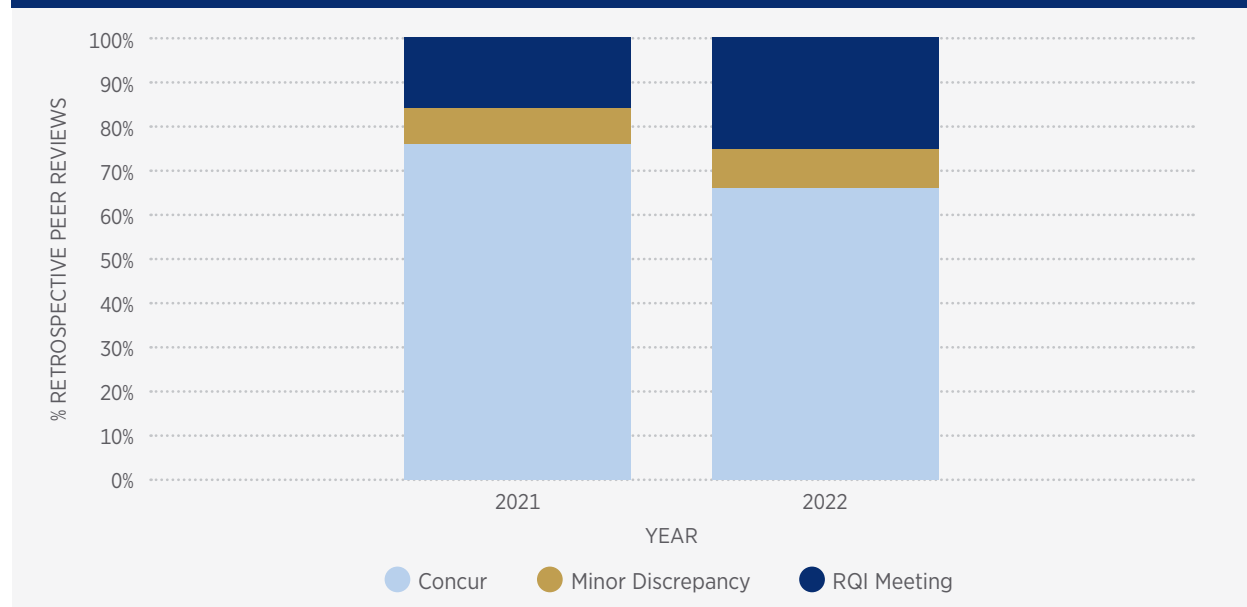
The 2022 data show that 66% of all retrospective peer reviews were in concurrence with the original report, this is 9% less than in 2021. The percentage of cases referred to an RQI meeting on peer review completion increased by 9% in 2022, to 25% (Figure 5.7).

Minor discrepancy, similar to 2021 findings, was the outcome recorded with the least frequency at 9%.

Assigned Peer Review - Outcomes

One of three possible outcomes as outlined in figure 5.6 above, should be recorded by the radiologist completing an assigned peer review.

FIGURE 5.8: Assigned Reviews by Outcome, as a Percentage of All Assigned Reviews Completed, 2021 v 2022
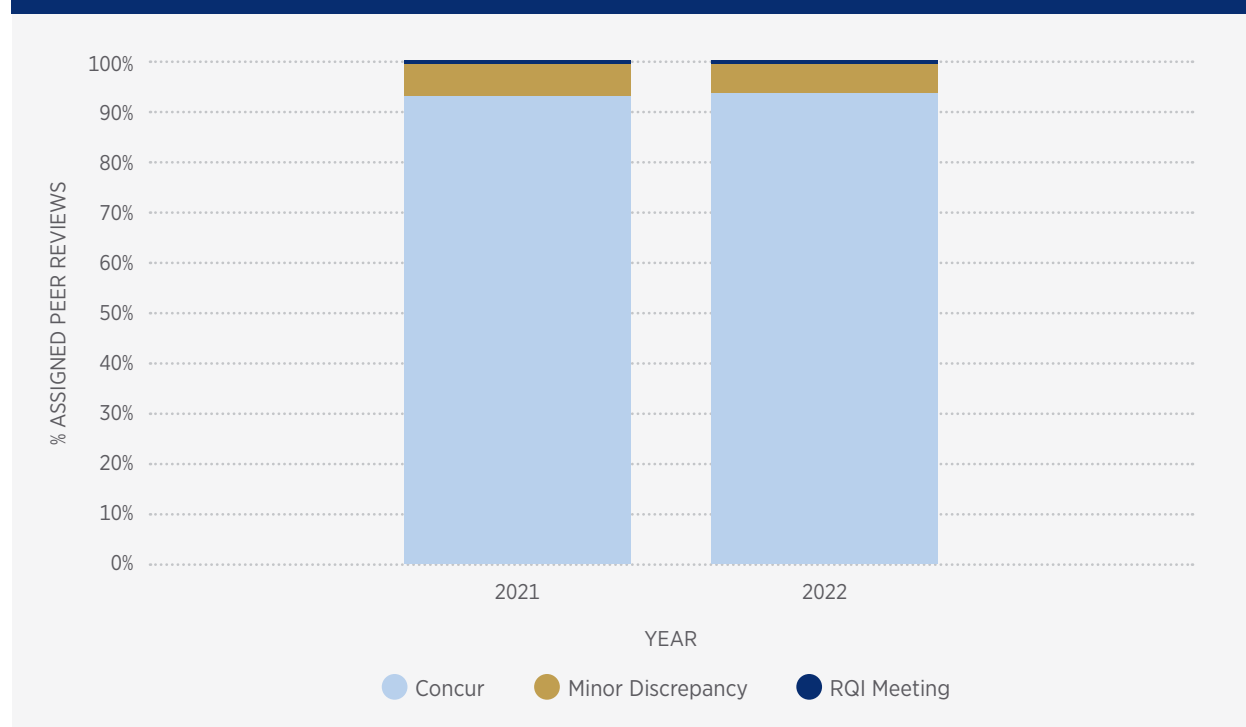
Findings in 2022 reveal that concurrence was the outcome recorded for the majority of assigned peer reviews at 94%, just a 1% increase on 2021 (Figure 5.8). This was followed by minor discrepancy recorded for 6% of assigned peer reviews in 2022, a slight decrease of 1% compared to 2021. RQI meetings were selected for 0.7% assigned peer reviews in 2022, which is 0.1% increase from 2021, based on the data available in the national dataset. As noted previously in this chapter, there may be additional activity taking place that is not being recorded locally and is therefore not reflected in the findings.

These findings illustrate the difference in the recording of outcomes between retrospective and assigned peer reviews, particularly in relation to RQI meetings.

As outlined earlier in this chapter, a retrospective review takes place as part of the routine review of a patient's case, when it is necessary to refer to a previously taken image but this can also occur when previously unknown clinical information becomes available or during preparation for an MDT. The original reporting radiologist should also be informed of any potential quality issues and afforded the opportunity to engage in discussion on the matter.

Assigned reviews, in contrast are a random allocation by the local system and the cases will be no older than seven days.

A key difference, which may explain the greater use of RQI meetings as an outcome for retrospective peer review is the nature of this review in terms of the direct and immediate engagement with a patient awaiting a report. This higher level of engagement is likely to reveal greater learning opportunities.

To record a retrospective or prospective peer review the radiologist needs to tick the appropriate box in the local system on completion and select the review outcome, recording any comments, if required.

This will then ensure the work is logged and contributes to both that hospitals local and the national QI dataset.

KEY RECOMMENDATION

The NRQI working group recommend that all radiologists ensure they record the completion of a retrospective, assigned and prospective peer reviews in the local system. This is essential to ensure the data are captured and an accurate picture of QI activity can be both recorded and used to improve patient care.

CHAPTER 6
RADIOLOGY ALERTS

6

A radiology alert is defined as the communication of a high priority finding or report from one healthcare professional to another.

KEY QUALITY INDICATORS

Number of radiology alerts for each urgency level (expressed as % of total workload).

Number of acknowledged communicated cases of unexpected and clinically significant radiological findings (expressed as % of total workload).

Number of radiology alerts where the acknowledgement was received within the guideline acknowledgement time (expressed as a % of the number of radiology alerts).

A radiology alert must be acknowledged by an appropriate individual, typically the referring physician or an appropriate member of their team.

By acknowledging the alert, the referring clinician confirms that they are aware that the report contains high priority information, are aware of the urgency and will follow-up and act on the radiology alert as appropriate.

The duration of the acknowledgement window is calculated from the moment that the alert is activated until the moment that the alert is marked in the system as acknowledged.

The category of alert is assigned by the reporting radiologist based on the type and urgency of finding. Each of three categories, which are critical, urgent and unexpected-clinically significant are assigned a defined acknowledgement timeframe (Figure 6.1).

FIGURE 6.1: Radiology Alerts Acknowledgement windows as defined in the Guidelines for the Implementation of a National Radiology Quality Improvement Programme - Version 3.0.

CRITICAL	URGENT	UNEXPECTED - CLINICALLY SIGNIFICANT
60 MINUTES	24 HOURS	6 DAYS
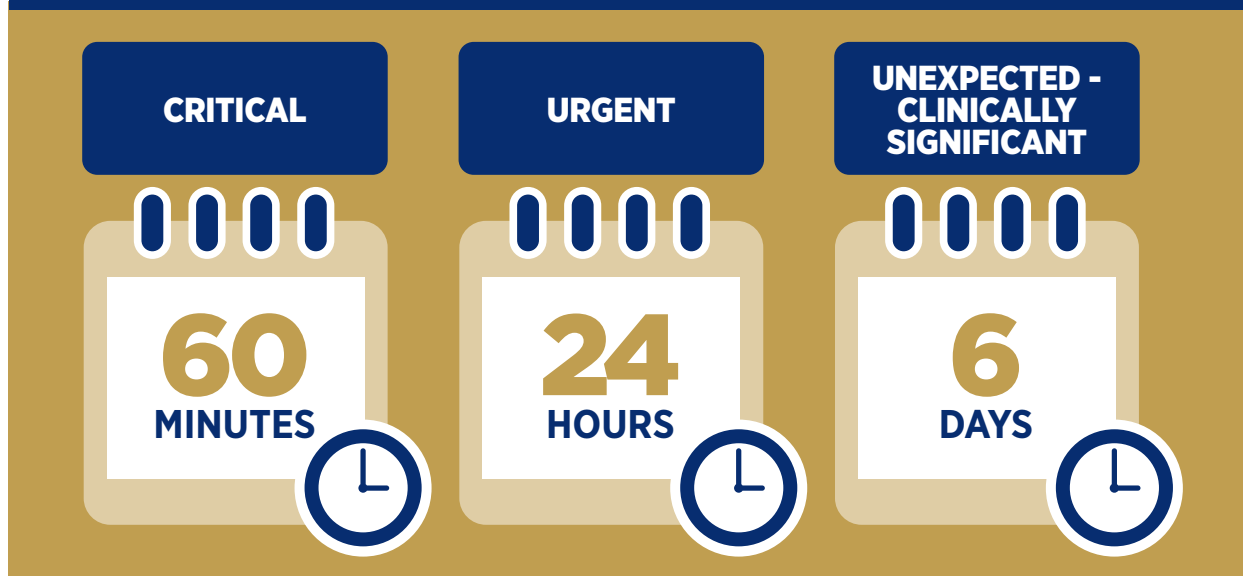
Each hospital/radiology department, in conjunction with the referring clinicians and hospital management, is responsible for the creation and implementation of a local policy which clearly defines the processes for communication and the responsibilities of the radiologists, the referring clinicians and hospital management within that process.

A locally agreed escalation procedure should be in place in the event of a radiology alert not being appropriately acknowledged. Radiology reports are a vital part of patient care and overall diagnostic decision making. Communicating information from these reports in a timely manner is crucial for ensuring the best possible patient outcomes.

RADIOLOGY ALERTS OVERVIEW

Radiology alerts are recorded using various systems across all NQAIS sites and therefore some are captured differently to the process outlined in this report. Due to these differences in capturing data, the volume of radiology alerts included in this report do not represent all alerts activated.

The manual nature of the input of radiology alerts and the associated outcome also contribute to incomplete records. In particular, many 'Critical' alerts are communicated directly via telephone or in person to the referrer, which may be less likely to be recorded.

FIGURE 6.2: Percentage of Activated Radiology Alerts for Each Referral Source (Patient Class) by Urgency Level, 2022
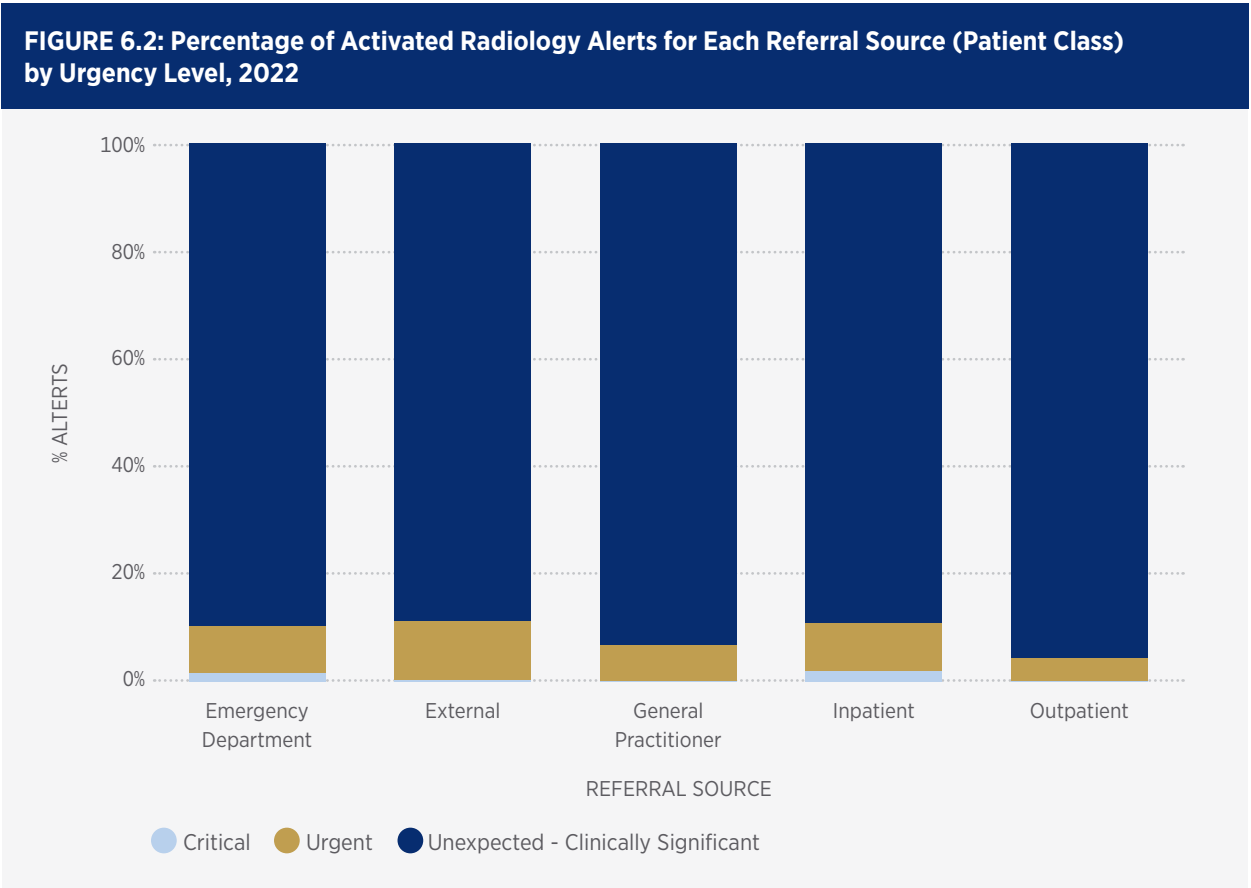
As seen in previous national data reports, the majority of radiology alerts activated in the local systems fall into the unexpected-clinically significant (U-CS) category. The highest percentage of U-CS alerts was recorded in 2022 for OP referrals at 95.6% of total alerts, and GP referrals at 93.2% (Figure 6.2), which is 0.5% and 1% higher than in 2021, respectively. Of the externally referred cases recorded in 2022, the percentage of urgent category alerts was 10.9% the highest in 2022 and also 1.7% higher than in the previous year. The highest proportion of alerts activated and recorded as critical in 2022, was recorded for emergency department (1.7%) and inpatient referrals (1.9%).

FIGURE 6.3: Number of All Radiology Alerts (National Aggregate) by Referral Source (Patient Class), 2021 v 2022
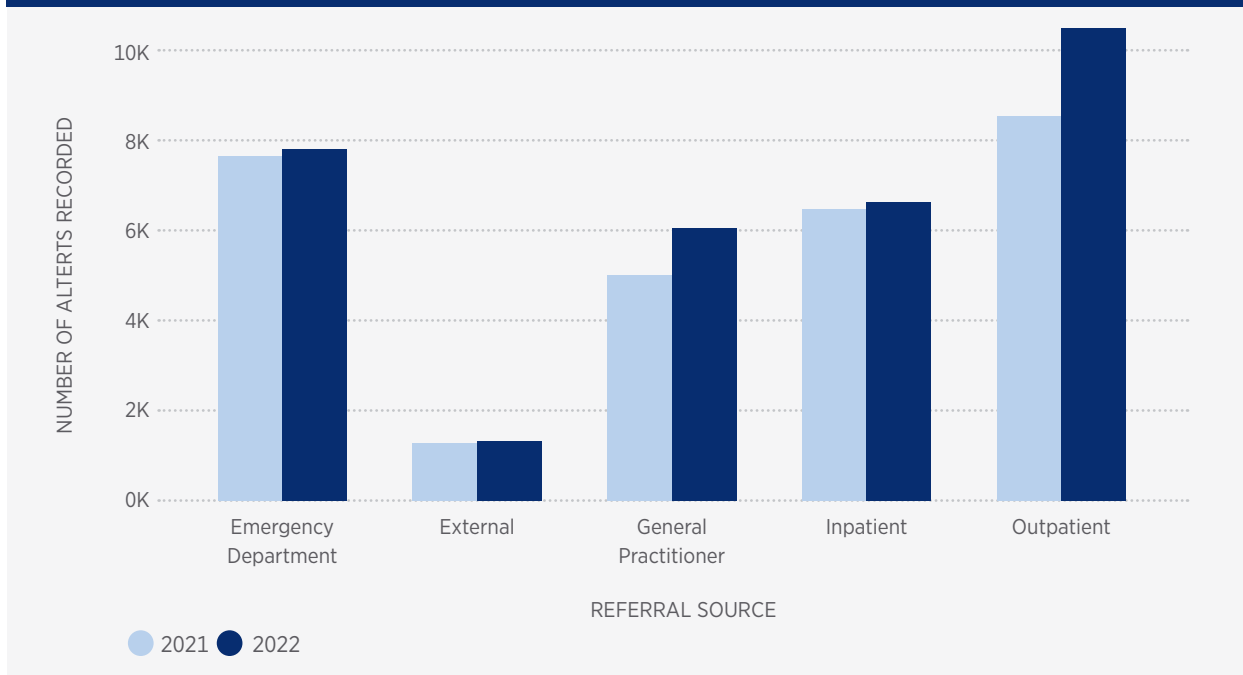
The findings reveal that the overall number of alerts recorded in 2022 was higher across all referrals, when compared with 2021 (Figure 6.3). The most significant increase was recorded for OP referrals, 10,459 in 2022, which is 1,951 more than in previous year.

FIGURE 6.4: Number of All Radiology Alerts Recorded (National Aggregate) by Urgency Level, 2021 v 2022
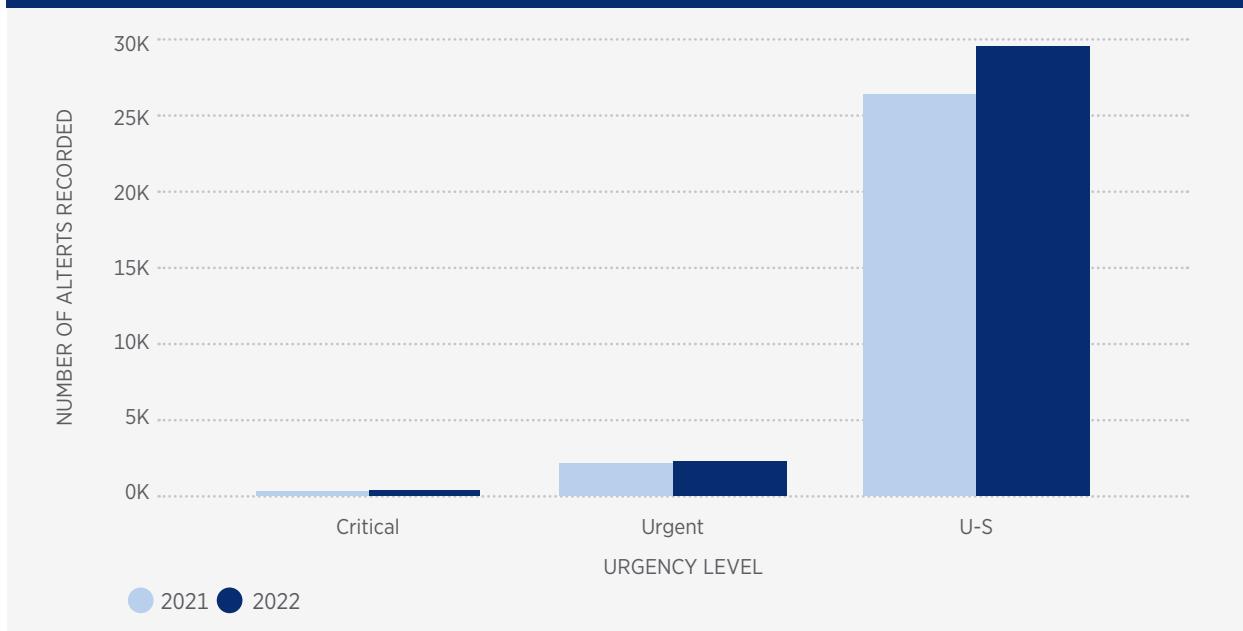
While an increase can be noted for U-CS alerts, 3,165 more alerts recorded in 2022 than in 2021. The volumes of recorded urgent and critical alerts remain at a similar level to previous years (Figure 6.4). As presented in previous national data reports, the number of alerts activated in local systems had been decreasing year on year which was most likely influenced by the COVID-19 pandemic in 2020 and the cyber-attack in 2021.

The above results should be viewed in the broader context of the annual workload and its fluctuations over the last few years (see Chapter 3).

FIGURE 6.5: Percentage of Radiology Alerts (National Aggregate) Acknowledged Within Set Timeframe out of All Recorded Radiology Alerts, by Referral Source, 2021 vs 2022
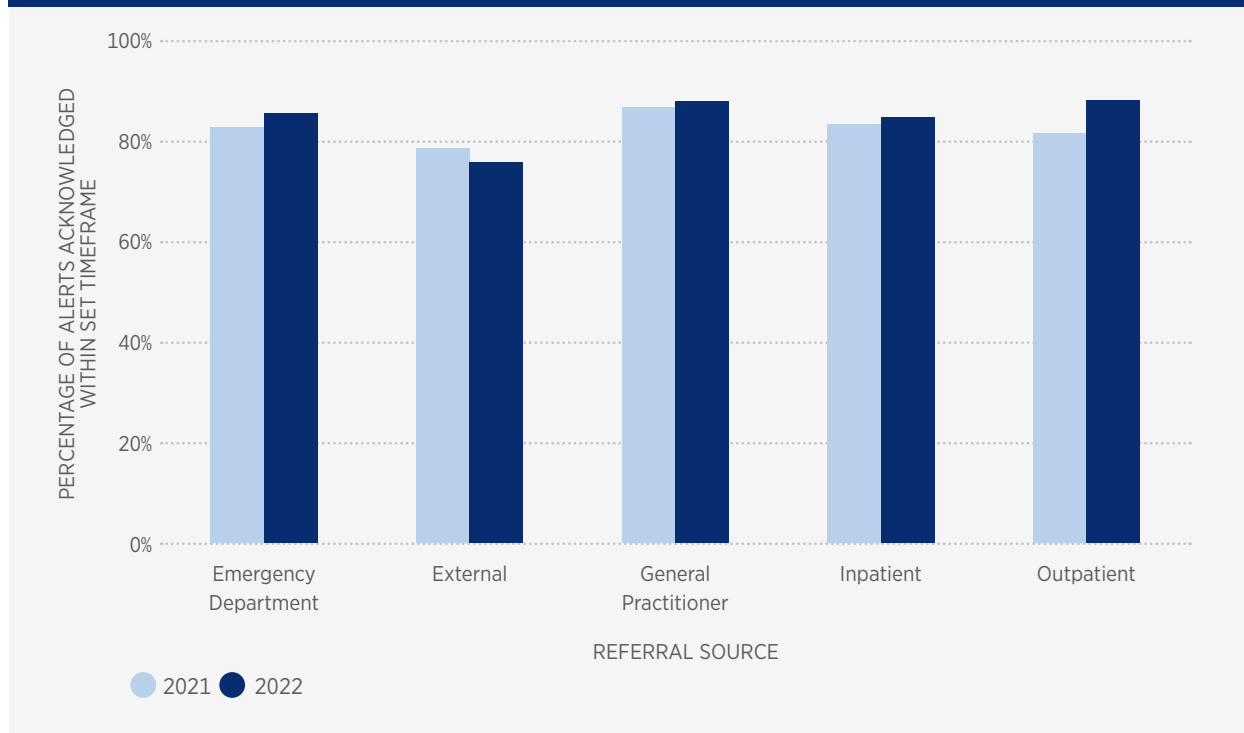
Figure 6.5 demonstrates an increase of the percentage of radiology alerts acknowledged within the set timeframe in 2022 when compared to 2021. The highest increase can be observed for OP referrals, 6.5% more than in the previous year. Alerts raised for ED referrals saw an increase of 2.6% followed by GP (1.1% increase) and IP (1.2% increase) referrals. The percentage of alerts acknowledged within set timeframes for external referrals decreased by 2.9% in 2022 in comparison to 2021.

UNEXPECTED – CLINICALLY SIGNIFICANT RADIOLOGY ALERTS

FINDING
Any new or unexpected findings that suggests a patient's condition could result in significant morbidity if not appropriately managed but are not immediately life-threatening.

COMMUNICATION
From the reporting radiologist to either the referring clinician or appropriate member of their healthcare team.

Either via a direct conversation or via an alternative locally approved method of communication.

UNEXPECTED - CLINICALLY SIGNIFICANT

ACKNOWLEDGEMENT TIME FOR ALERT

6 DAYS

Any clinical finding of concern should be clearly specified in the dictated report. As is the requirement for all alerts, a defined local escalation process must be in place.

FIGURE 6.6: Number of Cases with Unexpected-Clinically Significant Radiology Alerts, per NQAIS Site, 2021 vs 2022
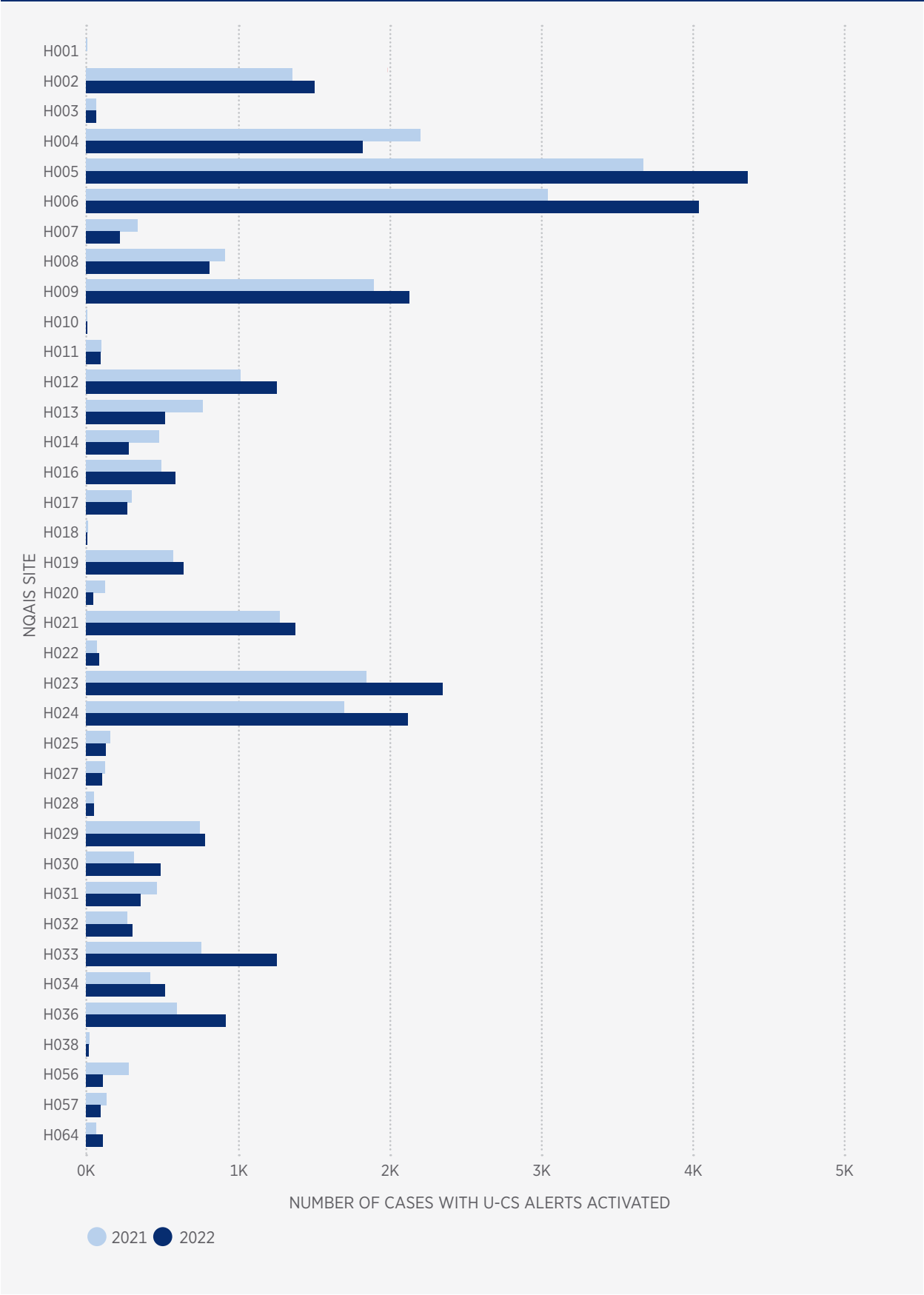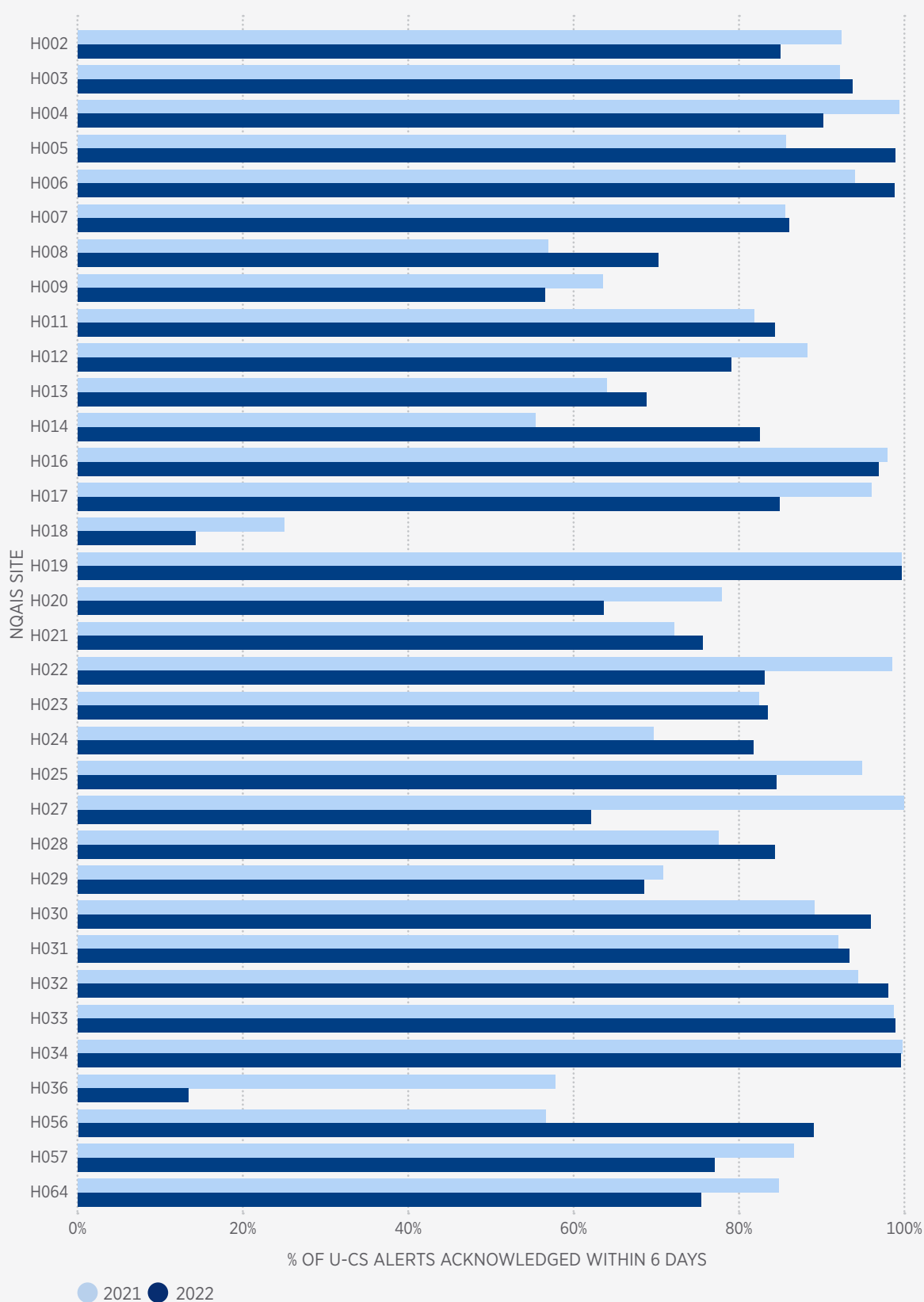
FIGURE 6.7: Percentage Unexpected-Clinically Significant Radiology Alerts Acknowledged Within 6 Days, per NQAIS site, 2021 vs 2022

NQAIS SITE

% OF U-CS ALERTS ACKNOWLEDGED WITHIN 6 DAYS

● 2021 ● 2022

[Please note that where a site has either not recorded an alert, is using a system incompatible with NQAIS or does not have available data, they do not appear on the above graphs.]

The two bar charts above illustrate the volume of U-CS alerts activated by each NQAIS site in their local system (Figure 6.6) and the percentage of those alerts acknowledged within the set timeframe of six days (Figure 6.7). It is important that these charts are read in conjunction with one another as they provide necessary context.

As illustrated in Figure 6.7, 34 out of 41 NQAIS sites provided data for Unexpected – Clinically Significant Alerts acknowledged on time within 6 days in 2022. These are the same sites which provided data in 2021. Out of those 34 NQAIS Sites, 11 sites recorded 90% or more U-CS alerts acknowledged on time in 2022.

The acknowledgement of an alert is an external event and one that is outside the control of the radiologist. Figures 6.6 and 6.7 above are intended to provide some evidence that there is little or no apparent correlation between the numbers of alerts activated within NQAIS sites and the percentage of alerts acknowledged from year to year.

It is important to highlight that administrative staff in radiology departments play an important role in providing support to clinicians by monitoring U-CS radiology alerts and executing and recording acknowledgements of those alerts. Availability of this support varies between sites and it could be a contributing factor to the length of time in which acknowledgements are recorded in the ICT system.

URGENT RADIOLOGY ALERTS

FINDING

Any new or unexpected findings in conditions that could result in mortality or significant morbidity, if not addressed urgently.

COMMUNICATION

From the reporting radiologist to either the responsible clinician or other healthcare team members who can initiate the appropriate clinical action for the patient.

Via a direct conversation with the responsible clinician or other licensed caregiver, otherwise, via an alternative method approved by the participating hospital, with a defined escalation process.

URGENT

ACKNOWLEDGEMENT TIME FOR ALERT

24 HOURS

Local ICT systems currently used in hospitals are not tailored to record and monitor critical and urgent alerts with ease and in a timely manner reflecting an alerts urgency.

Verbal, direct communication remains the quickest, most effective and therefore the safest form of communication for these types of alerts.

CRITICAL RADIOLOGY ALERTS

FINDING

Any new or unexpected clinical finding that is potentially life-threatening or requires immediate clinical action in patient management.

COMMUNICATION

Immediate, interruptive, direct communication with the referring clinician, covering clinician or other healthcare team member who can initiate the appropriate clinical action for the patient.

CRITICAL

ACKNOWLEDGEMENT TIME FOR ALERT

60 MINUTES

As with the acknowledgement of other alerts, a defined local escalation process should be put in place by the participating hospital.

When critical results are diagnosed, patient care should be prioritised immediately. It is not unusual to find that a radiology alert is recorded only within the text of a report, accompanying verbal communication of critical findings, and not activated separately in the local system.

Like urgent category of alerts, direct verbal communication remains the safest method for communicating critical findings at present.

In instances where an alert is recorded in the system, recording of its acknowledgement can take place long after the conversation with the referring clinicians has occurred and not within the recommended 60 minutes.

This can have a direct impact on completion of the data provided for this KQI as well as the volumes of alerts recorded and percentage of those acknowledged on time.

The NRQI programme continues to collaborate with the Faculty of Radiologists and Radiation Oncologists and software suppliers to ensure the mechanisms for recording are continuously improved.

CHAPTER 7
RADIOLOGY QUALITY IMPROVEMENT MEETINGS

7

The aim of Radiology Quality Improvement (RQI) meetings is to provide opportunities for knowledge sharing, facilitating routine review and discussions on examples of best practice. RQI meetings are promoting collective learning by creating a safe environment to practice radiology and therefore are recognised as a vital element of the departmental educational process. Through their support of continuous quality improvement, they are key to improvements in patient care.

> RQI meetings should take place five times a year at a minimum and attendance where possible should be mandatory for all departmental radiologists including radiologists in training.

Those meetings create an opportunity to highlight review areas and allow identification of suboptimal practice as well as examples of excellence.

The RQI meeting should be a forum where peer-to-peer education is facilitated. Radiologists with subspecialty training or particular expertise in an area can provide educational feedback to colleagues without such training and expertise.

Regular meetings promote learning and awareness amongst participants, providing mutually beneficial and non-adversarial environment to promote learning for all attendees. This results in a culture of positive feedback and learning becoming ingrained in the departments regular workings, promoting good examples of excellent performance to encourage over improvements in individual and departmental performance.

It is important to note that RQI meeting fora remain separate to the appropriate alert systems, peer review feedback and open disclosure processes and cases should only be listed for RQI meetings when these separate actions have been initiated and ideally concluded.

KEY QUALITY INDICATOR

Percentage of Attendance

Number of accession numbers reviewed at RQI meeting (expressed as a percentage of total workload).

Number of accession numbers reviewed at RQI meeting by source: Peer Review, MDM (to include Clinico-Radiological conferences) or other.

Number of accession numbers reviewed at RQI meeting with assigned category (expressed as a percentage of total workload).

In order to record attendance at RQI meetings in NQAIS-Radiology, data must be input manually under the summary data section, by each individual NQAIS site where such meetings take place.

The following details are required
✔ RQI meeting date
✔ Number of radiologists invited
✔ Number of radiologists in attendance

RQI meetings are routine activity in every radiology department and therefore it should be assumed that they are taking place in all sites. However, not all departments are recording attendance in NQAIS-Radiology. The majority of sites that submit their data to the national data repository, do it sporadically and therefore accurate measurement and reporting on this quality indicator poses a challenge.

FIGURE 7.1: Attendance at Radiology QI Meetings by NQAIS site as recorded in NQAIS Summary Data, 2021 vs 2022
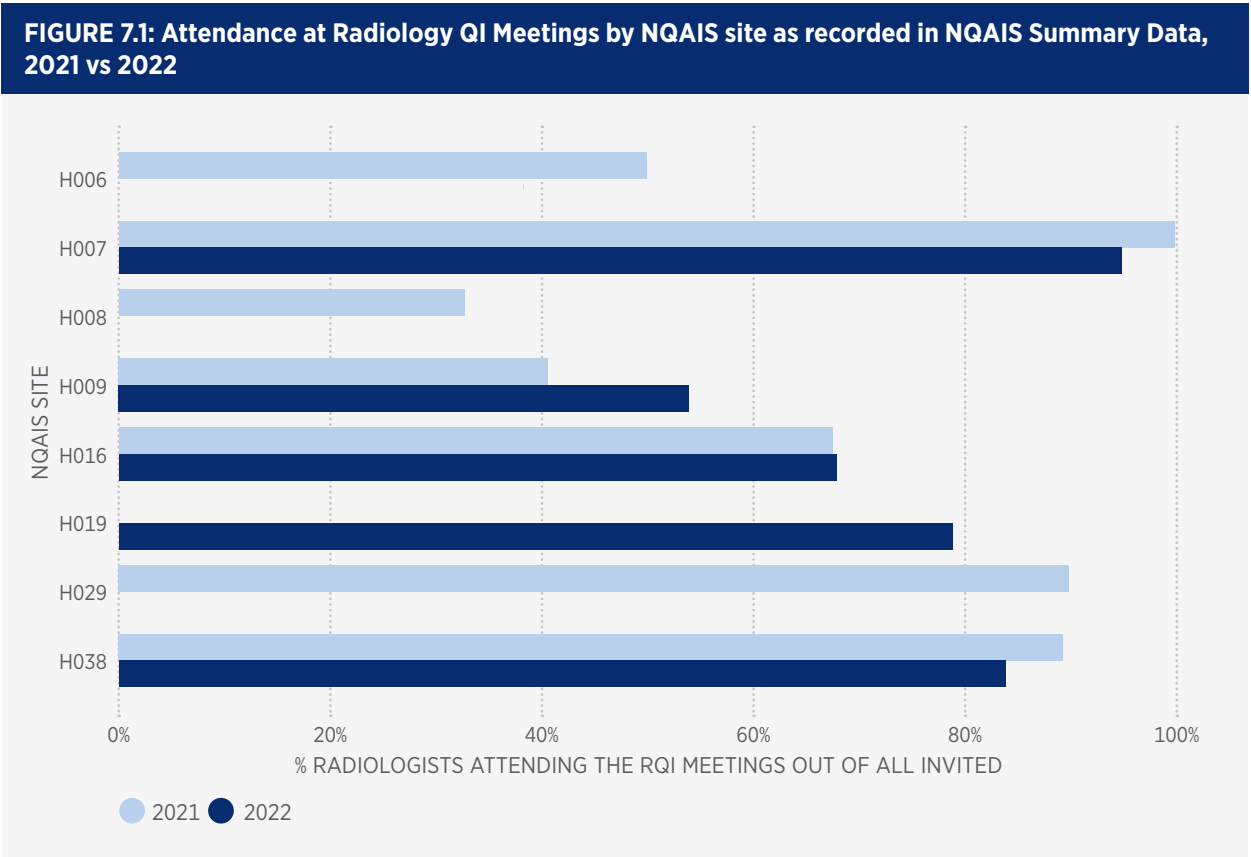
Figure 7.1 reveals that not all NQAIS sites are recording RQI meeting dates and attendance. Those sites that did not record data in either 2021 or 2022, are not represented on this chart.

In 2022, five sites input this summary data in NQAIS-Radiology, which was two less than in 2021.

Cases reviewed at RQI meetings are assigned to one of the below categories in local information system (adapted from *Guidelines for the Implementation of a National Radiology Quality Improvement Programme*).

TABLE 7.1: Categories Outlining Rationale for Review at RQI Meeting

Rationale	Description
Observation	The consensus is that the report failed to highlight a finding that may have had an impact on patient care.
Interpretation	The consensus is that the significance of an observed finding may have been overstated or understated.
Misleading Patient Data	The consensus is that there was inadequate or ambiguous patient data upon which the original report was based.
Report Completeness	The consensus is that the initial report was incomplete and the missing information may have been material to the patient's episode of care.
Inter-observer Variability	The consensus is that of a persistent difference in interpretation and/or perception of clinical relevance of the same finding between radiologists.
Information and Educational Feedback	This refers to the provision of clinical and radiologic follow up to aid more informed judgments in the future.
Compliment	The consensus is that this case illustrates a high standard of performance by the reporting radiologist with resultant benefit of shared learning.
Technical	The consensus is that an opportunity to form an accurate diagnosis was impaired by the poor technical quality of the source data.
Other	The "Other" category can be used if the outcomes do not fall into one of the reasons above.

FIGURE 7.2: Percentage of Cases Reviewed at RQI Meetings Categorised by the Rationale Offered, 2021 vs 2022
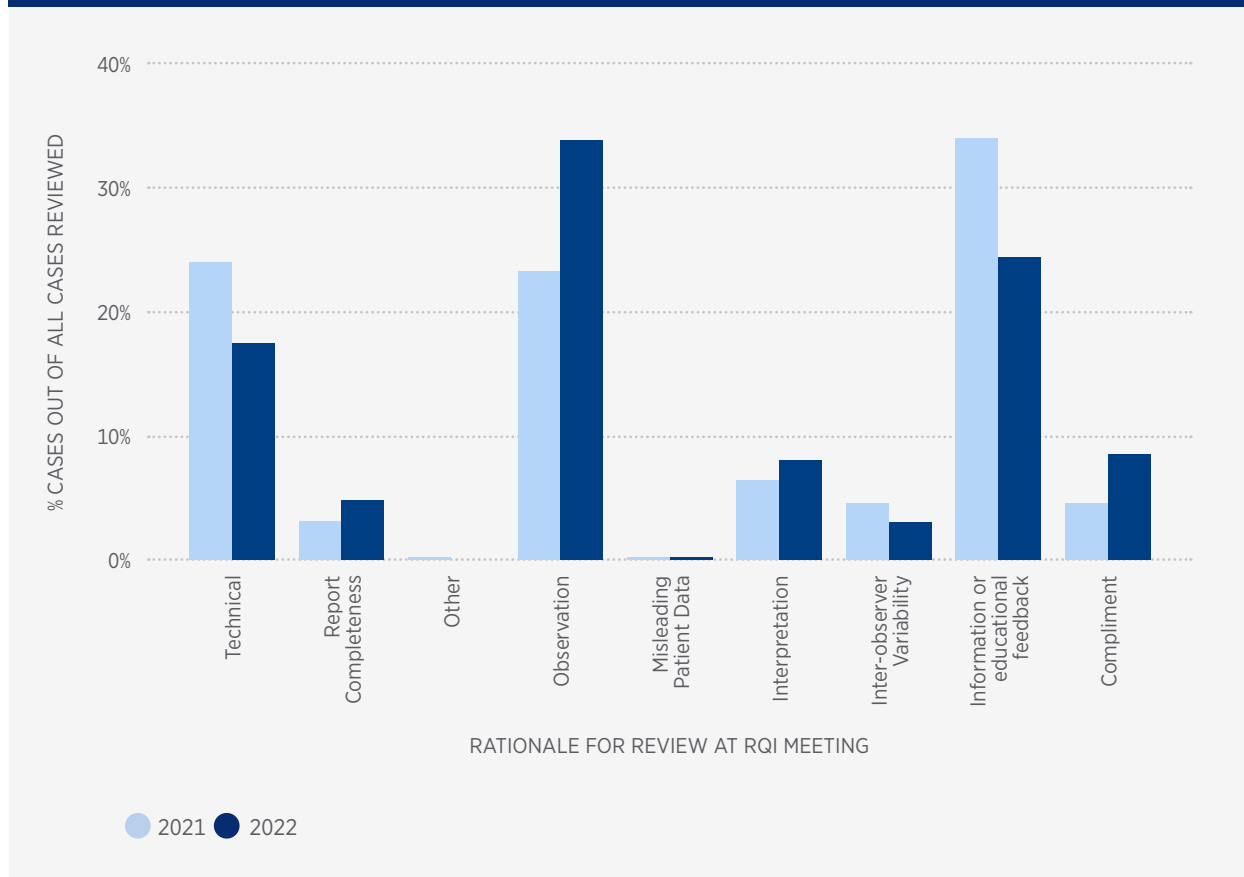
As illustrated in Figure 7.2, in 2022 the biggest increase was recorded for cases categorised as observation, at 33.7%, 10.5% more than in 2021. Information or Educational Feedback was recorded for 24.3%, a decrease of 9.6% from 2021, this was followed by the technical category, where 2022 records show 17.4%, which is 6.5% less than in 2021. Cases categorised as compliment were recorded in 2022 almost twice as frequently as in 2021, increasing to 8.5% from 4.5% noted last year. Report completeness was highlighted for 4.8% cases, seeing an increase of 1.7%. Interpretation was recorded for 1.6% more cases in 2022 than in 2021, at 8%, while Inter-observability variability noted a decrease of 1.5%, at 3% in 2022.

Following previous years' decrease of cases discussed under two categories: other and misleading patient data, 2022 records show that there were no cases referred to RQI meeting under the rationale other, and misleading patient data category remained at the same level of 0.2%

RECOMMENDED QI PRACTICE

The working group recommend that RQI meetings are used to encourage a culture of mutual respectful learning with emphasis on positive learning and feedback with "good pick up" cases forming a central role.

CONCLUSION

In 2022, over 3 million cases were recorded in 48 public and voluntary hospitals participating in the NRQI programme, representing an 8.8% increase in workload in comparison to 2021 records.

This report also presents an overview of workload changes over a 5-year period, 2018-2022. Data show that the volume of cases recorded in participating hospitals increased by 13.5% between 2018 and 2022, however this is only one aspect of the workload increase. The imaging for more complex modalities such as MR, CT or US, where a large number of images are recorded for each case, requiring careful review and therefore a significant time investment, increased by 44.8%, 36% and 35% respectively.

Increasing workload adds to already high pressure on radiology services nationally and highlights the need for adequate resourcing in radiology departments in Ireland, including staffing and equipment.

The QI data collected by the programme are available in NQAIS-Radiology and reports generated with use of that data provide a valuable tool for local quality improvement initiatives. The NRQI working group encourages radiology departments to generate NQAIS reports for local use, review local processes and to use suitable methodologies to explore opportunities for improvements.

To achieve process improvements which can translate into improved patient care, departments must be supported by hospital management, with the appropriate time and resources made available.

Quality improvement should be an integral part of everyday activity in a radiology department. Local clinical leadership and the ongoing support of senior hospital management for the NRQI programme are key to improve patient care through timely, accurate and complete radiology and reports.

The NRQI programme and the Faculty of Radiologists and Radiation Oncologists will continue their tireless efforts to promote a culture of QI and patient safety in Irish radiology services.

APPENDIX A: DETAILED RECOMMENDATION
CHAPTER 3: WORKLOAD

The NRQI Programme recommend that a protected time allocation of one hour per week for all local clinical leads, 1.5 hours per week for NRQI working group members and 2 hours per week for the working group chair are implemented to carry out the activities associated with these roles. In relation to public hospitals, this has been agreed in principle with HSE Acute Operations, who have emphasised the need to ensure QI is integral to workplans.

WHO BENEFITS FROM THE RECOMMENDATION?	• Patients/ members of public availing of radiology services in Ireland.
	• The radiology workforce of Ireland
	  - Medical staff under the scope of radiology
	  - Other healthcare professionals working under scope of radiology
	• Hospital-based services availing of radiology diagnostic services in Ireland.
	• Community based services availing of pathology diagnostic services in Ireland.
	• Radiologists/ other healthcare professionals involved in research and development in the field of radiology
	• Trainee radiologists / diagnostic radiographers/ other healthcare professionals working within the scope of radiology
	• Those participating in the NRQI programme
	• Working group members of the NRQI programme

WHO OWNS THE ACTION?	• Acute Operations, HSE
WHAT ACTION SHOULD BE TAKEN?	• Protected time to be assigned to local quality improvement clinical leads, NRQI working group members and the NRQI working group chair, as recommended by the NRQI working group as 1 hr/week, 1.5 hrs/week and 2 hrs/week respectively.
RATIONALE FOR THIS RECOMMENDATION	• The NRQI programme relies on consultant radiologists taking on the roles of QI clinical leads locally in a volunteer capacity. In addition, the working group members and chair dedicate significant time to the running of the programme at a national level also on a volunteer basis. • The benefits of the programme in maintaining appropriate standards in the Irish radiology services is well documented but cannot be realised without the time devoted by the radiology workforce. • Current data show that the volumes of cases have been steadily rising throughout the years since the introduction of the NRQI Programme. • Protected time is required to ensure data are collected and submitted to the national dataset, providing findings both locally and nationally and to ultimately allow vital clinical audit and quality improvement initiatives to take place, with the ultimate aim of ensuring the highest clinical standards are achieved and maintained. • Dedicated protected time that is well defined is required to enable this to happen. Clinicians require allocated time within their working hours to assist with this. • The role of the QI clinical lead, the NRQI working group members and chair involve an undertaking of a significant number of responsibilities and duties on a regular basis and in order for this to be carried out efficiently and effectively dedicated time is required.

RATIONALE FOR THIS RECOMMENDATION *(CONTINUED)*	**Role of the QI Lead Radiologist locally:** Such duties involve: • Overseeing the management of the programme locally (along with the QI Tech Lead). • Ensuring compliance is adhered to and investigating if not. • Uploading local summary data on selected KQIs to NQAIS-Radiology • Maintain the integrity and validity of the QI data locally, ensuring that required data are recorded routinely and accurately. • Analysing uploaded data and generating NQAIS reports and using them effectively to assess areas in need of improvement/ areas meeting defined targets. • Reporting to hospital management on a quarterly basis around KQIs achieved locally and using NQAIS data and their enrolment in the programme to highlight areas requiring attention.

Role of the NRQI Working Group Members:
Such duties involve:
• Attend monthly NRQI working group meeting.
• Responding in a timely fashion to WG meeting invite to ensure meetings can take place with appropriate quorum.
• Actively participate in meetings through attendance, discussion and review, completing corresponding tasks as and when required.
• Review of monthly decisions and actions from NRQI working group meeting.
• Responding to any queries raised by participants of the programmes in a timely manner.
• Review of correspondence from programme management and respond if required.
• Involvement in a considered review to any data requests submitted to the programme for NRQI data and respond in a timely manner to these.
• Assisting programme management in any issues that arise around compliance within the programme.
• Actively contributing to any updates for the programme, such as programme Guidelines, amendments to upload schedule, expressions of interest for new members.
• Actively contributing to the annual National Data Report and overseeing its final version for publication. This involves numerous reviews over a number of months providing expert advice on findings and recommendations.
• Attendance at the annual QI conference and contribution to any material that may be presented at it if required.
• Advocating for the programme by bringing information on the NRQI Programme, including the latest version of the QI Guidelines to hospital management.
• Supporting open discussion and debate and encourage fellow Working Group members to voice their insights.
• Research and generate specialist programme documentation as required.

Role of the NRQI Working Group Chair:
Additional duties to the above involve:
• Provide leadership within the working group and act as a strong advocate of the QI Programme.
• Encourage participation from working group members.
• Continually review the progress of the programme with the programme manager.
• Delegate tasks appropriately within the working group.
• Chair regular working group meetings and determine final agenda for such meetings.
• Format any correspondence required on behalf of the programme/working group to outside parties.
• Present at conferences as the NRQI Programme representative.
• Drive decision making on key programme activities within the working group.
• Resolve conflict that may arise in the course of working group meetings.
• Identify and seek resolution on working group issues which require input or steer from outside of the group.
• Represent the working group at the Steering Committee and other relevant forums.
• Identify an alternate to represent the working group at forums when not available.

Compliance Data Upload Schedule
- Review of compliance over the years has shown difficulties maintaining the programme quarterly uploads for summary data. The programme has requested that quarterly uploads occur, yet there are frequently less data than expected in this category. The programme aims to have the full year summary data uploads from participating radiology departments by the end of February/ start of March for inclusion in the NDR. In 2023, only five hospitals had submitted their summary data for 2022.

Survey on Protected Time 2022
- A survey was sent to 300 consultant radiologists in 2021, a response rate of 33% was achieved.
- Findings revealed that 84% respondents carry out QI as part of their role.
- On average respondents spent 1.5 hours performing QI activities per week.
- 84% of respondents said that time for QI activity is not included in their work schedule.
- 71% confirmed that their departments hold radiology QI (RQI) meetings but 67% responded saying that the time required for RQI meetings is not covered by protected time.
- 41% reported that they are unable to perform QI activity on a weekly basis.

Growing Workload
- Figures from this year's report show 2,906,333 radiology cases recorded in 2022, which represents a 7% increase from 2021.
- Over the five-year period of 2018-2022, the overall number of cases increased by 8%, from 2,700,434 in 2018 to 2,906,333 in 2022 while the number of complex exams, such as CT & MR, increased by 28% and 30% respectively.
- With workload growing and complexities increasing the need for clinical audit and quality improvement work is growing also.