NATIONAL DOCTORS TRAINING & PLANNING

The Radiology Workforce in Ireland 2024-2040

Preliminary Stakeholder Informed Review

HSE
National Doctors Training & Planning

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Executive Summary

The objective of this report is to inform the training requirements for Radiology (Diagnostic and Interventional) for 2026 to 2028. Key levers in the training pathway that can be adjusted include the number of Higher Specialist Trainees (HST) taken in each year and the number of 5th year places available for sub-specialty areas.

The focus of this report is on the trainee pipeline to feed into the consultant workforce. This report has been prepared in advance of a broader assessment, by the HSE, of the Radiology service workforce requirements outlined in the National Radiology Strategy 2025-2029.

There is currently limited capacity to hire consultants from outside the domestic training programme. The key constraint in expanding the consultant Radiology workforce is the capacity of the training programme to expand.

The report recommends increasing the training intake into Radiology from 39 in 2025 to 75 in 2028. Increasing the intake to 75 will require the total number of domestic training places to increase from 155 in 2024 to 375, if maintained at that level.

The number of Radiologists in Ireland per capita is substantially below European norms. The report outlines two demand scenarios to 2040, one based on the recent growth in activity and one based on a lower growth trajectory. Under either demand scenario a phased approach to increasing training will be required; a more rapid expansion of the training programme is not likely to be feasible. Thus, the pathway to bridging the demand gap under either scenario lies with firstly increasing the intake to 75 trainees in 2028.

This level of increase in training may be sufficient if there is a significant slowdown in demand growth. However, if demand continues to grow at the current rate, further expansion in the training programme will be required. Due to the substantial uncertainties in the projected future demand for radiologists, the report recommends commencing a review of the intake numbers in 2027.

1. Introduction

1.1 Overview of Medical Workforce Planning Within NDTP

The HSE National Doctors Training and Planning (NDTP) Unit operates within the Office of the Chief Clinical Officer and has statutory roles in medical education and training, medical workforce planning, and the consultant post approval process.

Under the Medical Practitioners Act 2007, NDTP is tasked with proposing the annual intake number of post-graduate trainees required for each medical specialty. NDTP works with specialty stakeholders including National Clinical Programmes, National Service Directors, Postgraduate Training Bodies and others to estimate the training requirements for consultants and specialists across the Irish healthcare system.

This information then feeds into the medical education and training role of NDTP via the commissioning of medical training required to meet workforce needs, ensuring that the training content and delivery is responsive to the changing needs of the Irish healthcare system, and supporting the retention of doctors upon completion of their training.

The approach taken to informing the annual intake number of post-graduate trainees required for each medical specialty is broadly based on the following principles as per existing Government policies:

- Alignment with Government policy e.g., Health Regions, Sláintecare (2017), the Health Service Capacity Review (2018), and the Smaller Hospitals Framework (2013).

- Recommendations should be consistent with the WHO Global Code on the International Recruitment of Healthcare Personnel (World Health Organisation, 2010, 2011). The Irish health service should be self-sufficient in the production of medical graduates, which eliminate dependence on International Medical Graduates.

- Recommendations should encompass medical workforce requirements for the entire population to include both the public and private healthcare systems.

- Recommendations should incorporate future health needs of the population. Training recommendations should include projections relating to, for example, demographic changes; alterations in disease incidence and prevalence; models of clinical care; medical and therapeutic innovations; policy initiatives and technological advances.

- More patient care should be consultant-delivered.

- Training capacity should match the recommended training numbers. Where recommendations are made to increase the intake of trainees into a particular specialty, additional training posts may be required.

1.2 Objective, Contingencies and Scope

The objective of this report is to inform the training requirements for Radiology. Key levers in the training pathway that can be adjusted include the number of HST trainees taken in each year and the number of 5th year places available for Interventional Radiology. The required number of trainees in Post-CSCST fellowships in sub-specialties areas of Diagnostic and Interventional Radiology across Neuro, Adult Body and Paediatric Radiology are also assessed.

The focus of this report is on the trainee pipeline to feed into consultant workforce. This report has been prepared in advance of a more in-depth assessment of the Radiology service requirements including the Radiology and Radiography workforces and infrastructure requirements.

1.3 Radiology Subspecialties

For the purposes of planning for the number of trainees, Radiology has be classified into broad areas: Adult Body Radiology, Breast Radiology, Neuro Radiology and Paediatric Radiology. Each of these areas (excluding Breast Radiology) is sub-classified as Interventional or Diagnostic. The extent to which Interventional and Diagnostic Radiology are interlinked through training and consultant activity requires that these specialisations be looked at in tandem.

Diagnostic Radiology (DR) uses various imaging techniques, mostly non-invasive, to diagnose medical conditions. In Interventional Radiology (IR), invasive surgical type procedures are performed using image guidance to treat patients with many medical conditions. DR and IR are closely related from a training perspective (imaging skills required for both) but IR now requires a clinical practice skill set as well as procedural skills training, to deliver more advanced procedures. Both DR and IR consultants deliver both services to a certain degree as some DR consultants provide basic IR services (but not advanced IR procedures) and IR consultants provide some DR reporting services. However, as the names imply, IR is primarily a therapeutic discipline whereas DR is primarily a diagnostic specialty (IR Model of Care 2023).

Diagnostic and Interventional Neuro-Radiologists are Radiologists that have further training in diagnosing (Diagnostic Neuroradiology consultants) and treating (Interventional Neuroradiologists) abnormalities in the central and peripheral nervous system, spine, head and neck.

Diagnostic and Interventional Paediatric Radiologists diagnose and treat children and young adults. Paediatric Radiology poses a number of intrinsic challenges. Key differences between Paediatric and Adult Radiology include the underlying spectrum of pathology and a more challenging interpretation of non-accidental injury.

The National Radiology Strategy recommends a detailed workforce plan for the multidisciplinary team involved in the delivery of Radiology services, including Radiologists, Radiographers, Medical Physicists, Radiography Assistants, Radiology Nursing staff, Radiology trainees and Administrative Staff. Consultant Radiologists take the longest of this group to train, the rationale for this report is to commence the process of increasing the Radiology training programme as soon as possible.

1.4 Training Pathway

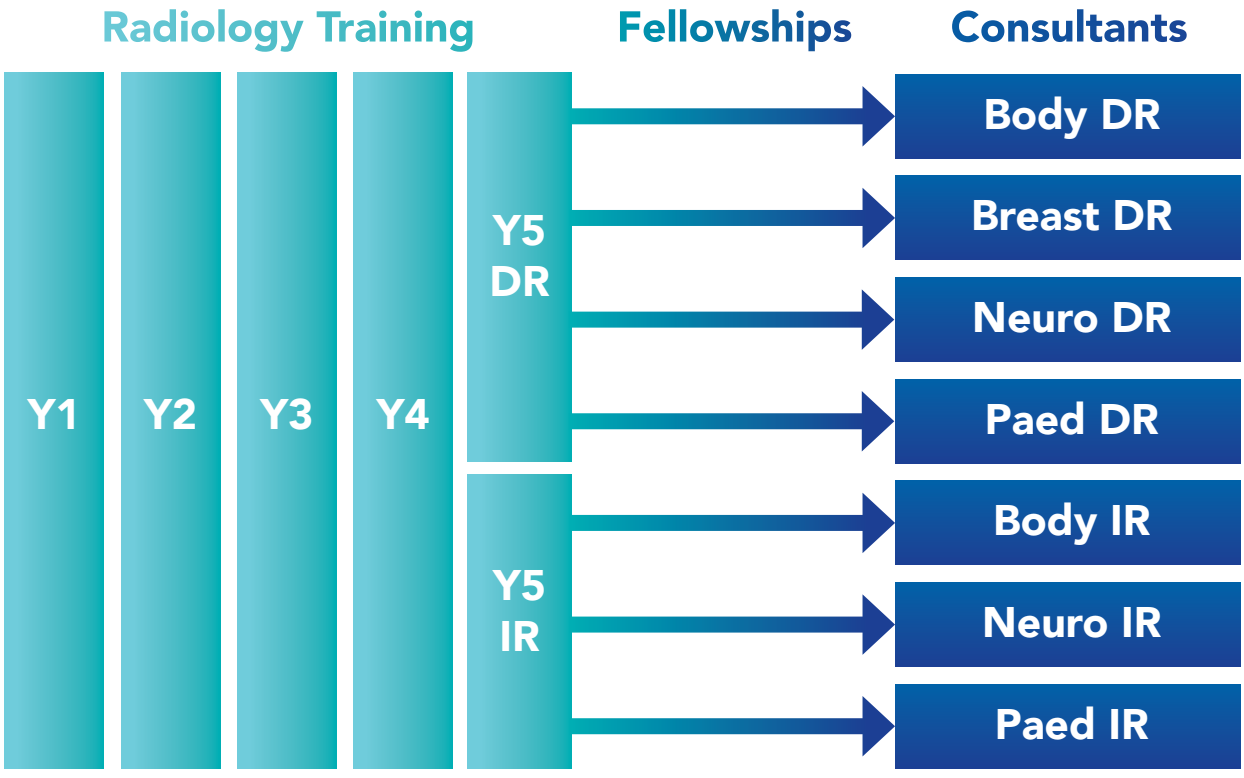
Entry into the Radiology training programme requires a minimum of 2-years clinical training (1 year internship plus one additional year). Trainees on the Radiology programme frequently come from General Internal Medicine and Surgery BST programmes.

There is a common pathway for all trainees for the first 4 years. In year 5 there is an option to branch off into various subspecialty training areas within Diagnostic or Interventional Radiology.

Radiologists can practice Interventional Radiology skills on a general Radiology contract as there is no criteria or standard for Interventional Radiology experience or training. Many Diagnostic Radiology subspecialties also incorporate specific Interventional Radiology components within their practice.

Two years of dedicated fellowship training in IR is required to be eligible to apply for a consultant Radiologist contract with a specialist interest in Interventional Radiology. A minimum of two years of dedicated training is required to practice as a Neuro or Paediatric Diagnostic Radiologist, with at least one dedicated year required to practice as a Breast Radiologist.

Figure 1: Radiology Training Pathway



2. Methods

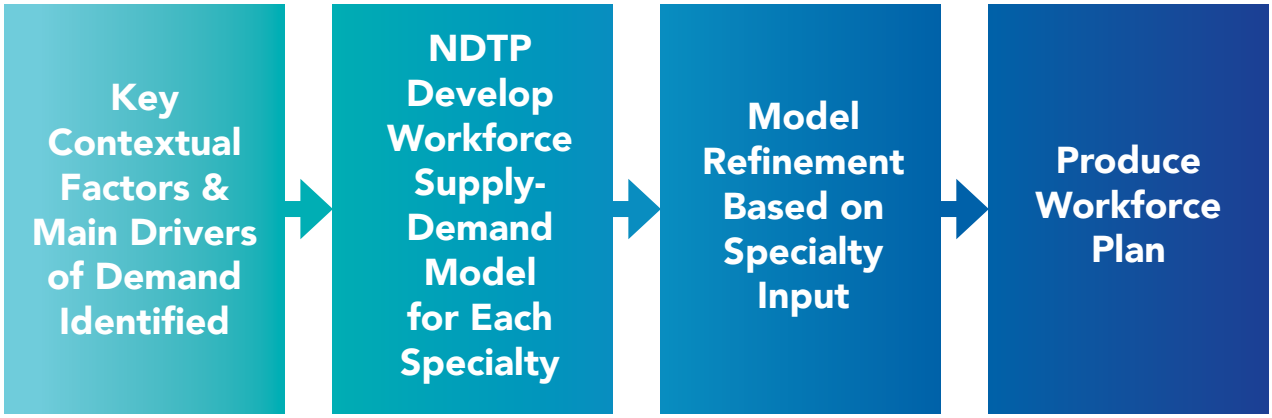
2.1 Collaborative Approach

The approach to medical workforce planning for the sub-specialties of Radiology is based on the methodological framework *'NDTP Health Workforce Planning, Ireland: A Simple Stepwise Approach'* (HSE NDTP, 2016).

Figure 2 below outlines the process through which the workforce plans for each of the Radiology sub-specialties were developed. This process involved active engagement with representatives of the Radiology specialties to develop a workforce plan. Specialty representatives (National Clinical Programmes and National Services Directors), provided contextual information for their sub-specialty, identified demand drivers and identified the level of trainee intake that was achievable to meet projected demand.

NDTP constructed supply-demand models for each specialty, provided data and assumptions on the stocks and flows of trainees and consultants, and assisted and coordinated the writing of the report using the information provided by each sub-specialty.

Figure 2 Process of engagement between NDTP and specialty stakeholders



2.2 Data Used and Limitations

The workforce data utilised in the analysis of the medical workforce are drawn from multiple sources. The Doctors Integrated Management E-System (DIME) is the main source of data in establishing the baseline age profile of the Radiology workforce. DIME workforce data was accessed in December 2024.

The DIME data was supplemented with a site survey carried out by the National Clinical Programme for Interventional Radiology which identified the names and WTE commitments of consultants to Adult Body, Neuro and Paediatric Interventional Radiology.

2.3 Supply-Demand Model Overview

A model was developed comprising of supply and demand modules. The workforce was modelled from 2024 to 2038. A long time frame is required given the large gap between current supply and current demand. Due to the extensive training period (minimum 5 years) between entering HST and taking up a consultant post, increases in the HST intake will only impact on consultant numbers in the later years of the model.

2.3.1 Supply Model

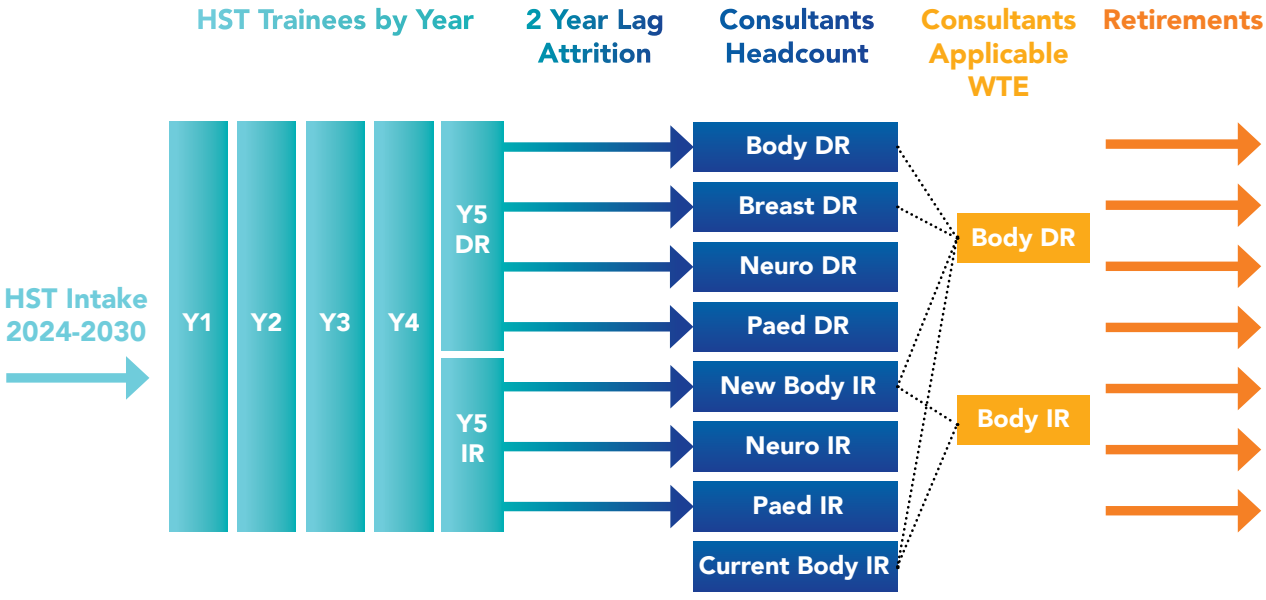
Supply is split into seven notional headcount categories; four Diagnostic categories and three Interventional categories as shown in Figure 3. Diagnostic is split into Adult Body, Breast, Neuro and Paediatric. Interventional is split into three categories one for Adult Body Interventional Radiology, one for Neuro Interventional Radiology and one for Paediatric Interventional Radiology. Adult Body Interventional Radiology is split into two to simulate new consultants in this category to operate differently to current Interventional Radiologists. The model assumes that new Interventional Radiology consultants will dedicate 80% of their time to Interventional Radiology (to encompass time for clinical practice as well as procedural work) and 20% to Diagnostic Radiology.

In practice, the current cohort of Interventional Radiologist's workload is approximately 50% dedicated to Adult Body Diagnostic Radiology. The total WTE allocated to Adult Body Diagnostic Radiology is the sum of the consultants who work purely in diagnostic radiology, and an allocation from consultants in Interventional Radiology who work across both Interventional and Diagnostic Radiology.

The supply model includes both public and private sectors; this is done as a small proportion of the graduates of post-graduate training programmes will go on to work exclusively in the private sector. In the model the public and private sectors are combined at the outset with projections based on the combined pool.

The model includes an adjustment to account for increased less than full time working. An assumption is made that each year the aggregate Whole Time Equivalent rate falls with increased less than full time working.

Figure 3 Supply Model Diagram



Model parameters for the supply model were derived from internal NDTP research, current values and expert opinion. Detailed supply assumptions are shown in Appendix 1.

2.3.2 Demand Model

The current demand for Adult Body Radiologists (WTE) is estimated based on the current median European rate of 11.5 per 100,000, minus the sum of Breast DR, Adult Body IR, Paediatric (DR & IR) and Neuro (DR & IR) demand. Growth in demand for Adult Body Diagnostic Radiology is based on recent growth.

Current demand for Adult Body IR is estimated based on the current estimated UK population ratio of 10.2 consultants per million (695 WTE consultants in UK, excluding PIR and NIR, for a population of 64.4 million). Growth in demand for Adult Body IR is based on the recent growth in activity.

Demand for Paediatric Radiology is based on the workforce target set in the Model of Care, amended and updated.

Current unmet demand for Neuro Radiology is a WTE target based on clinical input from the specialty. Growth in the Neuro Interventional Radiology is based on a small increase in the team sizes and an increasing proportion of time dedicated to Neuro Interventional Radiology. Demand for Diagnostic Neuro Radiology is projected to increase, year on year, in line with the general diagnostic growth scenarios.

3. Medical Workforce

NCHD Workforce

Table 1 shows the number of trainees by training year. There are currently 6 non-training scheme doctors in the specialty of Radiology. Fifth year includes 9 Out of Programme (OoP) trainees that are completing their training abroad in a range of specialisations.

Table 1 Trainees by Year (All Diagnostic Radiology)

Year of Training	Total
No. of trainees (First year of HST)	36
No. of trainees (Second year of HST)	36
No. of trainees (Third year of HST)	32
No. of trainees (Fourth year of HST)	29
No. of trainees (Fifth year of HST inc OoP)	31
Total HSTs in Post	**164**

Consultant Workforce

Characteristics of Radiology Consultant Workforce

The characteristics of the Radiology consultant workforce are outlined in Table 2. Since 2019, the Radiology workforce has been expanding at a rate of 6.5% per annum. Interventional and Diagnostic Radiology have been combined for Neuro and Paediatric Radiology, due to the small number of consultants involved in Diagnostic and Interventional Radiology respectively.

Table 2 Consultant Workforce Characteristics (Public Sector, December 2024)

Special Interest	HC	WTE	WTE Rate	% Female	% Over 55 Years	% Permanent	% Temporary	% Locum	Agency	% General Register
Adult Body DR	207	193.7	0.94	36%	30%	82%	10%	7%	1%	1%
Breast DR	52	46.6	0.89	84%	20%	92%	6%	2%	0%	0%
Adult Body IR	53	52.4	0.99	6%	32%	98%	2%	0%	0%	0%
Neuro DR & IR	12	12.0	1.00	8%	17%	100%	0%	0%	0%	0%
Paediatric DR and IR	28	26.5	0.95	61%	0%	100%	0%	0%	0%	0%
Total/ Average	**352**		**0.94**	**39%**	**26%**	**88%**	**7%**	**5%**	**1%**	**1%**

10 of the 12 Neuro Radiologists are categorised as Interventional.
3 of the 36 Paediatric Radiologists are categorised as Interventional.

Table 3 outlines the geographic distribution of the Radiology workforce by sub-group. Adult Body IR services are currently available in all health care groups within core working hours and 24/7 IR care is available in three Model 4 hospitals (Beaumont Hospital, Mater Hospital, and Cork University Hospital) or across 2/6 health regions. Neuro Radiology is located in Beaumont and Cork University Hospital and Paediatric Radiology is located in CHI.

Table 3 Consultant Radiology (Headcount) by Health Region

	Adult Body DR	Breast Radiology	Adult Body IR*	Neuro DR	Neuro IR	Paediatric DR	Paediatric IR	Total
HSE Dublin & North East	40	7	17	2	5	3	-	74
HSE Dublin & Midlands	51	5	9	-	-	-	-	65
HSE Dublin & South East	44	4	8	-	-	2	-	58
HSE South West	23	7	8	-	5	2	-	45
HSE Mid West	13	3	3	-	-	1	-	20
HSE West & North West	36	5	8	-	-	1	-	50
Breastcheck	1	20	-	-	-	-	-	21
CHI	-	-	-	-	-	16	3	19
Total	**208**	**51**	**53**	**2**	**10**	**25**	**3**	**352**

**Adult Body Radiologist with a special interest in Interventional Radiology (contributes 0.5WTE IR and 0.5WTE DR)*

Table 4 outlines the WTE per capita across the six Health Regions for Radiology (excluding Paediatric and Neuro Radiology). Further granular analysis is required to identify the appropriate distribution of radiologists across the regions; some highly specialised roles providing a national service are likely to be located in the large Dublin hospitals.

Adult Body Diagnostic and Interventional Radiology are closely integrated in terms of consultant staffing; the workforce of consultants that practice Interventional Radiology (Adult Body) currently on average spend approximately half of their time on Interventional Radiology with the remaining on Diagnostic Radiology. The table shows the relatively low number of consultants in the mid-west region.

Table 4 Consultant Workload Attributable to Diagnostic Radiology, WTE per 100,000 (Public Only)

WTE per 100,000	Radiology (excl. Paediatric and Neuro)
HSE Dublin & North East	4.1
HSE Dublin & Midlands	4.8
HSE Dublin & South East	4.7
HSE South West	3.8
HSE Mid-West	3.6
HSE West & North West	5.1
Average	**4.8**

Based on Medical Council data there are an additional 29 (headcount) consultants who work purely in the private sector which have been allocated to Adult Body Diagnostic Radiology. Table 5 outlines the headcount and WTE workload allocation across the six sub-specialty areas for the combined public and private consultant workforce.

Table 5 Consultant Workload Allocation (Public and Private)

Sub-Specialisation	HC	Allocated WTE
Adult Body DR	236	254.7
Breast	52	34.3
Adult Body IR	53	25.6
Neuro DR	2	7.8
Neuro IR	10	4.3
Paediatric DR	25	26.3
Paediatric IR	3	0.3
Total	**381**	**353.1**

The Number of Specialists Working Exclusively in the Private Sector

In Diagnostic Radiology the medical council register indicates that there are 29 consultants in Diagnostic Radiology working purely in the private sector. There are currently no consultants in IR working purely in the private sector.

Vacant Posts

There are currently 38 vacant posts in Radiology of which 4 have a special interest in Interventional Radiology, 12 in Breast Radiology and 2 in Paediatric Radiology. The Breast and Interventional posts are split between Adult Diagnostic and Breast and Interventional respectively.

A vacant post is a post that has been approved by the Consultants Applications Advisory Committee (CAAC) but is currently considered unfilled. The vacancy figures include a combination of vacant posts that have previously been filled and have now become vacant, and posts that have never been filled. Recruitment may be underway, or an appointment may have been made to a number of these vacancies with a prospective start date. There is often a significant period between approval of a consultant post through the CAAC process, to the commencement of the recruitment process and ultimately the recruitment of a consultant to a post.

Retention

A recent analysis of all Diagnostic Radiology CSCSTs from 2016 to 2019 shows that 61% of these cohorts are currently working in Ireland in the public and private health services. The retention of Interventional Radiology trainees has been higher with 8 of 9 trainees from the 2020-2021 cohorts now working in Ireland in the public health service.

Public Sector Activity

Diagnostic Radiology

While the national data collection landscape is fragmented, it is clear that there has been substantial growth in demand for Diagnostic Radiology. The National Radiology Quality Improvement Programme reported a crude growth rate of 5.5% between 2022 and 2023. However, labour intensive modalities such as CT and MRI grew at 9.7% and 13.6% over the same period. Demand for less labour intensive modalities X-Ray or Ultrasound has been growing at 3-4% per year.

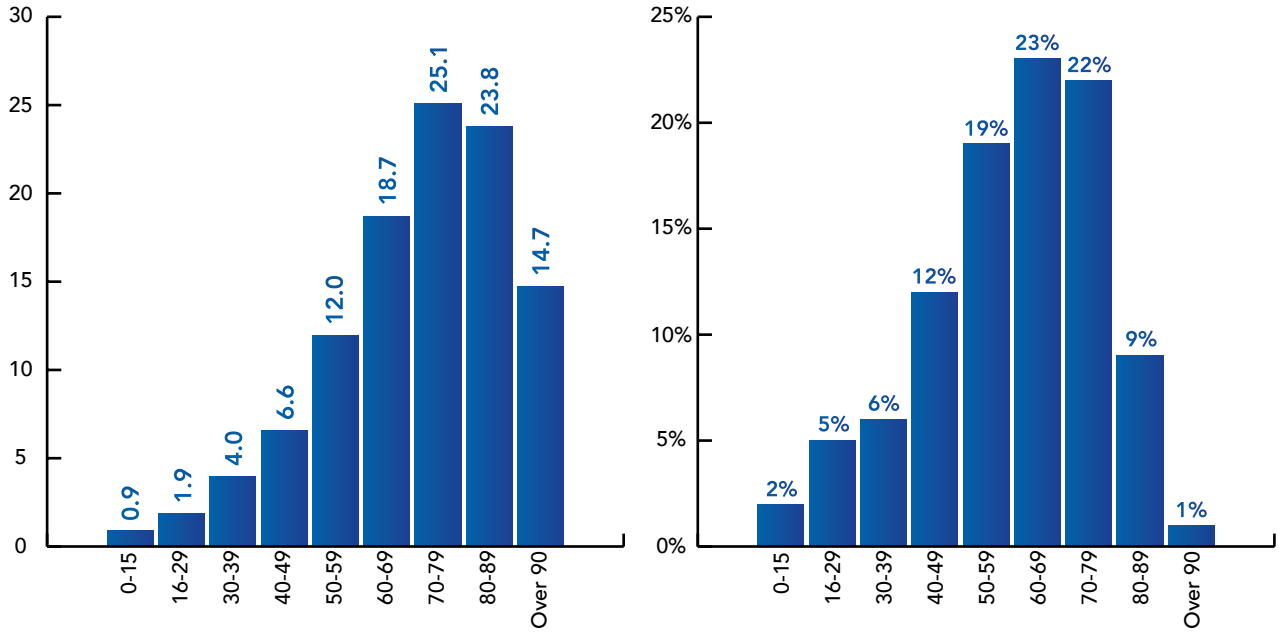
Interventional Radiology

In 2023, 50,488 Interventional Radiology procedures were performed in public hospitals, an increase of 3.5% on 2022. 1,919 of these procedures were performed out of hours, a 7% increase on 2022 and 11% increase on 2019. The three largest categories of procedures are Musculoskeletal Intervention, Venous Access and Biopsy. A detailed breakdown is shown in Appendix 2. The per capita number of IR procedures performed in Ireland in 2018 was 9,519 per million inhabitants.

Figure 4 shows the age profile of NIMIS Interventional Radiology procedures in 2023 (Body), 55% of these are carried out on the over 60 years age group. Thus, demographic ageing will drive increased demand for Interventional Radiology procedures. There were 801 procedures carried out on paediatric patients in 2023 (includes non-MIMIS), these procedures are mainly categorised as Gastrointestinal, Venous Access, Musculoskeletal Intervention or Biopsy.

In 2023, there were 3,594 interventional procedures performed by Neuro IRs. The overall number of Neuro IR procedures has increased by 27% between 2019 and 2023, an increase driven largely by a 45% increase in Stroke Thrombectomy procedures during the same time period. Neuro-Inerventional Radiology procedures are mainly categorised as Cerebral Angiography, Stroke Thrombectomy and Cerebral Aneurysm Coiling.

Figure 4 IR Public Sector Activity User Age Profile (NIMIS 2023, excludes Neuro-radiology). Left: Utilisation Rate per 1,000 People, Right: Overall % of Activity by Age Group.



4. Demand Projection Metrics

Globally there has been substantial growth in demand for imaging, driving the demand for Radiologists [1, 2]. This is particularly the case for more labour intensive modalities; in the UK between 2019 to 2023, MRI and CT scanning increased by an average rate of 5% p.a. [3]. Increased demand for Diagnostic Radiology is being driven by increased disease incidence, due to demographic ageing; increased survival rates and increasing numbers of treatments requiring radiology surveillance. The demand for Interventional Radiology has also been expanding rapidly with a continued expansion in the scope of conditions that can be treated with Interventional Radiology.

The number of Radiologists per capita in Ireland is substantially below European norms. There are currently an estimated 6.5 Clinical Radiologists (public and private, WTE) per 100,000 in Ireland, the median number of radiologists per 100,000 across Europe is 11.5 [4]. The number of Radiologists in Ireland per capita is comparable to that of the UK which has 6.8 per 100,000 (range 4.9 to 9.6) [3]. The estimated current shortfall in the UK is 30%, or an additional 2.8 Radiologists per 100,000 (ibid).

Due to the uncertainty in demand projections two scenarios are outlined.

Scenario 1: Continued Demand Growth

Table 6 outlines the current and projected notional demand for Radiologists in Ireland under the continued demand growth scenario. Current unmet demand for radiology (overall) is estimated based on the European median of 11.5 radiologists per 100,000. Current unmet demand for Adult Body Diagnostic Radiology is estimated by subtracting demand for, Breast, Adult Body Interventional, Paediatric and Neuro Radiology from the overall unmet demand. Demand is assumed to continue to expand at 5.5% per annum based on the recent experience in Ireland [5]. See Appendix 3 for an alternative approach to estimating demand for Diagnostic Radiology.

Current unmet demand for Breast Radiology is estimated at 37% in line with the current unmet demand for Diagnostic Radiology. Demand is assumed to expand at 5.5% per annum.

Adult Body IR current demand is estimated based on the current UK population ratio of 10.2 consultants per million (RCR, 2023).

Demand (current and projected) for Paediatric Diagnostic Radiology of 49 WTE is based on current plans for the new Children's Hospital. This is split between 44 WTE for Diagnostic Radiology and 5 WTE for Paediatric Interventional Radiology.

Current demand for Neuro Radiology is 19.9 WTE, based on expert judgement, split between Diagnostic (13.3 WTE) and Interventional (6.6 WTE). Demand for Neuro Interventional Radiology is projected to increase to 10.9 WTE with an expanding proportion of the working time being dedicated to Neuro Interventional with a corresponding reduction in diagnostic workload. Demand for diagnostic Neuro Radiology is assumed to expand in line with general Diagnostic Radiology (5.5%).

Table 6 Current Estimated Actual Workforce, and Target Workforce (Public and Private), Continued Demand Growth Scenario

Specialty WTE	Current Actual Workforce	Vacant Posts	Additional Current Unmet Demand	Current Recommended Workforce	Demand growth to 2040	Recommended Workforce 2040
DR Body	254.7	31	158.2	443.9	547.1	991.0
DR Breast	34.3	5	7.7	47.0	57.9	104.9
IR Body	25.6	0	29.1	54.6	25.7	80.3
DR Paed	26.3	1	17.2	44.5	0.0	44.5
IR Paed	0.2	0	5.8	6.0	0.0	6.0
DR Neuro	7.3	0	6.0	13.3	18.0	31.2
IR Neuro	4.8	1	0.9	6.6	4.3	10.9
Total	**353.1**	**38.0**	**224.8**	**615.9**	**652.9**	**1268.8**

Note: Vacant posts are allocated 50/50 with diagnostic radiology.

Scenario 2: Reduced Demand Growth

Table 7 outlines the current and projected notional demand for Radiologists in Ireland under the continued demand growth scenario. The methodology used for the second scenario is the same as above with two parameter changes. Current unmet demand for radiology (overall) is estimated based on the UK target rate of 9.6 radiologists per 100,000. Demand for Adult Body Diagnostic Radiology, Breast Radiology and Diagnostic Neuro Radiology are assumed to continue to expand at 3% per annum.

Table 7 Current Estimated Actual Workforce, and Target Workforce (Public and Private), Reduced Demand Growth Scenario

Specialty WTE	Current Actual Workforce	Vacant Posts	Additiona Current Unmet Demand	Current Recommended Workforce	Demand growth to 2040	Recommended Workforce 2040
DR Body	254.7	31	56.4	342.2	190.9	533.1
DR Breast	34.3	5	7.7	47.0	26.2	73.2
IR Body	25.6	0	29.1	54.6	25.7	80.3
DR Paed	26.3	1	17.2	44.5	0.0	44.5
IR Paed	0.2	0	5.8	6.0	0.0	6.0
DR Neuro	7.3	0	6.0	13.3	8.0	21.3
IR Neuro	4.8	1	0.9	6.6	4.3	10.9
Total	**353.1**	**38.0**	**123.0**	**514.1**	**255.1**	**769.2**

Note: Vacant posts are allocated 50/50 with diagnostic radiology.

5. Supply Projections

Proposed Radiology Intake

Table 8 outlines the proposed overall Radiology intake for 2025 to 2030. The report primarily aims to inform the 2027 and 2028 intake. A review of the intake for 2029 and 2030 will be required (commencing in 2027); based on current demand growth further increasing the intake beyond 75 in these years will be required.

The table also indicatively shows the broad areas of specialisation in year 5 of the programme. In 2024, 30% of trainees went abroad in year 5; this proportion going abroad for year 5 is assumed to continue. For some areas of specialisation, such as PIR, going abroad is required as there is not the capacity in Ireland to train in these areas.

Table 8 2024 Actual and Proposed Training Intake and Assumed Year 5 Specialisation

	Jul-24	Jul-25	Jul-26	Jul-27	Jul-28	Jul-29	Jul-30
Radiology Intake	36	39	45	65	75	75	75
5th Year Specialisation*							
Diagnostic	12	15	18	22	23	25	31
DR Breast	4	3	3	3	3	3	3
Interventional	6	6	6	7	7	7	7
Paediatric Diagnostic	5	2	2	2	2	2	2
PIR	0	1	1	1	0	1	1
Diagnostic Neuro	1	1	2	1	2	1	2
NIR	3	0	0	1	0	1	0
Total 5th Year	**31**	**29**	**32**	**36**	**36**	**39**	**45**
Total HST ROI	155	164	179	211	250	288	322
Total HST OoPE	9	8	9	10	10	11	13
Total HST	**164**	**172**	**188**	**221**	**260**	**299**	**335**

**Includes Ireland and abroadProjected Consultant Supply*

Projected Consultant Supply

Table 9 outlines the number of new hires by sub-specialty area required to meet supply projections. The projections outlined are based on new hires of 23 per year, increasing to 31 per year in 2030. Expansion of the radiology workforce is constrained by the historic number of trainees, the attractiveness of consultant posts and the limited number of internationally trained qualified Radiologists applying for consultant posts. The recruitment below is based on the assumption of 80% retention of Radiologists, a substantial increase on the current retention rate.

Table 9 Projected new hires (Headcount)

Headcount	2026	2027	2028	2029	2030
DR Body	12.4	11.6	14.8	16.4	18.8
DR Breast	2.5	3.2	2.4	2.4	2.4
IR Body	3.4	5.1	5.1	5.1	6.0
DR Neuro	0.6	0.8	0.8	1.6	0.8
IR Neuro	0.9	1.2	0.0	0.0	0.4
DR Paediatric	3.1	4.0	1.6	1.6	1.6
IR Paediatric	0.0	0.0	0.9	0.9	0.9
Total	**22.9**	**25.9**	**25.6**	**28.0**	**30.8**

Table 10 shows the projected consultant supply allocated by area of activity. The methodology used to generate the supply projections is outlined in section 2.3. Increasing the intake to 75 and stabilising at that level is projected to increase the overall supply to 725 WTE in 2040. This level of supply will almost meet the low growth scenario but will fall far short of the continued growth scenario.

Table 10 Projected supply (WTE Attributed to Activity Area)

WTE	YE 2024	YE 2025	YE 2026	YE 2027	YE 2028	YE 2029	YE 2030	YE 2031	YE 2032	YE 2033	YE 2034	YE 2035	YE 2036	YE 2037	YE 2038	YE 2039	YE 2040
DR Body	255	251	257	263	266	272	280	288	298	308	325	356	393	430	465	500	534
DR Breast	34	35	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
IR Body	26	27	30	32	35	38	40	44	47	51	54	57	60	64	67	70	73
DR Neuro	7	6	7	7	8	7	9	10	11	12	13	14	15	16	17	18	19
IR Neuro	5	6	7	9	9	11	11	11	10	11	10	11	10	11	11	11	11
DR Paediatric	26	26	29	31	35	37	38	40	41	42	42	42	43	42	43	43	43
IR Paediatric	0	1	1	1	1	2	2	3	2	3	3	3	3	3	3	3	3
Total	**353**	**354**	**359**	**373**	**385**	**398**	**412**	**428**	**444**	**461**	**483**	**520**	**562**	**605**	**646**	**688**	**725**

6. Discussion

Current Unmet Demand and Demand Growth

The provision of Diagnostic Radiology has been growing, with scheduled and unscheduled imaging growing at 2.9% and 2.4% respectively. However, the primary drivers of demand growth have been in labour intensive modalities such as MRI and CT which have been expanding at 7-8% per year. The growth in demand for these modalities in Ireland is in line with the international experience; in the UK, CT and MRI have been expanding at 5% per annum [3].

NTPF data shows that at the end of Quarter 4 2024, there was a total of 300,115 patients reported on the waiting list from all sites, this represents all outpatients waiting, urgent, semi urgent, routine and planned/surveillance (where diagnostic access is planned at particular time intervals). A quarter of those on waiting lists were waiting for greater than 12 months. While the number of consultant Radiologists in Ireland is in line with the UK, the UK service is viewed as being in crisis [3].

Two scenarios are outlined. Under Scenario 1 (Continued Demand Growth), the notional current met demand is benchmarked off the European rate. However, this is not an endpoint as demand is expected to continue to grow, under this scenario at 5.5% per annum. Under Scenario 2 (Reduced Demand Growth), the notional current met demand is benchmarked off the UK target rate and demand projected to grow at 3% per annum. The difference in the growth rate for Adult Body and Breast radiology primarily drives the long-term differences in notional demand. Total radiology demand is estimated at 1,269 and 769 respectively under the two scenarios.

Due to the substantial uncertainties in the projected future demand for radiologists, the report recommends commencing a review of the projected demand and intake numbers in 2027.

The benefits of IR procedures include reduced risk, shorter hospital stay, lower cost, greater patient comfort, and earlier return to work. Many other specialities now list the availability of IR as essential to the safe delivery of their service including Surgery, Obstetrics and Urology services. Ireland currently has a low rate of Interventional Radiology procedures, with half the per capita procedures performed when compared to other high-income countries (MOC). The lower rate of IR procedures in Ireland is predominantly due to lower levels of staffing. In the UK there are 11.5 WTE Interventional Radiologists per million [3]. This compares to 6.0 WTE per million in Ireland. Interventional Radiologists in Ireland make up a smaller proportion of the Radiology workforce compared to the UK (9% vs 17%).

The demand for Paediatric Radiology is estimated by the clinical programme to be 47 WTE. This would involve increases in CHI, the maternity hospitals and regional centres. Paediatric Interventional Radiology services are poorly resourced, there are currently 0.25 WTE consultants providing Paediatric Intervention. The paediatric clinical programme estimated demand of 6 WTE for Paediatric Interventional Radiology.

Based on consultation with the neuro radiology service, there is a demand for 6.6 WTE Neuro Interventional Radiologists and 13.3 WTE Diagnostic Neuro Radiologists. The current arrangement, where diagnostic neuro radiology is delivered by Neuro Interventional Radiologists is unusual by international standards. It is envisaged that increases in demand for neuro interventional radiology would largely be met through a reduction in the diagnostic workload of Neuro Interventional Radiologists. There is a substantial unmet demand for diagnostic neuro radiology with continued demand growth expected.

The potential impact of artificial intelligence (AI) has not been included in this report. In the short to medium term the most significant potential benefits of AI tools are improved accuracy and prioritisation. It is not clear how AI will affect workload, in the short term it may increase workload as additional anomalies are identified that need to be reviewed by a Radiologist.

The Training Programme

The proposed increase in the Radiology training programme intake, from 36 in 2024 to 75 by 2028, will require a substantial expansion of the overall Radiology training programme, with the total number of trainees projected to increase from 164 in 2024 to 375 in 2032. This assumes no further increases in training in 2029. A review of the intake, commencing in 2027, is recommended to feed into the estimates process and the 2029 trainee intake.

As Radiology has almost no non-training scheme posts to convert the majority of this increase would need to come from new funding.

Currently most trainees go abroad to complete a fellowship. Neuro Interventional Radiology currently provides post-CSCST fellowships for domestic and international trainees. There are potentially substantial advantages to providing additional fellowship training places in Ireland. These advantages include increased retention and service provision.

Consultant Posts

Under the assumption that the training intake is increased to 75 and then stabilised, the overall Consultant Radiology workforce is projected to increase from 353.1 WTE currently (6.6 consultants per 100,000) to 725 WTE (12.2 consultants per 100,000) in 2040. Demographic ageing is one important driver of demand for Radiology, the number of consultants is projected to increase from 42 per 100,000 of over 65s to 57 per 100,000 of over 65s. This will (almost) meet the low demand growth scenario but will fall far short of meeting the continued growth scenario.

The expansion of the consultant workforce until 2030 is constrained by the historic intake onto the training programme; there is limited capacity to hire consultant radiologists who have been trained abroad. Radiology is currently experiencing a low retention rate relative to other specialties. It is assumed in the modelling that the retention rate can be increased substantially. This will require increasing the attractiveness of new and replacement consultant posts.

The proposed expansion in Adult Body Diagnostic Radiology indicates new hires in the public and private sectors increasing from 11 to 20 per year in the next five years, as trainees come off the programme. The proposed expansion in Breast Radiology indicates new hires in the public sector of 2-3 per year over the next five years.

The proposed expansion in Adult Body Interventional Radiology indicates new hires of 3-5 per year in the coming years. This is projected to increase the IR workforce to 50 WTE in 2033, expanding at a rate of 6.6% per annum between 2024 and 2030. The proposed expansion of Interventional Radiology, is based on current consultants practicing Interventional Radiology, continuing to contribute 50% of their time to Interventional Radiology. The current arrangement where diagnostic radiology is delivered by Interventional Radiologists is unusual by international standards. It is envisaged that increases in demand for interventional radiology would largely be met through a reduction in the diagnostic workload of Interventional Radiologists and an appropriate level of clinical practice integration into individual work plans. New hires with a specialisation in Interventional Radiology would be allocated 80% to Interventional Radiology and

20% to Diagnostic Radiology. An appropriate minimum level of Diagnostic Radiology will need to be incorporated into individual work plans at post design stage to ensure that diagnostic skills are maintained.

The proposed expansion in Paediatric Radiology indicates new hires of 3-4 per year in the coming years, as suitable candidates become available, and falling to 1-2 per year thereafter. The proposed expansion in Neuro Radiology indicates new hires of 1-2 per year in the coming years, as suitable candidates become available.

The focus of this report is on the trainee pipeline to feed into the consultant workforce. This report has been prepared in advance of a broader assessment, by the HSE, of the Radiology service requirements outlined in the National Radiology Strategy 2025-2029. The National Radiology Strategy recommends a detailed workforce plan for the multidisciplinary team involved in the delivery of Radiology services, including Radiologists, Radiographers, Medical Physicists, Radiography Assistants, Radiology Nursing, Radiology trainees and Administrative Staff. The recently published EU-REST project, which has been endorsed by the European Commission, outlines current radiology staffing across the EU and approaches to estimating workforce requirements [6, 7]. This study outlines a machine/system/activity basic unit to calculate radiologist staffing needs [6]. This granular approach will require additional data to implement in the Irish context.

References

1. Chao, Y.-S., et al., *The Canadian Medical Imaging Inventory 2019–2020*. 2022.

2. Richards, M., *Diagnostics: Recovery and Renewal – Report of the Independent Review of Diagnostic Services for NHS England*. 2020.

3. Radiology, T.R.C.o.R.C., *Clinical Radiology Workforce Census 2023*.

4. Brady, A.P., et al., *Current status of radiologist staffing, education and training in the 27 EU Member States. Insights into Imaging, 2025*. **16**(1): p. 59.

5. RCPI, *Natitional Radiology Quality Improvement Programme 5th National Data Report*. 2023.

6. Brady, A.P., et al., *Guidelines and recommendations for radiologist staffing, education and training. Insights into imaging, 2025*. **16**(1): p. 57.

7. European Commision, A.B., B. Brkljačić, M. Coffey, J. McNulty, D. Visvikis, G. Paulo, C. Garibaldi, C. Pesznyak, F. Zarb, F. Jamar, C. Loewe, Y. Anacak, P. Lara, R. Sánchez, N. Jornet, M. Leech, I. Polycarpou, M. Hierath, M. Szucsich, *Analysis on workforce availability, education and training needs for the quality and safety of medical applications involving ionising radiation in the EU; Status and Recommedations*. 2025.

8. RCSI, *Diagnostic Radiology Guidance on Radiologist Workload Figures*. 2020.

Appendix 1: Supply Assumptions

Table A1 Supply model parameter values and sources

Group	Parameter	Value/Range	Description/Source
All	**Years Between CSCST and Consultants Post**	2	Eg. July 24 CSCST hired into consultant posts in 2026. Based on recent work this may underestimate the length of time CSCST's spend abroad before returning.
All	**Retirement Age**	65	For simplicity, the model assumes that people retire at a certain age depending on the specialty. For most specialties a retirement age of 65 is used.
All	**Projected Decline in WTE Rate of Consultants**	0.0025 per annum	It is widely believed that new consultants will not want to work as many hours of overtime as in the past. The variable is included in the model to account for a small decline in WTE rates over time due to increased Less Than Full Time (LTFT) work.
All	**Exit Rates Private Sector**	2.6%	No age data is available for the private sector only consultants, an average exit rate is used (Source: NDTP internal analysis).
All	**Additional Exits 0.6%**	0.6%	Exits from workforce of consultants under 55 years (Source: NDTP internal analysis).
Adult Body DR	**Consultants per year from outside training system**	2	Assumed that no inflows from outside the domestic training programmes for other areas of specialisation.
Adult Body DR/IR	**CSCST Retention Rate**	80%/85%	This is the proportion of CSCSTs that are retained in the Irish Health System.
Current/New Adult Body IR	**Allocation to IR**	50%/80%	
Neuro DR/IR	**CSCST Retention Rate**	70%/85%	
Neuro IR	**Retention Rate**	40%	
Neuro IR	**Allocation to Neuro DR**	20%	
Paediatric DR/IR	**CSCST Retention Rate**	70%/85%	
Paediatric IR	**Allocation to Paediatric DR**	50%	Currently there are 3 consultants providing approximately 0.25 WTE in Interventional Radiology. This is assumed to increase to 50% IR with all new consultants in paediatric IR allocating 50% of their time to IR.

Appendix 2: Interventional Activity Data

Adult Body IR

In Ireland in 2023, 50,488 IR procedures were performed in public hospitals, as shown in table A2. Of these, 9,065 were complex 'level 2' procedures which require a higher level of technical skill and clinical expertise reflecting the growing complexity of IR as a specialty. This data includes NIMIS & non NIMIS hospitals, Model 3s and Model 4s and adult body only.

Table A2 Public Sector Adult Body Interventional Activity (2023)

Procedure Category	Total Procedures 2023	%
Aspiration and drainage	6686	13%
Biliary and gallbladder Intervention	1760	3%
Biopsy	10289	20%
Body Arterial Intervention	2087	4%
Embolization Body	1024	2%
Gastrointestinal	913	2%
Genitourinary	4338	9%
Interventional Oncology	326	1%
Miscellaneous	155	0%
Musculoskeletal Intervention	8951	18%
Neurointervention*	16	0%
Venous Access	12460	25%
Venous Intervention	1483	3%
Grand Total	**50,488**	**100%**

Procedures classified as Neuro-intervention but performed in General IR Hospitals.

Neuro IR

3,594 procedures were performed by Interventional Neuroradiologists in 2023. The overall number of Neuro IR procedures has increased by 27% between 2019 and 2023, an increase driven largely by a 45% increase in stroke thrombectomy procedures during the same time period.

Table A3 Neuro-interventional Activity (2023)

Neuro IR Procedures	2023
Neuro-intervention Procedures	2958
Cerebral aneurysm coiling	372
Cerebral angiography	1709
Stroke thrombectomy	586
Other Neuro Procedures	291
Other Procedures*	636
ALL Procedures performed by Neuro IRs	**3594**

**non Neuro procedures performed by Neuro IRs*

Paediatric IR

A total of 801 IR cases were performed in the paediatric population (16 and under) in 2023. The majority of these cases (624) were performed in CHI. 177 cases were performed by adult interventionists in other centres that admit paediatric patients around the country. In addition, 26 neuro-interventional cases were undertaken in one of the two Neuro IR centres for the paediatric population.

Table A4 Paediatric-interventional Activity CHI (2023)

Paediatric IR Procedure Category	2023
Aspiration and drainage	71
Biliary and gallbladder Intervention	1
Biopsy	114
Body Arterial Intervention	6
Embolization Body	17
Gastrointestinal	222
Genitourinary	11
Interventional Oncology	1
Miscellaneous (Sclerotherapy)	95
Musculoskeletal Intervention	51
Neurointervention	1
Venous Access	205
Venous Intervention	6
Total	**624**

Appendix 3: Diagnostic Demand Estimates (Alternative Method)

A report published by the Faculty of Radiologists in 2020 outlines the hourly output of and Interruption Free Reporting Session by modality. Based on the 2023 demand by modality, outlined in the National Strategic Review, the table below estimates the number of required reporting hours by modality. This is converted into a WTE consultant demand estimate, by dividing by the recommended clinical working hours per year (1155) [8].

Table A5 Diagnostic Radiology Alternative Demand Estimate

Modality	Radiology Demand 2023	Reporting per Hour	Hours	Consultant WTE
Computed Tomography	689,000	4	172,250	
MRI	554,000	4	138,500	
Mammography	294,000	15	19,600	
Nuclear Medicine	28,000	6	4,667	
PET	14,000	2	7,000	
Ultrasound	753,000	12	62,750	
X-Ray	2,375,000	30	79,167	
Total	**4,789,000**		**483,933**	**419**

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