Feidhmeannacht na Seirbhíse Sláinte
Health Service Executive

NDTP
National Doctors Training & Planning

# REVIEW OF THE **CLINICAL RADIOLOGY** MEDICAL WORKFORCE IN IRELAND

2017

Human Resources
Leaders in People Services

*"Investing in the career development of doctors"*

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# 1 - INTRODUCTION TO REPORT AND OVERVIEW OF THE CLINICAL RADIOLOGY MEDICAL WORKFORCE

## 1.1 INTRODUCTION

The HSE National Doctors Training and Planning (NDTP) Unit is positioned within the HSE National Directorate for Human Resources, and has statutory roles in:

- Medical education and training;
- Medical workforce planning; and,
- The consultant post approval process.

Within its medical workforce planning remit, NDTP predicts and proposes on an annual basis the number of interns and medical trainees required for each specialty, as well as projecting the future medical workforce requirements for each speciality. This information then feeds into the medical education and training aspect of NDTP via the commissioning and funding 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 main objective of NDTP is to ensure that, at all times, the Irish health service is provided with the appropriate number of specialists, who possess the required skills and competencies to deliver high quality and safe care, and whose training is matched to the model of healthcare delivery in Ireland, regardless of location.

## 1.2 BACKGROUND TO SPECIALTY-SPECIFIC REVIEWS

In 2014, NDTP published "Population Based Ratios of Specialists in Ireland and Internationally: An Information Source to Support Medical Workforce Planning", which was a benchmarking exercise conducted across all medical specialties, comparing specialist numbers against international examples. Included in this benchmarking exercise were the projected number of specialists required per specialty in ten years' time (2024). Data and contextual information were requested from individual postgraduate medical training bodies and associated national clinical programmes, which were considered in the development of each specialty-specific chapter.
As a follow-up to this exercise, it is timely to provide a review of each medical specialty based on current available data and input again from the postgraduate training bodies and clinical programmes. These reviews are high-level and are a companion to the more in-depth specialty specific reports which are published by NDTP (i.e. "Future Demand for General Practitioners 2015-2025", published in 2015, with equivalent reports in Paediatrics and Emergency Medicine due in Autumn 2017). These reviews will be a useful reference for those with an interest in data on the medical workforce and medical workforce planning, comprising a live repository that will be continuously updated as each review is completed. Where a review has yet to be completed, the chapter from the benchmarking exercise in 2014 will be available for reference.

## 1.3 DATA USED AND LIMITATIONS

The data utilised in the analysis of the medical workforce in each speciality for these reviews are drawn from multiple sources:

- HSE Doctors Integrated Management E-System (DIME), which receives data from the postgraduate medical training bodies, the Medical Council of Ireland and each clinical site that employs doctors in the public health system in Ireland;
- HSE Workforce Planning, Analysis and Informatics Unit (WPAI);
- HSE Consultants Appointments Division;
- The Postgraduate Medical Training Bodies;
- The Medical Council of Ireland – Medical Council Workforce Intelligence Report;
- The National Clinical Programme linked to each specialty;
- International medical training bodies (UK and Australia);
- International medical workforce datasets (i.e. National Health Workforce Dataset in Australia); and,
- International health research groups (i.e. Health Workforce Australia).

Variations between datasets are not unexpected and therefore the results from the different sources in the reviews are not identical. These limitations of the datasets are due to variations in the time point of data collection, differences in the variables collected (i.e. whole-time equivalents (WTE) versus headcounts (HC)), differences in the definitions of some variables (e.g. less than full-time versus part-time), absence of variable values in datasets (i.e. missing data), and varying quality of data between sources.

The weaknesses of benchmarking domestic data against international data are known and include:

- a lack of contextual consideration;
- assumptions that the international standard is best practice; and,
- potential complacency should the domestic value equal that of the international value.

However, there is merit in this kind of comparison as these ratios are interesting in terms of contextualising the demand for consultants across international healthcare systems with similar training and healthcare delivery infrastructures to those in Ireland. Further, it provides an international baseline for comparison and can help identify areas for improvement. Irish doctors traditionally migrate to countries like the UK and Australia and so benchmarking against these countries is a useful exercise.
Should you require any further information on the reviews, please contact NDTP at doctors@hse.ie

### 1.4 CLINICAL RADIOLOGY

Clinical Radiology is the utilisation of imaging modalities to diagnose, treat and monitor various disease processes. It involves a multi-step process where high-tech imaging equipment is used to assist health professionals in the diagnosis of a range of conditions. Health professionals involved in Clinical Radiology include radiographers and radiologists supported by nursing, health care assistants, physicists, administration and portering staff - all of whom are needed for a modern functioning department. Diagnostic radiographers use sophisticated equipment to produce high quality images of the internal human body. Radiologists are highly trained specialist doctors who interpret and report on the images generated by radiographers to the hospital medical team or referring GP, in order to diagnose or treat diseases and conditions.

Radiologists use an array of imaging technologies such as X-ray, ultrasound, Computed Tomography (CT), nuclear medicine, Positron Emission Tomography (PET) and Magnetic Resonance Imaging (MRI) to diagnose or treat diseases. Much of the radiologist's time is occupied in helping to decide upon the best management of patients' problems, and in performing and interpreting complicated procedures. Interventional Radiology is a clinical specialty with outpatient, ward and procedural duties, commensurate with those of a consultant surgeon. In addition to the treatments performed, interventional radiologists also have a role in diagnosis e.g. tissue sampling and invasive diagnostics. As technology advances and high-quality imaging equipment becomes more widely available, it is able to offer patients and referral physicians a growing number of new treatment options, often replacing major surgery and improving recovery times. The role of radiology continues to expand into areas of non-interpretive skills including: management, quality improvement strategies, morbidity & mortality meetings, and multi-disciplinary team meetings. These are some of the fastest areas of growth in new demand for radiology time.

### 1.5 THE CONTEXT OF CLINICAL RADIOLOGY IN THE IRISH HEALTH SERVICE

Approximately 2.5 million diagnostic imaging tests are performed in Ireland annually. This represents an overall spend of approximately 350 million euros. These tests range from highly complex and expensive examinations like Positron Emission Tomography and Computed Tomography (PET/CT) to simple and relatively inexpensive studies like chest radiography. These tests are performed in a variety of settings but are carried out mainly in the diagnostic imaging department of public and private hospitals. In the public sector, there are very few non-hospital settings where radiology can be performed. Private sector provision is also primarily carried out within hospital settings but some standalone private imaging centres, predominantly Magnetic Resonance Imaging (MRI) centres, exist.

### 1.5.1 'HUB AND SPOKE' MODEL OF SERVICE DELIVERY

Irish Radiology departments are built around individual hospitals. Their size usually reflects the size of the hospital they serve. The largest departments perform about 200,000 studies annually and have a maximum of 16 consultant radiologists. However, only a few departments of this size exist in Ireland and even they are no more than medium-sized by international standards. There is a relatively larger number of small departments in Ireland. Growth is being witnessed in both scheduled and unscheduled care with a particular expansion of out of hours services on weekdays and weekends. Though there has been clear growth in advanced radiology services, growth in simpler high volume radiology remains a challenge to service provision. Provision of second opinions in hub and spoke models may require multiple radiologists reading the same study. Single studies are no longer indexed to single radiologists with a resultant burgeoning need for second opinions and specialist opinions. This impedes specialisation and means that many more specialised studies are either unavailable or available only to patients residing in the catchment area of a Model 4 hospital. Small departments cannot avail of the economies of scale that are possible with modern equipment, adding to system costs. The Hospital Group structure lends itself to a 'hub and spoke' model of radiology service provision.

In a Hospital Group, the Model 4 and larger Model 3 hospital radiology departments act as central 'hubs' providing a large volume of examinations, including the majority of more complex radiology investigations. Smaller Model 3 and Model 2 Hospitals perform a medium volume of less complex investigations. Reporting from off-site is not common, being used mainly for neuroradiology.

The reporting component of a wider range of investigations could be partially delivered remotely by consultants physically located in the larger institution. There is added value to an on-site radiologist presence, therefore it is not envisaged that the reporting component should be delivered remotely in its entirety. On-call work in Model 2 and Model 3 Hospitals, which is mainly CT-based, could be safely delivered by remote reporting.

# 2 – CURRENT WORKFORCE

## 2.1 INTRODUCTION

The staffing model for radiology in Ireland is different to many other specialities in that the vast majority of services are consultant-provided as opposed to consultant-led; many hospitals throughout the country do not employ non-consultant staff. In those hospitals with non-consultant staff (almost all at SpR level, on a formal accredited training scheme and supported by Radiology interns), virtually all work is directly consultant-supervised prior to achievement of the Fellow of the Faculty of Radiologists Royal College of Surgeons in Ireland (FFR RCSI) and/or Certificate of Satisfactory Completion of Specialist Training (CSCST).

## 2.2 SOURCES OF DATA

The major sources of data utilised in the analysis of the current medical workforce include:

- Medical Council Workforce Intelligence data from 2015/16 registrations (MCI);
- HSE Workforce Planning, Analysis and Informatics Unit (HSE- WPAI);
- HSE Consultants Division (HSE-CD), and;
- HSE National Doctors Training and Planning Unit (HSE-NDTP).

Variations between datasets are not unexpected and therefore the results from the different sources in this section are not identical. There are several possible explanations for this. The time-points at which the data are collected vary, for example, Medical Council data is collected annually in July, while for HSE WPAI data, this is collected as part of a monthly census. Also, definitions may be slightly different, for example, less than full-time working and whole-time equivalents. The quality of the data can also vary between sources.

Examination of the available data has allowed for a breakdown of the radiology medical workforce by consultants and NCHDs working in the public and private sector. It has allowed further analysis of those doctors actively participating in the medical workforce in Ireland by gender and working patterns, registration type, contract type, where doctors received their basic medical training, and age profile. The ratios of NCHDs to consultants are also considered.

The first section outlines the consultant workforce in Radiology, followed by an analysis of NCHDs.

## 2.3 THE NUMBER OF SPECIALISTS WORKING IN THE IRISH HEALTH CARE SYSTEM

### 2.3.1 THE NUMBER OF HSE APPROVED CONSULTANT POSTS

Table 1 outlines data from the HSE Consultants Division on the number of approved consultant radiology posts (by subspecialty where stated) in the public health system. The descriptions in Table 1 are limited. Some specialty listings require refinement to respond to rapid changes; such as the development of Emergency Department and Forensic Imaging special interests. Many radiologists have more than one specialty interest and some develop new areas of interest post fellowship training. There are no true academic positions in Ireland and many universities lack true chairs in radiology or subject, which is at variance with international norms. In 2017, there were a total of 257 approved posts (255 WTE).

**TABLE 1:** HSE Number of Approved Consultant Posts

| Approved Consultant Posts as at January 2017 | | |
|---|---|---|
| | HC | WTE |
| General Radiology | 165 | 164 |
| Neuroradiology (Exclusively) | 8 | 8 |
| Paediatric Radiology (Exclusively) | 14 | 14 |
| Breast Radiology (Special Interest) | 37 | 36 |
| Interventional Radiology (Special Interest) | 16 | 16 |
| Musculo-skeletal (Special Interest) | 3 | 3 |
| Nuclear medicine (Special Interest) | 5 | 5 |
| Paediatric Radiology (Special Interest) | 8 | 8 |
| Vascular Radiology (Special Interest) | 1 | 1 |
| Total Radiology (Special Interest) | 257 | 255 |

### 2.3.2 MEDICAL COUNCIL

Table 2 outlines the breakdown of the radiology specialist registered doctors participating in the workforce as per Medical Council Annual Retention Application Form (ARAF) data for 2016. A total of 318 doctors working in radiology in 2015 were on the specialist register and actively working in the specialty, of whom 21 worked exclusively in the private sector.

**TABLE 2:** Number of Doctors on the Specialist Register of the Medical Council

| Specialist registered doctors actively practicing Radiology in 2015 | | | |
|---|---|---|---|
| | Inside Ireland | Inside & Outside Ireland | Total |
| Specialist registered doctors (Total Public & Private) | 271 | 47 | 318* |
| Specialist registered doctors (Private Only) | 18 | 3 | 21 |
| Entrants on to the Specialist Register | 37 | | 37** |
| Exits from the Specialist Register | 17 | | 17** |

*Source, IMC ARAF (2016) ** Data from IMC 2015

### 2.3.3 COUNTRY OF BASIC MEDICAL QUALIFICATION

Of the 318 doctors on the specialist register and actively working in radiology in 2015, 77% qualified in a medical school in Ireland, 16% qualified in the EU and 7% qualified outside the EU (Table 3).

**TABLE 3:** Country of Basic Medical Qualifications – Specialist Register

| Country of Basic Medical Qualification | | |
|---|---|---|
| Qualified in Ireland | Qualified in the EU | Qualified outside the EU |
| 244 (77%) | 52 (16%) | 22 (7%) |

### 2.3.4 HSE WORKFORCE PLANNING, ANALYSIS AND INFORMATICS

As of November 2016, there were a total of 264 consultants (248 WTEs) in radiology working in publicly funded services (Table 4).

**TABLE 4:** Number of Consultants - Publicly Funded Services

| Consultants - Publicly Funded Services in Ireland | | |
|---|---|---|
| | HC | WTE |
| Consultant Radiologist | 264 | 248 |

## 2.4 PARTICIPATION OF CONSULTANTS / SPECIALISTS IN THE MEDICAL WORKFORCE IN IRELAND

### 2.4.1 GENDER AND WORKING PATTERNS

2.4.1.1 Gender

As of 2016, the gender breakdown for WPAI data indicates that of the 264 consultants working in publicly funded services, 57% were male and 43% were female. Of the 318 doctors with Medical Council specialist registration and actively working in radiology in 2015, 69% were male and 31% were female (Table 5).

**TABLE 5:** Gender Breakdown of Consultants/Specialists

| Gender of Consultants/Specialists Working in Ireland | | | | | |
|---|---|---|---|---|---|
| Source | Male % | Male HC | Female % | Female HC | Total HC |
| WPAI 2016 | 57% | 151 | 43% | 113 | 264 |
| IMC 2016 | 69% | 219 | 31% | 99 | 318 |

2.4.1.2 Working Patterns

Of the consultants working in HSE funded services in 2016 (WPAI data), 89% (236) were working on a full-time basis (Table 6). Working patterns of those doctors on the specialist register as per IMC data indicate that 91% (289) worked full-time and 9% (29) worked less than full-time. As already stated, part-time working infers an approximate WTE rate of less than 80% for IMC data. For WPAI, part-time working is defined as a WTE rate of less than 100%. The overall WTE rate for WPAI data is 94%.

**TABLE 6:** Working Patterns of Consultants/Specialists

| Working Patterns of Consultants/Specialists | | | | | | | |
|---|---|---|---|---|---|---|---|
| Source | HC | HC Full-Time | % Full-Time | HC Part-Time | % Part-Time | Overall WTE Rate | WTE |
| WPAI | 264 | 236 | 89% | 28 | 11% | 94% | 248 |
| IMC | 318 | 289 | 91% | 29 | 9% | | |

### 2.4.2 PERMANENT/TEMPORARY STATUS OF CONSULTANT CONTRACT

Of the 264 consultants working in HSE funded services (WPAI data), 85% (224) held a permanent contract. The remaining 15% held non-permanent contracts and were typically on locum posts with specified purpose contracts (Table 7).

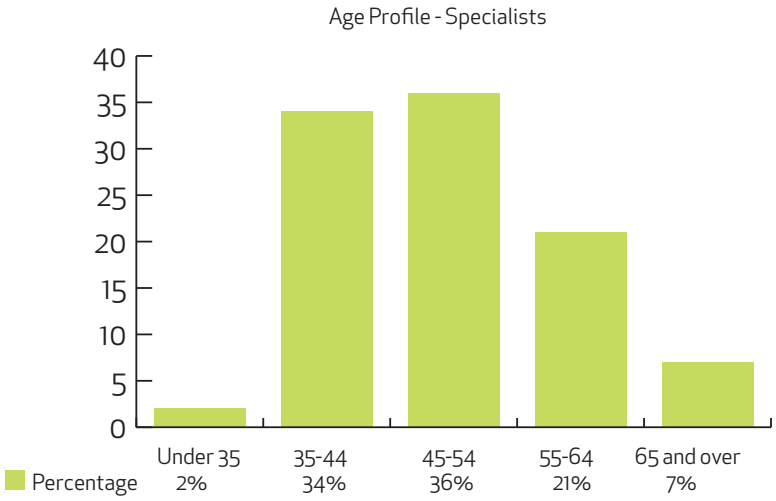
**TABLE 7:** Permanent/Temporary Status of Consultant Contract

| Permanent / Temporary Status of Consultant Contract 2016 | | | | | |
|---|---|---|---|---|---|
| | HC | Permanent | % Permanent | Non-Permanent | % Non-Permanent |
| WPAI | 264 | 224 | 85% | 40 | 15% |

### 2.4.3 AGE PROFILE OF SPECIALISTS

Of the specialists actively working in radiology and registered with the IMC in 2015, 2% were under the age of 35, 34% were between the ages of 35 and 44, 36% were between the ages of 45 and 54 and 28% were over the age of 55 years (IMC, 2016). These data indicate that, over the next 10 years approximately 90 radiologists are likely to exit the workforce due to retirement (representing all doctors over 55 years). Figure 1 illustrates the age profile of specialists working in radiology, with the majority in the age category of 35 years to 54 years.

**FIGURE 1:** Age Profile of Specialists




### 2.5 THE NUMBER OF NCHDS WORKING IN THE IRISH HEALTH CARE SYSTEM

Radiology is the only specialty that requires a minimum of just one post-internship clinical year as a requirement for applying to the higher specialist training programme and many clinical paths can lead to Radiology training, including Surgery, Medicine and Emergency Medicine. Radiology internships have been developed to a varying extent in Irish hospitals and have already provided candidates who have successfully competed for radiology positions.
The Faculty of Radiologists in Ireland is the sole body for radiologists in Ireland and is responsible for Continuous Professional Development.

Following consultation between NDTP, the RCSI Surgical Training Programme and the Faculty of Emergency Medicine RCSI, a pilot programme, named the 'Common Stem SHO' pilot project, was approved by the Faculty of Radiologists Board in 2015 and began in 2016. This provides an option for interns who are targeting a career in Radiology to spend their year 1 SHO experience in a post that will provide clinical experience relevant to Radiology and allow them to spend their academic half-day in a radiology department. The pilot project provides for approximately 10 places per year on the Common Stem, although 8 were appointed in January 2016. This option allows interns an alternative pathway for entrance to radiology training and addresses the issue of first-year surgical SHOs exiting Basic Surgical Training to apply for the radiology programme, thereby creating unexpected vacancies.

Radiology is dependent on both NCHDs in training and not in training programmes to support service delivery, although to a much lesser extent than other medical specialities. Table 8 below outlines the number of NCHDs who retained registration in 2015 and worked in Ireland in radiology in the previous 12 months. Of the 111 NCHDs, 64 were on the Trainee Specialist register, 44 were on the General Register and 3 were on the Supervised Register.

**TABLE 8:** NCHDs by Division of the Medical Register

| NCHDs Practicing in Radiology in the Previous 12 Months | | | | |
|---|---|---|---|---|
| | General Division | Supervised Division | Trainee Division | Total |
| NCHDs Radiology | 44 | 3 | 64 | 111 |

### 2.5.1 TRAINING POSTS

As of September 2016, there were a total of 87 NCHDs in higher-speciality training in radiology (Table 9).

**TABLE 9:** NCHDs in Higher-Speciality Training

| Radiology NCHD HST Trainees | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Total |
| HST Trainees | 20 | 20 | 18 | 18 | 10 | 1 | 87 |

### 2.5.2 EXPECTED TRAINING PROGRAMME EXITS

After satisfactory completion of five years training and having passed the Fellowship exam in radiology, candidates are eligible for inclusion on the Specialist Register of the Medical Council of Ireland and are eligible to apply for permanent consultant posts in radiology. An analysis of the number of doctors in HST training currently infers that between 10 and 20 trainees will complete their training and be eligible for specialist registration over each of the next 5 years (Table 10).

**TABLE 10:** Expected Training Programme Exits

| Expected Training Programme Exits By Year and Gender | | | | | |
|---|---|---|---|---|---|
| | 2017 | 2018 | 2019 | 2020 | 2021 |
| Male | 4 | 10 | 12 | 10 | 8 |
| Female | 6 | 8 | 7 | 9 | 12 |
| Total | 10 | 18 | 19 | 19 | 20 |

### 2.5.3 NCHDS NOT IN TRAINING POSTS

Medical Council data in Table 8 shows that 47 NCHDs were neither in recognised training posts or specialists. This compares with data from HSE NDTP which shows a total of 8 radiology NCHDs in non-training posts, all at registrar grade (Table 11).

**TABLE 11:** NCHDs Not in Training Posts

| Non-Training Radiology NCHD Data - DIME | | | |
|---|---|---|---|
| | SHO | Registrar | Total |
| Non-Training NCHDs | 0 | 8 | 8 |

## 2.6 PARTICIPATION OF NCHDS IN THE MEDICAL WORKFORCE IN IRELAND

### 2.6.1 GENDER AND WORKING PATTERNS

2.6.1.1 Gender

Future workforce planning should to be cognisant of the need to develop job descriptions that sustain and enhance a specialty that looks to support greater gender balance. Such plans must recognise the need for more numbers to fill WTEs and facilitate demand for flexible working patterns. According to the IMC, of the 111 NCHDs, 38% of radiology NCHDs registered in 2015 were female, while 62% were male.

**TABLE 12:** NCHDs Gender Breakdown by Division of the Medical Register

| NCHDs by Gender Radiology - Medical Council | | | | | |
|---|---|---|---|---|---|
| | Female (N) | Female (%) | Male (N) | Male (%) | Total No. |
| NCHDs Gender | 42 | 38% | 69 | 62% | 111 |

2.6.1.2 Working Patterns

According to the IMC, 95% of radiology NCHDs worked full-time. Of those doctors registered on the General Division, only 11% stated that they worked less than full-time, while 2% of trainee doctors stated that they worked on a less than full-time basis (Table 13).

**TABLE 13:** NCHDs Working Patterns Breakdown by Division of the Medical Register

| NCHDs by Working Patterns Radiology - Medical Council | | | | | |
|---|---|---|---|---|---|
| | Less than full-time (N) | Less than full-time (%) | Full-time (N) | Full-time (%) | Total N |
| General Division | 5 | 11% | 39 | 89% | 44 |
| Trainee Specialist Division | 1 | 2% | 63 | 98% | 64 |
| Supervised Division | 0 | 0% | 3 | 100% | 3 |
| Total NCHDs | 6 | 5% | 105 | 95% | 111 |

## 2.6.2 COUNTRY OF BASIC MEDICAL QUALIFICATION

According to IMC data, approximately 97% of trainees and 43% of general registered doctors working in radiology graduated from an Irish medical school, while 3% of trainees and 11% of general registered doctors graduated in an EU medical school, and 46% of general registered doctors graduated in a Non-EU medical school.

**TABLE 14:** NCHDs Country of Basic Medical Qualifications

| BMQ for NCHDs | | | |
|---|---|---|---|
| | Ireland | EU | Non-EU |
| General Division | 19 (43%) | 5 (11%) | 20 (46%) |
| Trainee Specialist Division | 62 (97%) | 2 (3%) | |
| Supervised Division | | | 3 (100%) |
| Total NCHDs | 81 (73%) | 7 (6%) | 23 (21%) |

## 2.6.3 AGE PROFILE OF NCHDS

There were a total of 111 NCHDs actively working in radiology in 2015/16; 64% were under the age of 35, 17% were between the ages of 35 and 44, 7% were between the ages of 45 and 54 and 10% were over the age of 55 years (IMC, 2016). The majority of NCHDs (64%) were under 35 years (Figure 2).

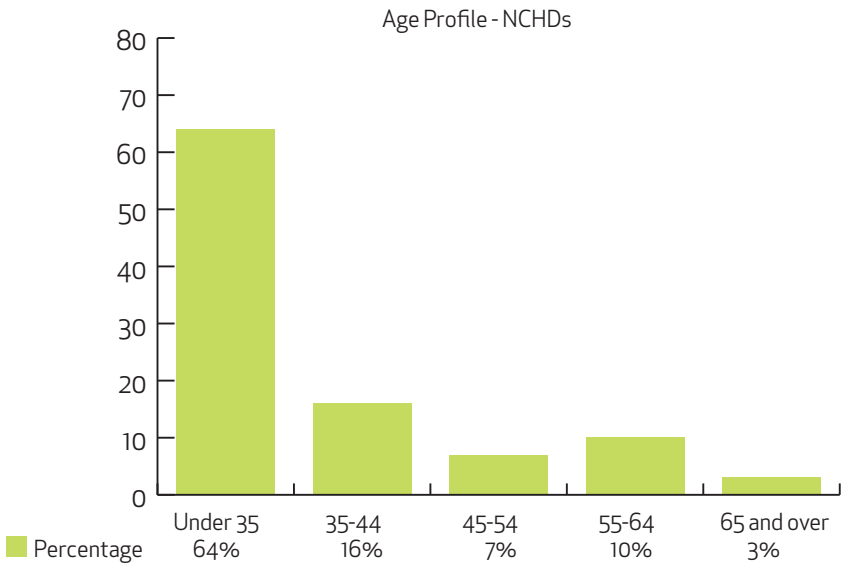



**FIGURE 2:** Age Profile of NCHDs

## 2.7 RATIO OF NCHDS TO CONSULTANTS

The ratio of training NCHDs to non-training NCHDs was 10.9: 1 for Clinical Radiology, while the ratio of NCHDs to consultants was 0.4: 1. This ratio of NCHDs to consultants is low relative to other specialties and reflects the model of service delivery which is predominantly consultant-provided.

**TABLE 15:** Ratio of NCHDs to Consultants

| NCHD & Consultant Ratios | | |
|---|---|---|
| | Training: Non-Training NCHDs | NCHDs: Consultant |
| Ratios | 10.9: 1 | 0.4: 1 |

## 2.8 SUMMARY OF CURRENT CONFIGURATION OF RADIOLOGY SPECIALIST WORKFORCE 2016/17

Table 16 provides a summary of the current configuration of the radiology specialist workforce including NCHDs. These data provide the high level information required to analyse inflows and outflows of doctors from the medical workforce in Ireland.

## TABLE 16: CURRENT CONFIGURATION OF THE CLINICAL RADIOLOGY SPECIALIST WORKFORCE

| Stocktake of the Clinical Radiology Specialist Workforce | | |
|---|---|---|
| Assumption | Value | Source |
| Number of consultants working in HSE-funded services – permanent and temporary | 264 HC<br>248 WTE | HSE Workforce Planning, Analysis & Informatics Unit Nov 2016 |
| Full-time consultants in HSE-funded services | 236 HC<br>233 WTE | HSE Workforce Planning, Analysis & Informatics Unit Nov 2016 |
| Part-time consultants in HSE-funded services | 28 HC<br>14 WTE | HSE Workforce Planning, Analysis & Informatics Unit Nov 2016 |
| Estimated number of private sector only consultants as per Medical Council data | 21 | Medical Council (2016) |
| Number of approved consultant posts for HSE-funded services | 257 HC | HSE Consultants Division 2017 |
| Share of females in consultant employment stock for HSE-funded services | 44% | HSE Workforce Planning, Analysis & Informatics Unit Nov 2016 |
| Share of males in consultant employment stock for HSE funded services | 57% | HSE Workforce Planning, Analysis & Informatics Unit Nov 2016 |
| Overall WTE rate for consultants in HSE-funded services | 0.94 | HSE Workforce Planning, Analysis & Informatics Unit Nov 2016 |
| Exits from MC Specialist Register | 4.4% | Medical Council (2016) |
| % Consultants / Specialists over 55 years | 89 (28%) | Medical Council (2016) |
| % Non-training NCHDs over 55 years | 14 (32%) | Medical Council (2016) |
| Total HST | 87 | Faculty of Radiologists (2016) |
| Total non-training NCHDs | 8 | NDTP DIME (2016) |

# 3 - ESTIMATION OF THE CURRENT UNDERSUPPLY OF DOCTORS IN THE RADIOLOGY WORKFORCE

It is acknowledged that tens of thousands of people are on waiting lists for diagnostic imaging studies. These include patients in primary care, outpatients and hospital in-patients. Those on radiology waiting lists potentially have poorer clinical outcomes through delayed diagnoses, and affected patients may be forced to endure unnecessarily long durations of symptoms including pain, uncertainty and anxiety. These waiting lists add significant additional costs on the health system as a whole, as patient care pathways are prolonged.

## 3.1 KEY DRIVERS OF CHANGE TO THE FUTURE OF THE RADIOLOGY WORKFORCE

### 3.1.1 INCREASING DEMAND AND COMPLEXITY

There are multiple factors that impact the demand for radiology services today and into the future. The demand for radiology services is steadily rising with an annual increase of between 8% and 10% per annum in OECD countries, including Ireland. Radiology has become more complex, with post-processing of imaging datasets requiring greater time spent per case for interpretation when compared with plain film studies. Multi-Disciplinary Team Meetings (MDMs) have often been overlooked with regards to workforce planning but are an increasingly fundamental aspect of modern healthcare deliver and quality of care. There is a growing expectation to expand the working day and to move to 24/7 radiology services.

Many of the clinical programmes have created additional demand for access to radiology services, and mandate tight time-scales in order to improve the provision of these services. Demand from emergency departments and various medical departments for faster turnaround time are in part driven by the need to make the patient journey through expensive hospital facilities as quick and efficient as possible. The provision of on-call services - diagnostic and interventional - to all hospitals in the country is mainly consultant-provided.

There is increased demand for access to diagnostic services for primary care; however, current levels of access vary widely, largely depending on the interplay between demand and capacity in individual hospitals. Where greater primary care access is available, it does not necessarily decrease demand from hospital-based patients; rather the effect is to increase utilisation of imaging services in general.

Workforce planning and national programmes need to more fully take account of downstream imaging demands. Hospitals should consider diagnostic and interventional radiology demands in parallel with other service and non-radiology consultant appointments. Similarly, developments in radiologist workforce expansion need to be indexed to radiographer, nursing, administration and other support roles.

### 3.1.2 TELERADIOLOGY

Rapid advances in technology, and our understanding of the features of disease on diagnostic studies, allow imaging to be used at progressively earlier stages of the diagnostic process. Similarly, changes in the characteristics of disease following treatment can be monitored by imaging, which is frequently used to assess progress.

The future of diagnostic imaging provision will make good use of developments in information technology. This will involve data sharing across institutions and the ability to split elements of radiology processes across different locations, for example, the image acquisition step can be separated from the reporting function. Though it can be an asset and enabler Teleradiology also contains risks (e.g. there's the potential for a lack of continuity or diminished communication in patient care).

Teleradiology is the transmission of images and associated data between locations for the purpose of primary interpretation or consultation and clinical review. Teleradiology also encompasses the process of remote viewing of images via a web browser. Examinations taken in one hospital can be reported by radiologists based in another hospital. This is facilitated through the use of remote reporting via NIMIS (National Integrated Medical Information System), which provides state of the art electronic radiology systems for 35 Irish hospitals. NIMIS ensures that radiological services are 'filmless' and enables secure and rapid movement of patient image data throughout the health service. NIMIS provides a framework for the delivery of radiology services across the country, with a centralised database managing 3.5 million studies annually. This digital imaging system allows medical service users, and providers, to electronically view a patient's diagnostic images, such as X-Rays and CT Scans, with the corresponding diagnostic report, quickly and easily. NIMIS facilitates remote reporting by radiologists, permitting faster turnaround times (TATs). Faster report TATs allow referring doctors to access reports sooner, enabling them to make treatment decisions earlier. This improves outcomes for patients.

# 4 – REQUESTED SUBMISSIONS ON RADIOLOGY WORKFORCE PLANNING

The following section outlines the recommendation on radiology workforce planning provided in a joint submission received by NDTP in 2017 by the Faculty of Radiologists and the National Clinical Programme for Radiology. These recommendations are the views of the relevant clinical programme and faculty and do not necessarily represent those of the HSE or Department of Health. However, these views have been sought in order to inform future workforce planning for the speciality.

### JOINT SUBMISSION ON RADIOLOGY WORKFORCE PLANNING PROVIDED BY THE FACULTY OF RADIOLOGISTS AND THE NATIONAL CLINICAL PROGRAMME FOR RADIOLOGY (JANUARY 2017)

- Benchmarking Ratio: To bring it in line with the European average of 8 consultant radiologists per 100,000 populations, Ireland will require a minimum of 150 additional radiologists over the next decade. That equates to 15 new appointments per year over 10 years, and does not factor in replacement posts for retiring radiologists. This will require a commensurate increase in radiology trainees, with a training scheme output of 35 SpRs per annum for ten years, declining thereafter when the expansion has been completed.

- Special Interest: Consultant radiologist with a 'special interest', specified in the header of the job description, and where the appointee spends a significant portion of his/her time devoted to that subspecialty, and a roughly equal amount of time covering general radiology work. Eligibility for such positions would include a minimum of 1 year at higher specialist/fellowship training level, or equivalent. Of the 150 new positions needed, approximately half (50%) should be in this category, with a further 30% from the General Consultant Radiologist category, and 20% being dedicated sub-specialists.

- The HSE must explicitly link general and subspecialist radiology support into clinical service plans e.g. orthopaedics, emergency, trauma, stroke etc., rather than radiology playing 'catch-up' as is currently the case. Alignment of consultant clinician appointments with consultant radiologist appointments should be formalised based on the level of demand likely to arise from particular clinical specialties.

- Interventional Radiology (IR): On a population basis (drawing on the UK experience), the Republic of Ireland requires a bare minimum of 46 WTE Interventional Radiologists (1 per 100,000). Currently there are approximately 24 WTE Interventional Radiologists practicing as such in Ireland. Therefore, a minimum of 22 of the total of 150 additional consultant radiologists needed for the country over the next decade should be Interventional Radiologists. Many surgical diseases are now managed by IR without a shift in resources. Contemporary IR requires specialists to practice as full clinical staff (with outpatients, admitting rights, rounds etc.) and the resources for these. Likewise, there needs to be a focus on team development, with nurse supports and development of nurse /radiographer practitioner roles. Programmes of IR (including radiology, radiographer and nursing) needs to be developed to provide 24/7 on-call for general, trauma and obstetric services. Acute Medical Unit/Acute Stroke Unit and out-of-hospital primary care imaging programmes are required.

- Split Positions: Between a level 4 or a larger level 3 hospital with a smaller peripheral hospital within hospital groups should be promoted. This is designed to maintain radiology service provision at remote sites. Such appointees can be predominantly based physically in the larger hospital and provide general reporting services electronically to the smaller peripheral site. The majority of the larger hospital component should be at sub specialty special interest level. A certain amount of on-site presence will be needed at the smaller site for patient and radiation safety reasons.

- Major Trauma Centre: Requirements include at least 3 consultant radiologists with special interest in either Emergency Radiology or MSK imaging, and at least 4 dedicated interventional radiologists as part of the multidisciplinary trauma team.

- Trauma Unit (TU): Requirements include at least 1.5 WTE consultant radiologists with special interest in either Emergency Radiology or MSK imaging, and at least 1 WTE dedicated interventional radiologist. This may be configured in the form of two consultant radiologists, each with special interest in Interventional Radiology.

- Co-located Adult General & Maternity Hospitals: Minimum requirements (see also recommendation no. 3) include:

    1. 3 WTE consultant radiologists, of which 2 should have special interest expertise in Women's Imaging or Gynaecological & Obstetric Radiology;

    2. MRI literacy is an essential skill-set for such positions;

    3. Special interest positions with oncoradiology expertise would be desirable if there is a gynaecological cancer service on-site;

    4. 1 position should have a special interest in Paediatric Radiology to cover Neonatal Radiology; and,

    5. 3 interventional radiologists – these can be dedicated IR specialists or those with a special interest in IR.

- GP Radiology: There should be 12 new appointments of consultant radiologists with special interest in Primary Care Radiology, 2 per hospital group (excluding the Children's Hospital Group). These positions may be primarily based at one of the smaller hospitals of a hospital group depending on how GP access to radiology services is configured in that group. Such positions may also have a commitment to deliver radiology services outside of hospitals in a community setting (e.g. in larger primary care centres).

- Paediatric Radiology: The main National Children's Hospital requirements include that there should be at least 7 WTE paediatric radiologists and 3 paediatric interventional radiologists. Paediatric Satellite Unit requirements include: at least 1.5 WTE dedicated paediatric radiologists. 1 of these radiologists can be a consultant radiologist with special interest in paediatric radiology who can also do part-time general radiology work at the co-located adult hospital. Any hospital engaged in ultrasound screening for developmental dysplasia of the hip (DDH) needs 1.5 WTE paediatric radiologists (1 of whom can be a radiologist with special interest in paediatric radiology).

- Radiologists in Management roles: Each hospital group requires the appointment of at least 1 consultant radiologist with special interest in radiology service optimisation or radiology informatics. Such appointees would be suitable for Clinical Director (CD) positions, and may be based in level 4 or larger level 3 hospitals. They would also be suitable for Group CD positions.

- Academic Radiologist Positions: Each hospital group should have 1 professor of radiology based at each level 4 hospital within the group, and linked to the academic partner of the group (who would be partly responsible for funding such positions). Each level 4 hospital within a hospital group should also have at least 1 associate professor, 1 lecturer, and 1 radiologist-educator. Each level 3 hospital within a hospital group should also have at least 1 associate Professor and 1 lecturer position, linked to the academic partner of the group (who would be partly responsible for funding such positions).

# 5 - A COMPARATIVE ANALYSIS OF THE RADIOLOGY WORKFORCE IN IRELAND, THE UK AND AUSTRALIA

## 5.1 IRELAND

Ireland's actual ratio of diagnostic radiologists per 100,000 population was calculated using WPAI data of 264 HC (248 WTE) and 21 HC (21 HC working in the private sector), giving a total of 285 HC (267 WTE). This equates to a ratio of 6: 100,000 population (Table 17).

The National Clinical Programme for Radiology (NCPR) recommends that Ireland should increase the number of diagnostic radiologists to the European average of 8 consultant radiologists per 100,000 population. This would equate to 381 HC (357 WTE) diagnostic radiologists required with a current population of 4,757,976 in Ireland.

**TABLE 17:** Actual & Recommended Ratio per 100,000 - Ireland

| Ireland Actual & Recommended Ratio per 100,000 | | |
|---|---|---|
| | Actual | Recommended (2017) |
| Ratios – Ireland | 6: 100,000 (HC) | 8: 100,000 (HC) |

## 5.2 ACTUAL AND RECOMMENDED INTERNATIONAL RATIO OF CONSULTANT RADIOLOGISTS

5.2.1 United Kingdom

The Royal College of Radiologists (RCR) census in 2015 showed that there are 3,318 consultant radiologists employed in the UK which equates to 5.1 consultant radiologists per 100,000 of the population. This equates to 3,125 WTE consultants or a WTE ratio of 94%. The RCR noted that if the workload of the consultant workforce was to exceed the conventional ten programmed weekly activities (i.e. greater than 40 hours), then the WTE figure would be approximately 3,358 WTE.

To satisfy the needs of patients and the NHS, the RCR believes that the UK requires a minimum of 8 (WTE) clinical radiologists per 100,000 of population (2015). This equates to a ratio of 8.5 (HC): 100,000 (in 2015, the WTE to headcount ratio was 0.94 to 1.00). The Royal College of Radiologists submission to HEE Workforce Planning (2015/2016) estimate that by 2026, there will be a requirement for 5,020 headcount to meet the recommended ratio of 8 (WTE): 100,000 or 8.5 HC: 100,000 population.

The needs of patients and the NHS were determined by taking a view on a combination of factors, such as increase in workload, increase in complexity of workload, and expansion of role.

**TABLE 18:** Actual & Recommended Ratio of Radiologists per 100,000 - United Kingdom

| United Kingdom Actual & Recommended Ratio per 100,000 | | | |
|---|---|---|---|
| | Actual | Recommended (2017) | Recommended (2025) |
| Ratios - UK | 5.1: 100,000 (HC) | 8.5: 100,000 (HC | 8.5: 100,000 (HC) |

5.2.2 Australia

The National Health Workforce Dataset (NHWDS) includes demographic and employment information for registered health professionals in Australia. It contains registration details of all registered medical practitioners in Australia at September 2015. In 2015, there were a total of 1,819 diagnostic radiologists. With a population of 24,127,200 (2016), this represents a ratio of 7.5: 100,000 of the population.

Health Workforce Australia (HWA) (2012) noted that jurisdiction advice was that there are shortages of this workforce in regional areas, with metropolitan areas better serviced by radiologists. In addition, there continues to be an increase in the number of female radiologists and the speciality is dominated by the private sector, making it difficult to recruit to the public sector due to pay parity and service models. This report recommends that by 2018, there is a requirement for 2,013 (HC) radiologists, which equates to a ratio of 8.3: 100,000 (Table 19).

HWA (2012) has projected that radiology supply will not be able to keep pace with expected increases in demand caused by a growing and ageing population. Therefore, it is reasonable to assume that more radiologists will need to be trained in the future. Expressed workforce demand for diagnostic radiology is estimated to grow at 3.8% per annum, with a requirement for 2,436 specialists by 2025. This is based on Medicare data identified on the basis of utilisation rates from peer groups and related specialties from 2005 to 2009 per 100,000 population, which was then projected into the future based on population projections. HWA recognises data is unavailable for diagnostics services provided in public hospitals and outpatient services (not billed through Medicare). As a result, expressed demand for diagnostic radiology is likely to be underestimated. In order to calculate a recommended ratio of radiologists to 100,000 population, long-term population projections released by the Australian Bureau of Statistics (ABS) in November 2013 were utilised. On 'medium' assumptions (Series B) Australia's population will grow to 28,099,273 million in 2025. Using this figure with projected demand for Australia, equates to a recommended ratio for 2025 of 8.7: 100,000.

The latest WTE rate available for radiologists working in Australia was in 2012, when it was cited as 0.85. The feminisation of the radiology profession is likely to continue upwards with an increasing proportion of trainees being female.

**TABLE 19:** Actual & Recommended Ratio of Radiologists per 100,000 – Australia

| **Australia Actual & Recommended Ratio of Radiologists per 100,000** | | | |
|---|---|---|---|
| | Actual | Recommended (2018) | Recommended (2025) |
| Ratios – Australia | 7.5: 100,000 (HC) | 8.3: 100,000 (HC) | 8.7: 100,000 (HC) |

# 6 - SUMMARY

The staffing model for radiology in Ireland is different to many other specialities in that the vast majority of services are consultant-provided as opposed to consultant-led; many hospitals throughout the country do not employ non-consultant staff.

## 6.1 CURRENT CLINICAL RADIOLOGY WORKFORCE

- HSE Approved Consultant Posts: In the public health system there were 257 approved posts (2017).
- There were 264 consultants (248 WTEs) in radiology employed in publicly-funded services.
- A total of 318 doctors were actively working in radiology in 2015, and on the Specialist Register of the Medical Council.
- Total entrants on to the Specialist Register in 2015 were 37, while there were 17 exits.

## 6.2 PARTICIPATION OF CONSULTANTS/SPECIALISTS AND NCHDS IN THE MEDICAL WORKFORCE IN IRELAND

- Permanent/Temporary Status of Consultant Contract: In HSE funded services, 85% held a permanent contract, while the remaining 15% held non-permanent contracts.
- Working Patterns: For specialists, 91% were working on a full-time basis, while 95% of NCHDs worked full-time.
- Gender: For Specialists, 69% were male and 31% were female, while for NCHDs 38% were female and 62% were male.
- Age: 28% of Specialists were over 55 years. For NCHDs, the majority (64%) were under 35 years.
- Country of BMQ: For specialists, 77% qualified in a medical school in Ireland, 16% qualified in the EU and 7% qualified outside the EU, while for NCHDs, 74% qualified in a medical school in Ireland, 6% qualified in the EU and 21% qualified outside the EU.
- Private Practice: 21 specialist registered doctors in radiology (of a total of 318) and 4 NCHDs were working exclusively in the private sector.
- Expected Training Programme Exits: Between 10 and 20 trainees will complete their HST radiology training and be eligible for specialist registration over each of the next 5 years.

## 6.3 KEY DRIVERS OF CHANGE TO CLINICAL RADIOLOGY WORKFORCE

A number of factors that may influence future workforce supply and demand:

- The demand for radiology services is steadily rising with an annual increase of between 8-10% per annum in OECD countries, including Ireland;
- Radiology work has become more complex, with a proportionately greater increase in cross-sectional imaging and Interventional Radiology when compared with less complex plain film studies;
- Many of the clinical programmes have created additional demand for access to radiology services, and mandate tight time-scales in order to improve the provision of these services
- Future Changes to Health Policy and Service Delivery: expansion to primary care diagnostic radiology proposed in the recent Oireachtas Committee on Future Healthcare (2017); and,
- New technology is expected to drive change within clinical radiology, for example, the further development of distance reporting models (teleradiology) and the use of electronic health records.

# 7 – REFERENCES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