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Health Service Executive

NDTP
National Doctors Training & Planning

SPECIALITY REVIEW:

RADIATION ONCOLOGY MEDICAL WORKFORCE IN IRELAND

2017

Human Resources
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"Investing in the career development of doctors"

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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 of data collection, differences in the variables collected (i.e. whole-time equivalents (WTE) versus headcounts), differences in the definitions of some variables (e.g. less than full-time versus part-time), absence of variable values (i.e. missing data) in datasets, 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 RADIATION ONCOLOGY

Radiation Oncology (Radiotherapy) is the branch of clinical medicine that uses ionizing radiation for the treatment of patients with malignant or benign diseases, either alone or in combination with other treatment modalities such as surgery and/or chemotherapy, or as a palliative modality to relieve symptoms in patients with incurable cancers. In Ireland, Radiation Oncology encompasses external beam radiation therapy, brachytherapy, and radio-isotopes therapy. Radiation Oncology can be practiced as an independent oncological specialty or it may be integrated into the broader medical practice of oncology, e.g. Clinical Oncology. Radiation Oncology is one of the three primary specialties in the treatment of cancer, the other two being Surgical and Medical Oncology.

Radiation oncologists have responsibility for the diagnosis, treatment, follow-up and supportive care of the cancer patient, and form an integral part of the multidisciplinary management and investigations of patients. In daily practice, radiotherapy, chemotherapy, hormone therapy, radioactive isotopes and other special techniques are used to treat patients with cancer. This requires specific biological and clinical competencies combined with in-depth knowledge of physics and technology.

1.5 THE CONTEXT OF RADIATION ONCOLOGY IN THE IRISH HEALTH SERVICE

Cancer, its prevention, diagnosis and treatment are a major challenge for our society. Each year approximately 28,480 people in Ireland develop cancer. Cancer continues to be the second most common cause of death in Ireland, after diseases of the circulatory system, and an annual average of 8,655 deaths from cancer or other neoplasms occurred during the period 2011-2013 (NCRI, 2016). In 2006, the second national cancer strategy, 'A Strategy for Cancer Control in Ireland', advocated a comprehensive cancer control policy programme. This strategy aimed to achieve better cancer prevention, early detection (including screening programmes) and well-organised programmes of treatment that maximise survival through a co-ordinated national service, based on international evidence and best practice. The National Cancer Control Programme (NCCP) was established in 2007 to ensure that all elements of this cancer policy are delivered in a planned way. The NCCP continues to reorganise cancer services in Ireland to improve the quality of cancer care and achieve better outcomes for patients.

The National Cancer Strategy (2006) and the HSE framework 'Establishment of Managed Cancer Control Networks and Designation of Eight Cancer Centres' (2007) led to the implementation of radical change in the delivery of hospital-based specialised cancer services. Eight cancer centres were designated, to each serve approximately half

a million people. Four cancer networks were established (two in the East, one in the West, and one in the South), each of which has two cancer centres. The networks are now evolving into the six new hospital groups. In 2009, the process of breast cancer surgery was moved from 32 hospitals to eight cancer centres, which provided timely access to diagnosis and care. Subsequently, the NCCP has progressively moved to centralise other fragmented services, including prostate, lung, pancreas, rectal and oesophageal cancer services in specified cancer centres.

1.5.1 Model of Service Delivery

The key characteristics of the eight designated cancer centres in Ireland are sustainable, high volume, multidisciplinary cancer services spanning the range of diagnostics, surgery, radiation oncology and medical oncology. Those centres without onsite radiotherapy facilities have consultant radiation oncologists participating in treatment planning. All new patients, and selected patients with recurrent cancer, are reviewed at multidisciplinary team meetings comprising all diagnostic and therapeutic specialists. Integrated care pathways from primary care (using electronic referral) into consultant oncology services have been developed in close collaboration with the Irish College of General Practitioners and with hospital consultants.

The National Programme for Radiation Oncology (NPRO) has made significant investment in staff and facilities for radiotherapy in order to meet the need for radical/curative (60% of treatments) and palliative therapy. According to the NCCP (2014), two new facilities opened in 2011 on the sites of St James's and Beaumont Hospitals in Dublin, with each offering Rapid Arc Technology and intensity modulated therapy. Together, the existing radiotherapy centre at St Luke's and the new centres at Beaumont and St James's form the St Luke's Radiation Oncology Network (SLRON) which operates across the three sites. SLRON now operates as a single network with patients and staff moving between the centres as required. This ensures patients equity of access to the next available appointment, subject to site-specific tumours and consultant availability. Based on the flow of patients, the SLRON currently treats approximately 55% of all radiotherapy patients nationally. Phase 2 of the national plan will involve the design and construction of new departments in CUH and UHG.

Originally, it was envisaged the NPRO would provide sufficient capacity in the public system to treat all patients in the Republic of Ireland. However, in the intervening years radiotherapy facilities were built in the private sector and the HSE has since entered into Service Level Agreements for the provision of radiotherapy by private sector providers in both Waterford and Limerick. There are also private radiotherapy facilities in Dublin (St. Vincent's Private Hospital, the Mater Private Hospital, The Hermitage and Beacon Hospitals). However, all of these units have two linear accelerators and operate independently of the NCCP.

2 CURRENT WORKFORCE

2.1 INTRODUCTION

The staffing model for Radiation Oncology in Ireland is different to many other specialities in that the vast majority of Radiation Oncology services in Ireland are consultant-provided as opposed to consultant-led, with relatively little service provision delivered by Non-Consultant Hospital Doctors (NCHDs). In those hospitals that utilise junior medical staff (almost all of whom are on a formal accredited training scheme at SpR level), virtually all their work is consultant-supervised prior to achievement of FFR(RCS1) and/or Certificate of Satisfactory Completion of Specialist Training (CSCST).

2.2 THE NUMBER OF SPECIALISTS WORKING IN THE IRISH HEALTHCARE SYSTEM

2.2.1 The Number of HSE Approved Consultant Posts

Table 1 outlines data from the HSE Consultants Division on the number of approved consultant Radiation Oncology posts in the public health system. In 2017, there were 26 approved posts (25.95 WTE).

Table 1: HSE Number of Approved Consultant Posts

Approved Consultant Posts as at Q3 2017		
	Head Count (HC)	**Whole Time Equivalent (WTE)**
Total Radiation Oncology	26	25.95

**Note that these posts have been approved by the HSE's Consultant Applications Advisory Committee (CAAC), they may or may not be filled at hospital site level.*
*** 11 of these have an special interest in Paediatric Radiation Oncology while 2 consultants have sessions in a paediatric hospital.*

2.2.2 Medical Council

Table 2 outlines the breakdown of the Radiation Oncology specialist registered doctors participating in the workforce as per Medical Council registration data for 2016. There were 37 doctors working in Radiation Oncology in Ireland in 2016 who were on the Specialist Register, of whom 4 worked exclusively in the private sector. During that year, one new specialist was added to the register, while 5 existing specialists did not re-register, the latter reflecting a major loss to the service in such a small specialty.

[1]*There were a further 10 doctors registered with the Medical Council who indicated that they worked exclusively outside Ireland in Radiation Oncology; however, this data is not considered for workforce planning, as only those doctors actively working in Ireland or inside and outside Ireland contribute to the Irish health system.*

Table 2: Number of Doctors on the Specialist Register of the Medical Council

Specialist Registered Doctors Actively Practicing Radiation Oncology in 2016			
	Inside Ireland Only	**Inside & Outside Ireland**	**Total**
Specialist registered doctors (Total Public & Private)	35	2	37*
Specialist registered doctors (Private Only)	4	0	4
Entrants on to the Specialist Register	1		1**
Exits from the Specialist Register	5		5*

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

2.2.3 Country of Basic Medical Qualification

Of the 37 specialist doctors working in Ireland in 2016, 61% qualified in a medical school in Ireland, 21% qualified in the EU and 18% qualified outside the EU (as per Table 3, page 7).

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
23 (61%)	8 (21%)	7 (18%)

2.2.4 HSE Workforce Planning Analysis and Informatics

In 2016 there were 21 consultants (19 WTEs) in Radiation Oncology working in publicly-funded services (Table 4). These include both permanent and specified purpose contracted staff.

Table 4: Number of Consultants - Publicly-Funded Services

Consultants - Publicly-Funded Services in Ireland		
	Head Count (HC)	Whole Time Equivalent (WTE)
Consultant Radiation Oncologist	21	19

This compares with the total number of 26 HSE approved consultant posts as per Table 1 above. Currently the estimated number of vacant approved posts in the specialty of Radiation Oncology is 4.

2.3 PARTICIPATION OF CONSULTANTS/SPECIALISTS IN THE MEDICAL WORKFORCE IN IRELAND

2.3.1 Gender and Working Patterns

2.3.1.1 Gender

As of 2016, the gender breakdown of WPAI data indicates that of the 21 consultants working in publicly-funded services, 57% were male. Of the 37 doctors with Medical Council specialist registration and actively working in Radiation Oncology in 2016, 65% were male (Table 5).

Table 5: Gender Breakdown of Consultants/Specialists

Consultants/Specialists Working in Ireland in 2016					
	Male %	Male HC	Female %	Female HC	Total HC
WPAI 2016	57%	12	43%	9	21
IMC 2016	65%	24	35%	13	37

2.3.1.2 Working Patterns

Of the consultants working in HSE-funded services (WPAI data) approximately 95% (20) were working on a full-time basis (Table 6). Working patterns of those doctors on the Specialist Register as per IMC data indicate that approximately 92% of specialists (34) worked full-time and 8% (3) of specialists 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 88%.

Table 6: Working Patterns of Consultants/Specialists

Working Patterns of Consultants/Specialists 2016							
Source	HC	HC Full-Time	% Full-Time	HC Part-Time	% Part-Time	Overall WTE Rate	WTE
WPAI	21	20	95%	1	5%	88%	18.5
IMC	37	34	92%	3	8%		

2.3.2 Permanent/Temporary Status of Consultant Contract

Of the 21 consultants working in HSE-funded services (WPAI data), 76% (16) held a permanent contract. The remaining 24% (5) held non-permanent contracts and were typically locums and specified purpose contracts (Table 7). Again, this compares to a total of 26 approved consultant posts.

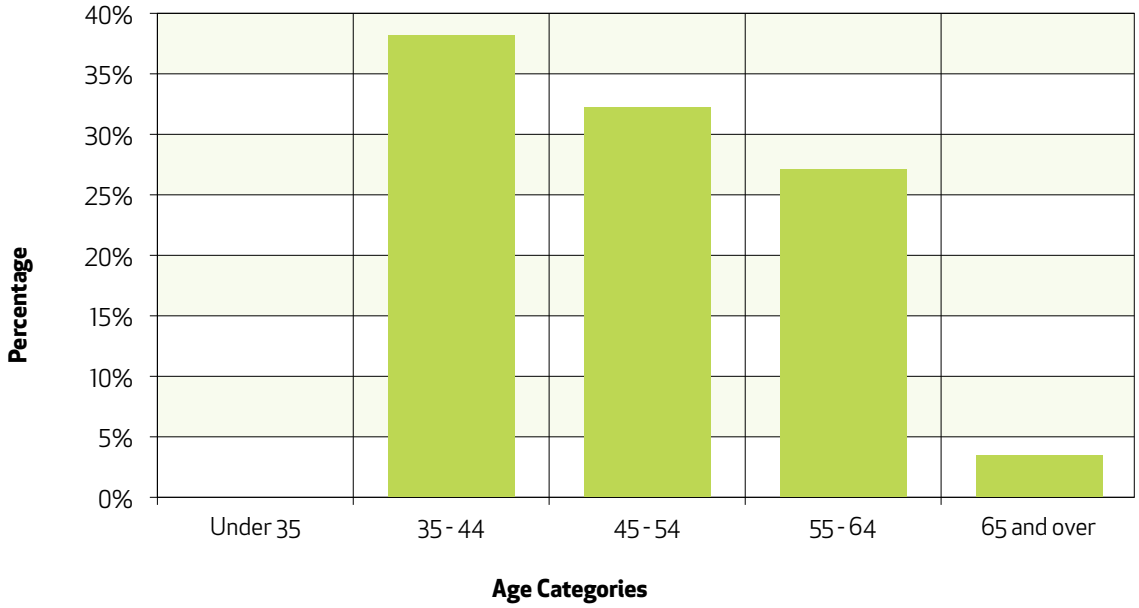
Table 7: Permanent/Temporary Status of Consultant Contract

Permanent / Temporary Status of Consultant Contract 2016					
	HC	**Permanent**	**% Permanent**	**Non-Permanent**	**% Non-Permanent**
WPAI	21	16	76%	5	24%

2.3.3 Age Profile of Specialists

Of the specialists actively working in Radiation Oncology and registered with the IMC in 2016, none were under 35, 38% were between the ages of 35 and 44, 32% were between the ages of 45 and 54 and 30% were over the age of 55 years (Figure 1). Over the next 10 years approximately 11 radiation oncologists are likely to exit the workforce due to retirement, if consultants, on average, retire at the age of 65 years.

Figure 1: Age Profile of Specialists



2.4 THE NUMBER OF NCHDS WORKING IN THE IRISH HEALTHCARE SYSTEM

Radiation Oncology depends on NCHDs in training and not in training programmes to support service delivery, although to a much lesser extent than in other specialities. Table 8 outlines the number of NCHDs who retained registration in 2016 and worked in Ireland in Radiation Oncology in the previous 12 months. Of the 38 NCHDs in Radiation Oncology, 15 were on the Trainee Specialist Register, 23 were on the General Register.

Table 8: NCHDs by Division of the Medical Register

NCHDs Practicing in Radiation Oncology in the Previous 12 Months				
	General Division	**Supervised Division**	**Trainee Division**	**Total**
Radiation Oncology	23	0	15	38

The following section provides data on NCHDs from the HSE DIME database for non-training posts and from the relevant training bodies for training posts. As of October 2016, there were a total of 32 NCHDs working in Radiation Oncology.

2.4.1 Training Posts

The Faculty of Radiologists, as part of the Royal College of Surgeons in Ireland, is the body responsible for provision of postgraduate training in Radiation Oncology in Ireland. Specialist training in Radiation Oncology in Ireland has been formalised and expanded over the last number of years.

To be eligible to sit qualifying exams, Radiation Oncology trainees have to hold an accredited training post in one of the 3 designated training centres. Over the past years, the number of accredited training posts was increased in agreement with HSE NDTP. In July 2017, 19 training posts were made available and filled across hospitals in Cork, Galway and across St Luke's Radiation Oncology Network (SLRON).

Table 9: NCHDs in Higher-Speciality Training

Radiation Oncology NCHD HST Trainees						
	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Radiation Oncology September 2017	3	6	2	5	3	19

2.4.2 Expected Training Programme Exits

In July 2016 new rules and regulations were implemented to allow better prediction of CSCST qualification date by individual trainee and to streamline the input-output of trainees (Table 9). The rules now apply to almost all trainees. Under the new rules, eligibility for inclusion on Specialist Division of the register of MCI requires:

- Completion of 5 accredited equivalent full-time years of training; and,
- Passing of a fellowship exam.

The number of doctors exiting Radiation Oncology training over the next 6 years is expected to vary from 3 to 6 annually.

2.4.3 NCHDs Not in Training Posts

Medical Council data (in Table 8) shows that 23 NCHDs were not in recognised training posts and were not eligible for specialist registration. This compares with data from HSE NDTP which shows 15 NCHDs in non-training posts in 2016. Of these, 6 were SHOs and 9 were Registrars. Again, HSE data represents HSE-funded posts only (Table 10).

Table 10: NCHDs Not in Training Posts

Non-Training Radiation Oncology NCHD Data - DIME			
	SHO	Registrar	Total
Radiation Oncology	6	9	15

2.4.4 NCHDs Working in the Private Sector

Medical Council data shows that of the 23 NCHDs registered on the General Division, one was practicing exclusively in the private sector in Ireland and was professionally active in the past 12 months (Table 11).

Table 11: NCHDs Working in the Private Sector

NCHDs Practicing in Radiation Oncology in the Private Sector Only	
	General Division
Professionally active in past 12 months	1

2.5 PARTICIPATION OF NCHDS IN THE MEDICAL WORKFORCE IN IRELAND

2.5.1 Gender and Working Patterns

2.5.1.1 Gender

According to the IMC, 53% of NCHDs registered in 2016 and practicing in in Ireland in the previous 12 months were female (Table 12).

Table 12: NCHDs Gender Breakdown by Division of the Medical Register

NCHDs by Gender Radiation Oncology - Medical Council					
	Female (N)	**Female (%)**	**Male (N)**	**Male (%)**	**Total No.**
Overall Total	20	53%	18	47%	38

2.5.1.2 Working Patterns

According to the IMC (2016), 97% of Radiation Oncology NCHDs worked full-time. Of those doctors registered on the General Division, 4% stated that they worked less than full-time, while no 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 Radiation Oncology - Medical Council					
	Less than full-time (N)	**Less than full-time (%)**	**Full-time (N)**	**Full-time (%)**	**Total**
General Division	1	4%	22	96%	23
Trainee Specialist Division	0	0%	15	100%	15
Supervised Division	0	0%	0	0%	0
Total NCHDs	1	3%	37	97%	38

2.5.2 Country of Basic Medical Qualification

Of all NCHDs working in Radiation Oncology: approximately 93% of trainees, and 87% of general registered doctors, graduated from an Irish medical school. No trainees, and 4% of doctors with general registration, graduated from an EU medical school. 7% of trainees and 9% of general registered doctors graduated from a non-EU medical school.

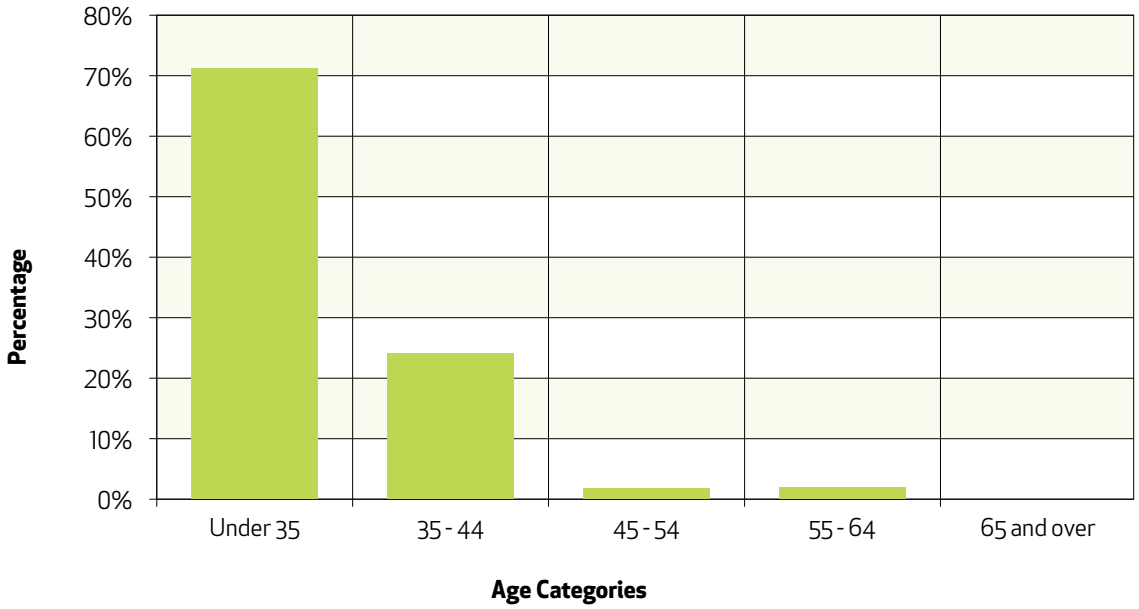
Table 14: NCHDs Country of Basic Medical Qualifications

BMQ for NCHDs			
	Ireland	**EU**	**Non-EU**
General Division	20 (87%)	1 (4%)	2 (9%)
Trainee Specialist Division	14 (93%)	0	1 (7%)
Supervised Division	-	-	0 (0%)
Total NCHDs	34 (89%)	1 (3%)	3 (8%)

2.5.3 Age Profile of NCHDs

There were 38 NCHDs actively working in Radiation Oncology in 2016; the majority of NCHDs (71%) were under 35 years (Figure 2).

Figure 2: Age Profile – NCHDs



2.6 RATIO OF NCHDS TO CONSULTANTS

The ratio of NCHDs to consultants working across the Irish health services is estimated to be 1.5: 1 (Table 15). The ratio of Higher Specialist Trainees to consultants is estimated to be .76:1.

Table 15: Ratio of NCHDs to Consultants

NCHDs to Consultants Ratio	
	NCHDs: Consultant
Total NCHDs	1.5 : 1
HST Trainees	.76 : 1

2.7 SUMMARY OF CURRENT CONFIGURATION OF RADIATION ONCOLOGY WORKFORCE 2016/2017

The table below outlines a summary of data on the consultant and NCHD Radiation Oncology workforce. 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 Radiation Oncology Specialist Workforce

Stocktake of the Radiation Oncology Specialist Workforce		
Assumption	**Value**	**Source**
Number of consultants working in HSE-funded services – permanent and temporary	21 HC 19 WTE	HSE Workforce Analysis, Planning & Informatics Nov 2016
Full-time consultants in HSE-funded services	20 HC 18.5 WTE	HSE Workforce Analysis, Planning & Informatics Nov 2016
Part-time consultants in HSE-funded services	1 HC 0.2 WTE	HSE Workforce Analysis, Planning & Informatics Nov 2016
Estimated number of private sector only consultants as per Medical Council data	4	Medical Council (2016)
Number of approved consultant posts for HSE-funded services	26	HSE Consultants Division 2017
Share of females in consultant employment stock for HSE-funded services	43%	HSE Workforce Analysis, Planning & Informatics Nov 2016
Share of males in consultant employment stock for HSE-funded services	57%	HSE Workforce Analysis, Planning & Informatics Nov 2016
Overall WTE rate for consultants in HSE-funded services	0.89	HSE Workforce Analysis, Planning & Informatics Nov 2016
Exits from MC Specialist Register	5 (10%)	Medical Council (2016)
% Consultants/Specialists over 55 years	11 (30%)	Medical Council (2016)
Total HST	17	Faculty of Radiologists (2016)
Total non-training NCHDs	15	NDTP DIME (2016)

3 ESTIMATION OF THE CURRENT UNDERSUPPLY OF RADIATION ONCOLOGY MEDICAL WORKFORCE

There is an international consensus that approximately 50-60% of cancer patients will require radiation therapy during their illness (Hollywood, 2003). Advances in radiotherapy technology and treatments have benefitted patients, but simultaneously increased the complexity, time and expertise required by radiation oncologists. As a result, practice has become increasingly sub-specialised into individual anatomic cancer sites, leading to radiation oncologists treating similar overall numbers of patients, but restricted to three or four different cancer types (NCCP, 2017). This has become standard in benchmark centres across the world. In tandem with this, is the increasing acceptance of the requirement that radiation oncologists have their treatment plans reviewed by suitably qualified peers prior to starting a treatment course. Both factors are considered international indicators of quality, and both bring a requirement for appropriate consultant numbers.

As outlined by the National Programme for Radiation Oncology, Ireland has the 3rd lowest number of radiation oncologists per capita of any country out of all EU, Canada, USA and Australia. Ireland currently has just under 7 radiation oncologists per million, while the international mean is 12.8. Furthermore, while international recommendations are that radiation oncologists see between 200 and 250 new patients per year (some of whom do not require radiotherapy), Irish radiation oncologists currently treat over 300 new patients per year (and see more than this number). One of the recommendations of the Hollywood report (2003) was that there should be a planned reduction in individual caseloads per consultant to achieve staffing ratios that are more in line with the international norm of one consultant radiation oncologist per 200- 250 new patients. This would permit the proposed service to approach the radiation oncologist staff ratios implemented in other Western countries. Data from the ESTRO-HERO survey on radiotherapy staffing in European countries (2014) highlighted that Ireland has the fifth highest ratio of radiotherapy courses per radiation oncologist (with other countries ranging from 100-250).

The National Programme for Radiation Oncology, in tandem with the National Cancer Strategy, continues to roll out a comprehensive building/expansion programme of radiotherapy centres, each based in large comprehensive cancer centres in Cork (2018), Galway (2020) and Dublin (2017 and 2025). These new and expanded centres require adequate staffing with suitably skilled radiation oncologists in order to maximise their potential and efficiency.

3.1 KEY DRIVERS OF CHANGE TO THE FUTURE OF THE RADIATION ONCOLOGY WORKFORCE

The future of Radiation Oncology provision in Ireland will be influenced by key drivers of change such as the projected future increase in the burden of cancer incidence and potential changes in therapy options over the next ten years.

3.1.1 Future Burden of Cancer

In 2015, the National Cancer Registry Ireland (NCRI) produced a set of projections of future cancer cases (2015-2040) . The total number of new invasive cancer cases (including non-melanoma skin cancer) is projected to increase by 84% for females and 107% for males between 2010 and 2040, based only on changes in population size and age distribution. The NCRI models project an increase of about 50% in cancer cases by 2025, and treatment numbers are expected to increase correspondingly. The total number of patients having cancer-directed surgery is projected to increase by 50%-55% between 2010 and 2025, the number having chemotherapy by 42%-48% and the number having radiotherapy by 32%-35%. These changes, combined with increasing survival, will inevitably increase the burden on cancer services and the corresponding demand for radiation oncologists.

It is important to note that although demographic change will be the main factor driving an increase in cancer numbers, trends in risk factor prevalence will also have an impact. 40% of the total cancer risk in the UK population (44% in males, 35% in females) has been attributed to five lifestyle factors—tobacco, diet, overweight/obesity, alcohol and low physical activity. The attributable risks in Ireland are likely to be similar but were outside the scope

of the recent projections by the NCRI. Early diagnosis of cancer, through screening initiatives provided by the NCCP and increased public awareness, will increase the workload as more patients will be amenable to radical, potentially curative treatment with radiotherapy and chemoradiotherapy.

In 2017 the Department of Health produced and released "National Cancer Strategy - 2017-2026", which updates potential changes in cancer-related service structures, models of delivery, and medical workforce numbers over the next decade. The strategy expects the number of cases of cancer in Ireland to almost double by 2040; mainly due to an increasing and an aging population. The National Cancer Strategy 2017-2026 gives a greater focus on improving the quality of life of the increasing numbers of those living with cancer; with over 150,000 cancer survivors now living in Ireland.

3.1.2 Service Configuration

Further investment in expansion of facilities for radiotherapy in Dublin will be required to address future demographic growth. In the event that the two private providers in Waterford and Limerick, who have service level agreements with the NCCP, was to be discontinued, the existing public facilities in Dublin, Cork or Galway are not in a position to absorb the public demand (or a proportion of the private patients from either of these centres).

In order to meet rising demand, and deliver optimal care, the National Cancer Strategy 2017-2026 reports that there will be an early emphasis placed on addressing workforce gaps in areas such as medical oncology (estimating that the number of medical oncologists in Ireland is just over half that which international standards would suggest as appropriate), urology (leading to regional variations in access to rapid access prostate cancer clinics) and nursing (with shortages noted in chemotherapy units and with the numbers of advanced practice nurses). The strategy seeks improvements in current models of service delivery (e.g. establishment of comprehensive multidisciplinary oncology teams), service reconfiguration (e.g. the centralisation of surgical services for more cancers), and places an emphasis on reducing health inequalities (e.g. through better uptake of preventive and screening services with different sections of the population).

3.1.3 Developments in Therapy Options

Historically, every improvement in technical radiotherapy has required greater clinical input in terms of radiotherapy planning time. The following developments in the future of Radiation Oncology provision could affect the demand for more specialists:

- The use of advanced radiotherapy techniques, such as IMRT and image-guided radiotherapy (IGRT), will continue to evolve;
- Technological development in genomics will increase the opportunity to deliver personalised medicine but will in turn increase the workload for clinical oncologists;
- Molecular radiotherapy options;
- Increase in systemic therapy options are likely to indirectly increase indication for palliative radiotherapy; and,
- Increase in radiotherapy indications either as alternative to existing therapy (e.g. Intracranial Stereotactic Radiosurgery – Pulmonary Stereotactic Ablative Body Radiotherapy as alternative to surgery, bladder preservation etc.) or previously non-existing (e.g. Pulmonary Stereotactic Ablative Body in elderly/non-operable patients).

4 INVITED VIEWS ON RADIATION ONCOLOGY WORKFORCE PLANNING

The following section outlines the recommendations for Radiation Oncology Workforce Planning received by NDTP in 2017, provided in a submission by the National Cancer Control Programme. These recommendations are views of the relevant clinical programme or 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.

VIEWS ON RADIATION ONCOLOGIST WORKFORCE PLANNING BY THE NATIONAL CANCER CONTROL PROGRAMME

- An initial accelerated expansion (or 'front-loading') of the national cohort of consultant radiation oncologists is required to a) address the deficit with international comparators, b) adequately staff the new centres, c) fulfil the goals of the National Cancer Strategy and NPRO and d) minimise the risk of attrition of the current highly qualified cohort of recent graduates of the national training programme.
- This expansion should comprise the creation of 5 additional posts each year in 2017, 2018 and 2019. These additional 15 posts will bring Ireland close to the international mean of consultants per capita.
- The national cohort must be distributed rationally among the regional radiotherapy centres to enable site-specialisation, peer-review, meeting of regional demand for radiotherapy, and fulfilment of specialist radiotherapy services specific to a centre.
- The early additional 15 posts would lead to total numbers by 2020 in each regional centre as follows: CUH (Cork) = 10; UHG (Galway) = 6; SLRON (Dublin) = 25 (evenly divided between SJH – St James's and BGH - Beaumont).
- From 2020 onwards, additional posts should be created, in line with increasing cancer incidence, to permit a constant ratio of consultant-to-new-patient-consultation of 1:225, as per international recommendations.
- Optimal work practices such as site-specialisation and peer-review are required to maintain Irish standards of radiotherapy in line with those of our international comparators.
- Workforce planning must account for time taken to provide essential non-clinical work such as guideline drafting, training, expert advice on policy etc. and development of academic and research programmes.
- The workforce plan should be reassessed at 5-year intervals to allow for changes in work practices, training, cancer incidence, utilization of radiotherapy, changes in radiotherapy techniques and complexity and international best practices.
- New workforce models should be developed, centred on the activities and skills required by a radiation oncologist to bring patients through their entire journey through radiotherapy, in line with thinking of international bodies such as IOM.
- Coordination mechanisms will be required between NDTP, DOH, NCCP, Faculty of Radiologists HSE, and the Medical Council to facilitate workforce planning and execution.

5 A COMPARATIVE ANALYSIS OF THE RADIATION ONCOLOGY WORKFORCE IN IRELAND, THE UK, AND AUSTRALIA

5.1 IRELAND

Ireland's actual ratio of radiation oncologists per 100,000 population was calculated using WPAI data of 21 HC and 4 HC working in the private sector, giving a total of 25 HC. This equates to a ratio of 0.5: 100,000 (Table 17).

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

Ireland Actual & Recommended Ratio per 100,000	
	Actual
Ratios – Ireland	0.5: 100,000 (HC)

5.2 ACTUAL AND RECOMMENDED INTERNATIONAL RATIOS OF CONSULTANT RADIOLOGISTS

5.2.1 United Kingdom

The Royal College of Radiologists "Clinical oncology UK workforce census 2015" provides detailed information on the total number of clinical radiologists in 2015 as 827 (headcount) and 722 WTE. This equates to an actual ratio of 1.3: 100,000 (Table 18). The WTE rate was 87%. The Faculty of Clinical Oncology estimates that to fully meet the needs of the service, it is anticipated that an extra 282 clinical oncology consultants (WTE) are required by 2018. Taking an estimated participation rate of 0.95, this equates to a headcount of 297. With this increase in consultant numbers, the total would be 1,127 headcount with a ratio of 1.7: 100,000.

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

United Kingdom Actual & Recommended Ratio per 100,000		
	Actual	**Recommended**
Radiation Oncology	1.3: 100,000 (HC)	1.7: 100,000 (HC)

Note: Clinical Oncology is not the same as Radiation Oncology – both can be practiced side – by – side.

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 314 specialists working in Radiation Oncology. With a population of 24,127,200 (2016), this represents a ratio of 1.3: 100,000.

Health Workforce Australia (HWA) (2012) noted that all jurisdictions agreed the demand for this workforce will grow at greater than historical rates, driven by the increasing incidence of cancer and the impact of new cancer centres. The placement of cancer centres in regional areas has implications for the distribution of this workforce. Recruitment and retention is a challenge, with sustainable rosters and levels of activity being important factors in attraction and retention of the regional radiation oncologist workforce. This report recommends that by 2018, there is a requirement for 429 (HC) radiation oncologists, and 572 (HC) by 2025.

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 25,201,317 in 2018 and to 28,099,273 million in 2025. Using this figure with projected demand for Australia, equates to a recommended ratio for 2018 of 1.7: 100,000 and 2: 100,000 in 2025 (Table 19).

Table 19: Actual & Recommended Ratio of Radiologists per 100,000 - Australia

Australian Actual & Recommended Ratio per 100,000			
	Actual	**Recommended (2018)**	**Recommended (2025)**
Radiation Oncology	1.3: 100,000 (HC)	1.7 :100,000 (HC)	2: 100,000 (HC)

6 SUMMARY

The staffing model for Radiation Oncology in Ireland is different to many other specialities in that the vast majority of services are consultant-provided as opposed to consultant-led.

6.1 CURRENT RADIATION ONCOLOGY WORKFORCE

- HSE Approved Consultant Posts: In the public health system there were 26 approved posts (2017).
- There were 21 consultants (19 WTEs) in Radiation Oncology employed in publicly-funded services. These were employed in both permanent and non-permanent posts.
- Four consultants in Radiation Oncology were estimated to be working in the private sector (IMC, 2016).
- A total of 37 (HC) doctors were actively working in Radiation Oncology in 2016 and on the Specialist Register of the Medical Council.
- There was one new entrant to the Specialist Register in 2015, and five 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, 76% held a permanent contract, while the remaining 24% held non-permanent contracts.
- Working Patterns: For specialists, 92% were working on a full-time basis, while 97% of NCHDs worked full-time.
- Gender: For specialists, 65% were male and 35% were female, while for NCHDs 53% were female and 47% were male.
- Age: For specialists, the majority were between the ages of 35 and 44 (38%), 32% were between the ages of 45 and 54 and 38% were over the age of 55 years. For NCHDs, the majority (71%) were under the age of 35, while 24% were between the ages of 35 and 44 and 4% were over the age of 45 years.
- Country of BMQ: For specialists, 61% qualified in a medical school in Ireland, 21% qualified in the EU and 18% qualified outside the EU, while for NCHDs, 89% qualified in a medical school in Ireland, 3% qualified in the EU and 8% qualified outside the EU.
- Private Practice: 4 specialist registered doctors in Radiation Oncology (of a total of 37) and 1 NCHD were working exclusively in the private sector.

6.3 KEY DRIVERS OF CHANGE TO RADIATION ONCOLOGY WORKFORCE

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

- Advances in radiotherapy technology and treatments have benefitted patients, but have simultaneously increased the complexity, time and expertise required by radiation oncologists;
- Practice has become increasingly sub-specialised into individual anatomic cancer sites, leading to radiation oncologists treating similar overall numbers of patients, but restricted to three or four different cancer types;
- Future burden of cancer, such as increased prevalence;
- Early diagnosis of cancer, through screening initiatives provided by the NCCP and increased public awareness, will increase the workload as more patients will be amenable to radical, potentially curative treatment with radiotherapy and chemoradiotherapy; and,
- Further investment in expansion of facilities for radiotherapy in Dublin will be required to address future demographic growth.

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National Cancer Strategy - 2017-2026
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