



# Clinical radiology UK workforce census 2020 report



April 2021



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**Without more investment in radiology, we are effectively turning the lights out and leaving other clinicians to tackle cancer, strokes and more in the dark.**

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## Foreword

It has been an extraordinary year for the NHS. Remarkable devastating, incredible, hopefully unrepeatable. From the depths of despair to stunning heroics; from hopelessness to life-saving innovation, healthcare staff have been on the front line in this battle. Their adaptability, resilience and innovation have been outstanding.

In radiology departments, COVID-19 has impacted in myriad ways. Clinical radiology and interventional radiology consultants have been at the forefront of the fight against this pernicious disease, identifying some of the unique attributes of COVID-19 to enable better diagnosis and treatment. But, in addition to the personal and community impact of COVID-19, it has also highlighted the vast gap in the radiology workforce – a gap that needs to be addressed urgently.

Simply put, our census reveals huge shortages across radiology departments – both diagnostic radiologists who enable accurate treatment and interventional radiologists who treat via non-invasive procedures. Without additional funding, patient care will be further compromised.

Our census is not an opinion piece; not a light piece of research. It is a robust document in which every single trust and health board in the UK has participated. Why? Because this is an urgent issue that needs to be tackled. Many lives are at stake if it is not.

Diagnosis is critical in improving patient outcomes. Whether for cancer, stroke, heart disease – even COVID-19 – diagnostic radiologists interpret and report complex imaging examinations to enable the correct treatment, providing expert guidance to other clinicians to ensure good patient care and outcomes. They are the light-bearers in clinical terms, guiding patient management; their detailed reports ensure that treatments have the best chance of success. Delays in imaging prevent early treatment and lead to worsening patient outcomes. Without more investment in radiology, we are effectively turning the lights out and leaving other clinicians to tackle cancer, strokes and more in the dark.

The Richards Report, which called for a major expansion and reform of diagnostic services over the next five years needs to be implemented urgently, as do the Cancer Services Recovery Plans for England and Scotland and the Getting It Right First Time Radiology report.<sup>1-4</sup> There are many voices now, all saying the same thing: we need more investment.

The facts are stark. There are 433 consultant radiologist vacancies across UK hospitals, equating to one-in-ten posts unfilled. In 2020, nearly two-thirds of consultant vacancies remained unfilled after a year, double the amount in 2015 – there are simply not enough applicants to fill the posts. In fact, our census reveals a current estimated shortage of 1,939 consultant radiologists, equivalent to a third (33%) of the workforce and a forecast of a significant shortage of 3,600 radiologists, equivalent to a 44% shortfall, by 2025. The Government has funded an additional 100 trainee places this year, but it is a drop in the ocean. Without a long-term funded plan for many more trainees, these shortages will continue to grow.

And that's just the diagnostics. Interventional radiology consultants deliver minimally invasive surgery – removing the blood clots that cause strokes, draining abscesses and stopping traumatic bleeding, as well as destroying tumours and clearing urinary and biliary tract obstructions. By avoiding surgery, interventional radiology enables patients to benefit from faster recovery times, shorter hospital stays and better outcomes. But again, there are not enough of them – not nearly enough.

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Our 2020 census found almost half of UK trusts and health boards (47%) cannot provide adequate 24/7 interventional radiology services. Respondents report chronically understaffed departments that simply cannot deliver the service required. To meet safe staffing guidelines, the UK needs at least another 364 full-time interventional radiology consultants in practice.

The issue of workforce is not a new one. But neither is it one that will go away until action has been taken. We need more funding, more trainees and more understanding of the pivotal role radiology plays in improving patient outcomes.

At the end of an extraordinary year, where so many have suffered but so much has been achieved, we urge the Government to understand the crucial role of radiology and radiologists in fighting so many of the devastating illnesses that blight so many lives. By investing now, many lives can be saved tomorrow.

*Professor Mark Callaway*

**Medical Director, Professional Practice, Faculty of Clinical Radiology**

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## 1. Executive summary

Produced yearly, The Royal College of Radiologists' (RCR) census provides robust data on the state of the clinical radiology consultant workforce in the UK. The findings are essential reading for local and national workforce planners and are the cornerstone of RCR policy.

Our most recent findings were returned at the end of 2020, following the most challenging year in NHS history. The health service remains under considerable pressure and 2021 and beyond will see profound change in response to the impact of the COVID-19 pandemic.

The pandemic has underlined the undisputed value and resilience of the healthcare workforce and highlighted its adaptability and ability to innovate.

Despite ongoing constraints, the importance of and opportunities for NHS radiology have been amplified in the past year, with:

- The clear impetus for community diagnostic hubs that act as a one-stop shop for patients in a COVID-19-secure environment
- A greater appreciation of interventional radiology (IR) as a non-invasive alternative to open surgery
- Rapid facilitation of home reporting of imaging examinations.

While these positive developments provide much to celebrate and build on, the 2020 census findings highlight that key, long-term issues must be addressed to truly safeguard and improve patient care.

### The increasing demand for vital imaging services



***We have a backlog of 10,000 examinations.***

***Long waits for patients to get results.***

***Chronically understaffed department.***

Medical imaging is central to the diagnosis and treatment of many medical conditions, including cancer, stroke and major trauma. Clinical radiology (CR) consultants are the expert doctors who interpret and report complex scans, perform image-guided surgery and provide expert guidance to other clinicians to support patient care.

The radiology workforce is not growing fast enough to meet demand and pressure on imaging teams has been compounded by backlogs of patients awaiting imaging due to the COVID-19 pandemic. The workload for complex imaging (computed tomography [CT] and magnetic resonance imaging [MRI] scans) is increasing at 7% every year while the CR consultant workforce is only growing at 4%.<sup>5</sup>

Before the pandemic, more than 120,000 scans were carried out every day across England alone.<sup>5</sup> In September 2020, more than 200,000 patients in England were waiting six weeks or more for a CT or MRI scan, ten times as many as in September 2019.<sup>6</sup> Waiting lists are at a record high and millions of patients waiting for treatment will need some form of imaging diagnosis and/or interventional radiology treatment.<sup>7</sup>

Prior to the pandemic, radiology leads increasingly reported that under-staffing was having a direct impact on patient safety and access to medical imaging and interventional treatment as well as escalating NHS outsourcing costs and workforce stress.<sup>8</sup>

The 2020 census confirms that the situation remains dire and investment is now essential to support early diagnosis targets and to improve patient care. Without increased funding and support for NHS radiology, patients will suffer, diagnoses will be further delayed and fewer patients will benefit from life-saving, minimally invasive interventional radiology.

### The impetus to deliver care differently



***We cannot deliver adequate services to our patients.***

***Not only is there a shortage of radiologists, but radiographers and nurses too.***

#### ***Risk of delayed diagnosis.***

Last year's NHS England-commissioned report by Sir Mike Richards called for a major expansion and reform of diagnostic services over the next five years to facilitate the NHS' recovery from the COVID-19 pandemic and meet rising demand across multiple aspects of diagnostics.<sup>1</sup> It stated that new facilities and equipment will be needed, together with a significant increase in the diagnostic workforce and skillmix initiatives.<sup>1</sup>

Focusing on supporting the workforce as part of the response to the COVID-19 pandemic is also outlined as a priority in the *Cancer services recovery plan for England* and the Scottish Government's *Recovery and redesign: an action plan for cancer services*.<sup>2,3</sup>

While there is now more political recognition of the need to expand imaging services to improve care, the 2020 census data reveal the true extent of the workforce crisis and the urgency of the action that's required.

### A workforce at two-thirds of adequate capacity



***Permanently overworked and under-supported radiologists set themselves up to fail patients.***

***We can no longer provide cancer care and acute care safely.***

#### ***Risk of delayed diagnosis.***

There are 433 CR consultant vacancies across UK hospitals, equating to one-in-ten radiologist jobs unfilled. Many posts are sitting empty for years despite numerous recruitment attempts. In 2020, nearly two-thirds of consultant vacancies remained unfilled after a year, double the proportion reported in 2015.

When hospital vacancies are combined with workloads to illustrate real-time demand, the census reveals a current estimated shortage of 1,939 radiology consultants which equates to a third (33%) of the workforce needed to keep up with the demand for scans and IR work.

There is acute regional variation with estimated workforce shortfalls above 40% across North and West Wales, the North of Scotland, North East England and the East Midlands. Without more local prioritisation to plug these staff shortages, patient care will suffer.

If nothing is done to improve staff recruitment and retention, forecasts indicate that the NHS will be facing an actual shortage of 3,600 CR consultants, equivalent to a 44% shortfall, by 2025.

Increased investment is urgently needed to boost radiologist training numbers and bridge these shortfalls.

### The urgent need to boost interventional services to provide acute life-saving care



***When there is a rota gap, we have to hope one of the IRs is about. If not, it is approximately 50 miles to the next IR unit.***

***We cannot provide an IR on-call service any time soon; not only is there a shortage of radiologists, but radiographers and nurses.***

IR consultants are specialist radiologists who perform minimally invasive image-guided procedures.

Life-saving IR procedures that improve quality of life for patients include removing the blood clots that cause stroke, draining infected organs and stopping traumatic bleeding, as well as destroying cancer tumours and clearing urinary and biliary tract obstructions. Benefits typically include faster recovery times, shorter hospital stays and reduced morbidity and mortality compared with conventional surgery.<sup>9</sup> IR is increasingly used to replace or enhance more invasive surgical procedures.

RCR guidelines recommend that timely access to IR is available to ensure patient safety, regardless of geography and hospital size.<sup>9</sup> Services consisting of a minimum of six IR consultants will usually be able to provide an effective and sustainable 24-hour IR service.<sup>9</sup>

However, the 2020 census found almost half of UK trusts and health boards (47%) cannot provide adequate 24/7 IR services.

The principal reason for the UK's inadequate 24/7 IR service is the lack of trained IR consultants. To meet safe staffing guidelines, the UK needs at least another 364 full-time IR consultants in practice.

### Recent developments impacting on clinical radiology

Radiology departments are key to an efficient and safe NHS. They are the backbone to diagnosis, early cancer detection, screening services and life-saving interventional procedures. However, there is still much to do so that departments are properly staffed to ensure patient care.

The RCR will continue to make the case for increased trainee numbers and the capacity to train them, work with our membership to identify and implement new ways of working and campaign for streamlined patient pathways through hub and networking models.

The RCR welcomes the opportunity to engage with the Department of Health and Social Care, the devolved administrations and the NHS across the UK to ensure radiology services can continue to be delivered safely and effectively and designed around patients' needs.



**To support these ambitions, RCR policy priorities are to:**

1. **Secure investment of £750 million to boost training places to meet forecast demand.** This should comprise 60 additional clinical radiology specialty training places per year for the next two years, rising to 100 per year for the following three years. In addition, 50 additional final-year IR training places are required each year for the next five years.<sup>10</sup>
2. **Achieve sustained and targeted investment in the wider diagnostic team.** This includes staff grade, associate specialist and specialty (SAS)-grade radiologists, radiographers, healthcare scientists, nurses and administrative support.
3. **Enable better use of the skills and experience of the workforce,** which can be achieved by fostering skillsmix and providing a comfortable, inclusive working environment.
4. **Secure dedicated beds for IR day-case services and control of their own beds.** This would support the workforce while maximising the use of existing equipment to bolster increased capacity. It would likely lead to significant savings compared to theatre and inpatient stay costs and improve access for patients.

## 2. Demand for radiology services

The demand for diagnostic and interventional radiology has risen rapidly over recent years, driven by:

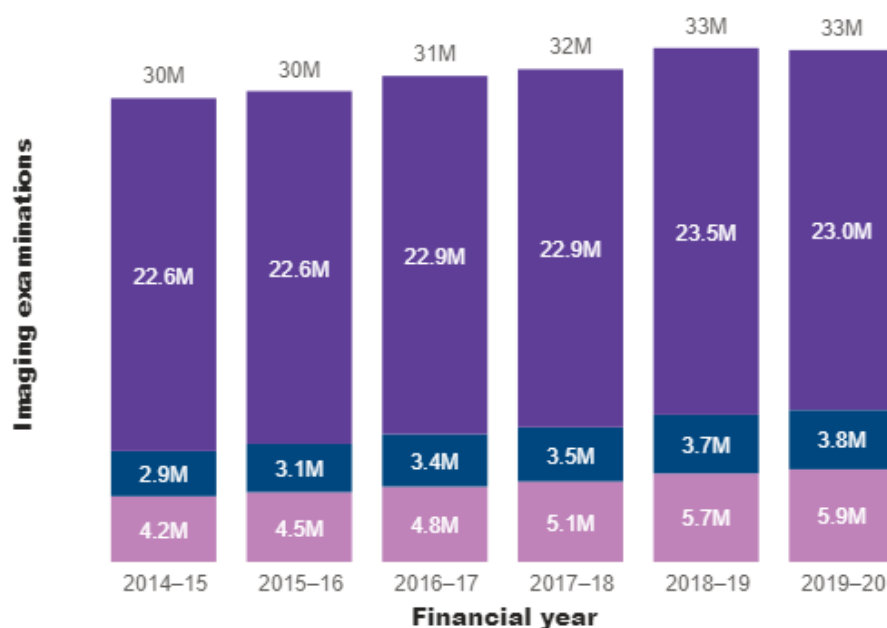
- An aging and growing population with increased long-term disease<sup>11</sup>
- Increased screening to support early diagnosis of cancer and other conditions
- New and updated clinical guidelines specifying imaging as part of the clinical pathway
- Technological advances benefitting patients but also increasing the diversity and complexity of imaging and IR procedures.

### 2.1 Diagnostic imaging demand

As highlighted in Professor Sir Mike Richards' *Diagnostics: recovery and renewal report*, the demand for diagnostics is increasing faster than the demand for NHS services as a whole.<sup>1</sup>

Three of the most common diagnostic imaging tests carried out in the UK are X-rays, CT and MRI. In England alone, 33 million such imaging tests were carried out in the past financial year (April 2019 to March 2020).<sup>5</sup> Imaging volumes by year are shown in Figure 1.

**Figure 1. NHS imaging activity – England, five-year trend (2014/15 –2019/20)<sup>5</sup>**



The fastest growth in demand for imaging has been in complex modalities (such as CT and MRI). CT and MRI are used to visualise the inside of the human body in three dimensions (3D), in great detail. Both play a vital role in diagnosing disease and injury, disease monitoring and treatment planning (such as surgery or radiotherapy). Over the past five years, imaging using CT and MRI in England has increased by (an average) of 7% per year, exceeding the CR consultant workforce growth of 4% per year.<sup>5</sup> CT and MRI are complicated and time-consuming to interpret and report, so the radiology workforce must expand to match the increased demand for complex imaging. In the census responses, several clinical directors commented on the increasing sub-specialisation and complexity of reporting and noted that specialist CR consultants were in short supply.

The diagnostic workforce in England has grown by 692 whole-time equivalent (WTE)\* CR consultants over the past five years. However, to cover the increase in CT and MRI in England over the past five years, the workforce needs an estimated additional 223 CR consultants.<sup>12</sup> Workforce growth is 24% short of required growth. This has contributed to increased workforce shortages. As one clinical director explained, 'The radiology department is under increasing pressure with more and more clinical pathways involving our services, but without any recognition of the increased workload.'

### Impact of COVID-19 on imaging

Figure 1 is based on financial years. Therefore, it includes imaging activity in England up to 31 March 2020. In the following six months (March to August 2020 – the remaining period covered by this report) imaging activity was severely affected by the COVID-19 pandemic. During the pandemic's first peak, it was widely reported that markedly fewer patients were attending emergency departments, including for serious conditions. Urgent general practice (GP) referrals for suspected cancer also dropped as fewer patients booked appointments with their GPs. Patients' fear of catching COVID-19 and reluctance to burden the NHS are considered to have been contributing factors to this reduction in patient attendance. The temporary suspension of cancer screening services and non-urgent imaging examinations at the onset of the pandemic (and subsequent gradual resumption) also reduced imaging volumes in these six months. Furthermore, the need to deep-clean equipment and follow rigorous infection-control procedures have slowed diagnostic imaging throughput.

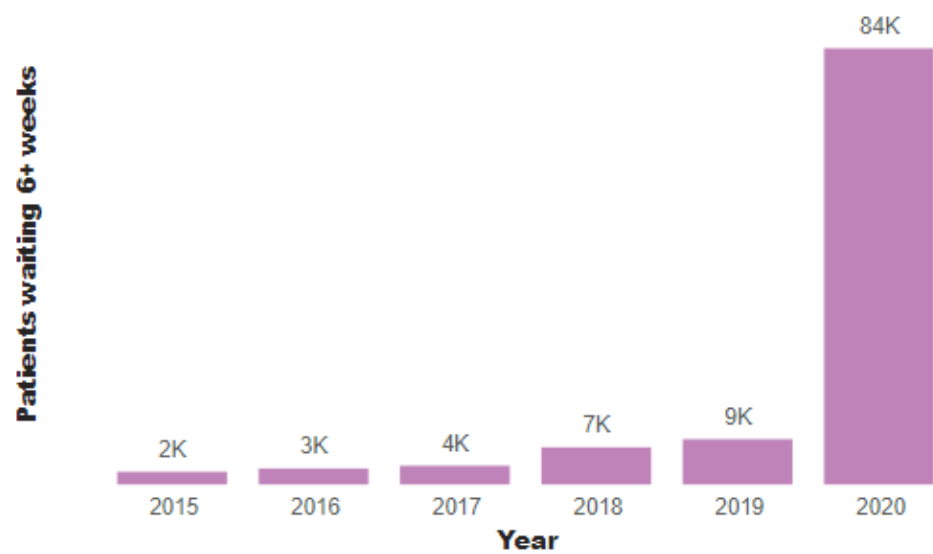
From 1 April until 30 June 2020, volumes of CT and MRI were 37% lower than in the same period in 2019.<sup>1</sup> In the following three months, significant recovery in imaging was observed; from July to September 2020, CT and MRI imaging volumes were only 8% lower than the same period in 2019. Imaging volumes approached 2019 levels by September 2020. During this period of reduced imaging throughput, a backlog of patients waiting for screening and diagnostic imaging has built-up. Despite concerted efforts, NHS staff have struggled to clear the backlog due to the ongoing COVID-19 pandemic, slower imaging throughput (due to infection-control procedures including deep-cleaning). This is in addition to widespread equipment and workforce shortages.

As of September 2020, 370,000 people in England alone were waiting for CT or MRI examinations, of whom nearly a quarter (23%) – 84,000 people – had been waiting for six weeks or more. By comparison, in September 2019, far fewer people – 9,000 or 3% of the waiting list (totalling 328,000) – had been waiting six or more weeks.<sup>7</sup> Reducing lengthy waiting lists is vital to ensure prompt diagnosis of cancer and other serious medical conditions to give patients the best chance of being cured.

\*A WTE is a whole-time (or full-time) doctor with a contract of ten programmed activities (PAs) per week; this is equivalent to a 40-hour week in England, Northern Ireland and Scotland and a 37.5-hour week in Wales.

Figure 2 illustrates that the number of patients waiting six weeks or more for a CT or MRI has increased significantly over the past five years but escalated much more rapidly during the COVID-19 pandemic. Several radiology clinical directors expressed concern about their growing imaging backlogs, for example: '[We have a] backlog of 10,000 examinations added to an escalating workload. Waiting lists will rise exponentially and patients will have delayed diagnosis and management.'

**Figure 2. Numbers of patients waiting six weeks or more for a CT or MRI examination – England, five-year trend (2015–2020)<sup>7</sup>**



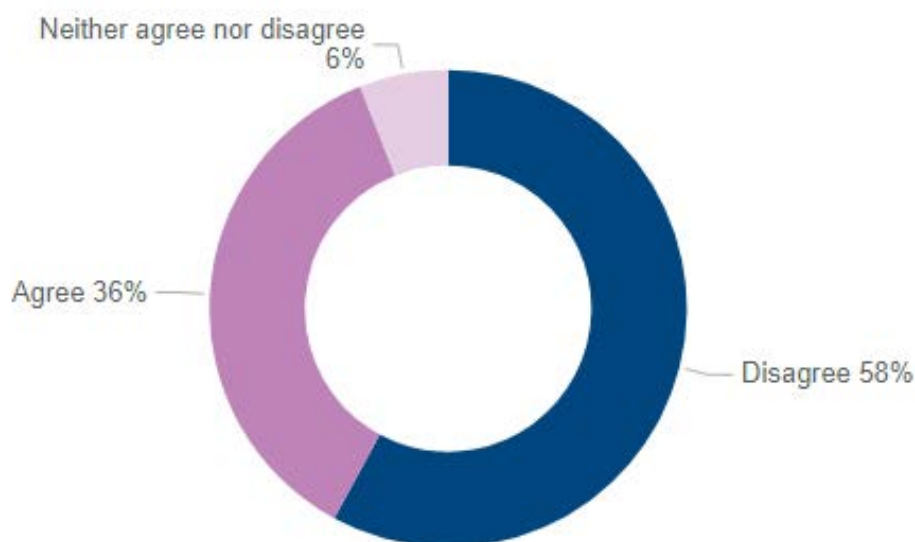
## 2.2 Radiology clinical directors' views on workforce capacity

In 2020, most radiology clinical directors (58%) reported insufficient CR consultants to deliver safe and effective patient care at their trust or health board. Findings were similar across UK countries except for Northern Ireland where a minority (33%) of clinical directors expressed the view that there were insufficient clinical radiology consultants. These findings are illustrated in Figure 3.

The proportion of radiology clinical directors who agree there are sufficient clinical radiology consultants to deliver safe and effective care increased from 22% to 36% over the past year. However, it is not clear whether this is due to the reduced volumes of imaging outlined in the preceding section or more enduring factors improving the trust/health board's ability to deliver radiology services.

### Figure 3. Clinical directors' views on radiology staffing levels – UK, 2020

*To what extent do you agree or disagree that there are currently sufficient CR consultants employed in your radiology department(s) to be able to deliver safe and effective levels of patient care?*



Radiology clinical directors expressed a range of concerns regarding workforce shortages, including:

#### **Safety concerns**

- 'We can no longer provide cancer care and acute care safely.'
- 'Backlog of urgent reports and no 24/7 interventional [services].'
- 'Inability to provide seven-day and out-of-hours service.'

#### **Backlogs and delays**

- 'Delays in reporting of radiology examinations' mean 'long waits for patients to get results' and the 'risk of delayed diagnosis impacting patient safety.'

#### **Shortage of subspecialty expertise**

- 'In specialty areas such as paediatrics and cardiology we cannot deliver adequate services to our patients.' This means patients 'might end up having invasive procedures' and 'patients might have to be sent further afield.'

#### **Insufficient scanners**

- 'Bottleneck of scanning due to insufficient machines.'
- 'We are short of CT and MRI scanners and the radiographers to run them. Lack of capacity in cardiac CT and cardiac MRI is a particular problem.'

#### **Workforce stress**

- 'Increased pressure on staff makes recruitment and retention more difficult and reduces morale.'
- 'Issues regarding safety as insufficient staff try to cover multiple areas/modalities as well as teaching and ...[other responsibilities].'
- 'Increasing pressure on radiologists to work faster and potentially longer. Quality and therefore safety is threatened.'
- 'Increased strain on radiologists to deliver the volume of reporting/activity with risk of burnout and decreased quality of service for patients.'
- 'Not enough focus on quality due to work pressure.'

#### **Inability to provide full service**

- 'Lack of support for referring clinicians due to competing priorities.'
- 'Cannot provide cover for all [multidisciplinary team meetings] which may affect patient management.'
- 'There are many facets of radiology we are not covering: multidisciplinary teams, IR, teaching.'
- 'There is not much capacity for service improvements as radiologist time is overloaded with acute, cancer and elective service pressures.'

### 3. Workforce supply

Census data show that UK radiology departments were unable to recruit all the clinical radiology consultants they needed in 2020. Alongside the significant difficulties and constraints caused by the global COVID-19 pandemic, there were ongoing problems of insufficient numbers of trainees, a lack of suitable UK candidates and challenges of global recruitment.

#### 3.1 Workforce overview

Multidisciplinary teams deliver diagnostic and interventional radiology services in the UK. Table 1 shows the distribution of CR consultants, SAS-grade doctors and specialty trainees across the UK. There were 4,277 clinical radiology consultants, 1,760 specialty trainees and 86 SAS-grade doctors in post in September 2020.

**Table 1. Clinical radiology workforce (headcount) – UK countries, 2020**

	England	Northern Ireland	Scotland	Wales	UK total	Change (last year)	Percentage change (last year)
Consultants	3,587	168	354	169	4,277	+201	+5%
Specialty trainees	1,451	54	170	85	1,760	+1,243	+7%
SAS-grade	77	0	5	5	86	+3	+3%
Total	5,115	222	529	259	6,123	+328	+5%

*[Consultant includes NHS, academic and mixed NHS/academic posts.]*

*[SAS-grade comprises associate specialists, specialty doctors and trust-grade staff.]*

*[Due to rounding, numbers in this table may not add up precisely to the totals provided.]*

The UK radiology workforce has grown by 5% over the past year. The 7% increase in clinical radiology specialty trainees reflects both a 5% increase in doctors starting clinical radiology specialty training over the past year and a reduced number of trainees completing their training. Training completions over the past year have likely been impacted by:

- Delays caused by the COVID-19 pandemic
- The trend towards less than full-time (LTFT) training.

The slowest growth over the past year (at 3%) was in the SAS-grade radiology workforce. Clinical radiology has a relatively low proportion of SAS-grade doctors compared to other medical specialties.<sup>13</sup> Within the UK, Scotland and Northern Ireland, in particular, have low numbers of SAS-grade radiologists. SAS-grade expansion should be considered as part of plans to grow the radiology workforce.

Census data show increasing numbers of doctors working as locums. Of the 4,277 clinical radiology consultants in post in 2020, 301 (7%) were employed in locum posts; this is treble the number of locums (3%) in post three years ago. While locums can be invaluable in covering vacant positions and long-term absence, the General Medical Council (GMC) highlights the challenges of effective locum induction and team integration due to the intended short-term nature of these appointments.<sup>14</sup>

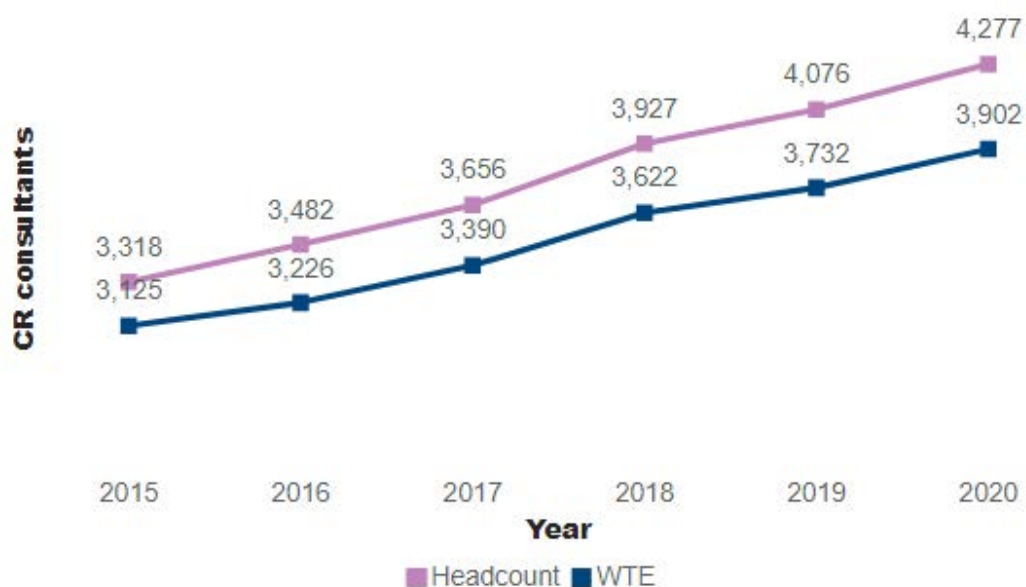
The census does not capture staff absence levels, for example, due to parental leave, sickness, shielding or secondment. In 2020, some radiology clinical directors reported significantly reduced workforce capacity during the COVID-19 pandemic.

### Consultant workforce: five-year trend

The UK total of 4,277 clinical radiology consultants equates to 3,902 WTEs. Figure 4 shows workforce growth over the past five years. The divergence of the headcount and WTE lines in Figure 4 reflects the increase in LTFT working.

The clinical radiology consultant workforce has grown by an average 4% per year over the past five years. This is on a par with workforce growth across all specialties in England, which averaged 4% per year over the past five years.<sup>13</sup>

**Figure 4. Clinical radiology consultant workforce – UK, five-year trend (2015–2020)**

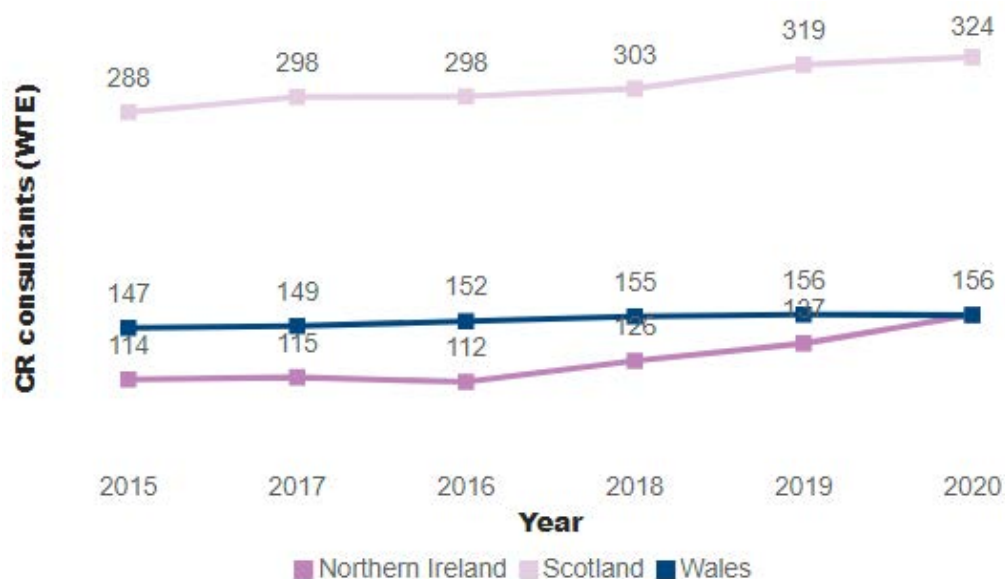


Workforce growth has varied across nations and regions. Growth has been much slower in Wales (average 1% per year), Scotland (average 2% per year) and in parts of England such as the North East (average 1% per year). Similarly, growth has been variable across trusts and health boards; non-teaching trusts have tended to see slower clinical radiology workforce growth than teaching trusts.



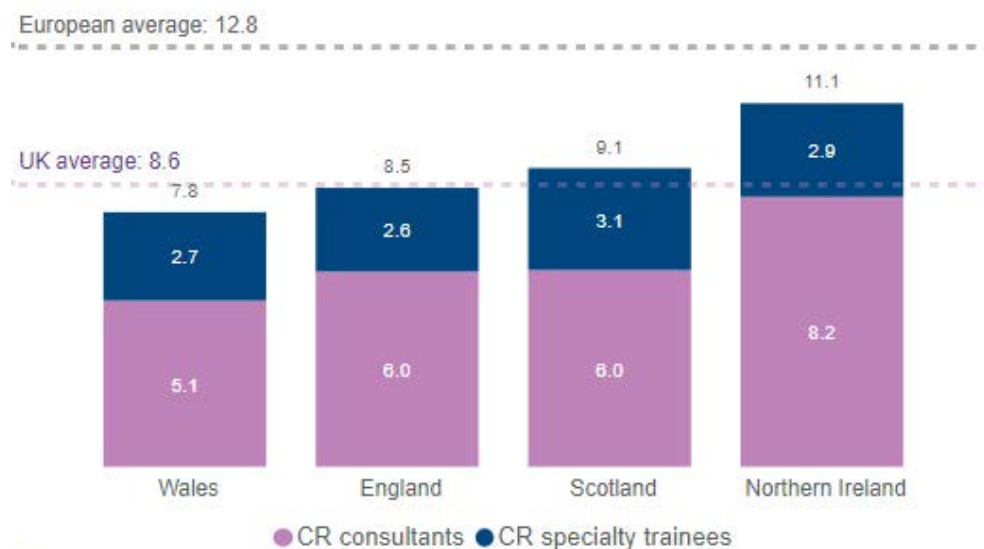
Figure 5 shows the clinical radiology consultant workforce growth across the devolved nations over the past five years. Scotland and Northern Ireland have gained (on average) seven and eight WTE CR consultants per year, respectively. Wales has seen the slowest growth with (an average of) just two additional WTE clinical radiology consultants per year.

**Figure 5. Clinical radiology consultant workforce – devolved nations, five-year trend (2015–2020)**



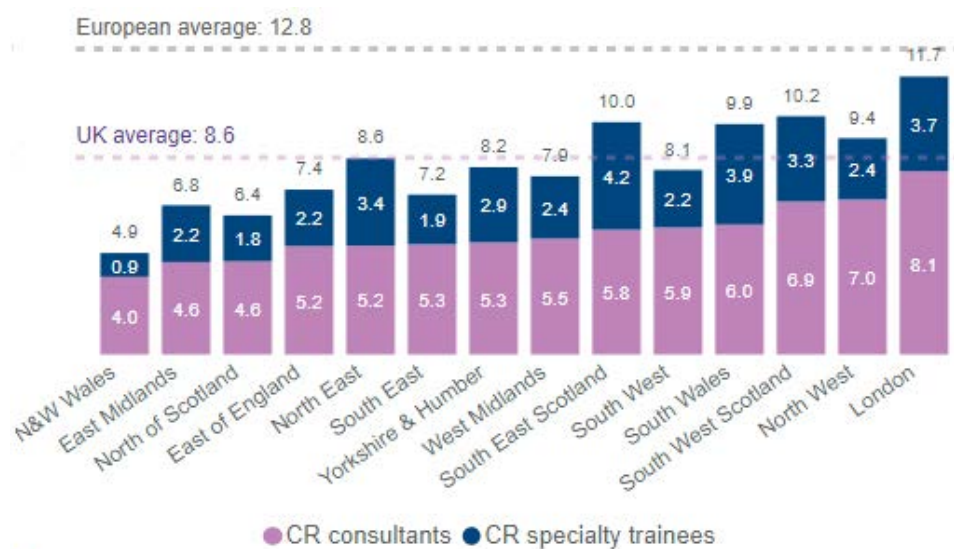
There is significant variability across the UK in the distribution of CR consultants relative to population size. While the European average is 12.8 radiologists per 100,000 population, Wales only has 7.8.<sup>15</sup> Compared to France and Spain, Wales has half the number of radiologists per head of population. Northern Ireland is the UK country with the highest number of clinical radiology consultants per head of population at 11.1 per 100,000. This is shown in Figure 6.

**Figure 6. Clinical radiologists per 100,000 population – UK countries, 2020**



There is also significant variation in the distribution of clinical radiology consultants across regions. North and West Wales and the North of Scotland are the UK regions with the fewest CR consultants per head of population. This is shown in Figure 7.

**Figure 7. Clinical radiology consultants per 100,000 population – UK regions, 2020**



While these figures give a broad indication of the relative supply of clinical radiology consultants per size of the population, they are simplistic so should be considered alongside other national and local indicators of demand. For example, the size of the elderly population, comorbidity levels and deprivation levels may significantly affect the demand for diagnostic and interventional radiology services.

### Homeworking

During the COVID-19 pandemic, UK workers were encouraged to work from home where possible to reduce the spread of the virus. The RCR issued interim guidance to support the deployment of home reporting during the pandemic.<sup>14</sup> Census data show that in September 2020, half of UK CR consultants and SAS-grade doctors had home-reporting capability. The picture varied significantly across nations and regions, as highlighted in Table 2. Three quarters (78%) of CR consultant and SAS-grade radiologists in Wales had home-reporting capability in September 2020 compared to only a quarter (25%) in Northern Ireland.

**Table 2. Percentage of CR consultants and SAS-grade doctors with home-reporting capability – UK regions, 2020**

Country	Home-reporting capability
<b>Wales</b>	<b>78%</b>
South Wales	85%
North and West Wales	65%
<b>England</b>	<b>52%</b>
South Central	72%
North West	67%
East of England	56%
North East	56%
East Midlands	55%
Yorkshire and Humber	53%
London	52%
South East	50%
South West	47%
West Midlands	27%
<b>Scotland</b>	<b>33%</b>
South East Scotland	52%
North of Scotland	33%
South West Scotland	28%
<b>Northern Ireland</b>	<b>25%</b>
<b>Total</b>	<b>50%</b>

[152/189 census respondents (80%) were able to provide home reporting data.]

Several radiology clinical directors commented that the roll-out of homeworking was underway or would be underway shortly.

Some radiology clinical directors felt that homeworking was effective for reporting and meetings. Comments included:

- 'Provides an improved work–life balance for radiologists, attracts new appointments, saves space in hospitals and prevents infection.'
- 'Helps recruitment, retention, parking and the planet.'
- 'It has enabled safe working for those at risk and also enables working when self-isolation has been necessary.'
- 'It has helped with insourcing, thereby decreasing the amount we have to outsource.'
- 'It provides flexibility to attract radiologists from outside the catchment area.'
- 'Given us the ability to have 24/7 service in these uncertain times. Really popular and increases productivity.'

Other radiology clinical directors commented on substantial technological challenges arising from homeworking:

- 'IT support and hardware acquisition to facilitate homeworking has been a struggle at times.'
- 'Awaiting installation of new PACS [digital storage and access system for imaging] later this year to facilitate home reporting.'
- 'Network speeds and computing problems at home [are] difficult to fix easily.'
- 'The connection and speed were poor and sometimes impossible.'
- 'The IT department has been unable to resolve voice recognition issues and, as such, have not rolled-out home reporting.'

Radiology clinical directors pointed out some disadvantages of homeworking:

- 'Some [radiologists] prefer it; others don't like it.'
- 'The disadvantage has been the impact on training and accessibility of radiologists.'
- 'Not good for general morale, not good for trainees.'
- 'Needs to be managed closely with the directorate policy regarding needs, expectations and "eligibility".'
- 'Success during COVID-19 but should be used responsibly as departmental presence is required.'

Several radiology clinical directors flagged the lack of funding, information technology (IT) support and senior-level support as barriers to the roll-out of homeworking. For example, 'We are having difficulty persuading the senior management of the benefits and difficulty identifying funding for workstations.'

Clinical directors indicated huge variability in homeworking practices with some trusts and health boards using it for on-call work only, while CR consultants at other trusts and health boards worked from home two to three days per week.

For many trusts and health boards, homeworking policies and practices are evolving. For example, one clinical director commented that home reporting (while in place) is not yet integrated into directorate service provision or formally incorporated into job plans.

### Programmed activities (PAs)

The RCR collects census data on CR consultants' contracted programmed activities (PAs) to monitor trends and variance from guidelines. It does not collect data on unpaid work in addition to contracted PAs.

The census monitors the following types of PAs:<sup>17</sup>

- **Direct clinical care (DCC):** work directly relating to the prevention, diagnosis or treatment of illness. DCC includes reporting imaging investigations, participation in clinical meetings, supervision of specialty trainees and carrying out clinical administrative tasks.
- **Supporting professional activities (SPAs):** activities undertaken to comply with clinical governance and revalidation requirements, including mandatory training, audit and quality improvement, continued professional development and appraisal. SPAs also include activities such as teaching and training.
- **Additional programmed activities (Additional PAs):** additional responsibilities not undertaken by the generality of consultants, such as those associated with the roles of a clinical or medical director, audit lead or clinical tutor.

In 2020, full-time CR consultants were contracted for an average of 10.7 PAs per week, equivalent to a 43-hour working week and LTFT CR consultants were contracted for an average of seven PAs, equivalent to a 28-hour working week.

The RCR recommends that the DCC element of a job plan for a full-time CR consultant should not usually exceed 7.5 PAs and should be balanced by 2.5 SPAs.<sup>17</sup> The 2020 census data show:

- **DCCs:** Full-time NHS CR consultants across the UK were contracted for 8.7 DCCs (on average) per week in 2020. This is equivalent to five hours more than the RCR recommended maximum. In Northern Ireland, full-time CR consultants were contracted for 9.1 DCCs (on average), exceeding the RCR recommendation by six hours. High levels of DCCs in job plans risk leaving insufficient time for SPAs and can contribute to excessive working hours.
- **SPAs:** Full-time NHS CR consultants were contracted for two SPAs (on average) per week in 2020, equivalent to two hours less than the RCR recommended threshold. Wales was the only UK country where most CR consultants' contracts met the RCR SPA recommendation of 2.5. Insufficient SPA time compromises doctors' ability to keep their knowledge up to date, revalidate and undertake audit and quality improvement activities. Such activities are vital to improving radiology services and facilitating better outcomes for patients.

The RCR and Academy of Medical Royal Colleges recommend a minimum is 1.5 SPAs per week.<sup>17,18</sup> It is concerning that, in 2020, 43% of LTFT CR consultants' contracts and 6% of full-time contracts fell below this recommended minimum. Approximately three-quarters (72%) of LTFT CR consultants in the 60+ age group reported having inadequate SPA time, with job plans including one SPA or fewer. These job plans fall at least two hours per week short of the recommended 1.5 SPA threshold. In addition to the difficulty of undertaking

SPA activities within compressed time frames, CR consultants with insufficient SPA time may be inclined to retire earlier rather than opting for a LTFT contract, thereby exacerbating workforce shortages.

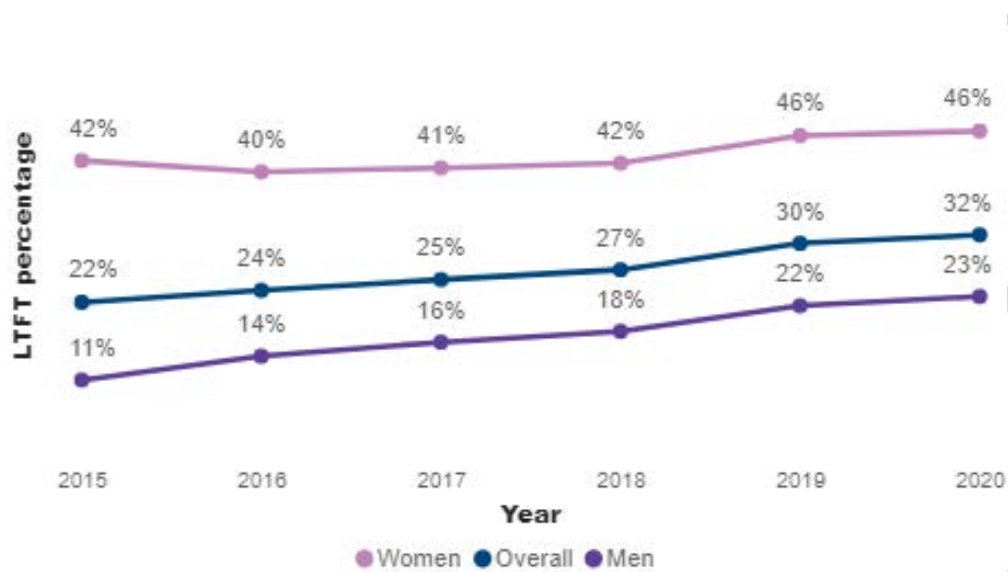
In 2020, one-in-seven full-time CR consultants (15%) had job plans including 12 or more PAs, equivalent to a working week of at least 48 hours (before any overtime). NHS employing organisations should monitor the risks associated with doctors working excessive hours. As one clinical director articulated, 'Permanently overworked and under-supported radiologists set themselves up to fail patients.'

### Less-than-full-time working

Less than full time (LTFT) is defined as working fewer than ten contracted PAs per week, equivalent to a 40-hour working week (or 37.5-hours in Wales). LTFT working across the UK CR consultant workforce has steadily become more common over the past five years, with the most significant shift towards LTFT working seen in those approaching retirement (the 55+ age group). In this age group, LTFT working has increased from around one-in-three (31%) CR consultants in 2015 to approximately half (47%) in 2020. A typical LTFT contract for the 55+ age group consists of six PAs (comprising five DCCs and one SPA), equivalent to a 24-hour week. LTFT and flexible working can play a crucial part in workforce retention; census data show that full-time CR consultants retire on average three years earlier than their LTFT counterparts.

LTFT working is more prevalent among women than men. As shown in Figure 8, almost half (46%) of female CR consultants worked LTFT in 2020. However, LTFT working is becoming increasingly common among male doctors; nearly a quarter of male CR consultants (23%) worked LTFT in 2020, approximately double the proportion (11%) who opted to do so five years ago.

**Figure 8. Proportion of LTFT working, clinical radiology consultants – UK, five-year trend (2015–2020)**



Reflecting the trend towards flexible working, census data show an increased number of CR consultants holding more than one employment contract. In 2020, 92 CR consultants (2%) held two NHS clinical radiology contracts, compared to 47 CR consultants (1%) in 2015.

The NHS should ensure the availability of, and support for, flexible career options to maximise staff wellbeing and retention. In addition, workforce planning should factor in the increasing demand for LTFT working.

### 3.2 Vacancies

Radiology clinical directors reported 443 vacancies in 2020. This primarily comprised consultant-grade vacancies (n=422), though four SAS-grade and six research/clinical fellow vacancies were also reported. Vacancy data provide insight into the extent of workforce shortfalls. However, they do not reflect the entire shortfall as vacancies are constrained by budgets, a lack of suitable candidates and other factors.

Three-quarters of UK trusts and health boards (76%) reported having at least one vacancy in September 2020. The UK CR consultant vacancy rate was 10%. The consultant vacancy rate is highest in Scotland at 12% and lowest in Northern Ireland at 8% (following successful recruitment in 2020). This is shown in Table 3.

**Table 3. Vacancies and vacancy rates, CR consultants – UK, 2020**

	England	Northern Ireland	Scotland	Wales	UK total
Vacancies	359	15	41	18	433
Vacancy rate	10%	8%	12%	10%	10%

Clinical directors highlighted many factors which restricted or delayed their recruitment activities in 2020.

**COVID-19**

- 'COVID-19 has prevented/delayed international fellows from taking up posts.'
- 'Interviews were set to go ahead in March [2020] but were postponed due to COVID-19 and ... rescheduled for September.'

**Waiting to fill current vacancies before further recruitment**

- 'We have at least ten vacancies, but funding is only released as posts are filled.'

**Awaiting budget sign off**

- 'We are awaiting the release of funding to appoint further radiologists.'

**Lack of suitable candidates**

- 'An estimated five vacancies would be funded without difficulty if we thought they could be filled.'
- 'We do not advertise these [vacancies] without knowing that there are available suitable applicants.'

**Waiting for trainees to complete training**

- 'We are advertising as trainees come on to the market.'

**Time to build the business case**

- 'Business cases are being worked-up.'

**Lack of funding**

- 'We need more funding for jobs. Plenty of trainees want to be neuroradiologists [yet] huge amounts outsourced.'

Clinical directors also commented on their approach to tackling recruitment difficulties, which included the following.

**Collaboration**

- 'We plan to advertise regional collaborative posts.'

**Fellowship programme**

- 'We started a Fellowship programme that has allowed us to train and recruit to unfilled vacancies.'

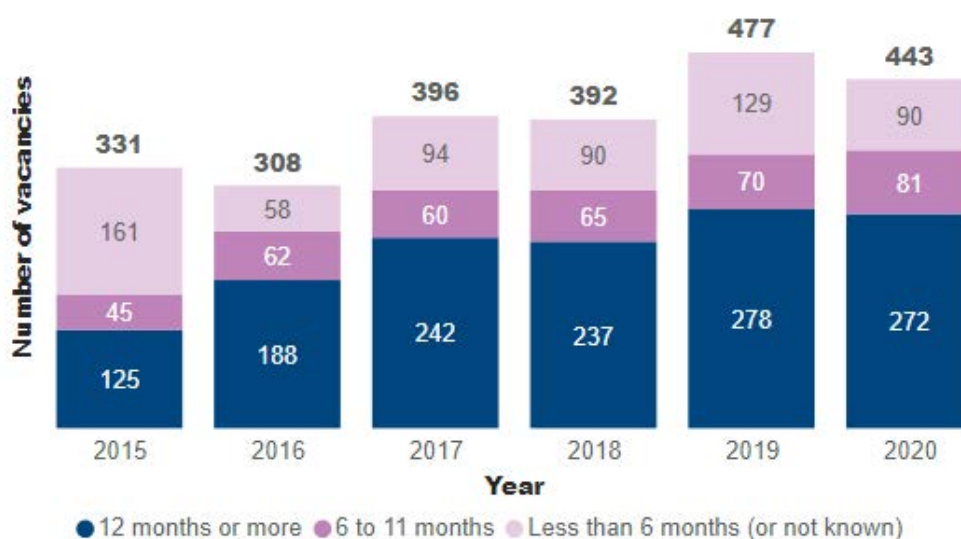
**Restructuring**

- 'Reconfiguration of duties within the department.'



CR consultant and SAS-grade radiologist vacancies are increasingly challenging to fill. This is highlighted by the growing proportion of vacancies that remain unfilled for over a year despite numerous recruitment attempts. In 2020, nearly two-thirds (62%) of CR consultant vacancies remained unfilled after a year compared to 38% in 2015. The five-year trend is shown in Figure 9.

**Figure 9. Number and length of radiologist vacancies – UK, five-year trend (2015–2020)**



Please see [Section 8](#) for information on vacancies and vacancy rates for specialty areas of practice.

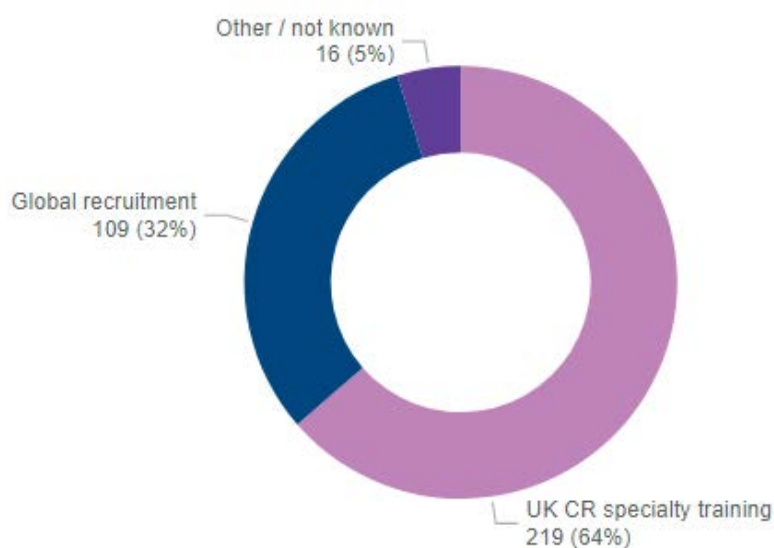
### 3.3 Recruitment

Census data show that 344 CR consultants (WTE) were recruited to the UK workforce over the past year (to September 2020). This is above the five-year average of 314 CR consultants (WTE), indicating some success with recruitment activities over the past year despite very challenging circumstances. Of newly appointed consultants over the past year:

- Approximately two-thirds (64%, n=219) came from UK clinical radiology specialty training.  
*[11% of this cohort joined the GMC clinical radiology specialty register more than five years ago, likely indicating that these are rejoiners to the workforce rather than new CR consultants.]*
- Approximately one-third (32%, n=109) are assumed global recruitment.  
*[These doctors undertook their primary medical qualification outside the UK and have not undertaken UK specialty training.]*
- The origin of the remaining 5% (n=16) is not known.  
*[This group includes older CR consultants returning to practice after taking time out and those whose GMC number is not known.]*

This is shown in Figure 10.

**Figure 10. Source of newly appointed clinical radiology consultants – UK, 2020**



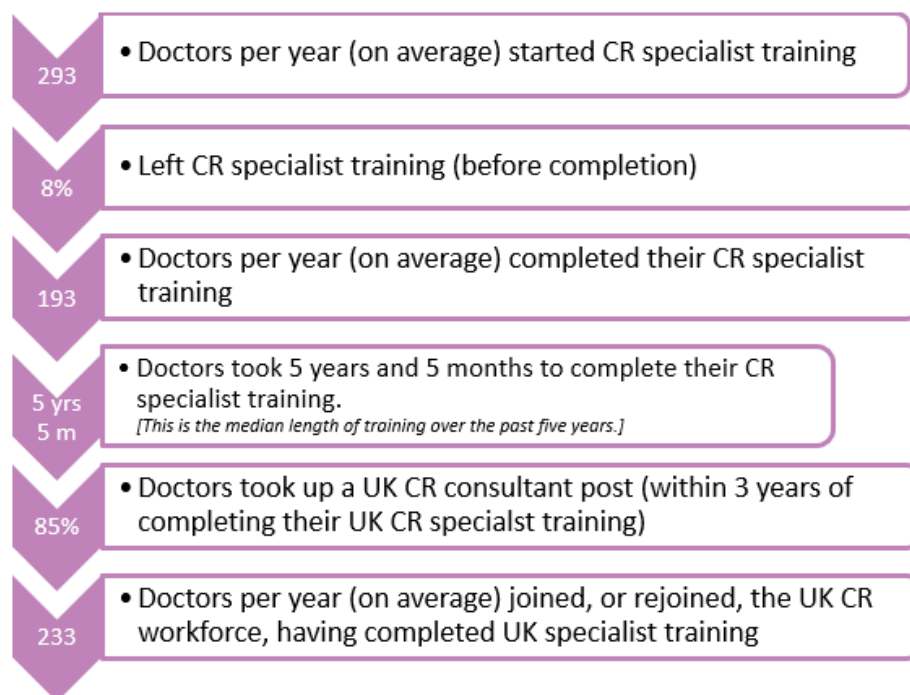
This pattern is similar to that seen in the UK over the past five years. However, there is national and regional variation in recruitment patterns. The level of (assumed) global recruitment over the past five years is approximately a third lower in Scotland and Wales than the UK average.

#### UK specialty training

An adequate supply of UK trainees is vital to ensure the UK clinical radiology workforce grows to meet patients' current and future diagnostic and interventional radiology needs. In regions where global recruitment is very challenging, an inadequate supply of UK trainees will likely mean that radiology services are unsustainable.

Figure 11 illustrates the flow of clinical radiology specialty trainees into UK CR consultant posts over the past five years.

**Figure 11. Supply of UK clinical radiology specialty trainees into the consultant workforce – UK, past five years (2015–2020)**

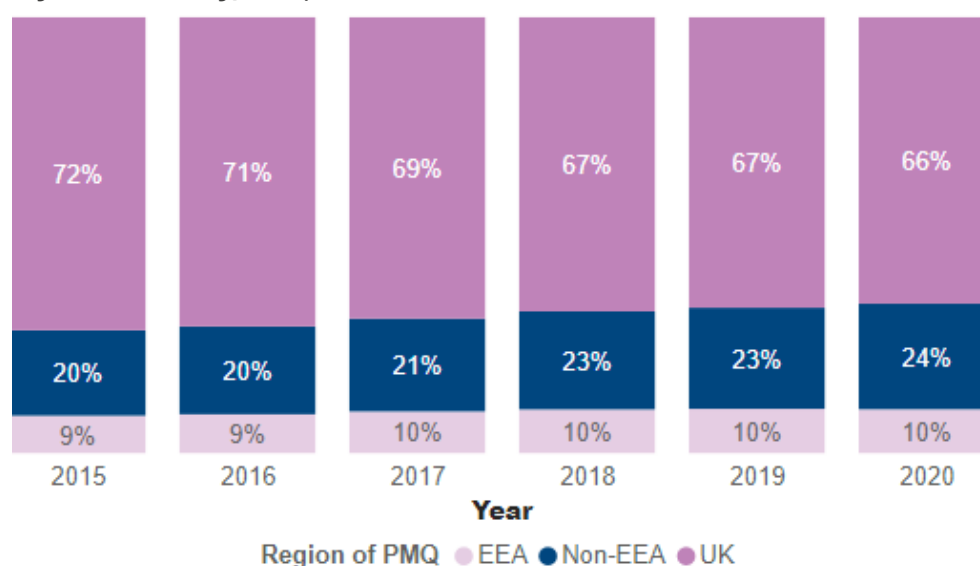


*[Please note this is not one cohort, so direct comparisons between categories are not possible. It takes clinical radiology specialty trainees roughly five to seven years to flow through these steps.]*

### Global recruitment

Over the past five years, radiology departments have increasingly turned to global recruitment to fill CR consultant and SAS-grade vacancies due to insufficient supply within the UK. Fuelled by recruitment from non-European Economic Area (EEA) countries, notably India, Pakistan and Egypt, the radiology workforce has gradually become more international. The non-EEA proportion of the UK CR consultant workforce has steadily grown from 20% to 24% over the past five years. EEA recruitment has not increased at the same pace in recent years; CR consultants from the EEA comprise 10% of the clinical radiology workforce compared to 9% five years ago. These trends are shown in Figure 12.

**Figure 12. Clinical radiology consultants' region of primary medical qualification (a proxy for nationality) – UK, 2020**



Global recruitment in this context refers to doctors recruited directly from outside the UK and global doctors who have undertaken UK clinical radiology specialty training (and chosen to remain in the UK).

Global recruitment challenges include visa processes, political uncertainty and English language requirements. Furthermore, for some trusts and health boards, attracting candidates to smaller radiology departments in more remote areas has proven very difficult. Global recruitment became even more challenging in 2020 due to the COVID-19 pandemic and associated sickness levels, self-isolation and restrictions of movement.

### 3.4. Retirement and other leavers

Over the past year, 134 CR consultants (WTE) left the workforce, equal to 4% attrition. This is on a par with the 4% average UK attrition rate seen over the past five years. It is a positive finding that attrition rates did not rise in 2020, given the significant workforce pressures including the COVID-19 pandemic and widespread radiology workforce shortages.

Over the past five years, annual attrition has been higher in Scotland (5% average) and lower in Northern Ireland (2% average), compared to the UK average (4%).

The median UK retirement age has remained steady at 60 years; census data show that full-time CR consultants tend to retire two to three years earlier than their LTFT counterparts. Over the past five years, the average retirement age for full-time CR consultants is 59 years, compared to 62 years for LTFT consultants.

## 4. Gap between supply and demand

Clinical radiology workforce shortages are widely acknowledged, including in Sir Mike Richards' *Diagnostics recovery and renewal report* and the *Getting it right first time (GIRFT) radiology report*.<sup>1,4</sup> This section estimates the extent of clinical radiology workforce shortages.

### 4.1 Estimated shortfall of CR consultants

There is an estimated shortage of 1,934 CR consultants across the UK, equivalent to a 33% shortfall. This is an average of estimates A, B and C outlined below, which consider population size, reliance on outsourcing, imaging volumes and the number of additional IR consultants required to provide 24/7 IR services to ensure patient safety.

- **Estimate A:** a shortfall of 1,442 CR consultants, which equates to 27%. This estimate is a sum of the following two components:
  1. **Diagnostic clinical radiology requirement:** An estimated 1,078 additional diagnostic CR consultants (WTE) are required based on the estimated reporting time for the X-rays (two minutes), CT (15 minutes) and MRI imaging examinations (20 minutes) carried out in FY 2019/20.<sup>12</sup> It is assumed that CR consultants report 90% of CTs and MRIs and 60% of X-rays across the UK.<sup>19-23</sup>
  2. **IR requirement:** Trusts and health boards need a minimum of six IR consultants (WTE) to provide an effective and sustainable 24-hour IR service. Alternatively, trusts and health boards need formal arrangements to transfer patients to other trusts and health boards for IR procedures. Census data indicate that the minimum number of additional IR consultants required in 2020 to meet these standards is 364.\* This equates to a 35% shortfall of IR consultants.
- **Estimate B:** The number of additional CR consultants needed to meet the European average of 12.8 radiologists per 100,000 population is 2,083.<sup>15</sup> This equates to a shortfall of 35%.
- **Estimate C:** The number of CR consultants' salaries that could be funded by 2020 insourcing, outsourcing and ad-hoc locum expenditure is 2,292 WTEs.<sup>24</sup> This equates to a shortfall of 36%.

There is national and regional variance in the severity of workforce shortages. The estimated shortfall is higher in Wales (37%) and lower in Northern Ireland (28%) than the UK average (33%). England and Scotland are broadly in line with the UK average.

Four UK regions have estimated workforce shortfalls above 40%: North and West Wales, the North of Scotland, North East England and the East Midlands. North and West Wales and the North of Scotland are of particular concern as census and training data indicate these regions are unlikely to see any clinical radiology workforce growth over the next five years.

\*This is likely to be an underestimate as units covering populations of more than one million will likely require eight or more IR consultants to ensure a safe and sustainable rota.<sup>9</sup>

## 5. Workforce shortfall management

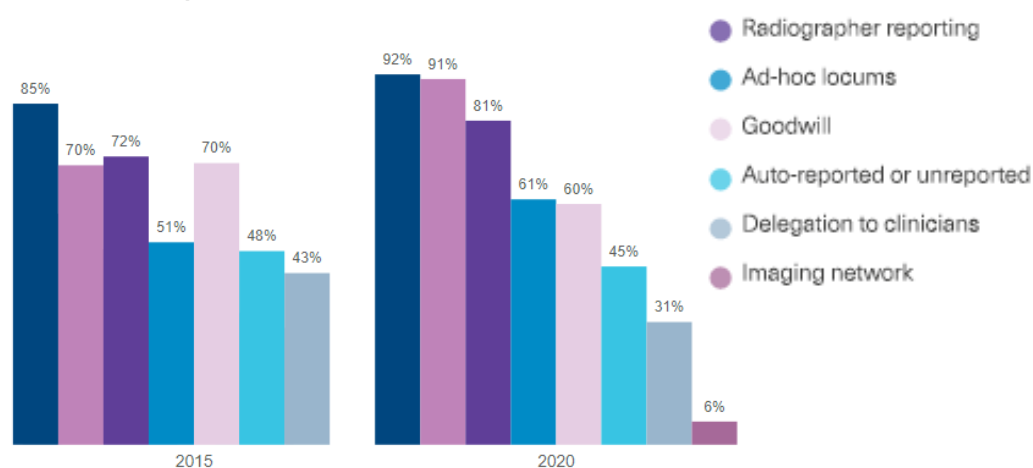
Only 1% of UK trusts and health boards met their reporting requirements within CR consultants' contracted hours in 2020. This compares to 8% in 2015, indicating that workforce shortages have increased over the past five years.

### 5.1 Methods used to manage workforce shortfalls

Trusts and health boards use various mechanisms to manage workforce shortages. The most frequently used are insourcing, outsourcing and radiographer reporting, as illustrated in Figure 13. These have become increasingly common over the past five years, as workforce shortages have increased. In 2020:

- Nine-in-ten trusts and health boards (92%) used insourcing, meaning department CR consultants undertaking additional paid reporting outside their contracted hours. Only specialist acute trusts did not use insourcing in 2020.
- Nine-in-ten trusts and health boards (91%) outsourced reporting to an independent sector company. Outsourcing expenditure is detailed in [Section 5.2](#).
- Eight-in-ten trusts and health boards (81%) used radiographer reporting, an increase from seven-in-ten trusts and health boards (72%) five years ago. However, radiographer reporting practice still varies significantly across trusts and health boards. One clinical director highlighted radiographer shortages, '[We have] ongoing training of reporting radiographers, but limited support ... to backfill their roles to enable increased reporting time.
- Almost half (45%) of trusts and health boards left images auto-reported\* or unreported. This is concerning due to the potential for diagnoses to be missed or delayed.

**Figure 13. Managing shortfalls in reporting capacity – UK, five-year comparison (2015 and 2020)**



Census data highlight the emergence of collaborative imaging networks. Six per cent of trusts and health boards reported using a network to help manage shortfalls in their reporting capacity in 2020. Other trusts and health boards commented that they were in the process of forming networks. Networks have many potential benefits, including increased flexibility and resilience through shared workforce capacity. They can also offer access to subspecialty opinions, supporting high-quality patient care and equality of access. However, networks do not in themselves increase the available workforce. Furthermore,

\*Auto-reporting is a standard response sent automatically to referrers, informing them that the imaging examination will not receive a formal radiology report and that it is their responsibility to provide one.

networks require an adequate IT infrastructure to support secure and efficient image sharing and ongoing IT support to troubleshoot and maintain services. Several trusts and health boards reported struggling with inadequate IT, which is slowing down the adoption of networks.

### Vetting of imaging requests

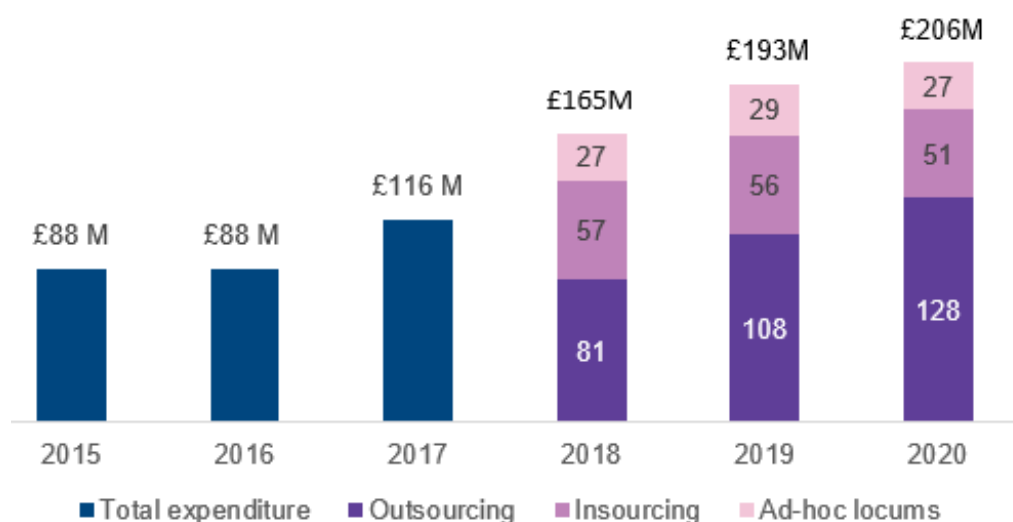
The census does not collect data on the use of vetting techniques for imaging referrals to minimise inappropriate imaging and patient radiation exposure. Evidence-based tools are available, notably, *iRefer*, which supports referring clinicians in determining the most appropriate imaging investigation(s) or intervention.<sup>18</sup> In complex cases, CR consultants provide expert advice to referring clinicians.

## 5.2. Expenditure on outsourcing, insourcing and ad-hoc locums

With the widespread use of outsourcing, insourcing and ad-hoc locums over the past five years, the annual census monitors the associated expenditure.

Combined outsourcing, insourcing and ad-hoc locum expenditure has increased significantly over the past five years. In 2020, estimated expenditure totalled £206 million; more than double the cost five years ago. This is shown in Figure 14.

**Figure 14. Estimated radiology expenditure (£ millions) on outsourcing, insourcing and ad-hoc locums – UK, five-year trend (2015–2020)**



[The years in this graph relate to financial years. For example, 2015 refers to the financial year ending 31 March 2015.]

From 2018 onwards, expenditure breakdown (outsourcing, insourcing and ad-hoc locum) was collected in the annual census. The components of the estimated £206 million expenditure in 2020 are as follows:

- **Outsourcing:** £128 million (62% of total expenditure) was spent on outsourcing reporting to the independent sector. The median expenditure per trust/health board was £521,000. Outsourcing costs have risen year-on-year; expenditure in 2020 was a stark 58% higher than 2018 costs.
- **Insourcing costs:** £51 million (25% total expenditure) was spent on insourcing, an 11% decrease from 2018 costs.
- **Ad-hoc locum costs:** £27 million (13% total expenditure) was spent on ad-hoc locums appointed to cover excess reporting workload, a 1% decrease from 2018 costs.

For context, the outsourcing expenditure of £128 million is equivalent to the combined salaries of a third of the current CR consultant workforce. Some radiology clinical directors expressed concern regarding outsourcing expenditure, as it 'results in less money for patient care.'

Table 4 shows the estimated outsourcing, insourcing and ad-hoc costs across the four UK countries in 2020. Relative to population size, Northern Ireland had the highest expenditure in 2020 at £5.41 per head of population, compared to the UK average expenditure of £3.08 per head of population.

**Table 4. Estimated radiology expenditure (£ millions) on outsourcing, insourcing and ad-hoc locums – UK countries, 2020**

Country	Outsourcing	Insourcing	Ad-hoc locums	Total expenditure	Total expenditure per head of population
England	£112.0 m	£42.9 m	£18.8 m	£173.7 m	£3.09
Northern Ireland	£4.6 m	£2.9 m	£2.7m	£10.2 m	£5.41
Scotland	£6.6 m	£3.5 m	£3.6 m	£13.8 m	£2.52
Wales	£5.1 m	£1.3 m	£1.7 m	£8.1 m	£2.58
<b>Total</b>	<b>£128.3 m</b>	<b>£50.7 m</b>	<b>£26.8 m</b>	<b>£205.9 m</b>	<b>£3.08</b>

Total UK expenditure on outsourcing, insourcing and ad-hoc locums increased by 7% over the past year. Estimated expenditure in Northern Ireland rose the most (by 10%), while Scotland was the only UK country where expenditure fell (by 5%).



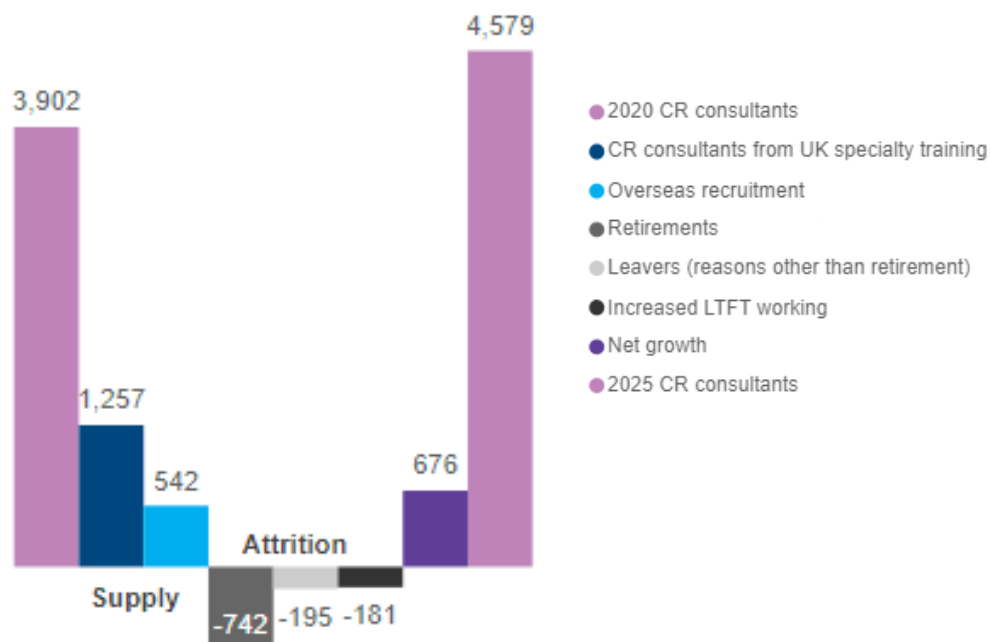
## 6. Five-year forecast supply and demand

The primary inflows and outflows impacting the CR consultant workforce capacity are new entrants from UK specialty training and global recruitment, set against attrition from retirements and other leavers. Workforce capacity is also impacted, though often to a lesser extent, by LTFT working and staff absence levels.

### 6.1 Forecast supply of CR consultants – next five years (2020–2025)

Comprehensive data on CR consultant joiners, leavers and working patterns have been captured through the RCR censuses and training data over the past ten years. Figure 15 illustrates the forecast CR consultant workforce (WTE) in five years (2025) based on trends observed over the past five years. An estimated 4,579 CR consultants (WTE) will be in post in the UK in 2025.

**Figure 15. Forecast supply of clinical radiology consultants (WTE) – UK, next five years (2020–2025)**



Workforce growth is forecast to slow down from the 4% per year growth seen over the past five years to 3% per year over the next five years. Slow growth is forecast for Wales and Scotland (2% per year) and Northern Ireland (1% per year) over the next five years.

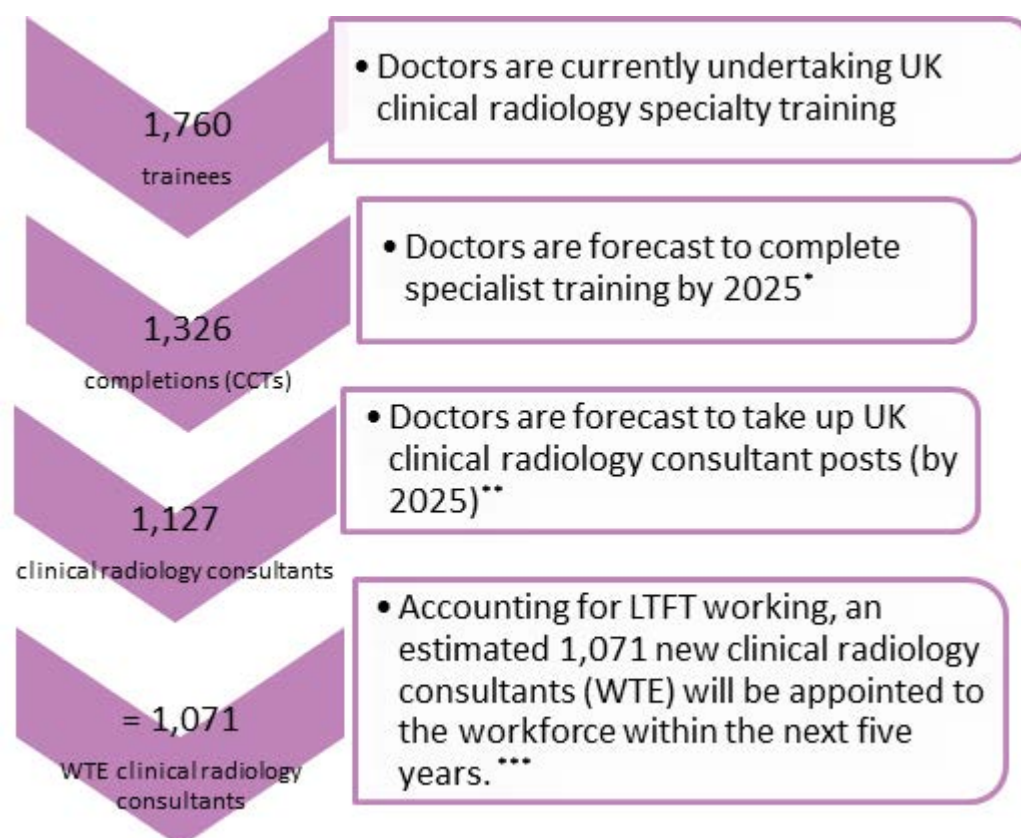
The following paragraphs explain the data and assumptions behind this forecast.

**Section 6.2** considers the gap between the forecast supply of CR consultants and the forecast demand for radiology services in 2025.

### Forecast supply from UK specialty training

An estimated 1,071 WTEs will join the CR consultant workforce over the next five years. This is based on the number of CR specialty trainees in training as of September 2020 and the trends observed over the past five years. The key components of this forecast are outlined in Figure 16.

**Figure 16. Forecast supply of UK clinical radiology trainees to the UK consultant workforce – next five years (2020–2025)**



\*Based on 8% attrition and training taking five years and five months.

\*\*Based on 85% of doctors taking up UK NHS CR consultant posts by 2025.

\*\*\*Based on 5% workforce capacity loss due to LTFT working (the observed level over the past five years for this age group).

In addition to the forecast outlined in Figure 16, which is based on current trainees, an estimated 183 CR consultants (WTE) will join the workforce within the next five years from the 'recently completed training' cohort. It is not uncommon for doctors to take-up consultant posts one or two years after completing their specialty training.

The total workforce forecast from UK specialty training is 1,253 CR consultants (WTE). This forecast is 14% higher than the post-specialty training intake observed over the past five years, reflecting increased clinical radiology specialty training places across the UK in recent years.

The 251 CR consultants (WTE) forecast to join the workforce in 2021 (following completion of UK specialty training) will only fill approximately half (58%) of the 433 CR consultant vacancies reported in 2020. Therefore, the forecast intake is woefully inadequate to cover the estimated 148 upcoming retirements in 2020.

### Forecast supply from global recruitment

Over the past five years, 542 CR consultants have been recruited from outside the UK. These are doctors who undertook their PMQ (medical degree or equivalent) outside the UK and have not undertaken UK clinical radiology specialty training. The forecast in Figure 15 assumes no change to the pace of recruitment over the next five years.

### Forecast retirements and other leavers

The median retirement age has remained steady at around 60 years for the past five years. Based upon a median retirement age of 60, an estimated 742 CR consultants (WTE), equivalent to 19% of the current workforce, will retire over the next five years. In Wales, a higher proportion of CR consultants are approaching retirement age, resulting in a retirement forecast of 23% of the current workforce.

Assuming the annual workforce attrition rate of 1% for other leavers (that is, all leavers excluding retirements) observed over the past five years remains unchanged, attrition in the next five years for this cohort is an estimated 195 CR consultants (WTE).

### Increase in less-than-full-time (LTFT) working

In 2020, the total UK workforce capacity reduction due to LTFT working equated to 375 WTE CR consultants (9% of the workforce). Levels of LTFT working are broadly similar across UK countries, between 7% and 9% workforce capacity reduction. This is shown in Table 5.

**Table 5. Workforce capacity reduction due to LTFT working, CR consultants – UK countries, five-year comparison (2015 and 2020)**

	England	Northern Ireland	Scotland	Wales	UK total
2015	-6%	-6%	-5%	-8%	-6%
	-158 WTE	-7 WTE	-16 WTE	-13 WTE	-193 WTE
2020	-9%	-7%	-8%	-8%	-9%
	-320 WTE	-12 WTE	-30 WTE	-13 WTE	-375 WTE

Over the past five years, the UK CR consultant workforce capacity loss due to LTFT working has increased by 3% or the equivalent of 181 CR consultants (WTE). If the trend of increased LTFT working continues linearly, we can expect a workforce capacity loss of at least 181 CR consultants over the next five years.

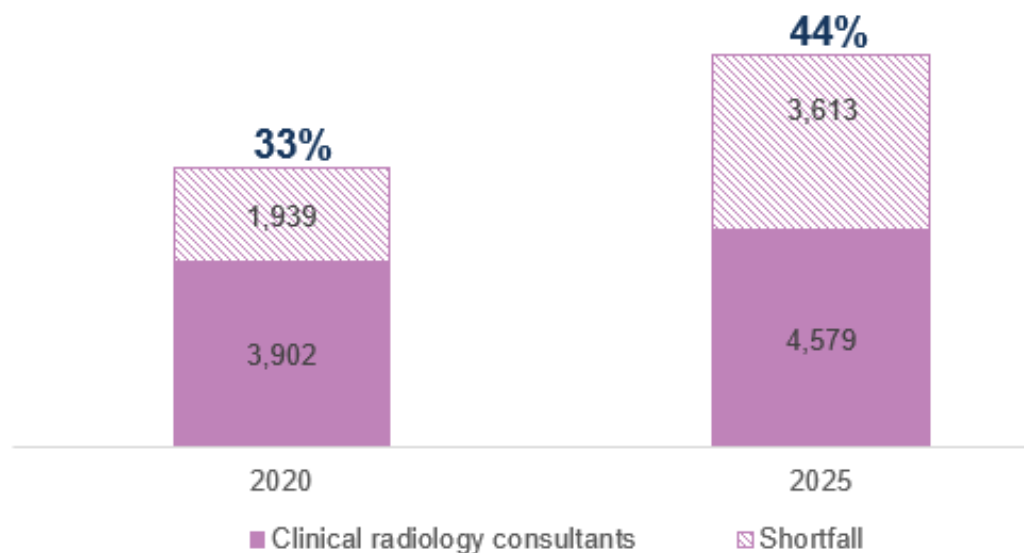
## 6.2 Forecast shortfall of CR consultants

The gap between CR consultant supply and demand will continue to grow over the next five years by an estimated 4% per year. This forecast is based upon the following difference between supply and demand:

- The demand for complex imaging (CTs and MRIs) is forecast to increase by 7% per year (on average) over the next five years, reflecting growth over the past five years.<sup>5</sup> It is estimated that the diagnostic CR consultant workload will also increase by 7% per year.
- The supply of CR consultants is forecast to grow by 3% per year over the next five years (see [Section 6.1](#)).

The CR consultant workforce shortfall is forecast to increase to an estimated 3,613 by 2025. This shortfall of 44% is illustrated in Figure 17.

**Figure 17. Forecast shortfall of clinical radiology consultants – UK, 2020 and 2025**



### 6.3 Workforce forecast scenarios

The CR consultant forecast in **Section 6.1** is based on inflow and outflow trends over the past five years continuing over the next five years. This section considers the impact of increases or decreases to workforce supply components over the next five years. Positive and negative scenarios are outlined in Table 6. This table does not consider the likelihood of the scenarios but rather illustrates which supply components have the most significant impact on the workforce size.

**Section 6.1** forecasts 3% growth per year in the CR consultant workforce over the next five years. However, Table 6 shows that if supply is increased by 25%, we can expect the CR consultant workforce to grow by 7% per year over the next five years. Conversely, if the supply factors decrease by 25%, we can expect the workforce growth to slow down to 1% per year over the next five years.

Table 6 highlights that the most significant component of CR consultant supply is UK specialty trainees.

**Table 6. Workforce scenarios – CR consultant workforce, next five years (2020–2025)**

Supply	Scenario A 25% increase	Scenario B 25% decrease
Increase in clinical radiology specialty trainees	+314	N/A
Clinical radiology specialty trainee attrition	N/A	-27
Global recruitment	+136	-136
Radiographer reporting (X-rays)*	+93	N/A
CR consultant retirements	+186	-186
Other attrition (leavers)	+49	-49
<b>Total impact (2025)</b>	<b>+778</b>	<b>-398</b>
<b>Annual workforce growth rate</b>	<b>7%</b>	<b>1%</b>

[This table does not consider the timescales for clinical radiology specialty training.]

\*Based on X-rays undertaken in England in FY 2019/20, uplifted by 15% to account for devolved nations X-ray volumes. Based on X-rays taking an average of two minutes to interpret and report.<sup>12</sup>

## 7. Interventional radiology

Interventional radiology consultants (IR consultants) are specialist radiologists who undertake additional clinical radiology training in minimally invasive image-guided procedures to treat both emergency and chronic conditions. There are several types of IR consultants, including:

- **Vascular IR consultants:** specialists who treat vascular conditions such as blockage of arteries (vascular disease), enlargement of blood vessels (aneurysms) and bleeding (haemorrhage)
- **Non-vascular IR consultants:** treat non-vascular conditions, including cancer and sepsis
- **Interventional neuroradiologists (INRs):** undertake minimally invasive procedures in the brain and spinal cord, for example, to treat stroke.

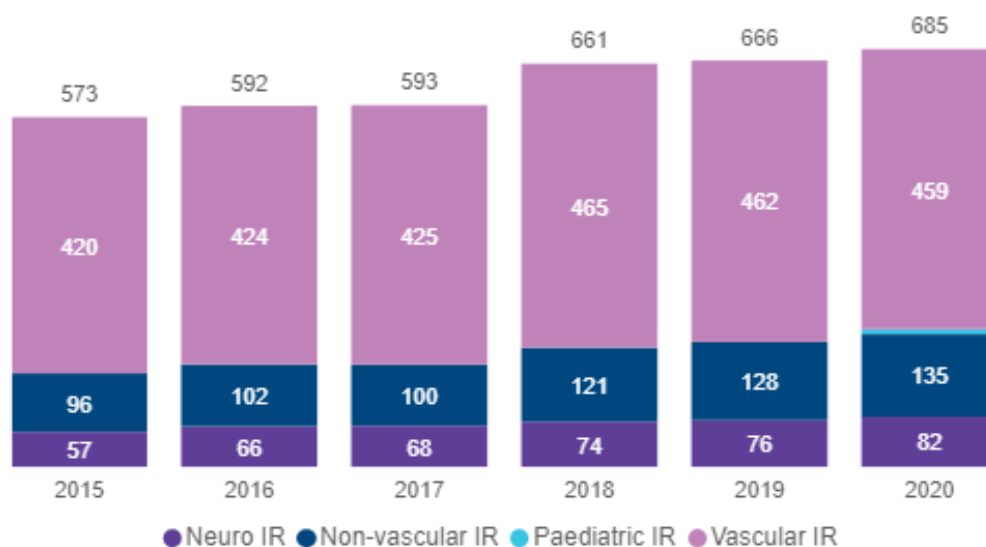
Over the past five years, the UK IR consultant workforce has grown by an average of 4% per year, keeping pace with the overall CR consultant workforce growth. The five-year trend is shown in Figure 18.

Average annual growth (over the past five years) by type of IR consultant is:

- Vascular: 2%
- Non-vascular: 7%
- Interventional neuroradiologists: 7%.

Despite relatively strong growth in the neuroradiology and non-vascular IR workforce, **Section 8** highlights persistently high vacancy rates for all types of IR consultants, averaging 8–10% over the past five years.

**Figure 18. Interventional radiology consultants (WTE) – UK, five-year trend (2015–2020)**



**Paediatric interventional radiology**

Paediatric IR is a growing area within IR. Census data on paediatric IR consultants were collected for the first time in 2020. Eight paediatric IRs were reported in England. None were reported in the devolved nations. Allowing for possible under-counting in the first year of data capture, this still means that most of the 30 UK children's hospitals do not have a dedicated paediatric interventional radiology consultant. Furthermore, only one children's hospital can offer 24/7 paediatric IR services.

An increase in the paediatric IR workforce is required to ensure more children benefit from minimally invasive IR procedures, which reduce risk (compared with more invasive surgery) and reduce the length of hospital stay (which benefits patients and reduces costs).

In practice, there is considerable overlap between diagnostic and interventional radiology. Approximately one third (30%) of the UK IR consultants reported through the 2020 census practised both.

- 12% (n=85) are primarily diagnostic radiologists with IR as a secondary area of practice.
- 18% (n=123) are primarily IR consultants with diagnostic radiology as a secondary area of practice.
- 70% (n=477) are IR consultants (without diagnostic radiology as a primary or secondary area of practice).

In addition, at most UK trusts and health boards, routine image-guided procedures including biopsies and drainages are frequently performed by diagnostic radiologists. In 2020, nine-in-ten trusts and health boards (88%) reported that some (or all) of their CR consultants carried out image-guided biopsies and eight-in-ten trusts and health boards (79%) reported that some (or all) of their CR consultants carried out image-guided drainages.

Due to the considerable overlap between diagnostic and interventional radiology, workforce shortages across clinical radiology reduce the workforce capacity for interventional radiology (and vice versa).

Table 7 shows the distribution of IR consultants across UK countries.

**Table 7. CR consultants (WTE) with a primary or secondary area of practice in interventional radiology – UK, 2020**

Country	Neuro IR	Non-vascular IR	Paediatric IR	Vascular IR	Total
England	74	114	8	403	599
Northern Ireland	2	8	0	12	22
Scotland	4	8	0	28	39
Wales	2	6	0	16	24
<b>Total</b>	<b>82</b>	<b>135</b>	<b>8</b>	<b>459</b>	<b>685</b>

The IR workforce has shrunk over the past five years in Scotland and Wales.

- **Scotland** has seen a decrease of ten IR consultants, equal to 20% of the IR consultant workforce.
- **Wales** has seen a decrease of two IR consultants, equal to 8% of the IR consultant workforce.

A reduced workforce has contributed to increased IR shortages in Scotland and Wales. Across the UK, there is wide variability in the number of IR consultants per head of population. Such figures are simplistic and do not account for national differences in demand or working practices. However, they give a broad indication of the relative supply of IR consultants across UK countries. While England and Northern Ireland have 11 and 12 interventional radiology consultants per million population (respectively), Wales has eight and Scotland only seven.

Women continue to be under-represented in IR; 2020 census data indicate that just over one-in-ten IR consultants (12%) are women. In comparison, four-in-ten diagnostic radiology consultants (37%) are women. Over the past five years, the proportions of female IR consultants and CR consultants have increased by 2%.

### IR recruitment and retirements

Over the past five years, the UK IR workforce has grown by an average of 24 IR consultants (WTE) per year. This growth is the net result of approximately 50 IR consultants (WTE) joining (or rejoining) the IR workforce each year and around 26 IR consultants (WTE) leaving. Annual attrition is approximately 4% per year, which is on a par with attrition across the clinical radiology workforce as a whole. Over the past five years, census data do not show any clear trend of increasing or decreasing numbers of IR consultants joining or leaving the UK workforce.

Of the newly appointed IR consultants over the past five years:

- Almost three-quarters (73% or 36 per year, on average) came from UK specialty training. This includes new joiners and rejoiners. On average, 19 doctors were added to the GMC IR subspecialty register each year (for the past five years)
- One-in-five (21% or 11 per year, on average) are assumed global recruitment *[These doctors undertook their primary medical qualification outside the UK and have not undertaken UK specialty training.]*
- The origin of the remaining 6% (three per year, on average) is not known. *[This group includes older IR consultants returning to practice after taking time out and those whose GMC number is not known.]*

Compared to the diagnostic CR consultant workforce (of whom an estimated 32% are from global recruitment), fewer IR consultants are recruited globally.

### IR forecast next five years

Without further investment in IR subspecialty training places, there will be an estimated 801 IR consultants (WTE) in post in the UK in five years (2025), equivalent to a 3% annual increase, or a total increase of 116 IR consultants. This forecast is based on the following supply and attrition data.



### Supply

- **UK training:** 216 IR consultants (WTEs). This forecast assumes no change in training places or attrition rates from the past five years.
- **Global recruitment:** 64 IR consultants (WTE). This forecast assumes no change from levels over the past five years.

If there is no increase in IR subspecialty training places, a total of 280 IR consultants (WTE) – an average of 56 per year – are forecast to join the workforce over the next five years.

### Attrition

- **Retirements:** 130 IR consultants (WTE). One-in-five (20%) of the vascular and non-vascular IR workforce are forecast to retire over the next five years, along with one-in-seven (14%) of the interventional neuroradiology workforce.  
*[Based on the average age of retirement of CR consultants of 60 years.]*
- **Other leavers:** 34 IR consultants (WTE) equivalent to 1% per annum.  
*[Based on the average clinical radiology attrition rate for non-retirees over the past five years.]*

A total of 164 IR consultants (WTE) – an average of 33 per year – are forecast to leave the workforce over the next five years. This equates to estimated attrition of 4% per year. This highlights the importance of workforce retention, especially for IR consultants approaching retirement age.

### Interventional radiology service provision

For patients' safety, guidelines recommend that timely access to IR is available regardless of geography and hospital size. Services consisting of a minimum of six IR consultants will usually be sufficient to provide an effective and sustainable 24-hour IR service. However, services should ensure an appropriate balance of vascular and non-vascular IR consultants on their rota or run more than one rota, to provide cover for all interventional procedures. Units covering populations of more than one million will likely require eight or more IR consultants.<sup>9</sup>

Interventional neuroradiology services are generally run as specialist services separate from vascular and non-vascular IR services. Trusts and health boards require sufficient interventional neuroradiologists to provide a safe and sustainable 24-hour neuroradiology service, which should include mechanical thrombectomy services for acute stroke patients.\*

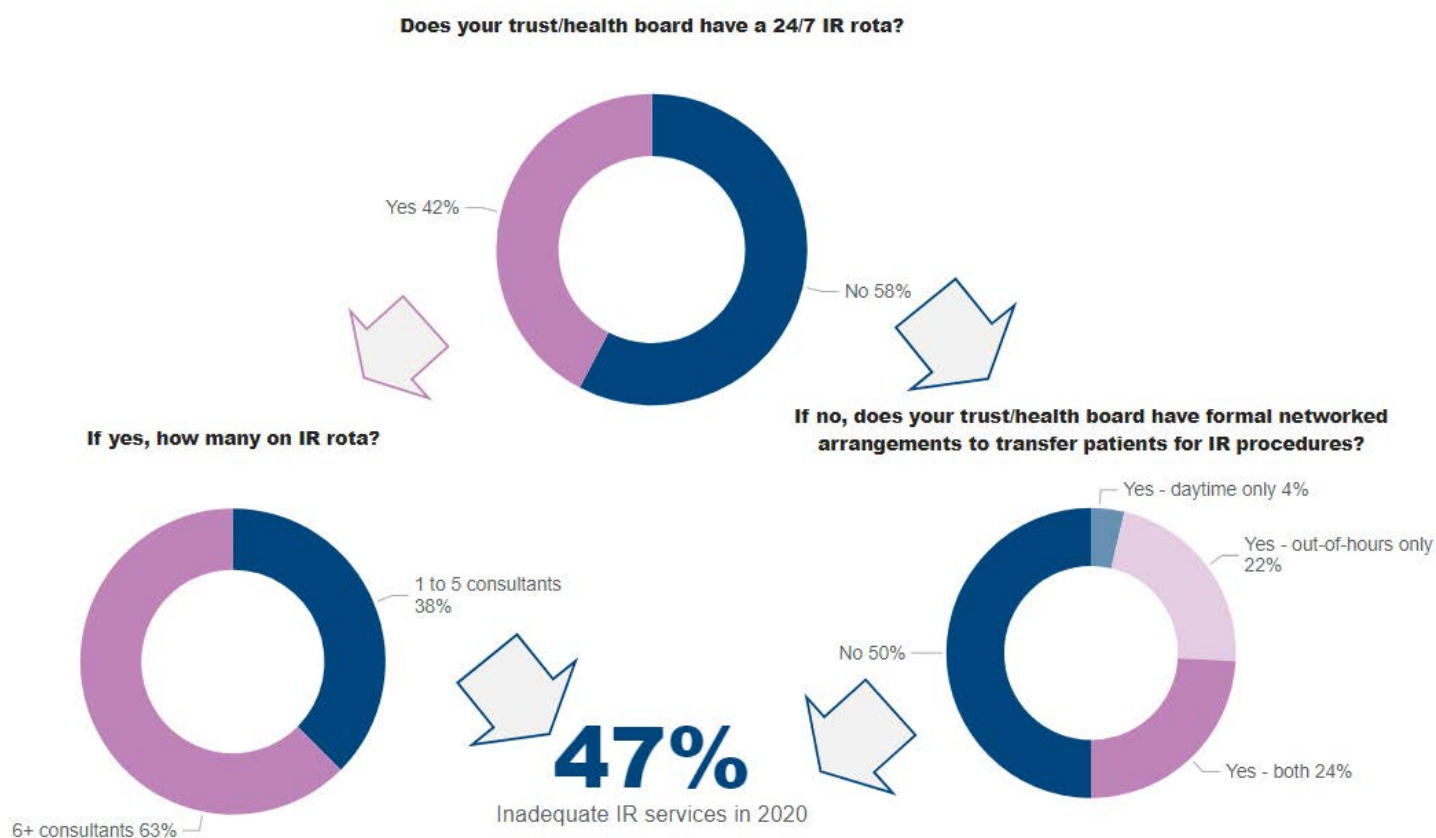
Almost half of trusts and health boards (47%, n=88) did not provide adequate 24/7 IR services in 2020.

- One-in-five trusts and health boards (16%, n=30) had a 24/7 IR rota comprising fewer than the recommended minimum of six IR consultants.
- More than a quarter of UK trusts and health boards (29%, n=54) did not operate a 24/7 IR rota and did not have formal networked arrangements in place to transfer patients for IR procedures either.
- A few trusts and health boards (2%, n=4) did not operate an IR rota and had formal networked transfer arrangements to transfer patients for IR procedures during the daytime only.

\*Mechanical thrombectomy involves clot retrieval, which aims to restore normal blood flow to the brain. Evidence suggests the quicker this intervention is delivered, the greater the benefits. Prompt treatment can prevent irreversible brain damage and long-term disability.<sup>25</sup>

These data are shown in Figure 19.

**Figure 19. Frequency of 24/7 interventional radiology (IR) rotas and formal transfer arrangements for IR procedures – UK trusts and health boards, 2020**



The lack of 24/7 IR services creates an unacceptable risk for patients. For example, clinical trials show that if eligible patients with acute stroke are treated rapidly with mechanical thrombectomy (an IR procedure), their prospects for independent recovery are significantly improved.<sup>26,27</sup>

Several clinical directors of imaging departments expressed concern regarding IR workforce shortages, for example:

- 'Chronically understaffed IR department.'
- 'We cannot provide an IR on-call service ... not only is there a shortage of radiologists, but radiographers and nurses.'
- 'IR service badly hit. I lost an IR recently. Difficult to recruit new ones.'
- 'When there is a rota gap, we have to hope one of the IRs is about. If not, it is approximately fifty miles to the next IR unit.'
- 'We have been struggling to recruit an interventional radiologist for over a year.'

The principal causative factor of inadequate 24/7 IR services is insufficient numbers of trained IR consultants.

**Estimated shortfall of IR consultants**

For all trusts and health boards to have a minimum of six IR consultants to provide an effective and sustainable 24-hour IR service, an additional 364 IR consultants (WTE) are required.<sup>9</sup> This equates to a 35% shortfall.

This shortfall means there are insufficient IR consultants to provide life-saving IR procedures to ensure patient safety.

The forecast increase of 116 IR consultants over the next five years covers a mere third (32%) of the current shortfall of 364 IRs. Furthermore, there is no provision for the growing demand for IR services. This means that the significant present risk to patient safety will increase unless urgent action is taken to address workforce shortfalls.

## 8. Specialty areas of practice and ARSAC licences

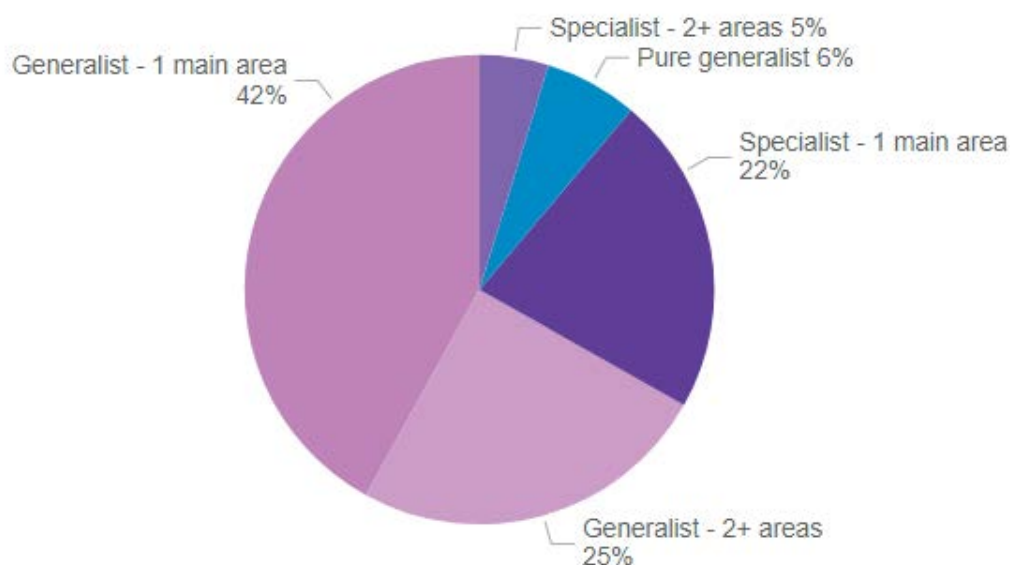
### 8.1 Specialty areas of practice

The vast majority of CR consultants (98%, n=4,197) are employed in NHS posts. A small number (2%, n=80) work in academic or mixed NHS/academic jobs. The academic workforce has seen no growth over the past two years. The lack of expansion in academic capacity within radiology in recent years is concerning given the importance of teaching and research within clinical radiology. Research is crucial to support improvements in patient care, as it generates evidence on ways to prevent, diagnose and treat medical conditions more effectively.

As well as capturing whether consultants held NHS or academic contracts, CR consultants are categorised as generalists or specialists. In 2020, approximately three-quarters of CR consultants (73%) in England were classified as generalists. Just over a quarter (27%) were classified as specialists. The proportion of specialists was lower in the devolved nations, where approximately 16% of CR consultants were reported as being specialists.

The majority of generalists and specialists across the UK have one main subspecialty area of practice; pure generalists comprise only 6% of the UK CR consultant workforce. This is shown in Figure 20.

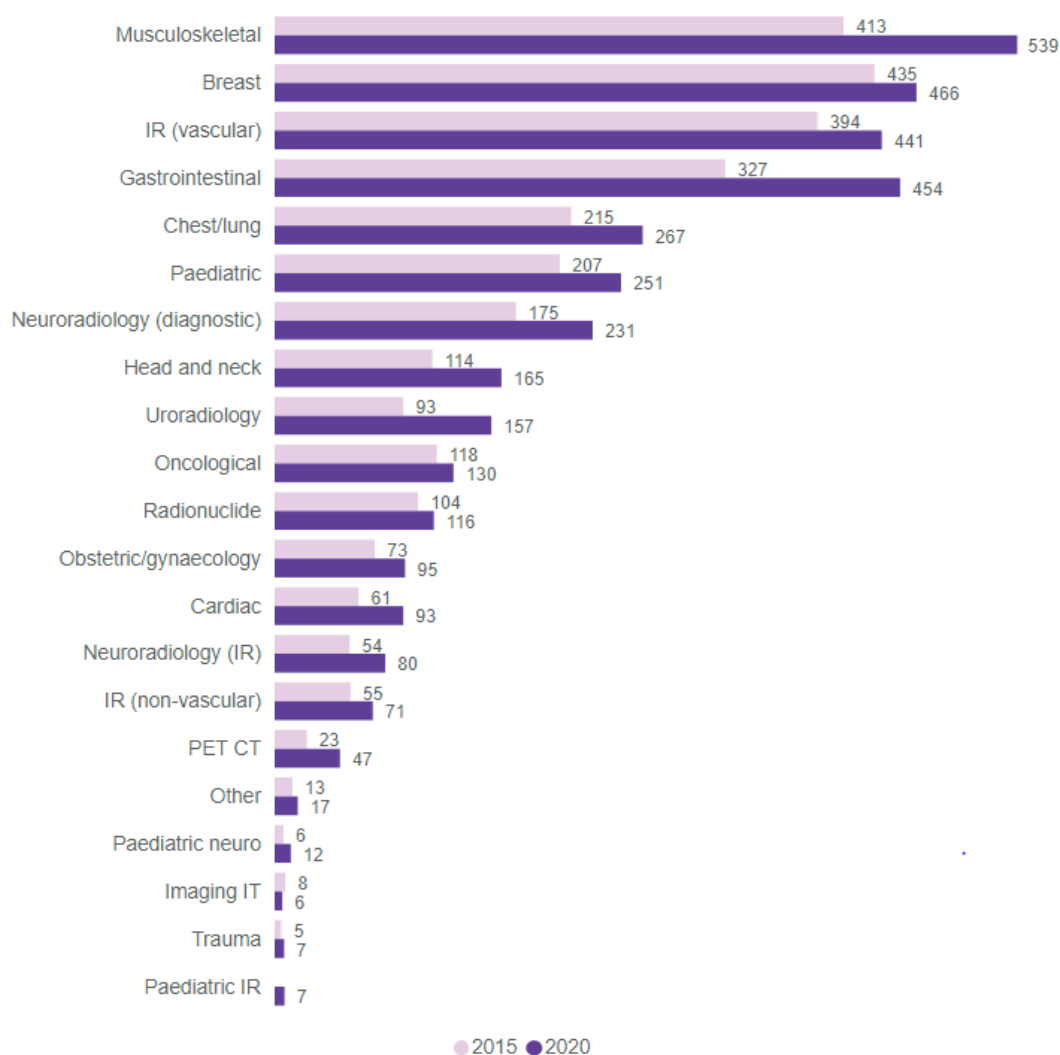
**Figure 20. Specialist and generalist clinical radiology consultants by type – UK, 2020**



### Specialty areas of practice and vacancy rates

The census collects information on CR consultants' primary and secondary specialty areas of practice. Figure 21 compares CR consultants' primary specialty areas of practice in 2020 with the equivalent picture in 2015. The largest increase in WTEs has been in gastrointestinal and musculoskeletal CR consultants (annual growth averaged 7% and 6% respectively). By contrast, there have been minimal increases in numbers of breast CR consultants (average 1% per annum) and vascular IR consultants (average 2% per annum).

**Figure 21. Primary specialty areas of practice, clinical radiology consultants – UK, five-year comparison (2015–2020)**



\*Other includes medical education, research, forensic and endocrine radiology.

### Vacancies for specialist CR consultants

Three-quarters (77%, n=334) of CR consultant vacancies in 2020 specified one or more specialty area of practice. The other quarter (23%, n=99) sought pure generalists and/or reflected radiology clinical directors taking a flexible approach to the specialty areas of practice sought. Flexibility appears to be beneficial for global recruitment in particular; over the past five years, almost a third (30%) of CR consultants recruited globally were pure generalists, which compares to 6% (pure generalists) of the CR consultant workforce. This flexibility means that vacancy rates by primary area of practice, outlined in Table 8, likely do not fully reflect demand. Nonetheless, these data are valuable indicators of comparative shortages and trends over time.

Breast CR consultants and vascular IR consultants were the most in-demand specialists in 2020 (with 41 and 38 vacancies, respectively) as shown in Table 8. This is consistent with the past two censuses, indicating persistent shortages of these specialists. These two specialist areas have seen minimal growth over the past five years; the number of breast CR consultants has increased by 1% per year (on average) and the number of vascular IR consultants by 2% per year (on average), compared to 4% average CR consultant workforce growth. Moreover, there is a relatively high proportion of breast CR consultants due to retire within five years – 24% compared to the CR consultant average of 19%. The shortage of breast CR consultants is highly likely to rise further over the next five years unless mitigating action is taken.

Workforce shortages are widespread across specialist groups. Vacancy rates were highest in 2020 for oncological, head and neck and paediatric radiologists. Vacancy rates for specialists in these areas have been persistently high (average over 10%) over the past five years for these areas of practice.

In addition, chest/lung radiology has had a vacancy rate of over 10% for the past two years, indicating that workforce shortages have worsened in recent years for these specialists. There is also a relatively high proportion of chest/lung radiologists due to retire within five years – 25% compared to the CR consultant average of 19%. The shortage of chest/lung radiologists is also highly likely to rise further over the next five years unless mitigating action is taken.

**Table 8. Primary area of practice sought for vacant consultant clinical radiology posts – UK, 2020**

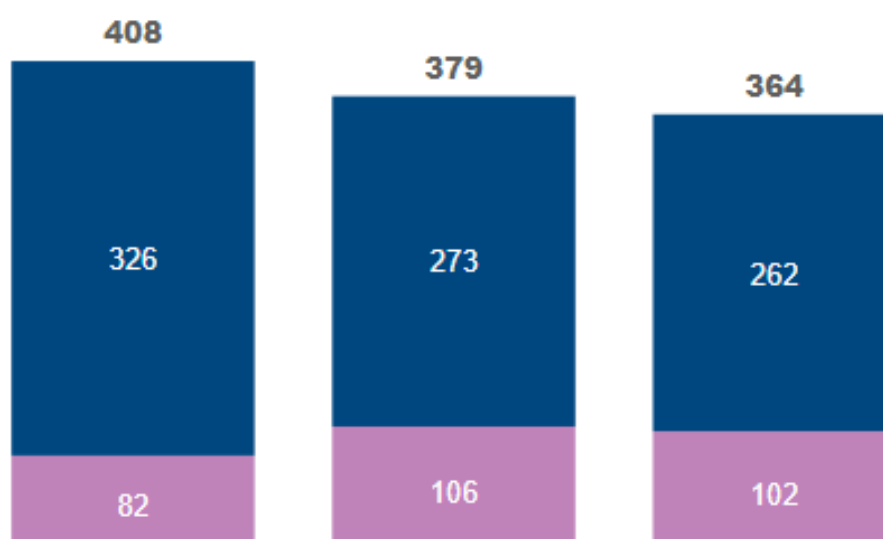
Primary area of practice	Vacancies 2020	Vacancy rate 2020	Average vacancy rate (2015–2020)
Oncological	19	13%	11%
Head and neck	22	12%	12%
Paediatric	34	12%	11%
Uroradiology	20	11%	10%
Chest/lung	30	10%	8%
Neuroradiology (IR)	9	10%	9%
Breast	41	8%	8%
Neuroradiology (diagnostic)	20	8%	8%
IR (vascular)	38	8%	8%
Radionuclide	9	7%	7%
Obstetric/ gynaecology	7	7%	9%
IR (non-vascular)	5	7%	10%
Cardiac	7	7%	8%
Gastrointestinal	31	6%	6%
Musculoskeletal	31	5%	7%

## 8.2 Administration of Radioactive Substances Advisory Committee (ARSAC) licence holders

A core function of radiology departments is to ensure strict adherence to radiation compliance policies and procedures to ensure patient safety. It is a legal requirement to have an ARSAC licence to carry-out nuclear medicine procedures. Single-photon emission computed tomography (SPECT) and positron emission tomography (PET-CT) scans are two of the most commonly used imaging techniques in nuclear medicine; they are increasingly used to diagnose disease. Over 600,000 nuclear medicine imaging examinations took place in 2020 in England.<sup>5</sup>

ARSAC licence holders, who ensure patient exposure to radioactive substances is clinically justified, are CR consultants or nuclear medicine physicians. The census collects data on the numbers of ARSAC licence holders employed by trusts and health boards – the results are shown in Figure 22. Over the past five years, there has been an 11% decline in ARSAC licence holders from 408 in 2015 to 364 in 2020.

**Figure 22. ARSAC practitioner licences holders – UK, five-year trend (2015–2020)**



*[A few trusts and health boards were unable to provide ARSAC licence holder data. The size of the 'not known' category was 10% in 2015, 5% in 2019 and 4% in 2020.]*

In relation to the growing shortage of ARSAC licence holders, several radiology clinical directors commented on the rigorous application process. Others commented that their current ARSAC licence holders are either approaching retirement age or have retired and returned. A few radiology clinical directors commented that they were (or would soon be) reliant on contractual agreements with other trusts and health boards to provide nuclear medicine procedures for their patients.

To ensure that patients continue to benefit from nuclear medicine techniques and developments, trusts and health boards must ensure succession plans are in place for ARSAC licence holders.



## 9. Recent developments impacting on clinical radiology

Imaging and IR services are essential to meeting national ambitions across the NHS, including cancer, stroke and, in the shorter term, recovery in the era of COVID-19.

Despite the efforts of the RCR to collaborate with partner organisations and policy makers and making the case to those who hold the purse strings, the continued staff shortages in our specialty remain untenable for staff and patients alike. However, silver linings emerged from the cloud of the COVID-19 pandemic; diagnostics and interventional procedures have been more widely recognised as fundamental to the smooth running of many services and pivotal to national ambitions for cancer care.

National initiatives for imaging have emerged in the last year and are gaining traction. The Sir Mike Richards report *Diagnostics: recovery and renewal* from October 2020, the NHS Getting it right the first time national programme (2020) *Radiology GIRFT programme national specialty report*, *Cancer services recovery plan* for England and the Scottish Government's *Recovery and redesign: an action plan for cancer services* strategy all make the strong case for urgent increases in the radiology workforce.<sup>1-4</sup>

Emergency measures implemented as a result of the pandemic include:

- Rapid facilitation of home reporting of images
- A national impetus for community diagnostic hubs that act as a one-stop shop for patients in a COVID-19-safe environment
- Deployment of scanning equipment
- Increased use of interventional radiology as a non-invasive alternative to open surgery.

These positive measures are to be applauded and built upon so that an agile and sustainable radiology service is available to all patients across the UK.

To capitalise on this window of opportunity, we have published our policy priorities for the next five years, which serve as a framework for focusing our efforts.<sup>28,29</sup> The three key pillars are maximising the workforce, providing the tools necessary for optimum patient care and supporting and nurturing new ways of working.

To this end, we welcome the opportunity to engage with the Department of Health and Social Care, the devolved administrations and the NHS across the UK in ensuring that radiology services can be delivered safely and effectively and designed around patients' needs. To help alleviate the issues highlighted in this report, the RCR will work to enact the following.

- **Increase radiology training places to ensure there are enough doctors to meet demand.** Meeting the forecasted shortfall in staff across the UK would require the number of new radiologists in training to treble, from 300 to 900 places per year. We recognise that huge-scale investment is unlikely – instead a realistic scenario for England in the near future is a £750m investment, which would give 60 additional clinical radiology specialty training places per year for the next two years, rising to 100 per year for the following three years. In addition, 50 additional final-year IR training places are required each year for the next five years.
- **Sustained and targeted investment in the wider diagnostic team**, including SAS-grade doctors, radiographers, healthcare scientists, nurses and administrative support.
- **Achieve consensus on how to use the wider workforce's skills and experience** better through the facilitation of skillmix and providing a comfortable, inclusive working environment.

- **Secure a requirement for IR day-case services and control of their own beds** with support workforce and equipment to bolster increased capacity, which leads to significant savings when compared to theatre and inpatient stay costs.

The RCR Officers and staff team continue to address all these challenges, in the last year the RCR:

- Submitted detailed evidence to the Comprehensive Spending Review in September 2020, continuing to make the case to the UK Government, stakeholders and partners that investing in clinical radiology is of paramount importance in delivering world-class diagnostics and imaging services
- Regularly met with the newly appointed National Imaging Advisor at NHSE/I to ensure that clinical radiology remains a top priority for the NHS and reinforced the role of the RCR as a key partner
- Invested in a public affairs function to ensure that we can continue to highlight the importance of clinical radiology. It has meant that we have been able to take our message straight to Members of Parliament and other stakeholders and cemented our role as a credible partner
- Continued contributions to the NHSE/I Imaging Working Advisory Committee (including membership from Health Education England (HEE), the Department of Health and Social Care (DHSC), the Institute of Physics and Engineering in Medicine (IPEM) and the Society and College of Radiographers (SCoR)). It has meant that we have remained at the forefront of developments in diagnostic and screening services in England and a trusted source for information and feedback on clinical radiology. Including around how to continue to support the workforce.
- Developed a strategy for clinical radiology policy priorities over the next five years, continuing to ensure that the RCR is a credible, evidence-based organisation and promote best practice in clinical radiology
- Responded to several high-profile consultations, including tariff reforms, the new Care Quality Commission (CQC) strategy, the Healthcare Safety Investigation Branch (HSIB) and National Data Guardian. Through this we have continued to highlight the current challenges and what is required to support the clinical radiology workforce. These areas include staffing levels, staffing configuration and new models of working and how to better use and invest in technology
- Worked closely with the GIRFT teams on the final reports for radiology and neighbouring specialties, ensuring that we remain a trusted partner across the sector. It is one example of how we have been working collaboratively with other organisations around the opportunities and challenges across the healthcare system and how clinical radiology is an essential component in improving access to services and to deliver the highest quality care
- Continued to work with the newly established RCR Support and Wellbeing working group. It has meant that we are continuing to support members, and we will build on the feedback when we are consistently making the case for supporting the workforce to stakeholders, including NHSE/I and the UK Government.

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## Appendix 1. Census objectives and methodology

### Objectives

The objectives of The Royal College of Radiologists' (RCR) 2020 clinical radiology workforce census are to:

1. Provide comprehensive, accurate and timely information on the numbers, distribution and working patterns of UK CR consultants and SAS-grade radiologists in NHS radiology departments
2. Forecast future workforce numbers and working patterns by analysing census data and trends and RCR specialty training data
3. Estimate the extent to which the workforce supply and demand for diagnostic and interventional radiology across the UK are aligned
4. Gain insight into the methods used to manage the shortfall in the radiology workforce and the associated costs.

The data and trends identified in this report should inform local and national radiology workforce training, planning and policy.

### Survey methodology

The RCR gathers clinical radiology workforce data annually through an online census completed by the clinical directors (or their delegates) of every radiology department in the UK. The census does not collect data on the clinical radiology workforce in the independent sector.

Standardised questions (see Appendix 2) have been used year-on-year to compare information and identify trends over time. Staff data from the 2019 census were provided to each radiology department to facilitate efficient data collection and data accuracy. Clinical directors were asked to update the details for substantive and locum posts as of 1 September 2020.

### Data accuracy

Due to consistent questions, established processes and data quality checks, data accuracy is estimated to be high. Where discrepancies and outliers were identified in the data, clarification was sought from census respondents.

### Response rate

The 2020 census achieved a 99% response rate, with 164 out of 165 acute trusts and health boards in the UK submitting information. One trust in England was unable to submit data in 2020 due to COVID-19 and staffing pressures. 2019 data has been used in this report for this trust. Censuses from 2015 to 2019 had a 100% response rate.

### Presentation of results

The workforce figures in this report are given as headcount unless otherwise stated. A staff member who works part-time across two regions will count as a headcount of one in each region and one in the UK total. Therefore, the sum of the regional headcounts will be slightly higher than the UK headcount.

To increase readability, many of the figures in tables and charts are rounded. This means that the totals provided may differ (by one) from the sum of the parts.

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## Calculations

### Attrition

Attrition refers to those leaving the workforce. The attrition rate is calculated as WTE leavers/mean WTE consultant workforce.

### Estimated shortfall of IR consultants

The number of additional IR consultants for all trusts and health boards to have a minimum of six. Trusts and health boards with formal networked transfer arrangements covering daytime and overnight are excluded.

### Expenditure

84% of trusts and health boards provided outsourcing costs, 78% provided insourcing costs and 82% provided locum costs. Median expenditure values were used to estimate expenditure for non-reporting trusts and health boards.

### Reporting times

This report uses estimated reporting times of 15 minutes per CT and 20 minutes per MRI. Annual time frames are 20 hours per week over 40 weeks.<sup>15</sup>

### Salary

This report uses an average CR consultant salary of £89,809 – point 4 of the NHS England 2019–20 pay scales.<sup>18</sup> This salary is used in shortfall estimate C.

### Vacancy rate

The vacancy rate is the percentage of WTE staff in post against planned workforce levels.  $\text{Vacancy rate} = \text{WTE vacancies} / (\text{WTE vacancies} + \text{WTE staff in post})$ .

### Whole-time equivalents (WTE)

A WTE is a whole-time (or full-time) doctor with a contract of ten programmed activities (PAs) per week; this is equivalent to a 40-hour week in England, Northern Ireland and Scotland and a 37.5-hour week in Wales.

Throughout this report, the WTE calculation conforms to the NHS convention of calculating one WTE as ten PAs (that is, it excludes PAs that exceed ten). WTE values include direct clinical care (DCC) and supporting professional activities (SPAs) but exclude research and additional responsibility PAs.

### Workforce capacity reduction due to LTFT working

$\text{Workforce capacity reduction} = 100\% - (\text{WTE consultants} / \text{consultant headcount})$ .

## Terminology

### Global recruitment

The country of primary medical qualification (PMQ) is used in this report as a proxy for nationality to monitor global recruitment. Recruitment activities may occur in the UK.

### Time periods

This report uses the March 2015 census as a comparator, so examines trends over the past five-and-a-half years.

For simplicity, the phrase 'in 2020' is used in this report to refer to the period covered by the 2020 census, which is September 2019 to August 2020 for non-financial data and April 2019 to March 2020 for financial data.

### Data processing

Census data is analysed together with the GMC medical register and clinical radiology specialty training data held by the RCR. The RCR processes data in accordance with UK data protection legislation.

### Data collection period

Data collection opened on 5 September 2020 and closed on 21 January 2020.

### Data limitations

The census does not capture work undertaken outside of contracted hours or sickness and absence rates.

### Queries

Please send queries regarding the census to [census@rcr.ac.uk](mailto:census@rcr.ac.uk)

## Appendix 2.

### Data table – summary data by UK nation, 2020

CR consultants, October 2020	England	Northern Ireland	Scotland	Wales	UK
Number of trusts/health boards (included in census)	141	5	12	7	165
<b>Radiology services overview</b>					
Proportion of clinical directors who think there are insufficient radiologists to deliver safe and effective patient care.	58%	33%	65%	60%	58%
Trusts/health boards with inadequate IR services %	47%	44%	40%	60%	47%
Proportion of trusts/health boards leaving reports unreported or auto-reported	43%	40%	64%	43%	45%
<b>Workforce</b>					
CR consultants (headcount)	3,587	168	354	169	4,277
Locum (headcount)	244	23	23	11	301
<i>Locums as % of workforce</i>	7%	14%	7%	7%	7%
Whole-time equivalents (WTEs)	3,267	156	324	156	3,902
<i>of which, IR consultants</i>	599	22	39	24	685
<i>IR consultants as % of WTE workforce</i>	18%	14%	12%	15%	18%
SAS-grade doctors	77	0	5	5	86
Clinical radiology specialty trainees (headcount)	1,451	54	170	85	1,760
<i>Trainees as % of workforce</i>	29%	24%	32%	33%	29%
Total headcount (consultants, SAS- grade doctors and clinical radiology specialty trainees)	5,515	222	529	259	6,123



CR consultants, October 2020	England	Northern Ireland	Scotland	Wales	UK
<b>Workforce trends</b>					
Percentage of WTE workforce forecast to retire within five years	19%	20%	19%	23%	19%
Average annual workforce growth (past five years)	4%	6%	2%	1%	4%
Vacancy rate	10%	8%	12%	10%	10%
Vacancies unfilled for a year or more	61%	67%	71%	56%	62%
Workforce loss due to LTFT working	9%	7%	8%	8%	9%
Workforce growth forecast – next five years (to 2025)	3%	1%	2%	2%	3%
<b>Workforce per population</b>					
Population <sup>11</sup>	56,286,961	1,893,667	5,463,300	3,152,879	66,796,807
Radiologists (WTE) per 100,000 population (includes clinical radiology specialty trainees) (European average is 12.8)	8.5	11.1	9.1	7.8	8.6
IR consultants (WTE) per million population	11	12	7	8	10
<b>Estimated outsourcing/insourcing/locum costs (financial year 2019/2020)</b>					
Outsourcing to teleradiology companies	£112,003,374	£4,645,161	£6,627,195	£5,051,212	£128,326,942
Additional payments to contracted radiologists (insourcing)	£42,913,941	£2,911,761	£3,549,401	£1,345,217	£50,720,320
Ad-hoc locums (for excess reporting)	£18,782,466	£2,690,089	£3,614,859	£1,740,995	£26,828,409
Total insourcing/outsourcing costs	£173,699,781	£10,247,012	£13,791,455	£8,137,423	£205,875,672
Outsourcing expenditure per head of population	£1.99	£2.45	£1.21	£1.60	£1.92
Insourcing expenditure per WTE consultant radiologist	£13,136	£18,665	£10,955	£8,623	£12,999

## Workforce shortfall estimates

CR consultants, October 2020	England	Northern Ireland	Scotland	Wales	UK
<b>Estimate A</b>					
IR consultant shortfall (based on six IR consultants per trust/ health board. Excludes trusts/health boards with formal daytime and out-of-hours network transfer arrangements)	317	12	13	22	364
Consultant (diagnostic) radiologist shortfall based on volumes of imaging examinations	997	5	58	51	1,078
WTE consultant shortfall (sum of above)	1,314	17	71	73	1,442
<b>Estimate B</b>					
Additional CR consultants required for 12.8 radiologists per 100,000 population (European average)	1,776	14	166	127	2,083
<b>Estimate C</b>					
Number of full-time CR consultants that outsourcing/insourcing costs could fund	1,934	114	154	91	2,292
<b>Estimated shortfall of WTE CR consultants 2020 (average of estimates A, B and C)</b>	<b>1,675</b>	<b>48</b>	<b>130</b>	<b>97</b>	<b>1,939</b>
<b>Estimated percentage shortfall 2020</b>	<b>34%</b>	<b>24%</b>	<b>29%</b>	<b>38%</b>	<b>33%</b>

See section 4.1 for further details on workforce shortfalls.

### Appendix 3. Census questions

This appendix outlines the questions that are found on the census website.

\*Indicates a mandatory field.

#### Stage 1: Workforce Census Privacy Notice

1.1 I have read and accept The Royal College of Radiologists' workforce census privacy notice\*

#### Stage 2: Organisation details

2.1 Radiology department(s)\*

2.2 Trust/health board\*

2.3 Census contact – full name\*

2.4 Census contact – email\*

2.5 Census contact – telephone number\*

2.6 Are the Clinical Director details the same as the census contact details?\*

- Yes – Please continue to the next page
- No – Please enter the Clinical Director details below.
  - Clinical Director – full name\*
  - Clinical Director – email\*
  - Clinical Director – telephone number\*

#### Stage 3a: Staff details

3.1 Forename\*

3.2 Surname\*

3.3 Grade\* (drop-down list)

- Consultant-grade radiologist (NHS contract)
- Consultant-grade radiologist (mixed NHS/academic–NHS contract)
- Consultant-grade radiologist (academic–university contract)
- SAS-grade radiologist
- Research or clinical fellow

3.4 GMC number (consultants only)

3.5 Direct clinical care (DCC) PAs\* (All patient-led activities to be counted as DCC)

3.6 Training only PAs

3.7 Supporting professional activities (SPAs)\*

*(All non-DCC and non-training-only PAs to be counted as SPAs)*

3.8 Total PAs (DCC, SPA and training) (auto-filled)

3.9 Employment type (Auto-filled – full-time = 10 PAs+)

- Full-time
- Part-time

## 3.10 Type of radiologist\* (consultants only – drop-down list)

- General
- General with one main area of interest
- General with two main areas of interest
- Specialist with one main area of interest
- Specialist with two main areas of interest

## 3.11 Area/s of interest (omitted for 'general' radiologists)

- Primary area of interest – breast, cardiac, chest/lung, endocrine...(drop-down list)
- Secondary area of interest (same drop-down list)

3.12 Employed as a locum  
if ticked.....

- Period employed as locum up to 1 September 2020\* (drop-down list)
  - 1–3 months
  - 4–6 months
  - 7–9 months
  - 10–12 month
  - >12 months
- Reason for locum position (drop-down list)
  - Ad-hoc reporting for excess workload
  - Cover for long-term (>1 month) sickness
  - Currently employed to fill vacant/unfilled post
  - Maternity/paternity cover
  - Other

## 3.13 Left since 1 September 2019. If ticked ...

- Reason for leaving (drop-down list)
  - Retired
  - Left for reasons other than retirement
  - Not known/don't wish to say

**Stage 3b: Home working**

3.14 How many of your consultant and SAS-grade radiologists (headcount) have home reporting capability?\* (drop-down list – All consultants/unknown/0,1,2....80)  
(If the exact number is not known, please provide an estimate).

## 3.15 Comments relating to home working: (free-text box)

You may wish to comment on the benefits, any difficulties encountered, and/or how home reporting is used within your radiology department/s.

## Stage 4a: Vacancies

### 4.1 Unfilled post status\*

- Funded but not yet advertised
- Funded but not thought worth advertising
- Advertised but not yet interviewed
- Appointed but not yet taken up
- Advertised but failed to appoint AND planning to re-advertise in next three months
- Advertised but failed to appoint AND not contemplating re-advertising in next three months

### 4.2 Grade\*

- Consultant-grade radiologist (NHS contract)
- Consultant-grade radiologist (mixed NHS/academic – NHS contract)
- Consultant-grade radiologist (Academic – university contract)
- SAS-grade radiologist
- Research or clinical fellow

### 4.3 Total PAs\* (SPA, DCC and training)

### 4.4 Employment type (Auto-filled – full-time = 10 PAs+)

- Full-time
- Part-time

### 4.5 Type of radiologist\* (drop-down list)

- General
- General with one main area of interest
- General with two main areas of interest
- Specialist with one main area of interest
- Specialist with two main areas of interest

### 4.6 Area/s of interest (omitted for 'general' radiologists)

- Primary area of interest (drop-down list)
- Secondary area of interest (drop-down list)

### 4.7 Unfilled period (to the nearest month)\* (drop-down list: 0 to 12+ months/don't know):

### 4.8 No vacancies (vacancy details must be entered or this box ticked to confirm no vacancies)

### 4.9 Comments relating to vacancies and recruitment over the past year: (free-text box)

## Stage 5: ARSAC license holders

### 5.1 How many Administration of Radioactive Substances Advisory Committee (ARSAC) license holders worked for your radiology department(s) as of 1 September 2020?\*

- Number of radiologists: (drop-down list: 0 to 10 or more/unknown)
- Number of nuclear medicine physicians: (drop-down list: 0 to 10 or more/unknown)

5.2 Additional comments (such as any pending retirements, or shortages, of ARSAC licence holders): (free-text box)

### Stage 6: Interventional radiology (IR)

6.1 Does your trust have a 24/7 IR rota?\* (drop-down list: yes/no)

6.2 If yes, how many interventional radiologists are on the 24/7 rota?  
(Headcount as of 1 October 2020 – drop-down list: 3 or fewer, 4,5,...10 or more)

6.3 If no, does your trust have a formal networked arrangement to transfer patients for IR procedures?

- No
- Yes – covers daytime AND out-of-hours
- Yes – covers daytime only
- Yes – covers out-of-hours only
- Don't know

6.4 What proportion of diagnostic radiologists in your trust perform image-guided biopsies?\*

- All/almost all (90%+)
- Most (51–89%)
- Some (11–50%)
- Very few/none (0–10%)

6.5 What proportion of diagnostic radiologists in your trust perform image-guided drainages?\*

- All/almost all (90%+)
- Most (51–89%)
- Some (11–50%)
- Very few/none (0–10%)

6.6 Further information regarding IR services at your trust: (free-text box)

### Stage 7: Workforce and patient care

7.1 To what extent do you agree or disagree that there are currently sufficient consultant clinical radiologists employed in your radiology department(s) to be able to deliver safe and effective levels of patient care?\*

- Strongly agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Strongly disagree
- Don't know/prefer not to say

7.2 What are your concerns, if any, regarding the impact of workforce shortages on patients? (free-text box)

### Stage 8a: Workforce shortfalls

8.1 How has your department managed any shortfalls in reporting capacity in the past year?\* Please tick all that apply.

- Additional paid reporting by the department's own radiologists outside their contracted hours
- Outsourcing of reporting to an independent sector company
- Reporting by radiographers
- Goodwill by radiologists (unpaid overtime)
- Images left unreported or auto-reported
- Delegation of reporting to clinicians through an agreed mechanism
- Employing ad-hoc locums
- Imaging networks
- N/A – All reporting requirements were met by radiology staff within contracted hours.

8.2 Additional comments (relating to management of reporting shortfalls): (free-text box)

### Stage 8b: Radiology reporting expenditure

8.3 What was the total department expenditure on the following three radiology costs in the 12 months ending 31 March 2020?

1. Outsourcing to teleradiology companies (daytime and overnight): £  
Actual/estimated/not known\*
2. Additional payments to contracted radiologists (insourcing): £  
Actual/estimated/not known
3. Ad-hoc locums appointed to cover excess reporting workload (include salaries, on-costs and agency fees): £  
Actual/estimated/not known\*

8.4 Additional comments relating outsourcing/insourcing expenditure: (free-text box)

### Stage 9: Final comments

9.1 Have you or your colleagues used past results of the RCR census? (drop-down list: yes/no/don't know)

9.2 If yes, How were census results used? Were they helpful? (free-text box)

9.3 Comments relating to the impact of COVID-19 on the radiology workforce, workload and ways of working: (free-text box)

9.4 Additional comments (for example, further details relating to your census submission, or suggestions of how the RCR could improve the census process, or reports, for future years): (free-text box)

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## Appendix 4. Census completions 2020

Thank you to the following trusts and health boards for completing the 2020 census:

### England – East Midlands

- Chesterfield Royal Hospital NHS Foundation Trust
- Kettering General Hospital NHS Foundation Trust
- Northampton General Hospital NHS Trust
- Nottingham University Hospitals NHS Trust
- Sherwood Forest Hospitals NHS Foundation Trust United
- Lincolnshire Hospitals NHS Trust
- University Hospitals of Derby and Burton NHS Foundation Trust
- University Hospitals of Leicester NHS Trust

### England – East of England

- Basildon and Thurrock University Hospitals NHS Foundation Trust
- Bedford Hospital NHS Trust
- Cambridge University Hospitals NHS Foundation Trust
- East and North Hertfordshire NHS Trust
- East Suffolk and North Essex NHS Foundation Trust
- James Paget University Hospitals NHS Foundation Trust
- Luton and Dunstable University Hospital NHS Foundation Trust
- Mid-Essex Hospital Services NHS Trust
- Norfolk and Norwich University Hospitals NHS Foundation Trust
- North West Anglia NHS Foundation Trust
- Royal Papworth Hospital NHS Foundation Trust
- Southend University Hospital NHS Foundation Trust
- The Princess Alexandra Hospital NHS Trust
- The Queen Elizabeth Hospital King's Lynn NHS Foundation Trust
- West Hertfordshire Hospitals NHS Trust
- West Suffolk NHS Foundation Trust

### England – London

- Barts Health NHS Trust
  - Chelsea and Westminster Hospital NHS Foundation Trust
  - Croydon Health Services NHS Trust
  - Epsom and St Helier University Hospitals NHS Trust
  - Great Ormond Street Hospital for Children NHS Foundation Trust
  - Guy's and St Thomas' NHS Foundation Trust
  - Homerton University Hospital NHS Foundation Trust
  - Imperial College Healthcare NHS Trust
  - King's College Hospital NHS Foundation Trust
-



- Kingston Hospital NHS Foundation Trust
- Lewisham and Greenwich NHS Trust
- London North West University Healthcare NHS Trust
- Moorfields Eye Hospital NHS Foundation Trust
- North Middlesex University Hospital NHS Trust
- Royal Brompton and Harefield NHS Foundation Trust
- Royal Free London NHS Foundation Trust
- Royal National Orthopaedic Hospital NHS Trust
- St George's University Hospitals NHS Foundation Trust
- The Hillingdon Hospitals NHS Foundation Trust (incomplete submission)
- The Royal Marsden NHS Foundation Trust
- University College London Hospitals NHS Foundation Trust
- Whittington Health NHS Trust

*[Barking, Havering and Redbridge University Hospitals NHS Trust was unable to provide 2020 census data due to COVID-19 and workforce pressures, so their 2019 census data has been used in this report.]*

### England – North East

- City Hospitals Sunderland NHS Foundation Trust
- County Durham and Darlington NHS Foundation Trust
- Gateshead Health NHS Foundation Trust
- Newcastle upon Tyne Hospitals NHS Foundation Trust
- North Tees and Hartlepool NHS Foundation Trust
- Northumbria Healthcare NHS Foundation Trust
- South Tees Hospital NHS Trust
- South Tyneside NHS Foundation Trust

### England – North West

- Aintree University Hospital NHS Foundation Trust
- Alder Hey Children's NHS Foundation Trust
- Blackpool Teaching Hospitals NHS Foundation Trust
- Bolton NHS Foundation Trust
- Countess of Chester Hospital NHS Foundation Trust
- East Cheshire NHS Trust
- East Lancashire Hospitals NHS Trust
- Lancashire Teaching Hospitals NHS Foundation Trust
- Liverpool Heart and Chest NHS Foundation Trust
- Manchester University NHS Foundation Trust
- Mid-Cheshire Hospitals NHS Foundation Trust
- North Cumbria University Hospitals NHS Foundation Trust
- Pennine Acute Hospitals NHS Trust
- Royal Liverpool and Broadgreen University Hospitals NHS Trust

- Salford Royal NHS Foundation Trust
- Southport and Ormskirk Hospital NHS Trust
- St Helens and Knowsley Teaching Hospitals NHS Trust
- Stockport NHS Foundation Trust
- Tameside and Glossop Integrated Care NHS Foundation Trust
- The Christie NHS Foundation Trust
- The Clatterbridge Cancer Centre NHS Foundation Trust
- The Walton Centre NHS Foundation Trust
- University Hospitals of Morecambe Bay NHS Foundation Trust
- Warrington and Halton Hospitals NHS Foundation Trust
- Wirral University Teaching Hospital NHS Foundation Trust Warrington, Wigan and Leigh NHS Foundation Trust

### England – South Central

- Buckinghamshire Healthcare NHS Trust
- Hampshire Hospitals NHS Foundation Trust
- Isle Of Wight NHS Trust
- Milton Keynes University Hospital NHS Foundation Trust
- Oxford University Hospitals NHS Foundation Trust
- Portsmouth Hospitals NHS Trust
- Royal Berkshire NHS Foundation Trust
- University Hospital Southampton NHS Foundation Trust

### England – South East

- Ashford and St Peter's Hospitals NHS Foundation Trust
- Brighton and Sussex University Hospitals NHS Trust
- Dartford and Gravesham NHS Trust
- East Kent Foundation Hospitals University NHS Foundation Trust
- East Sussex Healthcare NHS Trust
- Frimley Health NHS Foundation Trust Maidstone and Tunbridge Wells NHS Trust Medway NHS Foundation Trust
- Queen Victoria Hospitals NHS Foundation Trust
- Royal Surrey County Hospital NHS Foundation Trust
- Surrey and Sussex Healthcare NHS Trust
- Western Sussex Hospitals NHS Foundation Trust

### England – South West

- Dorset County Hospital NHS Foundation Trust
- Gloucestershire Hospitals NHS Foundation Trust
- Great Western Hospitals NHS Foundation Trust
- North Bristol NHS Trust

- Northern Devon Healthcare NHS Trust
- Poole Hospital NHS Foundation Trust
- Royal Cornwall Hospitals Trust
- Royal Devon and Exeter NHS Foundation Trust
- Royal United Hospitals Bath NHS Trust
- Salisbury NHS Foundation Trust
- Taunton and Somerset NHS Foundation Trust
- The Royal Bournemouth and Christchurch Hospitals NHS Foundation Trust
- Torbay and South Devon Healthcare NHS Foundation Trust
- University Hospitals Bristol NHS Foundation Trust
- University Hospitals Plymouth NHS Trust
- Weston Area Health NHS Trust
- Yeovil District Hospital NHS Foundation Trust

### England – West Midlands

- Birmingham Women's and Children's NHS Foundation Trust
- George Eliot Hospital NHS Trust
- Sandwell and West Birmingham Hospitals NHS Trust
- Shrewsbury and Telford Hospital NHS Trust
- South Warwickshire NHS Foundation Trust
- The Dudley Group NHS Foundation Trust
- The Robert Jones and Agnes Hunt Orthopaedic Hospital NHS Foundation Trust
- The Royal Orthopaedic Hospital NHS Foundation Trust
- The Royal Wolverhampton NHS Trust
- University Hospitals Birmingham NHS Foundation Trust
- University Hospitals Coventry and Warwickshire NHS Trust
- University Hospitals of North Midlands NHS Trust
- Walsall Healthcare NHS Trust Worcestershire Acute Hospitals NHS Trust
- Wye Valley NHS Trust

### England – Yorkshire and the Humber

- Airedale NHS Foundation Trust
- Barnsley Hospital NHS Foundation Trust
- Bradford Teaching Hospitals NHS Foundation Trust
- Calderdale and Huddersfield NHS Foundation Trust
- Doncaster and Bassetlaw Teaching Hospitals NHS Foundation Trust
- Harrogate and District NHS Foundation Trust
- Hull and East Yorkshire Hospitals NHS Trust Leeds Teaching Hospitals NHS Trust
- Northern Lincolnshire and Goole Hospitals NHS Foundation Trust

- Sheffield Children's NHS Foundation Trust Sheffield Teaching Hospitals NHS Foundation Trust
- The Mid-Yorkshire Hospitals NHS Trust
- The Rotherham NHS Foundation Trust
- York Teaching Hospital NHS Foundation Trust

### **Northern Ireland**

- Belfast Health and Social Care Trust
- Northern Health and Social Care Trust
- South Eastern Health and Social Care Trust
- Southern Health and Social Care Trust
- Western Health and Social Care Trust

### **Scotland**

- NHS Ayrshire and Arran NHS Borders
- NHS Dumfries and Galloway NHS Fife
- NHS Forth Valley NHS Grampian
- NHS Greater Glasgow and Clyde NHS Highland
- NHS Lanarkshire NHS Lothian NHS Tayside
- NHS Western Isles

### **Wales**

- Aneurin Bevan University Health Board
- Betsi Cadwaladr University Health Board
- Cardiff and Vale University Health Board
- Cwm Taf Health Board
- Hywel Dda Health Board
- Swansea Bay University Health Board
- Velindre University NHS Trust

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