

Clinical radiology England workforce 2019 summary report

August 2020

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Foreword

This report conveys the findings of the data collected in late 2019 for the RCR annual workforce census. Since then, COVID-19 has changed many aspects of healthcare. However, the shortages outlined in this report remain highly relevant. Meeting the ongoing demand for diagnostic and interventional radiology (IR) is essential to ensure patients receive the best possible care as the NHS recovers and learns from COVID-19. However, workforce shortages are making it exceptionally difficult for radiology departments to provide safe and effective patient care, in a changing and challenging environment. For example, following the decision to pause elective procedures during the pandemic, many radiology departments are now facing huge backlogs of imaging examinations. Where those departments are understaffed, this risks patients not getting the prompt diagnoses and treatment they need.

Almost three-quarters of clinical directors (72%) of radiology departments in England state there are still not enough consultant clinical radiologists to deliver safe and effective care. With an estimated shortfall of 1,613 consultants (34%), outsourcing and insourcing costs have increased to an estimated £162 million in England in 2019. Due to upcoming retirements and insufficient trainees, workforce shortages in England are forecast to worsen. Urgent action is needed to mitigate the workforce shortages.

This year's report highlights particular difficulties in breast, chest/lung and interventional radiology, where services are under intense pressure. Increased recruitment to these areas is vital. IR is an acute problem, with insufficient consultants to provide these lifesaving procedures on a 24/7 basis. This is unsafe and puts patients at risk. The estimated shortage of IR consultants in England is 323 (36%).

Regional variation remains a problem and undermines the delivery of 'equity of care'. Shortages of consultant clinical radiologists are particularly severe in the East Midlands (44%) and the North East (44%).

There have been welcome, but modest, increases in clinical radiology specialty training places in England in recent years. However, these increases have been woefully insufficient to meet demand. To ensure our patients receive the best possible care, we need more specialist training and more flexible working patterns to improve staff retention. In addition, innovative delivery models and streamlined patient pathways are required to ensure that every patient receives the right imaging examination at the right time.

Professor Mark Callaway

Medical Director, Professional Practice, Clinical Radiology

Executive summary

Objectives

This report provides details of the radiology workforce in England in 2019, with a focus on regional variation, the estimated shortfall of consultant clinical radiologists and workforce forecasts over the next five years. It goes on to make recommendations on how to tackle the radiology workforce shortage in England. Closing the gap between the radiology workforce supply and demand is essential to support safe and effective care for patients.

This report for England supplements the *Clinical radiology UK workforce census 2019 report*.¹ Please refer to the UK report for UK-wide radiology trends and for information such as census timings and methodology.

Key findings

Workforce shortages in clinical radiology are negatively affecting patient care in England by delaying the diagnosis and treatment of many conditions, including cancer, and restricting the availability of minimally invasive interventional radiology procedures. This has implications for patient safety. Of concern, clinical directors at approximately three-quarters of trusts in England feel there are not enough consultant radiologists to deliver safe and effective patient care.

Furthermore, workforce shortages are pushing up NHS outsourcing, insourcing and locum costs to the extent that these expenditures reached an estimated £162 million in England, in 2019.* For context, £162 million is equivalent to the combined salaries of more than half of the existing consultant clinical radiologist workforce in England.²

Workforce shortages are putting the radiology workforce in England under immense pressure. This pressure significantly increases the likelihood of stress and burnout and staff leaving the profession, further exacerbating workforce shortages in England.

This report estimates that there is a current shortfall of 1,613 whole-time equivalent (WTE) consultant clinical radiologists in England.** This is equivalent to a 34% shortfall, indicating severe workforce shortages. The situation is likely to worsen as a fifth of consultant clinical radiologists in England are forecast to retire within five years and there are insufficient trainees to fill the pending vacancies. At a time when there is continued growth in demand for diagnostic and interventional radiology, it is clear that patients will be adversely affected unless urgent action is taken to rectify the radiology workforce shortages in England.

This report highlights that, while there is a severe shortage of consultant clinical radiologists across England, the shortage is particularly severe in some regions and for some specialist posts. Of particular concern:

- There is a severe shortage of interventional radiologists in England, estimated to be 36% (n=323). Provision of interventional radiology in England is patchy, with inadequate IR services in some regions; this is unsafe and puts patients at risk.
- The shortages of breast and chest/lung radiologists in England are likely to increase rapidly over the coming five years, as many specialists are approaching retirement age and few of the newly qualified consultant clinical radiologists are choosing to specialise in these areas.
- Shortages of consultant clinical radiologists in the North East and East Midlands are particularly severe.

**Insourcing describes additional paid reporting by trust radiologists outside of their contracted hours.*

***A WTE is a whole-time (or full-time) doctor contracted for ten programmed activities (PAs) per week, equivalent to a 40-hour week.*

Recommendations

The COVID-19 era has highlighted diagnostics and interventional radiology as being vital to the NHS. The increase in training numbers in recent years, while welcome, is not sufficient to close the growing gap between supply and demand for radiology services.

To address radiology workforce shortages in England, our recommendations are:

- **Increase training places:** the number of clinical radiology training places needs to be increased, including additional funding for interventional radiology posts, as soon as is practicable following the COVID-19 recovery period. Radiology remains a popular specialty among doctors in England; training posts are oversubscribed so increased numbers can be easily achieved with adequate funding.
- **More flexible working patterns:** several changes to radiologist working patterns have taken place as a result of the COVID-19 pandemic, including increased working from home and more flexible working. NHS Employing organisations should support flexible working in order to increase staff morale and improve staff retention, for example through providing fully integrated picture archiving and communication system (PACS) workstations for home working. Other changes, such as multi-site working and network formation should also be embraced.
- **Innovative delivery models:** initiatives such as multi-site working, skillmix and network formation (with fully resourced IT connectivity and software) should be embraced to support workforce flexibility, best use of clinical expertise and sharing of good practice.
- **Ensure patients get the right imaging examination at the right time:** further collaboration is required between relevant NHS bodies, royal colleges and primary care to streamline patient pathways, ensuring patients receive the right imaging investigation at the right time.

1. The radiology workforce in England in 2019

There were 3,415 consultant-grade radiologists employed by 147 acute trusts in England in September 2019. This includes NHS, academic and mixed NHS/academic posts.

Table 1. Clinical radiology workforce (headcount) – England regions, 2019

	Consultant-grade	Specialty trainee	SAS-grade	Total
East Midlands	221	100	6	327
East	337	121	6	464
London	748	300	17	1,065
North East	144	86	0	230
North West	496	169	17	682
South Central	229	102	6	337
South East	263	68	8	339
South West	359	128	5	492
West Midlands	315	128	9	452
Yorkshire and Humber	305	153	3	461
England total	3,415	1,355	77	4,846

[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.]

Taking into account the contracted hours of less than full-time (LTFT) doctors, the total of 3,415 consultant clinical radiologists in England equates to 3,120 whole-time equivalents (WTEs).*

The consultant clinical radiologist workforce in England has grown by an average of 4% per year over the past five years (2014–2019), but growth has slowed to 3% over the past year. Growth has not been uniform across the country. Notably, the North East has seen average growth of only 1% per year over the past five years, whereas growth in the South East has averaged 8% per year.

Specialty trainees in England comprise 28% of the radiology workforce.** Within England, the trainee ratio is lowest in the South East (21%) and highest in the North East (37%). As there is a tendency for clinical radiology trainees to take up consultant posts in the regions where they undertook their specialty training, this indicates that the relatively strong workforce growth in the South East seen over the past five years may slow and the slow workforce growth seen in the North East has the potential to rise.

*LTFT is defined as working fewer than ten PAs (equivalent to a contract of 40 hours) per week.

**In this context radiology workforce refers to consultant clinical radiologists and specialty trainees (it excludes SAS-grade doctors).

Census data highlight significant variation in the clinical radiology workforce distribution per head of population across England. These data are summarised in Table 2. Across England, there are 5.5 consultant clinical radiologists per 100,000 population. London has the highest ratio of consultant clinical radiologists, with 7.4 per 100,000 population, while the East Midlands has the lowest with only 4.2. However, it should be noted that these figures are simplistic; they give a broad indication of the relative supply of consultant clinical radiologists across regions or countries, but do not take into account local factors, which may increase or decrease the demand for radiology services. Taking into account the severe clinical radiology workforce shortages across the UK, it should be noted that regions, or countries, with a relatively high number of consultants per population compared to the UK average may still have significant shortages.¹

Table 2. Radiology workforce per 100,000 population – England regions, 2019³

Region	Consultant clinical radiologists (WTE)	Consultant clinical radiologists (WTE)	Consultant clinical radiologists (WTE) and specialty trainees
East Midlands	204	4.2	6.3
East	306	4.9	6.8
London	664	7.4	10.8
North East	134	5.0	8.2
North West	466	6.4	8.7
South East (includes South Central)	448	4.9	6.7
South West	327	5.8	8.1
West Midlands	288	4.9	7.0
Yorkshire and the Humber	283	5.1	7.9
England total	3,120	5.5	8.0

Interventional radiology

Interventional radiology (IR) is a subspecialty of clinical radiology and there are currently 582 WTE interventional radiologists (IRs) working in the NHS in England. IRs perform minimally invasive image-guided procedures, including emergency treatment for patients with bleeding, sepsis and stroke. The demand for IR has increased over many years, as has the range and complexity of IR procedures. However, with ongoing workforce shortages, IR provision remains patchy in England. This is unsafe and puts patients at risk.

Trusts need a minimum of six IRs (WTE) to provide an effective and sustainable 24-hour IR service.⁴ Alternatively, trusts need formal arrangements in place to transfer patients to other trusts for IR procedures. Almost half of the 147 trusts in England (48%, n=71) were unable to meet these requirements in 2019. To meet these standards, census data indicate that the minimum number of additional IRs required in England is 323. This means that the IR workforce in England is currently understaffed by 36%.

2. Workforce supply and attrition

Three hundred and eighty funded consultant clinical radiologist vacancies were reported in England in September 2019. This equates to a vacancy rate of 11%. Within England, the North East had the highest vacancy rate at 16% and the South East and London had the lowest vacancy rate at 9%. However, as highlighted in the UK report, vacancies reported through the annual census significantly understate the true extent of clinical radiology workforce shortages; vacancies may be restricted due to lack of funding or lack of suitable candidates, or may be postponed to allow internal candidates time to complete their specialty training. More than half of vacancies in England have been unfilled for a year or more, indicating a severe shortage of suitable candidates.

Supply of new consultant clinical radiologists in England most frequently comes from specialty training within England, but overseas recruitment is increasingly common.

Clinical radiology specialty training

RCR training data show that, on average, 235 doctors have started specialty training in clinical radiology in England each year, over the past three years. Clinical radiology trainees in England took an average of five years and nine months to complete their specialty training and gain a Certificate of Completion of Training (CCT) over the past five years.* Approximately 10% of trainees withdraw and do not complete their clinical radiology training.

Over the next five years, it is estimated that 822 doctors (WTE) will take up consultant clinical radiology posts in England, following completion of specialty training; approximately 164 are expected to join the workforce each year. This forecast accounts for expected attrition, including an estimated 12% who will complete their specialty training, but not take up a consultant posts in England.** One hundred and sixty four newly appointed consultant clinical radiologists (WTEs) in 2020 will not even fill half of the 380 funded vacancies reported in 2019. Current training numbers are clearly inadequate to cover current vacancies, let alone gaps resulting from upcoming retirements and rising demand.

Overseas recruitment

Radiology departments in England are increasingly turning to overseas recruitment to try to fill consultant radiologist vacancies. In 2019, over half of the 147 trusts in England (59%) attempted to recruit from overseas. Of those who attempted overseas recruitment, half of trusts (50%) reported success and a further third (30%) reported success in some instances. Despite overseas recruitment attempts being successful in many instances, clinical directors reported that overseas recruitment is often a challenging, expensive and slow process.

Retirements

Numbers of consultant clinical radiologists leaving the workforce vary from year to year, but the general trend over the past five years has been one of increased attrition rates. The most frequently cited reason for UK consultant clinical radiologists leaving the profession is retirement. The average (median) age of retirement in 2019 in the UK was 60 years.

*Includes trainees who have undertaken additional interventional radiology training.

**Based on the UK trends observed over the past five years.

Based upon the UK average age of retirement of 60 years, an estimated 601 WTE consultants in England – equivalent to 19% of the current consultant workforce – are expected to retire over the next five years. This level of attrition will put considerable additional strain on the radiology workforce. Table 3 shows that a very high level of consultant retirements (23% of consultant workforce) is forecast in the East Midlands over the next five years.

Table 3. Forecast retirements – Consultant clinical radiologists, England regions, next five years (to 2024)

Region	Forecast consultant clinical radiologist retirements (WTE)	Forecast retirements as percentage of workforce
East Midlands	47	23%
East	59	19%
London	114	17%
North East	25	19%
North West	89	19%
South Central	40	19%
South East	49	20%
South West	65	20%
West Midlands	54	19%
Yorkshire and Humber	59	21%
England total	601	19%

3. Workforce forecast illustrated – next five years

The size of the consultant clinical radiology workforce in England is determined by entrants from UK specialty training and recruitment from overseas, set against attrition from retirements and other leavers and the trend towards LTFT working. This section forecasts the size of the clinical radiology workforce in England in five years' time, based upon these determinants and trends observed in recent years.

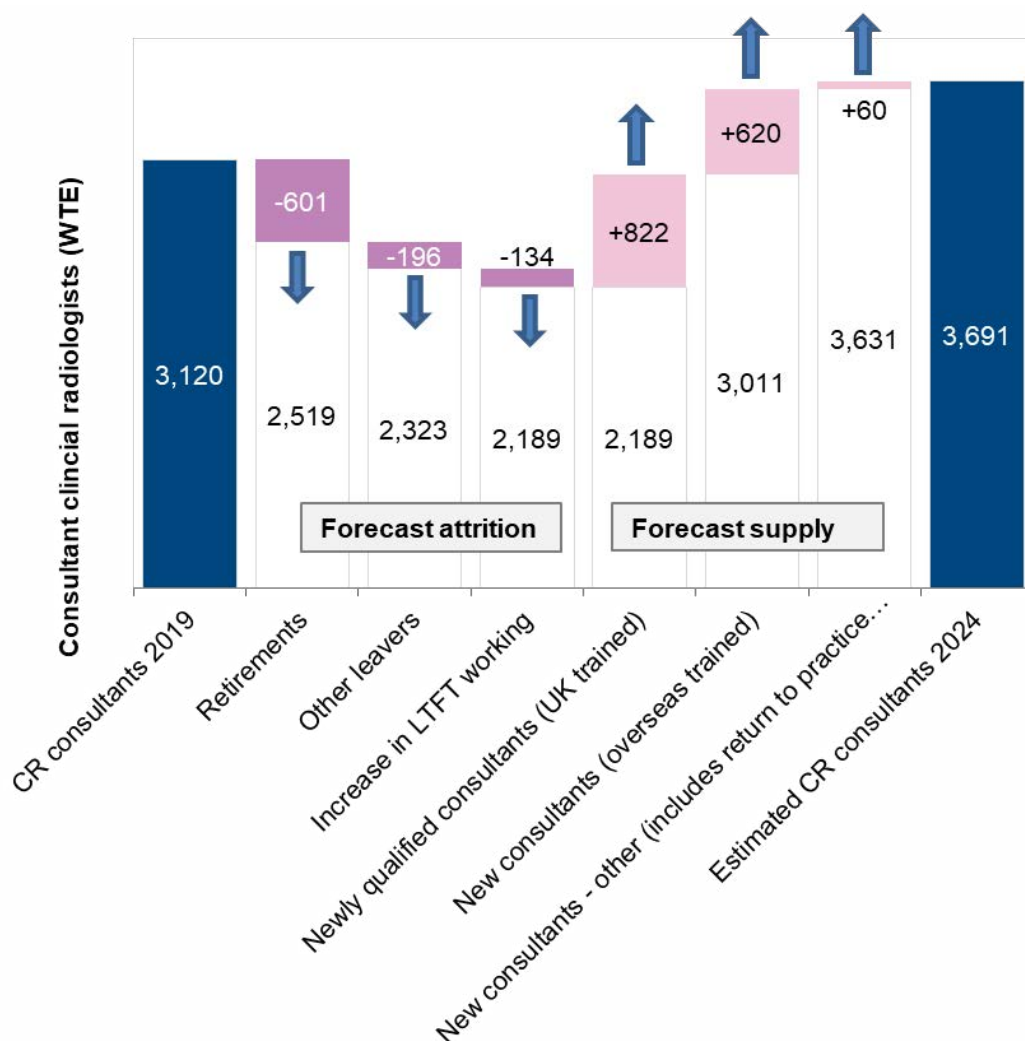
- **Specialty training in England:** based on RCR training and census data, the total number of UK-trained consultant clinical radiologists who will join the workforce in England in the next five years is estimated to be 822 WTE consultants.
- **Overseas recruitment:** if trends from recent years continue, approximately 620 WTE consultant clinical radiologists will be recruited from overseas (or the rest of the UK) to the workforce in England in the next five years.*
- **Retirement:** based on the median age of 60 years, an estimated 601 WTE consultant clinical radiologists in England – equivalent to 19% of the workforce – are expected to retire in the next five years.** This level of attrition will put considerable additional strain on the workforce in England.
- **Other leavers:** Assuming the annual attrition rate of 1% for other leavers (excluding retirees) observed over the past five years remains unchanged, attrition in the next five years is estimated to total 196 consultants (WTEs).
- **Increase in less than full-time (LTFT) working:** The workforce capacity loss due to LTFT working in England has increased from 160 WTEs consultant clinical radiologists in 2014 to 294 WTEs in 2019. In other words, if all consultant clinical radiologists working LTFT in 2019 were to switch to full-time working, the workforce would increase by the equivalent of 294 WTE consultant clinical radiologists. If this trend towards increased LTFT working continues in a linear fashion, the effect will equate to an additional 134 fewer WTE consultant clinical radiologists in England by 2024.

*Overseas recruitment refers to the recruitment of all consultant radiologists who have undertaken specialty training outside of the UK.

**The UK median retirement age has been used for this forecast.

Figure 1 shows that, should trends from the past five years continue over the next five years, there will be approximately 3,691 WTE consultant clinical radiologists in post in England in 2024. This is on a par with the workforce growth of 4% per year recorded in England over the past five years. Set against rapidly increasing demand for diagnostic imaging and interventional radiology, this indicates that the gap between the estimated supply of consultant clinical radiologists and the estimated demand for radiology services in England will widen further, unless timely mitigating action is taken.

Figure 1. Estimated supply of consultant clinical radiologists (WTE) – England, next five years (2019–2024)



4. Workforce demand

Demand for imaging has been growing over many years, driven by many factors including an aging population, increased screening to support early diagnosis initiatives and new clinical guidelines. Imaging is used routinely in many patient pathways and plays a vital role in diagnosing and monitoring many medical conditions, including cancer and stroke. Demand for complex imaging, which is more time consuming to report, has grown particularly rapidly. For example, computed tomography (CT) and magnetic resonance imaging (MRI) examinations carried out on NHS patients in England have increased by 50% over the past five years.⁵ By comparison, growth in the consultant clinical radiology workforce has lagged behind at 30% growth over the same period.

Only 1% of trusts in England were able to meet their reporting requirements within consultant clinical radiologists' contracted hours in 2019, indicating severe workforce shortages across England. Clinical directors at nearly three-quarters of trusts (72%) in England felt there were insufficient consultant clinical radiologists in their departments to deliver a safe and effective level of patient care.

Two of the most commonly used methods for managing shortfalls in radiology reporting capacity are outsourcing of reporting to the independent sector, used by 86% of trusts (n=127) in England in 2019, and insourcing – additional paid reporting by trust radiologists outside of their contracted hours – used by 93% of trusts (n=137) in England in 2019.

Estimated costs of outsourcing and insourcing

Many of the mechanisms used by radiology departments in England to manage shortfalls in reporting capacity incur direct and indirect costs. Combined outsourcing, insourcing and ad hoc locum expenditure has increased significantly in England over the past five years. In 2019, expenditure totalled £162 million, more than triple the £48 million expenditure for these activities in 2014. For context, £162 million is equivalent to the combined salaries of more than half of the existing consultant radiology workforce in England (1,802 WTE consultants).^{2*} A breakdown of insourcing, outsourcing and ad hoc locum costs by English region can be found in Appendix A.

**Based on point five of the 2019 NHS consultant pay scales for England).*²

Outsourcing of reporting to the independent sector amounted to £93 million in England in 2019, accounting for most (57%) of the £162 million combined insourcing, outsourcing and ad hoc locum expenditure. There is significant variability across England in terms of outsourcing costs relative to population size, as shown in Figure 2. While outsourcing expenditure across the whole of England in 2019 was an estimated £1.65 per head of population, it was comparatively high in the North East, at £2.84 per head of population and comparatively low in London, at £1.36 per head of population. High outsourcing costs are generally indicative of workforce shortages.

Figure 2. Outsourcing expenditure for radiology reporting, per head of population – England regions, 2019



*South East includes the South Central region.

Insourcing expenditure totalled £47 million in England in 2019. There is significant variability across England in terms of insourcing costs relative to the size of the consultant radiology workforce. As shown in Figure 3, the average insourcing expenditure in England was £15,000 per consultant clinical radiologist (WTE). Expenditure was highest in the North East at £21,000 per radiologist and lowest in the South West at £9,000 per radiologist.

Figure 3. Insourcing expenditure per consultant clinical radiologist (WTE) – England regions, 2019



Estimated shortfall of consultant clinical radiologists in England in 2019

It is estimated that an additional 1,046 consultant clinical radiologists are required to report the volumes of imaging examinations conducted in England in 2019.⁵ This estimate takes into account the estimated time taken to report each type of imaging examination and the estimated percentage of images reported by consultant clinical radiologists.

Combining the estimated shortfall of diagnostic consultant clinical radiologists (n=1,046) and interventional radiologists (n=323), the total estimated shortage of consultant clinical radiologists (WTE) in England in 2019 was 1,369. However, this estimate does not take into account the radiology workforce required to report complex imaging, which takes longer to report, so understates the true shortfall. Other data indicating the shortage of consultant clinical radiologists are:

- The number of additional consultant clinical radiologists required in England to meet the European average of 12.8 radiologists per 100,000 population is 1,911.⁶
- The number of consultant clinical radiologists that could be funded by insourcing/outsourcing costs in England in 2019 is 1,802.

Using the average of all three shortfall estimates, the shortfall of consultant clinical radiologists in England is estimated to be 1,613 consultant clinical radiologists (WTE). This equates to a 34% workforce shortfall. As shown in Table 4, census data indicate the shortage of consultant clinical radiologists is most severe in the North East and the East Midlands, with estimated workforce shortfalls of 44%.

Table 4. Consultant clinical radiologist workforce, supply versus demand – England regions, 2019

Region	Consultant clinical radiologists in post (supply, WTE)	Estimated demand (mean of the three shortfall indicators)	Estimated shortfall	Percentage shortfall
East Midlands	204	363	159	44%
East of England	306	496	190	38%
London	664	820	155	19%
North East	134	239	105	44%
North West	466	707	241	34%
South East (including South Central)	448	726	278	38%
South West	327	456	129	28%
West Midlands	288	468	180	38%
Yorkshire and the Humber	283	458	175	38%
England total	3,120	4,773	1,613	34%

Demand for radiology services in England is likely to grow further over the next five years given the increased demand for diagnostic imaging, the greater complexity and diversity of imaging studies and the rising demand for interventional radiology.

The current shortfall of 1,613 WTE consultant radiologists in England is forecast to increase in line with demand unless urgent action is taken to address the situation.

5. Workforce scenarios and potential solutions for England

This section considers the impact that various scenarios could have on the estimated shortfall of 1,613 consultant clinical radiologists in England.

As outlined in Table 5, increasing training places and incentivising consultants to delay retirement would have the most significant impact on the capacity of the workforce in five years' time. By realising all of these measures, almost three-quarters of the current radiologist workforce shortfall in England could be eliminated.

Table 5. Workforce capacity scenarios for England, next five years

Scenario	Estimated increase in WTE consultants over five years	Proportion of 2019 workforce shortfall met*
Training		
Increase annual training places by 50% from 235 to 350**	414	26%
Reduce training attrition from 10% to 5%	12	1%
Recruitment		
Increase overseas recruitment by 50%	310	19%
Retention		
Incentivise consultants to retire at 65 (increase from 60)	338	21%
Increase staff retention – halve attrition for reasons other than retirement	98	6%
TOTAL	1,172	73%

[Please note, trainees who start training in five years' time are forecast to finish training in approximately 11 years' time. To present the data clearly, this time lag is not demonstrated in Table 5.]

**235 is the average number of trainees starting specialty training in clinical radiology in England each year between 2017 and 2019.*

In conclusion, to meet the increasing demand for radiology services, clinical radiology specialty training numbers in England need to be boosted further, including additional funding for IR posts. In addition, strategies for workforce retention are vital and should include support for flexible and home working.

References

1. The Royal College of Radiologists. *Clinical radiology UK workforce census 2019 report*. London. The Royal College of Radiologists, 2020.
 2. NHS Employers. *Pay and conditions circular (M&D) 1/2019*. London: NHS Employers, 2019.
 3. www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates (last accessed 12/8/20)
 4. British Society of Interventional Radiology and The Royal College of Radiologists. *Provision of interventional radiology services, second edition*. London The Royal College of Radiologists, 2019.
 5. NHS England and NHS Improvement. *Diagnostic Imaging Dataset Annual Statistical Release 2018/2019*. London: NHS England, 2019.
 6. <https://ec.europa.eu/eurostat/data/database> (last accessed 3/8/20)
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Appendix A.
Regional
workforce data
table

Consultant clinical radiologists (2019 unless stated otherwise)	East Midlands	East of England	London	North East	North West	South Central	South East	South West	West Midlands	Yorkshire and the Humber	England
Number of trusts/health boards (included in census)	8	16	23	8	26	8	12	17	15	14	147
Radiology services overview											
Proportion of clinical directors who think there are insufficient radiologists to deliver safe and effective patient care.	38%	71%	50%	75%	77%	100%	75%	82%	63%	73%	72%
Percentage of trusts/health boards with inadequate IR services	25%	50%	43%	50%	46%	38%	50%	71%	47%	50%	48%
Workforce											
Consultant clinical radiologists (headcount)	221	337	747.5	143.5	496	229	263	359	315	305	3,415
<i>Locums as % of workforce</i>	8%	11%	5%	7%	6%	2%	9%	2%	7%	4%	6%
Whole time equivalents (WTEs)	204	306	664	134	466	207	241	327	288	283	3,120
<i>of which, interventional radiologists</i>	43	46	129	23	88	44	43	58	57	52	582
<i>IRs as % of WTE workforce</i>	21%	15%	19%	17%	19%	21%	18%	18%	20%	19%	19%
Trainees (headcount)	100	121	300	86	169	102	68	128	128	153	1,355
<i>Trainees as % of workforce</i>	31%	26%	29%	37%	25%	31%	21%	26%	29%	33%	28%
SAS-grade doctors (headcount)	6	6	17	0	17	6	8	5	9	3	77
Total headcount (consultants, trainees and SAS)	327	464	1,065	230	682	337	339	492	452	461	4,846
Workforce trends											
Percentage of WTE workforce forecast to retire within five years	23%	19%	17%	19%	19%	19%	20%	20%	19%	21%	19%
Percentage of IR WTE workforce forecast to retire within five years	16%	14%	19%	24%	25%	23%	15%	22%	23%	19%	20%
IR - Annual workforce growth (average - past five years)	10%	4%	7%	-1%	7%	4%	4%	5%	4%	5%	5%
Annual workforce growth (average - past five years)	4%	6%	5%	1%	5%	1%	8%	4%	2%	2%	4%
Vacancy rate	13%	10%	9%	16%	11%	12%	9%	12%	12%	11%	11%
% workforce loss due to LTFT working	8%	9%	11%	7%	6%	10%	8%	9%	8%	7%	9%
Programmed activities (PAs)											
Mean PAs per week (full-time NHS consultants)	10.8	11.1	10.9	10.8	11.0	10.9	10.7	10.7	10.8	10.9	10.7
<i>of which, DCCs</i>	8.7	9.2	8.7	9.0	8.8	9.0	8.8	8.7	8.6	8.8	8.7
<i>of which, SPAs</i>	2.1	1.9	2.2	1.8	2.2	1.9	1.9	2.0	2.2	2.1	2.0
Imaging examinations (financial year 2018-2019)											
CT examinations	417,525	568,885	888,210	294,765	792,950	329,735	515,955	525,960	545,865	607,335	5,665,930
MRI examinations	248,690	303,845	573,845	175,265	448,650	203,590	314,035	275,070	421,960	338,845	3,743,995
X-rays	1,752,000	2,280,750	3,614,995	1,317,230	3,337,590	1,281,670	1,993,380	2,156,075	2,273,775	2,299,625	23,467,930
Population (2019)											
Population ³	4,835,928	6,236,072	8,961,989	2,669,941	7,341,196	9,180,135		5,624,696	5,934,037	5,502,967	56,286,961
WTE radiologists per 100,000 population (excludes trainees)	4.2	4.9	7.4	5.0	6.4	4.9		5.8	4.9	5.1	5.5
WTE radiologists per 100,000 population (includes trainees)	6.3	6.8	10.8	8.2	8.7	6.7		8.1	7.0	7.9	8.0
European average is 12.8 ⁶											
WTE IRs per million population (excludes trainees)	9	7	14	8	12	5		10	10	10	10
Outsourcing/insourcing/locum costs (financial year 18/19)											
Outsourcing to teleradiology companies	£8,293,799	£10,629,506	£12,194,261	£7,589,053	£17,302,755	£5,784,087	£7,861,244	£8,086,779	£6,937,795	£8,237,124	£92,916,404
Additional payments to contracted radiologists (insourcing)	£3,430,175	£4,731,777	£9,719,282	£2,839,459	£9,190,799	£2,686,602	£3,122,342	£3,101,380	£3,252,040	£4,738,024	£46,811,878
Ad hoc locums (for excess reporting)	£1,563,671	£2,444,708	£2,849,560	£2,204,950	£5,076,955	£548,079	£2,998,501	£527,952	£1,696,132	£2,309,645	£22,220,152
Total insourcing/outsourcing costs	£13,287,645	£17,805,991	£24,763,103	£12,633,462	£31,570,509	£9,018,768	£13,982,087	£11,716,111	£11,885,967	£15,284,792	£161,948,435
Expenditure (outsourcing+insourcing+locum) per head of population	£1.33	£2.20	£2.76	£4.73	£4.30	£2.51		£2.08	£2.00	£2.78	£2.88
Insourcing expenditure per WTE consultant radiologist	£16,852	£15,472	£14,633	£21,177	£19,715	£13,007	£12,953	£9,479	£11,284	£16,730	£15,004

	East Midlands	East of England	London	North East	North West	South Central	South East	South West	West Midlands	Yorkshire and the Humber	England
Workforce shortfall indicators											
Estimate A											
IR consultant shortfall (based on six IRs per trust, excluding those with formal daytime and out-of-hours network transfer arrangements)	14	41	43	19	62	10	25	35	30	43	323
Consultant (diagnostic) radiologist shortfall based on volumes of imaging examinations	94	71	20	70	96	39	115	36	138	125	1046
WTE consultant shortfall (sum of above)	108	112	63	89	159	49	140	72	168	167	1,369
Estimate B											
Additional consultant clinical radiologists required for 12.8 radiologists per 100,000 population (European average)	221	260	128	85	213	390	185	240	188		1,911
Estimate C											
Number of full-time consultant clinical radiologists that could be funded by outsourcing/insourcing costs	148	198	276	141	351	100	156	130	132	170	1,802
Estimated shortfall of WTE consultant clinical radiologists 2019 (average of estimates A,B and C)	159	190	155	105	241	278	129	180	175		1,613
Estimated percentage shortfall 2019	54%	38%	19%	44%	34%	38%	28%	38%	38%	38%	34%

Appendix B.
England trusts
and regions

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
United Lincolnshire Hospitals NHS Trust
University Hospitals of Derby and Burton NHS Foundation Trust
University Hospitals of Leicester NHS Trust

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

London

Barking, Havering and Redbridge University Hospitals NHS Trust
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

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

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
Wrightington, Wigan and Leigh NHS Foundation Trust

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

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

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

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

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



The Royal College of Radiologists

The Royal College of Radiologists
63 Lincoln's Inn Fields
London WC2A 3JW

+44 (0)20 7405 1282

enquiries@rcr.ac.uk

www.rcr.ac.uk

[@RCRradiologists](https://twitter.com/RCRradiologists)

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