IPEM
Institute of Physics and Engineering in Medicine

Radiotherapy Census Report

Full report 2021/22

Contents

62

Participants responding

89%

response rate

Introduction

IPEM's Workforce Intelligence Unit conducted a Radiotherapy Workforce Census in November 2021. A short summary report was subsequently published in June 2022 with initial data and findings. This report provides in-depth analyses and conclusions from the census, including future workforce projections and suggestions to combat the workforce shortage.

An invitation to respond was sent to all Heads of Radiotherapy Physics and Engineering services in the UK, including NHS and independent providers, with 62 participants responding, giving an overall response rate of 89%.

Data was gathered on four professional groups:

- Clinical Scientists
- Clinical Technologists (Physics)
- Clinical Technologists (Engineering)
- Other staff, including:
  - IT support (IT technicians, software engineers, clinical system administrators/ assistants)
  - Junior physicists
  - Clinical pathway co-ordinators
  - Healthcare Scientist support staff
  - Treatment planners
  - Brachytherapy radiographers
  - Quality managers

Analysis of the data was performed to inform:

- Staff establishment
- Rates of vacancies
  - Regionally
  - By Agenda for Change (AfC) banding
  - In comparison to IPEM's recommendations
- Proportion of Consultant Clinical Scientists within workforce
- Retention rates of Radiotherapy Clinical Scientists and future workforce projections
- Age profile
- Staffing provision satisfaction within workforce

7%

Vacancy rates for Clinical Scientists

8%

Vacancy rates for Clinical Technologists (Physics)

9%

Vacancy rates for Clinical Technologists (Engineering)

Executive Summary

Radiotherapy Physics is a large workforce within Medical Physics and Clinical Engineering (MPCE), comprising over 1800 staff across the UK. Across the professional groups within Radiotherapy Physics, there is an average vacancy rate of 8%. Combined with the predicted training shortfall and the concerning proportion of staff approaching retirement age, our analysis has shown that workforce vacancies will increase further if appropriate measures are not taken.

Primarily, further funding is required to increase the annual allocation of trainees to ensure the provision of an active pipeline of staff entering the workforce. This will allow gradual easing of workforce pressures higher up the demographic chain, such as difficulties in retaining experienced staff and impending/early retirement.

This funding should be provided by budget holders to allow trainees to participate in established training schemes, in addition to in-service training routes.

To improve trainee output, budget holders and training centres should be aware of all available training routes. These routes include (but are not limited to):

- Association of Clinical Scientists Route 2[1]
- Modernising Scientific Careers, Scientist Training Programme[2]
- Scottish Medical Physics and Clinical Engineering Training Scheme[3]
- Academy of Healthcare Science, Scientist Training Programme Equivalence[4]
- IPEM Clinical Scientist Guided Training Scheme[5]
- IPEM Clinical Technologist Training Scheme[6]
- Healthcare Science Practitioner Degree Apprenticeships[7]

Furthermore, an increase in funding to expand the establishment of staff posts in the 'Other staff' professional group should be considered to ease workforce pressures on Clinical Scientists and Technologists.

Consideration should also be given to career progression, ensuring that established staff have available training routes and opportunities to fill vacant senior posts. This will facilitate an appropriate skill mix within the workforce to provide a safe and effective clinical service.

The Radiotherapy Physics workforce comprises over

1800

staff across the UK

Key findings

Since the last Radiotherapy census was performed in 2019, vacancy rates have reduced across all four professional groups. However, the average vacancy rate is still unsustainably high at 8%. Workforce predictions outlined later in this report conclude that the projected trainee output will not redress the current workforce shortage in the next 3 years.

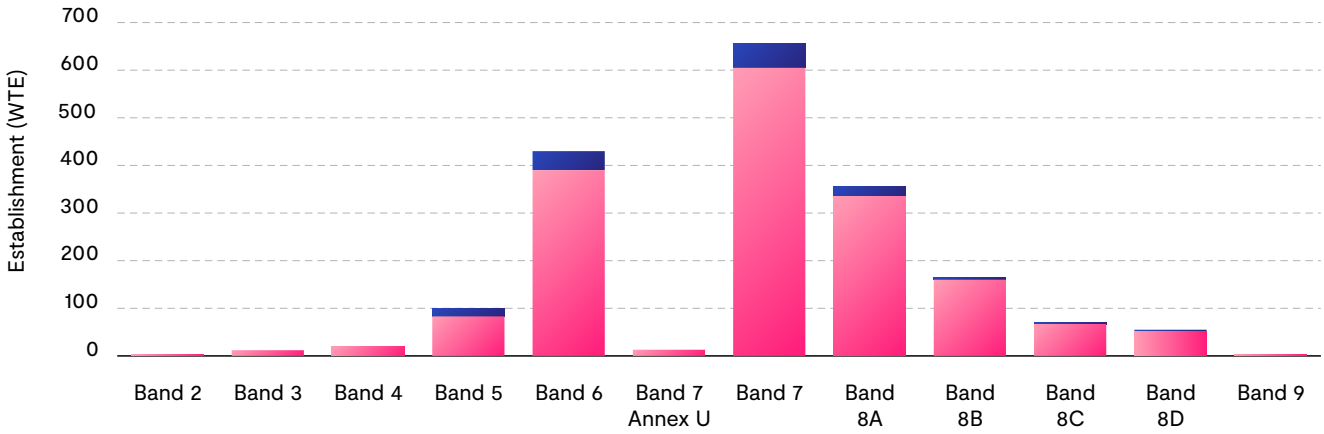
	In Post WTE	Vacancy WTE	Vacancy Rate
Clinical Scientist	819.6	64.4	7%
Clinical Technologist (Physics)	562.6	46.1	8%
Clinical Technologist (Engineering)	318.5	32.0	9%
Other	58.0	7.8	12%
Total	**1758.7**	**150.3**	**8%**

In-post and vacant WTE and vacancy rates. Some figures are estimated and based on previous census responses.

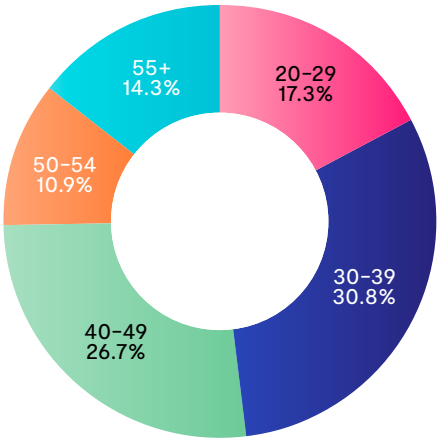
The average vacancy rate in Radiotherapy is

8%

which is unsustainably high



Workforce establishment by Agenda for Change (AfC) banding.



Age profile of all staff in the Radiotherapy workforce.

The majority of established posts in Radiotherapy Physics are at Agenda for Change Bands 6, 7 and 8A, with Bands 6 and 7 having the largest number of WTE vacant.

In addition, 24% of the Radiotherapy workforce is aged over 50, indicating that a large proportion of this workforce will be approaching retirement within the next 5-10 years.

Comparatively, 17% of the workforce are aged 20-29, which typically consists of early-career staff such as trainees or newly qualified staff

This paints a concerning picture – this workforce has a high vacancy rate which will likely worsen due to retirement and lack of training posts unless effective actions are taken.

24%

of the Radiotherapy workforce is aged 50+

"The Radiotherapy workforce has a high vacancy rate, which will worsen due to impending retirements and lack of sufficient training posts"

Establishment and vacancies

Vacancy rates over time

Vacancy rates from the 2021 census were compared to previous Radiotherapy censuses to assess the trend of vacancies over time (Fig. 1).

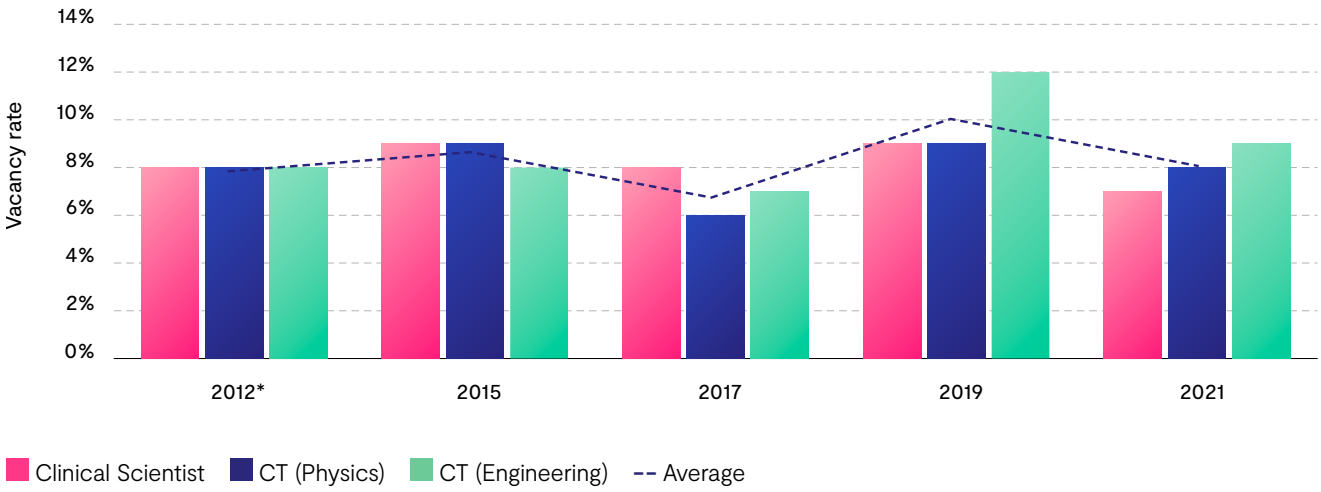
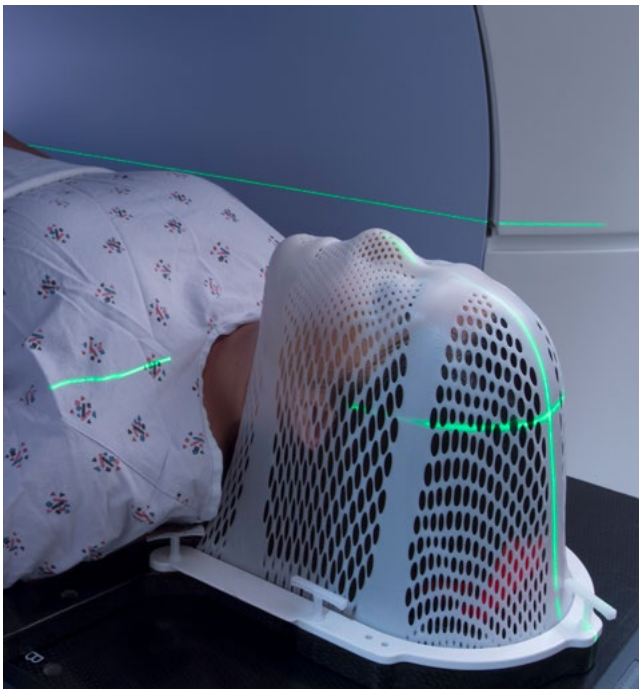


Figure 1: Assessment of vacancy rates over time for Clinical Scientists and Clinical Technologists (CT) in Physics and Engineering.
*The 2012 census did not differentiate Clinical Scientists from Clinical Technologists.

Encouragingly, vacancy rates have reduced across all four professional groups since the 2019 Radiotherapy census. Clinical Scientist 2021 vacancy rates have reduced to an all-time low since the beginning of IPEMs workforce surveys in 2012.

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Comparison to other specialisms

To assess whether Radiotherapy Physics and Engineering vacancy rates are reflective of the Medical Physics and Clinical Engineering workforce as a whole, this data was compared to recent workforce surveys performed for Nuclear Medicine, Diagnostic Radiology and Radiation Protection and Clinical Engineering specialisms (Fig. 2).

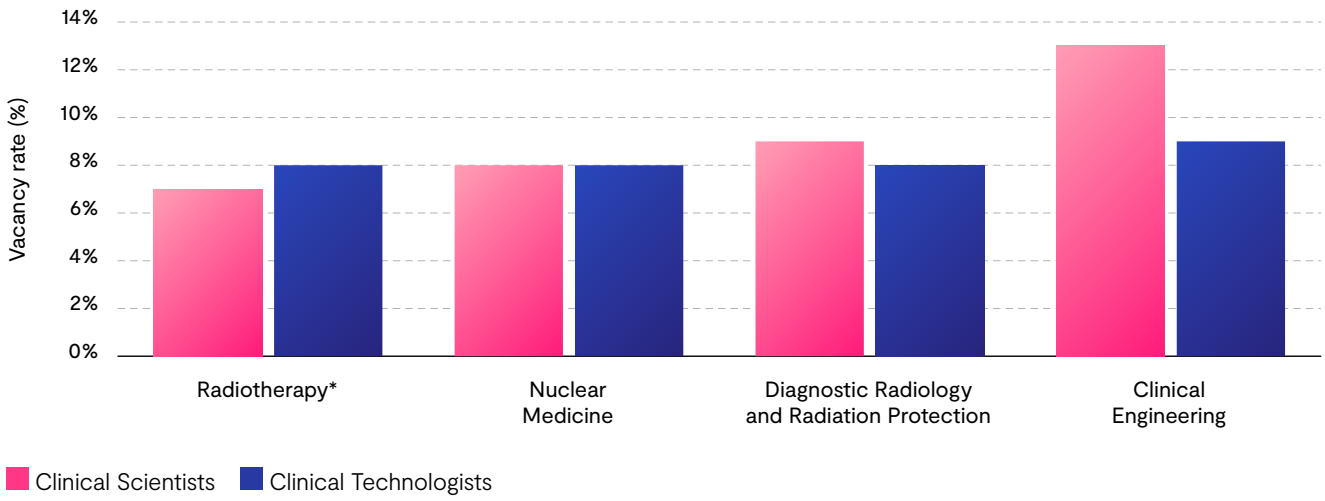


Figure 2: Vacancy rates for Radiotherapy Physics compared to other specialisms.
*Clinical Technologists includes both Physics and Engineering technologists.

This analysis indicates that whilst Radiotherapy has the lowest Clinical Scientist vacancy rate when compared to other specialisms, vacancy rates for Clinical Technologists are consistent with other specialisms within the workforce.

Whilst a smaller vacancy rate in Radiotherapy Physics and Engineering might be utilised as a technique to attract trainees towards other specialisms within Medical Physics and Clinical Engineering, this is not a sustainable approach. This would create further staff shortages and therefore further input to the workforce must come from additional training opportunities across all specialisms of Medical Physics and Engineering.

> **Further input to the workforce must come from additional training opportunities across all specialisms**

Increase of 83.5 WTE

Clinical Scientists require an increase of 83.5 WTE to meet IPEM guidance

30% increase

Clinical Technologists involved in Physics require a 30% increase from current occupied posts to reach recommended staffing levels

Comparison to IPEM recommended staffing provision

The table below summarises established staff (this includes filled and vacant posts), staff in-post and the number of staff IPEM recommends for NHS radiotherapy services across the different staffing groups. Private radiotherapy centres follow a different service structure to the NHS and therefore may not reflect the workforce requirement accurately.

	WTE			Workforce increase required to meet:	
	Establishment	IPEM recommendations	In-post	Establishment	IPEM recommendations
Clinical Scientist	884.0	903.1	819.6	64.4 (+7.3%)	83.5 (+9.2%)
Clinical Technologist (Physics)	608.7	798.0	562.6	46.1 (+7.6%)	235.4 (+29.5%)
Clinical Technologist (Engineering)	350.5	565.1	318.5	32.0 (+9.1%)	246.6 (+43.6%)

Table 1: Current establishment in Radiotherapy Physics staff compared to IPEM recommended staffing establishment. The 'Workforce increase required' relates to the increase required to the number of staff in-post to redress the current vacancy rates and to meet IPEM staffing recommendations

From this data, an increase in establishment of 19.1 WTE Clinical Scientists are required to meet the IPEM recommended staffing provision, which is equivalent to 2.1% of the established Clinical Scientist posts. Conversely, Clinical Technologists involved in Physics and Engineering require a 31% and 61% increase, respectively, from the current established posts to meet IPEM recommended staffing levels.

However, when considering the current vacancy rates, an increase of 83.5 WTE Clinical Scientists are required to meet the IPEM recommended staffing provision. Concerningly, Clinical Technologists involved in Physics and Engineering require a 30% and 44% increase, respectively, from the current occupied posts to reach recommended staffing levels.

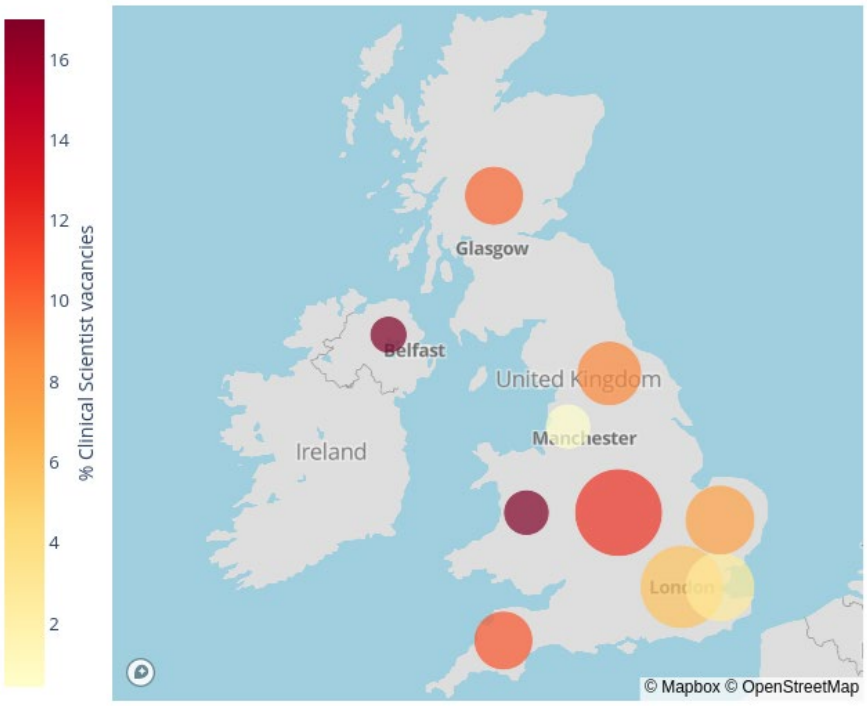
We have however noted that several respondents believe the current recommendations do not sufficiently evaluate the requirements of differing departmental configurations and size, and consequently may overstate the number of technologists required. These recommendations are being revised and as a result, the recommended Clinical Technologist staffing levels may be reduced, and so the required uplift may not be as great. However, this does not diminish the need for an active pipeline for training Clinical Technologists, which is currently lacking.

Regional vacancy rates

Staffing levels were assessed across Scotland, Northern Ireland and Wales, as well as English regions.

The figures in this section illustrate the establishment of Clinical Scientists and Clinical Technologists in Physics and Engineering across the UK.

Clinical Scientist establishment by region



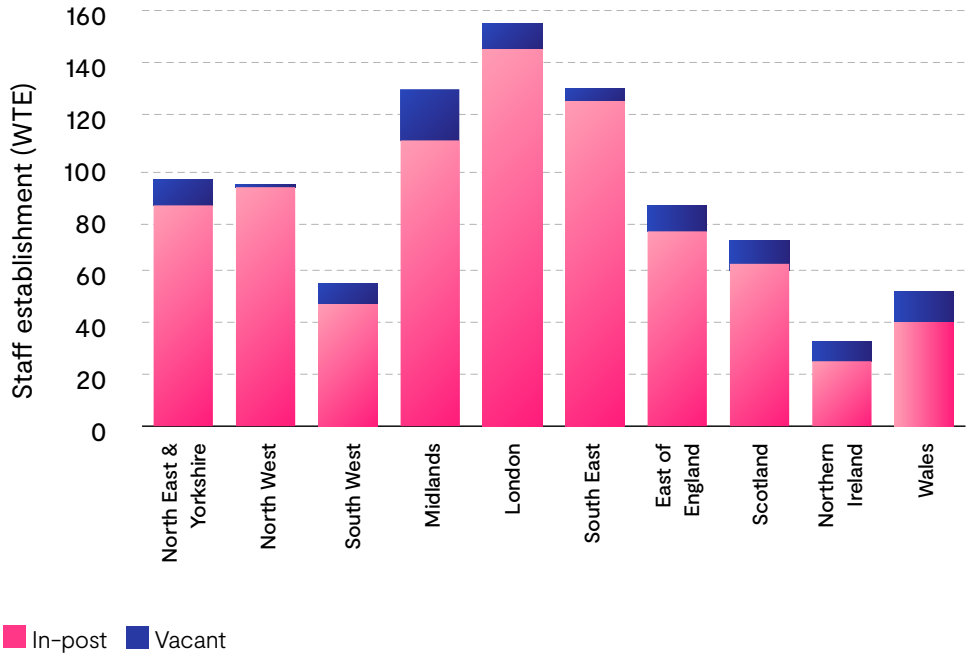
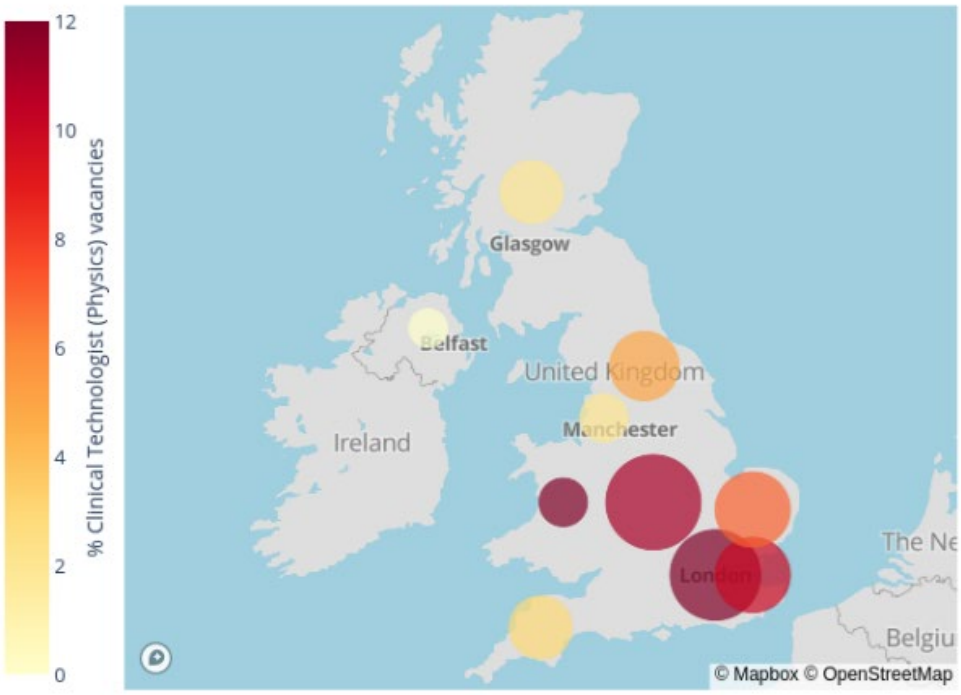


Figure 3: Top - Geographical establishment of Clinical Scientists in Radiotherapy. Size of markers indicate the number of centres responding to the survey in that region (ranging from 2 in Northern Ireland to 11 in the Midlands), with the colour of the marker indicating the vacancy rates. Bottom – WTE staffing in-post and vacant across the regions.

Clinical Technologist (Physics) establishment by region



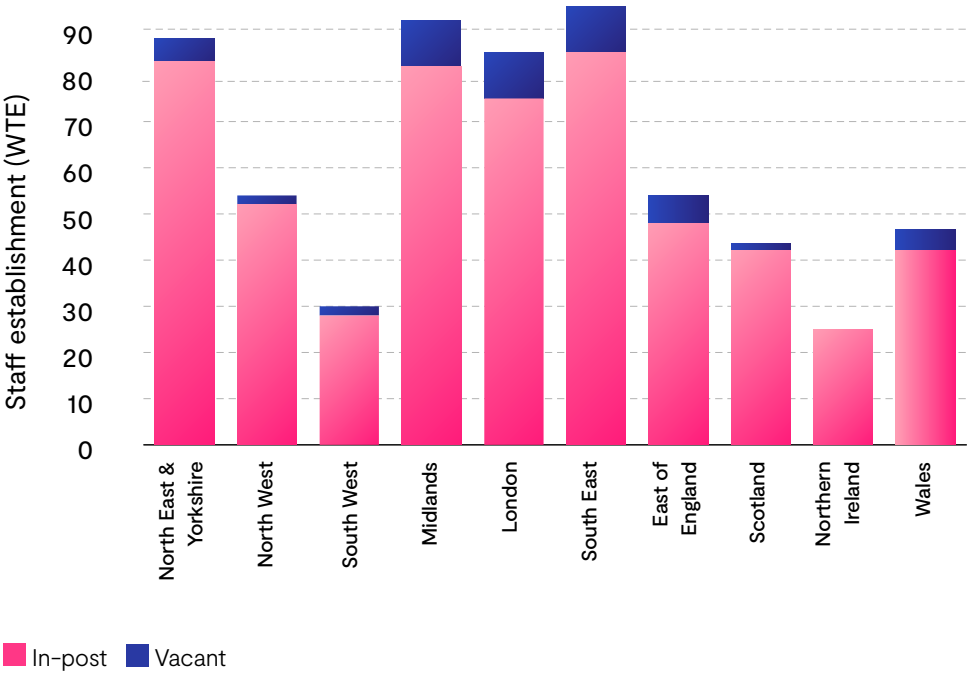
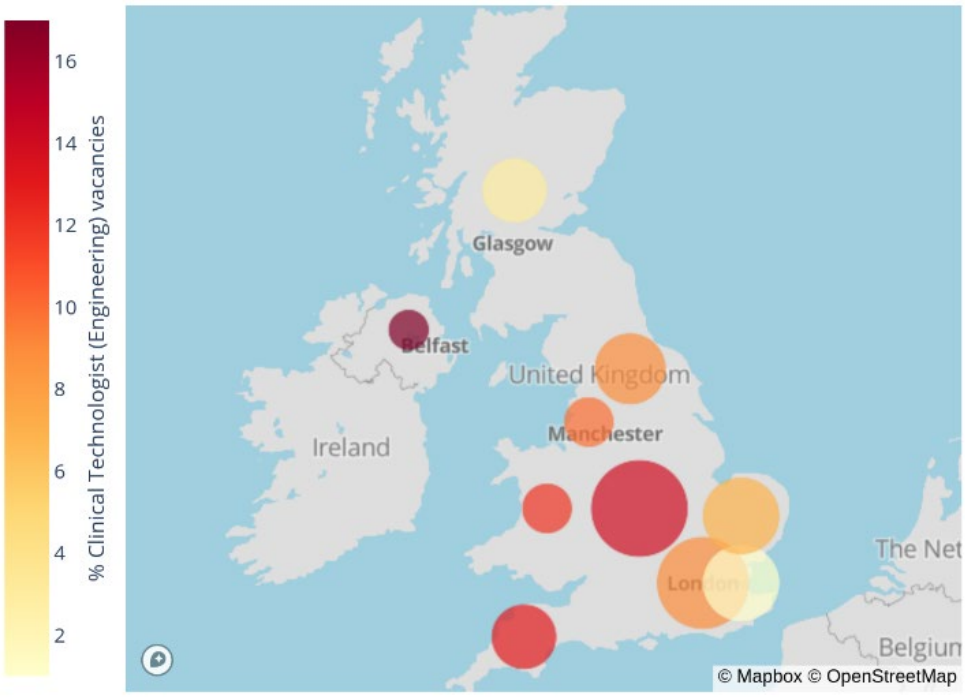


Figure 4: Top - Geographical establishment of Clinical Technologists (Physics) in Radiotherapy. Size of markers indicate the number of centres responding to the survey in that region (ranging from 2 in Northern Ireland to 11 in the Midlands), with the colour of the marker indicating the vacancy rates. Bottom – WTE staffing in-post and vacant across the regions.

Clinical Technologist (Engineering) establishment by region



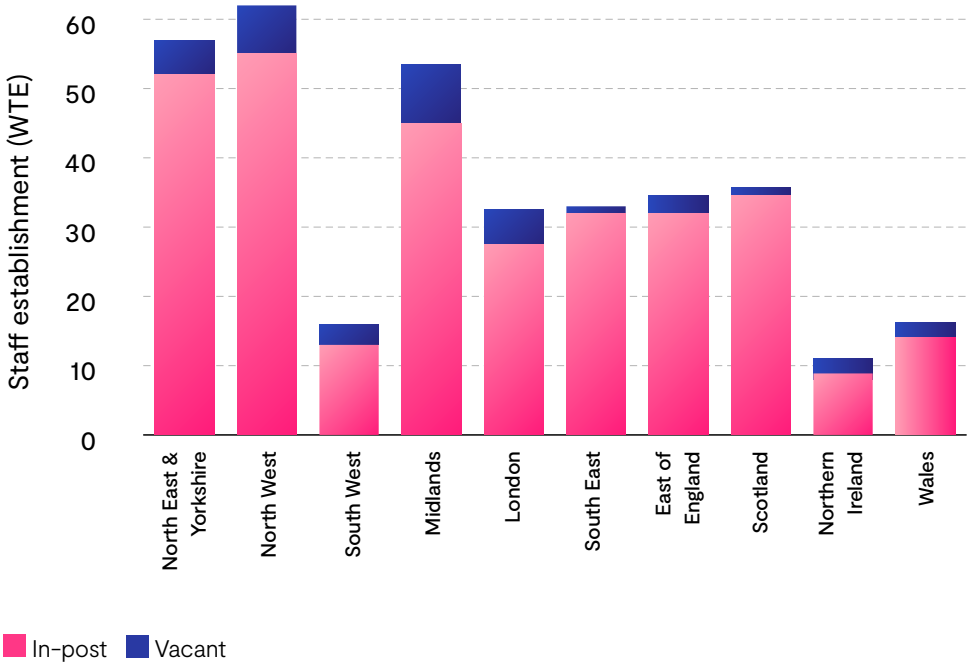


Figure 5: Top - Geographical establishment of Clinical Technologists (Engineering) in Radiotherapy. Size of markers indicate the number of centres responding to the survey in that region (ranging from 2 in Northern Ireland to 11 in the Midlands), with the colour of the marker indicating the vacancy rates. Bottom – WTE staffing in-post and vacant across the regions.

Clinical Scientists

The Midlands contains the largest proportion of survey respondents (11), and this region has the highest number of Clinical Scientist vacancies in England. This could indicate difficulty in recruitment and retention in these areas or could indicate that this region serves a large population and therefore demand for services is high.

The smallest number of survey respondents were located in Wales and Northern Ireland, which have the highest vacancy rates of Clinical Scientists in the UK of 17%. This suggests that services are stretched thinly across these regions and further recruitment and retention strategies to improve the workforce gap are essential.

Wales and Northern Ireland have the highest Clinical Scientist vacancy rates in the UK at 17%

Clinical Technologists (Physics)

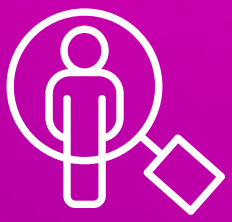
The geographical establishment of Clinical Technologists (Physics) in the workforce differs to that of Clinical Scientists. Vacancies are the greatest in London and Wales, at a rate of 12%. The Midlands and South East England vacancy rates are at a similar level of 11%. This could be indicative of a training or skills gap within these regions that causes difficulties in recruitment of technologists into these posts. Of note, the vacancy rates appear to correlate to the size of the region, with regions containing a smaller number of centres having fewer vacancies. These centres also have a lower number of staff established in the field, potentially indicating that other staff may perform Clinical Technologist (Physics) responsibilities, and therefore these staff groups are not captured in this data.

Clinical Technologists (Engineering)

With the exception of Scotland and South East England, vacancy rates for Clinical Technologists (Engineering) are greater than 7% in all regions in the UK. This shows that in general, recruitment and retention rates for this staff group in the UK is poor.

Recruitment and retention rates in the UK for Clinical Technologists in Engineering are poor.

Northern Ireland, Wales and the South West of England have considerably smaller establishments of Clinical Technologists in Engineering than the remainder of UK regions, in addition to some of the highest vacancy rates. This could indicate that these regions require more Clinical Technologists to meet patient demand, but due to already poor vacancy rates, the establishment is impossible to increase further.



Workforce banding profile

To further investigate vacancies within the Radiotherapy Physics and Engineering profession, vacancies were stratified into Agenda for Change (AfC) banding. This can indicate whether vacancies are a result of difficulty recruiting trainees, or due to skill gaps at higher consultancy levels.

This analysis was performed across all four professional groups (Figs. 6–10).

Clinical Scientists

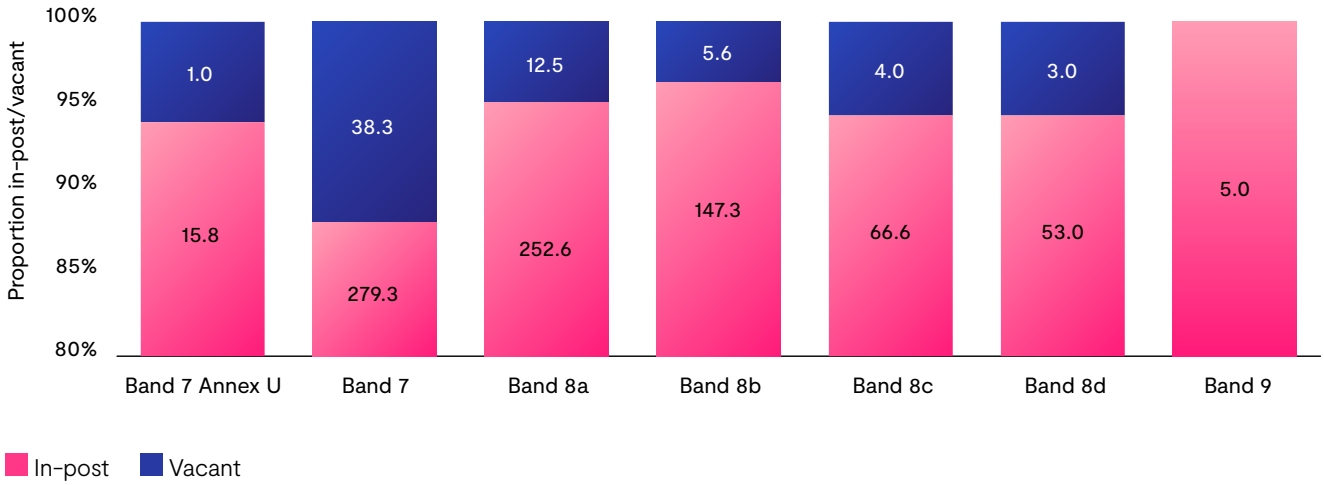


Figure 6: Proportion of Clinical Scientist workforce in-post and vacant by AfC banding. The WTE occupied/vacant is indicated by the numerical labels on the chart.

Fig. 6 indicates that the majority of vacancies within the Clinical Scientist Radiotherapy workforce exist at a Band 7 level. This could be due to difficulty in recruiting newly-qualified Clinical Scientists, or reflective of the general shortage created by too few annual training posts.

The majority of vacancies for Clinical Scientists in Radiotherapy exist at Band 7.

Consultant Clinical Scientists

Consultant Clinical Scientists (CCS) provide valuable scientific clinical advice and care alongside medical consultants and other healthcare professionals from across the healthcare system. The role of CCS has been well established in the NHS for over 40 years, and involves significant responsibilities relating to quality improvement, innovation and research within their specialism to enable the enhancement and modernisation of healthcare services. With their extensive training and highly specialised expertise, CCS staff have the same level of professional competency as medical consultants. To assess the proportion of CCS staff within Radiotherapy Physics, we have assumed that Clinical Scientists reported as Bands 8C, 8D and 9 in terms of NHS AfC banding are classed as CCS staff. The data from this census was then compared to previous census data to analyse any trends in this staff group over time.

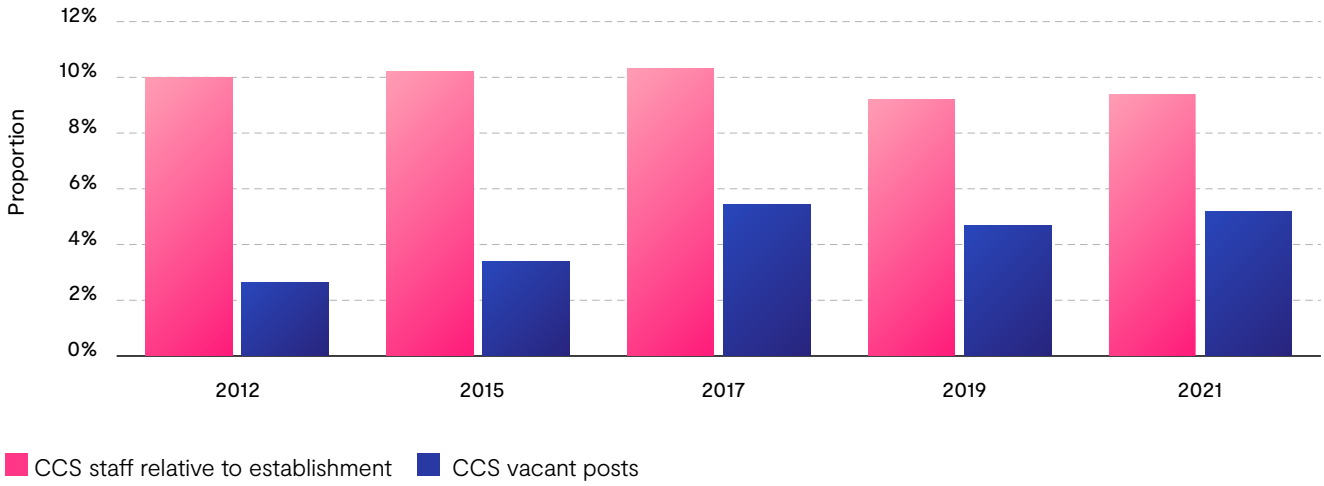


Figure 7: Proportion of CCS staff in the workforce and proportion of vacant CCS posts since 2012.

Currently, 9% of the Radiotherapy workforce are Consultant Clinical Scientists, with a current vacancy rate of over 5%. This constitutes approximately 7% of all vacancies within Radiotherapy.

In general, despite the total number of CCS staff increasing over time, there has been a slight decrease in the proportion of CCS staff in the workforce, with a 2% decline since 2012. This indicates that Radiotherapy services might be expanding faster than CCS staff are developing. Further incentives for career progression are required within the workforce to increase the proportion of CCS staff. This will also increase training capacity and increase movement towards an enhanced state-of-the-art healthcare system.

9%

of the Radiotherapy workforce are Consultant Clinical Scientists, with over 5% of posts for this staff group being vacant

Clinical Technologists (Physics)

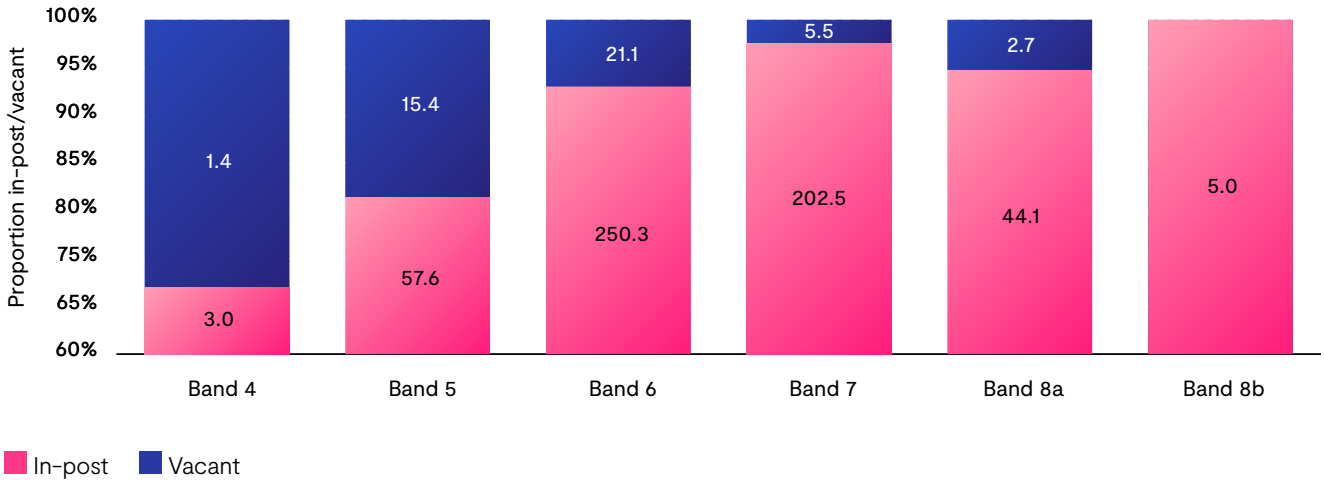
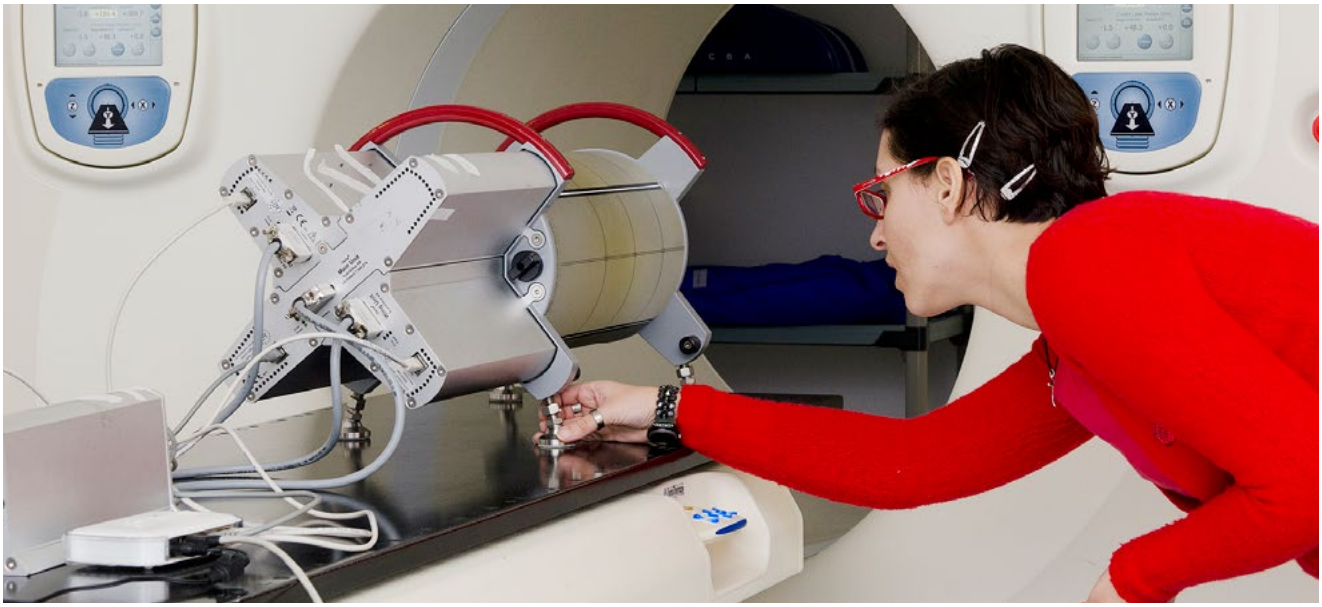


Figure 8: Proportion of Clinical Technologists (Physics) workforce in-post and vacant by AfC banding. The WTE occupied/vacant is indicated by the numerical values on the chart.

Clinical Technologists in Physics working at Bands 4, 5 and 6 have the highest vacancy rates, with Bands 5 and 6 having the largest WTE vacant. This is likely to be indicative of difficulties in attracting and training Clinical Technologists in their early career and the overall shortfall in training numbers.

Vacancy rates at a Band 5 and 6 level for Clinical Technologists (Physics) highlight issues relating to sufficient training provision for this staff group.



Clinical Technologists (Engineering)

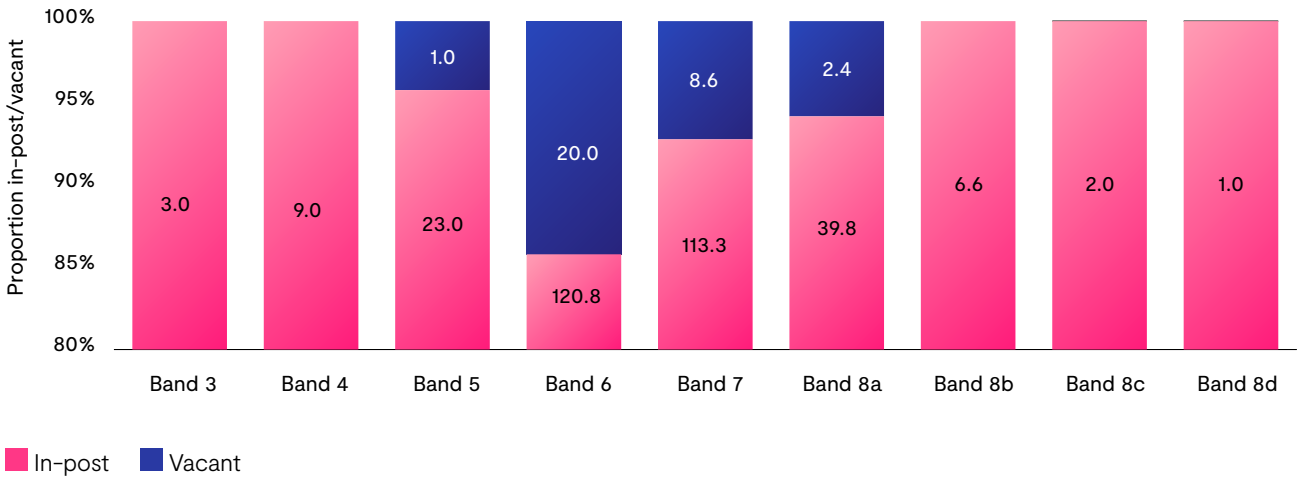


Figure 9: Proportion of Clinical Technologists (Engineering) workforce in-post and vacant by AfC banding. The WTE occupied/vacant is indicated by the numerical values on the chart.

For Clinical Technologists in Engineering, Bands 6 and 7 have the largest number of vacancies with 21% of positions vacant at these bands. Similarly to Clinical Technologists in Physics, this could be due to difficulties in training and supporting staff at these levels.

89%

of vacancies for Clinical Technologists in Engineering exist at Bands 6 and 7, indicating difficulty in recruitment and retention of trainees

Other staff

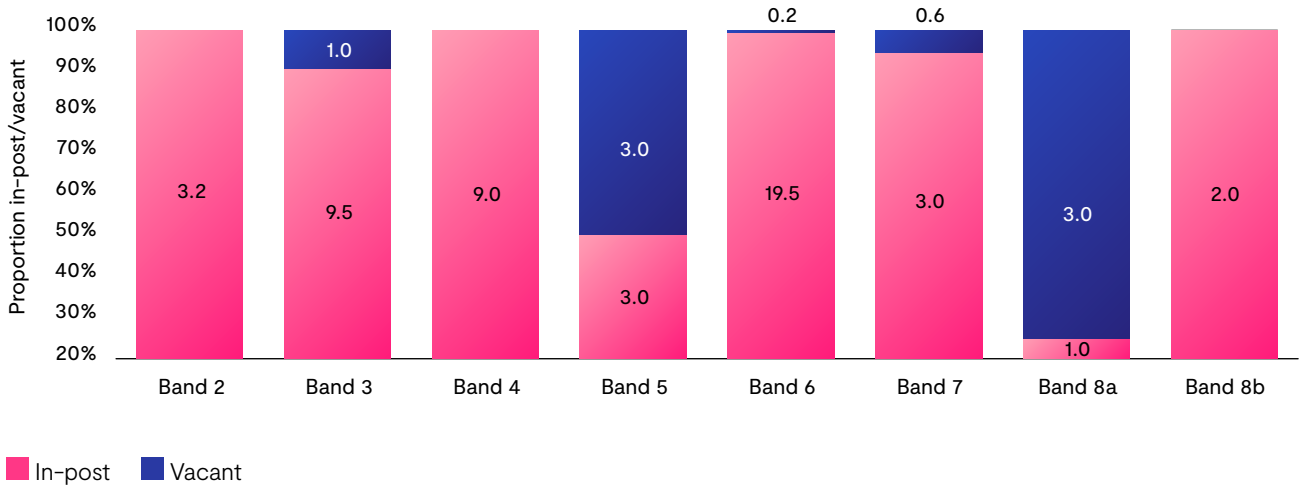


Figure 10: Proportion of Other Staff workforce in-post and vacant by AfC banding.
The WTE occupied/vacant is indicated by the numerical values on the chart.

Posts which fall under the Other Staff category have increased to significant numbers since IPEM's Radiotherapy workforce census in 2012, which now make up 4% of the Radiotherapy workforce.

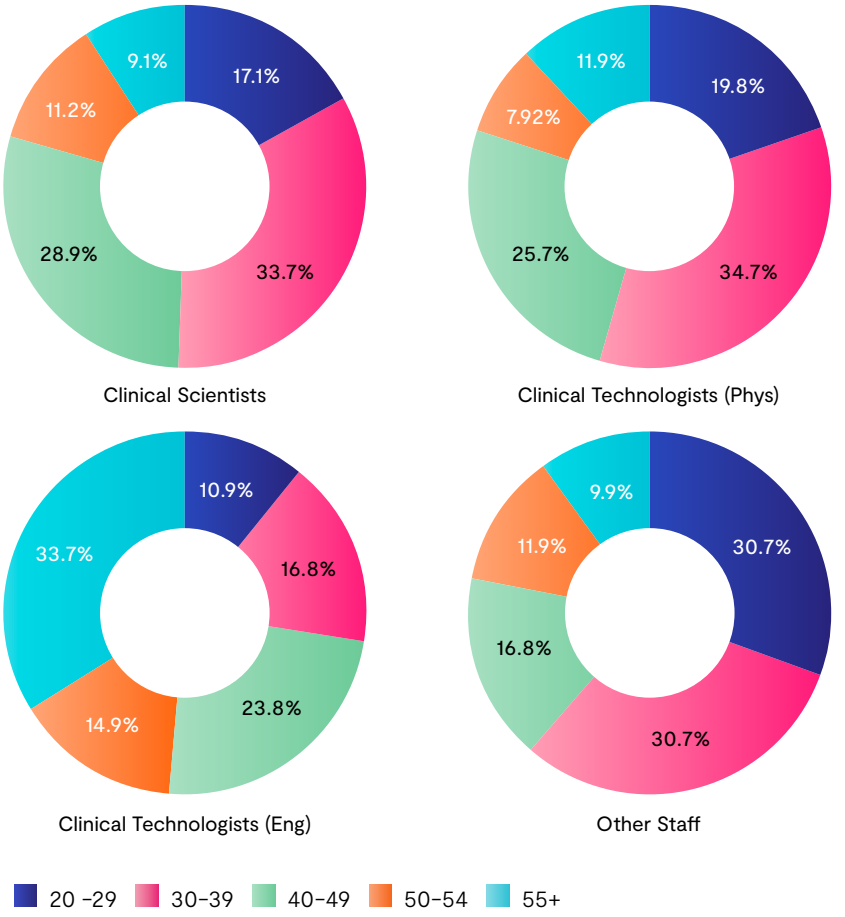
The posts included within this category are often creative and strategic solutions that have been created where there is flexibility in service structure and allow shifts in resposibilities, creating posts that require less experience and expertise, thereby allieviating pressures on the workforce.

Band 6 have the most established posts in this category, which could be due to a shortage of Clinical Scientists. From our interpretations, a Band 6 post could be created if the responsibilities of existing Clinical Scientists are shifted, as this can leave the remaining responsibilities to a post that does not require HCPC registration.

> **'Other staff' posts are often strategic solutions to allow a shift in responsibility and alleviate pressures on the workforce.**

Workforce age profile

Survey respondents were asked to provide information relating to the age profile of their workforce. This information is crucial for workforce modelling to determine the number of staff that could leave the workforce due to early retirement, in addition to assessing the number of early-career staff members entering the workforce.



Approximately 14% of the entire Radiotherapy workforce are approaching retirement age

Over a third of Clinical Technologists in Engineering are approaching retirement, with almost half aged over 50

Figure 11: Age distribution of the four professional staffing groups within Radiotherapy Physics and Engineering.

Approximately 14% of the overall Radiotherapy workforce are approaching retirement age (aged over 55). Additionally, over a third of Clinical Technologists in Engineering are approaching retirement age, which is of great concern. This is over three times higher than the other professional groups, which sits at 10% on average. Furthermore, almost 50% of Clinical Technologists in Engineering are aged over 50, indicating that this workforce will deteriorate unless action is taken to tackle the challenges relating to recruitment and training of staff.

The age distribution of Clinical Scientists in Radiotherapy is consistent with the age profile of all Clinical Scientists in Medical Physics and Clinical Engineering (based on IPEM membership data). Therefore, the age profile of Clinical Scientists is not necessarily a cause for concern if the workforce demand were to remain static. However, if a series of early retirements occurs along with the immediate retirement of over 55s there will be a major shortage of Clinical Scientists. This will lead to a further increase of an already lengthy back log of patients awaiting treatment.

To contextualise this data effectively, this was compared to proportion of other Healthcare Professionals within the NHS approaching retirement age (Fig. 12).

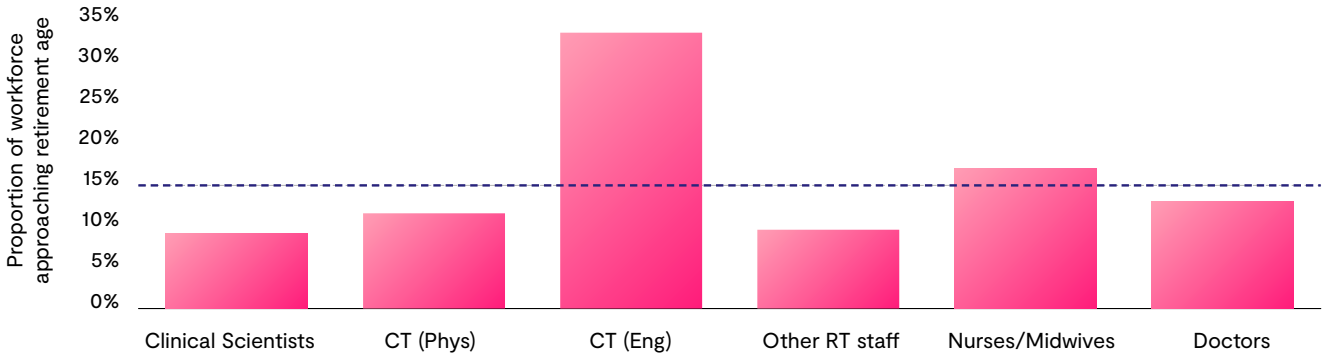
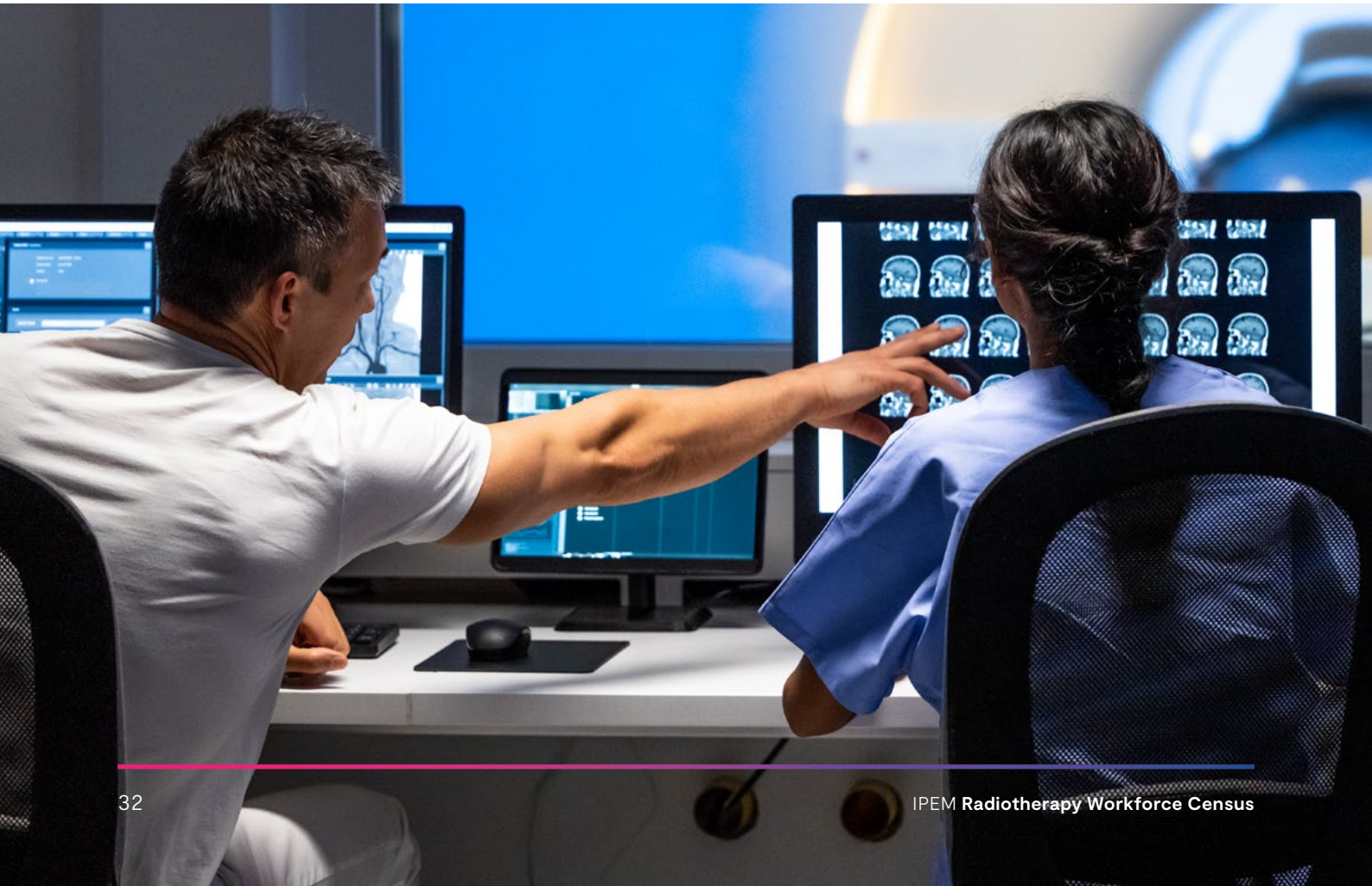


Figure 12: Comparison of Radiotherapy workforce (Clinical Scientists, Clinical Technologists [CT] and Other Staff) approaching retirement age to other healthcare professionals within the NHS[8].



Whilst the national retirement age is likely to rise in line with national practice, the literature[9] suggests that the recent stresses of the pandemic and staffing shortages may contribute to a number of early retirements in parallel with other medical staff groups.

The comparison in Fig. 12 illustrates that whilst Radiotherapy Clinical Scientists, Clinical Technologists (Physics) and Other RT staff are below the national average for Healthcare Professionals approaching retirement age, Clinical Technologists (Engineering) are in a precarious position with over double the national average.

This data is alarming as this indicates that Clinical Technologists (Engineering) may face an even larger workforce shortfall if effective measures are not implemented. If a series of early retirements occurs along with immediate retirement of the 'over 55s' group, it would force services to outsource to manufacturers via service contracts while the workforce recuperates. This is of course a non-trivial "quick-fix" and offers less flexibility than having a reliable and robust Clinical Technologist workforce. Service contracts will also be at the expense of the centres, which will not be financially sustainable for an extended period of time.

Therefore, as a matter of urgency, there must be an increase in training a sufficient number of Clinical Technologists in Engineering. This will ensure a sufficiently large and qualified talent pool to replace the vast number of staff approaching retirement, whilst also allowing for natural service expansion.

Recent stresses following the Covid-19 pandemic and staffing pressures may contribute to a number of early retirements

Clinical Technologists (Engineering) have over double the national average for Healthcare Professionals approaching retirement age

As a matter of urgency, training provision must increase for Clinical Technologists (Engineering)

Staffing provision

Survey respondents were asked whether they felt that their current staffing provision was:

- Far too little
- Too little
- Sufficient
- Too much

0% of participants stated that they felt their staffing provision was 'too much', with 61% of respondents stating that they feel their staffing provision is below what is required to provide an adequate Radiotherapy Physics and Engineering service. This has slightly decreased from the 2019 Radiotherapy census where this value stood at 68%.

This data was also assessed geographically to determine whether there were any regional trends relating to opinions on staffing provision. Vacancy rates in these regions were also considered.

Staffing Provision Satisfaction within Radiotherapy Physics

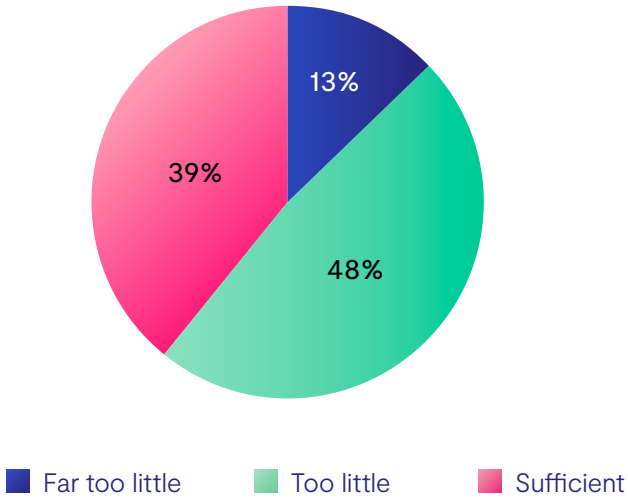


Figure 13: Proportional response of survey participants regarding staffing provision.

61%

of respondents felt their staffing provision was below the requirement to provide a safe Radiotherapy service

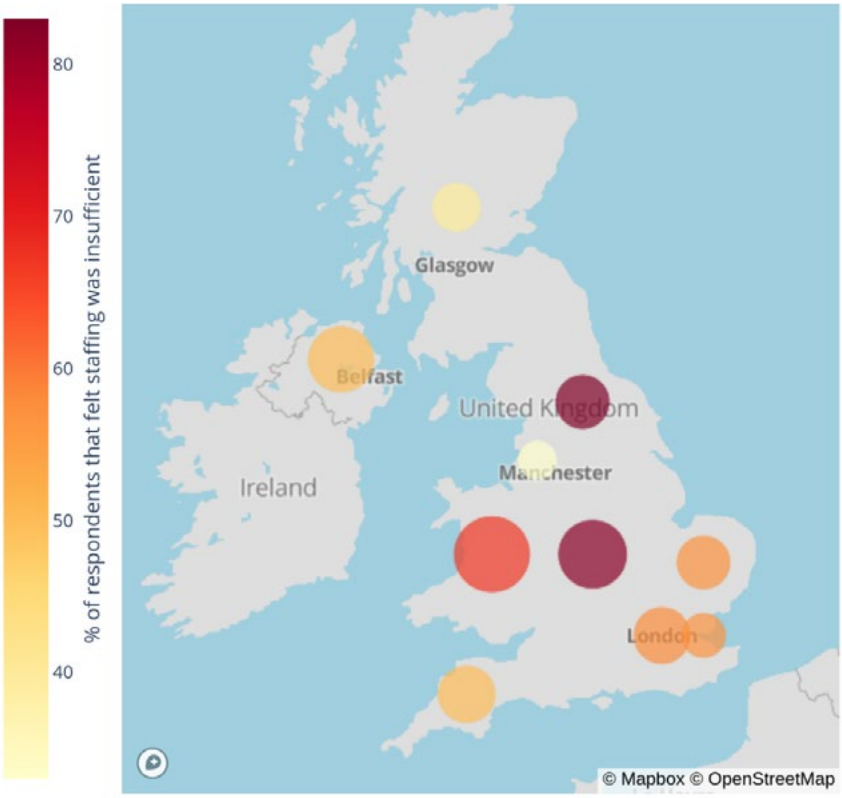


Figure 14: Regional map, with colours indicating the proportion of responders that felt staffing was insufficient (ranging from 40% in Scotland to 83% in North East England and North Yorkshire). The size of the markers indicate the relative vacancy rates in this region across all four professional areas (ranging from 4% vacancy in North West England to 16.4% vacancy in Wales).

In general, regions with higher vacancy rates felt that their staffing was insufficient, however there is not a significant linear correlation. For example, North East England and North Yorkshire had the greatest number of participants state that staffing was insufficient whilst having a lower vacancy rate when compared to other regions (7.8%). However, this could indicate differences in numbers of patients accessing services within these regions, with full staffing capacity still being insufficient to meet clinical demand. Furthermore, the North West had the largest variation in responses, with 33% in this region station that the staffing was far too little, and 67% stating that staffing was sufficient. This illustrates that individual centres have specific challenges relating to staffing that cannot be resolved by a 'one size fits all' approach.

Participants were able to provide comments to complement their response to this question. These comments indicated that overall, although the workforce is currently coping with existing pressures, there are serious concerns relating to having little or no provision for training and service development.

Comments were also made relating to struggles in the recruitment of Clinical Technologists, especially in Engineering which has the largest shortfall of staff. In addition, there are also significant difficulties covering long-term sick and maternity leave, thereby putting large strains on services.

> **Staff have serious concerns regarding the lack capacity to facilitate training and service development**

Staff retention

Prior to the establishment of the Scientist Training Programme (STP), IPEM was the sole provider of training for Clinical Scientists. Analysis has been performed to assess the proportion of Clinical Scientists remaining in the workforce in 2022, after being recorded passing the ACS Radiotherapy exam between 2007–2015.

Analysis has not been performed for Clinical Technologists as it is challenging to quantify the number of technologists who have entered the workforce in the last decade, as this professional group are not trained via a commissioned supernumerary route but through on-the-job training.

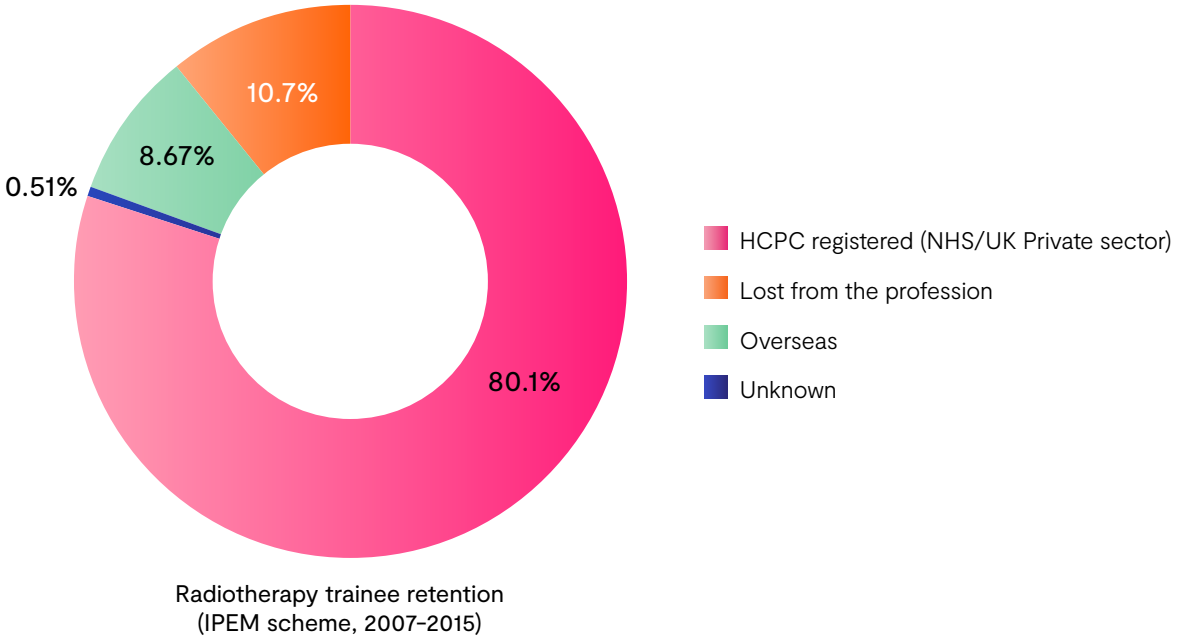


Figure 15: Retention of Clinical Scientists in 2022 following completion of IPEM training scheme between 2007–2015.

This analysis indicates that 80% of this cohort currently remain as registered Clinical Scientists working in the UK in the NHS or the Private Sector. 19% of this cohort are now working overseas, retired or have undergone a career change.

The 5-year retention of all Clinical Scientists who passed the ACS radiotherapy exam between 2007–2015 was also assessed.

19%

of Clinical Scientist trainees trained between 2007–2015 were no longer in the workforce as of 2022

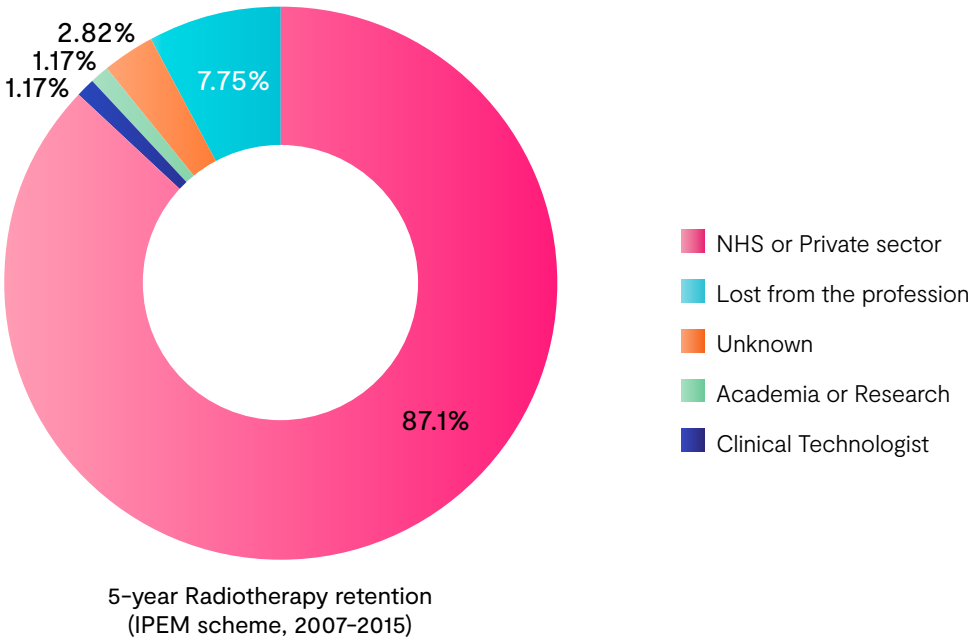


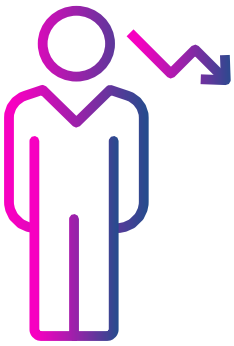
Figure 16: 5-year retention of Clinical Scientists following completion of IPEM training scheme between 2007-2015.

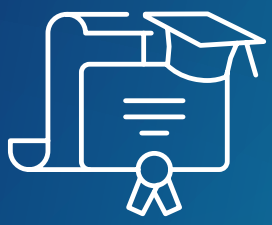
Fig. 16 indicates that approximately 10% of the profession leaves within five years of qualifying to become Clinical Scientist. Further data could be gathered in future to determine specific reasons relating to staff leaving the profession and to assess whether these issues could be addressed to improve retention.

Of particular relevance, many staff working within the Radiotherapy workforce were subjected to similar stresses of the Covid-19 pandemic which has contributed to staffing shortages and career changes in other medical staff groups[8]. Therefore, it would be beneficial to reassess retention data over the next 5 years to assess and mitigate the effect of the pandemic on workforce retention.

10%

of Clinical Scientists in Radiotherapy leave the profession within 5 years of achieving registration

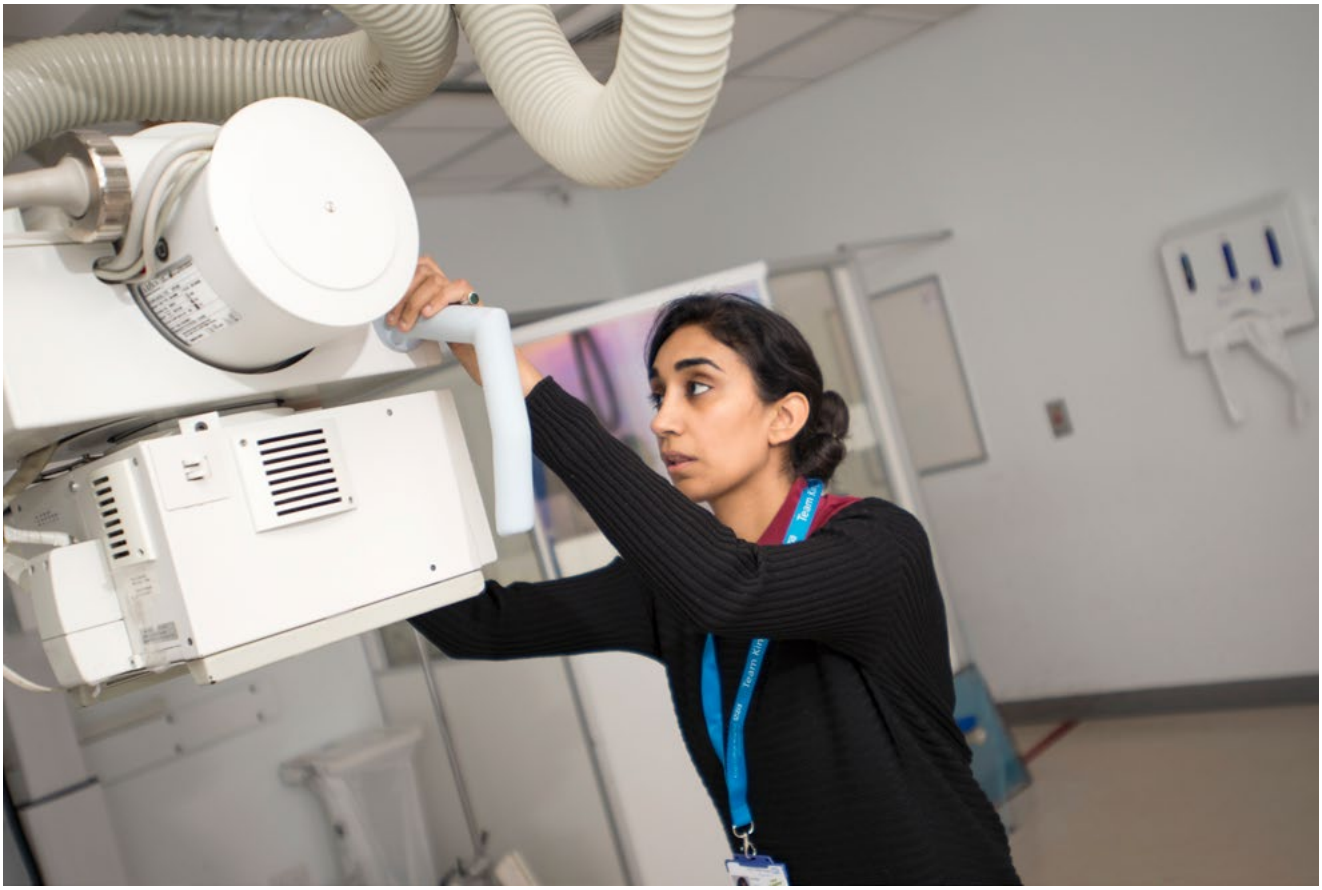




Training and future of the workforce

Predictions have been performed to determine the number of trainee Clinical Scientists and Technologists that will be entering the workforce over the coming years. These predictions are based on training and recruitment within the UK, as staff recruited from overseas are already included in the current establishment and therefore are incorporated within the overall workforce model.

It is worthwhile to note that additional recruitment from overseas may be a viable option to improve staffing, however this process is complex and often lengthy. Radiotherapy Physicist (Scientist and Practitioner) job roles are listed on the National Shortage Occupation List, and are eligible occupations for the Health and Care Worker Visa established in 2020, meaning that recruitment from overseas may now be easier to approach. However, the impact of the UK leaving the European Union is likely to have had a detrimental impact on increased recruitment from overseas[10] and may not be a viable option to improve the workforce shortage.



Clinical Scientists

From data gathered in the 2021 census, there are currently 64.4 WTE vacant Clinical Scientist posts. In addition, the workforce requires a further 19.1 WTE Clinical Scientists to meet IPEMs recommended workforce provision.

Figure 17 illustrates the number of qualified Clinical Scientists that entered the Radiotherapy workforce from 2007-2021 and the predicted number anticipated to enter the workforce in 2022-2026 via different routes to registration.

The total number of projected Clinical Scientists joining the Radiotherapy workforce is 251 over the course of 2022-2026. This averages to 50 Clinical Scientists joining the workforce per annum.

However, based on the existing 2007-2021 data, an annual injection of 56 Clinical Scientists is required to maintain the workforce and to allow for normal service expansion.

Furthermore, to fill the current vacancies and meet IPEM recommended staffing provision within the next 3 years, the workforce requires 84 Clinical Scientists to join the workforce every year between 2022-2024.

Staffing requirement	Number of trainees required per annum	Predicted number of trainees qualifying per annum
Maintaining workforce	56	50
Meet IPEM staffing provision in 3-years	84	

Table 2: Required and predicted trainees entering workforce per annum.

The 50 Clinical Scientists entering the Radiotherapy workforce each year between 2022-2026 is clearly insufficient to fill the existing vacancies and to meet IPEMs recommended levels. This will lead to an increase in vacancies at a rate of 6 WTE per year from 2022-2026.

> **The number of Clinical Scientists entering the workforce over the next 4 years is insufficient, with an additional 6 WTE vacancies generated each year**

Number of Clinical Scientists passing ACS Assessment in Radiotherapy Physics 2007-2021 and projected numbers for 2022-2026

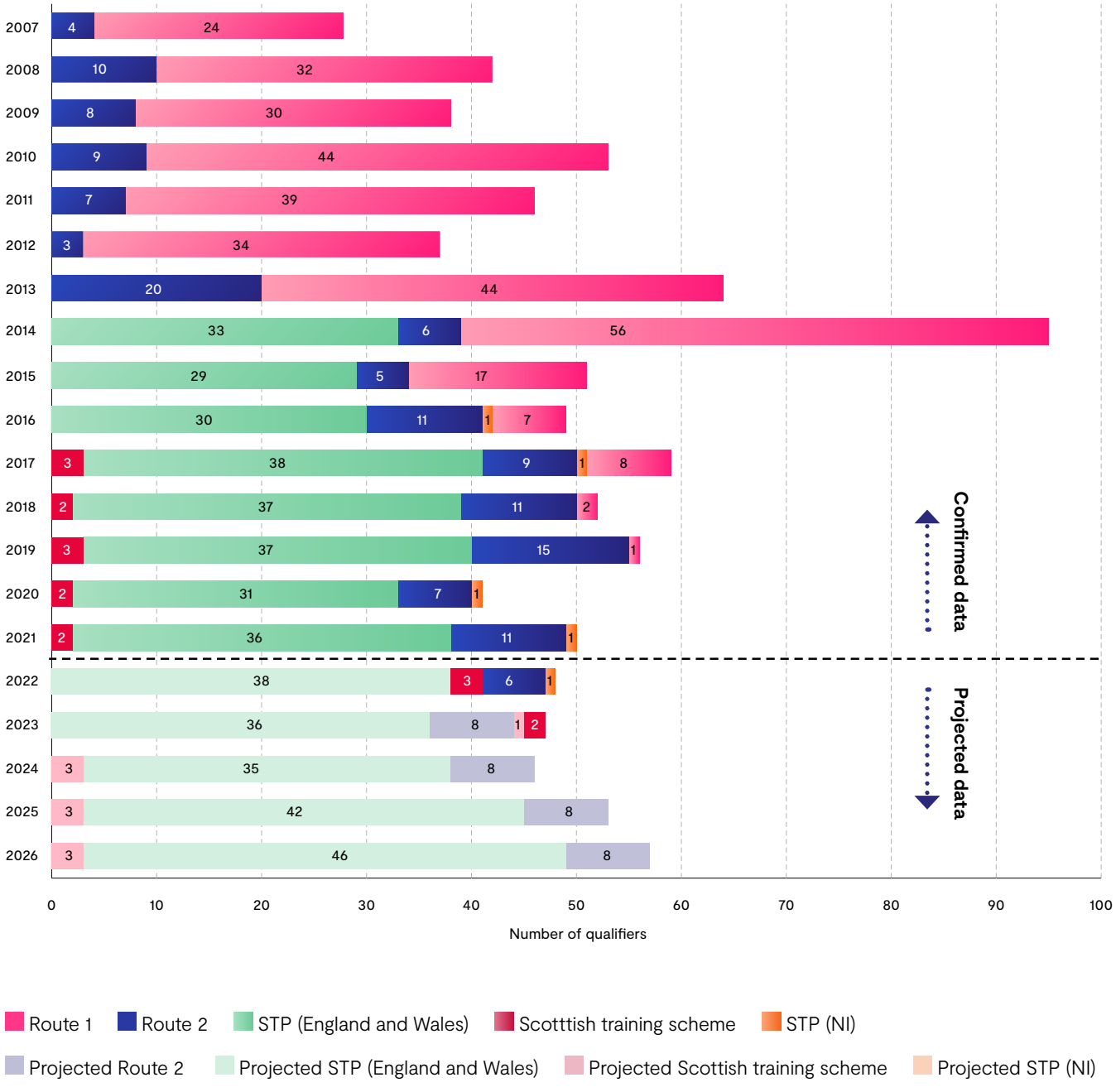


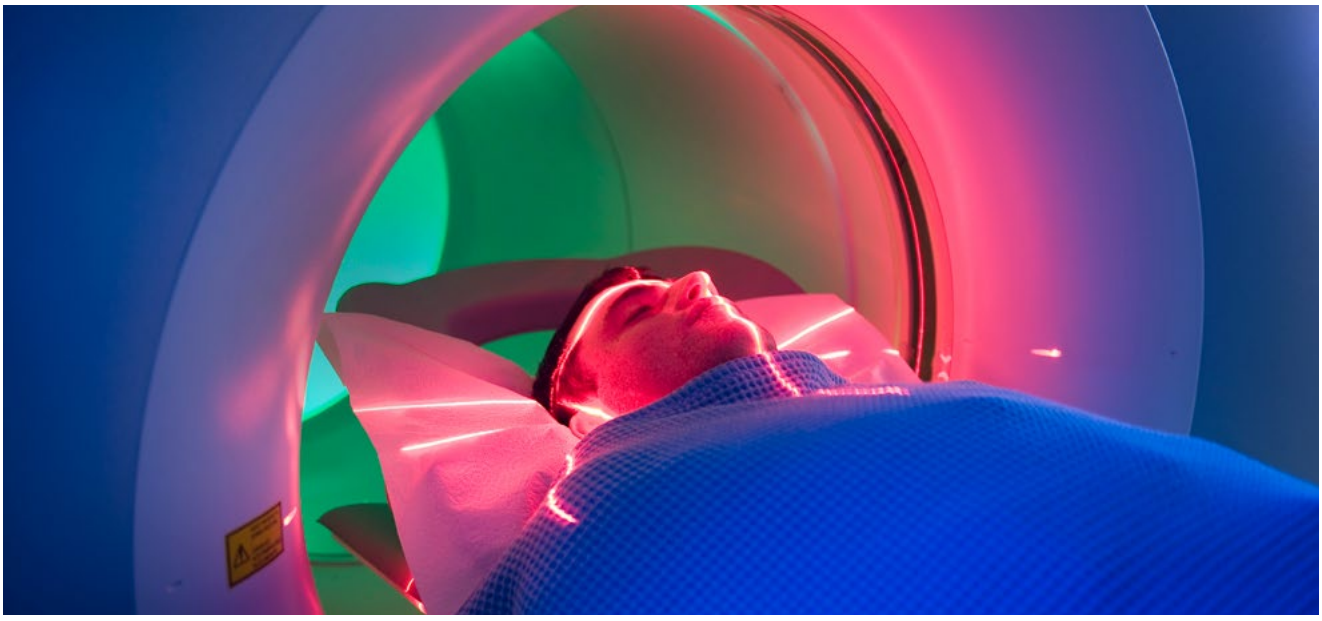
Figure 17: Number of Clinical Scientists passing relevant training programmes in Radiotherapy Physics from 2007-2021 (confirmed) and 2022-2026 (predicted). Bar graphs with solid colour indicate real and confirmed data, bar graphs below the bold dashed line indicating predicted data based on a workforce model.

Clinical Technologists

Clinical Technologists in both Physics and Engineering have an 8% vacancy rate. Table 3 indicates the shortfall in Clinical Technologists and the increase in staff required to both redress the current vacancies and meet IPEM's staffing provision recommendations. It is difficult to perform a prediction model akin to that performed above for Clinical Scientists as there is little data outlining the number of technologists entering the workforce.

	Clinical Technologist requirement (WTE)	
Staffing requirement	Physics	Engineering
Meet establishment	46.1	32.0
Meet IPEM staffing provision	235.4	246.6

Table 3: Increase in WTE required for Clinical Technologists to meet establishment and IPEM staffing provision



At present Clinical Technologist training routes are:

- IPEM's Technologist Training Scheme
- Level 6 integrated apprenticeships

When considering the current vacancy rates and retirement age profiles for Clinical Technologists, it is estimated that 29 Clinical Technologists (Physics) and 32 Clinical Technologists (Engineering) are required to enter the workforce annually over the next 3 years to redress the workforce shortage.

However, IPEM's technologist training scheme currently has an enrolment of 11 Clinical Technologist trainees in Physics and 16 in Engineering. As these are on-the-job-training posts they are already accounted for in the workforce. There is little existing literature surrounding technologist candidates undertaking apprenticeship schemes, therefore it is difficult to ascertain the number of technologists training through this route.

While there is still capacity within these routes to increase the Clinical Technologist workforce, it is clear that there are significant organisational barriers, such as access to funding and provision of training posts. This therefore creates challenges in creating full capacity of Clinical Technologists within the workforce.

Therefore, to improve training output of Clinical Technologists the following actions should be taken:

- Focusing outreach/communications to enable the growth of IPEMs technologist training scheme
- Promoting awareness of existing practitioner training programs
- Lobbying of influential institutions to enable funding for Trusts to create training posts

"There are significant barriers in increasing training output for Clinical Technologists which must be addressed"

Recommendations

The results from this survey illustrate a workforce which has challenges regarding vacancies and retention, with an average vacancy rate of 8%. Our analysis indicates that the training forecast will not meet the current workforce need within the next 3 years.

These figures are clearly met with concern within the workforce, with 61% of respondents stating that they feel their staffing provision is insufficient to provide an adequate Radiotherapy Physics and Engineering service.

From the data analysed, IPEM has produced several recommendations in order to improve the workforce shortage:

- **Increasing trainee output:**
  - **Lobbying to influential institutions to increase funding for Trusts to create training posts**
  - **Increase in funding to commissioned training programmes**
  - **Improving awareness/communications regarding the career and different training routes**
- **Increase in support for career progression to enable an effective skill-mix within the workforce**
- **Increase in 'Other staff' posts to ease workforce pressures on Clinical Scientists and Technologists**

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