

Research report September 2023

Waste not, want not

Strategies to improve the
supply of clinical staff to
the NHS

William Palmer, Lucina Rolewicz and Emma Dodsworth

nuffieldtrust

Contents

	Key facts	2
	Our assessment	4
1	Introduction	6
2	The level and nature of attrition during clinical training	10
3	Participation and retention of graduates in nursing, midwifery and the allied health professions	16
4	Participation and retention of medical graduates	26
5	Solutions for improving the domestic supply of clinical graduates	36
6	Discussion and recommendations	45
	Acknowledgements	52
	Appendix 1: Methodology	53
	Appendix 2: Additional charts	57
	Appendix 3: Student loan forgiveness calculations	59
	References	61

Key facts

Scale of the domestic clinical training pipeline

More than 83,000

students accepted a place to study an undergraduate or postgraduate clinical degree (including medicine, nursing, midwifery and the allied health professions) across the UK in 2022.

£2.6 billion was spent on undergraduate education and training in 2022/23 in England, with a further **£2.5 billion** spent on postgraduate medicine and dentistry.

Only half of nurses,

midwives and nursing associates (52%) and **two in five doctors** (39%) joining the UK professional registers were trained domestically in the latest year of data.

Leakiness of the domestic training pipeline

Around **one in eight** nursing (13%) and radiography (13%) students did not gain their intended degree between 2014 and 2020, compared with 5% for physiotherapy.

Attrition was on the rise for nursing, physiotherapy and radiography in the two years before the Covid-19 pandemic – for radiotherapy it was up to one in six (17%) in 2018/19 compared with 13% in 2016/17.

Only **one in 14** nursing graduates (7%) do not begin their career as a nurse after graduating. However, around one in nine midwifery graduates (11%) and one in seven occupational therapy graduates (15%) do not immediately join their respective profession.

6,325 fewer new nurses with a UK nationality joined NHS hospital and community services in the year to March 2022 compared with the two years before that (a fall of 32%).

Early-career participation and retention in NHS services

Around one in five

radiographers (17%), nurses (18%), occupational therapists (21%) and physiotherapists (21%) have left NHS hospital and community settings within two years...

... this is broadly **twice** the level seen for midwives (10%), although some professions have more alternative employment opportunities than others, both inside the public sector (for example, general practice) and outside (for example, private practice and social care).

The annual leaving rate from NHS hospital and community services **flattens out after five years** (leaver rates in the subsequent three years vary from 1 percentage point for nurses to 5 percentage points for occupational therapists).

Medical training pipeline

Most medical students successfully graduate and start their first foundation year (which they must complete to become fully registered) but only **30%** of those completing foundation training in 2021/22 continued straight into GP or consultant training posts.

Fewer than **three in five** doctors (56%) in 'core training' remained (even in a different role) in NHS hospital and community services in England eight years later, with half (24%) of this attrition seen in the first two years.

While the data on the GP training pipeline are limited, we estimate that, on average, nearly **two training posts are required to get one** fully qualified, full-time-equivalent GP joiner.

Our assessment

For too long, the domestic training pipeline for clinical careers has been unfit for purpose. This is a major problem for students, graduates, the NHS and the government. Our research, which primarily focuses on England, highlights leaks across the training pathway, from students dropping out of university, to graduates pursuing careers outside the profession they trained in and outside public services. This – alongside high numbers of doctors, nurses and other clinicians leaving the NHS early in their careers – is contributing to publicly funded health and social care services being understaffed and under strain. It is also failing to deliver value for money for the huge taxpayer investment in education and training.

As ever, there is no simple solution. Financial worries are commonly cited as contributing to students dropping out of university but they are just one of a huge number of factors, including placement experience, feeling overwhelmed, stress and a lack of support. Improvements are needed and, while they will not be easy, they hold the promise of substantial *and* immediate returns – for example, increasing the proportion of graduates joining the NHS represents a more immediate benefit than increasing the numbers starting training.

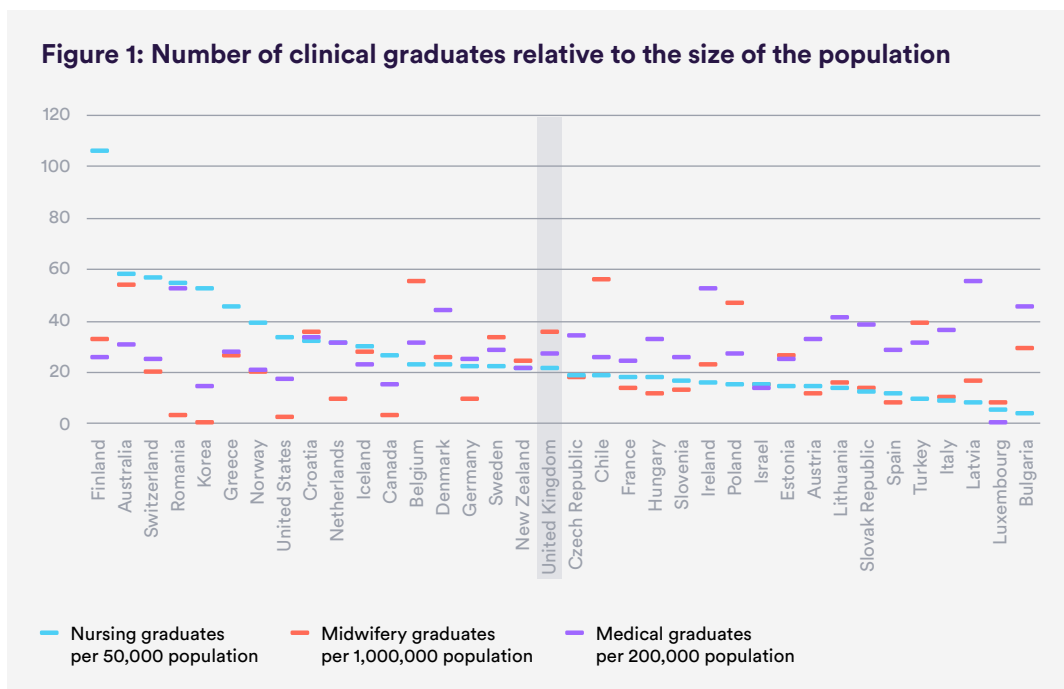
The recently published NHS Long Term Workforce Plan sets out some proposals around the increased use of apprenticeships, shorter courses and the ability of graduates to start earning sooner. These have the potential to decrease attrition and improve participation. But any gains rely on an already overstretched NHS implementing these policies well. They also carry a degree of risk, including whether, by lowering the threshold for accepting applicants onto clinical courses, attrition increases. The vast proposed increase in training numbers means that even more investment from the public purse and the NHS is at stake.

Bold policy-making is needed. Other countries, such as Australia, Canada, Ireland and Wales, appear to have been more proactive than England in

exploring and testing policy solutions. In this report we set out a 10-point plan for improving the situation, including consideration of a ‘student loans forgiveness scheme’. Based on previous work by London Economics, we illustrate how such a scheme would gradually write off outstanding student debt, clearing it after 10 years of eligible employment, with the aim of increasing applications to study, reducing attrition during training and improving participation and retention in public services on qualifying. The estimated cost would be somewhere in the region of £230 million for nurses, midwives and allied health professionals per cohort in England. A similar scheme or early-career loan repayment holidays for doctors and dentists in eligible NHS roles should also be seriously considered. We believe this would represent a very sound investment.

1 Introduction

Growing the domestic supply of health care staff is critical to ensuring a long-term, sustainable solution to meet the rising demand for health care, as well as replacing staff who leave. Historically, compared with other countries for which data are available, the UK has ranked around the middle for the number of clinical graduates, relative to the size of the population (see Figure 1). The latest information on undergraduate medical and dental training in England suggests that acceptances for courses starting in 2022 were 13% down on the previous year (2021), but similar to pre-pandemic levels (2019). For nursing, acceptances in 2022 were similarly down on 2021 (by 10%) but above 2019 figures (by 18%), with this trend broadly representative of the overall figures for courses allied to medicine.¹



Notes: Data are for 2022 or the latest year available. Nursing graduate numbers include associate professional nurses. Those on graduate-entry medical programmes are excluded. See the source for further details on the data.

Source: OECD.Stat

While the intentions are good – the 2019 NHS Long Term Plan for England, for instance, set out an aim to increase workforce supply through undergraduate courses and reducing attrition from training² – challenges in training a sufficient domestic supply of NHS staff persist. In fact, as it stands, the UK has become increasingly reliant on overseas recruits, with domestically trained clinicians only accounting for around half (52%) of new joiners to the nursing, midwifery and nursing associate register (managed by the Nursing & Midwifery Council [NMC]) in the year to March 2023³ and an even lower proportion still (39%) of new joiners to the doctors’ register (managed by the General Medical Council [GMC]) in 2021.⁴

We and other commentators previously highlighted the ‘leaky’ nature of the training pipeline, with one estimate having suggested that for every five university nursing places, only three full-time-equivalent nurses eventually join the NHS.⁵ Given this, solely seeking to increase the domestic supply by getting more people to start training seems unwise. In fact, general practitioner (GP) training places increased by a third around the middle of the last decade but the numbers subsequently joining as permanent, fully qualified GPs remained unmoved. So it is crucial to plug the leaks in the pipeline. This has the potential to:

- increase the number of staff completing their training and subsequently joining the NHS after they qualify, contributing to a more sustainable supply of staff
- be a ‘quick win’, as increasing the proportion of graduates joining the NHS is something that could be realised this year and is not reliant on higher numbers going through the whole training pathway – which is, for example, typically at least 12 years for a consultant
- benefit students and clinical graduates as it would imply both protecting against avoidable reasons for dropping out of courses and providing better public sector employment opportunities
- protect the taxpayer from avoidable waste – in 2022/23, undergraduate clinical education was expected to directly cost the government £2.6 billion in England (including for clinical placements, additional funding paid to universities to reflect higher costs of providing some clinical courses,

cost-of-living grants, and some medical and dental tuition fees), with a further £2.5 billion on postgraduate medicine. The investment is higher still if you account for the cost of writing off unpaid student loans, for example.¹

With these benefits in mind, using bespoke data we explored the nature of the domestic training pipeline across a range of professions – nursing, midwifery, occupational therapy, physiotherapy, radiography (both diagnostic and therapeutic) and medicine – to highlight where there is potential scope for addressing leakages. Other professions (including pharmacy and dentistry) will, of course, have some distinct opportunities and challenges in relation to the training pipeline and this deserves exploration in future work. The scope of this work assesses from the start of pre-registration courses through to early-career retention in the health and social care sectors, including postgraduate medical training for doctors. We also drew up a range of solutions that could – and, in our view, should – be adopted.

Given limitations in the data we were able to access, we were – regrettably – not able to look at apprenticeships in much detail. Similarly, we had limited data on protected characteristics and so were not able to explore inequalities as much as we would have liked. However, we are explicit in our recommendations that the apprenticeship route into clinical careers – especially given the emphasis on them in the recently published NHS Long Term Workforce Plan⁶ – warrants more research, particularly around the challenges in providing such opportunities and the potential benefits in terms of reducing attrition and improving participation.

More generally, this is a broad topic and there are many avenues that warrant further exploration but were beyond the scope of this specific piece of work, in part due to a lack of available information. This includes a formal evaluation of accelerated pre-registration training courses and looking in detail at professional clinical branches that are particularly under strain, including learning disability nursing. Further work comparing clinical professions to other professions, such as law and teaching, would also be instructive.

The nature of the issue under study in this report varies across the UK, given, for example, the differences in student funding and recent schemes to secure the participation of some clinical graduates in NHS services in Wales. However, while many of the figures presented in this report are specific to

England, we have drawn on data from the other nations of the UK and many of the considerations apply across the UK.

While we were able to access an array of bespoke data, some of the data are limited and there is also no consensus on what the best metrics for attrition, participation and retention are. With this in mind, we provide a detailed overview of our methods in Appendix 1. The work would not have been possible without the research that preceded it, provision of bespoke data, and various experts supporting us in our interpretation of the results. We acknowledge these contributions further at the end of the report (page 52).

Structure of this report

Chapter 2 sets out the level and nature of attrition during clinical training. Chapter 3 looks at the participation and retention of graduates in the nursing, midwifery and allied health professions. Chapter 4 presents a similar discussion for medical graduates. Chapter 5 outlines the array of policy solutions available to improve the domestic supply of clinical graduates. Chapter 6 concludes the report with a discussion and sets out recommendations in the form of a 10-point plan to create a sufficient and sustainable domestic clinical training pipeline.

2 The level and nature of attrition during clinical training

More than 83,000 students accepted a place to study an undergraduate or postgraduate degree in medicine, nursing or other clinical professions across the UK in 2022.⁷ However, a notable proportion of students drop out of their degree programme. Previous research has highlighted associations between attrition and stricter entry requirements,⁸ academic difficulty,⁹ as well as individual factors such as ethnicity,¹⁰ age¹¹ and gender.¹² Some level of attrition is inevitable; we see it across all higher education courses. And of those leaving health care-related courses prematurely, two-fifths (40%) will gain a 'step-off award' (such as a certificate or diploma of higher education*) and may well still be contributing to health and social care.

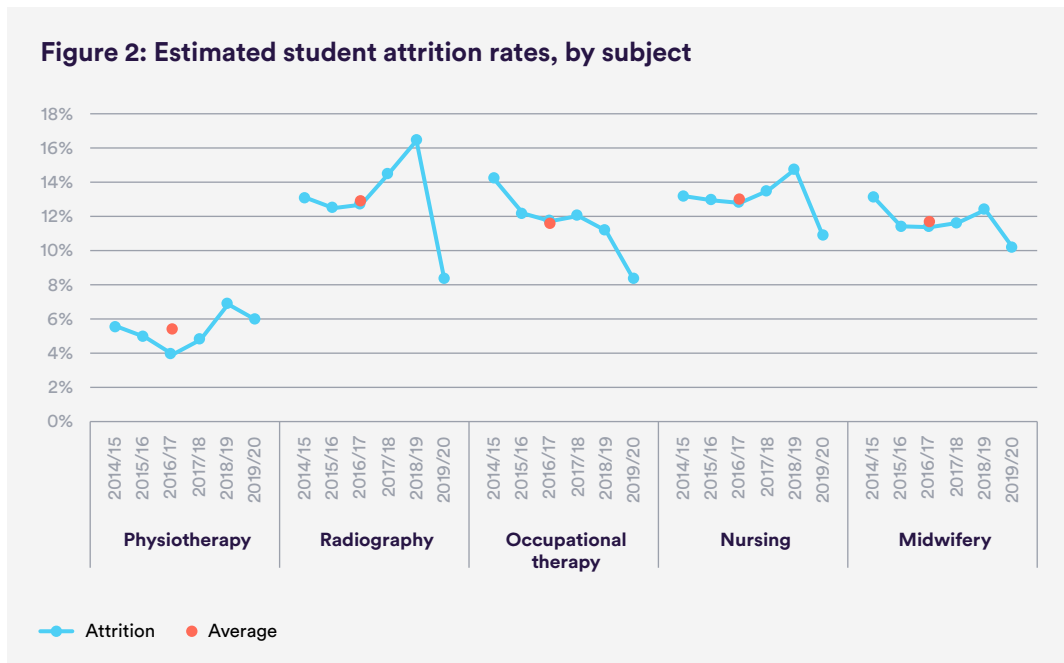
However, avoidable and undesirable attrition can be bad for the student, the higher education institution, health and social care, the government and the taxpayer. And the programme of work on delivering the 2019 Conservative Party manifesto commitment to have 50,000 more nurses within this parliament includes a goal to reduce the proportion of students leaving nursing training by 2 percentage points by 2024.⁶

There are various reasons why people might not complete their intended course; however, some challenges are consistently raised in previous research exploring attrition. A 2018 report – before the most recent changes in student funding for nurses, midwives and allied health professionals – found that financial, academic, workload and placement factors were commonly cited reasons for considering leaving.¹³ Based on a more recent national

* A student can gain a certificate of higher education if they have completed the first year of a full-time bachelor's degree, while they can gain a diploma of higher education if they have completed two years.

survey from 2022, around a third (30%) of allied health professionals still in training have considered leaving, with two in five student nurses (42%) and a remarkable three in five student midwives (58%) indicating this. Placement experience, stress, a lack of support and doubts over ability are among the most commonly cited reasons for considering leaving.¹⁴ The recently published NHS Long Term Workforce Plan proposes a more consistent policy for funding excess travel and accommodation costs incurred by students undertaking placements.⁶

The level of attrition in physiotherapy has typically been less than half that seen in the other professions we looked at (see Figure 2). We did not have comparable data on attrition from medical schools, but medical student attrition has previously been estimated to be 5%.⁵ Physiotherapy attrition during training is as low as 5.5% on average, compared with 13% for nursing and radiography. In fact, using older but more detailed data suggests that physiotherapy consistently has lower attrition rates across various student characteristics, including gender, ethnicity and socioeconomic status (see Figure 20 in Appendix 2). There would have been in the region of an extra 1,700 nurse graduates every year had attrition levels in the nursing profession been similar to those seen in physiotherapy.



Note: See Appendix 1 for details on the calculation of attrition.

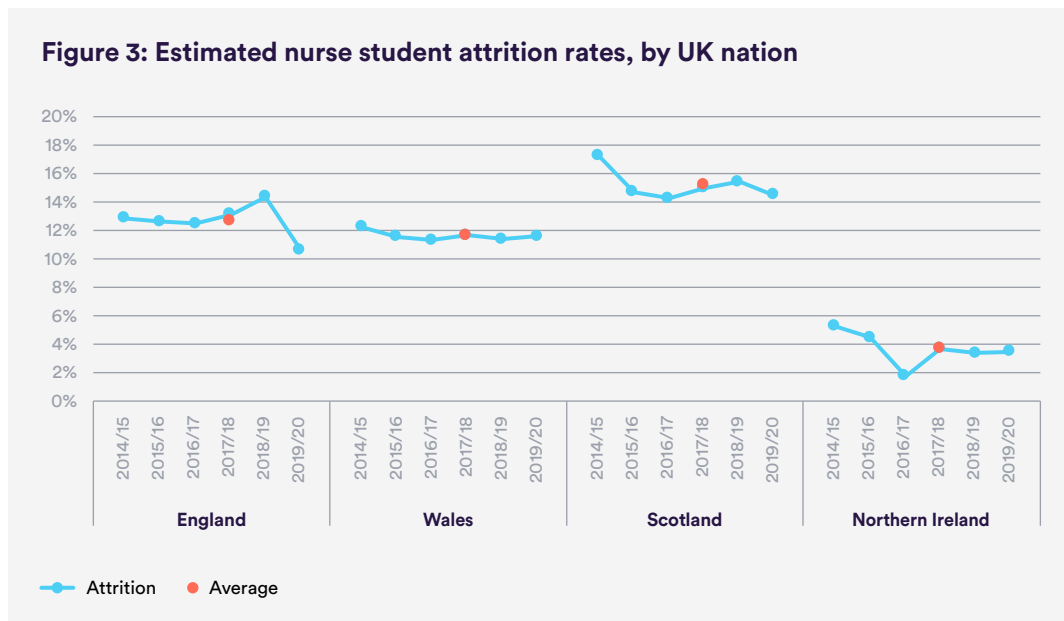
Source: Higher Education Statistics Agency (HESA)

As shown in Figure 2, attrition rates have varied over time. Previous analysis in England suggested reductions in attrition between 2009/10 and 2016/17.¹³ Although not directly comparable, since then, attrition rates implied by our data increased to 2018/19 for nursing (2 percentage points), physiotherapy (3 percentage points) and radiography (4 percentage points), although there were clear declines – to the lowest rates for nursing, radiography and occupational therapy – in the most recent year of data (2019/20), which coincides with the start of the Covid-19 pandemic.

While we did not have detailed, recent information on the specific characteristics of individuals in training, published data covering 2016–17 suggest some student inequalities in attrition. The numbers for some categories are small and we were not able to control for the various inter-related factors, so differences do need to be treated with a degree of caution. However, the data reveal that, for example, physiotherapy and occupational therapy students from less deprived areas or reporting White ethnicity were more likely to continue their studies in that year. Nursing often displayed a trend different from the other health care courses, including having higher continuation rates across mature students, which is not something seen (and often the opposite) for these other professions (see Figure 20 in Appendix 2). In fact, student characteristics could be contributing to differences in attrition between professions, with similarly low attrition for physiotherapy courses in Australia being attributed, at least in part, to this subject having more female and White students.¹⁵

Attrition also differs by year of study, with the first year typically having consistently higher rates. When looking at typical pre-registration clinical courses, drop-out rates were highest in the first year of study, and lowest in the third year, which was consistent across all subjects. There was also variation between undergraduate subjects – on average, 8% of nursing students left their course in the first year, compared with 4% of physiotherapy students. The recently published NHS Long Term Workforce Plan suggests (based on unpublished management information) that attrition rates across nurse degree apprenticeships are substantially lower (around 4%) than for traditional undergraduate and postgraduate courses (which was calculated at 15%).⁶

Comparing England to other UK nations suggests that attrition rates might be amenable to reduction. In nursing, for instance, around one in eight students drop out of their course in England and Wales, compared with one in six in Scotland and one in 26 in Northern Ireland (see Figure 3). Comparing across the different branches of nursing, the levels of attrition are fairly consistent.^{13,16}



Notes: Scottish attrition is over four years, the typical length of undergraduate courses. See Appendix 1 for details on the calculation of attrition.

Source: Higher Education Statistics Agency (HESA)

While there are likely many factors affecting the variation between the nations of the UK – Scottish degrees are typically four years, for instance, although leavers in that final year are typically low (around 0.5% for nursing) – the differences in student funding arrangements are worth highlighting (see Table 1).

Table 1: Annual fees, loans and bursaries available to students on nursing, midwifery or allied health profession courses, by UK nation

		Loans:		Bursaries/grants:	
		For tuition fees (maximum)	For maintenance loans (maximum)	For tuition fees	Other bursary/training grant
England		£9,250 (£0 up to 2016)	£9,978	£0	£5,000–£6,000 (since 2020)
Scotland	Nursing and midwifery:	£0	£0	£1,820	£10,000 (£7,500 in final year)
	Allied health professions:		£6,000–£7,000		£0–£2,000
Wales		£9,000 (not committed to working in NHS Wales for 2 years)	£5,360	£9,000 (for eligible students who commit to work in NHS Wales for 2 years)	£4,651–£5,491
Northern Ireland	Nursing and midwifery:	£0	£0	£4,710	£5,165*
	Allied health professions:		£1,780–£2,370**		£2,355**

Notes: Fees, loans and bursaries are for the 2023/24 academic year unless indicated otherwise. * applies to the 2022/23 academic year. ** applies to the 2020/21 academic year. Figures for each nation typically apply to those who are also domiciled in that nation. Further notes are given in Appendix 1.

Sources: GOV.UK, Student Awards Agency Scotland, University of South Wales, University of Swansea, Student Finance Northern Ireland, Ulster University and House of Commons Library

Student funding arrangements have changed a number of times in England. We discuss the impact of these changes in Box 1.

Box 1: Impact of student finances for the nursing, midwifery and allied health professions in England

In 2017, the government scrapped the NHS bursary in England, which had covered tuition costs and living costs for those on nursing, midwifery and allied health profession courses. The intention was to lift the cap on the number of training places that the government previously funded, so that a higher proportion of applicants could be accepted onto these courses and so students could access 25% more financial support. One of the objectives was to deliver ‘reduced student attrition and increased commitment to employment in the health system’.¹⁷

While the numbers enrolled on nursing, midwifery and allied health courses increased between 2016–17 and 2017–18¹³ (the latter cohort being the first one affected by the removal of the bursary), attrition during training appeared to increase among undergraduate students in their first year of study in 2017–18 relative to the year before – from 7% to 9%. This increased further to 10% in 2018–19. On top of this, scrapping the bursary was associated with a sharp fall in the number of part-time and mature students starting higher education.¹⁸ This was a particular concern for courses that rely on mature students to fill places, such as mental health and learning disability nursing.¹⁹ Mature students, as well as those from low-income households, are more likely to be debt averse, and some have argued that the 2017 reforms to health care education funding created new barriers for these groups.^{20,21}

A 2018 paper found that a third (32%) of students on non-medical clinical courses cited financial concerns as their top reason for considering leaving their course. Many explained that they were unable to earn enough money while being a student and said they had difficulties in finding part-time employment alongside clinical placements.¹³

The government subsequently introduced training grants from £5,000 a year in 2020, with additional funding available for certain subjects such as mental health nursing and radiography, but retained student loans for tuition fees and maintenance costs. It is too early to tell if the reintroduction of the training grant has had an impact on drop-out rates, but we have seen increased numbers of mature students starting a nursing degree.⁷

3 Participation and retention of graduates in nursing, midwifery and the allied health professions

In this chapter we cover the rates at which those who do graduate from pre-registration training in nursing, midwifery and selected allied health professions move into clinical work. We also look at retention in early careers. We cover medical graduates (doctors), who also have structured postgraduate clinical training career pathways, in Chapter 4.

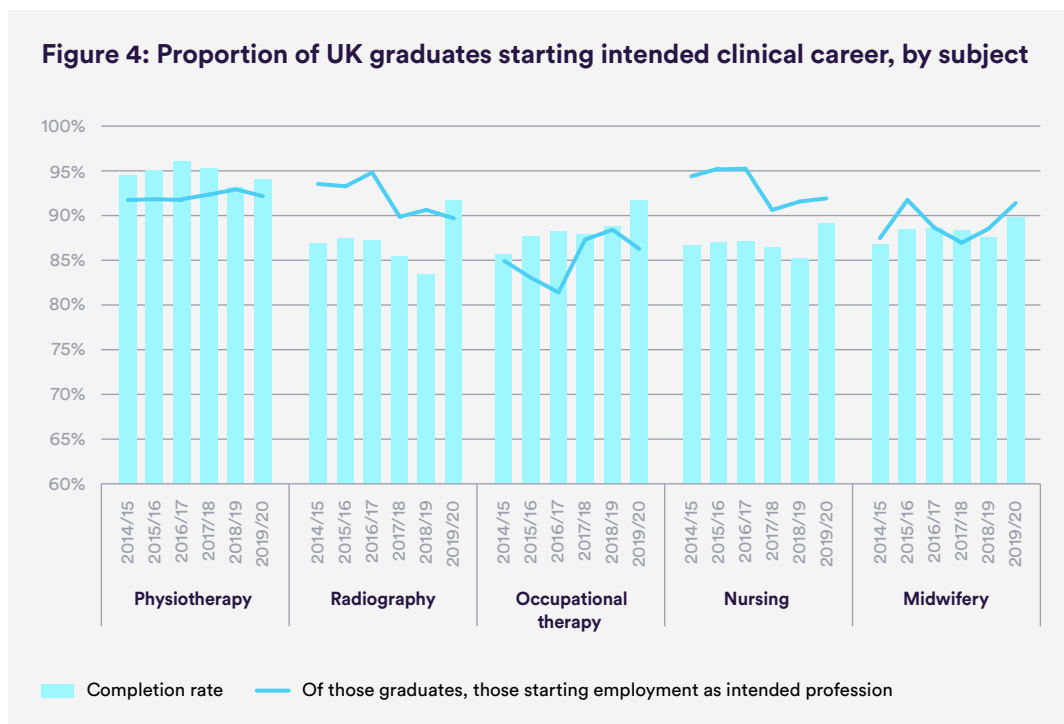
Employment following graduation

The proportion of graduates moving into clinical work ('participation rates') varies by subject. While, as shown in Chapter 2, nursing courses have one of the highest rates of attrition *during* training compared with other courses, a low proportion (7% between 2014 and 2020) of nursing students who graduate go on to begin their career outside of nursing. In comparison, on average, around twice as many graduating in occupational therapy (15%) do not end up starting employment as an occupational therapist (see Figure 4). Among occupational therapy graduates, there are higher proportions going into non-health-related employment (such as welfare or teaching work) as well as more graduates taking time to travel or care for someone instead of taking up employment, relative to other clinical graduates.

Interestingly, participation in clinical work by occupational therapy graduates in the UK has generally been higher than previously in the most recent three

years for which data are available, but generally lower than previously for nursing and radiography graduates. For nursing and radiography, it appears that in more recent years, a higher proportion of graduates are engaged in something other than employment or further study (such as going travelling or caring for someone).

Participation levels are fairly similar across the UK nations for nursing courses (with less apparent variation than we showed in Chapter 2 for attrition rates). However, a significantly lower proportion of nursing graduates go on to begin their career as a nurse in Northern Ireland (90.6%) than is the case for graduates in England (93.1%).



Notes: Data are derived from the Destination of Leavers from Higher Education Survey and the Graduate Outcomes Survey. This will include those working in clinical roles outside of the NHS. ‘Completion rate’ is the percentage of students estimated to graduate with their intended degree.

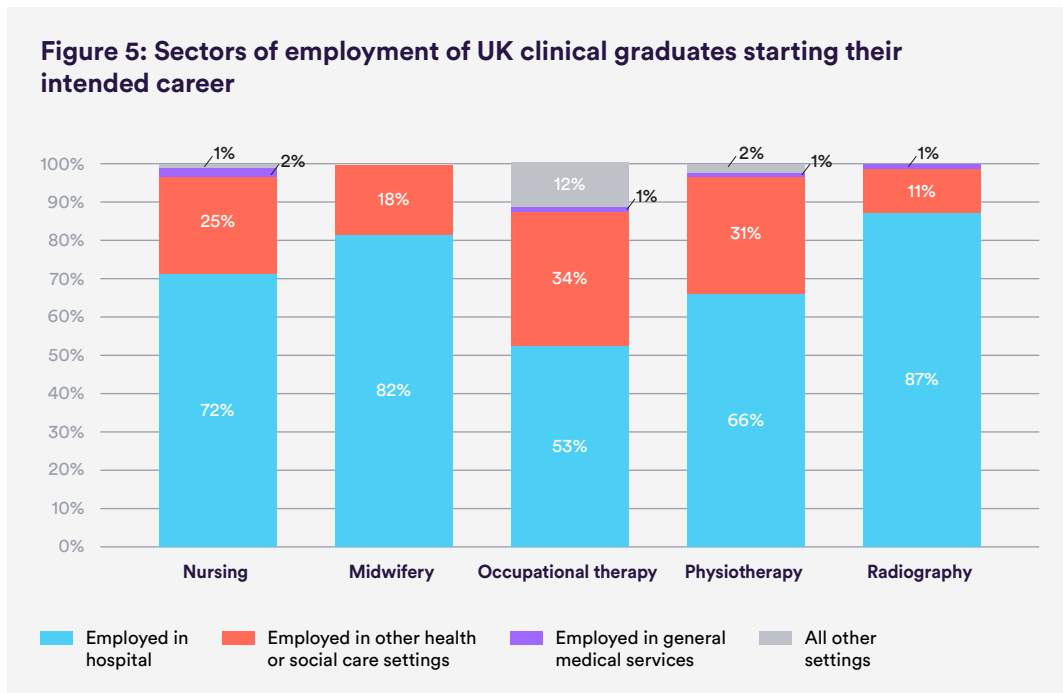
Source: Higher Education Statistics Agency (HESA)

Alternative data suggest that, on average, the number of UK-trained joiners to the nursing register as a proportion of placed nursing applicants three years before has fallen over time – while more than four in five accepted nursing students (82%) joined the professional register in 2013, this fell to three in four in 2022 (75%) (see Figure 19 in Appendix 2).

Of course, this does not mean that these graduates will never end up working in health care or other public services. Participation may, in fact, be different in the long term. So these comparisons between professions need to be treated with caution. Data on those who graduate with a different (lower) or no award are even more limited.

Of those who do begin a career in their intended clinical profession, the balance of sectors and settings they work in varies by profession. The vast majority of newly trained radiographers (87%) and midwives (82%) are recorded as joining the hospital sector – this will include both NHS and non-NHS hospitals. In comparison, two thirds (66%) of physiotherapists and just over half (53%) of occupational therapists join the hospital sector. A proportion (25%) of nursing graduates begin employment in social care and health settings other than general practice or hospitals (see Figure 5).

Variation between the professions needs to be seen in the context of the natural differences between the professions and graduates' ability to work outside hospital when new to their career, along with the availability of roles. For instance, by its nature, occupational therapy has a far greater range of roles outside health care.



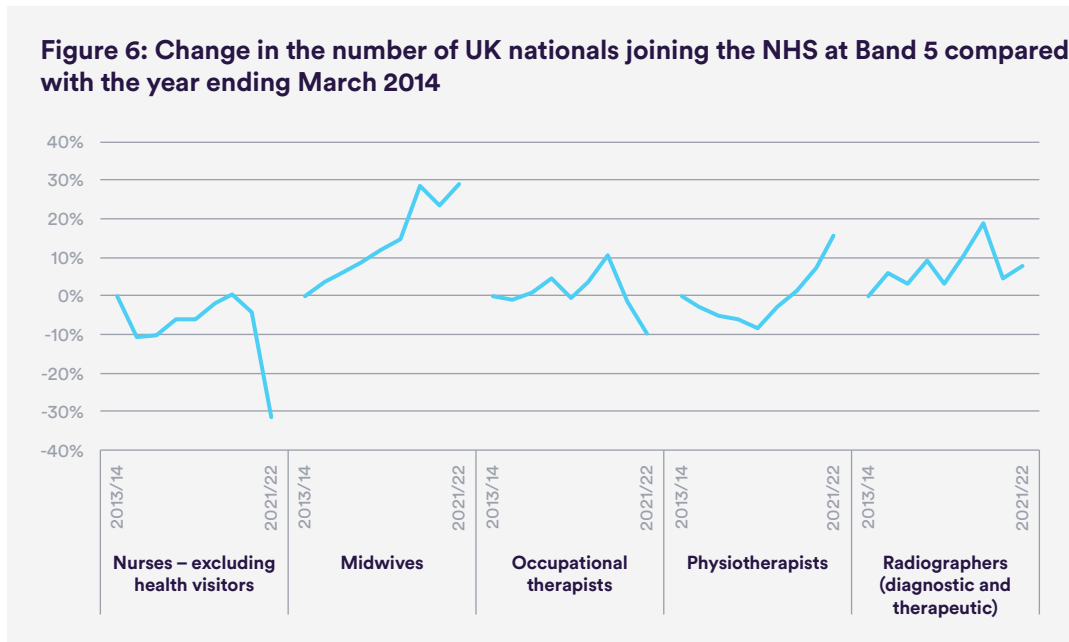
Notes: Data are derived from the Graduate Outcomes Survey and show the average proportion starting employment in each setting between 2017/18 and 2019/20. This will include those working in clinical roles outside the NHS.

Source: Higher Education Statistics Agency (HESA)

There appears to have been a substantial fall in joiners with a UK nationality to NHS services in recent years. Data supplied for this research, which looked only at joiners to Agenda for Change (AfC) Band 5 (which is typically the pay band that new graduates join), suggest that in the year to March 2022, compared with the two years before this (2019–20), the number of UK-national nurses joining NHS hospital and community services fell by 32% (6,325 nurses, excluding health visitors) (see Figure 6). This is a rapid and significant fall, and it will be important to monitor whether this is in some way an outlier or a more worrying trend.

While not directly comparable due to differences in data sources and definitions, the decrease of 2,371, or 14%, in the number of UK-trained nurses (the majority of which are known to be UK nationals) joining the register in England is not as stark as the fall in the number of nurse joiners to the NHS over the same period. This suggests that there are not only fewer UK-trained nurses gaining professional registration, but also fewer nurses choosing to take up employment in the NHS.

There were also falls in the number of UK-national occupational therapists (decreasing by 205, 18%) and radiographers (decreasing by 100, 9%) joining the NHS. That said, there was an increase in UK-national physiotherapists joining (increasing by 185, 14%). Looking over a longer-term trend shows how there were also some annual falls between 2014 and 2019.



Notes: Turnover data are based on headcount and show people leaving or returning to active service, including those going on or returning from maternity leave or a career break, for example.

Source: NHS Digital

Separate data suggest that, between 2016/17 and 2022/23, there was little change in the proportion of joiners to these professions working full time. On average, nurses were primarily contracted to work 90% of full-time hours (around 34 hours) compared with 95% of full-time hours (37 hours) for allied health professionals. However, some clinicians may work additional hours through an agency or as bank staff.

It is worth reflecting here on what might be considered ‘desirable’ employment for these clinical graduates from a public perspective. Having some graduates stay in academia to help further the profession and educate future clinicians is important. Conversely, some graduates joining the hospital sector might be employed in the private sector, which might not be deemed

desirable from the perspective of either the NHS (if it has significant staffing shortfalls) or taxpayers (given they have contributed substantially – and more than for non-clinical professions – to the cost of training). There is, however, some precedent for promoting supply in some types of employers with, for example, the health and care visa rules applying to: the NHS; an organisation providing medical services to the NHS; and an organisation providing adult social care.²²

Retention of newly qualified, domestically trained staff

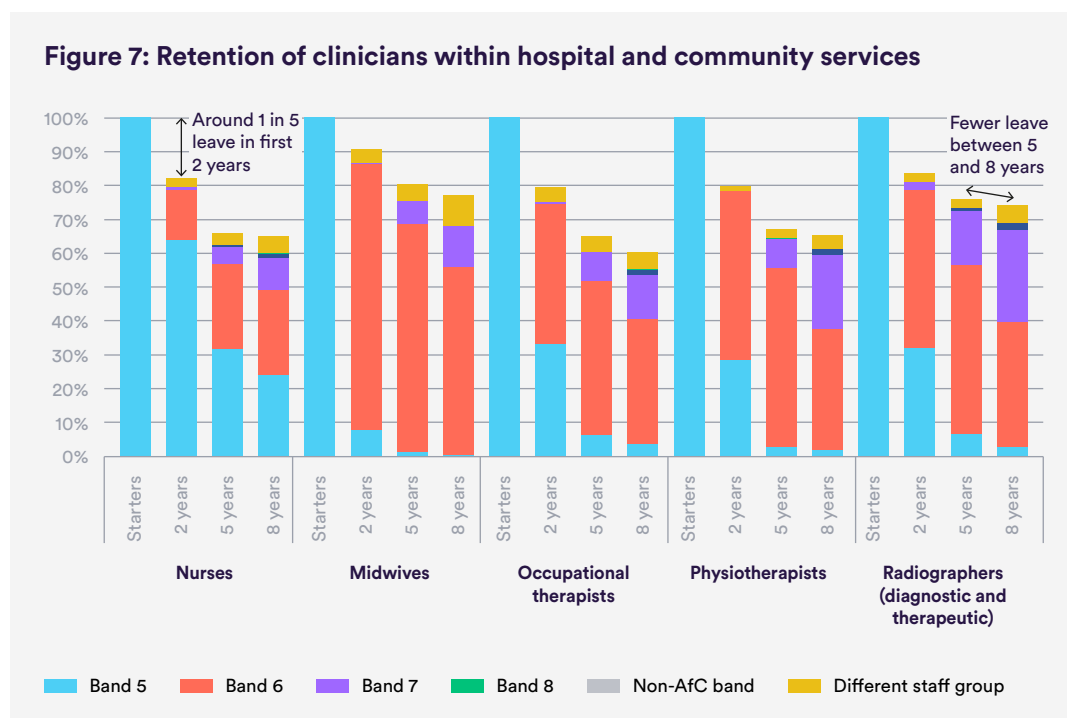
Once a clinical graduate has joined the relevant profession, few leave their professional register in the first few years. Across the non-medical professions we focused on, retention on the register within three years varied from 98% for nurses and midwives* to 95% for physiotherapists. Across a broader set of allied health professions, there is more variation, ranging from one in 56 paramedics leaving the register within three years compared with one in 10 orthoptists.**

Among allied health professionals, there are some differences in retention by age, with those aged 30–49 more likely to remain on the register after four years than the under-30s. In addition, there are statistically significant differences by region where people trained – in England, the North West has the lowest levels of retention on the professional register and the South East has the highest – although all regions’ retention rates are within 94–96%. Beyond England, Scotland and Northern Ireland have lower levels of retention, at 89% and 91% respectively.²³

* This includes UK-trained joiners between 2016 and 2019, compared with leavers between 2019 and 2022. Source: Nursing and Midwifery Council (NMC).

** This analysis includes first-time UK-trained registrants between 2013 and 2018, with each cohort followed each year for three years. Source: Health and Care Professions Council (HCPC).

Some remaining on the register may not, however, be currently practising in either their related profession or public services. Bespoke data, while limited (for instance, they do not exclusively cover those who trained in the UK), give stark insights on progression and retention within NHS hospital and community health services in England. Around one in five radiographers (17%), nurses (18%), occupational therapists (21%) and physiotherapists (21%) have left NHS hospital and community settings within two years. This is broadly twice the level seen for midwives (10%), although it is important to note that some professions have more employment opportunities outside hospital and community services, such as in general practice. The annual leaving rate seen in the first two years appears to continue to five years from joining the NHS but then flattens out (leaver rates between five years and eight years vary from 1 percentage point for nurses and 5 percentage points for occupational therapists) (see Figure 7).



Notes: AfC = Agenda for Change. Career destination is at March 2020, with ‘2 years’ referring to the destinations of those at the typical graduate entry point (Band 5, spine point 16) in March 2018, ‘5 years’ to the March 2015 cohort and ‘8 years’ to the March 2012 cohort. These figures are not tracking the same cohort over time. Data cover those employed in England only and include non-UK graduates. Those leaving to take a career break or maternity leave are not counted as leavers.

Source: Nuffield Trust analysis of NHS Digital data: ‘Specified HCHS staff groups turnover, March 2012 to March 2020’.

Progression opportunities may be a significant factor affecting early career retention. Across all NHS hospital and community services, the numbers of staff leaving their role voluntarily and citing a lack of opportunities, wanting better reward packages or to undertake further education or training have doubled in the last decade.²⁴ A recent study on radiographers, for example, paints a more detailed picture of the lure of agency and private practice roles and increased flexibility:

Private healthcare and public health related opportunities became increasingly attractive; not necessarily for more pay, but facilitating roles that spanned their full scope of practice... Several participants cited frustrations at a lack of *additional* earning potential beyond their basic pay, particularly when they were saving for significant life expenses such as a house deposit, wedding or car. Several had registered with radiography agencies and bank work at other hospitals, working additional shifts around their standard working hours. Over time several began to appreciate the flexibility of agency work, leaving the NHS to concentrate on agency employment.²⁵

There are large differences in progression levels between staff groups, with two thirds (64%) of new nurses joining the NHS remaining at a Band 5 (the starting grade) after two years in post, and around one in seven (15%) progressing to a Band 6, whereas for midwives only 8% remain at Band 5 after two years and over three-quarters (78%) progress to Band 6. The pattern is broadly similar among allied health professionals, with around 40–50% of them moving to a Band 6 after two years (lower than for midwives but higher than for nursing).

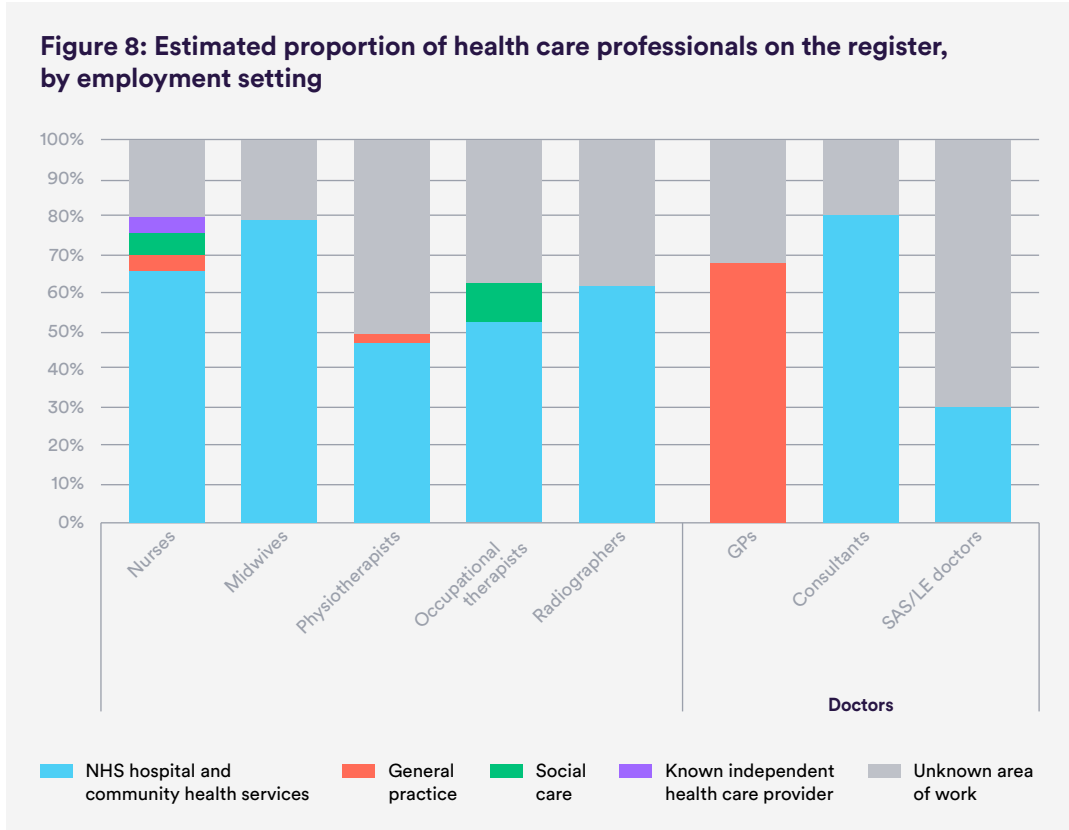
The data do not allow us to determine causality or control for the many factors affecting retention, but across the allied health professions we looked at, a higher proportion of staff at Band 7 after five years and eight years was associated with higher retention in NHS hospital and community services. However, previous research has highlighted frustration among clinical professionals – particularly when mature entrants – in relation to a lack of career progression and that their skills and knowledge were not sufficiently well used or appreciated.²⁵

It is also worth considering the longer-term retention of clinicians within NHS and social care services, beyond early careers, our primary focus. When comparing the numbers currently on the register with the numbers employed in different settings, it is not entirely clear who employs those who remain on the register. Admittedly, the data are limited, particularly data on the independent health care sector (which only includes providers undertaking NHS-commissioned work), and there are no sufficiently detailed available data on those working in agency roles within health and social care. But from the data that are available (see Figure 8) we can identify the following:

- Three quarters (76%) of registered nurses are directly employed in NHS hospital and community services, general practice or social care. The limited data on independent health care capture a further 4%, leaving a lack of information about who employs one in five registered nurses.
- There are differences between fields of nursing with regards to the proportion on the professional register recorded as working in NHS hospital and community services. While more than half (56%) of children’s nurses on the register work in NHS hospital and community services, only 23% of learning disability nurses work in these services.* However, many registered nurses may be working in NHS services but within a different staff group (such as managers), and this proportion may differ by branch of nursing.
- Only one in five midwives (21%) are not directly employed by the NHS compared with around half of physiotherapists (51%). The corresponding figures equate to around two in five for occupational therapists (37%) and radiographers (38%).

We discuss the levels for doctors in the next chapter.

* Due to data availability, this comparison is based on full-time-equivalent staff employed in NHS hospital and community services, as opposed to headcount (as used in Figure 8).



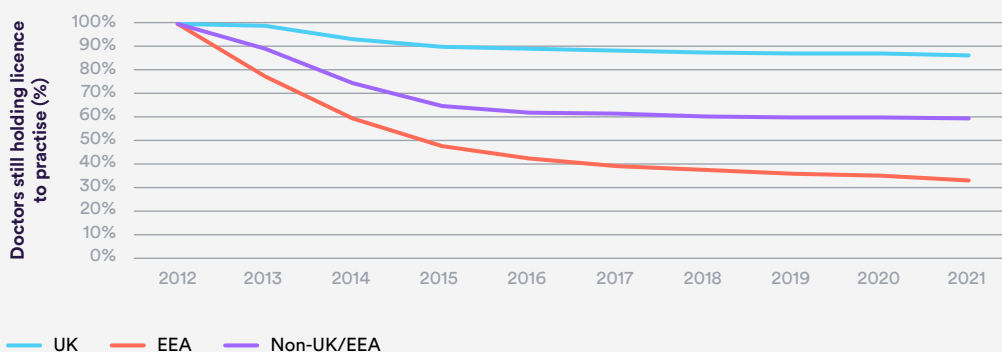
Notes: SAS/LE = specialty and associate specialist/locally employed. SAS doctors hold permanent posts with national terms and conditions and recognised career progression, whereas locally employed doctors are employed by organisations on local terms and conditions and are typically non-permanent posts. Based on headcount data on staff from multiple sources, which may mean some staff are counted twice, so figures must be interpreted with caution. See Appendix 1 for further details.

Sources: General Medical Council (GMC), Nursing and Midwifery Council (NMC), Health and Care Professions Council (HCPC), NHS Digital and Skills for Care

4 Participation and retention of medical graduates

The proportion of medical students joining the medical register appears to have remained fairly constant over the last decade, at around 94% (see Figure 19 in Appendix 2). Similar to non-medical clinical graduates, historically the vast majority of doctors joining the medical register who have graduated from UK medical schools remain on the register for many years after they graduate. Fewer than one in seven UK medical graduates joining the register in 2012 (13%) had left the register nine years after initial registration, with the majority of these (10%) leaving three years after first registering. Over the same period, leaver rates were higher among those trained in the European Economic Area (EEA) and the rest of the world, at 67% and 40% respectively (see Figure 9). Of course, being on the register does not give us an understanding of what roles people have and so, in this chapter, we explore the postgraduate medical pipeline in more detail.

Figure 9: Doctors retaining their licence to practise, by world region of primary medical qualification, 2012 joiners



Note: EEA = European Economic Area; non-UK/EEA refers to those who did not train in the EEA or the UK.

Source: General Medical Council (GMC)

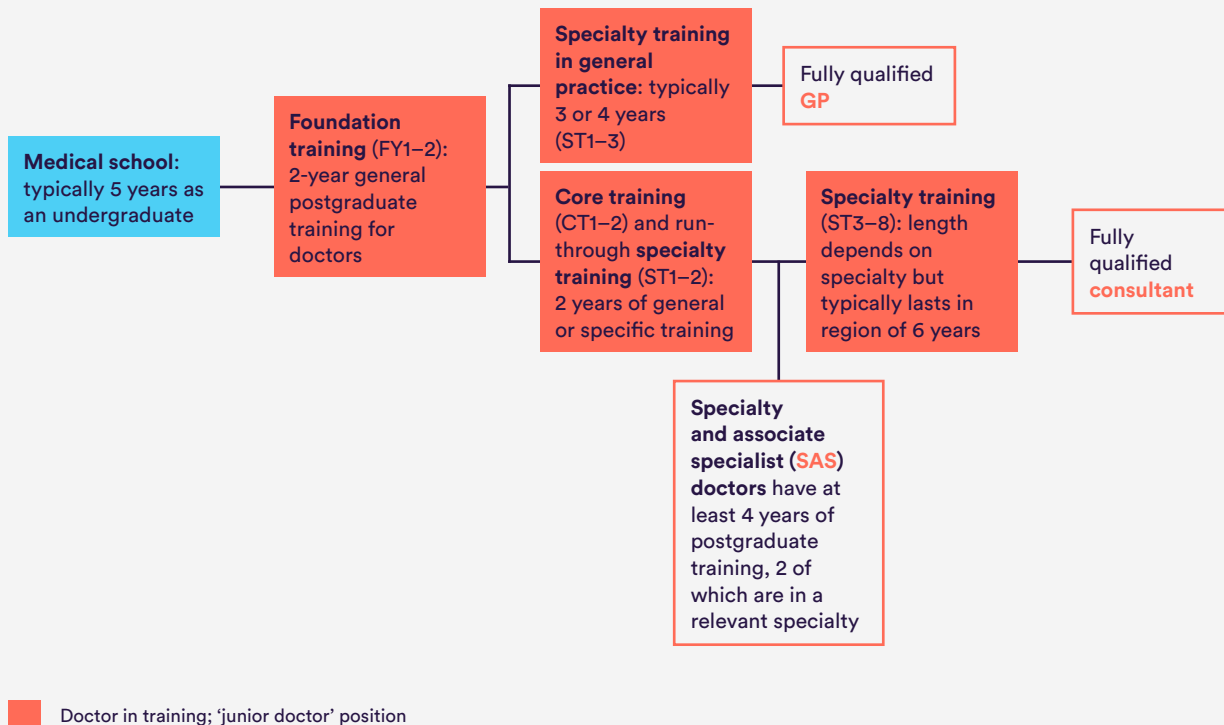
Foundation training

After completing medical school, graduates typically undertake a two-year foundation programme. This is effectively medical graduates' first paid employment as a doctor and involves completing several placements in medical or surgical specialties. In fact, medical graduates can only get a *provisional* registration (with a licence to practise) to allow them to take part in an approved foundation year 1 programme. Doctors then completing this first year who demonstrate the necessary knowledge, skills and behaviours are then eligible to apply for full registration (and can continue to foundation year 2). Participation in foundation training is high; between 2015 and 2021, on average 96% of UK medical graduates started their first foundation year.

Career choices following foundation training

Following foundation years, doctors can continue their training by moving into specialty or core training in, for example, general surgery, anaesthetics or general practice. If they complete this subsequent training, which typically ranges from approximately three years for general practice to up to around eight years for other specialties, they can join the GP or consultant specialty registers as appropriate. However, after two years, they can leave training and move into a specialty and associate specialist (SAS) role (see Figure 10). Experienced doctors can also become a fully qualified GP or consultant without completing an approved programme of training by submitting evidence that their knowledge, skills and experience are equivalent to the approved curriculum for that specialty.²⁶

Figure 10: Standard medical training pathway in England



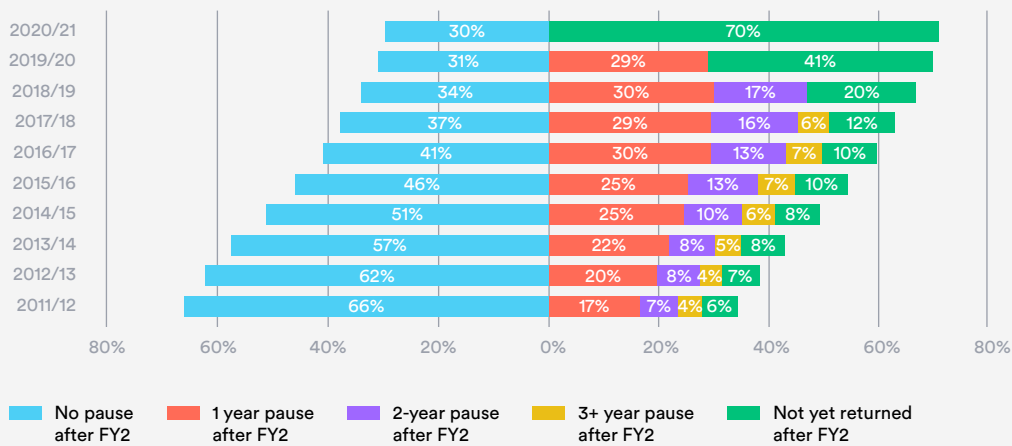
Notes: CT = core training, FY = foundation year and ST = specialty training. This figure is intended to represent typical medical careers and not to comprehensively reflect all career pathways. Some doctors, for instance, will take time out of training programmes to complete a PhD.

Source: Nuffield Trust

The proportion of doctors taking a pause in training after their foundation years doubled over the nine-year period from 2011/12 to 2020/21, from 34% to 70% (see Figure 11). The length of the break appeared to be increasing too. Notwithstanding differences in training length between specialties, an increasing number of doctors taking breaks in between training will have implications for the length of time that it typically takes to train a doctor, and this should be factored into plans to expand the domestic supply of doctors. The reasons for doctors considering stepping away from training – even if temporarily – are complex and interdependent, including taking a break from training because of burnout, uncertainty over which specialty to pursue, a lack of appropriate training posts, the natural breakpoint within the training pathway and the influence of peers.²⁷

Data for more recent cohorts cannot provide a full picture due to not enough time passing to identify how many of those pausing training will rejoin it. However, if we extrapolate from historical trends, we might expect to see around one in six of those initially pausing not returning. If this were the case, it would represent a 12% loss in that stage of the medical training pipeline alone for those completing foundation training in 2020/21. Certainly, a previous national report has also expressed caution not to assume that previous fairly high levels of those taking a break after foundation training returning to specialty training will continue.²⁷

Figure 11: Proportion of second-year foundation doctors entering core/specialty training



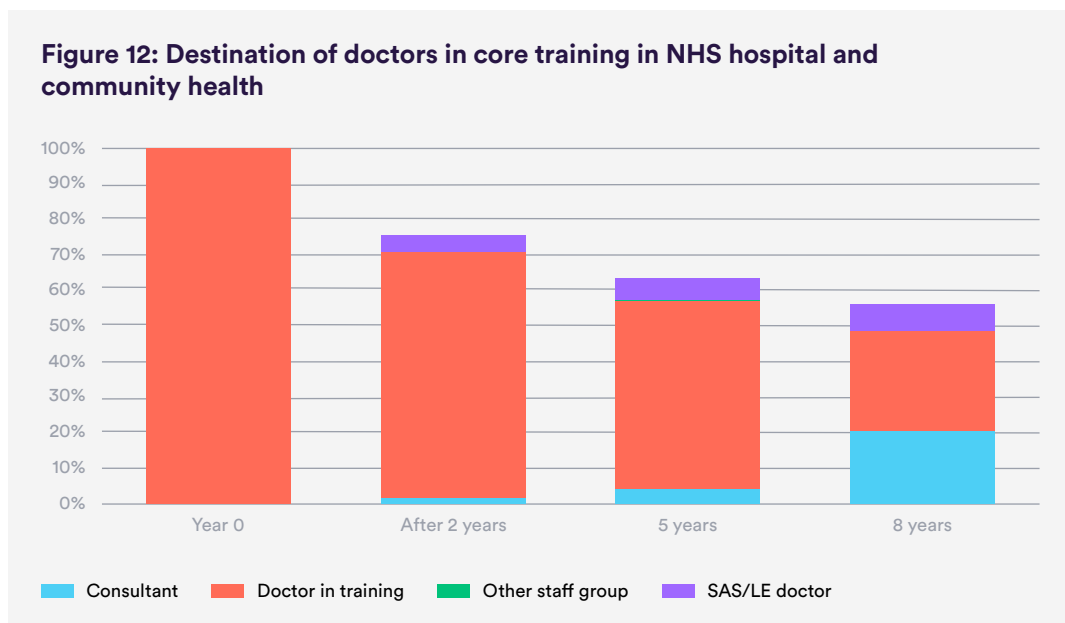
Notes: FY = foundation year. Percentages may not add up to 100 due to rounding.

Source: General Medical Council (GMC)

The destination of doctors after their foundation years is also changing. In particular, there was a 20 percentage-point increase in doctors taking up service appointment posts – that is, taking up temporary posts without a recognised training component – between 2011/12 and 2019/20, as well as an increase in doctors going into other areas of employment – for example, working in research or military settings. One in 11 doctors completing foundation training in 2019 (9%) reported their next career destination as being outside of the UK, which was actually lower than the average over the previous eight years (peaking at 13% in 2012).²⁸

Core training

We were able to explore the retention of those in post-foundation, core training in more detail using bespoke data. Of the 10,273 doctors in core training in 2018 (which excludes those in general practice or specific run-through programmes), data suggest that around one in four (24%) left the NHS hospital and community sector in England within two years. Looking over a five-year period (that is, the career destinations as at 2020 of those in core training in 2015) this rose to 37% (see Figure 12). This sector does not include general practice but doctors who have started core training have already moved away from the GP training pathway. Perhaps unsurprisingly, of those remaining in hospital and community health services, virtually none move staff group (that is, away from medicine and into a different profession).



Notes: SAS/LE = specialty and associate specialist/locally employed. Career destination is at March 2020, with '2 years' referring to the destinations of those in core training in March 2018, '5 years' to the March 2015 cohort and '8 years' to the March 2012 cohort. These figures are not tracking the same cohort over time. Data cover those employed in England only and include non-UK graduates. Those leaving to take a career break or maternity leave are not counted as leavers. Some leavers may take up training posts in general practice.

Source: Nuffield Trust analysis of NHS Digital data

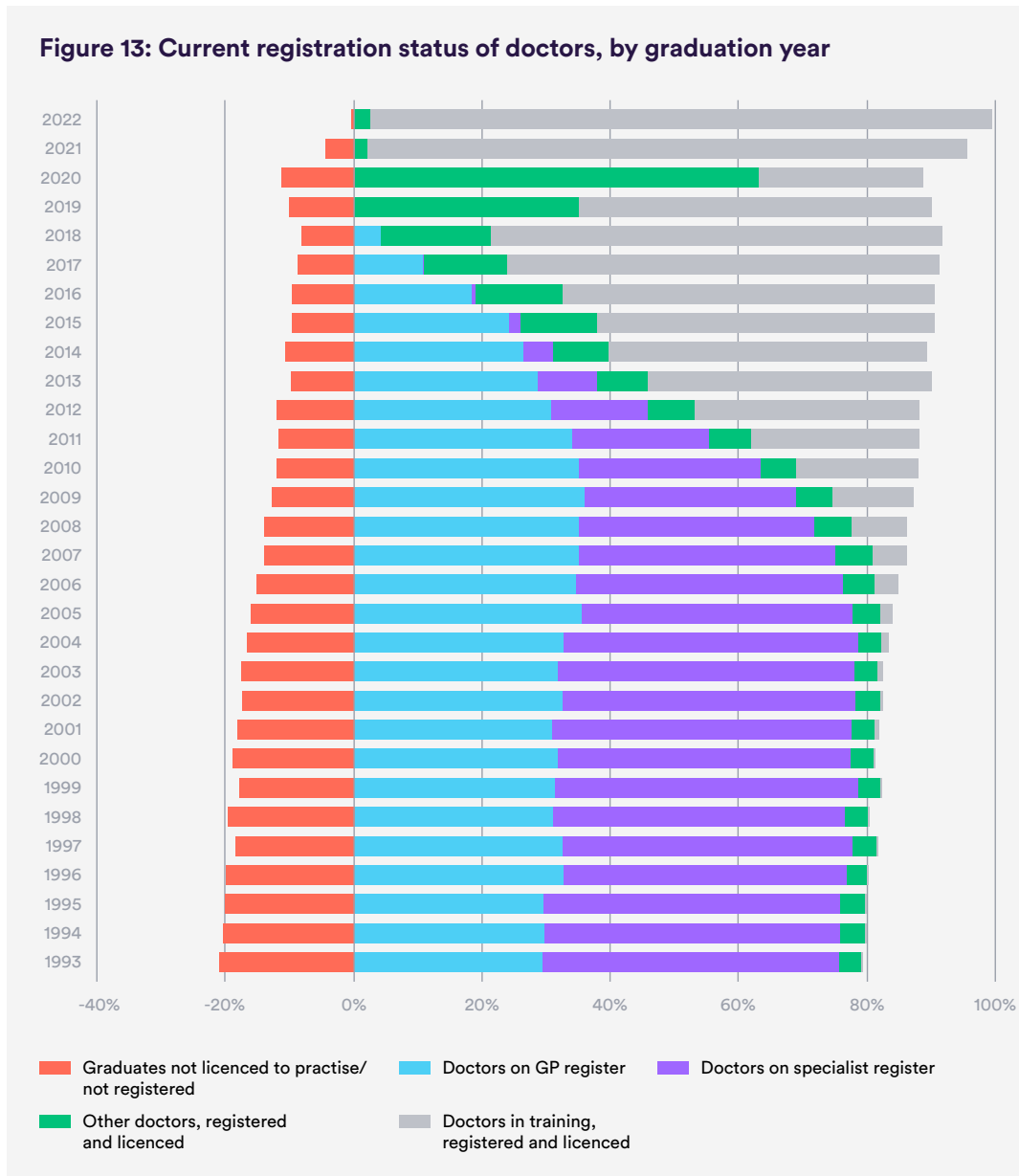
Published turnover rates (covering people leaving active service, including those going on or returning from maternity leave or a career break, for example) suggest that actually there has been a fall in the proportion of doctors in core training leaving, from 22% in 2012 to 18% in 2022, although this could potentially be related to, for example, changes in the typical time taken to complete this part of the training pathway.²⁹ While reasons for leaving are unclear, in a survey – covering all doctors still in training – a third of respondents (31%) had considered leaving, with workload, stress, feeling overwhelmed and placement experience being common reasons for this. One in six respondents (17%) reported experiencing bullying and/or harassment by other staff in their training post.³⁰ A recent report by doctors’ professional regulator painted a worrying picture of doctors reporting high levels of burnout and finding it hard to provide sufficient care to patients but, on training specifically, also identified issues around the need to increase training capacity and better support trainees in building their confidence and autonomy.³¹

Progression from medical training

Looking at those who graduated from medical school 10 years ago, just under a third (29%) are now on the GP register, while 9% have completed specialist training (see Figure 13) – this is partly due to the length of time it takes to complete all stages of further training. For those who graduated 20–30 years ago, just under half (46%) of doctors are on the specialist register, compared with around a third (31%) who are GPs and a smaller proportion (4%) who are classified as ‘other doctors’.

This latter category among the registration of newer graduates is, however, very striking. Nearly two-thirds (63%) of 2020 graduates on the register are ‘other doctors’, which is likely to correspond to those taking a pause in training after foundation years and moving into other non-training service roles. There are also increased numbers in, for example, the 2015 and 2016 graduate cohorts, which may correspond – at least in part – with those moving out of training and into specialty and associated specialist (SAS) roles – a group of doctors that has grown by 19% since 2010.³²

Across all medical graduates since 1993, around one in eight (13%) either no longer hold a licence to practise or are no longer registered doctors. Even when looking at those that graduated three decades ago, this only rises to 21%.

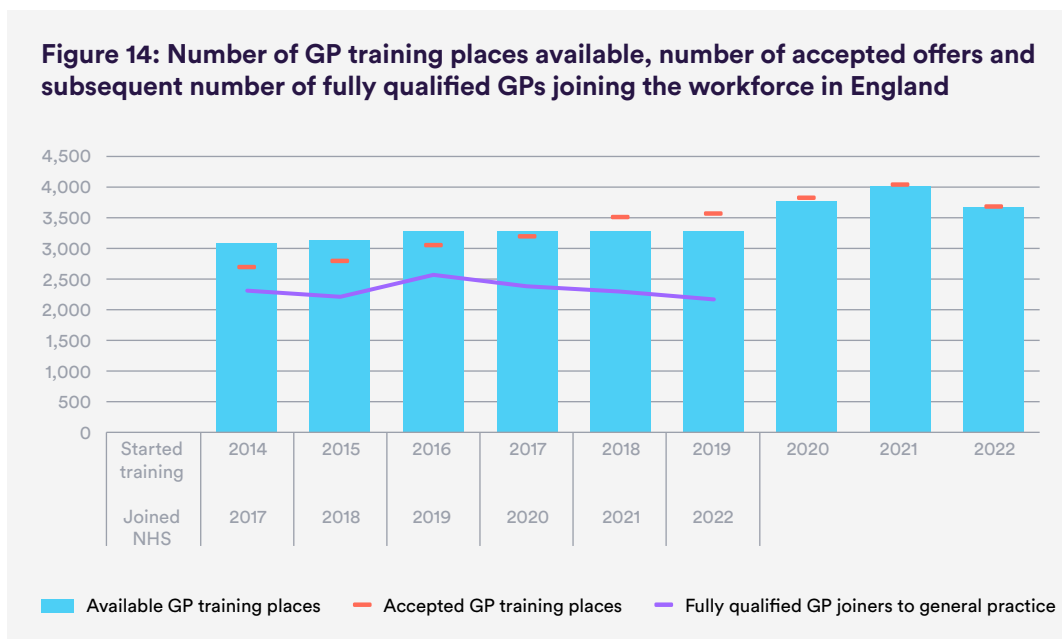


Note: Data are based on the current registration status among doctors who graduated from medical school in England and subsequently joined the medical register.

Source: Nuffield Trust analysis of General Medical Council (GMC) data

GP training

While the number of accepted GP training places increased by roughly a third in the middle of the last decade, the numbers subsequently joining the GP workforce have largely remained unmoved (see Figure 14). In fact, in the year to December 2022, the joiner rate for fully qualified GPs in England (including both UK and international medical graduates) was 8% – the lowest joiner rate across the six years that data are available for. This is despite the introduction of initiatives offering financial incentives of around £20,000 for GP trainees who take up a post in ‘hard-to-recruit’ areas, as well as for some taking up GP partnerships.^{33,34} This suggests that lessons need to be learnt quickly, given the commitment in the NHS Long Term Workforce Plan to increase the number of GP training places by half by 2031/32.⁶

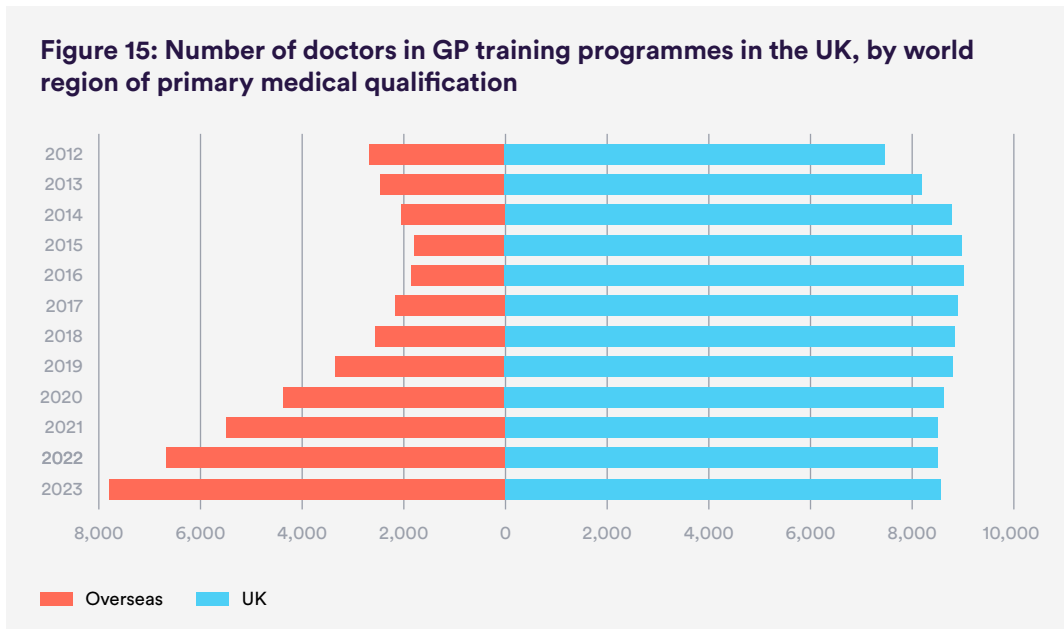


Notes: Time periods run from the beginning of September of the previous year to the end August of the year listed in the chart. Given GP training takes three years, we would expect, for example, those taking up training posts in 2014 to join the fully qualified GP workforce in 2017. Numbers include both UK graduates and international medical graduates. Some fill rates will exceed 100% due to, for example, placement deferrals.

Source: NHS Digital and Health Education England

In fact, our undergraduate and foundation-training pipeline and planning have failed significantly to provide the UK doctors needed to fill GP training posts. Given that the number of training places in general practice has increased, we would expect that international recruitment would play a bigger part in helping to fill these posts – particularly as not all GP training places were being filled before 2017. So as a result of GP training expansion, we have become increasingly reliant on doctors who went to medical school abroad to fill such positions – nearly one in five of GP training posts were filled by overseas doctors in 2017, which increased to around two in five in 2021. And indeed Figure 15 shows that there was a fall (of around 850) in the number of such posts that UK graduates filled between 2016 and 2023.

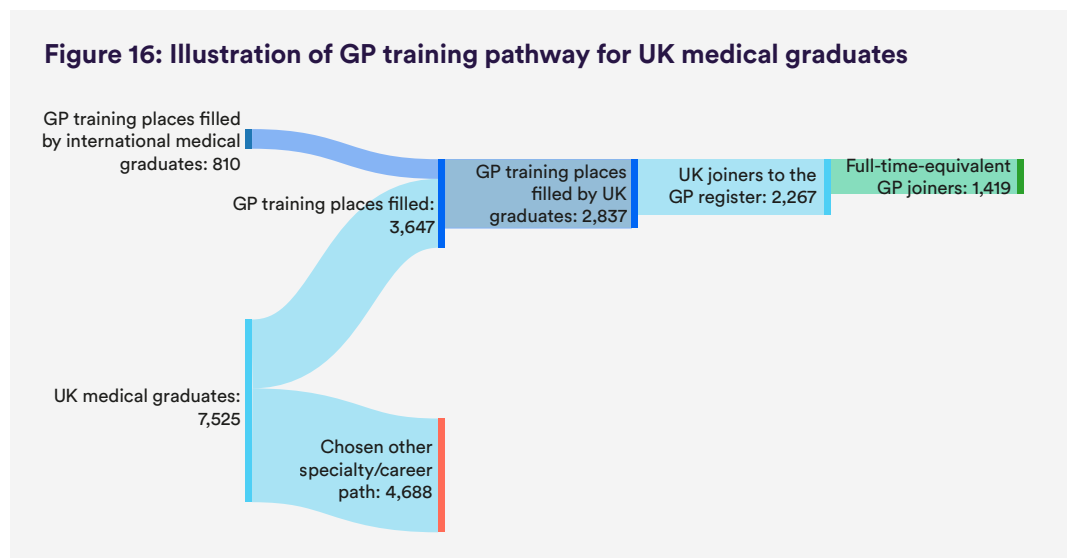
For a doctor who trained overseas, there are more barriers to entering the fully qualified GP workforce compared with those trained domestically, such as finding a practice to sponsor their visa after training.³⁵ The recently published Delivery Plan for Recovering Access to Primary Care committed to introducing a four-month visa extension for international medical graduates in GP training.³⁶ This must be closely monitored to ensure that the desired impact of increasing the permanent GP workforce is achieved – otherwise the risk of exacerbating the problem of the ‘leaky’ training pipeline will persist.



Source: General Medical Council (GMC)

Aside from the ability to fill training places, the GP specialty training pathway is also leaky, in terms of the proportion who go on to complete training and participate in NHS services. While the data are somewhat limited, we estimate that every two filled training posts in general practice result in around one fully qualified, full-time-equivalent GP joiner (see Figure 16). This is partly because the proportion of fully qualified GP joiners working full time has fallen, from three in four in 2016/17 to one in three in 2022/23.³⁷ Such a loss in the training pipeline comes at a significant cost, particularly given that all GP trainee salaries are funded through central training budgets (on top of funding provided during medical school and foundation training).³⁸

Revalidation data for GPs in 2019 suggest that some fully qualified GPs not in the NHS may still be working in public services (the Ministry of Defence and defence services, including the Royal Navy, the Royal Air Force and the British Army, made the highest number of revalidations) although others will be employed by private health care providers such as BUPA and Nuffield Health (see Figure 8).



Notes: Includes 2015 UK medical graduates taking up GP training places in 2017 and subsequently joining the GP register in 2020. Not all those taking up GP training places in 2017 and joining the register in 2020 will be 2015 graduates. Full-time equivalents were calculated by applying the ratio of full-time equivalent to headcount GP joiners in England. Participation of GPs in the workforce may vary across the UK nations so figures must be interpreted with caution.

Source: General Medical Council (GMC), NHS Digital.

5 Solutions for improving the domestic supply of clinical graduates

The leaks in the clinical training pipeline should not be considered intractable: other countries have adopted various initiatives to shore up their domestic supply. These policies have varied in nature, with some seeking to improve training experience during education while others incentivise public sector employment. That said, the majority of the policies outlined in this chapter have an overt financial incentive component to them. Financial mechanisms can include tie-in agreements with publicly funded health care services, pre-registration paid employment models and student loans forgiveness schemes.

The success of these schemes is largely dependent on how they are implemented, and it is likely that investment in all aspects of students' education and graduate employment experiences is necessary to radically improve workforce retention.³⁹ However, evaluation of these schemes is limited and, moreover, their effectiveness may have changed recently, including because of changing employment dynamics due to the Covid-19 pandemic. The ever-important question of where graduates end up long term remains unanswered; indeed, tracking cohorts is challenging. There is a plethora of evidence, however, that financial incentives alone will not solve retention issues⁴⁰ and, naturally, interventions – financial or otherwise – will come at a cost.

We now look in more detail at tie-in initiatives, pre-registration employment models and student loans forgiveness schemes, and then set these and other mechanisms out in international context (see Table 2).

Tie-in initiatives

Tie-in initiatives are relatively common and involve free or heavily subsidised education in exchange for commitment to employment in publicly funded health care services. Tie-in agreements range in restrictiveness; Malaysia, for instance, offers medical school scholarships to a proportion of its students in return for a 10-year commitment (for a typical five-year course). A previous health secretary in the UK government considered the idea of a four-year mandatory service for newly qualified UK medical graduates in 2016, although this was never implemented. The NHS Wales bursary's two-year tie-in is not well understood in terms of long-term retention effects in the Welsh NHS. The Welsh government is currently undertaking a review of the bursary scheme and it is anticipated that there will be changes to the scheme in the future.⁴¹

Box 2: NHS bursary in Wales

The Welsh government introduced a bursary tie-in scheme in 2017 for nursing, midwifery and allied health profession students, which includes funded places covering the cost of tuition fees and a bursary for living costs. In return, students must commit to working in the NHS in Wales for two years following the completion of a three-year course (18 months for a two-year course). Our analysis of the bursary does not suggest that there has been a fall in the proportion of students prematurely dropping out of their course in Wales since the introduction of the bursary, and there is no other publicly available information on how this scheme affects attrition rates. From our limited data, we equally see no impact of the bursary on participation rates. For context, it is also worth mentioning that, since 2010/11, the Welsh government has the ability to cancel up to £1,500 of a student's maintenance loan debt, but we discuss the treatment of student loans later in this chapter.⁴²

Pre-registration paid employment models

Potential associations between pre-registration paid employment during training – as used in the Republic of Ireland and Australia – and longer-term workforce retention are unclear. Knowledge on the proportion of students participating in health care post-education is again limited. But there is evidence to suggest that students have increased ‘clinical readiness’.^{43,44} However, it is important to recognise the risk that, due to shortages of practising staff, many student interns become rostered as part of the nursing or midwifery team. It appears that, without staff available in the first place, improvements in training experiences and provision of high-quality preceptorships* are limited.

Box 3: Republic of Ireland: paid internship for nursing and midwifery students

In the fourth and final year of nursing and midwifery courses in the Republic of Ireland, students complete a 36-week paid internship in a clinical setting.⁴⁵ The initiative was set up in 2002 to enable students to develop their clinical skills, and to aid in the recruitment and retention of graduates. Salaries are 80% of the first point of the registered nurse/midwife pay scale. After substantial cuts in pay for internships from 2010, pay was reinstated back to this 80% in May 2021.⁴⁵

Pay was reinstated in part to persuade students to remain in the system and to make them feel valued for their work. A 2018 survey of these interns identified that, while there were some challenges in securing subsequent permanent contracts, the vast majority wanted to remain in the public sector immediately upon graduation if offered a guaranteed permanent contract.⁴⁶

* A preceptorship describes a structured period of support to newly qualified practitioners in their transition from student to independent professional.

Student loan forgiveness

One compelling policy is to forgive student loan debt in return for years of service. These types of policy, which feature in Canada and the United States, are typically designed to increase recruitment and retention in underserved regions and clinical specialisms, with a relatively short service commitment of one to five years of full-time employment. The goals of such schemes are to provide a substantial financial incentive for students to choose clinical education, complete training and join a relevant public sector career, and to reduce avoidable attrition early in their careers.

Such a scheme has been proposed previously for clinical graduates. Civitas recommended replacing NHS bursaries with the student loans system – a proposal that was eventually adopted – as well as recommending a student loans repayment scheme where health care professionals have their student loan debt repaid on their behalf if they commit to working for the NHS after graduating.^{47,48} More recently, in the context of mental health nurses, the chair of a national review suggested that ‘employers may, for example, consider contributing to paying student university loans after a period of service of between 3 and 5 years’.⁴⁹ Such schemes have obvious advantages: students and graduates typically overestimate the financial impact of their student loans (so it can have a disproportionately large effect on, for instance, their perception of financial security) and a significant proportion of loans are written off anyway (so it is *relatively* cheap to the Exchequer). Similarly, the Royal College of Nursing commissioned London Economics to model the costs and benefits of a student loans forgiveness scheme for nurses in England, which we build on below.^{50,51}

The level of student debt for graduates will depend on various factors, but previous work suggested, as a ballpark average, that a nursing graduate typically started with a debt of £48,000, while those finishing medical school had a £60,000 debt.^{48,52} Similarly, the lifetime repayment will vary but, under the systems being introduced this year, the average lifetime repayments for male and female nurse graduates are expected to be £42,000 and £26,000, respectively.

There are also potential equality benefits to a loans forgiveness scheme. The incoming changes to student loan repayments involve reducing the repayment threshold, reducing how quickly that threshold is uplifted over time, and increasing the period of repayment from 30 to 40 years. This makes for a more regressive system (that is, an increasing number of lower to middle earners making significantly larger loan repayments over their working lives – both in absolute terms and compared with higher-earning graduates), with nursing, midwifery and allied health profession graduates disproportionately negatively affected. More generally, the student debt-funded higher education system has been argued as negatively affecting equality of access to clinical training given that, generally speaking, the most debt-averse individuals are those from low-income households, which can influence their decision to even enter higher education.²⁰ A loans forgiveness scheme could counter this. Given this would represent a fairly novel approach, we have sketched out this policy proposal in more detail (see Box 3). Others have also suggested such schemes potentially have a range of wider benefits including boosting take-home pay for younger professionals and easing industrial unrest.⁵³

Box 3: What a loans forgiveness scheme would look like

Design: There are many ways to design a loans forgiveness scheme, including around the timeframe for, and level of, forgiveness and specifics around what role and sectors would be eligible. But to illustrate such a scheme, we use the precedent (from London Economics) of 30% of a student’s loan balance being written off after three years of service, 70% written off after seven years and 100% after 10 years.

Impact on graduates: On average, for a typical nurse for example, the total value of their lifetime repayment would fall from around £27,900 to £19,900 (in present-value terms). For those working in eligible services, it would mean that they have no outstanding student debt 10 years after they graduate, whereas, under the incoming system, approximately 87% are not expected to repay their debt even after 40 years, when it is finally written off.⁵⁰

Impact on the NHS and social care: We would expect a great number of applications to clinical education courses, lower attrition during training and increased participation in NHS, social care and other eligible services if

a loans forgiveness scheme was in place. The exact level of increase is not clear but we have modelled for a 10% increase in joiners.

Impact on the taxpayer: The true cost of such a scheme will depend on the exact nature of any changes in attrition and participation and the current data for some clinical professions are limited, but we estimate that the loans forgiveness scheme outlined here might be expected to cost in the region of £230 million per cohort across nurses, midwives and allied health professionals, based on current numbers joining the NHS.

Expanding this same indicative scheme to the current medical school graduates intake might cost in the region of an additional £170 million per cohort. That said, the dynamic around participation is somewhat different for medics (and dentists) and a scheme could, instead, focus on delaying any loan repayment (and freezing the loan amount) for a certain number of years so that there is a benefit not only in terms of loan burden but also, particularly, in terms of take-home pay in the early years of being a junior doctor.

More detail on the estimated costs is given in Appendix 3.

Such a scheme would be cheap compared with some other workforce policies and interventions. While not directly comparable, the Department of Health and Social Care has suggested that a 1% increase in pay for the hospital and community services workforce would cost around £900 million.⁵⁴ Even factoring in an indicative 10% increase in clinicians joining, the estimated costs would be the same as the amount saved (some £300 million annually) by HM Treasury from each nursing cohort through the incoming changes in the student loan repayment system.⁵⁰

In Table 2 we set out the three financial mechanisms we have focused on here, along with non-financial incentives, in international context, looking at precedence and the key benefits and weaknesses of each.

Table 2: Examples of international initiatives

Policy	Precedence	Key benefits	Key weaknesses
During training			
Pre-registration employment			
<p>Paid internship or employment during training.</p> <p>Students work under the supervision of a qualified nurse or midwife.</p>	<p>Ireland (nurses and midwives): A 36-week paid internship in the fourth and final year of training. Salaries equate to around 80% of the starting salary of a qualified nurse. Students are also entitled to premium pay for working unsociable hours and enter full-time employment as a registered nurse at the second point on the pay scale.</p> <p>Australia: Victoria state only (nurses and midwives): Students can be paid after the first year of study. Although they are hospital employees, students work under the delegation of a qualified nurse or midwife. Salaries range from 75% to 85% of the starting salary of a qualified nurse or midwife.⁵⁵</p>	<p>Increased confidence and preparedness for employment.⁵⁶</p>	<p>Difficulty maintaining work–life balance and coping with stress associated with clinical demands and academic work.</p> <p>Ambiguity regarding scope of practice, role confusion, scheduling students to work consistently alongside staff support.</p> <p>Impact on long-term retention unknown.</p>
Tie-in agreements/return of service obligations			
<p>Training fees totally or partly paid for while student is in training, in return for employment in publicly funded health care services.</p> <p>Often alongside other financial incentives.</p> <p>Employment either in a specific specialism and location, or health care services more widely.</p> <p>Financial benefit applied during education (unlike loans forgiveness policies) and public sector commitment must usually occur within a particular timeframe.</p>	<p>UK Armed Forces (medics): Generous financial package for a 4–6-year commitment depending on sector.⁵⁷</p> <p>Wales (nurses, midwives, allied health professionals): 2-year commitment for 3-year course.⁵⁸</p> <p>Malaysia (doctors): Full scholarship to proportion of students in return for two years’ commitment to publicly funded health care services for every one year of training.⁵⁹</p> <p>Australia (medics and nurses): Bonded Medical Programme. Part-paid tuition fees in a medical course in return for commitment to work in eligible regional, remote or rural areas for 3 years after completion of training.⁶⁰</p>	<p>Relative high service fulfilment rate and rural retention in Australia.</p>	<p>Restrictive.⁵⁹</p> <p>Stricter interventions are associated with lower retention.⁶¹</p> <p>Lack of evidence of long-term positive retention.</p> <p>Limited cost-effectiveness evaluation.</p>

Policy	Precedence	Key benefits	Key weaknesses
During employment			
Student loans forgiveness			
<p>Student loans forgiveness for those employed in specific hard-to-staff specialties and regions</p>	<p>United States (National Health Service Corps) Federal Loan Repayment Programme (doctors, nurses, midwives, physician associates and mental and behavioural health nurses): This scheme is reserved for those employed in eligible underserved areas. The amount of loan forgiven is dependent on how underserved/remote the site is. Up to \$50,000 worth of student loan can be forgiven after an initial and obligatory 2-year commitment.⁶²</p> <p>Canada (family doctors and nurses): After 12 months of service, the clinician can receive up to \$8,000 a year for up to 5 years applied to outstanding loan balance.⁶³</p>	<p>Greater evidence for improved long-term retention in the United States.⁶⁴</p>	<p>Narrow eligibility criteria for certain schemes creates accessibility issues for those interested in working in underserved regions.⁶⁵</p> <p>Large workloads in hard-to-staff regions and poorer job satisfaction.⁶⁶</p>
Other financial incentives			
<p>Additional payments for working in underserved region or specialty in the first 3 to 5 years of employment. Payments can be used to repay student loan or as a top-up to income.</p>	<p>New Zealand: Voluntary Bonding Scheme agreement (doctors, dentists, GPs, nurses, midwives and allied health professionals).⁶⁷ Similar to other bonded schemes mentioned above; however, financial benefit is received after training.</p>		<p>Impact on long-term retention unknown.</p>

Policy	Precedence	Key benefits	Key weaknesses
During employment (continued)			
Non-financial incentives – for example, increasing the number of full-time positions for new graduates			
	<p>Canada (nurses): Ontario’s Nursing Graduate Guarantee Program: The Ministry of Health funds new registered nurses by providing temporary full-time employment opportunities above employers’ existing staffing complement. New graduate nurses are also paired with a mentor to help with the transition from education to employment.⁶⁸</p>	<p>Scheme participants are more likely to be in full-time employment compared to non-participants.⁶⁹</p> <p>Increased retention four to five years from graduation.⁷⁰</p> <p>Scheme participants indicated a perceived higher level of clinical proficiency compared to non-participants.⁷⁰</p>	<p>Permanent full-time positions post scheme vary by size of hospital.⁶⁹</p>
Other non-financial incentives – for example, professional support and education			
<p>Additional training, research and education opportunities throughout career, with a particular focus on new recruits.³⁹</p>	<p>Queensland, Australia (nurses and allied health professionals) and Scotland (nurses, midwives and allied health professionals).⁷¹</p> <p>Resources to support the transition and development of new graduates. Designed to complement professional support and mentorships.</p>	<p>Increased confidence, although individual experiences will differ.⁷²</p>	<p>Lack of conclusive evidence showing a positive correlation between Flying Start Scotland and recruitment.</p> <p>Impact on long-term retention unknown.</p> <p>Dependent on support from more experienced staff. Individual experiences will differ.⁷³</p>

6 Discussion and recommendations

For too long, the domestic training pipeline for clinical careers has not been fit for purpose, representing a problem for students, graduates, government and the NHS. Across nursing, midwifery, occupational therapy, physiotherapy and radiography, we have identified potential scope to decrease attrition during pre-registration education as well as getting more graduates to embark on their clinical careers. Although few graduates tend to leave their professional register a few years after initial registration, around one in five nurses, occupational therapists, physiotherapists and radiographers have left NHS hospital and community settings within two years.

The situation among medical students is slightly different. To date, the vast majority have graduated with a medical degree and most have gone into an NHS training programme, perhaps because they are not eligible for full professional registration until completion of their first foundation year. Thereafter, however, we see large numbers stepping out of training and leaving the NHS.

Some clinicians leaving the NHS will move into other public sector roles, including in the armed forces, and some will still be providing care for NHS patients even if employed in the independent sector or as locums. As with other professions, the NHS and wider UK public sector do not have a right of first refusal on clinicians. But the NHS does have significant staff shortages across various health care professions, which is hindering its ability to provide consistently high-quality care.

To date, the NHS has used international recruitment to make up for a failure of our domestic supply to meet health care needs. While some level of international recruitment will always be a key part of the long-term workforce plan for the NHS, this policy lever is not in itself sufficient. The global nature of the health care labour market means that a continuously high supply of

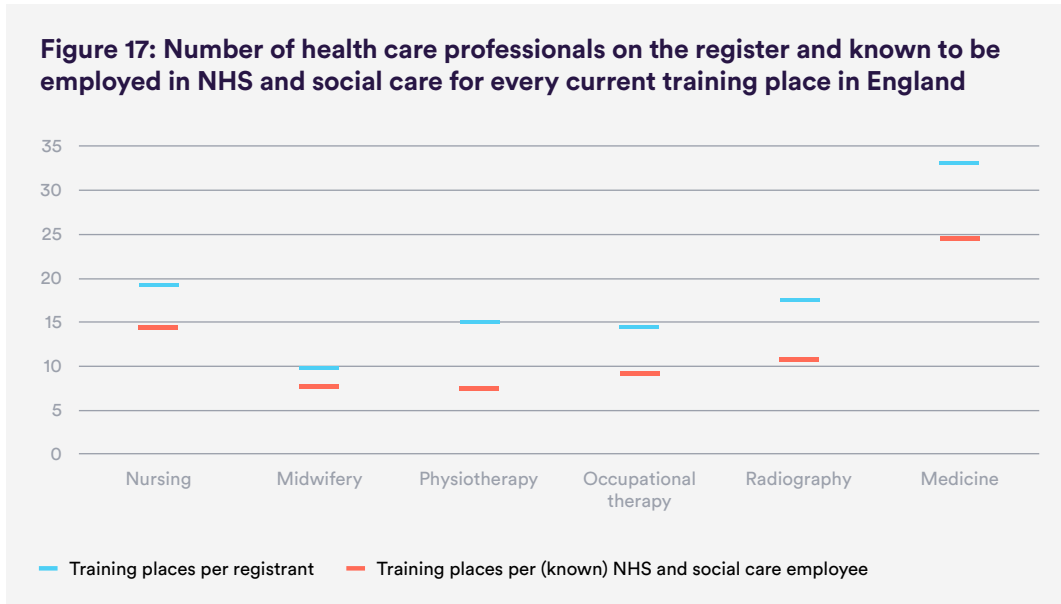
overseas staff over a number of years is difficult to sustain. This is particularly the case since the Covid-19 pandemic, with increased global demand for health care professionals creating more competition between countries. There is also a stated ambition for the NHS to become less reliant on overseas recruitment over time. Yet as already mentioned, overseas recruitment plays a substantial part in the number of registered clinicians in England, with more than four in 10 nurses and doctors joining NHS hospital and community services having a non-UK nationality in the year to June 2022.⁷⁴

While the ambition to increase clinical education capacity is welcome, doing so comes with the need for substantial investment (Health Education England and Office for Students expected to spend over £5 billion across pre-registration clinical courses and postgraduate medicine in 2022/23^{75,76}). Previous estimates suggest a total investment of around £244,700 for someone to complete medical school, rising to £430,500 for a GP and £584,100 for a consultant. For nurses and allied health professionals, the corresponding figure is around £64,600.⁷⁷ Given the commitment to increase training places by, for example, 92% for adult nursing by 2031/32,⁶ consideration must be given to how cost-effective the current system is and how to make steps to improve it.

The proposals around making training shorter and potentially changing the number and type of clinical placement hours could potentially help if implemented well,⁶ but the expansion in training also means that fixing leaks in the domestic pipeline would have a larger absolute impact on the number of clinicians joining public services. The NHS Long Term Workforce Plan does suggest exploring a tie-in period to encourage graduates to spend a minimum proportion of their time delivering NHS care, but this proposal is limited to dentistry (albeit a profession where the modelling points to a huge increase in participation in NHS-commissioned services being required to have any chance of staffing levels matching demand for care).

We have not focused in this report on the number of clinical training places being made available. However, the levels do tell us something about the scale of domestic training to the NHS and broader workforce. For every registered doctor, there are around 33 undergraduate medical training places available, compared with just under 10 training places for every registered midwife (see Figure 17). However, the NHS Long Term Workforce Plan does commit to

increase the training places from 2022 to 2031, by anywhere from 0% for children’s nursing and 11% for physiotherapy, through to doubling for learning disability nursing and medical school intakes.⁶



Notes: Based on planned training places for 2022/23 and the number of registrants and known employees across NHS and social care in England. Medical training places do not include the numbers on the graduate entry programme.

Sources: General Medical Council (GMC), Health and Care Professions Council (HCPC), Health Education England (HEE), NHS Digital, Nursing and Midwifery Council (NMC) and Skills for Care

Recommendations

There is likely no single solution to the issues around the domestic clinical training pipeline that we have raised in this report. For example, in terms of attrition during training, while financial factors have typically been one of the most commonly cited reasons behind decisions to leave, there is a broad range of other factors, including the quality of clinical placements and supervision support. With that in mind, there will need to be various strands to any policy that will deliver substantial improvements. Managing the different training pipelines for different professions at any one time is, of course, complex, and consideration must be given to the number of training places for different courses, specialties and geographies to create an optimal skill-mix across the NHS.

But before making our recommendations, it is important to recognise that work is already being done at national and local levels to try to plug the leaks in the domestic training pipeline. A 2018 national report in England set out various recommendations to improve retention, including ensuring prospective students really do understand the career they have chosen and the requirements of the course, the creation of buddy schemes to provide support to students, and the standardisation of practice assessment documentation.¹³ However, based on a report on therapeutic radiography, the content and targeting of such initiatives vary substantially.⁷⁸

Any solutions need to consider the impact not only on the scale of the supply of clinicians to public services but also on equality.^{20,21} For example, mature students, as well as those from low-income households, are more likely to be debt averse, and it has been argued that the 2017 reforms to health care education funding in England created new barriers for mature learners. In addition, any solutions must consider potentially different consequences for local areas and the challenges they face. We recently highlighted a lack of published evaluations on how cost-effective pay supplements (including geographical weightings) have been for recruiting and retaining NHS staff to particular roles and localities; this gap in knowledge must be addressed.⁷⁹

Any action needs to be seen in the context of the wider terms and conditions being offered to clinicians. Expectations on these are changing over time and, while the two-year bursary tie-in in Wales provides an interesting example, without further evidence on its effectiveness, policy-makers should be cautious about introducing constraints on training – we should look first to ‘carrots’ before ‘sticks’. With this in mind, we recommend a 10-point plan to create a sufficient and sustainable domestic clinical training pipeline. While some of our recommendations are directed at UK-wide organisations, others are worded with English organisations in mind. However, in most cases, the recommendations could be applied to equivalent national bodies in Scotland, Wales and Northern Ireland.

- 1 **National bodies must act quickly to correct some of the inaccurate and negative perceptions of clinical training and careers.** NHS England, the Council of Deans of Health and Universities UK, working in partnership with the Department for Education and the Department of Health and Social Care, should provide support and materials to help individual

universities give a positive and realistic picture of clinical training and careers to potential students – including options around portfolio careers within the public sector (which may involve clinical education). This would seek to increase demand for training while also reducing the currently relatively high levels of attrition in some clinical courses, particularly in the first year.

- 2 **Public bodies must better manage the value for money of the £5 billion spent on clinical education and training.** Commissioners of undergraduate and postgraduate medical, nursing, midwifery and allied health profession courses and placements must ensure that education, training and placements are consistently achieving the intended outcomes, while also being mindful not to impose unnecessary burden on providers. This should involve developing – in partnership with universities, the Council of Deans of Health and the Medical Schools Council – conditions on the quality, success and balance of placements. NHS England (as the single largest funder since it incorporated Health Education England) should consider issuing relevant guidance, particularly in light of stress, a lack of support and placement experience being key reasons cited for considering leaving training.⁵
- 3 Government should commission **an independent review on degree-level clinical apprenticeships**, exploring funding models, challenges in providing such opportunities and the extent to which benefits around inclusion, retention and participation are being realised. Given limited data, we were not able to look at apprenticeships in detail but further work on this is required, particularly in light of the strong commitment to this route in the NHS Long Term Workforce Plan.
- 4 Government must now seriously **consider a formal proposal for a student loans forgiveness scheme for nurses, midwives and allied health professionals**. Such a scheme can be – relative to other widespread workforce strategies – relatively affordable, in part because a significant proportion of student loans are not repaid anyway. The proposal should also consider the costs and benefits of including doctors and dentists in the scheme, although for this group the proposal could, for example, include an option to delay (interest-free) the start of repayment for a number of years, subject to remaining in training. Thinking more widely,

the government should also explore the option of a broader public sector scheme, including teachers, for example, given apparent issues in some other training pipelines.

- 5 **Government should also formally evaluate other models currently used to improve participation.** This should include the Irish and Australian preceptorship model (noting English students' doubts about their ability and feeling overwhelmed being key reasons for considering leaving training) and the Welsh bursary tie-in. Such evaluations should consider what lessons there would be for introducing similar schemes, how effectiveness has changed in the light of the Covid-19 pandemic and other shifts in employment expectations, and what would need to be changed given it would be in a different context.
- 6 The Office of Manpower Economics, as part of its secretarial role for the pay review bodies, should **undertake (or commission) a substantive analysis of the competitiveness of NHS (and other public sector) starting and early-career salaries for clinicians.** For doctors, in particular, this should be expanded to assessing the competitiveness of salaries at key decision points in their career pathways. The research should include a survey of joiners to the NHS and other sectors to better understand the importance of pay in their decision, systematic analysis of job adverts and – to be aware of changing motivations – a discrete choice experiment for those approaching key career decision points.
- 7 **The apparent inequalities in career advancement opportunities between professions must be urgently addressed.** NHS Employers – alongside professional associations, the Royal Colleges and unions – should seek to better understand the inconsistencies in pay progression within the NHS between individual professions, and the nature of the apparent association between this and retention. This analysis should include an evaluation of any significant variation in progression between different clinicians' demographics, contract nature and employers (including regions).
- 8 Workforce planners at national and regional levels **must proactively plan for the increased desire for more diverse career pathways.** The General Medical Council (GMC), the Nursing and Midwifery Council (NMC), the

Health and Care Professions Council (HCPC), NHS England, employer representatives and others should revisit their policies – in light of the NHS Long Term Workforce Plan and relatively substantial and rapid changes in typical career decisions – on how different career paths and experiences are recognised, incentivised and rewarded (including relative pay), and made available to all. For doctors this should fully recognise the current trends in staff stepping away from the training pathway after completing their foundation years and also taking up specialty and associate specialist (SAS) and locally employed (LE) roles.

- 9 Government needs to urgently revisit the policies in place for promoting the supply of GPs into NHS services.** Our work suggests that the current strategies to ensure a sustainable GP training pipeline are at best unproven and, more likely, are falling well short of what is needed. New schemes need to be developed, piloted, evaluated, revised and, if appropriate, implemented nationally. A new strategy on retaining new GPs could include, among other things, reimagining the current GP fellowship scheme to provide more funded posts designed around the motivations of this group of doctors as well as the needs of the NHS. Further changes to visa restrictions should also be considered if the current policies (including the four-month extension of the GP visa for overseas doctors completing GP training) prove inadequate.
- 10 The data on attrition, participation and retention in public services need improving.** NHS England, in collaboration with the Higher Education Statistics Authority (HESA) and professional regulators, should also ensure that there are processes in place for accurately monitoring levels of, variations in and reasons for people not completing training as well as collecting information on their early-career choices. This should enable close monitoring of emerging trends from the different and more diverse education routes proposed in the NHS Long Term Workforce Plan.

Acknowledgements

We are grateful to the individuals from key stakeholder organisations who helped us interpret our findings (for example, through attending a workshop or commenting on an earlier draft). These experts included representatives from:

- Universities UK
- The Health Foundation
- Office for Manpower Economics
- Council of Deans of Health
- Royal College of Physicians
- Royal College of Nursing
- NHS England
- Chartered Society of Physiotherapy
- Society of Radiographers
- London Economics
- NHS Digital
- The King's Fund
- NHS Employers
- General Medical Council.

As ever, we owe a great deal of gratitude to our communications colleagues at the Nuffield Trust for their help in delivering and launching the report. We would also like thank our colleagues Helen Buckingham, Rebecca Rosen, Rowan Dennison, Eleanor Martin and Louella Vaughan for providing comments on an earlier draft.

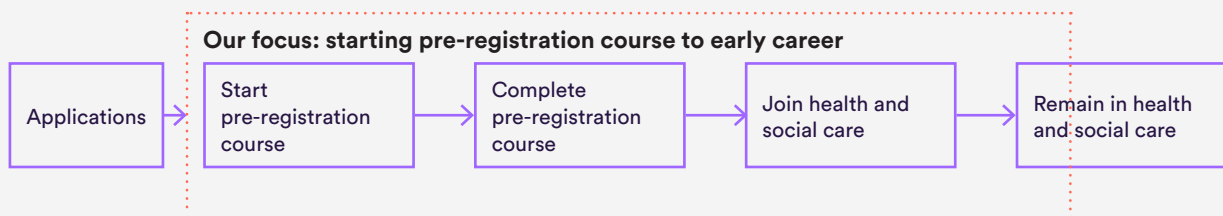
Appendix 1: Methodology

Scope of the research

For this research we first looked at data for the nursing, midwifery, physiotherapy, occupational therapy and radiography professions, from pre-registration courses through to early careers. We then looked at the medical profession, from pre-registration courses through to retention following take-up of a consultant/GP/specialty and associate specialist (SAS) role in the NHS. See Figure 18 for an illustration of the stages we focused on.

Figure 18: Data capture for the research

Nursing, midwifery, physiotherapy, occupational therapy and radiography



Medicine



Note: SAS = specialty and associate specialist.

Calculating training attrition

- Estimated attrition rates for nursing, midwifery, physiotherapy, occupational therapy and radiography are the weighted average attrition rates for undergraduate and postgraduate courses for the year of study.
- For undergraduate courses, attrition is calculated over three years of study, except for Scotland, which is taken over four years. Attrition in postgraduate courses for all UK countries is taken over two years.
- Yearly attrition is calculated by taking the sum of those on pre-registration courses who have been recorded as either leaving their course with no qualification or a different qualification over the total number of students who were eligible to graduate in that year (that is, excluding dormant/writing-up students who are not formally deregistered from their course*).
- For a given year, our calculation is based on the level of attrition across all years of study in that year, rather than tracking specific cohorts over time.
- We manually selected courses for each of our interested subject areas to narrow the focus on pre-registration courses only. We also filtered for courses that were at least one year in length.
- For medicine, we compared the number of doctors joining the medical register by year of qualification to the number of medical school acceptances in UCAS five years prior to the year of qualification. We were unable to disaggregate this by UK nation, so values are reported for the UK as a whole.

* Writing-up students, as per the definition from HESA, includes those who are 'normally expected to submit a thesis to the higher education provider for examination (generally research students), have completed the work of their course and are not making significant demands on higher education providers resources, plus those on sabbatical'.
www.hesa.ac.uk/support/definitions/students#mode-study-qualification

Calculating graduate participation

- We identified the rates of graduate participation across five clinical subjects between 2014/15 and 2019/20, using the Destination of Leavers from Higher Education Survey (between 2014/15 and 2016/17) and the Graduate Outcomes Survey (between 2017/18 and 2019/20).
- Our analysis looked at the number of graduates – that is, those who ‘gained intended award or higher’ in Higher Education Statistics Agency (HESA) data – entering the profession that they studied in – so for example, of those who studied physiotherapy, the proportion of graduates starting employment as physiotherapists.
- We used continuation status and included those in ‘full-time employment’, in ‘part-time employment’, in ‘employment and further study’ and ‘unemployed and due to start work’.
- Of these, we looked at the Standard Occupational Classification codes from the Office for National Statistics (ONS) and categorised those who started employment as a health care professional related to the degree they studied. We grouped together all other health care professional employment as ‘other health care-related employment’ and categorised all other employment/graduate activity as ‘other employment, further study or voluntary work’.
- Since the data were based on a sample, we scaled this up to reflect the population of graduates identified in the HESA data.

Table 1

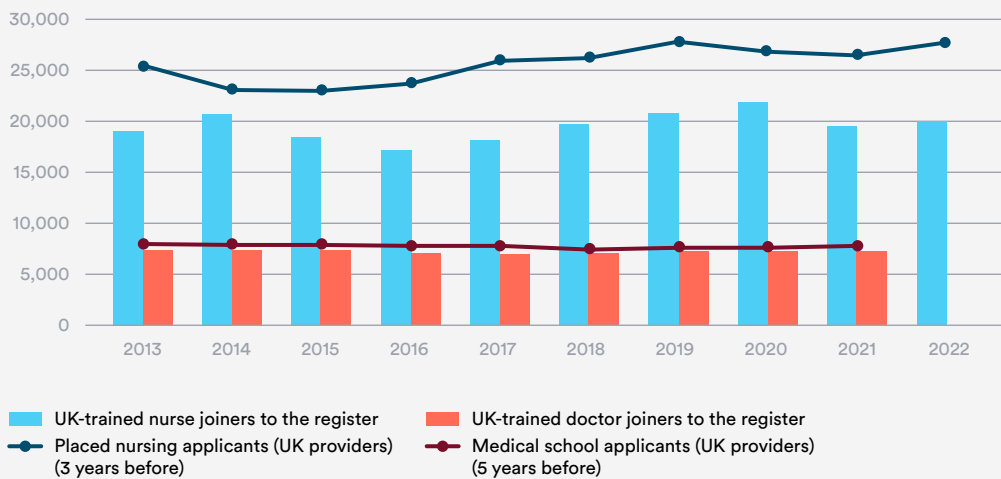
Maintenance loan eligibility is an illustrative example of those in full-time study who live away from the family home and are not based in London. Other support grants and allowances are available to some students – those who are eligible for childcare support or disability allowance, for example – but have been excluded for simplicity.

Figure 8

The number of registered health care professionals in England was mapped to the headcount of staff within each group across health and social care settings (where known). Numbers from the Nursing and Midwifery Council (NMC) and Health and Care Professions Council (HCPC) registers were taken as of March 2023 and the General Medical Council (GMC) register as of December 2021. Independent health care provider statistics only include organisations that undertake NHS-commissioned work, so the numbers in this regard are likely to be an underestimate of all those working in private health care. From the data available, we were unable to distinguish between different types of doctors and allied health professionals working in independent providers.

Appendix 2: Additional charts

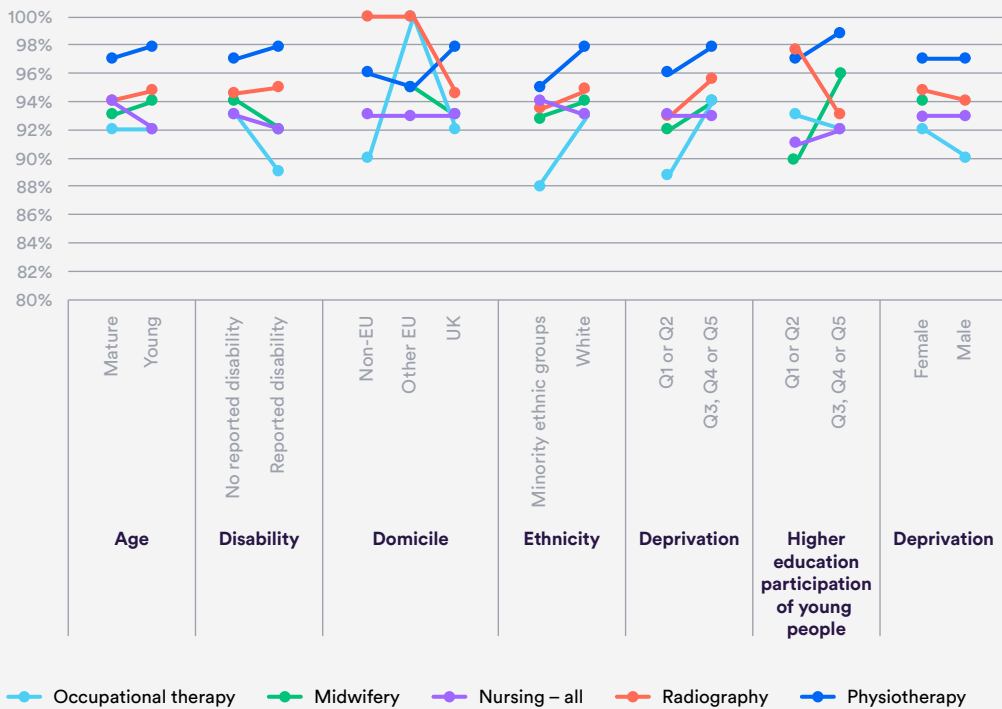
Figure 19: Number of accepted medical school places and undergraduate nursing degree places versus UK-trained doctors and nurses joining the professional register



Notes: Data are for all those who accepted a medical school place or an undergraduate nursing place at UK higher education providers. This chart uses the old definitions of subject areas, which may overestimate the number of accepted/placed applicants compared to the new classification of courses, which suggests that the number of applicants and acceptances is lower. The number of joiners to the medical register relates to calendar years, while the number of joiners to the nursing register covers financial years (for example, 2022 refers to the 2021/22 financial year). Both sets of registration data cover those who trained in the UK only.

Sources: General Medical Council (GMC), Nursing and Midwifery Council (NMC) and Universities and Colleges Admissions Service (UCAS)

Figure 20: Continuation rates of pre-registration nursing, midwifery and selected allied health students in England, 2016–17



Notes: Based on one-year continuation data for cohorts of full-time, undergraduate entrants to pre-registration courses at English higher education providers between 18 July 2016 and 17 July 2017. EU = European Union. ‘Deprivation’ refers to the indices of multiple deprivation and ‘higher education participation of young people’ relates to the ‘POLAR4’ measure. Q1 and Q2 represent areas of the highest deprivation and the lowest higher education participation.

Source: Underlying data produced by Office for Students analysts in October 2019 from HESA data

Appendix 3: Student loan forgiveness calculations

We used previous work by London Economics, commissioned by the Royal College of Nursing, as a basis for providing a broad estimate for the cost of student loan forgiveness (see Table 3). The calculation is not intended to be a precise figure – not only is the existing data not sufficiently detailed to enable this to happen, but also the actual cost will be hugely dependent on the exact design of the scheme. If anything, our figures may be an overestimate, as our analysis was not able to differentiate between those taking up employment in the NHS and those starting work at private health care providers, for example.

Table 3: Estimated Exchequer and graduate costs of student loan forgiveness proposals for nursing, midwifery and allied health profession graduates

	Old system	Incoming system	Incoming system + loans forgiveness	Incoming system + loans forgiveness + 5% cohort increase	Incoming system + loans forgiveness + 10% cohort increase
Number of joiners		27,952		29,350	30,747
Total Exchequer cost (£ million)	£1,015	£568	£797	£836	£876
Cost difference to incoming system (£ million)	+£447	–	+£229	+£268	+£308
Average graduate lifetime repayments (male/female)	£24,400/ £10,700	£42,000/ £26,000		£29,500/£18,600	

This analysis builds on London Economics' previous modelling of the Exchequer and graduate costs of student loans for nurses under different scenarios. We have assumed that the cost of fee and maintenance loans, teaching grants, lifetime earnings, loan repayments and Exchequer benefits remains the same across our cohort of joiners (which also includes midwives and all allied health professionals) as for the cohort of nurses in the London Economics analysis. The number of joiners in our cohort refers to the average number of Band 5 nurse, midwife, ambulance, and scientific, therapeutic and technical staff (including some staff outside the allied health professions group) joiners to the NHS with a UK nationality between 2016 and 2022. More details on the underlying methodology and assumptions are available in a previous London Economics publication.⁴⁸

Other groups such as doctors and dentists should, of course, be considered. For example, expanding this scheme to a cohort of 7,500 medics would likely cost somewhere in the region of £170 million. This assumes a debt on graduation of £60,000, of which 90% is currently repaid. Under the outlined loans forgiveness scheme, we might expect somewhere in the region of £31,300, on average, to be repaid until the loan is written off. That said, the dynamic around participation is somewhat different for medics, and a scheme could, instead, focus on delaying any loan repayment (and freezing the loan amount) for a certain number of years so that there is a benefit not only in terms of loan burden but also, particularly, in terms of take-home pay in the early years of being a junior doctor.

The costs – and benefits – of any scheme will be significantly dictated by how it is designed and implemented. Our analyses are intended only to give a broad estimate for the scale of costs. Rather it will be incumbent on government to provide a detailed impact assessment of any proposed policy. The NHS Long Term Workforce Plan sets out the intention to increase clinical training places considerably, from 80,346 in 2022 to 131,738 in 2031 (a 64% increase).⁶ In this scenario, the overall costs would rise equivalently but so too would the benefits.

References

- 1 Health Education England (2023) 'HEE Board Meeting – 20 March 2023'. www.hee.nhs.uk/about/how-we-work/board-meetings-papers/hee-board-meeting-20-march-2023. Accessed 14 July 2023.
- 2 NHS England (2019) *The NHS Long Term Plan*. NHS England. www.longtermplan.nhs.uk/wp-content/uploads/2019/08/nhs-long-term-plan-version-1.2.pdf.
- 3 Nursing and Midwifery Council (no date) 'Registration data reports'. www.nmc.org.uk/about-us/reports-and-accounts/registration-statistics. Accessed 14 July 2023.
- 4 General Medical Council (2022) *The State of Medical Education and Practice in the UK: The workforce report 2022*. General Medical Council. www.gmc-uk.org/-/media/documents/workforce-report-2022---full-report_pdf-94540077.pdf.
- 5 Beech J, Bottery S, Charlesworth A, Evans H, Gershlick B, Hemmings N, Imison C, Kahtan P, McKenna H, Murray R and Palmer W (2019) *Closing the Gap: Key areas for action on the health and care workforce*. The Health Foundation, The King's Fund and Nuffield Trust. www.nuffieldtrust.org.uk/files/2019-03/heaj6708-workforce-full-report-web.pdf.
- 6 NHS England (2023) *NHS Long Term Workforce Plan*. NHS England. www.england.nhs.uk/publication/nhs-long-term-workforce-plan.
- 7 UCAS (2022) 'UCAS undergraduate end of cycle data resources 2022'. www.ucas.com/data-and-analysis/undergraduate-statistics-and-reports/ucas-undergraduate-sector-level-end-cycle-data-resources-2022. Accessed 14 July 2023.
- 8 Declercq K and Verboven F (2018) 'Enrollment and degree completion in higher education without admission standards', *Economics of Education Review* 66, 223–44.

- 9 Maher B, Hynes H, Sweeney C, Khashan A, O'Rourke M, Doran K, Harris A and O'Flynn S (2013) 'Medical school attrition – beyond the statistics a ten year retrospective study', *BMC Medical Education* 13(1), 1-6.
- 10 Eudy C and Brooks S (2022) 'Factors impacting student success in a fundamentals course of an associate degree nursing program', *Teaching and Learning in Nursing* 17(1), 11-16.
- 11 Ryan JM, Potier T, Sherwin A and Cassidy E (2021) 'Identifying factors that predict attrition among first year physiotherapy students: a retrospective analysis', *Physiotherapy* 110, 26-33.
- 12 Johnes G and McNabb R (2004) 'Never give up on the good times: student attrition in the UK', *Oxford Bulletin of Economics and Statistics* 66(1), 23-47.
- 13 Health Education England (2018) *RePAIR: Reducing pre-registration attrition and improving retention report*. Health Education England.
https://healtheducationengland.sharepoint.com/Comms/Digital/Shared%20Documents/hee.nhs.uk%20documents/Website%20files/RePAIR%202018/RePAIR%20Report%202018_FINAL.pdf.
- 14 Health Education England (2022) 'NETS 2022 reporting'. www.hee.nhs.uk/our-work/quality/national-education-training-survey-nets/nets-2022-reporting. Accessed 14 July 2023.
- 15 McKeeken J, Webb G, Krause KL and Garnett R (2008) 'Australian physiotherapy student intake is increasing and attrition remains lower than the university average: a demographic study', *Australian Journal of Physiotherapy* 5(1), 65-71.
- 16 Palmer W, Dodsworth E and Rolewicz L (2023) *In Train? Progress on mental health nurse education*. Nuffield Trust. www.nuffieldtrust.org.uk/sites/default/files/2023-05/Mental%20Health%20nursing%20update_WEB_FINAL.pdf.
- 17 Department of Health and Social Care (2016) 'Changing how health care education is funded'. www.gov.uk/government/consultations/changing-how-healthcare-education-is-funded. Accessed 14 July 2023.

- 18 Marginson S (2017) 'Global trends in higher education financing: the United Kingdom', *International Journal of Educational Development* 58, 26–36.
- 19 Marketwise Strategies (2019) *Recruitment of Mature Students to Nursing, Midwifery and Allied Health Courses – Research*. Office for Students. www.officeforstudents.org.uk/media/14f84fe4-47c4-47c3-a125-559feed1f712/mature-students-and-nmah-courses-report.pdf.
- 20 De Gayardon A, Callender C and Green F (2019) 'The determinants of student loan take-up in England', *Higher Education* 78, 965–83.
- 21 MillionPlus (2018) *Forgotten Learners: Building a system that works for mature students*. MillionPlus. www.millionplus.ac.uk/policy/reports/forgotten-learners-building-a-system-that-works-for-mature-students. Accessed 14 July 2023.
- 22 GOV.UK (no date) 'Health care worker visa'. www.gov.uk/health-care-worker-visa/your-job. Accessed 14 July 2023.
- 23 Health and Care Professions Council (2023) *How Long Do New Registrants Stay Registered For? An analysis of first-time HCPC registrations: 2013 to 2018*. Health and Care Professions Council.
- 24 Palmer W and Rolewicz L (2022) 'The long good-bye? Exploring rates of staff leaving the NHS and social care'. www.nuffieldtrust.org.uk/resource/the-long-goodbye-exploring-rates-of-staff-leaving-the-nhs-and-social-care. Accessed 14 July 2023.
- 25 Nightingale J, Sevens T, Appleyard R, Campbell S and Burton M (2023) 'Retention of radiographers in the NHS: influencing factors across the career trajectory', *Radiography* 29(1), 76–83.
- 26 General Medical Council (no date) 'Certificate of eligibility for specialist registration of certificate of eligibility for GP registration application'. www.gmc-uk.org/registration-and-licensing/join-the-register/registration-applications/specialist-application-guides/specialist-registration-cesr-or-cegpr. Accessed 14 July 2023.

- 27 Health Education England (2022) *The F3 Phenomenon: Exploring a new norm and its implications*. Health Education England. www.hee.nhs.uk/sites/default/files/documents/F3_Phenomenon_Final.pdf.
- 28 UK Foundation Programme (2020) 2019 F2 Career Destinations Survey. <https://foundationprogramme.nhs.uk/resources/reports>.
- 29 NHS Digital (2023) 'NHS workforce statistics – December 2022'. <https://digital.nhs.uk/data-and-information/publications/statistical/nhs-workforce-statistics/december-2022>. Accessed 14 July 2023.
- 30 Health Education England (2022) 'National Education and Training Survey results overview: postgraduate medicine'. www.hee.nhs.uk/our-work/quality/national-education-training-survey-nets/nets-2022-reporting. Accessed 15 July 2023.
- 31 General Medical Council (2023) *The State of Medical Education and Practice in the UK: Workplace experiences: 2023*. General Medical Council. www.gmc-uk.org/-/media/documents/somep-workplace-experiences-2023-full-report_pdf-101653283.pdf.
- 32 NHS Digital (2023) 'NHS workforce statistics – February 2023'. <https://digital.nhs.uk/data-and-information/publications/statistical/nhs-workforce-statistics/february-2023>. Accessed 14 July 2023.
- 33 NHS England (no date) 'Targeted Enhanced Recruitment Scheme'. www.england.nhs.uk/gp/the-best-place-to-work/starting-your-career/recruitment. Accessed 15 July 2023.
- 34 NHS England (no date) 'New to Partnership Payment Scheme'. www.england.nhs.uk/gp/the-best-place-to-work/new-to-partnership-payment-scheme. Accessed 15 July 2023.
- 35 Royal College of General Practitioners (2023) *Fit for the Future: Opening the door to international GPs*. Royal College of General Practitioners. www.rcgp.org.uk/getmedia/7747a58e-bb5a-423e-ad25-5af9e0f0e90f/opening-door-international-gps.pdf.

- 36 NHS England (2023) *Delivery Plan for Recovering Access to Primary Care*. NHS England. www.england.nhs.uk/wp-content/uploads/2023/05/PRN00283-delivery-plan-for-recovering-access-to-primary-care-may-2023.pdf.
- 37 NHS Digital (2023) 'General practice workforce, 31 March 2023'. <https://digital.nhs.uk/data-and-information/publications/statistical/general-and-personal-medical-services/31-march-2023>. Accessed 15 July 2023.
- 38 Department of Health and Social Care (2022). *Education and Training Tariffs*. Department of Health and Social Care. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1064526/Education-and-Training-Tariff-Guidance-2022-23.pdf
- 39 Barriball K, Bremner J, Buchan J, Craveiro I, Dielman M, Dix O, Dussault G, Jansen C, Kroezen M, Rafferty AM and Sermeus W (2015) *Recruitment and Retention of the Health Workforce in Europe*. European Commission. https://health.ec.europa.eu/system/files/2016-11/2015_healthworkforce_recruitment_retention_annex1_en_0.pdf.
- 40 Bimpong KA, Khan A, Slight R, Tolley CL and Slight SP (2020) 'Relationship between labour force satisfaction, wages and retention within the UK National Health Service: a systematic review of the literature', *British Medical Journal* 10(7), e034919.
- 41 Welsh Government (2023) *National Workforce Implementation Plan: Addressing NHS Wales workforce challenges*. Welsh Government. www.gov.wales/sites/default/files/publications/2023-01/national-workforce-implementation-plan.pdf.
- 42 Welsh Government (no date) 'Student finance partial cancellation scheme'. www.gov.wales/student-finance-partial-cancellation-scheme/cancellation-examples. Accessed 15 July 2023.
- 43 Jayaskara R, Smith C, Hall C, Rankin E, Smith M, Visvanthan V and Friebe TR (2018) 'The effectiveness of clinical education models for undergraduate nursing programs: a systematic review', *Nurse Education in Practice* 1(29), 116–26.

- 44 Oja KJ (2013) 'Financial, performance, and organizational outcomes of a nurse extern program', *Journal for Nurses in Professional Development* 29(6), 290–3.
- 45 McHugh S (2021) *Longer Term Review: Matters relating to student nurses and midwives*. Government of Ireland, Department of Health. <https://assets.gov.ie/203584/965c6f7d-4de1-4f21-a51d-528bd89961c9.pdf>.
- 46 Irish Nurses and Midwives Organisation (2018) *2018 Nursing and Midwifery Internship Survey*. 2018 Nursing and Midwifery Internship Survey (inmo.ie).
- 47 Stubbs (2015) *Supplying the Demand for Nurses: The need to end the rationing of nurse training places*. Civitas. www.civitas.org.uk/content/files/nursetraining.pdf.
- 48 Stubbs (2016) *Supplying the Demand for Doctors: The need to end the rationing of medical training places*. Civitas. www.civitas.org.uk/content/files/Supplyingthedemandfordoctors.pdf.
- 49 Health Education England (2022) *Commitment and Growth: Advancing mental health nursing now and for the future*. Health Education England. www.hee.nhs.uk/news-blogs-events/news/major-hee-review-recommends-ways-develop-mental-health-nursing-workforce. Accessed 15 July 2023.
- 50 London Economics (2022) *The Exchequer Costs and Benefits of Student Loan Forgives for Nurses: Report for the Royal College of Nursing*. London Economics. <https://londoneconomics.co.uk/wp-content/uploads/2023/04/LE-Analysing-student-loan-forgiveness-options-for-nurses-26-05-2022-STC.pdf>.
- 51 Royal College of Nursing (2018) 'Fund our future nurses'. www.rcn.org.uk/Professional-Development/publications/pub-007348. Accessed 15 July 2023.
- 52 Halterbeck M and Conlon G (2017) *The Impact of Student Loan Repayments on Graduate Taxes: London Economics report for the University and College Union*. London Economics. <https://londoneconomics.co.uk/wp-content/uploads/2017/07/LE-Impact-of-student-loan-repayments-on-graduate-taxation-FINAL.pdf>.

- 53 Cater J (2023). Are ‘forgivable’ fees the answer? HEPI.
www.hepi.ac.uk/2023/07/03/are-forgivable-fees-the-answer
- 54 NHS Pay Review Body (2022) *NHS Pay Review Body: Thirty-fifth report 2022*. GOV.UK. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1092270/NHSPRB_2022_Accessible.pdf.
- 55 Mumford S, Newton M, Benzie C, Forster D, Matthews R, Hyde R, Llewelyn F and McLachlan H (2023) ‘Supporting the midwifery workforce: an evaluation of an undergraduate midwifery student employment model at a large tertiary maternity service in Victoria, Australia’, *Women and Birth* 36(1), e65–e77.
- 56 Bradshaw C, Tighe SM and Doody O (2018) ‘Midwifery students’ experiences of their clinical internship: a qualitative descriptive study’, *Nurse Education Today* 68, 213–17.
- 57 Royal Medical Benevolent Fund, ‘Armed forces medical bursaries’. <https://rmbf.org/get-help/help-for-medical-students/medical-student-advice-hub/armed-forces-bursaries>. Accessed 15 July 2023.
- 58 NHS Wales (no date) ‘Student Awards Services’. <https://nwssp.nhs.wales/ourservices/student-awards-services>. Accessed 15 July 2023.
- 59 Gowda A, Alhazza HN, Cahill ED, Ong JB, Flaherty GT (2022) ‘Stemming the brain drain of medical graduates from developing countries: controversies and solutions’, *International Journal of Travel Medicine and Global Health*, 10(3), 104–7.
- 60 Australian Government (no date) ‘Bonded Medical Program’. [www.health.gov.au/our-work/bonded-medical-program#:~:text=The%20Bonded%20Medical%20Program%20provides,service%20obligation'%20\(RoSO\)](http://www.health.gov.au/our-work/bonded-medical-program#:~:text=The%20Bonded%20Medical%20Program%20provides,service%20obligation'%20(RoSO)). Accessed 15 July 2023.
- 61 Mason J (2013) *Review of Australian Government Health Workforce Programs*. AARPN. <https://aarpn.com/wp-content/uploads/2022/10/Review-of-Australian-Government-Health-Workforce-Programs-2013.pdf>.
- 62 Heisler EJ (2017) *The National Health Service Corps*. Congressional Research Service. https://ecommons.cornell.edu/bitstream/handle/1813/79414/CRS_National_Health_Service_Corps_0917.pdf.

- 63 Government of Canada, 'Canada student loan forgiveness for family doctors and nurses'. www.canada.ca/en/services/benefits/education/student-aid/grants-loans/repay/assistance/doctors-nurses.html. Accessed 15 July 2023.
- 64 U.S. Department of Health and Human Services Health Resources and Services Administration (2021) *Report to Congress: National health service corps for the year 2021*. DHHS-HRSA-Report to Congress – National Health Service CORPS for the Year 2021. Accessed 1 August 2023.
- 65 Lapidus A, Shah S, Mekonnen M, Araj J, Nguyen M, Mason H, Eggan B and Genao I (2023) 'Medical student intention to practice internal medicine in underserved areas associated with debt, identity and extracurricular participation', *BMC Medical Education* 23(1), 1-8.
- 66 Harwood K, Frye J and Albo H (2022) 'Closing the gap in primary care: a systematic review and interpretation', *International Journal of Clinical Medicine* 13(6), 213-20.
- 67 Te Whatu Ora, Health New Zealand (no date) 'Voluntary Bonding Scheme'. www.tewhatauora.govt.nz/whats-happening/what-to-expect/for-the-health-workforce/voluntary-bonding-scheme/voluntary-bonding-scheme. Accessed 18 July 2023.
- 68 Ontario Ministry of Health (no date) 'Capacity and Health Workforce Planning Branch'. www.health.gov.on.ca/en/pro/programs/hhrsd/nursing/early_career.aspx. Accessed 15 July 2023.
- 69 Beaty J, Young W, Slepko M, Isaac W, Matthews S (2009) 'The Ontario new graduate nursing initiative: an exploratory process evaluation', *Healthcare Policy* 4(4), 43.
- 70 Baumann A, Hunsberger M, Crea-Arsenio M, Akhtar-Danesh N, Alammeddine M (2018) 'A government policy on full-time nursing employment in Ontario, Canada: An evaluation', *Health Policy* 122(2), 109-14.
- 71 TURAS (no date) 'Flying Start NHS'. <https://learn.nes.nhs.scot/735/flying-start-nhs>. Accessed 15 July 2023.

- 72 Banks P, Kane H, Roxburgh M, Lauder W, Jones MC, Atkinson J and Kydd A (2010) *Evaluation of Flying Start NHS*. University of Stirling. <https://dspace.stir.ac.uk/bitstream/1893/2950/1/Roxburgh%20-%20Evaluation%20of%20Flying%20Start%20NHS%20-%20Final%20Report.pdf>.
- 73 Upton D, Solowiej K and Upton P (2010) 'Supporting the transition from student to practitioner: a scheme to support the development of newly qualified practitioners', *International Journal of Therapy and Rehabilitation* 17(9), 494–504.
- 74 NHS Digital (2022) 'NHS Workforce Statistics – June 2022 (Including selected provisional statistics for July 2022)'. <https://digital.nhs.uk/data-and-information/publications/statistical/nhs-workforce-statistics/june-2022>. Accessed 15 July 2023.
- 75 Health Education England (2023) *HEE Board Meeting – 20 March 2023*. Health Education England. www.hee.nhs.uk/about/how-we-work/board-meetings-papers/hee-board-meeting-20-march-2023.
- 76 Office for Students (2023) *Freedom of Information request: 2023-533-FOI*.
- 77 Jones KC, Weatherly H, Birch S, Castelli A, Chalkley M, Dargan A, Forder JE, Hinde S, Markham S, Ogunleye D, Premji S and Roland D (2022) *Unit Costs of Health and Social Care 2022: Manual*. University of Kent. <https://kar.kent.ac.uk/100519/1/Unit%20Costs%20of%20health%20and%20Social%20Care%202022%20%28amended%29.pdf>.
- 78 Tuckey M and Hutton N (2021) *RePAIR: Reducing pre-registration attrition and improving retention in radiotherapy*. Society of Radiographers. www.sor.org/learning-advice/professional-body-guidance-and-publications/documents-and-publications/policy-guidance-document-library/reducing-pre-registration-attrition-and-improving. Accessed 18 July 2023.
- 79 Rolewicz L and Palmer W (2022) *Placed at a Premium? The use of recruitment and retention pay supplements to address staffing shortfalls*. Nuffield Trust. www.nuffieldtrust.org.uk/research/placed-at-a-premium. Accessed 15 July 2023.

Nuffield Trust is an independent health charity. We aim to improve the quality of health care in the UK by providing evidence-based research and policy analysis and informing and generating debate.

**59 New Cavendish Street
London W1G 7LP
Telephone: 020 7631 8450
www.nuffieldtrust.org.uk
Email: info@nuffieldtrust.org.uk**

Published by the Nuffield Trust.
© Nuffield Trust 2023. Not to be reproduced without permission.