National Institute of Economic and Social Research

BREXIT AND THE HEALTH & SOCIAL CARE WORKFORCE IN THE UK

Prepared for the Cavendish Coalition for the project

"Incentivising the domestic workforce and securing clear, reasonable routes for immigration both during and after the UK's exit from the EU"

Peter Dolton, David Nguyen,
Maria Castellanos and Heather Rolfe

Date: 6 November 2018

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NIESR Policy Report

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Structure and content of this report

This report is divided into six parts:

1. We have undertaken a substantial review of existing evidence from the literature from a variety of sources. The aim was to provide a comprehensive overview of the health and social care workforce (H&SC) in all constituent countries of the UK. We found it beneficial to not only highlight trends over time but also across regions and job roles.

2. We also looked at the training and supply of the future health workers in the UK system. We examine the past pattern of application and recruits to nursing and medicine over the previous ten years.

3. We conducted a number of focus groups and group interviews with a total of 34 representatives of a range of health and social care occupations. These included social care, medicine and dentistry, nursing, and physiotherapy.

4. Based on the quantitative and qualitative evidence we provided a number of simulations on the workforce in the next few years. Specifically, we have examined data on joiners and leavers over the years before and after the Brexit referendum to produce some baseline estimations of the workforce impact on the first stage of the Brexit process up until mid-2017.

5. In a preliminary effort to understand the potential implications of Brexit on the NHS in England staff numbers and how this relates to patients we model statistically the relationship between staff turnover share from the European Economic Area (EEA) and the variation in patient waiting times across NHS Trusts over the last three years.

6. At the end of this report we have provided series of annexes and tables which demonstrate in more detail the quantitative grounding for our analysis and recommendations.

As usual there are many caveats and qualifications to the data and conclusions in this report. Most obviously we are limited by the available sources of statistical data, its accuracy and reliability. In addition, our conclusions could well be changed quite quickly by upcoming events. It should also be stressed that describing the likely scenarios of what might be the position in the UK after Brexit is uncertain.

Executive summary

The UK's H&SC workforce is under considerable strain to provide services for an ageing population with increasingly complex needs. While many of the problems supplying new recruits into the sector pre-date the 2016 Brexit referendum, the vote to leave the European Union (EU) has added another layer of challenge and uncertainty for planning this future workforce.

This report examines recent trends in the UK's H&SC workforce and the critical role of EEA nationals within it. This is a vital issue because the vote to leave the EU and ongoing uncertainty regarding any deal between the UK and EU, will undoubtedly impact on their decision whether or not to stay with significant implications for the sector. It can also impact the decision of EEA nationals to move to the UK in the future.

Below we present a number of key findings and recommendations. These are designed to ensure that Brexit works in the interests of patient care, and to make sure that the H&SC sector is able to secure the skills and people it needs to continue to provide good care going forward.

Our key findings are:

1. In the UK a little over 5% of the regulated nursing profession, around 9% of doctors, 16% of dentists and 5% of allied health professionals were from inside the EEA. Not only are they a sizeable component of the workforce, the patterns of their numbers and their composition by occupation and geography has changed rapidly since the 2016 Brexit referendum.

2. While the contribution of EEA nationals to the NHS is important, it is arguably even more so in social care services across the UK. In 2016, EEA nationals made up 5.4% of the workforce, though in absolute terms their number grew by 68%, or 30,600 individuals, since 2011. Interestingly the strongest growth was in Northern Ireland (206%), followed by Scotland (61%), Wales (56%) and then England (40%).

3. By examining the pattern of leavers and joiners to the NHS over the year prior to June 2016 and the year post June 2016 we were able to estimate what might happen to the overall numbers of doctors and nurses going forward. Our model suggests that in the short run, the UK may have an additional shortage of around 2,700 nurses. Projecting this shortfall over the remaining period of Brexit transition to 2021 we suggest that there may be a shortfall of around 5,000-10,000 nurses (in addition to current vacancies).

4. Our stakeholder engagement strongly suggests that EEA nationals are more likely to work in specialties and locations with weak domestic supply. EEA doctors are well-represented in shortage specialties and there are regional differences in the reliance on EU nationals.

5. We have found that waiting times tend to increase in NHS Trusts which are losing EEA workers (particularly nurses). While inference based on statistical data is subject to caveats, it is reasonable to suggest that if hospital staff is turning over more quickly, then we would expect that patient outcomes deteriorate.

6. Challenges around developing a sufficient workforce supply pre-date the referendum. However, turnover is reported to have increased since the vote in June 2016. This includes a large fall in job applications in nursing, dentistry and allied health care professions, as well as increased turnover in social care.

7. In addition to this, Government-led reforms to education and training routes have driven down applications to study nursing in the UK by more than 20% since 2016, while applications to read medicine have also fallen by 10% since 2016.

Our recommendations are:

1. **The UK and devolved governments' must urgently review their workforce planning approaches across the Health and Social Care (H&SC) sector.** Planning needs to recognise that public, private and third sectors form a common system and common labour market. It also needs to recognise that supply has to be sufficient to meet the whole system need and not focus solely on NHS employers. While we acknowledge the devolved responsibility for delivery of services, we would highlight that data, analysis and planning at country level appears to be insufficient and this makes effective planning very challenging.

   A number of measures currently in place have the potential to increase future supply to professional occupations. These include investing to expand medical school places and providing additional funds to support clinical placements for nursing, midwifery and physiotherapy. However, other policy decisions, such as replacing the bursary system with student loans and inadequate funding mechanisms for apprenticeships in England for example may need to be reviewed. It appears from our review that there are few significant efforts currently active to increase supply in social care.

   Increased efforts could also be made to encourage back individuals who have left H&SC work. This might include formal return to work schemes, encouraging agency workers to move into permanent roles or by providing more opportunities for flexible working. In the social care sector, more access to training could improve the attractiveness of the job offer and small employers may need to find imaginative ways of providing this. These measures could also help bolster any additional recruitment activity targeting specific community groups.

   Finally, international recruitment should form part of a costed, holistic workforce strategy. Occupations in health and social care should be acknowledged as being in shortage and therefore any future immigration system needs to cover recruitment from the EEA and outside at all levels of skill. However, the UK Government and employers should not presume that the UK's significant shortfall of H&SC workers can simply be met by hiring them from outside the UK and that more effective ways of sourcing skills through the domestic pipeline need to be developed.

2. **Any future immigration system needs to be uncomplicated to operate.** It should also be transparent and cost effective for applicants, responsive to the changing health needs of the population and agile to meet the needs of employers. At present, many H&SC jobs do not fulfil the requirements for the minimum skills or salary levels of the current non-EEA immigration system. If a future immigration system is to be modelled on the current non-EEA system, it will need to acknowledge the value and contribution of the H&SC workforce and adjust skill and salary levels accordingly to minimise any further detrimental impact to workforce supply.

   In addition to reviewing how Tier 2 works for employers in health and social care we suggest that the post-study route also needs to be reviewed. It currently has significant restrictions which limit the ability for skilled individuals to access the UK labour market. International students are a valuable source of talent and their skills could be harnessed by health and social care employers.

3. **The Home Office should guarantee that its settled status programme for EU nationals will be honoured in the event of a no-deal Brexit.** Stemming the outward flow of EU nationals could be achieved by strengthening assurances about their long-term right to settle in the UK. Health and social care employers also need to consider ways in which they could help EEA staff (and other non-UK nationals) to register for settled status, leave to remain or citizenship.

4. **All levels of Government should work together to review career routes within social care.** In particular, we would advise that they look into the potential for opening up routes from support and social care roles into nursing and allied health professions.

5. **Professional regulators should regularly review their processes for registering international professionals.** This needs to ensure that they are proportionate and do not unnecessarily hinder international recruitment.

6. **The UK Government should introduce measures to monitor and address the decline in the number of applications to medical schools.** This holds for UK and EU applicants, though the decrease is sharpest for prospective EU students. Applications to training places need to be monitored and action taken to mitigate changes which may have a negative impact on future supply of the workforce.

Acknowledgements

We would like to thank the Cavendish Coalition for their support and guidance throughout the research project. We also acknowledge the role of the Local Government Association as part of the project steering group and for their useful observations.

We would like to thank all participants of the focus groups for medicine and dentistry, nursing, social care and physiotherapy for the time and thought they gave in responding to our research questions. Their identities and those of their organisations have been anonymised within the report. In addition, a number of organisations supplied valuable datasets and research reports used in various parts of the report. They include Cavendish Coalition members (NHS Employers, NHS Partners, the Royal College of Nursing, and Skills for Care England) and the Scottish Social Services Council. Responsibility for the interpretation of the data is the authors' alone.

Finally, this report has benefitted greatly from internal discussion with colleagues at NIESR. We are particularly grateful to Jagjit Chadha, who has commented extensively on various versions of the report.

Contents

1. Introduction

The health and social care (H&SC) workforce in the UK is under considerable strain to provide services for an increasingly ageing population. Brexit adds another layer of uncertainty and complexity when planning for the future workforce in the health and social care sector. Any deal that is concluded between the UK and the EU has long-term implications for patients and people receiving care and support in the UK (Nuffield Trust, 2017).

Between 1976 and 2016 the share of people aged 65 and over increased from 14.2% to 18%, while the population increased by 9.5 million to 65.5 million (see Figure 1). The total number of finished consultant episodes in the NHS increased from 6.3 million in 1970 to almost 21 million in 2012, while the average number of available beds per 1,000 people fell from 8.8 in 1975 to 2.9 in 2012 (Office of Health Economics, 2013).

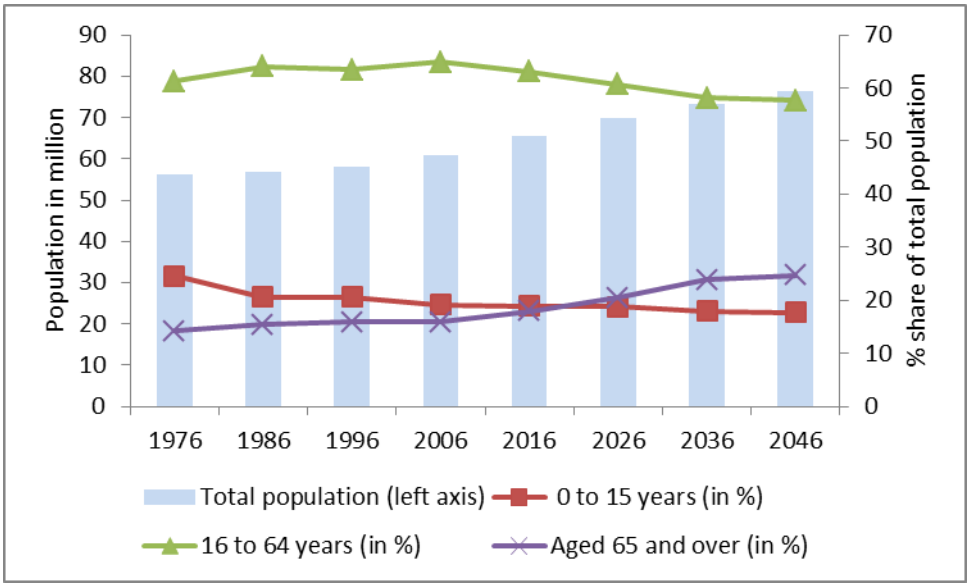
Clearly this increase in service was only possible due to an increase in the H&SC workforce. For example, the number of nurses and midwives increased from 441,000 in 1975 to 467,000 in 2012, though per 100,000 people their number fell from 784 to 739.

The ONS projects the share of elderly in the population to increase to almost 25% by 2046. Hence it is likely that the pressure on the health and social care system to deliver more services is also going to increase further.

Decreased levels of international migration are likely to exacerbate this problem as migrants tend to be younger and healthier,[1] which means that the share of GDP spent on health care is lower (OBR, 2015).

Figure 1. UK population by size and age composition, past and future trends, 1976-2046.

[1] The Migration Observatory (2016) reports that 83% of foreign-born people in the UK were under the age of 35, based on the 2011 Census conducted by the ONS. The Migration Advisory Committee (2018) reports that migrants have less reported health problems.



Source: NIESR calculations based on ONS 'Overview of the UK population', July 2017

While an ageing population is a demand-side issue, it is common across advanced economies. However, the health and social care system in the UK also faces immense supply side pressures. This is due to inadequate planning for a future domestic workforce (IES, 2016; RCN, 2018) and lack of a national strategy for training and recruitment (HEE, 2018).

In addition, there is increasing uncertainty about the ability to recruit from outside the UK in the future. Both directly affect the supply of health and social care services via their contribution to the workforce supply pipeline and flow. According to a survey by NHS Employers, NHS Providers and the Shelford Group (2018) the share of NHS in England trusts stating that the impact of Brexit on their workforce will be negative increased from 19% in 2016 to 41% in 2017.[2] At the same time, only 35% (down from 49% in 2016) stated that they have plans to recruit from the EU due their uncertain future rights in the UK.

Add to these pressures the negative impacts of the 'fiscal squeeze' in the UK which has meant that the health care sector alone was short of around £440 in funding per person in 2016-17 (Hantzsche and Young, 2018).

This report will examine these pressures on the health and social care system in more detail. We will use latest data on the workforce in different UK countries and examine trends across time, regions and occupations. In the second part of the report we look at hospital waiting times to test whether we can find an association with shortages in different staff groups.

We also need to highlight what this report is not about, as there are numerous other aspects related to Brexit that affect the health and social care sector in the UK. This includes regulations or tariffs on drugs and pharmaceutical products, medical devices and equipment, as well as research

[2] NHS Employers (2018) case study based on quarterly survey of NHS trusts
http://www.nhsemployers.org/case-studies-and-resources/2018/02/brexit-one-year-on

collaborations, procurement rules, and basic reciprocal health care for citizens that are travelling to the EEA. Some of these are discussed elsewhere and we would refer the interested reader there.[3]

[3] Nuffield Trust (2017); The Kings Fund (2017); The UK in a Changing Europe (2018); NHS Confederation (2018); British Medical Association (2018)

2. The Health and Social Care Workforce in the UK: The role of EU nationals

2.1 Composition and trends for Health Care Workforce in the UK

The health and social care sector is a large employer in the UK. However, since health care provision is devolved to the individual countries there is no unified source of data on the workforce in the health or social care sector. This presents a challenge to the provision of a complete picture of the composition of the workforce and trends in staffing across occupations, regions and nationalities. We have collected available data from the national health care providers individually and complemented them with data from the social care sector, as well as the Nursing and Midwifery Council, the General Medical Council and the independent sector. Where there are still gaps in the data we aim to highlight those as well.

In 2017 the public health care sector in the UK employed around 1.5 million people (see Table 1). The majority worked in the NHS in England (1.2 million), followed by Scotland (161,000), Wales (88,000) and Northern Ireland (54,000).[4] Unfortunately there is no unified, reliable data source on public health care workers in the UK by nationality. The NHS in England reports that around 5.2% of its workforce comes from the EEA and 6.5% from the rest of the world (RoW). Figures by Statistics Wales show that 2.5% of NHS staff has an EEA nationality and 4.2% come from the RoW.[5] Similar estimates for Scotland and Northern Ireland are not available, though we will provide some additional figures for doctors and nurses only in the subsequent sections.

The focus on EEA/EU nationals is appropriate because EU nationals are most likely to be affected by the UK's withdrawal from the European Union. Another important limitation of the available data is that it does not provide information on hours worked. The role of EU nationals in different sectors of the H&SC workforce is also highlighted in Table 2. In addition to the statutory healthcare workforce, the independent sector employs in excess of 62,000 people and has a further 23,000 clinicians (mainly doctors) in contractual relationships. Of these 79.9% have a nationality that is British, 10.9% have a nationality from the EEA, and 8.1% from other non-EEA countries.[6]

Table 1. Size of national health care workforce by UK countries, September 2017.

Country	Headcount	Data source
England	1,193,107	NHS Digital
Scotland	161,806	NHS Scotland
Wales	87,883	NHS Wales
Northern Ireland	53,517	Department of Health NI
Total	**1,507,371**	

[4] Official data by the Northern Ireland Department of Health include public social care workers. Here they have been deducted from the total workforce to meet the definition of the other countries.
[5] However, the nationality of around 40% of NHS staff in Wales is unknown, making the figures less reliable as we cannot safely assume that the reporting 60% also represent the missing 40%.
[6] These figures have been provided by the NHS Partners Network, NHS Confederation.

Table 2. The place of EU migrants in the health and social care workforce: Case studies based on focus groups.

The place of EU migrants in the medical and dentistry workforce	**The place of EU migrants in the adult social care workforce**
Overseas doctors and dentists deliver a significant proportion of the service across the UK, and even more so in areas of social deprivation. EEA doctors are well-represented in shortage specialties, including General Practice and there have been particular efforts to attract them to work in the UK. EU dentists have formed an increasing proportion of migrant practitioners because of mutual recognition of qualifications and the absence of visa controls. There is an increasing shortage of practising doctors. There are multiple reasons and factors affecting this. Dentists are being attracted to the private sector at an early stage in their working lives.	Because of long-standing recruitment difficulties the sector has historically relied on migrants from the EU and outside the EU. There are large regional variations in recruitment difficulty and, consequently, the proportion of migrants in the workforce. Migrants are recruited into social care roles because of long-standing difficulties in attracting British workers. This is explained partly by the image of the sector and lack of understanding and appeal among young people, their parents and careers advisers.
The place of EU migrants in the nursing workforce	**The place of EU migrants in the physiotherapy workforce**[7]
Registered nurses and others in nursing roles are recruited from the EU. The NHS is reliant on overseas recruitment because of failures in workforce planning which have led to under-supply of newly qualified nurses and insufficient numbers of experienced staff. Many EU recruits are newly qualified because of over-supply of training in countries such as Spain, Portugal and Italy. Levels of demand are particularly high in London and the South East, but turnover of EU nurses is also high. Recruitment of nurses from outside the EU has historically been more important in meeting shortages than EU recruitment and even before the referendum vote employers were experiencing some reduction in supply.	All physiotherapists qualifying outside of the UK are required to register before practising, a process which takes a number of months and includes an assessment of skills, knowledge and English language ability. The proportion of physiotherapists with overseas qualifications is relatively small (14%), and the split between EU and non-EU qualifiers is roughly equal. Nevertheless, given the current shortage or physiotherapists, the sector is reliant on overseas qualifiers and to benefit from their different experiences and skills. There are reports of some proactive recruitment from outside the UK, in particular from Ireland by private sector providers.

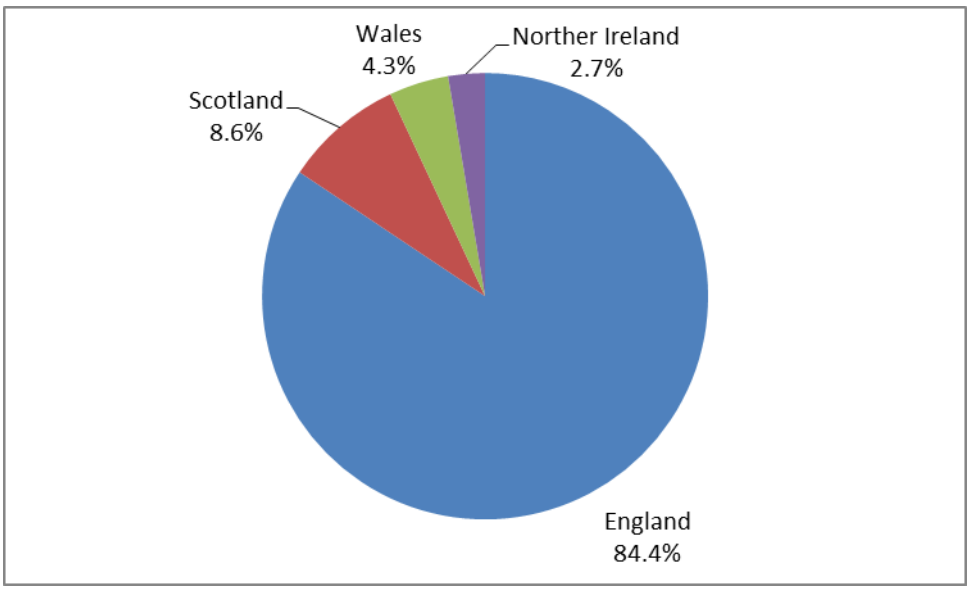
Source: Qualitative research findings based on focus groups conducted by NIESR

[7] Following the Health and Care Professions Council (2017) there were close to 5,000 physiotherapists from the EEA (i.e. country of origin) registered in the UK in July 2016. Considering that the total number of physiotherapists was reported by the same council in 2016 to be 51,747 this means that around 9.7% of all physiotherapists came from the EEA.

2.1.1 Additional findings for Doctors and Dentists

The General Medical Council (GMC) reported that in 2017 there were a total of 236,732 licensed doctors on the register for the UK as a whole.[8] Of these, 84.4% worked in England, 8.6% in Scotland, 4.3% in Wales and 2.7% in Northern Ireland (Figure 2). In terms of nationality, around 10.5% came from another EEA country and 22.9% from outside the EEA (GMC, 2017).[9] Figures are comparable when looking the region where doctors obtained their Primary Medical Qualification (PMQ), as 9.1% did so in an EEA country (excluding UK) and 24.1% in a non-EEA country (Table 3).[10] As data on the PMQ include Northern Ireland we will use both in the remainder of the section. When looking at the trends over time we can see that the number and share of non-British doctors has declined since 2012 (Table 3 and Figure 3). At the same time the total number of doctors increased by 1.9% to almost 237,000 in 2017. This is driven by an increase of supply of British doctors from 147,000 in 2012 to 158,000 in 2017.

Figure 2. Share of licensed doctors in the UK by country, 2017.



Source: NIESR calculations based on GMC data

[8] We report figures for licensed doctors as opposed to registered doctors as the latter are not licensed to practice, but for a variety of reasons choose to remain on the GMC register. The number of registered doctors in 2017 is around 45,000 higher than the number of licensed doctors.

[9] GMC Working Paper 4, December 2017: https://www.gmc-uk.org/-/media/documents/final-nationality-update_pdf-74268027.pdf (accessed 5. April 2018)

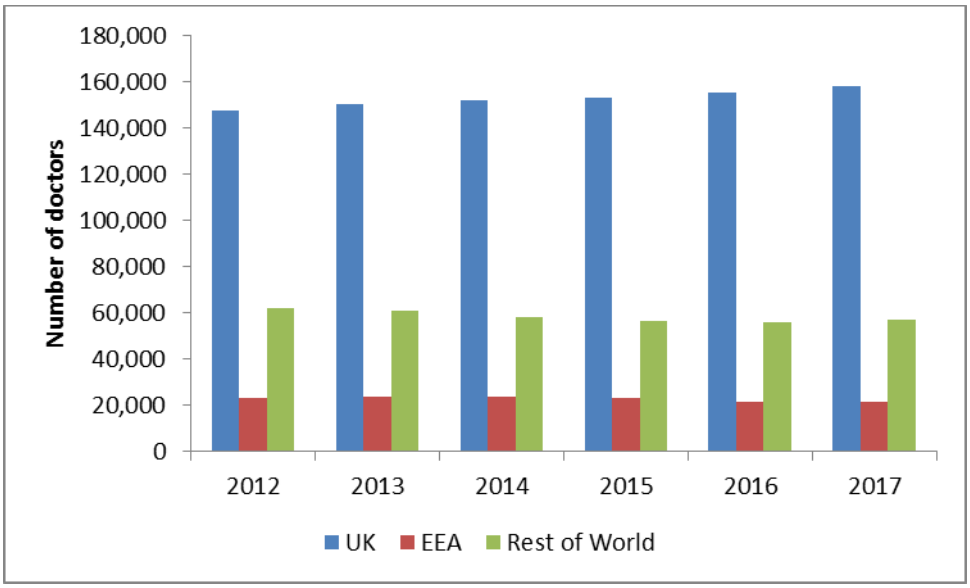
[10] The number of doctors obtaining their PMQ in the EEA technically includes British doctors that graduated in an EEA country (e.g. Republic of Ireland). On the other hand, it also includes EEA nationals that graduate in the UK in the UK figures. This can also explain the slightly lower share of EEA nationals in the figures by PMQ region.

Table 3. Number and share of licensed doctors in the UK by PMQ region in 2012 and 2017.

Nationality	Doctors in 2012	% of total	Doctors in 2017	% of total	% change 2012-17
UK	147,354	63%	158,121	67%	7.3%
EEA	22,967	10%	21,609	9%	-5.9%
Rest of World	61,929	27%	57,002	24%	-8.0%
Total	232,250	100%	236,732	100%	1.9%

Source: NIESR calculations based on GMC data

Figure 3. Number of licensed doctors in the UK, by region of the world where doctors gained their primary medical qualification (PMQ), 2012-17.



Source: NIESR calculations based on GMC data, 2017

Going down to the country-level we see in Table 4 that EEA doctors have the highest share in England (9.3%) before Scotland (7.8%) and Wales (6.9%). Data on nationality of doctors for Northern Ireland is not available, though we can use the share of doctors that obtained their PMQ in the EEA, which is 8.7%. Similarly, the share of doctors from the rest of the world (non-EEA) differs vastly across UK countries, while in England and Wales the share is 24.3% and 25.3%, respectively, it is only 12.2% in Scotland. Again, the best approximation for Northern Ireland is 5.4%.

It is also interesting to explore the changes between 2016 and 2017 as it includes the first 12 months after the referendum. It is fair to say, however, that it will take more time to see the full impact on the decision of doctors to join or leave the UK register.

The current statistics include the weeks and months directly after the referendum when it is unlikely that decisions to join or leave the workforce are affected by it. While in England the overall number of doctors increased by 2.2%, the share of EEA doctors from the EEA and the Rest of the World increased by 3.9% and 3.5% respectively. The share of doctors with a British nationality increased by 1.5% over the same period. Again, large variations across countries are evident. In Scotland the

share of EEA doctors on the register increased by 5.9%, while doctors with a nationality from the Rest of the World only increased by 0.2%. The picture in Wales looks again different, as the number of EEA doctors actually decreased by 1.2%, while the other two nationality groups expanded.

When looking at these changes it is crucial to consider that a significant number of doctors on the register have an unknown location or are based outside of the UK. In 2017 this number was close to 5,800. Importantly, the number of EEA nationals that fall into this category has fallen disproportionately by 17% following the referendum. This highlights a potential problem with these statistics as the other two groups of nationalities with an unknown location did not change much. It is possible that these 500 EEA doctors submitted information on their location following the referendum (e.g. to apply for permanent residency or nationality). This would have a large impact on the apparent increase in the number of EEA doctors in England and Scotland as their location is now known. The UK-wide increase of doctors from the EEA between 2016 and 2017 would shrink to 1.3%, a third of the official 3.9% reported by the GMC.

Table 4. Number and share of licenced doctors in UK countries by nationality.

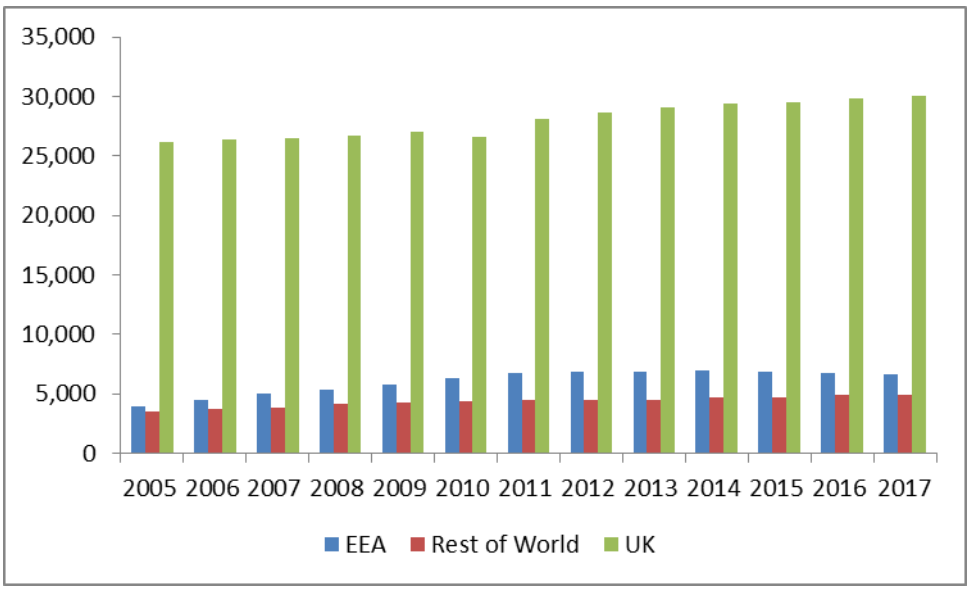
Region	Nationality	Doctors in June 2016	% of total	Doctors in June 2017	% of total	% change 2016-17
England	UK	127,450	66.9	129,402	66.4	1.5
	EEA	17,401	9.1	18,102	9.3	3.9
	Rest of World	45,703	24.0	47,356	24.3	3.5
	Total	**190,554**	**100.0**	**194,860**	**100.0**	**2.2**
Scotland	UK	15,688	80.1	15,979	80.0	1.8
	EEA	1,465	7.5	1,557	7.8	5.9
	Rest of World	2,426	12.4	2,432	12.2	0.2
	Total	**19,579**	**100.0**	**19,968**	**100.0**	**1.9**
Wales	UK	6,593	67.5	6,766	67.7	2.6
	EEA	702	7.2	694	6.9	-1.2
	Rest of World	2,467	25.3	2,530	25.3	2.5
	Total	**9,762**	**100.0**	**9,990**	**100.0**	**2.3**
Northern Ireland*	UK	5,137	85.9	5,275	85.9	2.6
	EEA	514	8.6	535	8.7	3.9
	Rest of World	329	5.5	334	5.4	1.5
	Total	**5,980**	**100.0**	**6,144**	**100.0**	**2.7**
Non-UK or unknown location	UK	1,004	15.9	991	17.2	-1.3
	EEA	3,677	58.2	3,142	54.5	-17.0
	Rest of World	1,636	25.9	1,637	28.4	0.1
	Total	**6,317**	**100.0**	**5,770**	**100.0**	**-9.5**

Notes: *Figures for Northern Ireland refer to region where doctor obtained Primary Medical Qualification (PMQ), rather than nationality. Source: GMC, June 2017

The General Dental Council (GDC) provides additional information on the number of dentists that licensed to operate in the UK. In April 2018 there were around 40,500 registered dentists, in addition to around 70,500 dental care professionals (GDC, 2018). This data only shows the number of dentists on the GDC register, not those who are currently practicing, the extent of NHS activity they undertake, or the number of hours they are practicing.

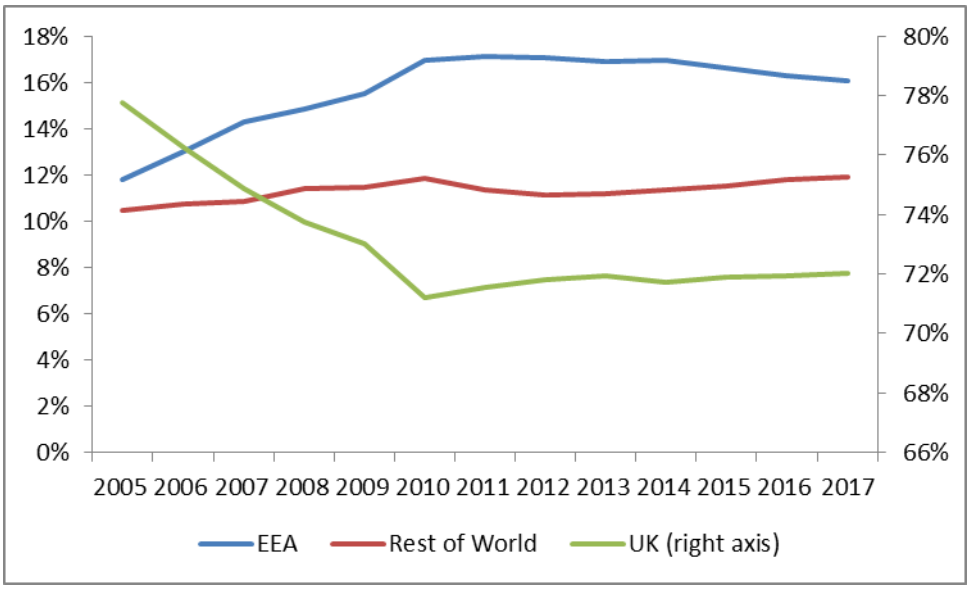
In September 2017 the GDC released figures under a Freedom for Information request on the number of dentists and dental care professionals by country of qualification. It was reported that in 2016 there were 6,725 dentists on the register that obtained their qualification in the EEA. Considering that the total number of dentists in 2016 was 41,483 this amounted to a share of 16.3%. In addition, 11.8% qualified in non-EEA countries. Looking at the trend of total number and share of dentists in Figure 4 and Figure 5 it is apparent that the number and share of non-UK dentists has increased steadily until around 2011. From then onwards especially the number of dentists that qualified in the EEA has dropped slightly to around 6,700 in 2016.

Figure 4. Number of dentists in the UK on GDC register by country/region of qualification, 2005-17



Source: NIESR calculations based on GDC data, 2017

Figure 5. Share of dentists in the UK on GDC register by country/region of qualification, 2005-17

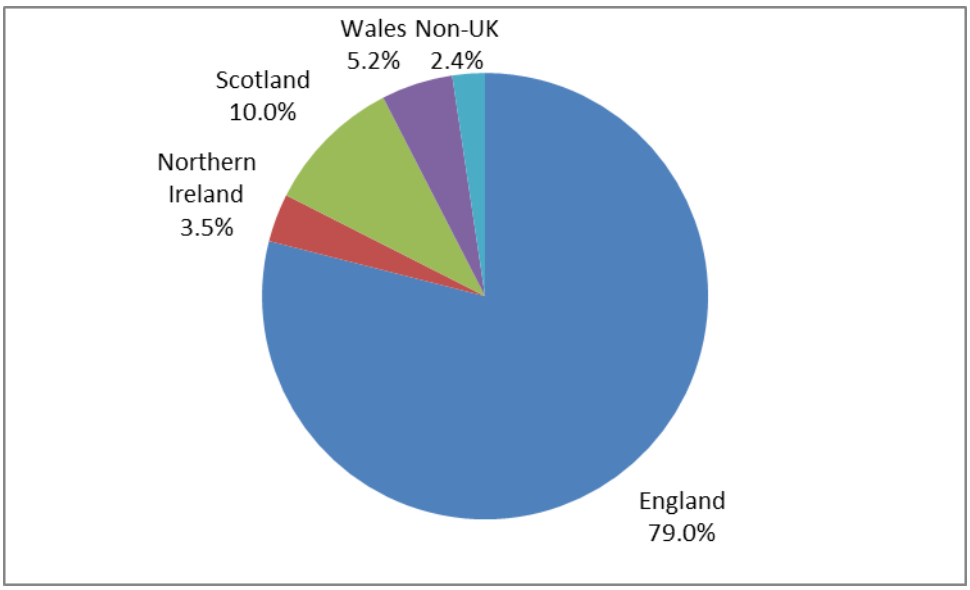


Source: NIESR calculations based on GDC data, 2017

2.1.2 Additional findings for Nurses

The Nursing and Midwifery Council (NMC) reported that in September 2017 there were almost 690,000 registered nurses in the UK. As shown in Figure 6, the majority is registered in England (79%), followed by Scotland (10%), Wales (5.2%) and Northern Ireland (3.5%). In addition, 2.4% on the register are not working in the UK. 85% of nurses had their initial registration in the UK, 5% in the EEA and 10% in the Rest of the World (Table 5). Of the nurses with an initial registration in the UK almost 80% did so in England, followed by 12% in Scotland, 5% in Wales and 3.7%in Northern Ireland. In 2010 there were 12,300 nurses with an initial registration in the EEA, while by March 2017 this more than trebled to 38,000. Similarly, their share rose from 1.8% to 5.5%. We need to keep in mind that these figures are likely an understatement of the number of EEA nurses in the UK as foreign nurses that obtain their degree in the UK and register there are counted in the UK figures.

Figure 6. Share of total nurses on NMC register by UK country, 2017



Source: NIESR calculations based on NMC data (Sep. 2017)

More recent data up to September 2017 shows that the number of nurses from the EEA has dropped to 36,300. Based on reports and data from the NMC this is due to less EEA nurses joining and more EEA nurses leaving the register than in previous years. Hence this drop in joiners and increase in leavers led to an overall drop of EEA nurses that are registered in the UK. Based on Table 6 we can see that from March 2016 to April 2017 almost 6,400 EEA nurses joined the register as compared to 9,400 in the previous year (see also Figure 7).[11] In the same time period 3,100 had left as compared to 2,000 in the year before that. Based on these figures we can also calculate the turnover rates for different groups of nationalities.

[11] This needs to be seen against the backdrop that in recent years the number of nurses from the UK that are leaving exceed the numbers that are joining (Figure 8). As a result, the net change since 2014/15 has been negative.

In Table 7 we show the number of nurses that join or leave in a given year and country as a proportion of the total number of nurses of that group on the register. For example, in 2015/16 15,434 nurses from England joined the register, representing around 3.3% of total English nurses on the register. Looking at the most recent data for 2016/17 the turnover of nurses from the EEA stands out. Compared to the previous year the proportion of joiners decreased to 16.8% (down from 27.2%) and the proportion of leavers increased to 8.1% (up from 5.7%). This is another way of showing that EEA nurses appear to react to the referendum result. The NMC (2017) further reports that the largest decreases were registered for nurses from Spain, Portugal, Poland, Romania and Italy.

Table 5. Number and share of registered nurses in the UK by region of initial registration (annual data until 13th March).

	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18*
UK	587,456	588,825	590,390	592,960	593,548	590,991	585,404	585,796
	87.7%	87.5%	87.4%	87.1%	86.4%	85.3%	84.7%	84.9%
EEA	12,298	14,493	16,798	20,916	27,012	34,572	38,024	36,259
	1.8%	2.2%	2.5%	3.1%	3.9%	5.0%	5.5%	5.3%
Rest of World	70,262	69,315	68,118	67,023	66,251	66,993	67,345	67,683
	10.5%	10.3%	10.1%	9.8%	9.6%	9.7%	9.7%	9.8%
Total	670,016	672,633	675,306	680,899	686,811	692,556	690,773	689,738
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

*Notes: *Figures for 2017/18 only until Q2, i.e. September 2017. Source: NIESR calculations based on NMC data (Sep. 2017)*

Another reason that affects the number of nurses from the EEA that join the register are changes to language requirements. As of January 2016, nurses and midwives from the EEA that want to register with the NMC are subject to new language standards. The three ways to satisfy them are: 1. Passing a language test such as IELTS (minimum score of 7); 2. Qualifying on a course that was taught and examined in English; or 3. Previous working experience in an English-speaking country if this country requires a language assessment upon registration. However, the number of registered nurses in fact increased from September 2015 to September 2016. Hence it is not clear whether this actually led to a decrease in joiners to the register, though it is possible that the increase could have been larger without the language requirements. Certainly, language requirements could not explain the increase in the number of nurses leaving between 2016/17, as the test was not applied retrospectively.

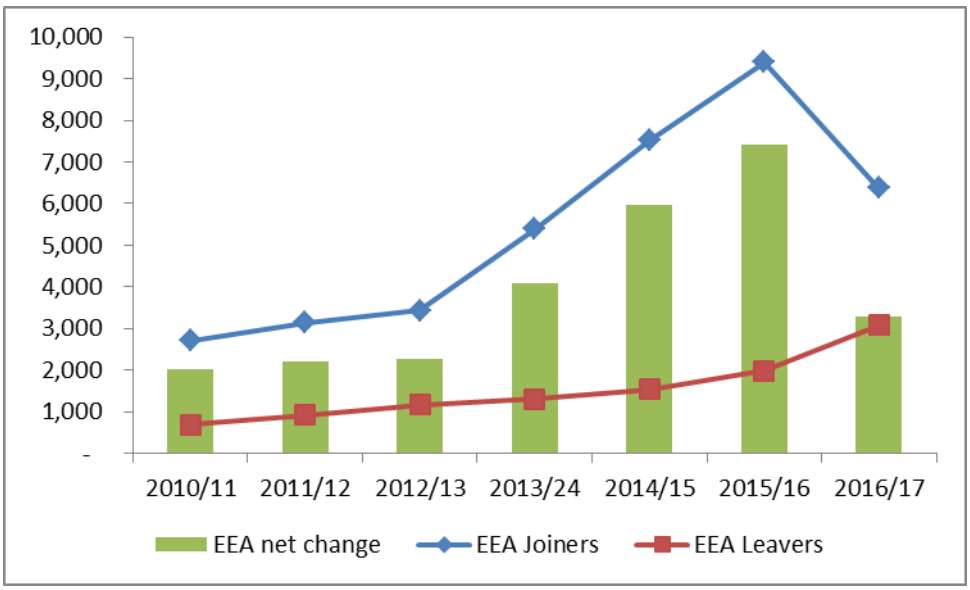
While this section presents high-level findings for the nursing workforce as a whole in the UK we need to keep in mind that there are considerable differences and nuances across roles and regions. The RCN (2018) highlights this issue in a recent policy report and describes particular difficulties in recruiting sufficient nurses specialising in mental health and learning disabilities. Also, large regional variations were reported and are a matter of concern.

The report also highlights a drop in recruitment of mature students into the sector, which is concerning as these are more likely to choose shortage specialisations and also have more life

experience in general. We acknowledge all of these concerns, which were also partially confirmed by our focus group interviews.

In the following section most of these will be addressed in more detail, though for the NHS in England only. Unfortunately, a more detailed analysis is not feasible at this point, due to the lack of appropriate data of joiners and leavers by nursing specialisation, region and age.

Figure 7. Number of nurses from EEA joining and leaving the NMC register, 2010-17.



Source: NIESR calculations based on NMC data, 2017

Figure 8. Number of nurses from UK joining and leaving the NMC register, 2010-17.

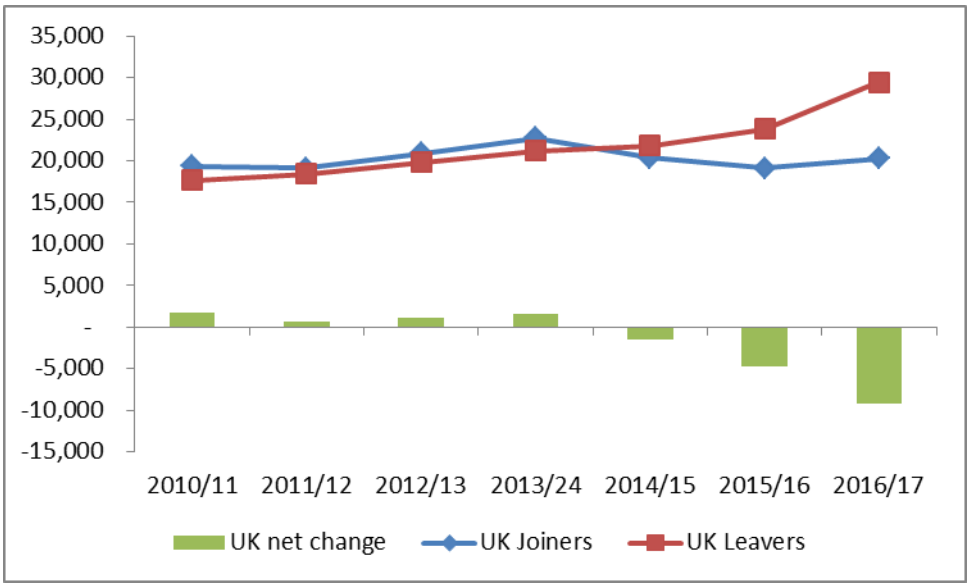


Table 6. Joiners and leavers to the NMC register, by nationality, 2010-2017.

Joiners from:	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17
England	15,418	15,238	16,883	18,190	16,171	15,434	16,135
Northern Ireland	632	654	607	720	735	619	630
Scotland	2,314	2,304	2,487	2,741	2,347	2,165	2,474
Wales	1,012	952	926	1,077	1,080	896	1,001
EU/EEA	2,716	3,137	3,436	5,389	7,518	9,389	6,382
Rest of World	1,144	1,155	869	840	665	2,135	2,403
Total	23,236	23,440	25,208	28,957	28,516	30,638	29,025
Leavers from:	**2010/11**	**2011/12**	**2012/13**	**2013/14**	**2014/15**	**2015/16**	**2016/17**
England	14,236	14,885	16,052	17,154	17,582	19,070	23,672
Northern Ireland	596	591	608	649	724	799	987
Scotland	2,154	2,330	2,420	2,534	2,620	2,888	3,593
Wales	654	643	739	830	864	1,031	1,182
EU/EEA	683	918	1,173	1,311	1,545	1,981	3,081
Rest of World	2,151	2,087	2,095	1,974	1,664	1,710	2,426
Total	20,474	21,454	23,087	24,452	24,999	27,479	34,941

Source: NIESR calculations based on NMC data (Sep. 2017)

Table 7. Proportion of nurses on the NMC register that join/leave each year, by nationality, 2010-2017.

Joiners from:	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17
England	3.3%	3.3%	3.6%	3.9%	3.4%	3.3%	3.5%
Northern Ireland	2.9%	3.0%	2.8%	3.3%	3.3%	2.8%	2.9%
Scotland	3.3%	3.2%	3.5%	3.8%	3.3%	3.0%	3.5%
Wales	3.6%	3.4%	3.3%	3.8%	3.7%	3.1%	3.5%
EU/EEA	22.1%	21.6%	20.5%	25.8%	27.8%	27.2%	16.8%
Rest of World	1.6%	1.7%	1.3%	1.3%	1.0%	3.2%	3.6%
Total	3.5%	3.5%	3.7%	4.3%	4.2%	4.4%	4.2%
Leavers from:	**2010/11**	**2011/12**	**2012/13**	**2013/14**	**2014/15**	**2015/16**	**2016/17**
England	3.1%	3.2%	3.4%	3.6%	3.7%	4.1%	5.1%
Northern Ireland	2.7%	2.7%	2.8%	2.9%	3.3%	3.6%	4.5%
Scotland	3.0%	3.3%	3.4%	3.5%	3.7%	4.1%	5.1%
Wales	2.3%	2.3%	2.6%	2.9%	3.0%	3.6%	4.1%
EU/EEA	5.6%	6.3%	7.0%	6.3%	5.7%	5.7%	8.1%
Rest of World	3.1%	3.0%	3.1%	2.9%	2.5%	2.6%	3.6%
Total	3.1%	3.2%	3.4%	3.6%	3.6%	4.0%	5.1%

Source: NIESR calculations based on NMC data

2.2 Overview of Social Care workforce composition and trends by nationality

According to the ONS the social care sector employs around 2 million people in the UK. In terms of employment this makes it larger than the national health care sector. To get an initial overview of the social care workforce in the UK as a whole we analyse data prepared by the ONS based on the Annual Population Survey (APS) for 2011 to 2016.[12]

In 2016 there were around 1.65 million social care workers in England, 198,000 in Scotland, 100,000 in Wales and 48,000 in Northern Ireland (see Table 8). Based on Figure 9 we can see that the share of EU nationals in the social care workforce differs across countries in the UK. It is highest in Northern Ireland (9.6%), followed by England (4.9%), Scotland (4.4%), and lowest in Wales (2.4%). The trend is pointing upwards as the comparable figures in 2011 were 3% for Northern Ireland, 3.6% for England, 2.7% for Scotland and 1.6% for Wales.

Looking at the total number of EU nationals in the social care workforce in Figure 11 we see that it has been increasing in recent years. Between 2011 and 2016 the total number in England increased from 58,000 to 81,300 (+40%), in Scotland from 5,400 to 8,700 (+61%) and in Wales from 1,600 to 2,500 (+56%). In Northern Ireland it increased by 206% from 1,500 to 4,600.[13] It is important to note that these figures show that more EU nationals are employed in the social care sector (total and relative). This does not necessarily mean that more of them have moved to the UK, though this is possible.

These figures have to be compared against the fact that the overall number of workers that are British has declined between 2015 and 2016, though not in Northern Ireland. In England around 30,000 (-2%) British workers left the sector, 12,500 in Scotland (-6.3%) and 5,000 in Wales (-5.1%). The scale of these numbers is very different to the total number of EU workers that are joining the sector that we can exclude any large-scale displacement effects.

The data also holds information on non-EU workers in social care (Figure 10-11, and Table 8) and the picture looks more mixed. The total number and share has been stable in England, though with an upward trend since 2013. In Scotland and Northern Ireland their number has dropped significantly. Scotland experienced a decline in the share from 3.6% in 2011 to 1.1% in 2016, while in Northern Ireland the share of non-EU nationals dropped from 3.2% to 0.6% over the same period. Wales experienced a more moderate but still significant decrease from 3.9% to 2.2%. It is important to keep these numbers in mind when looking at potential scenarios going forward. Considering that in recent years it has been mainly EU nationals joining the social care workforce and non-EU nationals dropped out, this highlights an increasing dependence on EU nationals to fill jobs in the social care sector.

[12] This includes workers in Pre-primary education, Residential care activities, and Social work activities without accommodation (SIC codes 85.1, 87 and 88). The APS reports nationalities of workers, rather than country of birth as in the Census. Hence it does not include people that have migrated to the UK and subsequently became British citizens.

[13] 2016 figures for Northern Ireland look irregular, though it could be that in 2016 a number of Irish nationals registered in Northern Ireland as a result of the Brexit referendum. We also note that these are official figures coming from the ONS.

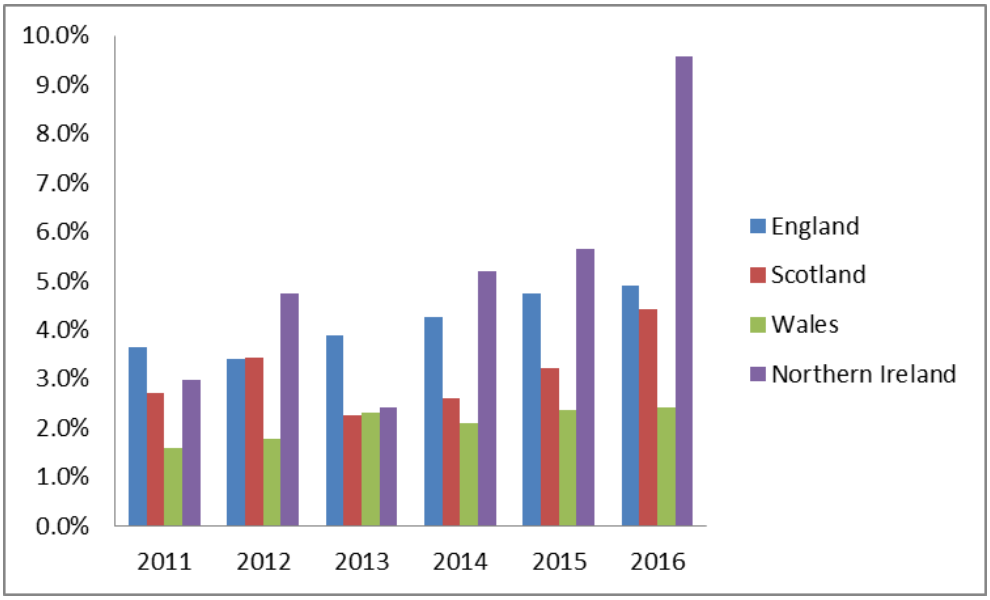
It is important to point out that the ONS data have some severe shortcomings, though at present they are the only comprehensive data source to compare UK countries. The main issue is that the Social Care sector is not well-defined in the data, hence no analysis for specific job roles is possible. In addition, since the ONS derives the data from a 1% sample of workers it is not possible to provide regional-level breakdowns, which would be desirable for this analysis. When compared to data by Skills for Care England it is likely that the ONS captures a slightly different subset of the labour market. For example, following Skills for Care there are only around 1.34 million employees in the social care sector in England, as opposed to 1.65 million according to the ONS.

Table 8. Overview of social care workforce in social work, residential care and pre-primary education (SIC 85.1, 87 and 88) by UK country, 2011-2016.

	UK (number)	EU (number)	Non-EU (number)	Total (number)	UK (% of total)	EU (% of total)	Non-EU (% of total)
England							
2011	1,455,689	58,629	94,254	1,608,572	90.5%	3.6%	5.9%
2012	1,464,406	54,951	92,809	1,612,166	90.8%	3.4%	5.8%
2013	1,456,255	62,568	85,905	1,604,728	90.7%	3.9%	5.4%
2014	1,489,666	70,444	90,717	1,650,827	90.2%	4.3%	5.5%
2015	1,507,490	79,788	91,319	1,678,597	89.8%	4.8%	5.4%
2016	1,477,791	81,313	95,342	1,654,446	89.3%	4.9%	5.8%
Scotland							
2011	186,164	5,393	7,051	198,608	93.7%	2.7%	3.6%
2012	182,522	6,732	6,598	195,852	93.2%	3.4%	3.4%
2013	191,070	4,503	3,871	199,444	95.8%	2.3%	1.9%
2014	196,771	5,393	4,498	206,662	95.2%	2.6%	2.2%
2015	199,777	6,823	4,825	211,425	94.5%	3.2%	2.3%
2016	187,110	8,748	2,103	197,961	94.5%	4.4%	1.1%
Wales							
2011	94,850	1,604	3,948	100,402	94.5%	1.6%	3.9%
2012	97,699	1,826	3,295	102,820	95.0%	1.8%	3.2%
2013	101,090	2,444	2,229	105,763	95.6%	2.3%	2.1%
2014	101,549	2,236	2,553	106,338	95.5%	2.1%	2.4%
2015	104,724	2,581	1,495	108,800	96.3%	2.4%	1.4%
2016	99,340	2,532	2,300	104,172	95.4%	2.4%	2.2%
Northern Ireland							
2011	48,291	1,535	1,625	51,451	93.9%	3.0%	3.2%
2012	54,580	2,817	1,980	59,377	91.9%	4.7%	3.3%
2013	56,799	1,453	1,782	60,034	94.6%	2.4%	3.0%
2014	46,646	2,591	538	49,775	93.7%	5.2%	1.1%
2015	38,770	2,364	660	41,794	92.8%	5.7%	1.6%
2016	43,219	4,607	300	48,126	89.8%	9.6%	0.6%

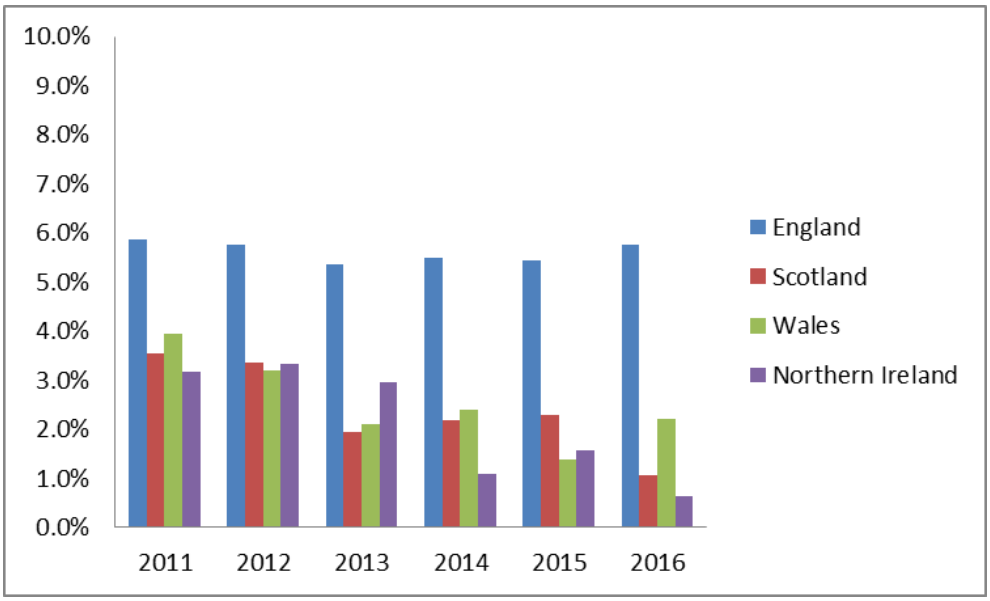
Source: Annual Population Survey, ONS (April, 2017)

Figure 9. Share of EU nationals (excl. UK) in UK's social care workforce, 2011-2016.



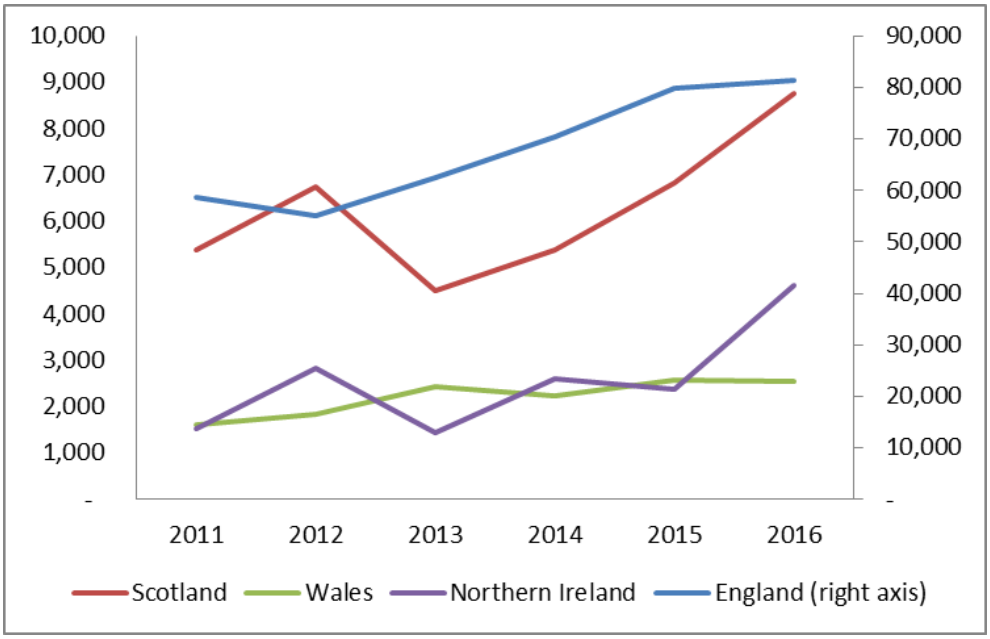
Source: NIESR calculations based on Annual Population Survey, ONS (April, 2017)

Figure 10. Share of non-EU nationals in UK's social care workforce, 2011-2016.



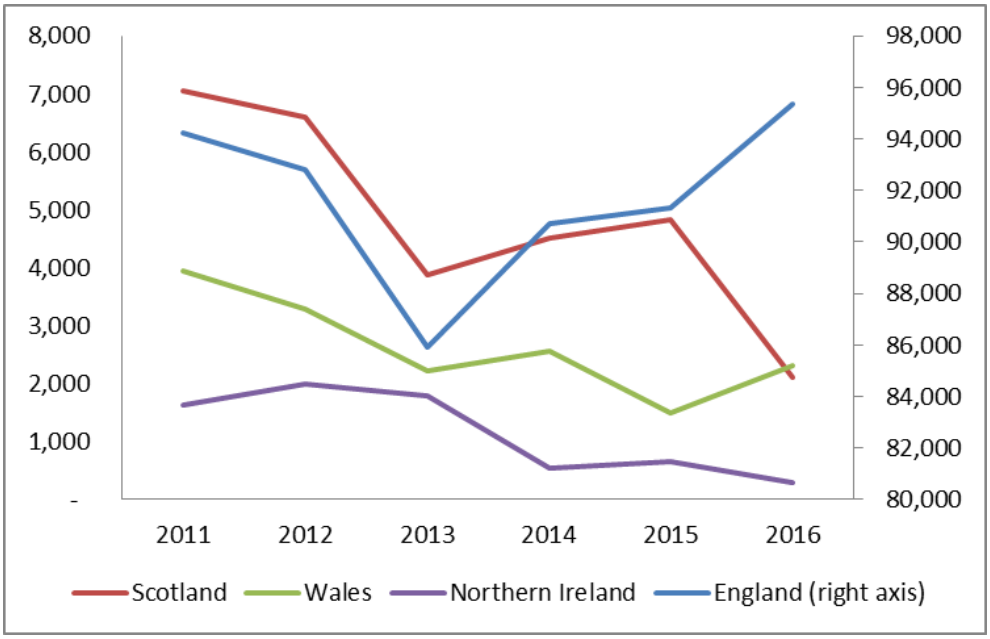
Source: NIESR calculations based on Annual Population Survey, ONS (April, 2017)

Figure 11. Total number of EU nationals (excl. UK) in UK's social care workforce, 2011-2016.



Source: NIESR calculations based on Annual Population Survey, ONS (April, 2017)

Figure 12. Total number of non-EU nationals in UK's social care workforce, 2011-2016.



Source: NIESR calculations based on Annual Population Survey, ONS (April, 2017)

3. Training of clinical staff: Becoming a health care professional in the UK

While the previous section highlights the crucial importance of overseas staff in the health and social care workforce in the UK, the majority of staff are British. Our analysis has demonstrated that this varies considerably across occupations and regions, where EU nationals often fill bottlenecks as confirmed by our focus group interviews. We have shown that the total workforce has expanded since 2009, though the share of British workers decreased.

Sections 2.1.1 and 2.1.2 explored recent trends for the supply of doctors and nurses specifically, also distinguishing the nationality of joiners and leavers to the registers. While the number of registered British doctors has increased by 7.3% since 2012, the number of registered nurses has fallen by 0.8% over the same period. The number of nurses leaving the register (e.g. due to retirement) has increased markedly in recent years to 29,434 in 2016/17 compared to 20,240 that joined. It means that on a net basis there were almost 9,200 British nurses less on the register in one year. This stands in contrast to 2013/14 and previous years when the number of joiners registering with the NMC still exceeded the number of those that left.

This section will look specifically into the domestic training of the health care workforce. We will focus on doctors and nurses and midwives as key clinical occupations. After looking into typical training pathways, we will examine recent data on the number of applications and admissions to medical degrees. Here we also look into recent changes in the tuition fees for nurses and early impacts on supply. We will also discuss the findings that emerged from the focus groups meetings since the scope to recruit from domestic workforce was one of the focus topics. The case studies are reported in Table 9.

Using UCAS data we show that applications to study Nursing or Medicine have declined in recent years. This trend has also been explored in a recent study by the Health Foundation (2017). The number of applications to study Nursing have peaked in 2014 and sharply declined particularly in 2017, coinciding with the removal of the NHS bursary in England. Applications to read medicine also declined over the same period, though more steadily (but sharp for EU students in 2017).

Table 9. Scope for increasing recruitment from the domestic workforce. Case studies based on focus group meetings.

Scope for increasing recruitment to medicine and dentistry from the domestic workforce	**Scope for increasing recruitment to adult social care from the domestic workforce**
Places at British medical and dental schools are heavily over-subscribed, indicating scope to significantly increase the domestic supply of dentists and doctors in the longer term. There is scope for part-time practitioners, especially in dentistry to increase their hours. Practitioners taking a career break could be encouraged to return to work to fill gaps. There is currently no return to work scheme in dentistry although there is an active scheme for some groups of doctors. Returners could be attracted with more opportunities to work flexible hours, and those wishing to retire could be encouraged to stay on a similar basis. There is a view that the UK is currently not training sufficient numbers of dentists, but the Department of Health and Social Care is seeking a higher ratio of dental hygienists to dentists, in view of the increasing importance of preventative work and improved health in the teeth of the UK population.	The sector is not regarded as attractive by British workers as a result of poor understanding of the work and opportunities, but also because of lack of clear career pathways from care work to higher level social care roles. Employers feel careers guidance could improve understanding of the sector, but that this would inform decisions made by individuals at a later stage in their working lives rather than on leaving full-time education. Employers are putting more resources into local recruitment than in the past. Some see a potential to recruit older workers and have some success in doing so. Scope was also identified to recruit disabled people in some parts of the sector where their experience would be of particular value. While qualifications are not a barrier to recruitment, employers find difficulty attracting care workers with the necessary personal qualities of empathy and compassion. The predominance of small employers and constraints on funding result in low investment in training and development, making the sector less attractive to individuals who wish to progress.
Scope for increasing recruitment to nursing from the domestic workforce	**Scope for increasing recruitment to physiotherapy from the domestic workforce**[14]
Entry to registered nursing roles could be facilitated through opening up of routes from nursing support and social care roles. An apprentice route has been set up but this is both expensive and may not produce sufficient numbers to meet demand for registered nurses who can meet clinical needs. Employers need to attract back nurses who have left the profession through improving the attractiveness of working arrangements, including by offering flexible working. There is a large pool of nurses who work temporarily, for banks and agencies, who could be attracted back to permanent roles. This could include accommodating rotas according to their preferences for working hours. Looking ahead, there is a need to replace the large cohort of nurses who will be leaving the workforce through retirement in the mid-2020s.	Workforce planning has underestimated the demand for physiotherapists because it has only looked at numbers required by NHS employers. This covers around 70% of the workforce need as it excludes NHS sub-contractors, private providers, private practice, charities and other public bodies such as the MOD. The bursary for trainee physiotherapists has been recently replaced by a loan system which is expanding the number of available English university places, previously subject to a cap. The Welsh and Northern Irish authorities are also expanding the number of commissioned places. Places are heavily over-subscribed, and the profession is attractive to young British people. However, it will take several years for the impact to be felt. There are low rates of drop-out from the profession. The high proportion of women results in periods of withdrawal from the labour market, although return to practice schemes are being developed to facilitate earlier re-entry.

[14] To practice as a physiotherapist in the UK a practitioner must be registered with the HCPC. A recognised UK BSc or MSc in physiotherapy qualifies someone for registration and there is no equivalence of qualifications for EEA physiotherapists. Overseas trained physiotherapists, including those from the EEA, can join the register if their language skills, levels of education, scope of practice and knowledge, match UK standards – as judged by the HCPC. It is therefore common for EEA trained physiotherapists to have to undergo a "period of adaption" prior to registration in the UK. This is a supervised work-based practice period where physiotherapists develop skills and knowledge which were not covered in their original training or subsequent professional practice and development.

3.1 Becoming a registered nurse

Becoming a registered nurse with the Nursing and Midwifery Council (NMC) requires a 3-year bachelor's degree in nursing, with a specialisation in adult, child, mental health or learning disability. Applications are processed by the Universities and Colleges Admissions Service (UCAS) and it is possible to study on a part-time basis. Upon completion of the programme a graduate can register within 5 years with the NMC online, for a fee of £120. The registration should be completed within 10 working days.

The NMC lists online 163 approved programmes in the UK for a specialisation in adult care, 143 for mental health care, 109 for childcare and 48 for learning disabilities.[15]

Costs vary mainly across UK countries, rather than universities. In England the NHS stopped its bursaries for nursing, midwifery and other health degrees on the 1st August 2017. Instead applicants are referred to the same student loan system as for other students.[16] Some bursaries remain for eligible students with children or those facing severe hardship. Students only need to pay back the loan once they are in employment and earn above £25,000. For UK and EU nationals it currently costs around £9,250 in tuition per year to become an adult care nurse in England. Fees for overseas students can be significantly higher, sometimes exceeding £15,000 per year (e.g. University of Lincoln, London South Bank University).

In Scotland students are eligible for the NHS bursary under the Student Awards Agency Scotland (SAAS) if they are domiciled in Scotland or EU nationals. Students from the rest of the UK (not domiciled in Scotland) need to pay the full £9,250 per year, and fees for international students can exceed £23,000 in the case of the University of Edinburgh.

In Wales, eligibility for the NHS bursary depends on whether the student lived in the UK for 3 years prior to starting the course and commits to working for a minimum of 2 years in Wales upon graduation. Additional means-tested financial support is available. Fees for UK and EU students without the bursary are £9,000 and fees for international students can be considerably higher.

Finally, in Northern Ireland tuition fees for nursing are fully funded by the Department for Health. To be eligible students need to live for 3 years in Northern Ireland prior to starting the degree or be an EU national (apart from rest of the UK).

Figure 13 and Table 10 show the total number of applications and acceptances to nursing degrees in the UK. While the total number of applications has increased from 185,000 in 2010 to almost 224,000 in 2016, this number fell drastically to 176,000 in 2017. Considering the timing it seems obvious that this year-on-year decrease of more than 21% can be attributed to the nursery reform in the English NHS (the decrease for men even exceeds 27%). Looking at the total number of acceptances only a small decrease of 4% to 26,000 is visible since the acceptance rate has gone up from 12.2% to 14.8%. While a more detailed analysis of this phenomenon is beyond the scope of our

[15] https://www.nmc.org.uk/education/approved-programmes/ (Accessed on 26th March 2018)

[16] https://www.gov.uk/government/publications/nhs-bursary-reform/nhs-bursary-reform (Accessed on 26th March 2018)

study a continuation of these trends has potential implications for the quality of the workforce as the pool to choose applicants from is smaller.

A study by the Royal College of Nursing (2018) reports that only around 70-75% of nurses that are accepted will in the end register with the NMC (based on graduate figures in England for 2015 and 2016). This implies that of the 26,000 accepted nurses in the class of 2017 only around 19,500 would actually enter the nursing workforce when they graduate in September 2020.

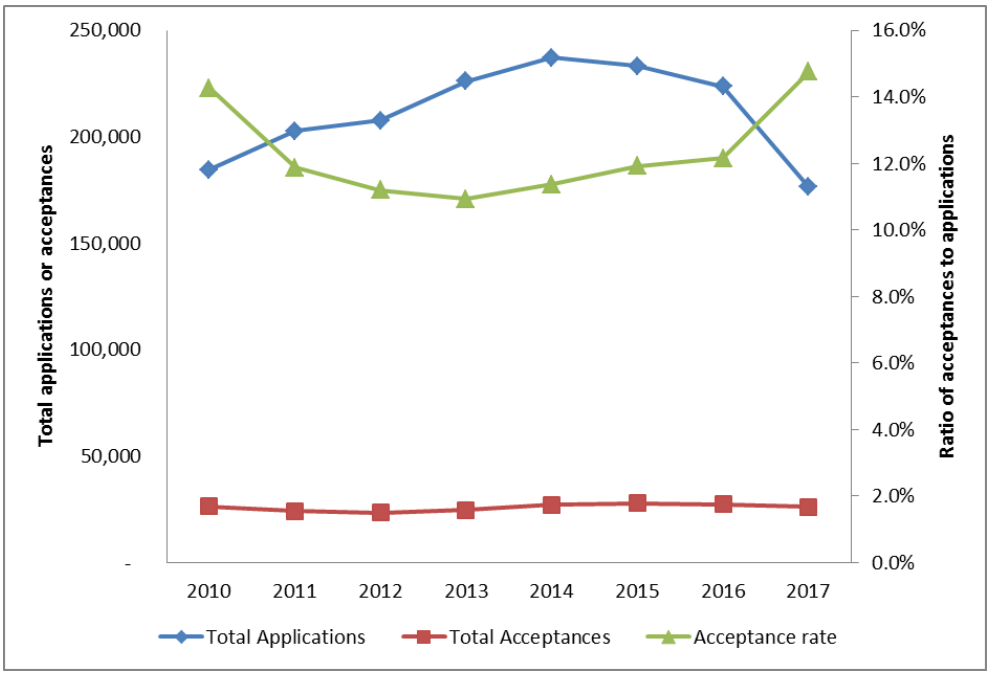
Based on Figure 14 we can furthermore see that not only the number of British applicants decreased, but also the number of applicants from the EU dropped by 26% between 2016 and 2017. Applications from non-EU countries on the other hand increased by 30%, though in absolute terms this only makes up for 1.4% of the total decrease from the UK and EU. The decreasing popularity of nursing degrees is also discussed in a recent report by the Royal College of Nursing (2018) and though the Secretary of State for Health and Social Care announced to expand the number of funded clinical placements, this must be seen against the backdrop of fewer applicants. Unless application criteria will be dropped it is unlikely that these places can be filled with equally good candidates. The RCN also reports that application for 2018 intake has again fallen.

Table 10. Applications, acceptances and acceptance rate to Nursing (B7) in the UK, by gender, 2010-2017.

	Total			Women			Men		
	Applications	**Acceptances**	**Acceptance rate**	**Applications**	**Acceptances**	**Acceptance rate**	**Applications**	**Acceptances**	**Acceptance rate**
2010	184,595	26,330	14.3%	165,925	23,740	14.3%	18,670	2,590	13.9%
2011	202,815	24,070	11.9%	182,580	21,755	11.9%	20,235	2,315	11.4%
2012	207,655	23,245	11.2%	188,315	21,195	11.3%	19,340	2,050	10.6%
2013	226,015	24,685	10.9%	205,500	22,450	10.9%	20,515	2,235	10.9%
2014	237,085	26,960	11.4%	215,075	24,485	11.4%	22,010	2,475	11.2%
2015	233,215	27,790	11.9%	210,505	25,165	12.0%	22,710	2,625	11.6%
2016	223,735	27,205	12.2%	201,800	24,655	12.2%	21,935	2,550	11.6%
2017	176,385	26,030	14.8%	160,415	23,785	14.8%	15,970	2,245	14.1%

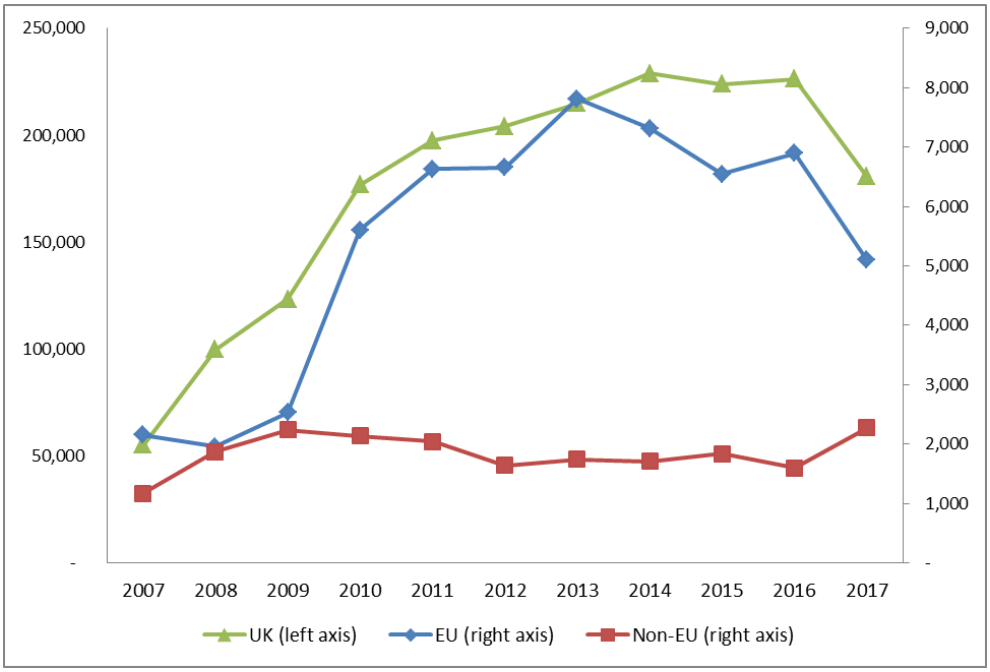
Source: NIESR calculations based on UCAS data

Figure 13. Total applications, acceptances and acceptance rate to Nursing (B7) in the UK, 2010-2017.



Source: NIESR calculations based on UCAS data

Figure 14. Number of applicants to Nursing degrees in the UK by country of origin. 2007-2017.



Source: NIESR calculations based on UCAS data

3.2 Becoming a licensed doctor in the UK

To become a doctor in the UK, students first enrol in an undergraduate medical degree that takes four to six years depending on the circumstances or choices of the student, though the majority of students will complete their degree in five years. This is followed by the two year foundation programme after which students train to become a clinical specialist or GP. A significant number will also end up in non-training posts, as shown in Figure 15, prepared by the GMC (2017). The figure shows the total number of medical students and doctors at different stages of medical education.

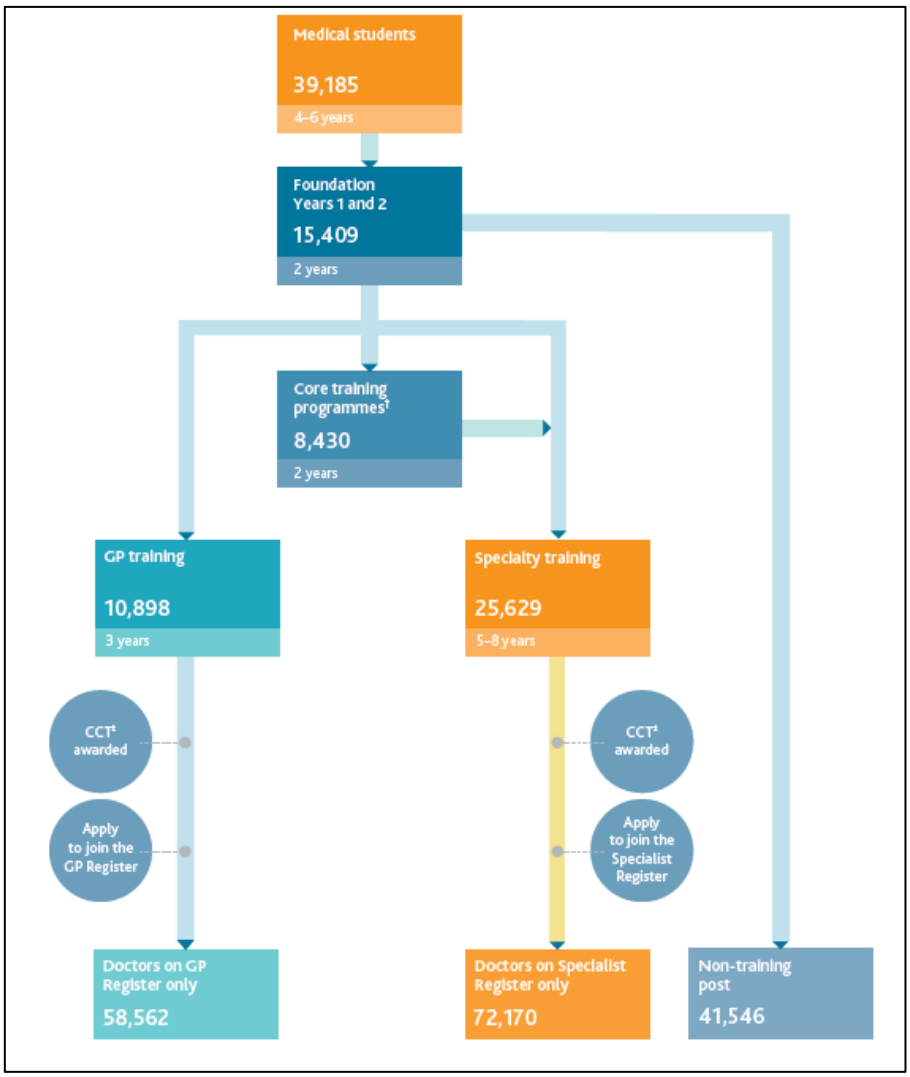
In 2016 there were around 58,500 GPs, 72,000 specialists and 41,500 doctors in non-training posts. In addition, there were around 40,000 medical students, 24,000 students in their foundation years or core training programmes, 11,000 doctors in GP specialty training and 25,500 in specialty training. As we know that most students graduate after five years, GPs take around ten years to train, whereas specialists can take between 12-15 years as a minimum. This does not account for time out of training (for reasons such as research and career breaks), less than full time training or education reasons to delay training. The time lag between entering medical school and a fully trained doctor is considerable, though not uncommon in international comparisons.

Funding for medical and dental students differs between UK countries. Students that are classed as domiciled in England are entitled to a student loan by Student Finance England that will cover tuition costs for the first 4 years of studies in the form of a repayable loan. Years four and five will be paid by the NHS Bursaries Scheme. Similar arrangements are in place for students that are classed as domiciled in Northern Ireland, where the Northern Ireland Department of Health covers costs from year 5 onwards. Before that, students can apply for student loans and a means-tested grant. Students classed as domiciled in Wales can apply for a means-tested bursary provided by the NHS Welsh Bursary Scheme. Funding from year 5 onwards is covered automatically. In Scotland the government pays for the tuition fees if students are classed as domiciled there or qualify as home students.

In 2017 there were 6,071 medical school places in England. Most are allocated to King's College (401)[17], University of Birmingham (374) and University of Manchester (371). In addition, there are 809 dental school places.

[17] Higher Education Funding Council for England (13th April 2017). http://www.hefce.ac.uk/lt/healthcare/intake/ (accessed on 27th March 2018)

Figure 15. GMC graph on number of medical students and doctors at different stages of their education in 2016.



Source: GMC (2017) report "The State of medical education and practice in the UK" (p.60)

The Department for Health and Social Care first announced in October 2016 that the number of medical undergraduate places in England will be expanded by 1,500.[18] Of these, 500 are to be offered in September 2018 and the remaining 1,000 in the year after, both following a competitive bidding process. This process has now concluded, and has led to the creation of new medical schools that will begin teaching in the coming years. The plan also includes potentially charging international students. The GMC welcomes this initiative but acknowledges there is a long time lag between offering a place in a medical degree and becoming a full trained doctor. It estimates that earliest in 2028 these additional doctors would become fully trained as GPs or 2033 as hospital specialists.[19] Also, the Department of Health states that "there is a lag in the time it takes to train a new member

[18] https://www.gov.uk/government/news/1500-extra-medical-undergraduate-places-confirmed (accessed on 27th March 2018)

[19] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/693470/General_Medical_Council.pdf (accessed on 27th March 2018)

of staff, especially for medics and therefore continued migration across the NHS is vital to maintain service levels".[20]

Looking at the latest data from UCAS on the application to medical undergraduate degrees, it is clear that the number of applicants applying to fill current and additional places is decreasing (see Figure 16). While in 2011 around 83,000 students applied to pre-clinical medicine degrees, this number dropped to below 69,000 in 2017 – a decline of 17% (see Table 11). The decrease in applications from 2016 to 2017 has been strongest for EU applicants (-20%), followed by Non-EU (-10%) and UK (-6%). Since the total number of acceptances remained stable, the acceptance rate necessarily went up to around 13% for UK students, 4.3% for EU and 6.8% for Non-EU students. Hypothetically, an additional 1,500 places would mean that the acceptance rate for UK students would have to increase to 15.6% of all applicants.[21]

Table 11. Applications, acceptances and acceptance rate to Pre-clinical medicine (A1). 2007-2017

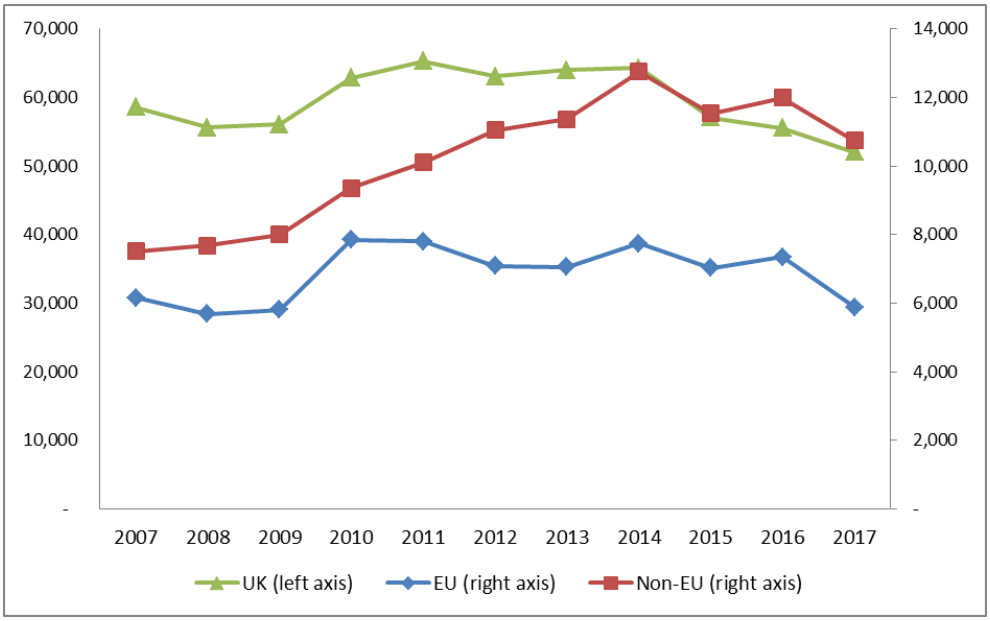
	Applications			Acceptances			Acceptance rate		
	UK	EU	Non-EU	UK	EU	Non-EU	UK	EU	Non-EU
2007	58,610	6,155	7,515	6,995	205	645	11.9%	3.3%	8.6%
2008	55,655	5,685	7,680	7,120	215	675	12.8%	3.8%	8.8%
2009	56,055	5,805	8,005	7,045	220	715	12.6%	3.8%	8.9%
2010	62,855	7,850	9,355	7,010	225	710	11.2%	2.9%	7.6%
2011	65,270	7,810	10,105	6,910	170	715	10.6%	2.2%	7.1%
2012	63,120	7,090	11,050	6,985	195	625	11.1%	2.8%	5.7%
2013	64,000	7,065	11,375	6,695	185	635	10.5%	2.6%	5.6%
2014	64,345	7,750	12,755	6,825	205	650	10.6%	2.6%	5.1%
2015	57,105	7,025	11,530	6,730	230	705	11.8%	3.3%	6.1%
2016	55,520	7,350	11,990	6,815	255	755	12.3%	3.5%	6.3%
2017	52,030	5,885	10,740	6,770	255	725	13.0%	4.3%	6.8%

Source: NIESR calculations based on UCAS data

[20] *Evidence on EEA nationals working within the health and care system, focusing on England*. The Department of Health and Social Care's written response to the call for evidence issued by the Migration Advisory Committee (MAC) on 4th August 2017

[21] We assume that 1,326 (or 88.4%) of the additional 1,500 offered places go to UK students, in line with the average from 2007-2017. While we cannot exclude that additional places will attract additional applicants we need to consider that the number of applicants has actually been decreasing in the last 5 years. Hence we assume that these opposing effects cancel each other out

Figure 16. Number of applications to Pre-clinical medicine (A1) by country of origin. 2007-2017



Source: NIESR calculations based on UCAS data

4. Considerations for future staffing in the health and social care sector

4.1 Current status of the negotiations between the UK and the EU on future mobility of citizens

On the 8th December 2017 the UK and the EU reached an agreement during Phase I of the negotiations on the orderly withdrawal of the UK from the EU.[22] It was approved by the European Council and subsequently the negotiations on the actual Withdrawal Agreement commenced. It covered the three main areas of protection of citizens' rights, the issue of Northern Ireland, and outstanding financial settlements. As the present study is mainly concerned with issues related to immigration we will place a focus on the rights to free movement of citizens. The agreement set out a reciprocal right of citizens to have their full rights protected under EU law until the UK leaves on 29. March 2019.

In addition, both parties published a draft Withdrawal Agreement on the 19. March 2018 that sets out a 21-month transition period from the 29. March 2019 to the 31 December 2020.[23] Regarding the movement of labour, the draft states that UK and EU nationals that move during the transition period will have the same rights as those that did before Brexit.

At his stage little is known about the future immigration system that the UK will put in place post 2020. A report by the Home Office on the delivery of Brexit and immigration states that:[24] "*The Government has not yet provided details about what the post-Brexit immigration arrangements might look like, what the costs and benefits might be or what it hopes to achieve—beyond reducing immigration and continuing to attract the 'brightest and the best'.*" (p.14).

The government commissioned the Migration Advisory Committee (MAC) to examine the impact of Brexit on the UK labour market and a future immigration system that reflects the UK's 'deep and special partnership with the EU'.[25] The MAC reported their findings in September 2018.[26] We expect their findings will be one factor among many in determining the Government's new policies. This means that we need to make assumptions and work with different scenarios, of which some might be more likely than others, though these probabilities keep changing.

Though we are mainly interested in the movement of labour during and after the transition period, it is clear that this is closely linked to other aspects of Brexit such as future access to the EU market.

[22] https://www.gov.uk/government/publications/joint-report-on-progress-during-phase-1-of-negotiations-under-article-50-teu-on-the-uks-orderly-withdrawal-from-the-eu (Accessed on 20. March 2018)
[23] https://www.gov.uk/government/publications/draft-withdrawal-agreement-19-march-2018 (Accessed on 20. March 2018)
[24] https://publications.parliament.uk/pa/cm201719/cmselect/cmhaff/421/421.pdf (Accessed on 20. March 2018)
[25] https://www.gov.uk/government/publications/commissioning-letter-to-the-migration-advisory-committee (Accessed on 20. March 2018)
[26] https://www.gov.uk/government/publications/migration-advisory-committee-mac-report-eea-migration

In a comprehensive review of the Brexit options for the UK, Amit et al. (2018) describe this as the 'great British trade-off'. From their analysis it becomes clear that a higher level of access to the EU market goes hand in hand with concessions on the freedom of movement of labour. It remains to be seen which compromise will be struck between the UK government and the EU.

Since the current position of the UK government is to remain outside the Customs Union one possible scenario is restricted freedom of movement of EU citizens to the UK – and vice-versa. However, the future immigration regime that will be put in place is unknown at this stage, making it extremely difficult to project any of the trends into the future.

It is important to point out that most of the discussions about the future of the UK after Brexit have focussed predominantly on the implications for trade. Comparatively little attention has been devoted to what might replace the Free Movement of Labour. This is despite the topic of immigration being one of the key drivers leading up to the Brexit campaign. It is evident that this lower immigration could be achieved by the strict control of the UK borders and ending free movement. However, this may only be accomplished by giving up access to the EU single market.

4.2 Potential scenarios for international migration post-2020

Inevitably there will need to be many compromises – but it is likely that Free Movement of Labour will end, at least as it exists currently. There has been much discussion of possible future Brexit 'scenarios'. We review these different visions and focus on what they may mean for the HSC workforce.

The Fahy et al. (2017) paper in the Lancet attempts to set out the possible scenarios which are likely in the near future over the possible forms that Brexit may take and the likely consequences. They distinguish between a 'Soft Brexit', a 'Hard Brexit' and a 'Failed Brexit'. The Box below sets out their definitions of these three concepts (see Table 12).

To develop a clear view of what the main scenarios are for UK immigration policy – during the transition process and after Brexit - is fraught with uncertainty. It is fair to say that nobody knows for sure exactly what will happen in the next 2-5 years. For developing some final implications of this research, we need to consider what might happen with respect to various domains of policy:

- Different possible options on movement of labour in a post Brexit UK
- Arrangements for EU nationals currently living in the UK.
- The timeline of immigration policy changes and implementation.
- Assumptions about what happens to UK nationals presently abroad.

Below we consider the possibilities in each of these domains and develop two basic scenarios: Hard Brexit and Soft Brexit. These terms are somewhat clichéd and overused, but we define what we mean quite precisely and then we will use this as our two possible extremes. This will allow us to make projections from our review of relevant statistics which will bound the set of reasonable and feasible outcomes. We used the stakeholder engagement focus groups to investigate if any of the stakeholders believe that other scenarios are possible (see also Table 16).

Since any agreement on immigration will be tied up with an agreement on trade we must consider the different possibilities as arrangements which cover both aspects of Brexit. There are many alternatives (for a more complete description see Ntampoudi, 2017) but there are three main positive possibilities. To this a fourth pessimistic scenario has been gaining ground (Portes, 2018). These possibilities are summarised in Table 12.

Table 12. Brexit Scenarios based on Fahy et al. (2017) and Portes (2018).

The basic language which has been used up to date is conveniently described by Fahy et al (2017) in the Lancet:

- **Soft Brexit:** Basically, this amounts to continued integration with the EEA single market. As a likely consequence of this access of the UK to the single market, the UK is likely to be forced to forgo the complete control of their own immigration. This may not mean complete free movement of labourbut certainly the EU will insist on continued access to the UK labour market for its citizen on preferential terms.

- **Hard Brexit:** This means a new set of wide ranging free trade deals and being outside the customs union of the EU. In this case the UK would not have to be open to EU citizens and Free Movement would no longer operate.

- **Failed Brexit:** In this case the UK would need to fall back on WTO rules for trade. In this event the UK would not have to be open to EU citizens and Free Movement of Labour would end.

An alternative interpretation of what might be the different post-Brexit scenarios has been provided by Portes (2018). This report is a summary of the different possible deals which might be adopted after Brexit:

- EEA Rules (like Norway, Lichtenstein and Iceland) – Free movement of labour – this would entitle the UK to have access to the single market for goods and services. In many respects this is the same as a 'Soft Brexit' as outlined above.

- No Deal, WTO Rules – No free movement of labour (and no access to the single market) at all. In which case it would be down to the UK to determine what visas or quota system it wanted to put on the entry of EU nationals. One possibility is that we use similar rules to those that presently apply to the Non-EU immigrants. This would mean the use of a points based system. In many respects this is the same as a 'Failed Brexit' as outlined above.

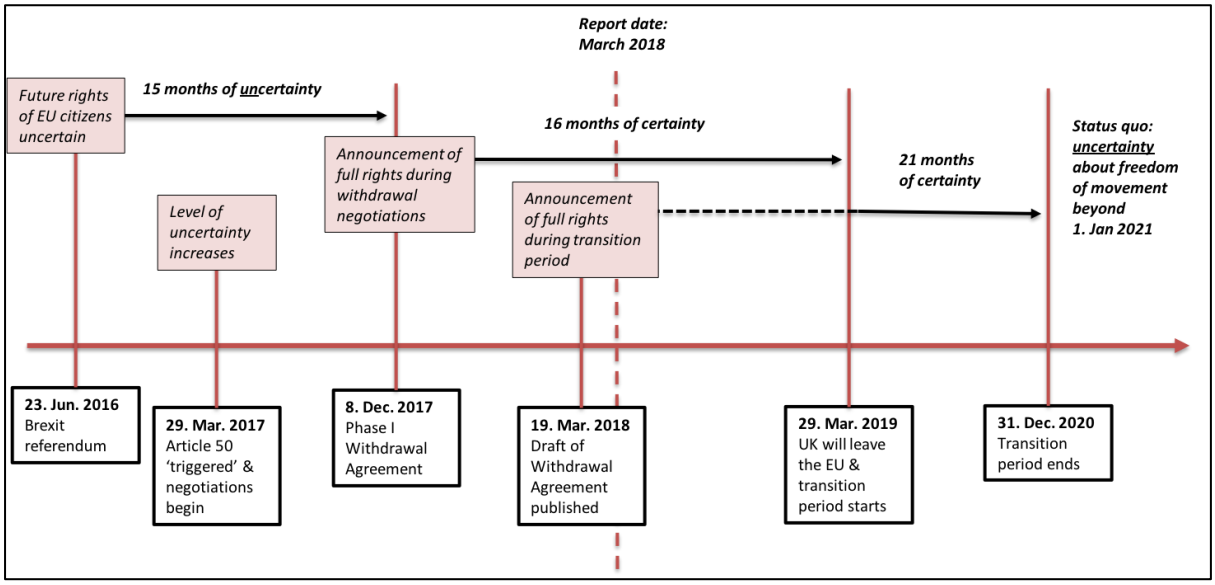
- EFTA Rules (like Switzerland) – Entry possible for EU nationals provided you have a job already lined up before enter the country and other restrictions apply like – jobs being first offered to nationals. In many respects this is a specific version of a 'Soft Brexit' as outlined above.

- May's Bespoke Option: Current reports of the negotiated settlement that is sought by the current government would involve trade deals with whichever countries can be agreed, a new customs union deal and not the one which operates currently in the EU, and the removal of free movement of Labour to be replaced by whatever immigration arrangements are necessary for the needs of the UK economy. In some respects this is a version of a 'Hard Brexit' as outlined above – but it seems very unlikely that all the desired features that the present Government seeks would be attainable.

4.3 Implications of uncertainty over future immigration system

In Figure 17 we look at the events since the Brexit referendum and implications for the uncertainty of EU citizens to stay or move to the UK. Considering the trends in the workforce that we have observed following the referendum and the fact that formally the UK is still in the EU it seems obvious that uncertainty is one of the main drivers. In Table 14 we provide an overview of the current immigration system for non-EU nationals. Though this is only an indication it is a useful one since any future immigration system needs to put in place certain restriction criteria unless we continue to allow for freedom of movement of labour. The current system distinguishes jobs by their level of scarcity but also the required skills and pay. Based on evidence gathered during the focus groups it is very clear that this is a real concern for many stakeholders in the H&SC workforce. Related findings from focus groups are summarised in Table 16.

Figure 17. Timeline of Brexit and protection of rights of EU citizens



We can also relate the uncertainty factor to the most recent trend in net changes in the H&SC workforce. Following the GMC, in 2012 there were almost 23,000 doctors from the EEA licensed in the UK and this figure has dropped to 21,600 by 2017 – a decline by 6%. At the same time the share of EEA doctors dropped from 10% to 9%, though we need to look at post-Referendum figures to say something about the potential impact of the referendum vote. It is also possible that the UK became less attractive for EEA doctors. A survey conducted by the GMC in February 2017 found that 61% of doctors from the EEA were considering leaving the UK. Of these, 91% stated that Brexit played a part in their decision and 45% were considering leaving within 2 years.[27] While we cannot assess the generalizability of these results the magnitude of these numbers is certainly alarming. We are also in no position to speculate about potential drivers or reasons for these statements.

[27] GMC survey (N = 3,363) published in February 2017: https://www.gmc-uk.org/Briefing GMC survey of EEA doctors February 2017 .pdf 69558586.pdf (accessed 26th March 2018)

According to the NMC, over the same period the number of EEA nurses that are licensed in the UK increased from 12,300 to 38,000 by the end of March 2017. All while the total number of UK and non-EEA nurses decreased. Based on these figures it appears that the UK is increasingly reliant on nurses that come from the EEA and this stands in contrast to the trends observed for doctors. However, latest NMC figures for September 2017 also show that the number of registered nurses from the EEA has fallen to 36,259. This can be explained by the fact that following the referendum, the number of EEA nurses joining the UK workforce has dropped to 6,400 (compared to 9,400 in the previous 12 months). At the same time the number of EEA nurses leaving the register increased to 3,100 (compared to 2,000 in the previous year).

The NHS England recorded a net decrease of almost 1,000 nurses from the EEA in the 12 months after the referendum (see Table 13). However, when comparing this to the net increase of 2,000 nurses in the 12 months before the referendum, the absolute difference is actually 3,000.

In other words, if the trends observed before the referendum would have continued there would have been an additional 3,000 EEA nurses working in the UK by the end of June 2017. Some of the concerns described here regarding the difficulties of attracting and retaining EU workers were also raised during the focus groups (see Table 15). Such drastic trends cannot be observed for EEA doctors, though the positive net change has dropped slightly by around 5%.

Table 13. Net changes in the workforce in the NHS England, 12 months pre- and post-referendum[28]

		Q3-2015 to Q2-2016	Q3-2016 to Q2-2017	Change %	Change absolute
Total staff (net)	UK	10,598	12,545	18.4%	1,947
	EEA	7,167	2,837	-60.4%	-4,330
	Non-EEA	4,424	5,355	21.0%	931
	Unknown	1,230	-263	-121.4%	-1,493
	All	23,419	20,474	**-12.6%**	**-2,945**
Doctors (net)	UK	-618	864	239.8%	1,482
	EEA	448	424	-5.4%	-24
	Non-EEA	717	1,443	101.3%	726
	Unknown	176	298	69.3%	122
	All	**723**	**3,029**	**318.9%**	**2,306**
Nurses (net)	UK	-4,183	-3,888	7.1%	295
	EEA	1,934	-993	-151.3%	-2,927
	Non-EEA	-307	-30	90.2%	277
	Unknown	-515	-871	-69.1%	-356
	All	-3,071	-5,782	**-88.3%**	**-2,711**

Source: Calculations based on data from NHS Digital

[28] More detailed figures are reported in Table 29, Appendix C.

Table 14. Current labour migration system for non-EU citizens coming to the UK.

Current labour migration system for non-EU citizens coming to the UK.

The UK relies on a permit-based system for citizens from outside the EU that want to come and work in the UK. In general the system is designed to fill jobs with a scarcity in domestic supply. There are a number of ways in which non-EU citizens can obtain a relevant work permit, also known as Tier 2 and Tier 5. Workers with a Tier 2 permit are eligible to remain in the UK indefinitely after 5 years if they meet the necessary criteria including have a minimum salary of £35,000 or fill a job that is on the shortage list. This does not apply for intra-company transfers or Tier 5 permits. The routes can further be summarised as:

- Workers being recruited by a new employer must usually be taking up a 'graduate job' that meets the a minimum salary threshold that applies to all occupations,; as well as a higher, occupation-specific minimum salary that applies in many occupations. Exceptions to the higher salary threshold apply to graduate recruits and under-26 year olds, as well as certain public sector occupations. Employers must have advertised the job to UK workers. This route is known as Tier 2 (general).

- Workers already employed by a company abroad can transfer to an office of the same company in the UK if they are in a graduate job and meet occupation-specific salary requirements. There is also a minimum overall salary threshold This route is known as Tier 2 (intra-company transfer).

- Some workers in occupations that do not meet these requirements can come as temporary workers under what is known as Tier 5. For example, 18-30 year olds from countries with which the UK has reciprocal agreements (such as Australia, Canada and New Zealand) can work in most jobs for up to 2 years. There are also various temporary visa options for creative workers, sportspeople and participants in government-approved exchange schemes, among others.

- Entrepreneurs and investors can come to work in the UK without an employee contract if they meet a separate set of requirements, including raising sufficient capital for a business venture or investment.

Source: Based on research by the Migration Observatory, 2018.

Table 15. Uncertainty and difficulties of recruiting or retaining EU migrants. Findings from focus groups conducted by NIESR.

Early impacts of the EU vote: difficulties recruiting or retaining EU migrants

Dentist organisations report a large fall in applications from EU citizens in 2017 which they believe is a result of the referendum vote.

Doctors organisations report concern among EU qualified practitioners which they believe will result in increased levels of turnover in the short to medium term. Hostile attitudes and incidents are believed to be a factor in EU doctors' increased interest in working outside the UK. There are also reports of employers looking to recruit outside the EU in expectation of a fall in applications from EU citizens.

Employers in the social care sector report increased churn since the referendum vote with increased staff turnover and difficulty recruiting staff, especially those from EU countries. They explained this with reference to the fall in the value of sterling and comparative wages in their countries of origin. However, Brexit was seen as exacerbating long-term problems rather than causing any new ones.

There is a reported fall in applications to the Health Care Professions Council for registration in order to practice in the UK. Representatives of the physiotherapy profession explain this with reference to uncertainty over the future right to settlement for EU citizens in the UK.

There is a fall in nursing applications from the EU which is believed to have resulted from the referendum vote. An increase in hostility towards migrants was seen as a factor in this reduction, along with uncertainty about rights to future settlement in the UK. Employers, at least in the private sector, are also recruiting less actively for nurses in the EU now, in expectation of lower levels of interest in moving to the UK, and moving their focus to outside the EU.

Table 16. Feasibility of alternative immigration policies. Findings from focus groups conducted by NIESR.

Feasibility of alternative immigration policies for adult social care	**Feasibility of alternative immigration policies for physiotherapy**
Social care employers expressed concern that post-Brexit immigration policies will be complex, bureaucratic and costly. All had made Tier 2 applications and did not want this system extended. They were against a Resident Labour Market test requiring posts to be advertised for 28 days since posts often need filling quickly. A future requirement for EU migrants to have a job offer in advance of arrival was not seen as problematic.	The physiotherapy profession would like reciprocal arrangements which ensure that UK qualified practitioners are able to work elsewhere in Europe to enhance their skills and experience, and where EEA physiotherapists who are registered with the HCPC are free to work in the UK. There is a perceived need for free movement between Ireland and the UK given cross-border healthcare provision in the Island of Ireland. The profession would like greater clarity on the rights of current EU citizens in the workforce to minimise a short-term fall in their numbers. The profession would also like a post-study route allowing permanent settlement for international students qualifying in the UK. The profession has historically attracted, and benefited from the experience, of both EEA and non-EEA nationals. The existing visa regime is proving problematic for non-EEA physiotherapists so is not seen as a good future model. Linking visas to salaries is particularly problematic for social care and health where pay is constrained through either Government policy or funding of contracts.
Feasibility of alternative immigration policies for nursing	**Feasibility of alternative immigration policies for doctors and dentists**
The profession is clear about the need to continue to recruit from overseas in the immediate future at least. It is also clear that nursing should be classified as a shortage occupation and not included in the cap on Tier 2 visas. New immigration policies need to be uncomplicated and any licenses and visas need to be low cost. Short-term visas would create high turnover when time-limits are reached and would not be in the interests of the health service. They would also be wasteful of investment in training. Employers would not be opposed to having to make a job offer to migrants prior to entry in the UK but the policy would increase the use of agencies. New immigration policies also need to be attractive to migrants themselves who have options other than the UK. This includes keeping tests and paper work to a minimum.	Health Service employers would not wish the current system applying to non-EEA nationals to be extended to recruitment from within the EU, since this would be both bureaucratic and costly. Particular difficulties are experienced by GP practices because of issues with the sponsorship system within Tier 2 visa applications, and also for reasons of disproportionate costs for smaller employers. Time delays are a further reason why Health Service employers would not wish the Tier 2 system to be simply extended. A light touch Resident Labour Market Test was seen as feasible, involving licensing of employers through a trusted sponsor system. It was also felt that the current distinction between EEA and non-EEA doctors could be discontinued under new immigration arrangements. A system requiring a job offer before entry to the UK was seen as workable. Temporary visas were seen as jeopardising continuity of care for patients and were therefore not considered feasible.

5. Conclusions and implications

5.1 Summary of findings

- In the UK in 2017 a little over 5% of nurses, around 9% of doctors, 16% of dentists and 5% of allied health professionals were from inside the EEA. They are a sizeable component of our H&SC workforce. The patterns in terms of their total number and composition by occupation and geography have been changing rapidly since the Brexit Referendum.

- Overall, examining the pattern of the NHS in England leavers and joiners over the 12 months since the Brexit Referendum, we found that the number of EEA joiners has fallen by 17.6% while the number of leavers has risen by 15.3%. These are large relative changes before the UK has even formally left the EU.

- The share of nurses from the EEA that work in the UK has increased the most across all health occupations, from 1.8% in 2010 to more than 5% in 2016. This shows an increasing reliance on nurses from the EEA. Similar trends are not observed for EEA doctors, though the number of dentists has increased markedly until 2011.

- The pattern of leaving the H&SC workforce is very different by occupation and by geographical region and locality. Specifically, London areas and parts of the South and South West have a much higher concentration of EEA workers than the rest of the UK. Accordingly, the turnover of these employees in terms of the fraction who leave jobs each year (or quarter) is higher.

- Our qualitative findings confirm this in the sense that EU nationals are more likely to work in specialties and locations with weak domestic supply. EEA doctors are well-represented in shortage specialties and there are regional differences in the extent of reliance on EU nationals. Our qualitative findings confirmed this through recruiters' reports of weak domestic supply being met by EU and non-EEA nationals.

- Weak domestic supply results from a range of factors, including for example, in medicine and dentistry high rates of part-time working and turnover. Real wage levels may also make a contribution. Workforce planning has not adequately taken account of such factors. Workforce need has also been underestimated in allied professions, for example physiotherapy.

- Examining the composition and trends in the Social Care workforce we see that a relatively small proportion come from the EU (between 2.4% and 4.9%), although this fraction had been growing up until 2016. Again, there are considerable differences across occupations and geography. However, our qualitative research indicates that, given recruitment and retention difficulties, the sector places a high value on their availability particularly in regions with labour shortages.

- There have been significant changes in the funding of higher education (HE) support for clinical undergraduates. Specifically, the support of fees for nursing and allied health profession students was withdrawn in 2016 and impacts have varied across professions. Applications for HE places to study nursing have fallen by more than 20% since 2016. Applications to read medicine have also fallen by 10% since 2016. Physiotherapy places, however, expanded as a result of the change lifting an artificial cap on places. It is uncertain what the knock-on consequences of these changes will be on numbers graduating and entering training in 5 years' time. Further changes to university fees are being proposed by both major political parties which may impact application numbers. It is also possible that lower fees or the abolition of fees being mooted could solve the problems of future potential supply of health workers. However, it should be stressed that this may only solve problems in 10 or more years' time as it takes a long time (5-15 years) to train as a fully qualified clinical specialist.

- By examining the pattern of leavers and joiners to the NHS in England over the year prior to June 2016 and the year post June 2016 we were able to estimate what might happen to the overall numbers of doctors and nurses. If we project this existing pattern forward it suggests that in the short run we may have a shortage of around 2,700 nurses. Projecting this shortfall over the remaining period of Brexit uncertainty over the 3 years into 2021 we suggest that there may be a shortfall of around 5,000-10,000 nurses in the NHS in England alone.

- Although the patterns of workforce movement since 2016 are quantifiable it is much harder to measure and document how these patterns might have affected patient outcomes. We have attempted to do this by exploiting data on the variation in relative share of EEA workers leaving by NHS trust over the last 3 years and relating this to the waiting times for those patients awaiting treatment of over 18 weeks. We find that there is a significant negative association between the share of EEA nationals in total staff turnover and patient waiting times. While the effect is small, it can be measured and is robust to various econometric robustness checks. One explanation could be that EEA nationals occupied key clinical roles (potentially in niche occupations or specific regions), that makes it difficult to replace them in the short-term.

- The qualitative research confirmed that problems of sufficient supply of recruits across the H&SC sector pre-date the referendum and in some cases are of long-standing. However, turnover is reported to have increased since the decision to leave. This includes a large fall in job applications in nursing, dentistry and allied health care professions, as well as increased turnover in social care. Some of the reasons mentioned include the fall in the value of sterling, reports of hostile attitudes and incidents, and general uncertainty about the outcome of the negotiations. The fall in EU applications has placed increased pressure the UK's visa's system as employers are switching recruitment strategies to outside the EU.

5.2 Consequences & Implications

It will become harder to recruit HSC workers from Europe.

We have already seen in this report that the UK has become less attractive to EU workers after the Referendum due to the uncertain future of their worker status. This trend will be very likely to continue. However, it is not completely straightforward to distinguish between:

1. *The effect of Brexit uncertainty around future right to work status.* The extent to which EEA citizens have left the UK directly because of the uncertainty surrounding their work status because of Brexit is not clear. It is even more uncertain how many EEA citizens might return to the UK at some stage in the future depending on immigration rules as yet to be determined.

2. *The effect of declining real wages and pension changes in the public sector since 2008.* This has been clearly documented in Dolton et al. (2018) and it is clear that for H&SC workers their real earnings have fallen by between 10-15% over the period 2008-2018. Although there is a clear difference between workers who are on different grades and different levels of seniority. Public sector pensions have also been reformed and have declined in real terms of a component of Total Reward (See Danzer and Dolton 2014). This means that the value of their future income in retirement has fallen since Defined Benefit pension schemes have been replaced by Career Average schemes.

3. *The declining value of the pound.* Clearly foreign workers – especially those who seek to send remittances home to their family in foreign countries – are a lot worse off by coming to the UK now to work than they were a few years ago. As a result, it will be much harder to recruit workers from other countries as the wage offer is significantly lower that is was in 2008 – for example. How much this might change if the pound was to retrieve some of its former value is unclear.

What is actually likely to happen post Brexit?

- **No Free Movement of Labour:** One way or another, under nearly any scenario, it is unlikely that Free Movement of Labour will continue after the transition period since the Government has strongly indicated that it is not prepared to sign a deal with the EU which includes such provision.

- **It will be harder to recruit from EEA:** All the evidence on this report and our analysis of the turnover and trends on immigration from the EEA over the period from 2015-2018 suggests that EEA citizens are leaving in relatively large numbers – sufficient that they outweigh the numbers arriving. This shortfall will not easily be made up from other non-EEA countries, although the government has currently exempted nurses and doctors from the cap on immigration with this aim in mind. It is uncertain how the flow of migrants to the UK may pick up again after the full transition out of the EU by the UK is complete. Depending on the system in place this can take years. At this point in the negotiations, it appears that they will face new restrictions on getting into the country in the first place and possibly new regulations about

how long they may stay. This will inevitably affect their choices about the UK as a possible destination.

- **Will the shortfall be made up from outside the EEA?** It seems clear that there is a presumption by the UK government that should there be a significant shortfall of H&SC workers then the UK can simply hire them from the other countries in the world outside the EEA. There is little evidence about whether this presumption is correct, although the current changes to the immigration cap for doctors and nurses may provide an indication in the coming months.

How will the Home Office administer migration into the UK after Brexit?

Assuming that the UK eventually leaves the EU - what might be the real consequences for immigration policy in the UK? At this current time, the answer is not known.

However, various commentators (Charter 2016) have made some well-informed guesses. The reality is that if the UK is not subject to rules on Free Movement of Labour from the EEA then it will need to regulate migrants coming into this country much as it does for those arriving from the non-EEA. However, it would also be possible for the UK to put in place a system which would give priority to EEA applicants.

Specifically, the UK currently has a range of policies to regulate this flow:

- Arrangements for applicants according to their skills and occupation and the shortage status in the UK for labour of that type, in particular through Tier 2.
- Eligibility based on the salary of the job which the applicant has been considered for. At present various bounds and limits on salary apply which act as a crude proxy for the shortage and skill level of the job.
- Requirements that the applicant for immigration already has a job lined up and offered in the UK

Other policies which are variously used by other countries could also be used or adopted or adapted to the UK's needs:

- *Quotas*
- *Immigration Points Systems*
- *AdHoc Rules for immigration as Needs Arise*. It is always possible that there may be short run crises in the provision of skills and labour in the event of sudden resignations. It may always be necessary to change the rules on quotas, tiers, or points in the event of sudden needs
- *Recruitment and Retention Allowances on Ad Hoc basis.* In some cases it may well be appropriate to have policies to induce personnel in key occupations to stay in their jobs – rather than trying to hire new people. Such recruitment and retention bonuses are paid, for example by the Armed Forces in the UK. The problem they face is exactly analogous – namely

to have to replace key personnel at short notice. The solution is frequently to pay retention bonuses to prevent people leaving. (See e.g. AFPRB report 2017)

Which jobs are eligible in any future immigration system: Workable future immigration policies for the Health and Social Care sector?

In light of the analysis presented in this report, the question arises of which jobs are eligible in any future immigration system. This is a very relevant question as many jobs in the health and social care sector do not fulfil the current requirements for minimum skill or salary levels.

This concern is shared by recent research, arguing that care workers, nursing assistants and infrastructure support in particular are prone to be placed in the lower skilled category and hence this could lead to additional pressure on the NHS (Menon et al., 2018).

The health and social care sector has historically recruited more migrants from outside the EU than from within it, although the analysis we have presented shows that there has been an increase in flow from the EU for some occupations in recent years. The data coupled with the focus group contributions show that the sector requires and values both EU and international recruitment.

Following the Migration Advisory Committee (2018), any future immigration system needs to look beyond skill levels and acknowledge the value and contribution of the health and social care workforce to the population in the UK.

Research participants were clear that occupations in health and social care should be acknowledged to have shortages and therefore covered by a future immigration system.

When discussing the value of a preferential system for EU nationals in the focus groups, participants found it difficult to justify the benefits of a preferential system. As drawn out in the findings section of this report, the health and social care sector use and value the contributions made by EU and international staff and any future immigration system would need to enable both.

However, in terms of current policy and process, the restrictive rules on recruiting non-EU nationals through the Tier 2 visa system were already causing problems for the health service. This is especially so because the cap on Tier 2 visas was being reached and only occupations with high salary levels were being approved. For this reason, the rules were altered, temporarily, in June 2018.

More generally, health and social care employers identify a number of problems in extending immigration policies as they currently apply to non-EEA nationals to EU citizens. They include:

- The use of salary and qualifications criteria which excludes medium and lower skilled jobs found particularly in social care;
- The costs of visas and other charges both to employers and employees, including the immigration health surcharge;
- The relatively complex application process;
- The requirement to carry out a Resident Labour Market test for occupations not on the shortage list, which is not feasible where posts need to be filled at short notice, as in social care

New immigration policies therefore need to be uncomplicated for health and social care employers to operate and visas need to be low cost.

Our qualitative research shows that employers would not object to having to provide proof that they could not fill a vacancy with a local worker, and to do so by registering as a trusted sponsor of migrant employees.

Short term visas, of two years or less, would create high turnover when time limits are reached. They would be wasteful of training and impact on patient care.

The post-study route could be used to meet staffing needs and should be made more open to help meet current and future shortages.

Health and social care employers would not object to a requirement to offer a job to a non-British national in advance of their arrival in the UK. However, this would be likely to encourage large recruitment programmes overseas and use of recruitment agencies. Both of these would be costly for health and social care employers.

5.3 Future supply of the Health and Social Care workforce: What can be done to address current difficulties?

- Current difficulties recruiting sufficient health and social care staff could be addressed through a range of measures. In the short term, the outward flow of EU nationals might be reduced through assurances about their long-term right to settle in the UK. This appears to be now guaranteed as a result of agreement between the UK Government and EU in March. However, health and social care employers might consider ways in which they could help EU staff (and other non-UK nationals) to apply for settled status, leave to remain or citizenship.

- Procedures which act as barriers to recruitment, for example unnecessarily strict language tests (language test per se are still important), or which create lengthy periods to obtain professional registration and complete checks to work, should be reviewed.

- It is clear that some measures need to be put in place to monitor the trends in applications to health and care professional training across all parts of the UK and take appropriate action to address issues. For example, there has been a decline in the number of applications to medical schools from both UK and EU applicants, though the decrease is sharpest for prospective EU students.

- Increased efforts could be made to encourage back individuals who have left health and social care work. This might include encouraging agency workers to move into permanent roles or by providing more opportunities for flexible working. Opportunities to update skills through refresher training or formal return to work programmes may also attract returners. In the social care sector, training could improve the attractiveness of the job offer and small employers may need to find imaginative ways of providing a range of on-the-job training experiences.

- There may also be scope for local recruitment campaigns both to attract back qualified and experienced staff. Employers in the social care sector could target groups such as the early retired and disabled people, who may have the skills and attributes needed.

- Workforce planning needs to be reviewed across the healthcare sector. Planning needs to recognise that public, private and third sectors form a common system and common labour market. Supply needs to be sufficient to meet the whole system need and not focus solely on NHS employers. A number of measures currently in place have the potential to increase future supply. These include investing to expand midwifery and physiotherapy places. At the same time, the replacement of a bursary system with student loans – as currently done in England - may deter applicants concerned about debt, so that application trends should be monitored.

- Apprenticeships may be helpful in meeting some future needs. However, employers see the lack of flexibility in being able to use the funding to support the whole apprenticeship as a barrier to increasing uptake. It is therefore difficult to see how employers will use these

apprenticeships as a major source of future skills. The development of higher level apprenticeships will take time to increase domestic workforce supply for professionals. Career routes within social care need to be reviewed, particularly the potential for opening up routes from nursing support and social care roles into nursing and allied health professions.

There are currently too many restrictions on the post-study route, yet international students are a valuable source of current and future skills across the healthcare sector.

Social Care Sector: In this report we have been mindful that H&SC segment of the economy consists of two sectors – Health and Social Care – which are very different in many ways:

- The Health Care sector consists mainly of highly qualified professionals who take 3-10 years to train and the Social Care sector mainly employs less skilled workers who work at the level of the Living Wage and can be trained on a shorted time scale.

- One of the key differences between Health and Social care is the reliance on highly paid skilled labour in healthcare, against the greater reliance on relatively low-skilled and low-paid labour in social care. Recent Low Pay Commission Reports highlight the large difference in the on the share of minimum wage workers in the social care and/or care home workforce.

- The average wage in Health Care against average wages in Social Care is radically different and consequently there may be very different elasticity of labour supply responses to immigration changes in these two sectors.

- Health Care is a predominantly public sector activity, while social care is a publicly funded activity which is carried out by private and third sector entities. This means that the different sectors are variously and distinctly dependent on changes in public funding and potential changes in tax policy – e.g. vis-a-vis inheritance tax and social care funding rules.

- Social Care relies on local authority funding on a per-case basis, and may have a limited ability to adjust wages to respond to staff shortages, unless local authority funding were to increases commensurately which in turn requires an increase in funding from national Government to cover the known shortfall and provide greater purchasing power in future to cope with demand. Data provided by the Local Government Association shows that adult social care now consumes almost 40 per cent of council budgets and faces a shortfall in funding of £3.5 billion by 2025.

- The NHS has been affected by public sector wage freeze over the last 8 years. Similarly, any real-terms increases in pay to replace and retain non-UK staff would either need to come out of real-terms increases in NHS funding or cut-backs in services. In Social Care the intensive margin for economies has been to force workers to pay more of their own work costs e.g. in terms of the allowed travel time between seeing patients. These factors will all play into the extent to which further recruitment in the future may or may not be more difficult.

Common issues and differences across health and social care sectors: It is clear that there are a number of issues that are common across both sectors, while there are also others that are somewhat different. In this section we aim to spell these out in more detail to inform targeted policy-making.

Common issues across sectors/stakeholders:

- Pressure on existing and future staff due to ageing population affecting demand and supply of health and social care services;
- The concentration of EU workers varies across job roles and geographies;
- Increasing reliance on EU workers in recent years, though to varying degrees across job roles, countries and regions;
- Lack of coherent, reliable data sources across countries and sectors that include breakdown by job roles and nationality;
- Potential issue of low wages in some occupations for design of criteria in future immigration system;

Differences across sectors/stakeholders:

- Higher share of EU workers in the NHS, particularly the South-East;
- Government focus often placed on NHS and healthcare;
- Views on specific policies such as resident labour market tests, prior job offers; temporary visas;
- Average skill and wage level of workers;
- Treatment of EEA vs non-EEA workers in future immigration system.

5.4 Some implications of the Present Research and Future Research of Importance to the Cavendish Coalition when the Outcome of the Brexit Negotiations are Known

After consultation with the Cavendish Coalition and considerations of data collected from the focus groups we explored the consequences of different Brexit scenarios for the H&SC workforce. In conjunction with our detailed analysis of all the statistical evidence and basic econometric analysis we suggest that there are many implications of Brexit for the H&SC sector workforce generally. Many of these implications merit much more research – especially in the medium to long run when more details are known about the exact form that the migration policies post Brexit will take. We summarise a number of areas that are likely to become more relevant:

1. **Exploring other Sources of Data relating to H&SC Workers**. We have scoped out the likely short-term losses of EU employees to the UK by occupation based on the trends over the year before and year after the Brexit Referendum. So far this has been based on the aggregate and trust-level data from NHS Digital. Further prescriptive analysis could be undertaken based on modelling data from the QLFS, LFS, ASHE, APS and potentially Burning Glass.

2. **Detailed Analysis of open Vacancies by Occupation, Trust and CCG over time**. To appreciate the nature of how difficult it is to hire into specific jobs and locations it is necessary to understand exactly how many vacancies are arising and how long it is taking to fill specific jobs or whether they remain unfilled. If vacancies remain unfilled exactly what contingency arrangements are made to cover shifts by extending existing workers contracts – particularly part time staff -, hiring agency or temporary staff, or meeting existing demand from reduced complement of staff. If the latter is the case how is this affecting patient care? It is clear from our analysis of staff turnover that these issues will be markedly different by region and locality.

3. **The Aggregate Effects of Falling Net-migration**. The immediate consequences on the UK leaving the EU have already been documented. There has been a large and dramatic fall in net migration into the UK. What is less clear is what the impact of this has been and will be into the future on employment and earnings of the indigenous population. There is a vast literature on the effects of migration on employment and wages. It is fair to say that there is still some considerable controversy over the conclusions though (Whyman and Petrescu, 2017; Dustman et al., 2017; Borjas, 2014). The usual context for all of the applied econometric work in the USA and UK in recent years has been on the consequences of rising net migration on employment and wages. What has not been studied is the effect of falling net migration. It is not necessarily obvious that the impact will be symmetrically opposite to rising net migration. These consequences need to be studied and specifically what might be the impact of losing between 10,000 and 100,000 foreign born workers from the H&SC workforce. We do not know, but it is surely our responsibility to pose and attempt to answer this question if it is a possibility.

4. **The Fiscal and Funding Consequences of Brexit**. One of the most important consequences of Brexit will be the fiscal consequences of either the new trade deal or a no-deal scenario. Various projections of these consequences predict a fall in trade and lower GDP growth. This will, in turn have clear knock-on consequences (see Whyman and Petrescu, 2017) for public sector spending and the NHS and Social Care specifically. Interestingly, Portes (2018) has distilled his predictions of the adverse consequences of Brexit into the size of the potential 'direct hit' for the NHS as a way of calibrating the impact. Although the impact of future public-sector finances would not all fall on the NHS it is a useful way to calibrate the impact and clarify the mind. His analysis is a stark reminder that the actual position relating to Brexit is that it may mean less can be spent on the NHS under the various Brexit scenarios.[29] If we add to this picture the increasing demand for health care as predicted by Centre for Workforce Intelligence, CfWI (2015), and the NHS Draft Health and Care Workforce Strategy (2018) along with predictions of the black hole for NHS funding of up to £30bn (see Dolton, 2017) then we will need to be appraised on how these challenges will be faced in the NHS.

5. **The Long-Run Future of Demand for H&SC Workers**. The nature of the future demand for H&SC workforce numbers is crucial in the next 20 years. The rising tide of demand for health care given an aging population is well documented. What is less clear are the detailed implications for the demand for nurses, doctors and social workers into the future. The Centre for Workforce Intelligence (CfWI 2015) was, until recently, responsible for examining and documenting the NHS in England workforce needs into the future. This responsibility has now been passed back into the Department of Health and Social Care and Health Education England.. It is unclear exactly what workforce planning is taking place and how this has been able to take on board the impact of Brexit (NHS Draft Health and Social Care Workforce Strategy, 2018). Whatever research work is being done on future H&SC workforce needs are should be rigorously examined by the Cavendish Coalition and taken into account in future long term planning.

6. **Consequences of Skill Shortages**. One of the most important aspects of the increased turnover of EU H&SC workers is the extent to which it may have knock on consequences for remaining existing UK workers in terms of: Overtime, shift-working, the employment of temporary and agency staff and the duration of unfilled vacancies. These consequences may have importance for stress and the burn-out of existing staff and longer run impacts on patients. Further study of these consequences is necessary if the Cavendish Coalition is to understand the needs of its members.

7. **How Long Until the EU Worker Numbers Return to Normal**. Any prediction of how long the loss of EU employees will go on for is problematic. At present, since we don't know the arrangements which will be in place it is hard to predict how, in the medium and long-term EU workers will react to the possibility of working in health and social care in the UK in

[29] Portes (2018): EEA model: £260m per week (equivalent to about 9% of what the UK currently spends on the NHS); FTA model: £875m per week (equivalent to about 31% of what is currently spent on the NHS); WTO model: £1.25bn per week (equivalent to about 44% of what is currently spent on the NHS); Government preferred bespoke model: £615 million per week (equivalent to about 22% of what it currently spends on the NHS).

future. This should be studied as it has a direct impact on how many H&SC workers the UK will need to attract and train in the future.

8. **The likely differential impact of these changes by region of the UK**. The report has offered a regional and detailed geographic breakdown of where the UK is losing EU workers and turnover is the greatest. There is great variation within the NHS in different locations. Further research work will be necessary to map these changes over the next 2-5 years to see exactly what the consequences of Brexit are on the spatial demand for H&SC workers.

9. **The Implications of EU Worker Turnover for Patient Outcomes**. This report has made a tentative start in trying to consider the implications of NHS staff turnover from the EU on patient outcomes. The Appendix to the report looks at a simple econometric model of the variation in patient waiting times and the impact that EU staff turnover has on this key patient outcome. We find – controlling for the size of the Trust and the total staff turnover that the higher the share of EU leavers the longer are waiting times for patients. A further assessment of the wider likely possible health outcome consequences of having a shortage of skills in terms of patient health outcomes is necessary. Specifically, we would suggest that an analysis in the long run be undertaken which studied the possible effect of EU workers leaving on: A&E admissions, Hospital admissions, Length of hospital stay and mortality. It is possible that the impact of higher EU staff turnover in the NHS could be felt on all of these indicators in the longer run.

10. **A review of the options of recruiting more UK workers into H&SC occupations**. This report has examined and described the impact of the recent changes in Higher Education in Section 3. There has been a reduction of around 20% in nursing applications to universities. The rising acceptance rates for applicants kept the number of acceptances to those degree courses relatively stable. The central issue here is whether or not bursaries should be replaced and what form they should take. A specific concern is the extent to which the removal of bursaries has caused a disproportionate fall in applications from mature student applicants (RCN, 2018) and what impact this may have on future recruits who bring a different level of life experiences to the job and the potential pool of trained recruits. The long run consequences of higher student debt on graduation from health professional courses also need examination. It is possible that the escalation of debt by graduates from these courses will cause a further reduction in future applications. The extent to which the various interventions to increase recruitment have had a positive impact on recruiting into training and employment across health and social care is unknown. It is critical that there is a co-ordinated and evidence based approach to reviewing current activity and determining next steps.

11. **The Potential for Inducing the Return of Former H&SC Workers**. Another area where evidence is scant is the extent to which former H&SC workers might be encouraged back into the profession. Specifically, for example, a question which is commonly asked is - by how much would earnings in nursing jobs need to be raised to induce former employees back into nursing. Analytically this is not a very straightforward question to answer. This is

because former employees who have left their job and the profession may have done so for pay, lifestyle or other reasons (Hudson-Sharp et al, 2017). In principle, with cohort and panel data over a number of years one may address this question. It has been done for the case of teachers (see Dolton, 1990; Dolton & Van der Klaauw, 1995a, 1995b) and so, in principle, with the appropriate data could be investigated for nurses and the range of other professionals working in health and social care.

12. **A review of the possibilities of recruiting more international, non-EU workers in the key occupations**. This requires an assessment of the past pattern of recruitment from different countries in the rest of the world – outside the EEA – and their likely future prospects as a source of future supply of qualified workers. This will require a substantial effort to collect data from each country that has sent workers to the UK in the past and the likely prospects for future recruitment. It is unclear if the whether the detailed data exists to perform this analysis or use the data gathered to predict supply into the future. There are also many other considerations relating to the sourcing of qualified workers from overseas as this could easily impose a considerable burden on those countries and the ethical issues of poaching labour from abroad requires careful analysis. At the same time many countries are content to see their workers emigrate to the UK as remittances sent home to the family can be a much-needed substantial source of revenue for the country's balance of trade.

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Abbreviations

APS	Annual Population Survey
CCG	Clinical Commissioning Group
EEA	European Economic Area
EU	European Union
FTE	Full Time Equivalent
GMC	General Medical Council
HC	Headcount
HCHS	Hospital and Community Health Service
H&SC	Health and Social Care
HE	Higher Education
HEE	Health Education England
IELTS	International English Language Testing System
NHS	National Health Service
NMC	Nursing and Midwifery Council
ONS	Office for National Statistics
PCT	Primary Care Trust
PMQ	Primary Medical Qualification
RCN	Royal College of Nurses
RoW	Rest of the World (i.e. non-UK, non-EEA)
RTT	Referral to Treatment
UCAS	Universities and Colleges Admissions Service
UK	United Kingdom
Y/Y	Year-on-year

List of tables

[30] Headcount totals are unlikely to equal the sum of components due to some staff working in more than one role.

List of figures

Appendices

Appendix A. Additional analysis for England

Health Education England (HEE) predicts that by 2027 the NHS in England alone will need an additional 190,000 workers, while supply at the current rate would only add 72,000. Hence the country faces a very real gap of 118,000 workers within the next 9 years. In other words, it would need to add a net total of 13,100 workers every year from now on, including 2018. The reality is that the NHS in England is losing a net total of 3,000 workers annually and by adding these figures up it would even need an additional 16,100 workers joining every year. Against the backdrop of Brexit and increasing number of leavers and decreasing number of joiners from the EU this appears to be a bleak future.

Considering that around 80% of doctors and nurses are working in England, this section will focus on the nationality of the NHS workforce at a more detailed occupational level. We also present trends for English regions and over time, with a particular focus on the post-referendum period. A similar analysis for other UK countries is not possible at this stage, as fine-grained data is not available. Throughout the section we focus particularly on EU nationals in clinical occupations. The impact on the clinical workforce is important because their higher skill levels and degree of specialisation may make it challenging to replace any lost staff in the short term, with potential impacts on NHS capacity and the quality of service delivery.

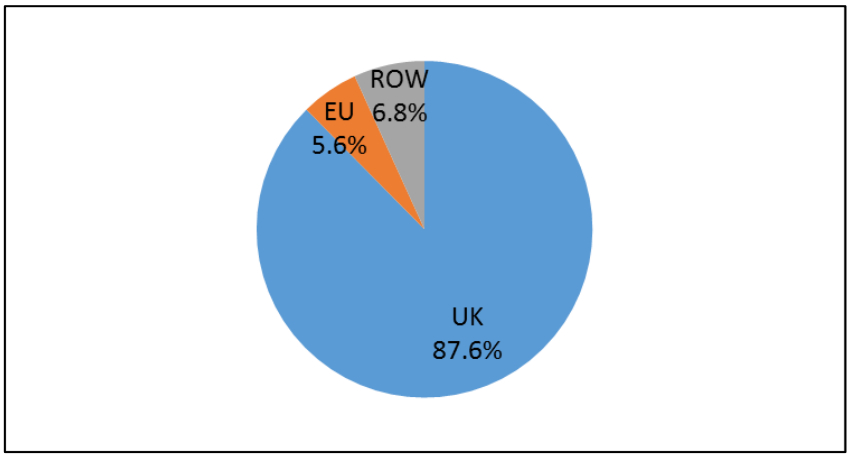
As shown in Figure 18, the majority of the staff in the NHS in England are British, but an important minority are not. According to NHS Digital, as of March 2017 around 137,000 NHS workers reported a non-British nationality,[31] equivalent to 12.4% of all the NHS staff members for whom a nationality is known.[32] Around 5.6%, or 62,000 of these workers are nationals of another EU country. The remaining 6.8% come from the Rest of the World (RoW). When looking at the age composition of the NHS in England workforce in Figures 19-21, a few additional observations emerge. The largest age group for UK staff is 50-54 (15% of staff), followed by 45-49 and 55-69. On the other hand, more than half of EU staff are found in age groups 25-29, 30-34, and 35-39. The somewhat different demographic age structure can shed additional light on the importance of the EU workforce for the NHS in England. Considering that in the NHS the normal retirement age is between 60 to 65, it is clear that in the coming years absolutely and relatively more UK than EU nationals are going to retire.[33]

[31] NHS Digital data do not include GPs, healthcare workers that are independent or contracted-out, and the social care sector. The latter will be analysed in more detail in Section 2.4, while GPs are included in Section 2.1.1.

[32] NHS Digital states that nationality is self-reported and may in some cases refer to cultural heritage rather than country of birth. 'Unknown' nationality refers to staff that choose not to or are not asked to provide this kind of information. In March 2017 this category included a total of 80,822 staff.

[33] The retirement age for some staff categories in post before 1995 is 55. Source: NHS Pensions Scheme Guide: http://www.wsh.nhs.uk/CMS-Documents/Staff/General-Documents/NHSPensionSchemeBooklet.pdf, Accessed on 7th March 2018.

Figure 18. NHS in England staff by nationality, March 2017.



Source: NIESR calculations based on NHS Digital data, 2017.

Figure 19. Age composition of NHS in England staff, UK vs. EU, Sep. 2017

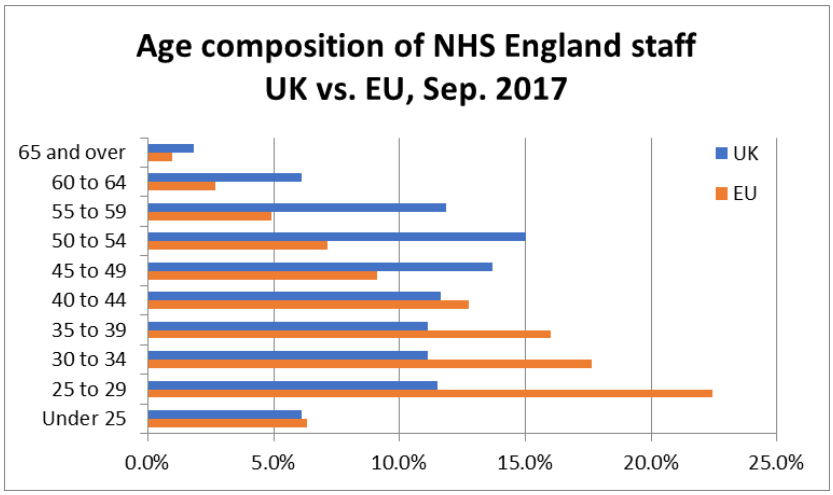


Figure 20. Age composition of NHS in England doctors, UK vs. EU. Sep. 2017

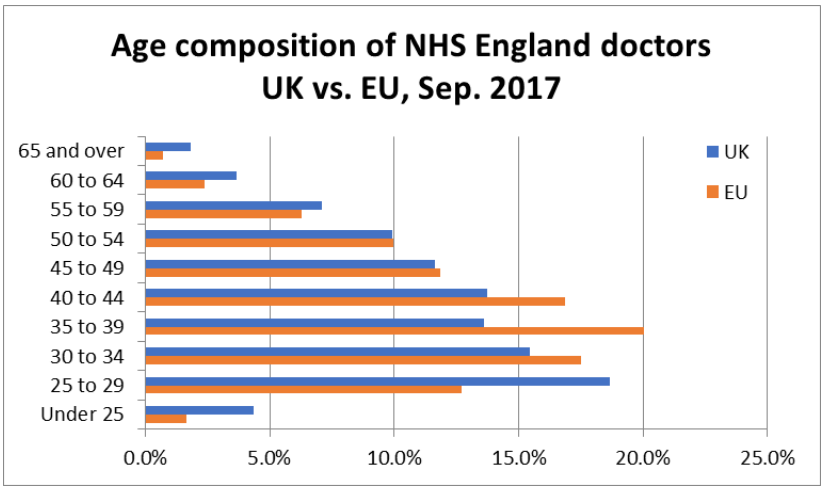
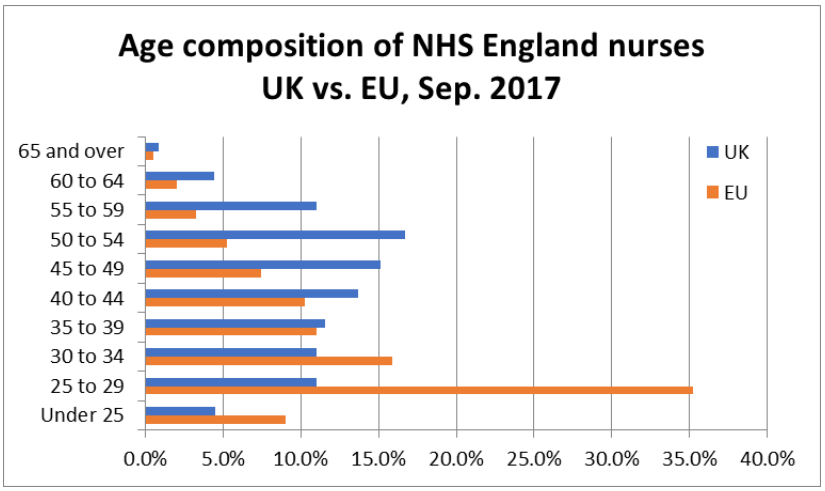


Figure 21. Age composition of NHS in England nurses, UK vs. EU. Sep.2017



Composition by job role

The share of EEA nationals working in the NHS varies for different job roles, as shown in Figure 13. Of the 62,000 EEA nationals almost 42,000 are working in clinical roles (Table 17). This is more than two thirds (67%), compared to 50% of UK staff in the same category. Non-EEA staff had a similar share of 66% in clinical roles, adding to the picture that foreign staff are more important in specialist job roles. Considering that clinical jobs require a relatively higher skill-level (and length of training), it will be more difficult to find adequate replacement for foreign staff in the event of negative supply shocks to these groups.

Table 17. NHS in England staff (headcount) by nationality and broad job categories[34]

	UK	EEA	non-EEA
Clinical Staff	482,500	41,900	49,400
Support to Clinical & Ambulance Staff	324,500	13,200	18,900
Infrastructure support	160,800	7,000	6,800
All Staff	969,400	62,200	75,200

Source: NHS Digital (March, 2017)

Figure 22 and Table 18 show a more detailed breakdown of the NHS in England staff by nationality. In terms of nationality shares, doctors in hospitals have the largest proportion of EEA nationals (9.9%), followed by nurses and health visitors (7.5%) and Midwives (5.7%). However, in headcount terms, the number of nurses and health visitors that reported an EEA nationality is twice the number of hospital and community health service (HCHS) doctors, with nearly 22,300 and 10,700 EEA workers respectively.

[34] Headcount totals are unlikely to equal the sum of components due to some staff working in more than one role.

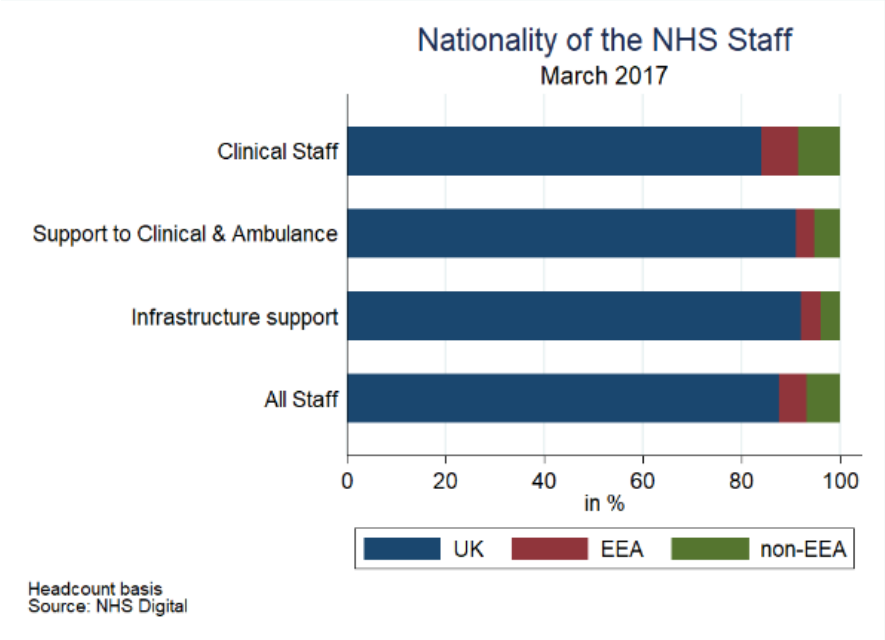
Table 18. NHS in England staff by nationality and job role (headcount)[35]

	UK	EEA	non-EEA
HCHS Doctors	79,600	10,700	17,700
Midwives	22,400	1,400	500
Nurses & health visitors	250,900	22,300	25,800
Scientific, therapeutic & technical staff	129,700	7,400	5,400
Support to Clinical & Ambulance Staff	324,500	13,200	18,900
Infrastructure support	160,800	7,000	6,800

Source: NHS Digital (March, 2017)

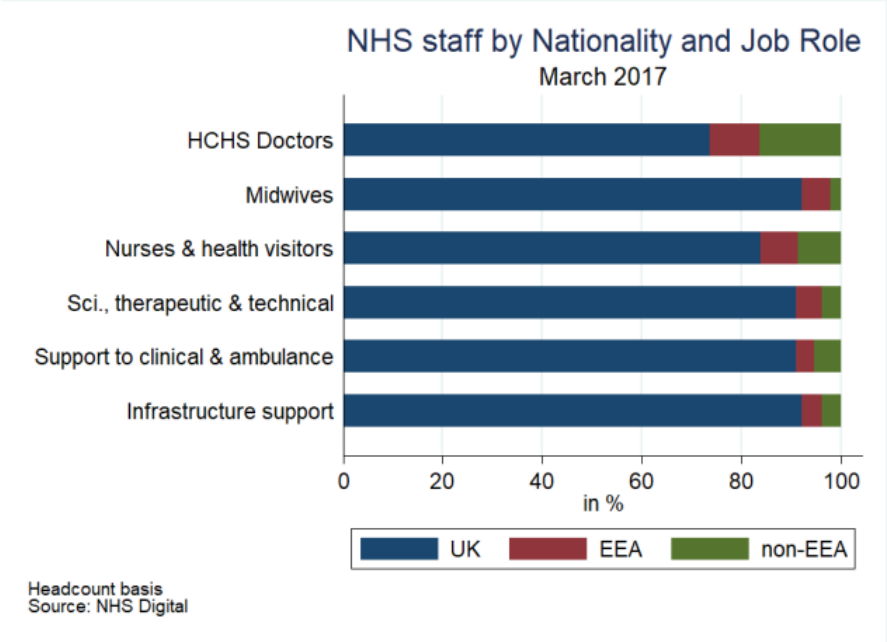
Some nationality groups are more likely to occupy certain kinds of NHS jobs (Figure 23). Around one third of EEA and non-EEA nationals work as nurses, while only one quarter of the British NHS staff work in this role. Additionally, 17.3 % of EEA staff work as doctors compared with 8.2 % of British staff.

Figure 22. Nationality of NHS in England staff in broad categories (share of total), March 2017.



[35] Headcount totals are unlikely to equal the sum of components due to some staff working in more than one role.

Figure 23. NHS in England staff (share of total) by nationality and detailed job categories

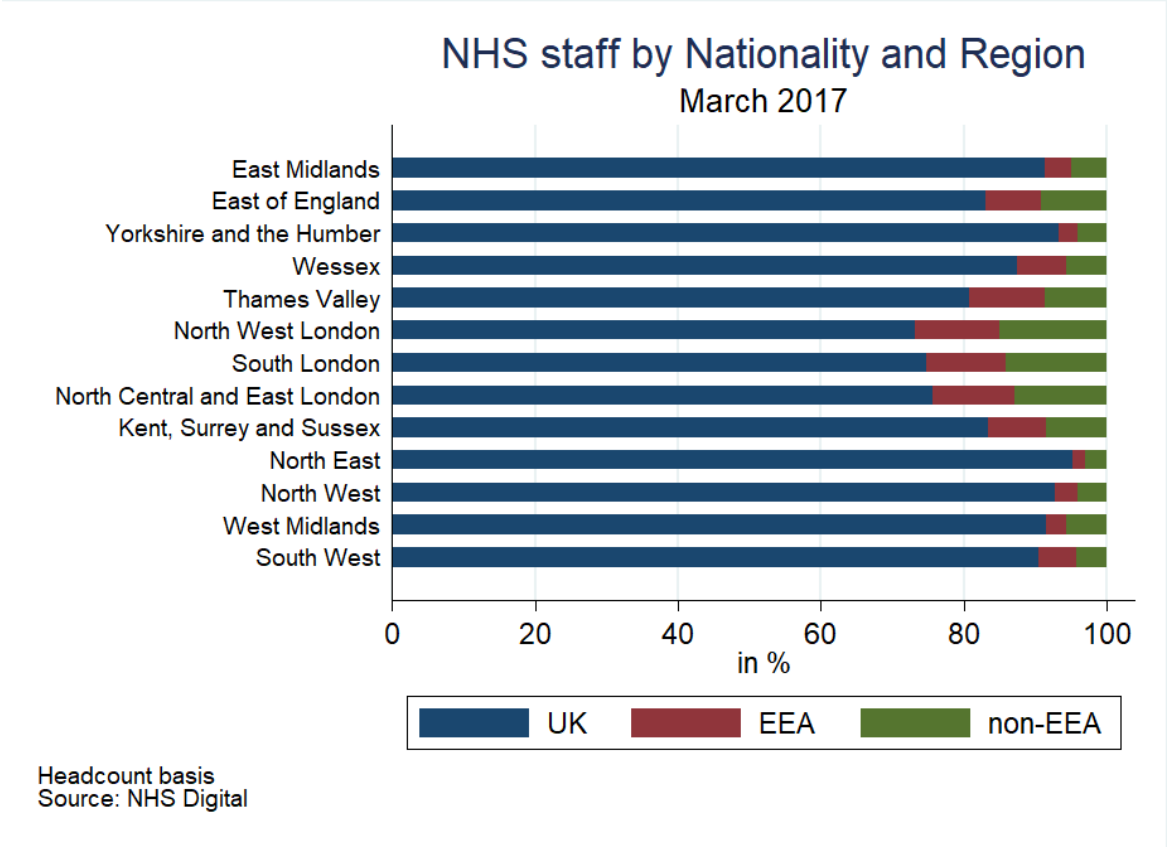


Composition by region

The nationality of NHS staff also differs across regions and hence any changes to the supply of workers of different nationalities will have impacts that differ across geographies.[36] London and the Thames Valley report the largest proportion of non-British NHS staff (Figure 24 and Table 19). By March 2017, the proportion of EEA nationals working in London ranged between 11.2% and 11.9%, above an average of 5.6% for the whole country.[37] In contrast, the North East of England has the lowest participation of non-British nationals with only 1.8% of EEA staff and 95.2% of British workers. In terms of absolute size most EEA nationals work in North Central and East London (8,300), followed by the East of England (7,300). Other regions with a large concentration of NHS staff from the EEA are South London and Kent, Surrey and Sussex with 6,600 and 6,500 workers respectively.

[36] In Appendix A we also explore the regional composition of different occupations.
[37] If we consider that 41,800 or 67% of all EU nationals work outside of London and 836,800 or 86% of UK nationals work outside of London, the proportion of EU nationals outside of London is only close to 5%. This is different to 5.6% as the national average also accounts for London.

Figure 24. NHS Staff by Nationality and HEE Region, March 2017.



Source: NIESR calculations based on NHS Digital data, 2017

Table 19. NHS Staff by Nationality and HEE Region (headcounts), March 2017

	UK	EEA	non-EEA
England	969,400	62,200	75,200
East Midlands	82,300	3,200	4,500
East of England	79,700	7,300	8,900
Yorkshire and the Humber	110,300	3,100	4,800
Wessex	47,900	3,700	3,100
Thames Valley	23,700	3,100	2,600
North West London	33,800	5,500	6,900
South London	44,100	6,600	8,300
North Central and East London	54,700	8,300	9,300
Kent, Surrey and Sussex	67,500	6,500	6,800
North East	67,900	1,300	2,100
North West	168,900	5,600	7,500
West Midlands	112,600	3,500	6,900
South West	76,700	4,500	3,500

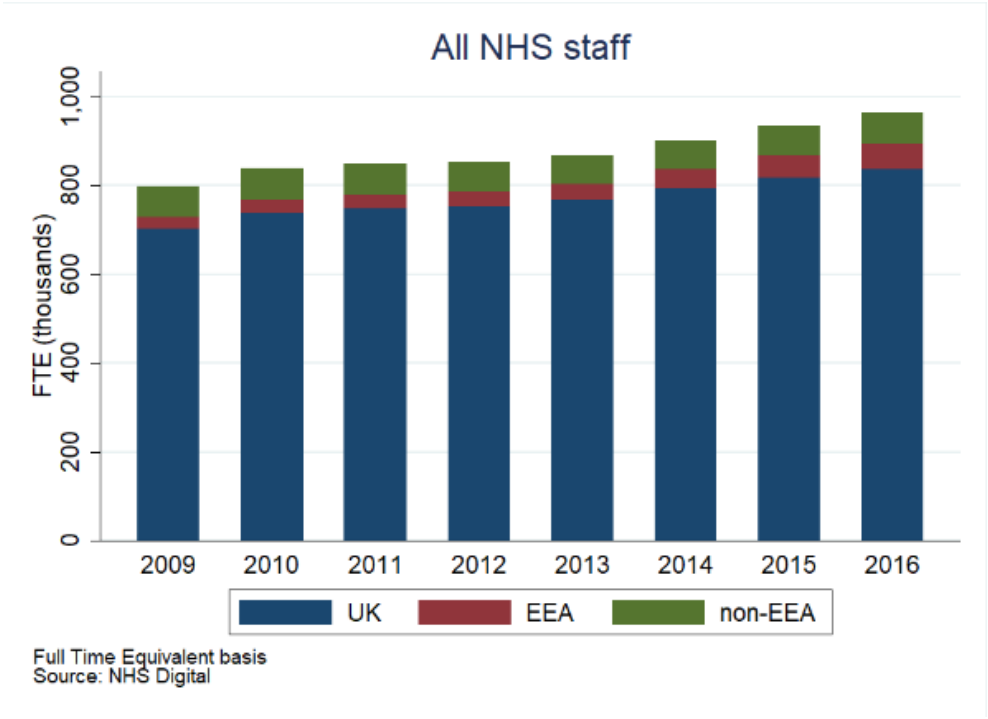
Source: NIESR calculations based on NHS Digital data, 2017

Pre-referendum trends

Using historical data from NHS Digital, we can also examine the pre- and post-referendum trends of the NHS workforce by nationality, staff category and HEE region[38]. The data presented in this section is measured in full time equivalents (FTE). FTEs may differ from the headcounts reported in the previous section if there are substantial numbers of staff working part time. However, nationality shares will be the same for FTEs and headcounts as long as all nationality groups share the same propensity to work part time.

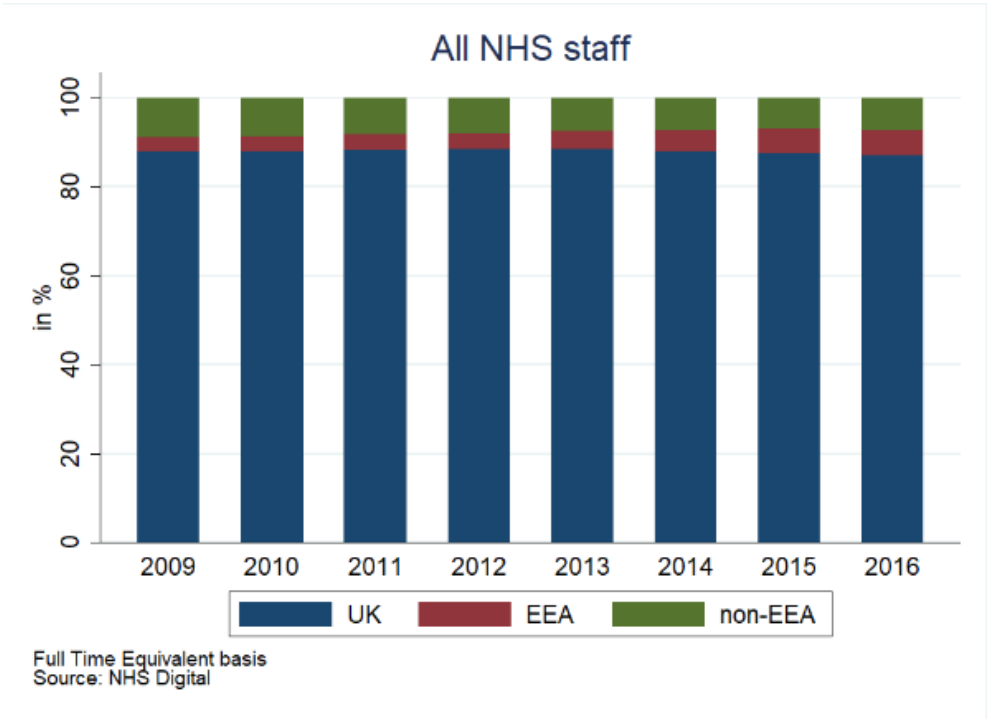
Between 2009 and 2016, the total number of workers in the NHS England has increased from 800,000 to around 970,000 (Figure 25). Over the same period EEA workers in the NHS increased from around 24,900 to 56,700 FTEs, presenting the highest average annual growth rate (12.6%. over the period) among the three nationality groups. This has resulted in a larger share of EEA nationals in the NHS workforce, from around 3% in 2009 to almost 6% in 2016 (Figure 26). Particularly, the largest year on year increase of EEA nationals in the NHS workforce was registered in 2014, when the annual growth of EEA FTE's reached 18.4%. In contrast, there has been a small decrease in the non-EEA nationals, from a total of 70,800 FTE workers in 2009 to 69,300 in 2016.

Figure 25. NHS Staff by Nationality (FTE), September 2009 to September 2016.



[38] NHS Digital reported data by Clinical Commissioning Groups (CCG's) and NHS Trusts for the most recent years, and Primary Care Trusts (PCT's) for the years before the NHS restructuring took place. Using the location of each organisation, we assigned its location to its HEE region.

Figure 26. NHS Staff by Nationality (share of total), September 2009 to September 2016.



Since 2009, the share of EEA nationals has risen among all NHS job roles. However, the largest increase in the share of FTE workers with an EEA nationality occurred among nurses and health visitors, followed by Hospital and Community Health Service (HCHS) doctors. This is shown in Figure 27, while Figure 28 shows the increase in the share of specific nationality groups in job roles.[39] By September 2016, the total number of FTE nurses and health visitors with an EEA nationality had reached 21,500, almost 3.4 times as large as the 2009 figure (6,300). In the same period, the number of FTE British nurses also increased but at a much slower pace, with the total number of UK nurses increasing by 17.8% between 2009 and 2016, while the FTE of non-EEA nurses decreased. These changes resulted in an increase in the share of EEA nationals working as nurses and health visitors, going from less than 3% in 2009 to 8% in 2016.

Over the same period, the number of HCHS FTE doctors with EEA nationality nearly doubled, from a total of 5,700 to 10,100. The number of British doctors also increased by around one third of the total FTE reported in 2009 (55,100) to reach around 74,000 FTEs, while the FTE number of non-EEA doctors declined. Taking all these fluctuations together, the share of FTE doctors with EEA nationality rose from 7% to 10% over the 2009-16 period.

In other clinical occupational groups such as midwives and scientific, therapeutic and technical staff, the number of FTE staff reported in 2016 with EEA nationality was at least twice as large as in 2009. For the support to clinical and ambulance staff groups, a similar trend was reported. Moreover, for these and all other categories the proportional growth of EEA nationals was larger than for non-EEA workers.

[39] For example, a 5-percentage point increase of EEA nurses and health visitors means that this nationality group has increased its share in this specific job category from 3 % to 8%.

Figure 27. Changes in the workforce (FTE) of NHS staff by nationality and job role (total changes), September 2009 vs September 2016.

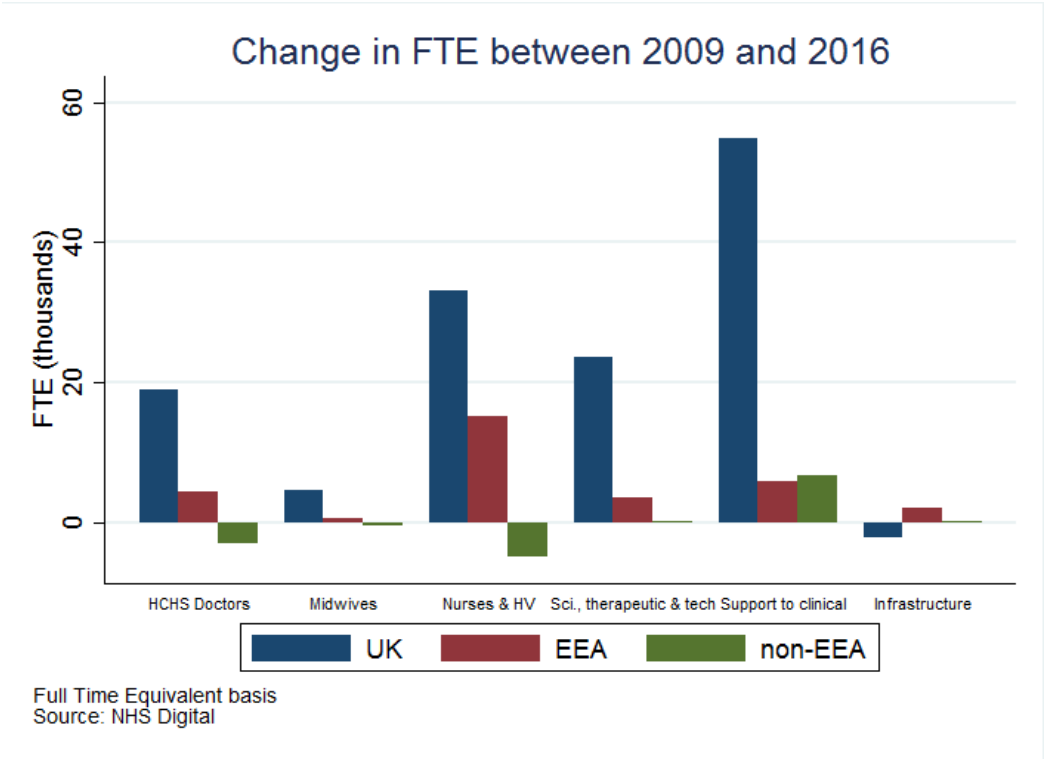
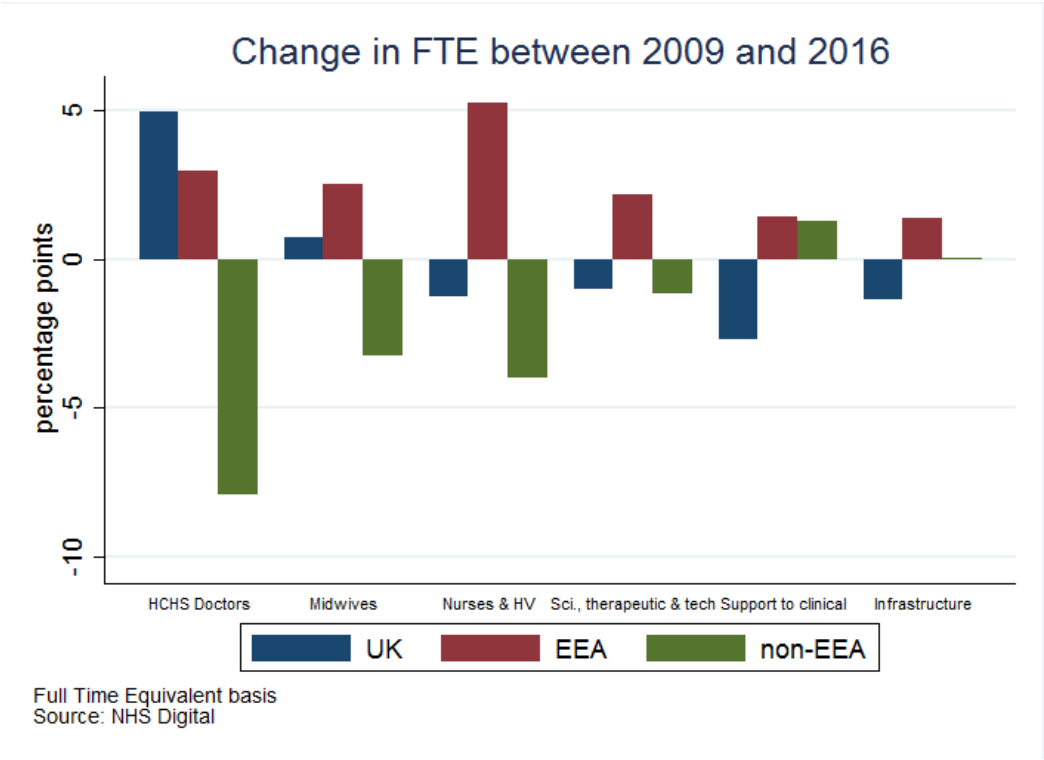


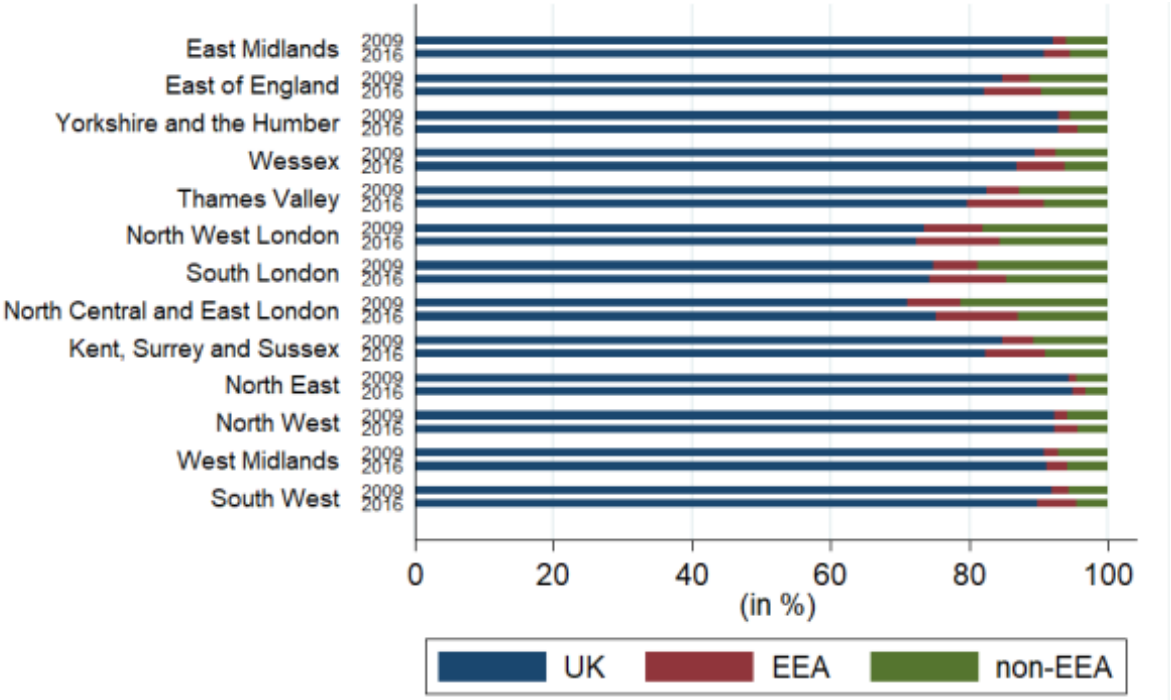
Figure 28. Changes in the share in total workforce (FTE) of NHS staff by nationality and job role, September 2009 vs September 2016.



Across HEE regions, London, the East of England and Kent, Surrey and Sussex reported the largest increase of EEA FTE workers, both in numbers and in shares (Figure 29 and Figure 30). In the three HEE regions in London, the share of EEA nationals increased from an average of 8% in 2009 to 12% in 2016. On average, the increase of FTEs in each London region was around 3,500, which adds up to a total of 10,300 additional EEA staff for the three London regions between 2009 and 2016. While the number of FTEs with an EEA nationality increased, the net change of non-EEA nationals was only positive for North West London. This resulted in an aggregate net figure of only 300 additional FTEs from non-EEA nationalities for the three London areas, which also resulted in a lower share of non-EEA staff.

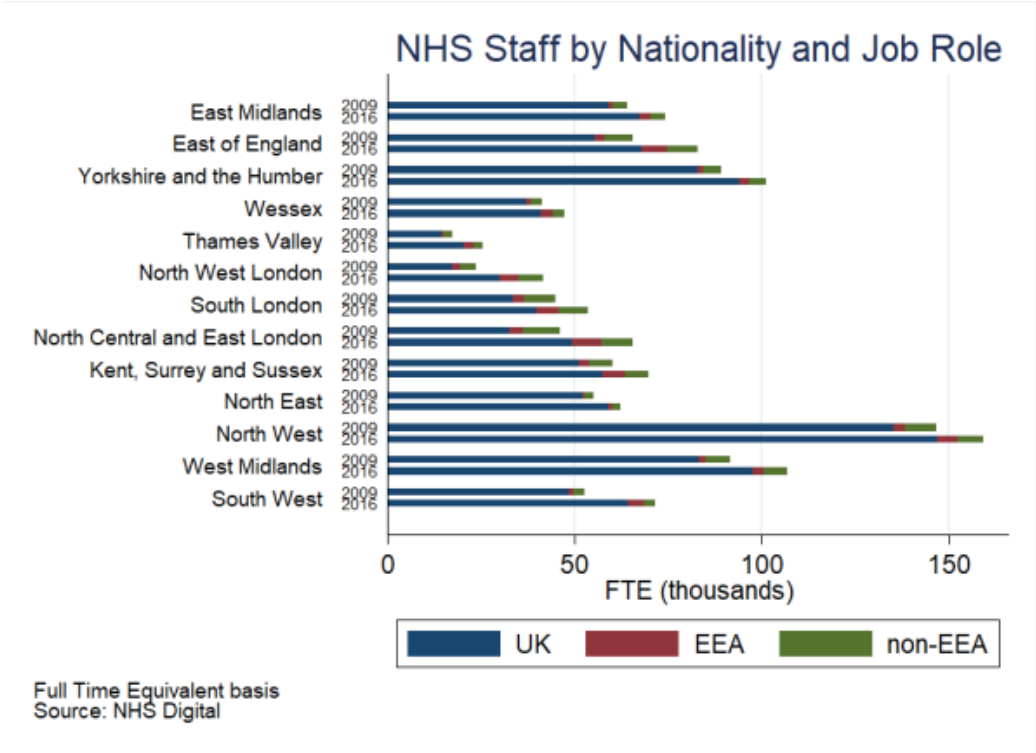
In the East of England and Kent Surrey and Sussex, the share of EEA FTE staff almost doubled between 2009 and 2016. In both regions, this figure went from nearly 4% in 2009 to over 8% in 2016. More specifically, the East of England registered an increase of nearly 4,200 FTE workers with an EEA nationality during this period, the largest among all individual HEE regions. In Kent Surrey and Sussex, 3,300 additional FTE's with an EEA nationality were reported between 2009 and 2016. Additionally, both regions had a slight decrease in the share of non-EEA FTE staff working in the NHS.

Figure 29. NHS Staff by nationality and HEE region, relative change Sep. 2009 – Sep. 2016



Full Time Equivalent basis
Source: NHS Digital

Figure 30. NHS Staff by nationality and HEE region, absolute change Sep. 2009 – Sep. 2016



Post-referendum trends (Q2-2016 to Q2-2017)

In order to understand in part how the EU referendum outcome has affected the NHS workforce in England, it is useful to consider the trends in nationalities of those joining and leaving the NHS.

Even in the relatively short time span since June 2016, the data indicate that fewer EEA nationals are joining the NHS, and more are leaving than immediately before the referendum. This has resulted in net outflows of EEA nationals from NHS employment, which have not been compensated by increases in net inflows by UK or non-EEA nationals.

These changes are particularly acute for clinical staff, particularly nurses, who are more difficult to replace in a short time frame due to their skill levels. The largest changes in inflows since the referendum were recorded in London, the East and South East, which are also the regions which rely most heavily on EEA nationals for clinical staffing.

We measure the changes in NHS labour dynamics since the referendum using statistics on joiners and leavers provided by NHS Digital. We compare the numbers of joiners and leavers in the quarter just before the EU referendum, April to June 2016, with data for the same quarter of the following year. By doing this, we aim to reduce the effect of possible seasonal trends when comparing only quarter to quarter data.

Between April and June of 2017, nearly 40,300 workers joined the NHS. Of these, 82.8% were British, 8.1% EEA nationals and the rest from other non-EEA countries. While the number of British staff that

joined the NHS is quite similar compared with the same period of 2016, the number of joiners from other EEA countries decreased by around 17.6% as shown in Table 20 (equivalent to around 700 fewer joiners).

In addition to a reduction in the number of EEA joiners, a larger number of leavers from these countries was also registered. Between April and June 2017, around 3,300 workers that had reported a non-British EEA nationality left the NHS, 15.3% more than in the same period of 2016.

These figures have resulted in a net outflow of NHS workers (joiners minus leavers). By nationality, British net figures added up to and outflow of around 2,550, comparable to the 2016 figures.

For EEA nationals, the net figures for 2017 indicated an outflow of almost 100, in stark contrast to the net inflow of almost 1,000 EEA workers reported to have joined the year before. On the other hand, the NHS joiners from non-EEA regions continue to outnumber the leavers.

During the second quarter of 2017 there was a net inflow of nearly 1,000 non-EEA workers into the NHS, similar to that recorded in 2016.

Overall, while UK and non-EEA net flows of workers did not change much after the referendum, there has been a registered outflow of EEA staff in the official statistics. This is clearly visible in Figure 31 and Figure 32 as the red bar in 2017 is smaller for joiners and larger for leavers than in 2016.

Table 20. Year-on-year growth of NHS Joiners and Leavers by Nationality, Q2 2017 vs Q2 2016.

	Joiners			Leavers		
	UK	EEA	non-EEA	UK	EEA	non-EEA
Clinical Staff	-0.9%	-24.2%	8.7%	-2.0%	15.8%	-3.5%
Support to Clinical & Ambulance Staff	0.3%	-2.5%	1.7%	3.6%	11.9%	17.8%
Infrastructure support	4.1%	-19.7%	-18.1%	-1.1%	21.1%	7.8%
All Staff	0.3%	-17.6%	2.8%	0.2%	15.3%	3.3%

Source: NIESR calculations based on data from NHS Digital

Figure 31. NHS Joiners by nationality (headcounts), Q2 2017 vs Q2 2016.

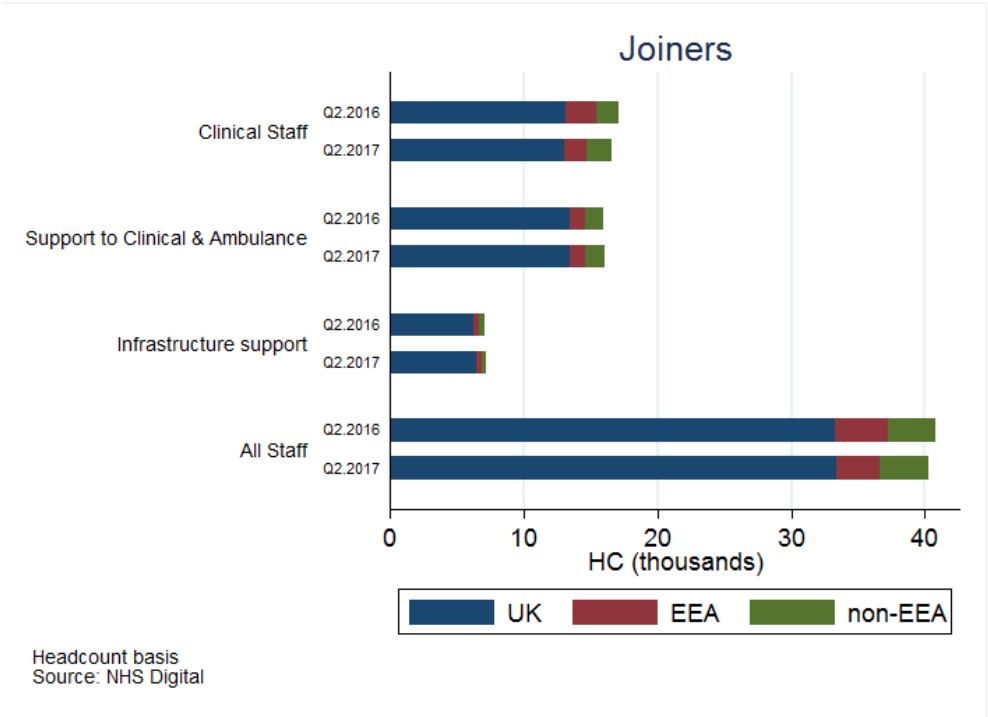
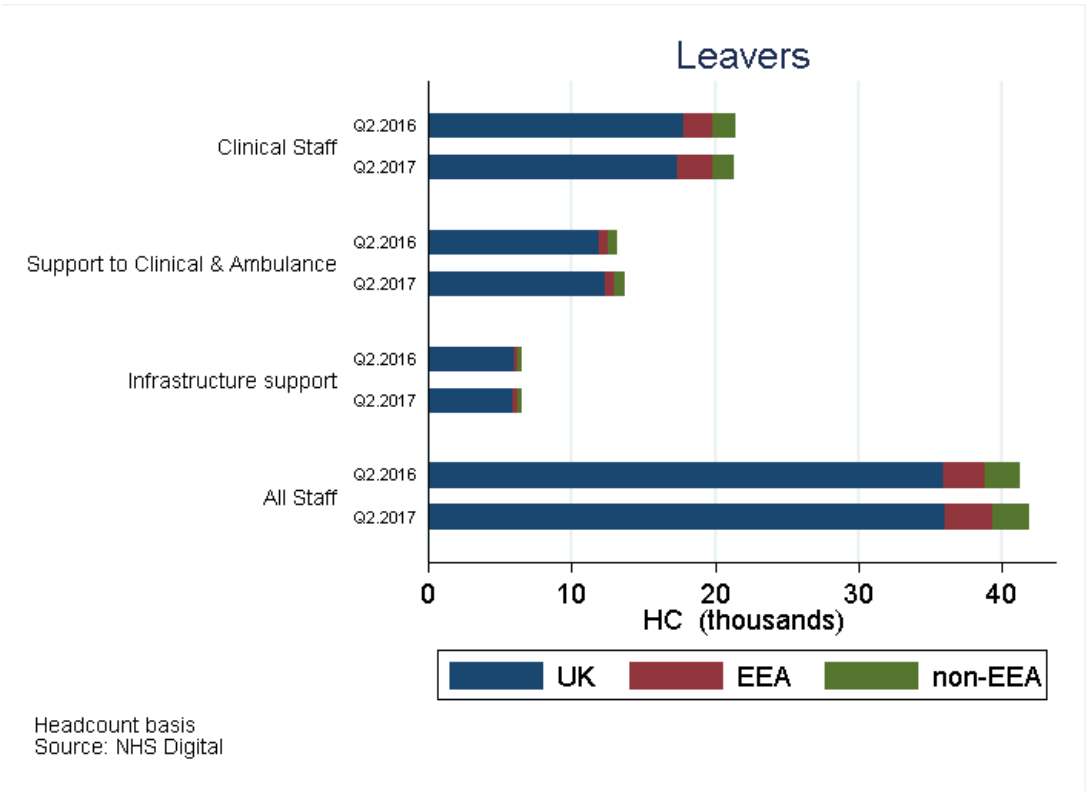


Figure 32. NHS Leavers by nationality (headcounts), Q2 2017 vs Q2 2016.



The inflow and outflow of NHS workers from different nationalities varies across occupation groups. For Doctors, a net outflow of nearly 400 was reported between April and June of 2017.

During the same period, over 2,000 doctors of British nationality joined the NHS, while 2,600 left the system. Although there is a net outflow of British doctors, it is smaller than the one for same period of 2016. This is explained by both a larger number of British joiners (+9.1%) and a lower number of leavers (-2.1%) as shown in Table 21. In contrast, the net outflow of EEA doctors has risen since the referendum in June 2016. This resulted from a reduction of EEA joiners (-7.1%) as well as an increase of leavers (+5.4%).

The nurses and health visitors group shows the most substantial changes in EEA joiners and leavers since the referendum (Figure 33 and Figure 34). Between April and June of 2017 (i.e. Q2), a total net outflow of 3,500 nurses across all nationalities was reported.

The number of British joiners in these occupations decreased from 6,800 in 2016 (Q2) to 6,500 in 2017 (Q2), equivalent to a 4.9% year-on-year reduction, while the number of leavers remained steady at around 9,400.

Focusing on EEA nationals, the number of nurses and health visitors joining the NHS during the second quarter of 2017 decreased by 37.4% from around 1,300 joiners in 2016 to only 800 in the following year. Moreover, there was a 20.8% increase in the number of EEA nurses that left the NHS. This resulted in a net outflow of around 600 nurses with EEA nationality in Q2 of 2017 alone.

Other job roles such as scientific, therapeutic and technical staff; as well as support to clinical staff do not report large proportional variations in terms of joiners. However, both report an annual increase of over 12% in leavers with EEA nationalities, while the support to clinical staff group also registers an increase of leavers of non-EEA nationals (Table 21).

Table 21. Annual growth of NHS Joiners and Leavers by Nationality and Job Role, Q2 2017-Q2 2016

	Joiners			Leavers		
	UK	EEA	non-EEA	UK	EEA	non-EEA
HCHS Doctors	9.1%	-7.1%	16.2%	-2.1%	5.4%	11.1%
Midwives	-1.6%	-13.1%	5.6%	0.0%	20.3%	-53.8%
Nurses & health visitors	-4.9%	-37.4%	3.1%	-0.3%	20.8%	-13.4%
Scientific, therapeutic & technical staff	1.3%	-2.4%	1.5%	-5.5%	12.8%	-4.9%
Support to Clinical & Ambulance staff	0.3%	-2.5%	1.7%	3.6%	11.9%	17.8%
Infrastructure support	4.1%	-19.7%	-18.1%	-1.1%	21.1%	7.8%

Source: NIESR calculations based on data from NHS Digital

Figure 33. NHS Joiners by Nationality and Job Role (headcounts), Q2 2017-Q2 2016

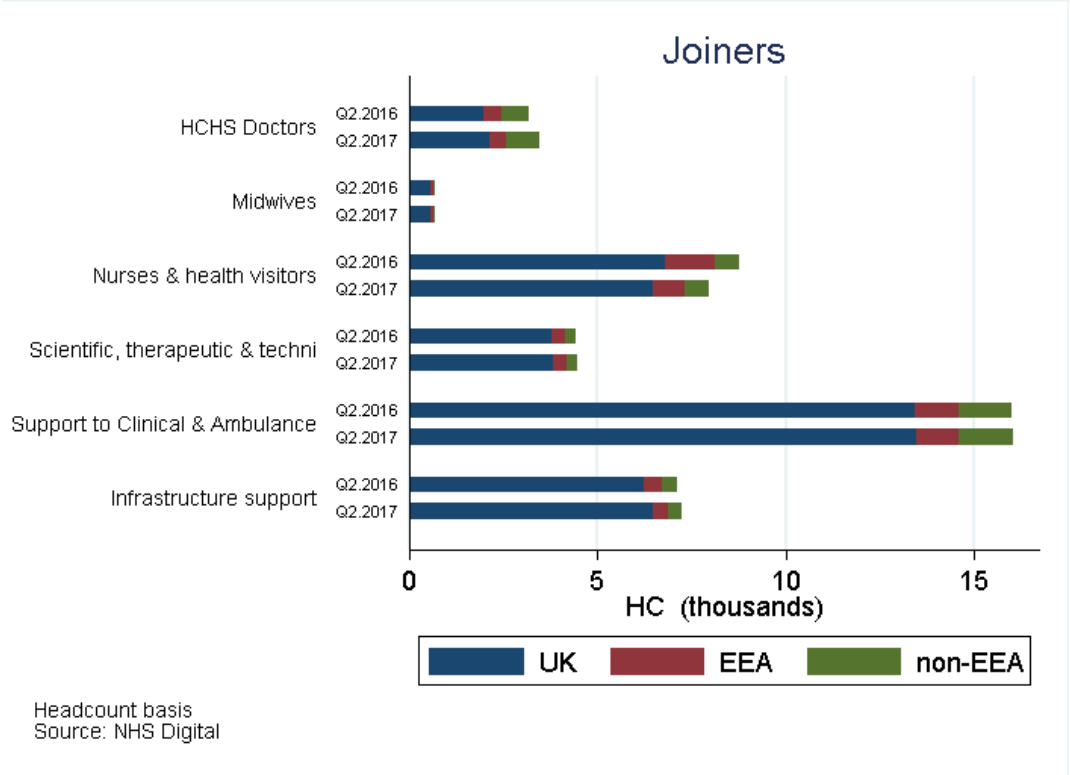
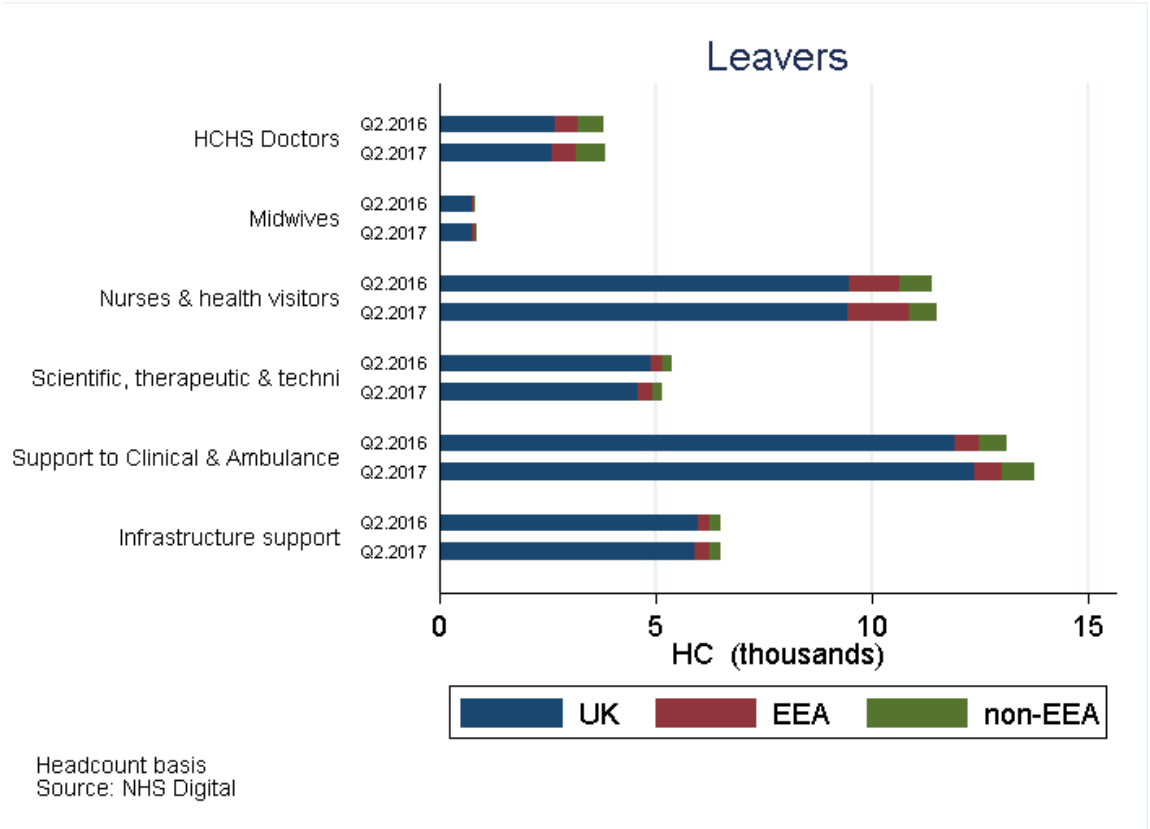


Figure 34. NHS Leavers by Nationality and Job Role (headcounts), Q2 2017-Q2 2016



Differences across regions

Across all Health Education England (HEE) regions, the net inflow of EEA workers to the NHS either decreased or became negative (a net outflow) between the second quarter of 2016 and the same period in 2017.

This situation stems both from a generalised reduction in the number of EEA joiners, as well as an increase in the number of EEA workers that left the NHS, with very few exceptions (North East and West Midlands). This is shown in Table 22, Figure 35 and Figure 36.

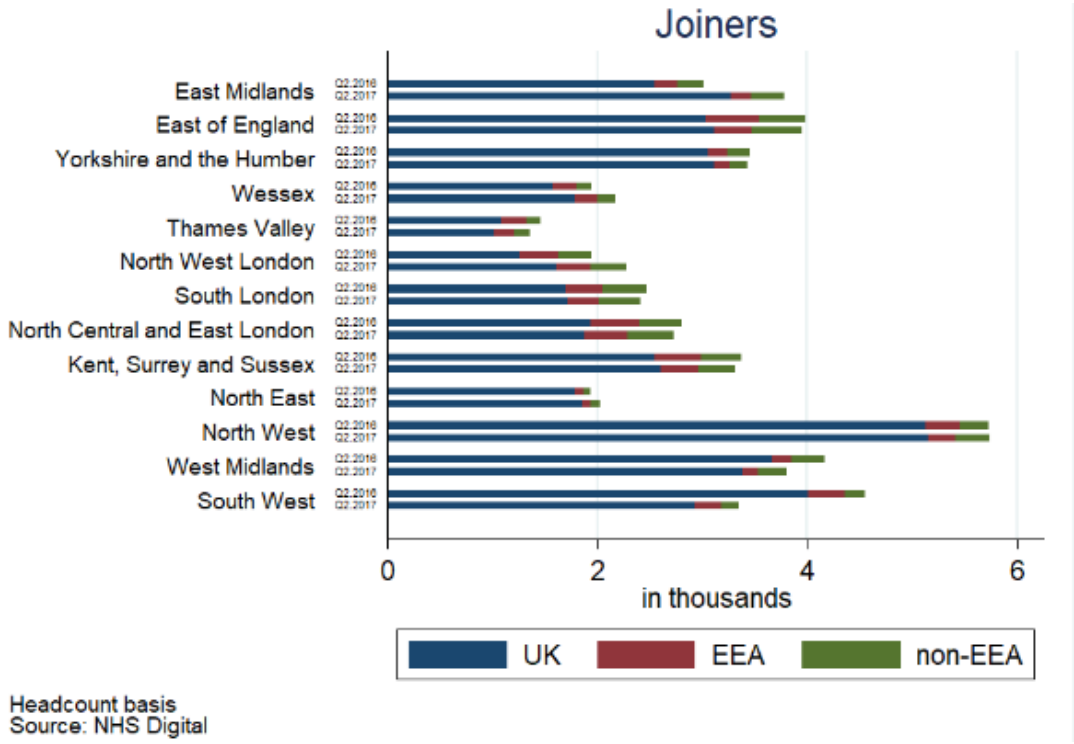
This pattern of decreases in EEA joiners and increases in leavers holds particularly for the regions that reported the largest shares of EEA workers. The number of joiners with EEA nationality ranged from 300 to 400 in the three London regions between April and June 2017, an average annual reduction of almost 12%. North Central London reported the largest increase in leavers among the three HEE London regions, as the number of EEA leavers reached 438, 11.5% more than the year before.

Table 22. Annual growth of NHS Joiners and Leavers by Nationality and HEE Region, Q2 2017 vs Q2 2016

	Joiners			Leavers		
	UK	EEA	non-EEA	UK	EEA	non-EEA
England	0.3%	-17.6%	2.8%	0.2%	15.3%	3.3%
East Midlands	28.8%	-15.3%	27.8%	-2.2%	26.6%	4.9%
East of England	2.5%	-27.7%	7.2%	8.6%	30.0%	6.7%
Yorkshire and the Humber	1.6%	-15.6%	-21.9%	8.5%	17.7%	-8.2%
Wessex	13.8%	-6.6%	19.4%	-12.2%	43.2%	-24.0%
Thames Valley	-6.1%	-20.6%	16.5%	4.0%	22.9%	-1.1%
North West London	27.1%	-10.1%	6.9%	-5.6%	4.9%	-3.6%
South London	1.0%	-14.3%	-6.4%	15.9%	8.1%	11.9%
North Central and East London	-2.9%	-11.0%	7.5%	1.5%	11.5%	-1.9%
Kent, Surrey and Sussex	2.4%	-19.4%	-7.6%	0.5%	30.3%	40.5%
North East	4.1%	-6.0%	34.8%	-4.8%	-8.5%	13.3%
North West	0.3%	-18.3%	17.1%	8.6%	9.6%	11.2%
West Midlands	-7.9%	-16.9%	-13.5%	-7.7%	-2.3%	-10.2%
South West	-26.8%	-28.6%	-14.7%	-13.1%	1.6%	2.3%

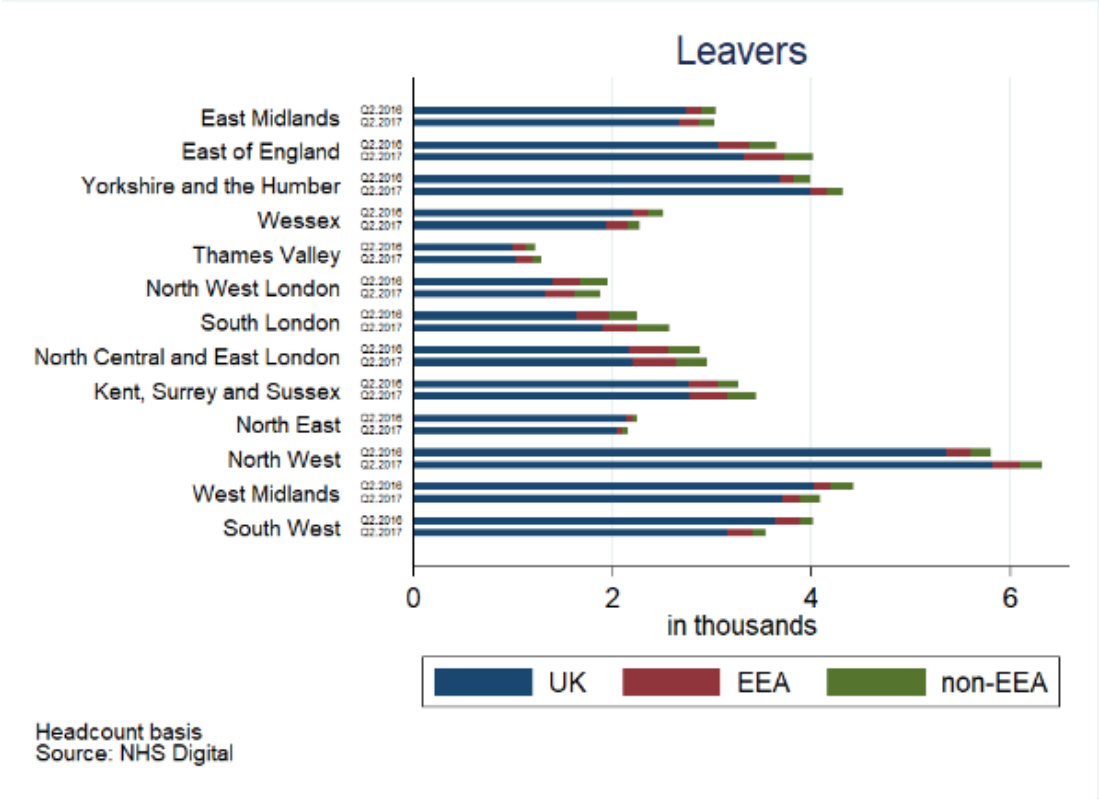
Source: NIESR calculations based on NHS Digital data

Figure 35. NHS Joiners by Nationality and HEE Region (headcounts), Q2 2017 vs Q2 2016



Headcount basis
Source: NHS Digital

Figure 36. NHS Leavers by Nationality and HEE Region (headcounts), Q2 2017 vs Q2 2016



Headcount basis
Source: NHS Digital

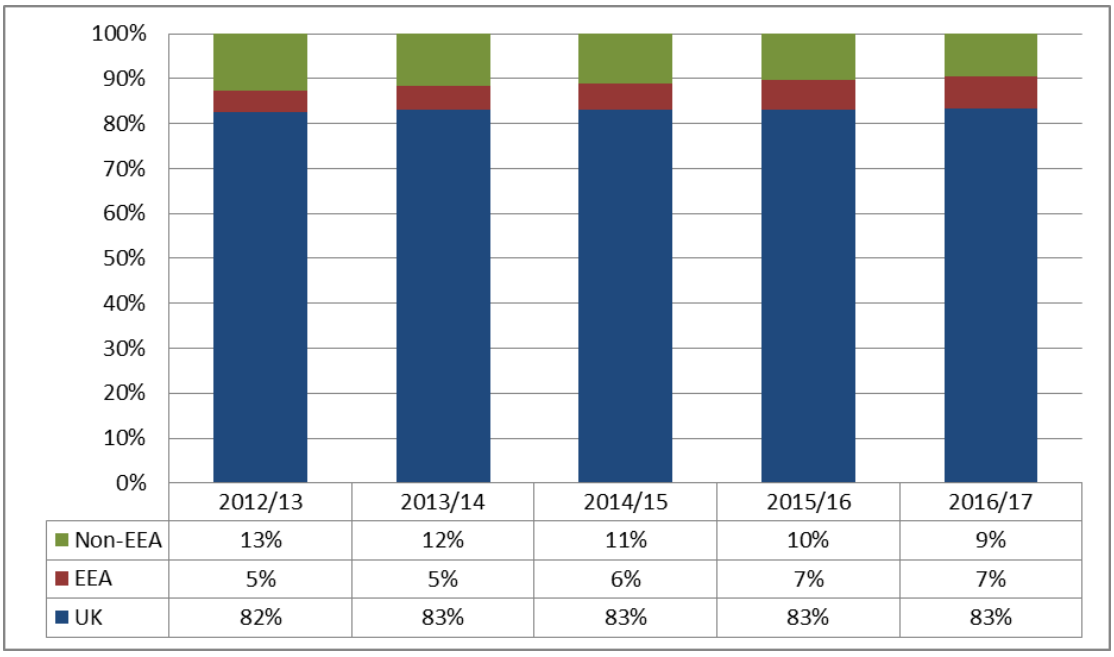
Additional trends in social care for England

Using data provided by Skills for Care (2017) we can look at more detailed trends in the social care workforce by occupation and region. Data are based on the National Minimum Dataset for Social Care (NMDS-SC) published in March 2017.[40] Similar data do not exist for Scotland, Wales and Northern Ireland.[41]

Results presented in Figure 37 indicate that since 2012/13 the share of EEA nationals rose from 5% to 7%. In relative terms this displaced non-EEA nationals, whose share declined from 13% to 9%. Turning to absolute number in Figure 38 we see that over the same period the adult social care workforce has expanded by 75,000 workers, from 1,265,000 to 1,340,000.

While the number of EEA nationals working in adult social care increased by nearly 65%, from 62,000 to 95,000, the number of non-EEA nationals fell by over 20%, from 160,000 to 127,000. Thus, in net terms, 33,000 non-EEA nationals were replaced by 33,000 additional EEA nationals in the social care workforce between 2012/13 and 2016/17. At the same time, the number of UK nationals grew by 75,000, representing an increase of about 7%.

Figure 37. Adult social care workforce by nationality, shares, 2012/13 to 2016/17.



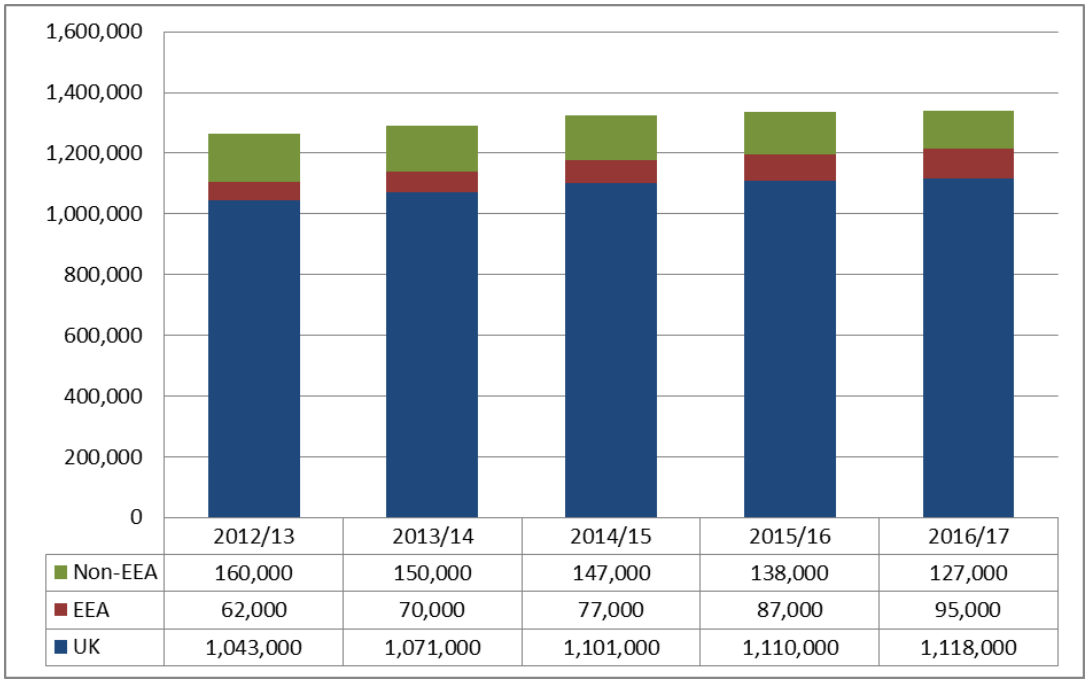
	2012/13	2013/14	2014/15	2015/16	2016/17
Non-EEA	13%	12%	11%	10%	9%
EEA	5%	5%	6%	7%	7%
UK	82%	83%	83%	83%	83%

Source: NIESR calculations based on Skills for Care data (March 2017)

[40] The NMDS-SC covers 1.34 million of 1.58 million jobs in the adult social care sector as it is based on local authority and independent sector employers. Though data provision is voluntary it has a large sample and hence allows for the creation of workforce estimates at national and local levels. A full explanation of the survey can be found in Appendix 1 of the Skills for Care report *The size and structure of the adult social care sector and workforce in England, 2017.*

[41] This has been confirmed by the Scottish Social Services Council, Social Care Wales, and the Northern Ireland Social Care Council.

Figure 38. Adult social care workforce by nationality, levels, 2012/13 to 2016/17.



	2012/13	2013/14	2014/15	2015/16	2016/17
Non-EEA	160,000	150,000	147,000	138,000	127,000
EEA	62,000	70,000	77,000	87,000	95,000
UK	1,043,000	1,071,000	1,101,000	1,110,000	1,118,000

Source: NIESR calculations based on Skills for Care data (March 2017)

Composition and trends by occupation

Across adult social care occupations, the regulated professions (incl. social workers, occupational therapists, and registered nurses) stand out as having particularly large shares of EEA and non-EEA nationals at 12% and 15% respectively (Table 23).

Taking a closer look at occupations reveals that these large shares of non-UK nationals in regulated professions are primarily due to their high share among registered nurses (Table 24).

EEA nationals make up 16% of registered nurses working in adult social care, while the share of non-EEA nationals among registered nurses is even larger at 20%, with only 64% of registered nurses working in social care reporting UK nationality.

In contrast, the shares of EEA and non-EEA nationals among social workers and occupational therapists are much smaller than average, only about half as large as the averages across all occupations. While members of regulated professions make up only a relative small proportion of the total adult social care workforce (64,500 out of 1.34 million, or about 5%), their relatively high skill levels make replacing them in a short time frame more challenging than other parts of the social care workforce.

Direct care and senior direct care workers form by far the largest group of adult social care workers in England (985,000 or about 74% of the total adult social care workforce), and EEA nationals make up about 7% of this occupational group, compared to 10% non-EEA nationals and 82% UK nationals.

EEA and non-EEA nationals are somewhat underrepresented in managerial roles, particular at more senior levels.

Table 23. Adult social care staff in England by nationality, 2016/17 – totals and by broad occupation and workplace type

	Total jobs	UK	EEA	non-EEA
All job roles	**1,340,000**	**83%**	**7%**	**9%**
Direct care	985,000	82%	7%	10%
Regulated profession	64,500	73%	12%	15%
Managerial	115,000	92%	4%	5%
Other	175,000	89%	6%	5%
Independent	1,230,000	82%	8%	10%
Local authority	112,800	95%	2%	3%
Domiciliary care services	505,000	84%	6%	9%
Care home services without nursing	305,000	85%	6%	8%
Care home services with nursing	290,000	76%	11%	13%

Source: NIESR calculations based on Skills for Care data (March 2017)

Table 24. Adult social care staff in England by nationality, 2016/17 – by selected detailed occupations

	Total Jobs	UK	EEA	non-EEA
Managerial	**115,000**	**92%**	**4%**	**5%**
Senior management	16,000	94%	2%	3%
Registered manager	22,500	93%	3%	4%
Regulated profession	**64,500**	**73%**	**12%**	**15%**
Social worker	17,000	92%	3%	5%
Occupational therapist	3,000	93%	4%	4%
Registered nurse	43,000	64%	16%	20%
Direct Care	**985,000**	**82%**	**7%**	**10%**
Senior care worker	85,000	83%	6%	11%
Care worker	815,000	82%	8%	11%
Other	**175,000**	**89%**	**6%**	**5%**
Support and outreach	60,000	89%	4%	7%

Source: NIESR calculations based on Skills for Care data (March 2017)

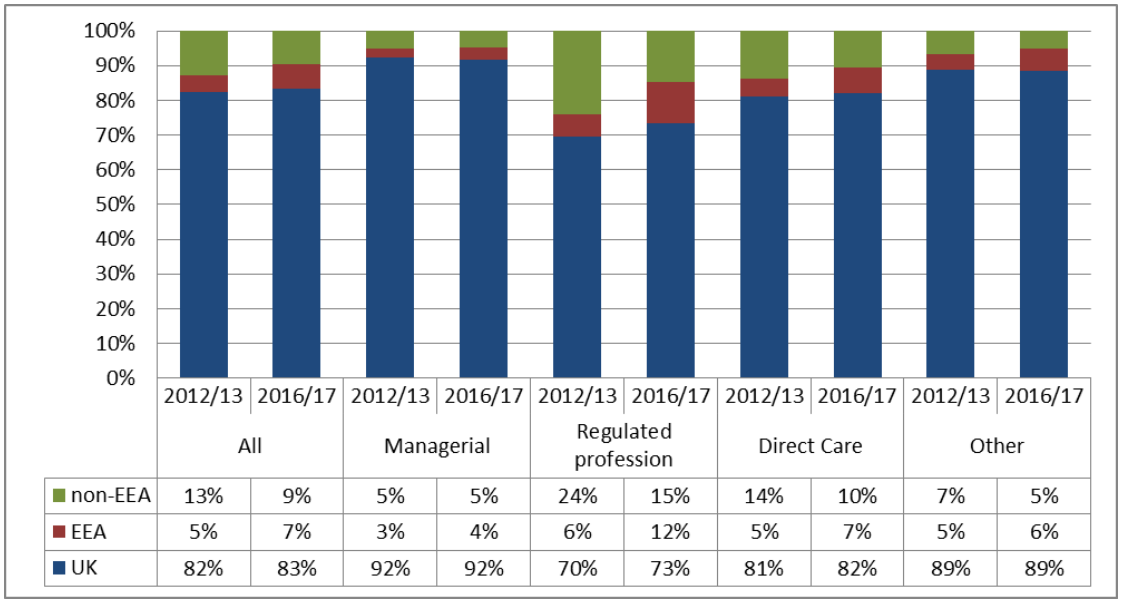
In Figure 39 we examine the trends in the broad occupations in terms of relative numbers respectively between 2012/13 and 2016/17. Direct care registered the largest increase in EEA nationals of all social care occupations, rising from 5% to 7% of employees.

There was also a substantial increase in EEA nationals employed in the much smaller group of regulated professionals, from 6% in 2012/13 to 12% in 2016/17, driven by registered nurses.

This increase is set against a backdrop of declining numbers of regulated professionals working in adult social care overall, driven by non-EEA and UK nationals. The numbers of EEA nationals also

increased in Managerial (3% to 4%) and Other occupations (5% to 6%), while numbers of UK and non-EEA nationals either remained steady or declined slightly.

Figure 39. Trends in adult social care workforce in England by nationality and occupation - shares



	2012/13	2016/17	2012/13	2016/17	2012/13	2016/17	2012/13	2016/17	2012/13	2016/17
	All		Managerial		Regulated profession		Direct Care		Other	
non-EEA	13%	9%	5%	5%	24%	15%	14%	10%	7%	5%
EEA	5%	7%	3%	4%	6%	12%	5%	7%	5%	6%
UK	82%	83%	92%	92%	70%	73%	81%	82%	89%	89%

Source: NIESR calculations based on Skills for Care data (March 2017)

Composition and trends by region

EEA nationals in the English adult social care workforce are most prevalent in London and the South East, where they make up 13% and 11% of the workforce respectively (Table 25). EEA nationals are also overrepresented in the East of England and the South West, with a share of 9%. The smallest shares of EEA nationals in the adult social care workforce are found in the North of England, with shares of 2% in the North East, 3% in Yorkshire and the Humber and in the North West.

Table 25. Adult social care staff in England by nationality, 2016/17 – by English region

	Total jobs	UK	EEA	non-EEA
England	1,340,000	83%	7%	9%
London	175,000	61%	13%	26%
South East	220,000	77%	11%	12%
East of England	145,000	82%	9%	9%
South West	150,000	86%	9%	6%
West Midlands	140,000	88%	4%	7%
East Midlands	125,000	90%	4%	6%
North West	180,000	93%	3%	4%
Yorkshire and Humber	130,000	93%	3%	4%
North East	75,000	96%	2%	2%

Source: NIESR calculations based on Skills for Care data (March 2017)

The regional patterns in adult social care employment are remarkably similar across occupations (Tables 26-28).

For all three major occupational groups - direct care, regulated professions and managerial – London and the South East have shares of EEA nationals in the adult social care workforce that is substantially above the English average.

The shares of direct care workers and regulated professionals are also above average in the East and South West. The shares of EEA nationals are also consistently below average for all occupations in the North East, North West, Yorkshire and Humber, as well as in the East and West Midlands.

The occupational patterns are also quite similar across English regions. The highest shares of EEA nationals are consistently found in the regulated professions, followed by direct care and management.

Accordingly, the highest concentration of EEA nationals is found in the regulated professions in the South East, with a 20% share, followed by the share of EEA nationals among regulated professionals in London at 17%.

In contrast, the lowest shares of EEA nationals at 1% are found among adult social care managers in the East Midlands, West Midlands and Yorkshire/Humber.

Table 26. Adult social care staff by nationality, 2016/17 – Regulated professions, by region

	Total jobs	UK	EEA	non-EEA
England	64,500	73%	12%	15%
South East	11,500	61%	20%	19%
London	8,900	60%	17%	23%
East	6,500	70%	15%	16%
South West	7,100	70%	15%	15%
East Midlands	5,100	79%	8%	13%
West Midlands	6,900	80%	7%	13%
Yorkshire and Humber	6,100	83%	7%	11%
North West	8,900	86%	6%	8%
North East	3,700	89%	5%	7%

Source: NIESR calculations based on Skills for Care data (March 2017)

Table 27. Adult social care staff by nationality, 2016/17 – Direct care, by region

	Total jobs	UK	EEA	non-EEA
England	985,000	82%	7%	10%
London	133,000	58%	13%	29%
South East	157,000	75%	12%	13%
East	108,000	80%	10%	10%
South West	106,000	85%	9%	6%
West Midlands	104,000	87%	4%	8%
East Midlands	93,000	89%	4%	7%
North West	131,000	92%	3%	5%
Yorkshire and Humber	96,000	93%	3%	5%
North East	55,000	96%	2%	2%

Source: NIESR calculations based on Skills for Care data (March 2017)

Table 28. Adult social care staff by nationality, 2016/17 – Managerial, by English region

	Total jobs	UK	EEA	non-EEA
England	115,000	92%	4%	5%
London	16,000	77%	8%	15%
South East	19,000	90%	5%	5%
East	12,000	91%	4%	5%
South West	14,000	94%	4%	2%
North East	5,000	97%	2%	1%
North West	15,000	97%	2%	2%
West Midlands	12,000	95%	1%	3%
East Midlands	10,000	96%	1%	3%
Yorkshire and Humber	11,000	97%	1%	1%

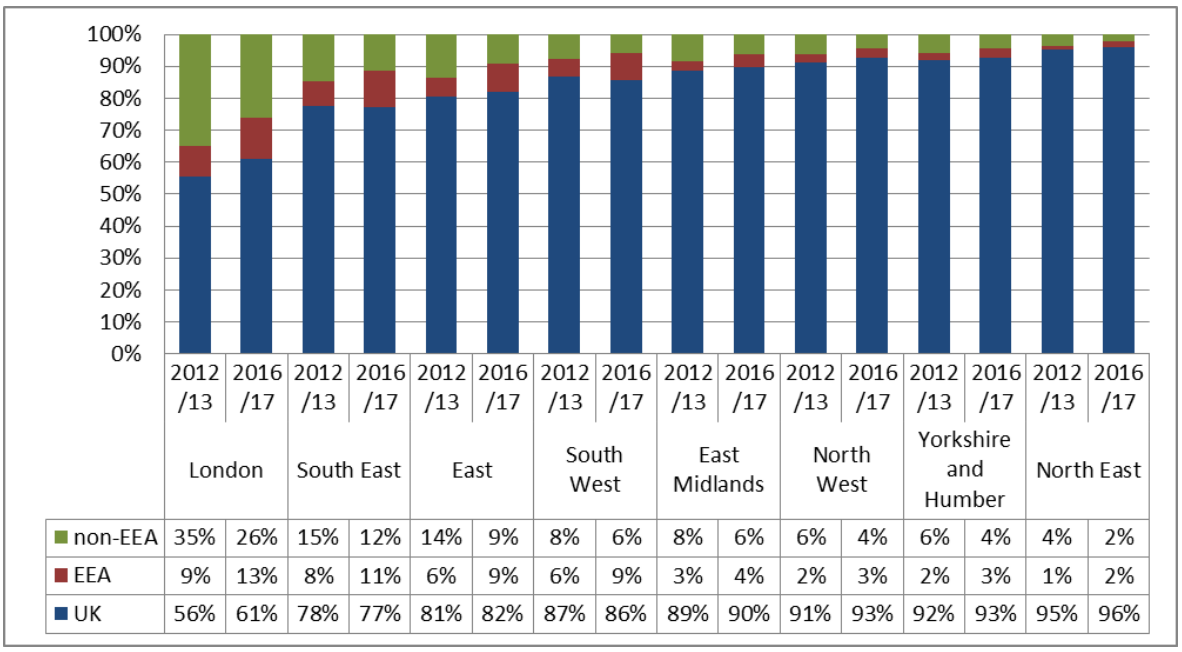
Source: NIESR calculations based on Skills for Care data (March 2017)

Across English regions, trends in nationality shares of the adult social care workforce have been remarkably similar qualitatively since 2012/13 (Figure 40).

Increases in the shares of EEA nationals have been balanced by decreases in shares of non-EEA nationals. However, the magnitudes of these increases are much larger in London, and somewhat larger in the South East, East and South West than in the northern regions.

In London, the share of EEA nationals in the adult social care workforce went from 9% in 2012/13 to 13% in 2016/17, while the share of non-EEA nationals decreased from 35% to 26% over the same period. In contrast, the share of UK nationals employed in adult social care has been quite stable over this time period, except in London, where it declined from 56% to 61%.

Figure 40. Trends in adult social care workforce by nationality and region - shares



	2012/13	2016/17	2012/13	2016/17	2012/13	2016/17	2012/13	2016/17	2012/13	2016/17	2012/13	2016/17	2012/13	2016/17	2012/13	2016/17
	London		South East		East		South West		East Midlands		North West		Yorkshire and Humber		North East	
non-EEA	35%	26%	15%	12%	14%	9%	8%	6%	8%	6%	6%	4%	6%	4%	4%	2%
EEA	9%	13%	8%	11%	6%	9%	6%	9%	3%	4%	2%	3%	2%	3%	1%	2%
UK	56%	61%	78%	77%	81%	82%	87%	86%	89%	90%	91%	93%	92%	93%	95%	96%

Source: NIESR calculations based on Skills for Care data (March 2017)

Appendix B. NHS England Staff by Nationality, Job Role, and HEE region

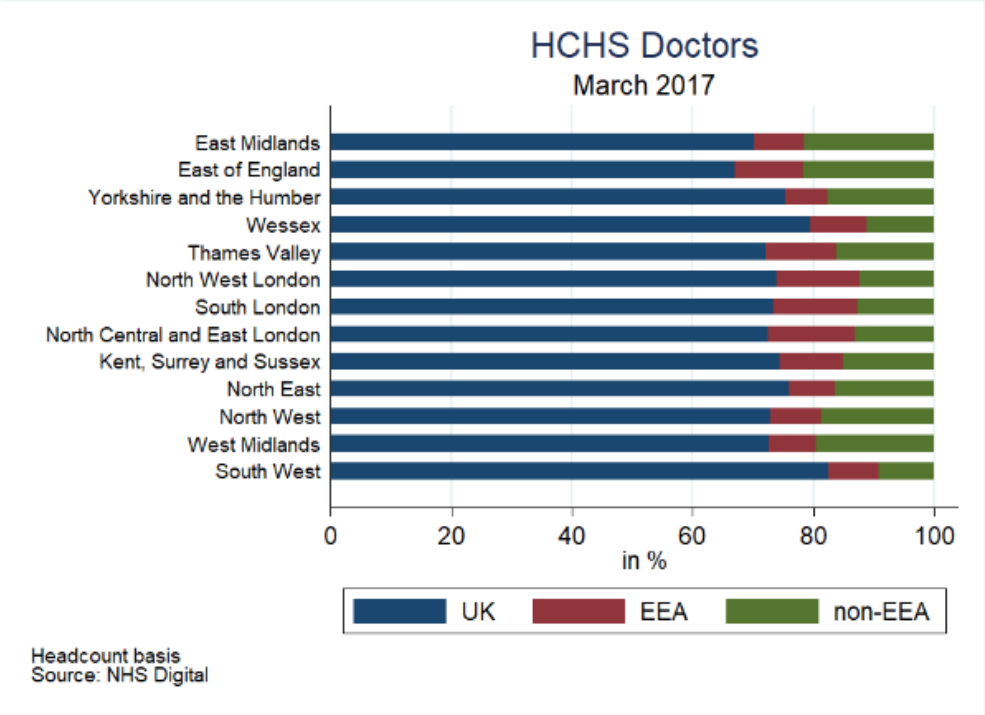
Doctors

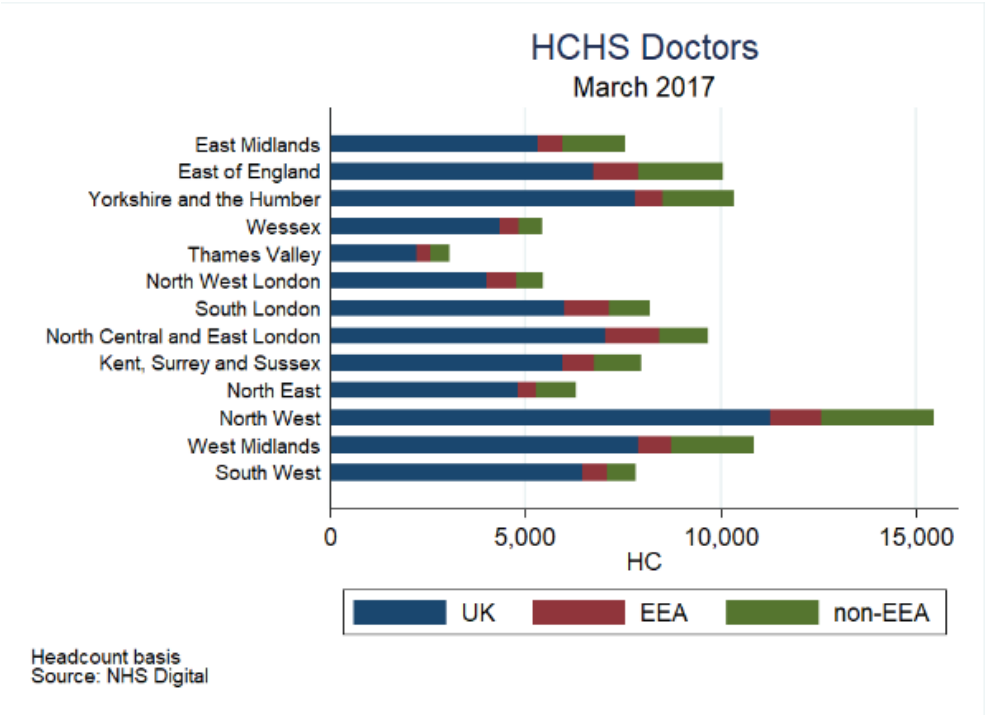
By March 2017 there were around 108,000 Doctors working in the NHS in England. On average, 74% reported their nationality as British, around 10% were EEA nationals and nearly 16% had a non-EEA nationality (Figure 41).

Across different HEE regions, the share of EEA doctors within each region ranges between 6.9% and 14.5%. Similar than for all the NHS staff, London and the Thames Valley also report the largest share of EEA doctors. In particular, HEE North Central London not only registers the highest participation of doctors from these countries within the region, but also concentrates the largest number of EEA doctors working in the country with around 1,400 doctors from the EEA.

Apart from London, other regions such as the North West and the East of England also have a large number of doctors with an EEA nationality, representing around 12.2% and 10.6% of all the EEA doctors that work in England.

Figure 41. HCHS doctors in NHS England by nationality and HEE region (share and total), March 2017.





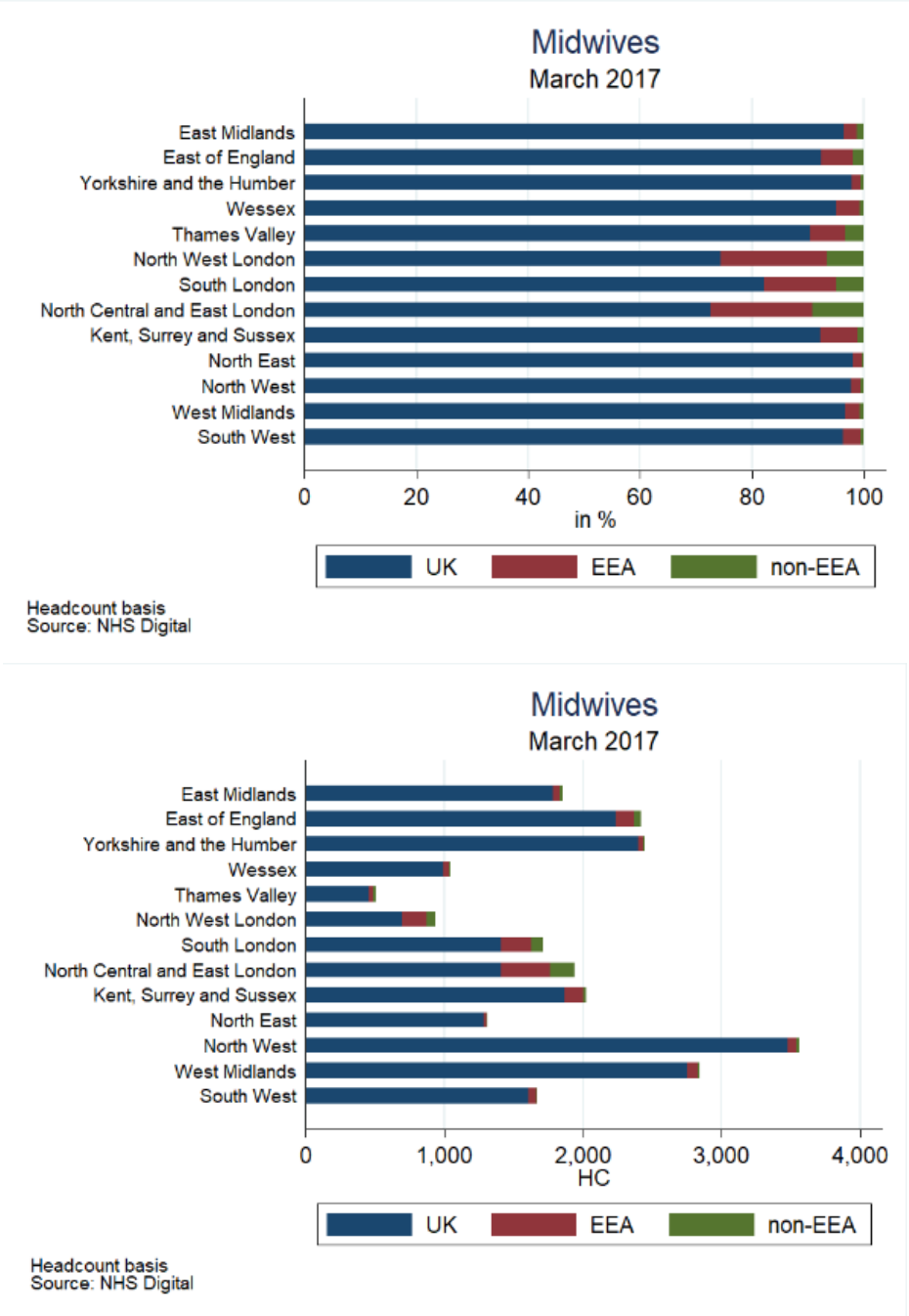
Midwives

Around 24,000 midwives worked in the English NHS by March 2017. Over 90% of these had a British nationality, while around 6% reported being from another EEA country (Figure 42).

While for most HEE regions the participation of EEA midwives within each region remains below the national average, in London the presence of midwives from these countries represents up to 20% of all the midwives working in the area.

In total, around 750 EEA midwives work in the three London HEE areas, which represents more than half of all the midwives with an EEA nationality that work in England.

Figure 42. Midwives in the NHS in England by nationality and HEE region (share and total), March 2017.



Nurses and health visitors

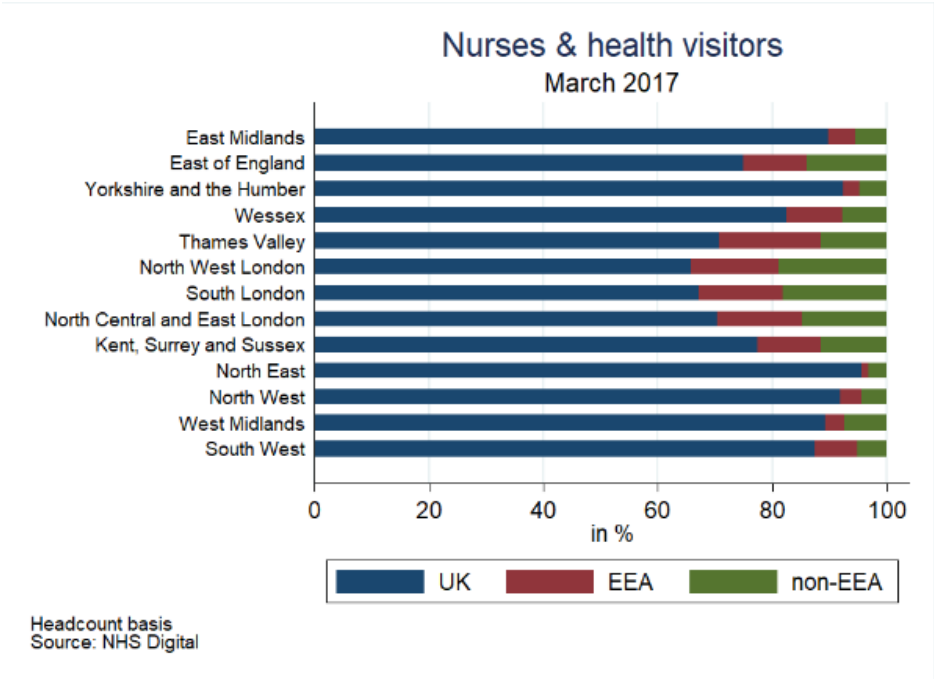
As of March 2017, the English NHS employed around 299,000 nurses and health visitors. Nearly 84% of this staff group has a British nationality, while the rest is divided almost equally between other EEA and non-EEA nationals (Figure 43).

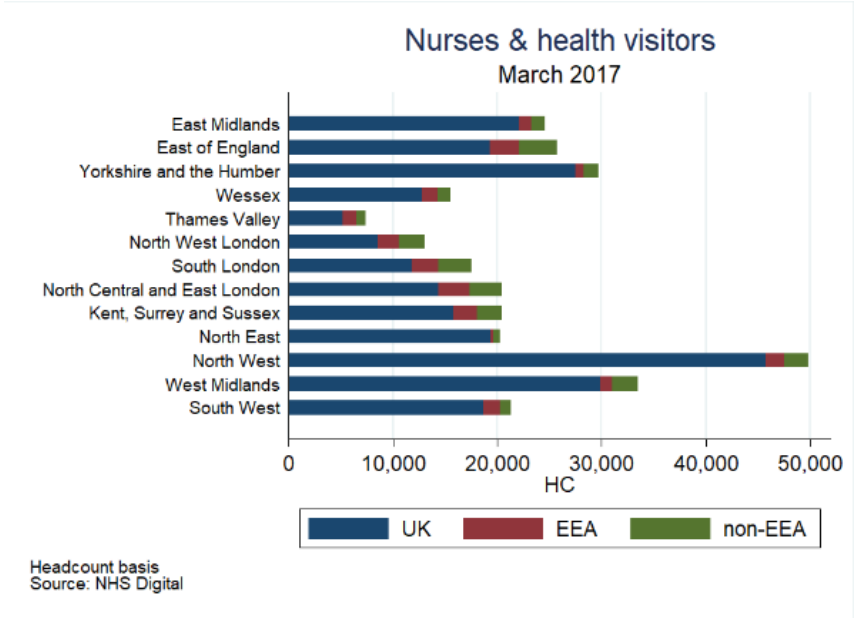
The participation of EEA nurses and health visitors within each region shows an important variation, ranging from below 3% in regions such as the North East and Yorkshire and the Humber, to near 15% for London and the Thames Valley.

In total, the number of EEA nurses and health visitors working in London reaches almost 7,600, equivalent to one third of nurses with an EEA nationality working in England.

Other regions that have a relatively large proportion of nurses from EEA countries are the East of England and Kent Surrey and Sussex. In these two regions, there were reported around 2,900 and 2,300 EEA nurses and health visitors, respectively. In total, the nurses and health visitors from both regions represent around 23% of the total EEA nationals from these occupations that work in England.

Figure 43. Nurses and health visitors by Nationality and HEE Region, March 2017.





Scientific, therapeutic & technical staff

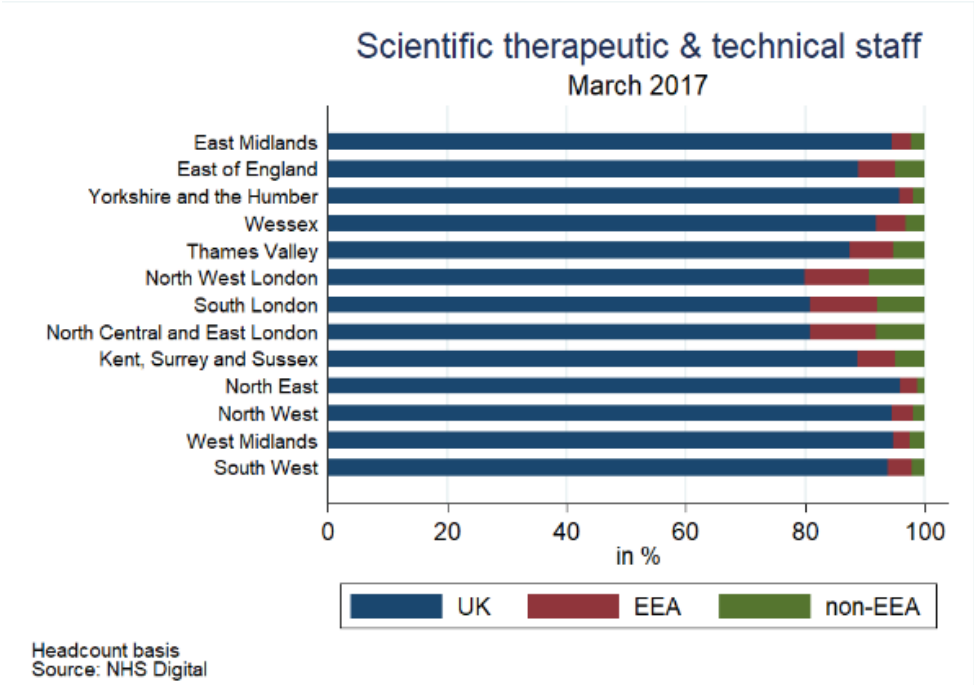
As of March 2017 there are nearly 143,000 NHS workers in scientific, therapeutic and technical roles. More than 90% of this staff group is British, followed by 5% EEA nationals and 4% non-EEA nationals (Figure 44).

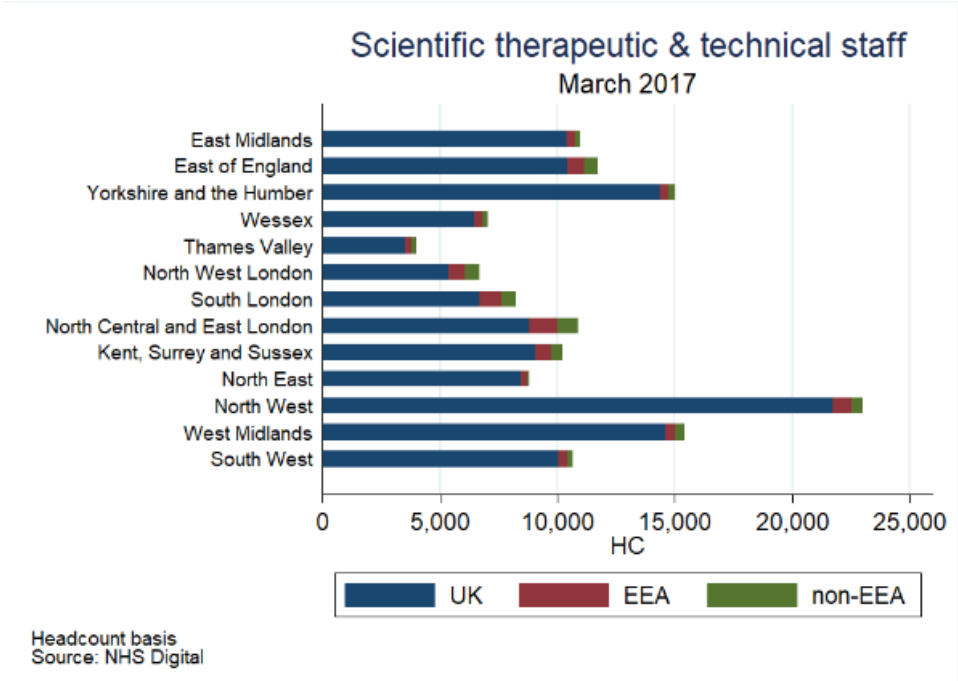
Similar to other occupations London presents a higher participation of EEA workers within the region, with around 11% of the workforce in scientific, therapeutic and technical roles reporting an EEA nationality.

The EEA nationals working in London for scientific, therapeutic and technical staff add up to almost 2,900 workers, which represents 38.4% of EEA nationals in this staff category that work in England.

Other regions that concentrate a substantial number of EEA scientific, therapeutic and technical staff are the North West and the East of England, with 800 and 700 workers that reported an EEA nationality, respectively. The total for the two regions is equivalent to 20.3% of all the EEA staff working in the country for the analysed occupations.

Figure 44. Scientific, therapeutic and technical staff in NHS England by nationality and HEE region (share and total), March 2017.





Support to clinical & ambulance staff

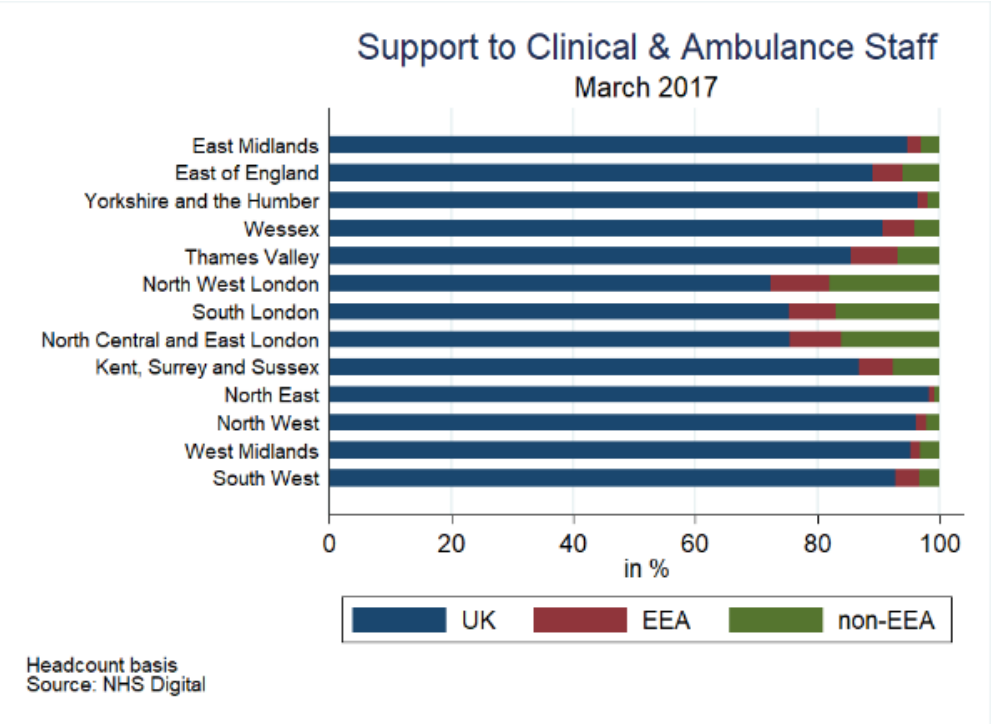
The support to clinical and ambulance staff category constitutes the largest NHS staff group in terms of number of workers, with around 357,000 people working in these positions as of March 2017 (Figure 45).

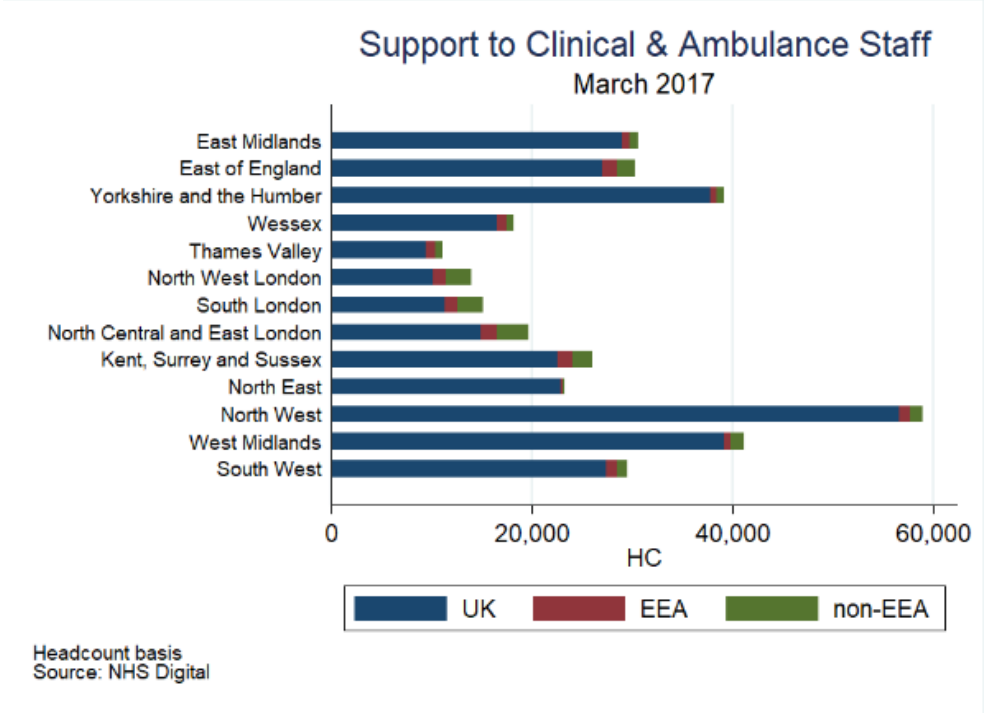
As it was shown at the beginning of this report, the share of EEA nationals working in these roles is generally lower than for clinical staff groups. In England, around 91% of the support to clinical staff were reported to be British, followed by 5% non-EEA nationals and 4% EEA nationals, the lowest share.

While London again has the largest share of EEA workers within the region (8.6% on average), it is worth noticing that the number of non-EEA nationals working in clinical support and ambulance staff roles in London (8,200) is almost double the number of EEA workers (4,200).

For the analysed support to clinical roles, regions such as Kent, Surrey and Sussex and the East of England also present a share of EEA nationals within each region above the English average. Moreover, with around 1,400 EEA workers in each of these regions, the total number of EEA workers for the two regions is equivalent to almost 20% of all the EEA workers occupying these jobs in the NHS.

Figure 45. Support to clinical and ambulance staff in NHS England by nationality and HEE region (share and total), March 2017.





Infrastructure support

As of March 2017, there were approximately 175,000 workers that provided infrastructure support[42] in the NHS in England. Around 92% had a British nationality, while the difference was almost equally divided between EEA and non-EEA nationals (Figure 46).

Compared with the clinical categories, the infrastructure and support staff has the lowest participation of EEA nationals across most of the HEE regions.

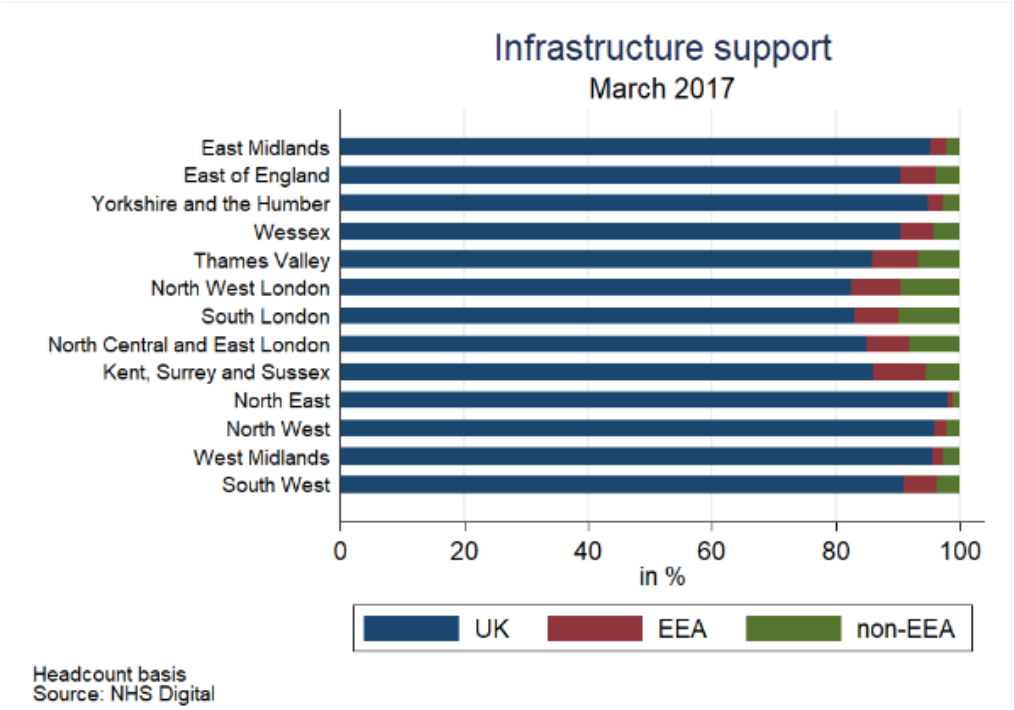
Looking at individual HEE regions, Kent, Surrey and Sussex reported the largest number of EEA nationals working in these roles. Particularly, there were 1,200 EEA workers in this region which represented 8.5% of the infrastructure support workers within the region, and 17.1% of all the EEA workers occupying these positions across the country.

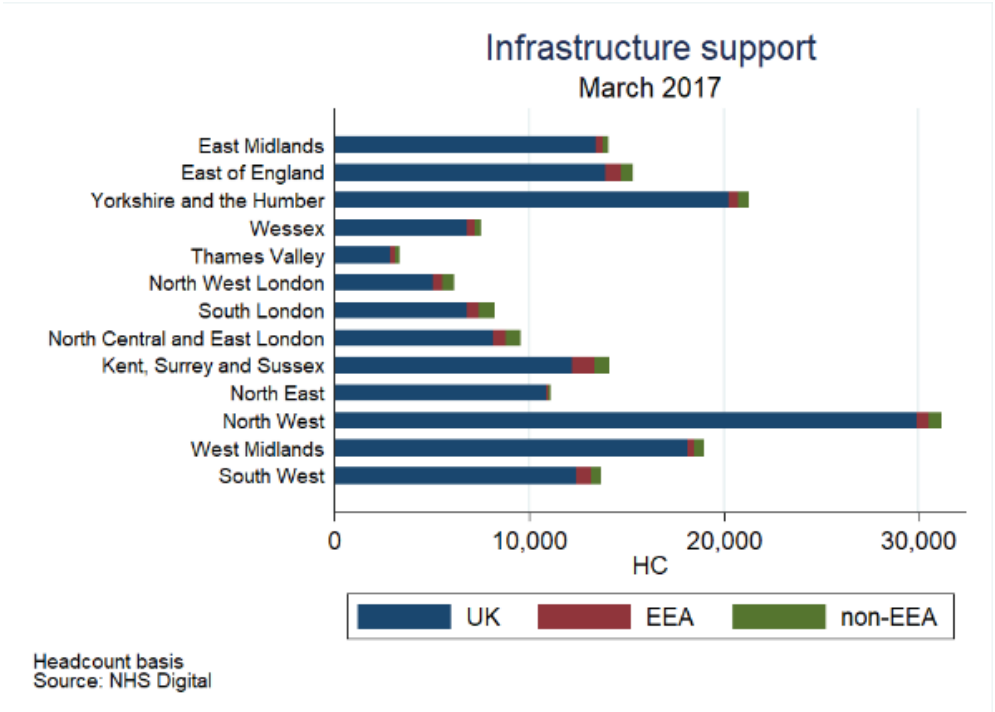
In London, less than 8% of the infrastructure and support workers reported a nationality from an EEA country, and a slightly higher proportion reported non-EEA nationalities.

In total, there were around 1,700 EEA infrastructure support workers in the three London HEE regions, equivalent to almost one quarter of all the EEA nationals that worked as infrastructure support in all the NHS in England.

[42] This includes managers, central functions staff and hotel, property and estates workers.

Figure 46. Infrastructure support staff in NHS England by nationality and HEE region (share and total), March 2017.





Appendix C. Joiners and leavers to NHS England before and after the referendum, by job role and region

Doctors

Between March and June 2017, a net outflow of almost 100 doctors with an EEA nationality was registered. Across the different HEE regions, the North West and West Midlands show the largest net outflow of EEA doctors with a total of 25 net leavers each (Figure 47). In the North West of England, 34 EEA doctors joined the NHS, 27.7% fewer than in the same period of 2016. Additionally, a total of 65 leavers was reported for 2017 (Q2), 34.1% more than the year before. In the West Midlands, the annual drop of joiners was larger (38.7% y/y change) reaching a total of 19 new EEA doctors during Q2 2017. Also, the number of leavers arrived to 44 showing an annual increase of 18.9%.[43]

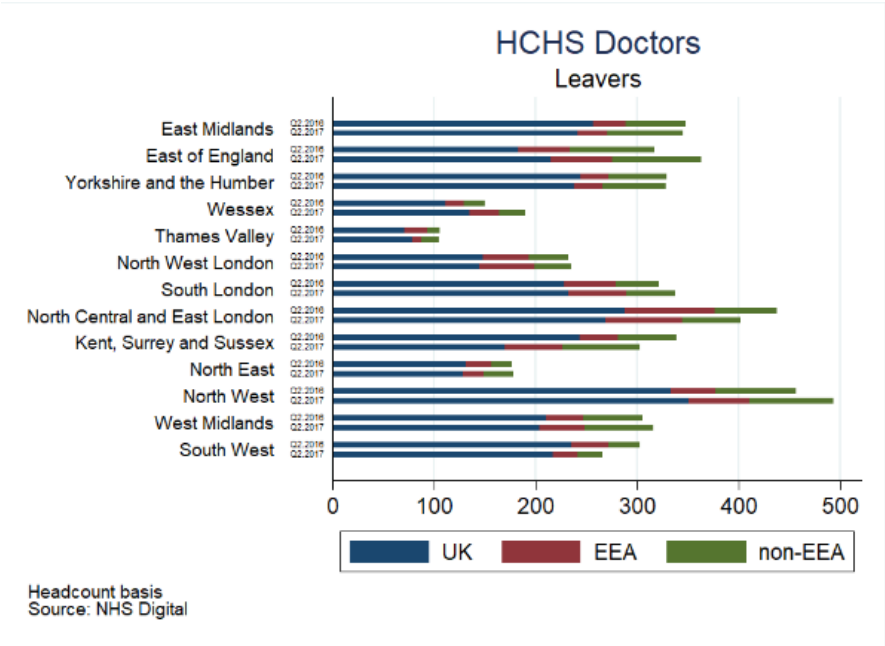
For the three HEE regions of London a total net outflow of 33 EEA doctors for the second quarter of 2017 was reported. On the one side, there were 155 EEA doctors that joined the NHS in these regions, 13.9% fewer than the number reported to have joined during the same period of 2016. In addition, a total of 188 EEA doctors were registered as having left the NHS, quite close to the 2016 figure (2.2% year-on-year increase).

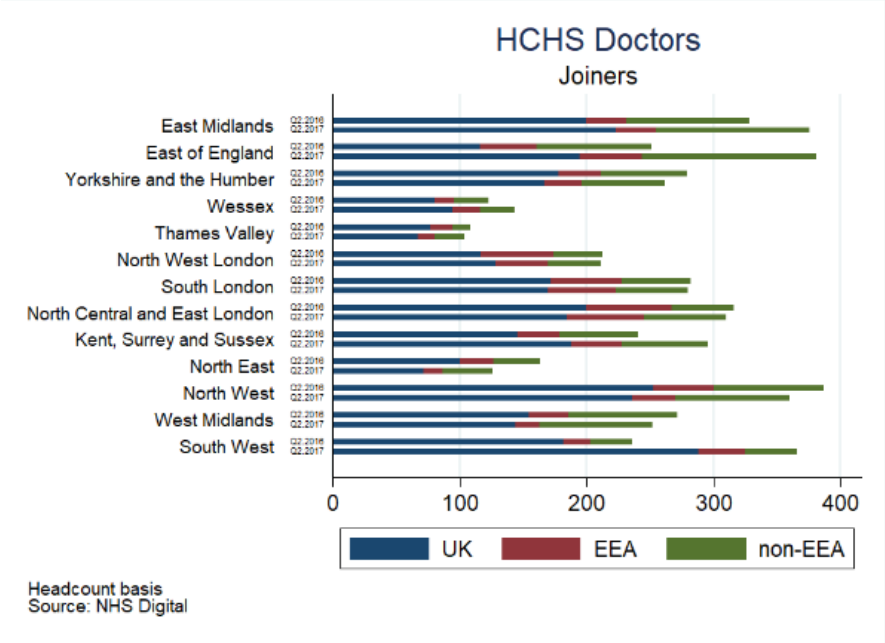
In the East of England, an increase in net outflows of EEA nationals are compensated by decrease in outflows of UK nationals and an increase in the inflows of non-EEA doctors.

In contrast, the South West reported the largest net inflow of EEA doctors, with a total of 13 doctors between March and June of 2016. This figure contrasts with the net outflow that was reported the year before, and results from both an increase in EEA joiners compared with 2016 (16 additional joiners equivalent to a 76.2% y/y growth) and a drop in EEA leavers (13 fewer leavers, equivalent to a 35.1% decrease).[44]

[43] It is important to bear in mind that these are small sample sizes, so that it is not surprising to observe a large amount of variability in percentage terms from year to year. However the patterns observed – a decrease in EEA joiners and an increase in EEA leavers – are consistent with those in regions with larger samples.
[44] The same caveat as in footnote 6 applies here.

Figure 47. HCSC Doctors in NHS England: Joiners and Leavers by Nationality and HEE Region (headcounts), Q2 2017 vs Q2 2016



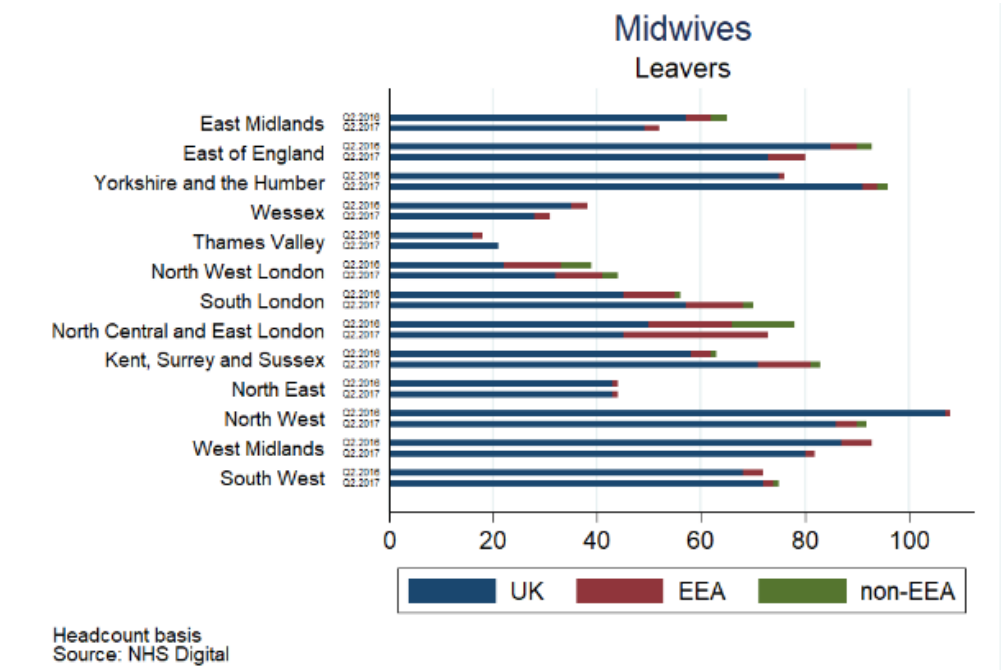


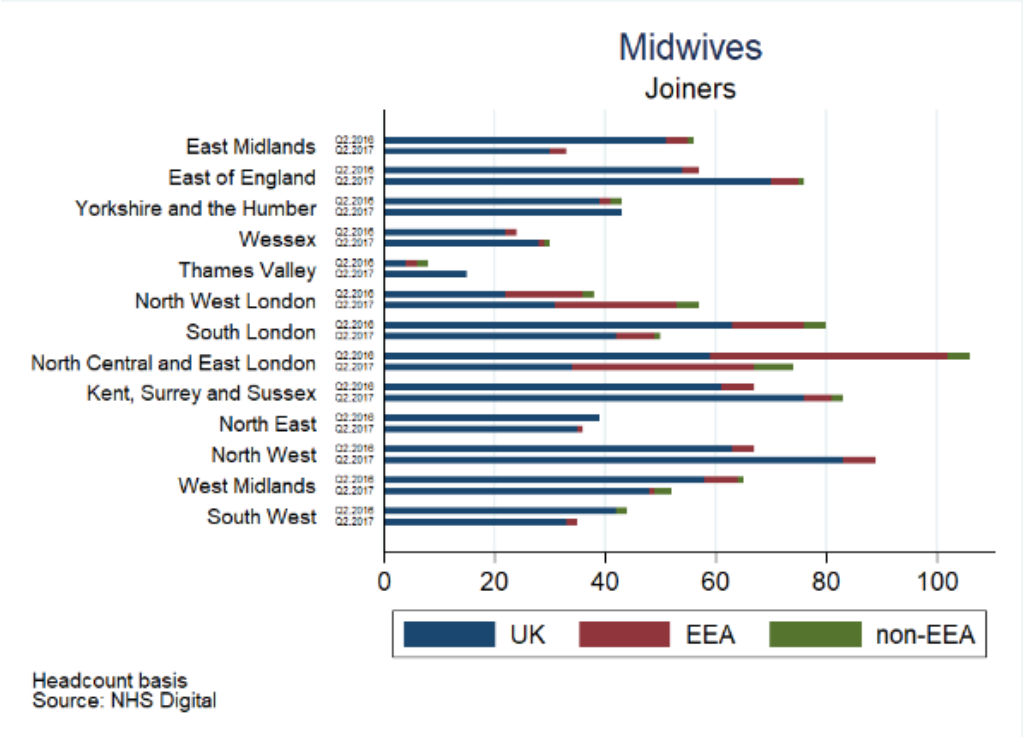
Midwives

The size of the midwifery workforce in the NHS is much smaller than that of other occupational groups, with nearly 24,000 midwives in total, and 6% of these reporting an EEA nationality (Figure 48). In this sense, the dynamics of EEA joiners and leavers are quite modest for most of the HEE regions, with quarterly net inflows or outflows of 5 people or less. The exception is London, where as mentioned before, up to one fifth of the midwifery NHS staff are EEA nationals.

Between April and June 2017 there was a net inflow of 14 midwives with an EEA nationality into the NHS of the three London HEE regions. However, this inflow of midwives to London is lower than the net inflow of 33 reported for the same quarter of 2016, explained by both a decrease in joiners (11.4% y/y) and an increase in leavers (29.7% y/y).[45]

Figure 48. Midwives in NHS England: Joiners and Leavers by Nationality and HEE Region (headcounts), Q2 2017 vs Q2 2016





[45] Again, some caution is warranted when relying on such small sample sizes. However, these trends within London are consistent with trends across England and across other occupational groups in London.

Nurses and health visitors

In the second quarter of 2017, a net outflow of 600 nurses and health visitors with an EEA nationality was reported (Figure 49). This figure contrasts starkly with the net inflow of over 100 EEA workers for these occupations during the same period of 2016.

Among the different HEE regions, the most important net outflows of EEA nurses and health visitors between April and June 2017 were registered in the East of England and in Kent, Surrey and Sussex; with around 100 net leavers from EEA countries.

In the East of England around 83 nurses and health visitors with an EEA nationality joined the NHS during 2017 (Q2), 51.5% fewer than in 2016 (Q2). Moreover, 174 nurses with an EEA nationality left the NHS, 23.4% more than the 2016 figure.

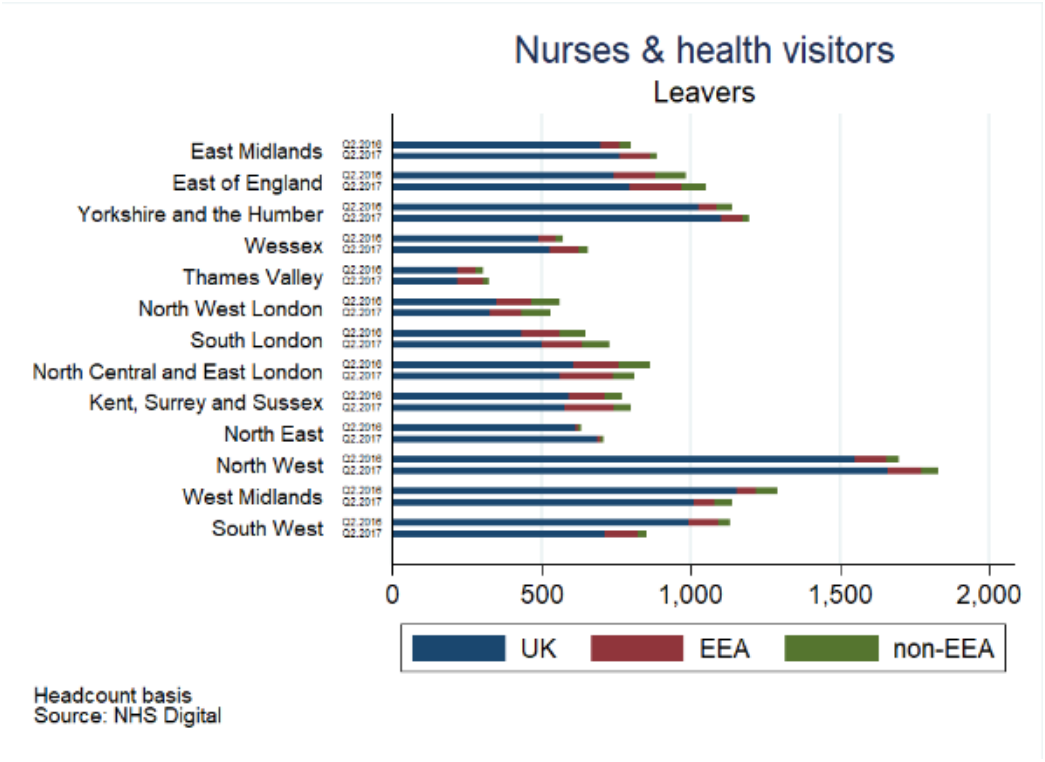
Similarly, in Kent, Surrey and Sussex, 74 nurses with an EEA nationality joined the NHS during the second quarter of 2017, 54.3% fewer than in 2016. Also, 165 EEA nurses and health visitors left the NHS in this region, which represented an annual increase of 37.5% compared with the 2016.

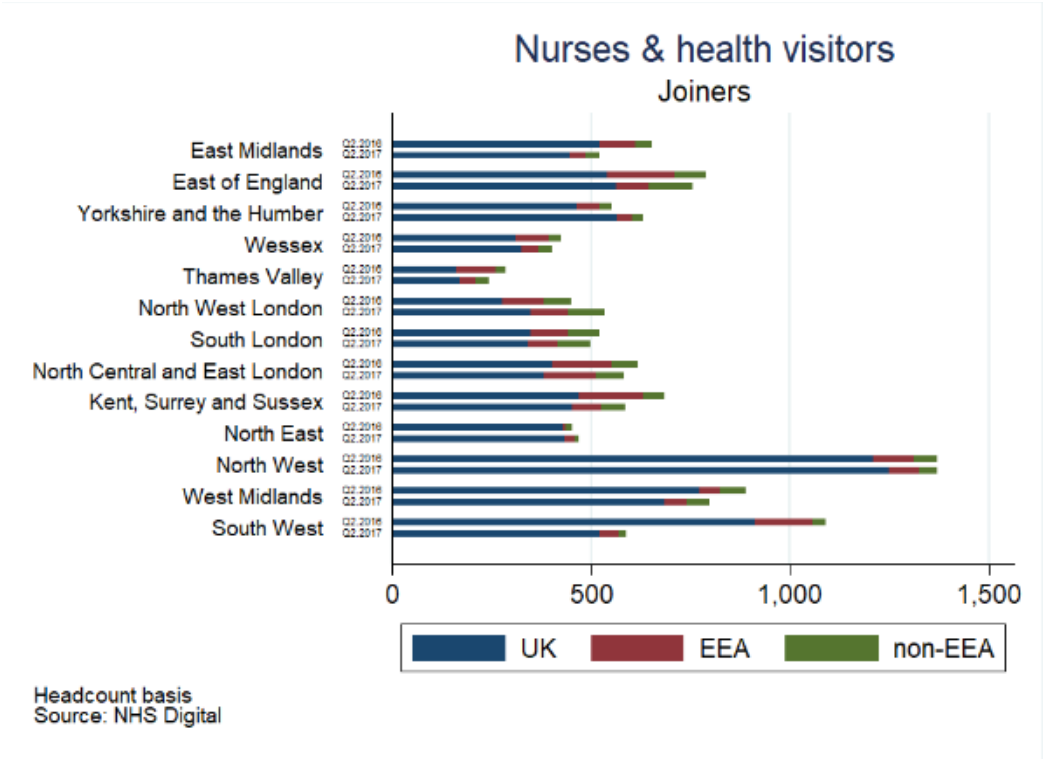
In London, a total net outflow of over 100 EEA nurses and health visitors was registered for the three HEE regions between April and June 2107. In this period and area, about 300 nurses with EEA nationality joined the NHS, 14.4% less than those that joined during the same quarter of 2016. At the same time, about 400 nurses and health visitors nationals from the EEA left the NHS in London, equivalent to a 7.7% y/y increase in leavers.

The North East of England was the only region to report a net inflow of nurses and health visitors with an EEA nationality for the second quarter of 2017. The numbers are very small, however, with a net inflow of 14 EEA nurses, driven mainly by an increase in the number of joiners from 6 to 26 between Q2 2016 and Q2 2017.[46]

[46] Again, caution is warranted when interpreting data from such small sample sizes.

Figure 49. Nurses and health visitors in NHS England: Joiners and Leavers by Nationality and HEE Region (headcounts), Q2 2017 vs Q2 2016



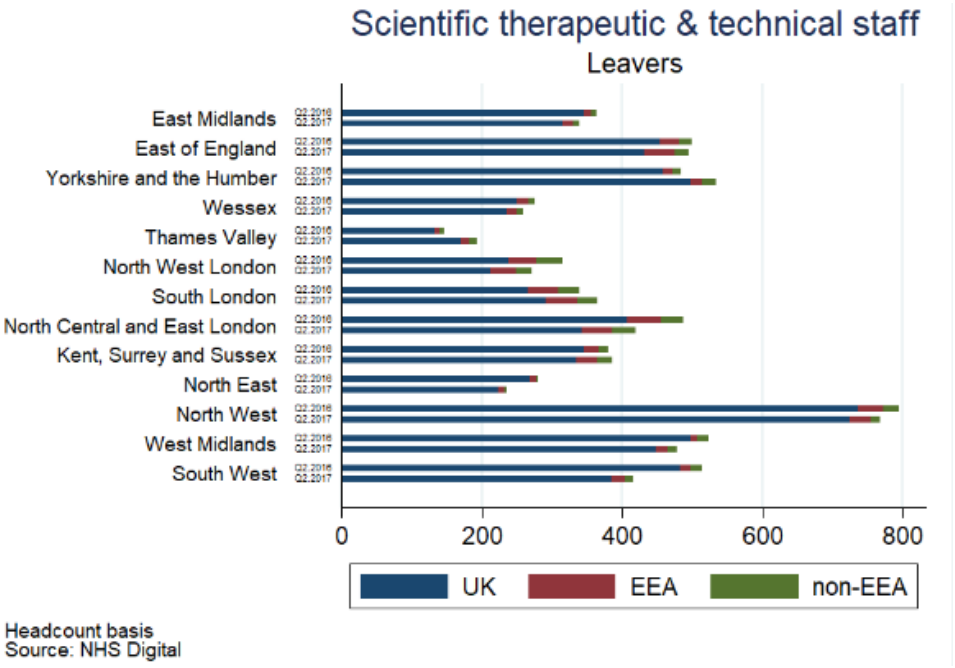


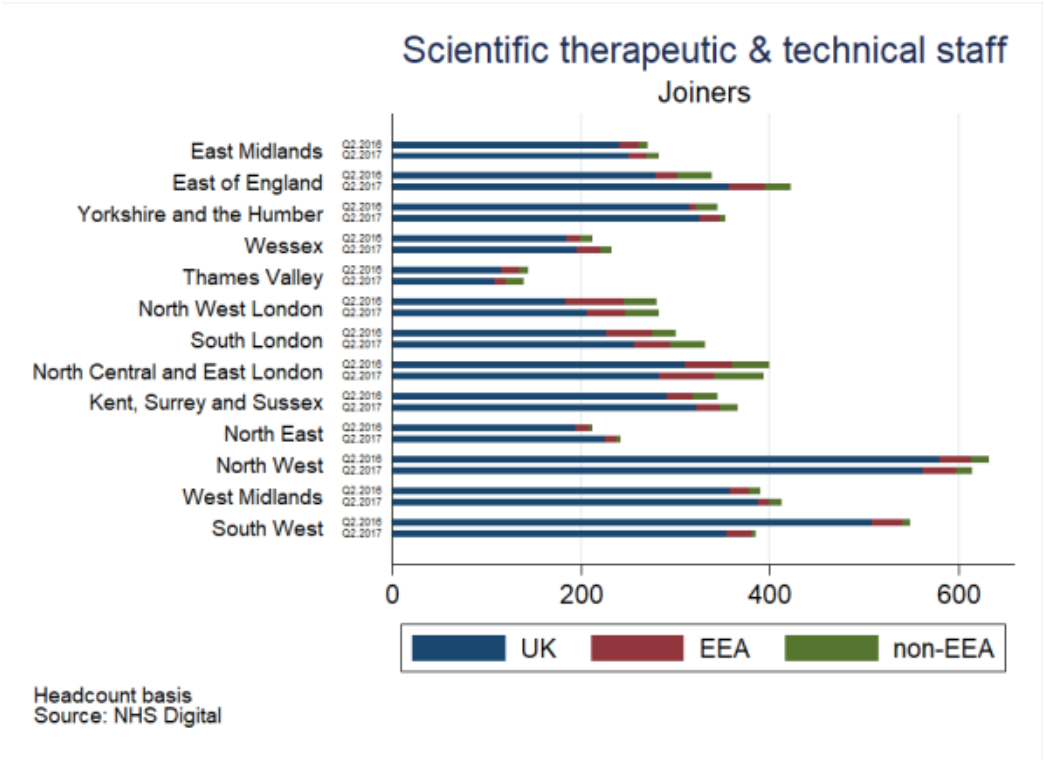
Scientific, therapeutic & technical staff

Compared with other job roles, the shares of EEA nationals in scientific, therapeutic and technical staff is relatively low. Likewise, looking at data for the entire country, the annual change of EEA joiners between Q2 2017 and Q2 2016 was below 3% while the increase of total EEA leavers was around 13% (Figure 50).

In general, the sample sizes are too small to draw reliable conclusions about the changes in job flows at a regional level for scientific, therapeutic and technical staff. We include the tables for information only.

Figure 50. Scientific, therapeutic and technical staff in NHS England: Joiners and Leavers by Nationality and HEE Region (headcounts), Q2 2017 vs Q2 2016





Support to clinical & ambulance staff

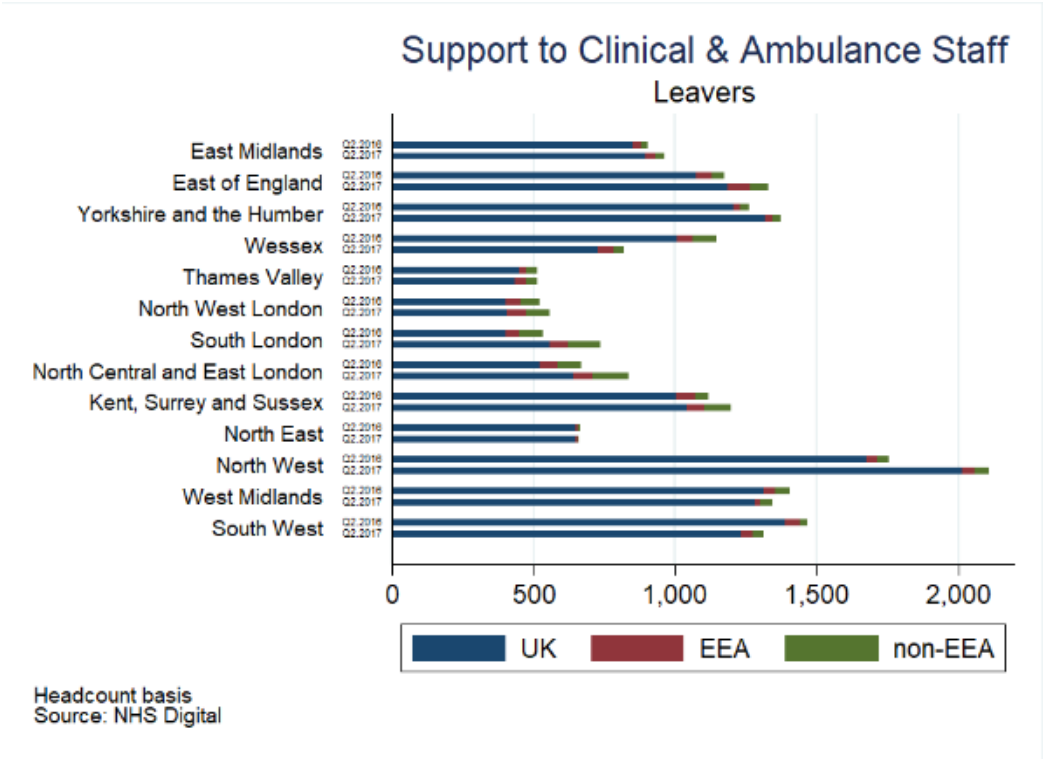
Despite presenting an overall increase in the number of EEA leavers working as support to clinical and ambulance staff in the second quarter of 2017 (11.9% y/y growth), there is still a net number of joiners with an EEA nationality across all the different HEE regions (Figure 51).

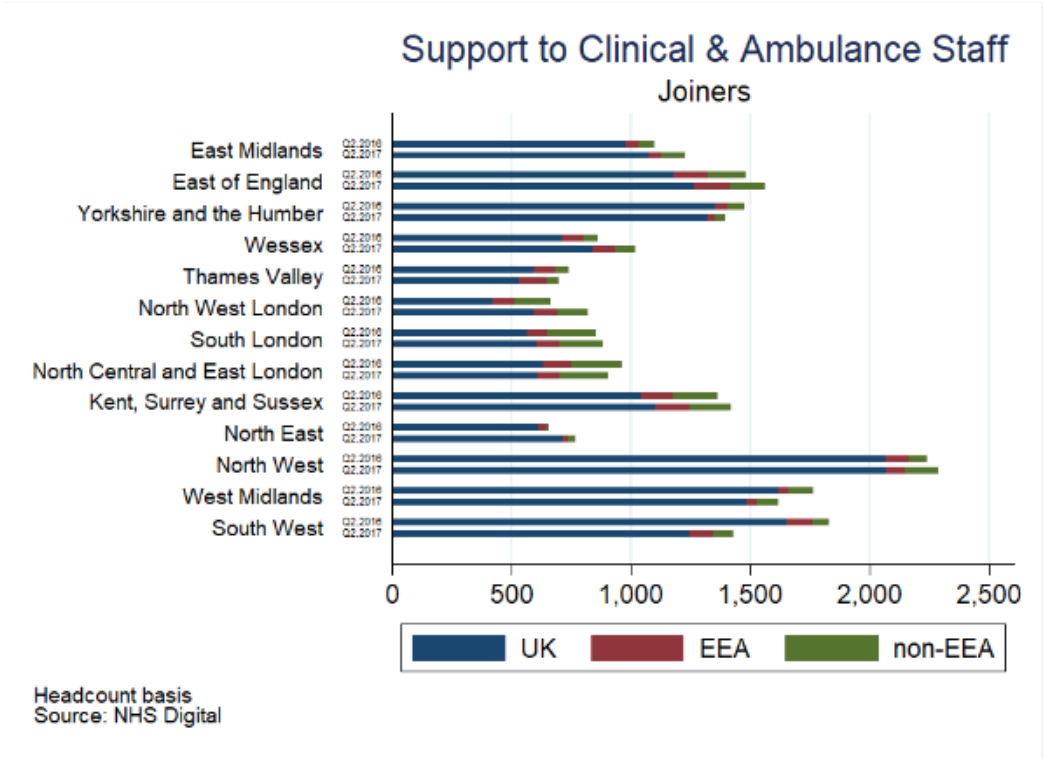
The largest net inflow of EEA nationals performing these jobs was registered in Kent, Surrey and Sussex, with a total of 77 net joiners. The figure is higher than the one from the previous year, and is mainly explained by both an increase in joiners (6.9% y/y) as well as a reduction of leavers (4.6% y/y).[47] A similar net inflow was reported in the East of England, with a total of 70 net joiners with an EEA nationality. However, in this case there was a reduction in the net inflow of EEA nationals of 18.5%, mainly due to an important increase in the number of leavers (42.9% y/y).

In London, between April and June 2017 the total number of net joiners with an EEA nationality added up to 85, 41.4% lower than the net inflow registered for the same period of 2016. Particularly, an aggregated reduction of 4.3% (Q2 2017 vs Q2 2016) was accompanied by an increase of 29.6% on the number of leavers over the same period.

[47] Again, caution should be exercised due to the relatively small sample sizes, particularly when interpreting these rather small increases in joiners and reductions in leavers.

Figure 51. Support to clinical and ambulance staff in NHS England: Joiners and Leavers by Nationality and HEE Region (headcounts), Q2 2017 vs Q2 2016





Infrastructure support

Between April and June 2017 the net inflow of EEA staff working in infrastructure support roles totalled 73 people, 68.0% below the net inflow reported over the same period of the previous year (Figure 52).

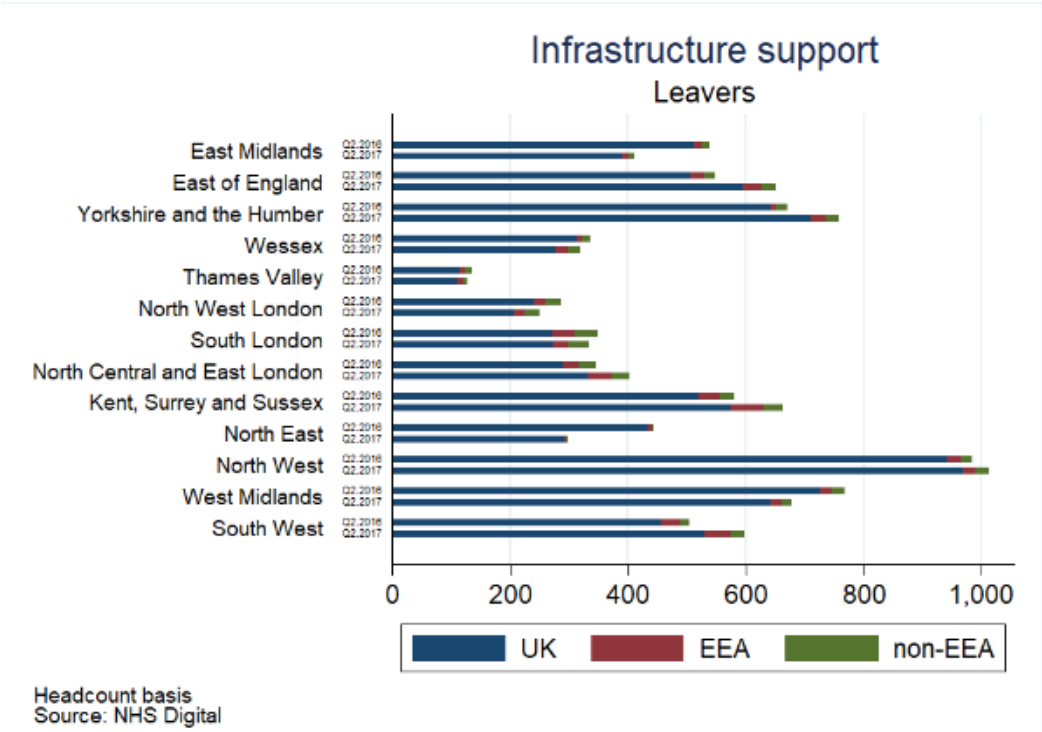
With the exception of the East Midlands and the North East, all of the other HEE regions registered a decline in the number of net joiners of EEA infrastructure support workers, turning in some cases into a net outflow figure.

The East of England registered one of the largest drops in terms of EEA workers (net joiners), were the net inflow of EEA infrastructure support staff went from 80 in 2016 (Q2) to only 8 in 2017 (Q2), which implies a reduction of 88.8% net EEA joiners for this region and occupation group. While in the second quarter of 2016 the East of England had by far the largest number of net joiners with an EEA nationality working as infrastructure support staff, by 2017 (Q2) the highest inflow of EEA workers was reported in Kent Surrey and Sussex, with a total of 16 net EEA joiners. However, also in this region the net inflow was inferior than the one registered the year before, specifically, 61.9% lower. For both regions, the changes were explained by a decrease of EEA joiners (especially in the East of England) and an increase of over 30% in the number of EEA leavers.[48]

In London, the total number of joiners with an EEA nationality was almost the same of the one of leavers for the three HEE regions (around 90 in total), which resulted in a modest net inflow of only 2 workers between April and June 2017. This figure represents only one tenth of the net inflow registered in the year before (20 net EEA joiners in Q2 2016).

[48] Once again, these are relatively small sample sizes, so caution should be exercised when interpreting these figures.

Figure 52. Infrastructure support staff in NHS England: Joiners and Leavers by Nationality and HEE Region (headcounts), Q2 2017 vs Q2 2016



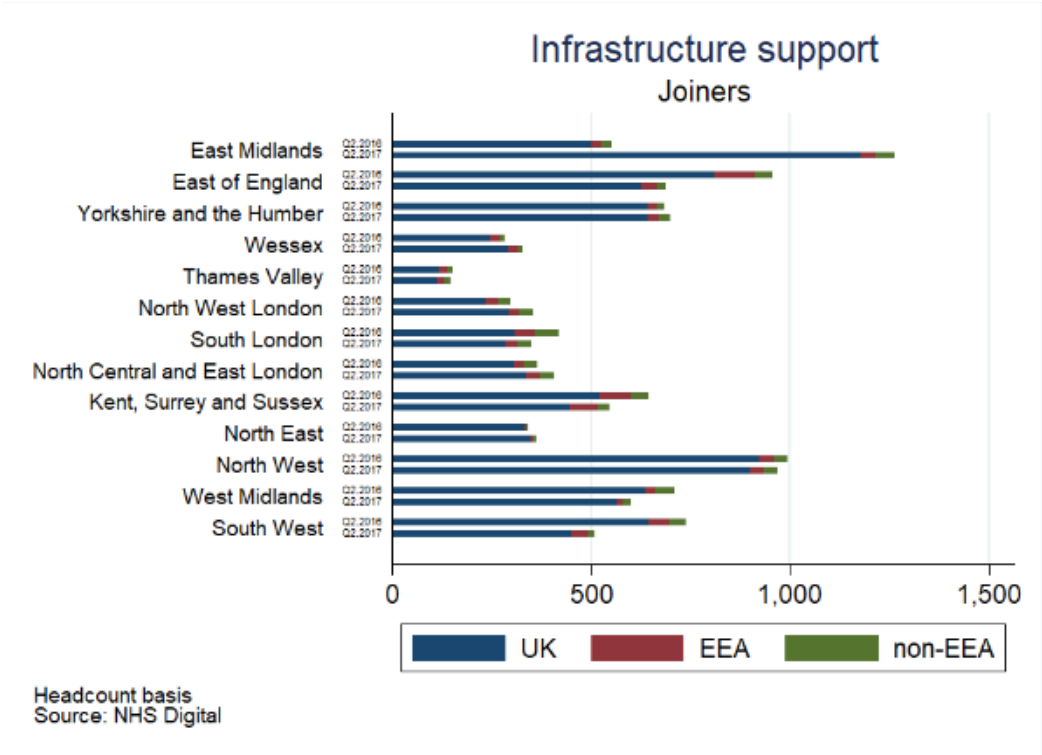


Table 29. Joiners and leavers in the NHS in England workforce, Q3-2015 to Q2-2017.

		Q3-2015	Q4-2015	Q1-2016	Q2-2016	Q3-2016	Q4-2016	Q1-2017	Q2-2017	Q3-2015 to Q2-2016	Q3-2016 to Q2-2017
Total staff (joiners)	UK	47,718	35,117	34,406	33,297	50,264	36,915	37,530	33,401	150,538	158,110
	EEA	5,033	4,615	4,956	3,946	4,909	3,798	4,312	3,253	18,550	16,272
	Non-EEA	4,331	3,619	4,369	3,569	4,903	4,017	4,458	3,668	15,888	17,046
	Unknown	3,509	3,127	2,187	4,176	3,248	2,153	2,326	2,531	12,999	10,258
	All	**60,591**	**46,478**	**45,918**	**44,988**	**63,324**	**46,883**	**48,626**	**42,853**	**197,975**	**201,686**
Total staff (leavers)	UK	40,899	32,684	30,488	35,869	42,050	36,286	31,272	35,957	139,940	145,565
	EEA	3,291	2,689	2,500	2,903	3,891	3,324	2,872	3,348	11,383	13,435
	Non-EEA	3,577	2,760	2,609	2,518	3,676	2,828	2,585	2,602	11,464	11,691
	Unknown	3,254	2,807	2,555	3,153	3,030	2,799	2,176	2,516	11,769	10,521
	All	**51,021**	**40,940**	**38,152**	**44,443**	**52,647**	**45,237**	**38,905**	**44,423**	**174,556**	**181,212**
Total staff (net)	UK	6,819	2,433	3,918	-2,572	8,214	629	6,258	-2,556	10,598	12,545
	EEA	1,742	1,926	2,456	1,043	1,018	474	1,440	-95	7,167	2,837
	Non-EEA	754	859	1,760	1,051	1,227	1,189	1,873	1,066	4,424	5,355
	Unknown	255	320	-368	1,023	218	-646	150	15	1,230	-263
	All	**9,570**	**5,538**	**7,766**	**545**	**10,677**	**1,646**	**9,721**	**-1,570**	**23,419**	**20,474**
Doctors (joiners)	UK	9,707	2,260	2,500	1,972	9,701	2,395	2,956	2,151	16,439	17,203
	EEA	1,239	601	680	480	1,312	611	675	446	3,000	3,044
	Non-EEA	1,611	851	932	742	1,879	1,063	1,186	862	4,136	4,990
	Unknown	578	181	159	161	563	159	193	225	1,079	1,140
	All	**13,135**	**3,893**	**4,271**	**3,355**	**13,455**	**4,228**	**5,010**	**3,684**	**24,654**	**26,377**
Doctors (leavers)	UK	8,571	2,546	3,266	2,674	7,901	2,786	3,035	2,617	17,057	16,339
	EEA	1,030	454	552	516	1,037	505	534	544	2,552	2,620
	Non-EEA	1,395	634	768	622	1,410	725	721	691	3,419	3,547
	Unknown	357	163	196	187	326	186	180	150	903	842
	All	**11,353**	**3,797**	**4,782**	**3,999**	**10,674**	**4,202**	**4,470**	**4,002**	**23,931**	**23,348**
Doctors (net)	UK	1,136	-286	-766	-702	1,800	-391	-79	-466	-618	864
	EEA	209	147	128	-36	275	106	141	-98	448	424
	Non-EEA	216	217	164	120	469	338	465	171	717	1,443
	Unknown	221	18	-37	-26	237	-27	13	75	176	298
	All	**1,782**	**96**	**-511**	**-644**	**2,781**	**26**	**540**	**-318**	**723**	**3,029**
Nurses (joiners)	UK	8,162	8,128	7,309	6,814	8,944	8,212	8,215	6,481	30,413	31,852
	EEA	1,413	1,774	1,662	1,315	1,245	1,033	1,178	823	6,164	4,279
	Non-EEA	635	722	824	646	692	726	698	666	2,827	2,782
	Unknown	516	827	500	617	504	433	412	381	2,460	1,730
	All	**10,726**	**11,451**	**10,295**	**9,392**	**11,385**	**10,404**	**10,503**	**8,351**	**41,864**	**40,643**
Nurses (leavers)	UK	8,562	8,958	7,607	9,469	8,903	9,612	7,788	9,437	34,596	35,740
	EEA	1,025	1,111	915	1,179	1,322	1,406	1,120	1,424	4,230	5,272
	Non-EEA	812	872	704	746	748	767	651	646	3,134	2,812
	Unknown	774	727	667	807	727	703	530	641	2,975	2,601
	All	**11,173**	**11,668**	**9,893**	**12,201**	**11,700**	**12,488**	**10,089**	**12,148**	**44,935**	**46,425**
Nurses (net)	UK	-400	-830	-298	-2,655	41	-1,400	427	-2,956	-4,183	-3,888
	EEA	388	663	747	136	-77	-373	58	-601	1,934	-993
	Non-EEA	-177	-150	120	-100	-56	-41	47	20	-307	-30
	Unknown	-258	100	-167	-190	-223	-270	-118	-260	-515	-871
	All	**-447**	**-217**	**402**	**-2,809**	**-315**	**-2,084**	**414**	**-3,797**	**-3,071**	**-5,782**

Source: NIESR calculations based on NHS Digital data

Appendix D. Qualitative research: Methods and additional findings

The research also included a small qualitative component consisting of focus groups involving 34 representatives of a range of health and social care occupations. The purpose of this stage of the research was to understand how in practice migration from the EU meets the staffing needs of the health and social care sector. A further objective was to identify early impacts of the vote to leave the EU in the supply of staff, and the sectors' responses.

Taking a longer view, the focus groups also explored the scope for increasing the domestic recruitment supply. Finally, the groups explored a range of possible post-Brexit immigration policies and how these might meet the sectors' needs.

Specific areas of questioning were:

- The place of EU migrants in the workforce: Why recruit EU workers and methods used to recruit
- Early impacts of the EU vote: difficulties recruiting or retaining EU migrants and how employers are responding
- Scope for increasing recruitment from domestic workforce: sources of supply and policy measures to facilitate
- Feasibility of a range of alternative immigration policies

The **social care** focus group was attended by representatives from eight care provider organisations and one association of care providers (total of 12).

The **doctors and dentist** group was attended by representatives of nine organisations working at professional and delivery level, including the BMA, NHS Partners, NHS Employers, Academy of Medical Royal Colleges, Association of Dental Groups, Medical Schools Council and the British Dental Association (total of 9).

The **nursing** focus group was attended by representatives of NHS Employers, NHS Providers, the RCN, NHS Partners, representatives of two healthcare trusts, a private healthcare provider and a trade union (total of 10). The RCN for Wales provided a separate written response to the questions covered in the focus group.

A further group interview was carried out with the Chartered Society of **Physiotherapy** (total of 3).

The focus groups were organised by the Cavendish coalition and facilitated by NIESR, taking place between December 2017 and February 2018. They were digitally recorded, transcribed and analysed using qualitative methods.

Incentivising the domestic workforce and securing immigration routes before and after the UK's departure from the EU

Focus Group Discussion Guide

Timing overview

10:30 – 10.35	Arrival, consent form, tea and coffee
10.35- 10.40	[1] Introductions from NIESR and from Cavendish Coalition
10.40 – 10.50	[2] Introduction from participants on their interest in workforce issues and immigration
10.50-11.10	[3] The place of EU migrants in the workforce: Why recruit EU workers & methods used to recruit
11.10-11.30	[1] Early impacts of the EU vote: difficulties recruiting or retaining EU migrants and how employers are responding
11.30-12.00	[6] Scope for increasing recruitment from domestic workforce: sources of supply and policy measures to facilitate
12.00-12.30	[7] Feasibility of a range of alternative immigration policies

10.30 –10.35	**Arrival, consent form, tea and coffee** Participants to complete consent form
10.35 – 10.40	**[1] Introductions from NIESR and Cavendish Coalition** **Brief project background** Research aims and objectives Place of the focus groups within the research. We are interested in perspective of your organisation and work you are doing on Brexit and immigration. **Housekeeping** The session will be recorded and transcribed. The content will be accessed only by the research team and contributions will be kept anonymous. **Introduction from Cavendish Coalition** – background to the project, plans for

	publication and dissemination
10.40 – 10.50	**[2] Participant introductions** Please introduce yourself, say which organisation you are from and your role. What do you see as the main challenges in relation to Brexit and recruitment?
10.50-11.10	**[3] The place of EU migrants in the workforce: why does the sector recruit EU citizens and what methods are used to recruit?** In what jobs /roles/ specialties are EU citizens employed? Why are EU citizens employed in these roles/jobs/specialties? • Probes: insufficient number of domestic applicants; shortage of suitable skills/aptitude/quality; wage and other expectations of domestic workers To what extent are recruitment problems regional/local? What recruitment methods are used? • Probes: trade press, job sites, adverts, social media, word of mouth, agencies • Which methods are more or less likely to attract EU migrants vs domestic applicants?
11.10–11.30	**[4] What have been the early impacts of the Leave vote?** Has the vote had any impact on the sector's ability to attract, recruit and retain staff? What plans has the sector put in place so far to respond to any reductions in supply of staff? • Probes: discussions to have taken place; conclusions and plans made What do you foresee the impact will be over the next 3-5 years?

11.30 – 12.00	**[6] What is the scope for increasing recruitment from the domestic workforce?** What alternatives does your sector have to recruiting EU migrants? • Probes: domestic workforce as appropriate: older employees, unemployed & inactive people, private practitioners, women returners What measures could the sector take to improve the flow of domestic recruits? • Probes: expand/improve training, improve reward package/contracts, improve working conditions, improve sector image, improve knowledge of sector and opportunities, improve career paths Could any other measures be taken to deal with any skills/labour shortages? • Probes: automation, reorganisation of services…….

12.00- 12.30	**[7] What immigration policies would be feasible for the sector once the UK leaves the EU?**
	
	How important is it for the sector to continue to access EU citizens post-Brexit? Does it accept that there will be some controls?
	
	What controls could the sector work with?
	
	• Probes for highly skilled: expansion of existing Tier 2 or other type of scheme?
	
	• Probes for sectors/occupations not covered by existing Tier 2: Would the following work?
	
	  ○ a sector based scheme
	
	  ○ quotas
	
	  ○ regional quotas
	
	  ○ temporary visas
	
	  ○ job offer before entry to the UK
	
	  ○ Priority to EU citizens or greater parity between EU and non-EU
	
	New immigration policies may place more administration & enforcement responsibilities on employers. What are your expectations, how do you think employers in your sector will cope with new requirements?

Brexit and employment in the social care sector

Recruitment to the social care sector

The sector has historically had recruitment difficulties which are being exacerbated by Brexit. There has been no Brexit committee impact assessment for health or social care, which employers see as reflecting the lack of importance attached to the sector.

Recruitment from inside and outside the EU has been important in meeting skill shortages which have been of long-standing. There are large regional variations in recruitment difficulty and, consequently proportion of migrants in the workforce. The sector sets high standards for recruits, in terms of personal qualities such as empathy and compassion.

There was general agreement that the social care sector needs to be made more attractive to British workers, including young people. Better careers guidance might make young people more likely to consider working in social care at a later stage in their lives, if not as an initial choice of career.

Training

Pay and conditions of employment are two factors which lead to recruitment difficulties. The poor and outdated image of social care work is a further issue. However, lack of clear career pathways is a problem, particularly access to higher level qualifications in social care.

The sector is highly fragmented and consists of a large number of small care homes, as well as large providers. Workforce investment in training and development is restricted by constraints on funding from local authorities. There is poor coordination in training activity, practices are poor in parts of the sector and there are high rates of non-completion of training. Social care providers cannot access publicly funded e learning programmes which would be valuable for the sector.

Brexit impact and response

Employers report increasing difficulty recruiting and retaining staff, particularly European care workers. This was thought to be a consequence in the fall in the value of sterling and value of wages.

Employers report putting more resources into local recruitment than in the past. Some see potential to recruit more older workers and have had some success with targeting this group. Some also see scope to recruit disabled people to parts of the sector and people who have been carers within the family. It was emphasised that the sector needs to recruit people with the right values for care work.

Employers are concerned that immigration policies post-Brexit will be more complex, bureaucratic and costly. All had made Tier 2 applications and did not want to have to increase their use of visas. They are not in favour of a Resident Labour Market test requiring a post to be advertised for 28 days, since posts have to be filled more quickly. The idea that a job offer might have to be made in advance of arrival in the UK was not seen as problematic.

Appendix E. Regression analysis of trends in NHS in England hospital waiting times

Waiting times as a measure of quality

In an early study of the NHS, Culis and Jones (1986, p.250) comment that "*Waiting time matters because the value of the good or service decays the longer it is delivered after order day*". Similarly, in a more recent international review of policy options to reduce waiting times, Kreindler (2010, p.7) states that "*Long waits for medical care are a source of dissatisfaction for patients, the public and policymakers*". Consequently, we use waiting times here as an indicator for the performance of NHS hospitals, which is consistent with past targets set by the NHS itself. However, after continuously failing to meet them they have been largely abolished in June 2015, despite evidence on their effectiveness (Harrison & Appleby, 2009; Propper et al., 2010; Siciliani et al., 2014).[49] The target is still in place for the time that patients spend waiting to start treatment (incomplete pathways), though recently there have been discussions to drop that too. In the present study we do not engage in the debate on optimal waiting times and the association with health outcomes, as this is done elsewhere.[50] For our purpose it suffices to state that patients generally prefer shorter over longer waits, and this preference can be distinguished by the type of treatment that is sought after (Harrison & Appleby, 2009).

In the public health and health economics literature hospital waiting times have been used to study the demand and supply of health services in the NHS (Gravelle et al., 2003; Martin et and Smith, 1999) and general findings suggest that longer waiting times lead to a decrease in demand of services and increase in supply. Waiting times are also the key hospital quality measure in studies on patient choice (Dawson et al., 2007) and hospital competition (Gaynor et al., 2003), in addition to mortality rates. In a comprehensive review of waiting times as a performance measure in the NHS, Godden and Pollock (2009) conclude that while they are the main indicator there are some drawbacks as they cannot capture the access to health care associated with individual need. This is supported by a study by Laudicella et al. (2012) as they can show that socio-economic status is an important factor in access to health care where patients that are worse off in terms of levels of education and income wait longer on average. We need to keep these in mind in the subsequent analysis of waiting for the NHS in the UK.

Data on waiting times

NHS Digital provides a number of different waiting times and it is important to be aware of the differences as only together they can provide a full picture (Table 30). Completed pathways, or

[49] However, while official waiting time decreased initially as the targets were set, the overall waiting time did not as patients waited longer before being included in the waiting list (Marques et al., 2014).

[50] There seems to be some theoretical consensus that waiting times should be reduced to the point where costs exceed benefits (Hurst & Sicialiani, 2003; Schaafsma, 2006) though in practice this point can be difficult to (Harrison & Appleby, 2010). A related question is whether longer waiting times are actually associated with worse health outcomes. There is some evidence that contradict this claim, though re-admission rates can be slightly higher (Moscelli et al., 2016). Others do find some negative effects, though small in magnitude (Nikolova et al., 2016).

inpatient waiting times, show the full waiting times from referral to the start of the treatment. Incomplete pathways show the waiting time of patients before starting treatment, i.e. the 'waiting list'. The difference between both is highlighted by Siciliani et al. (2014) who compare waiting times across OECD countries. They conclude that waiting list times should be preferred to monitor the performance of hospitals as it is a more 'up-to-date' indicator. For patients on the other hand the completed pathways matter more as they are interested in the time it takes until their treatment commences.[51] Other dimensions to consider when looking at waiting times are the considerable differences, not only across specialties and operative procedures, but also hospitals themselves as they matter more than patient characteristics such as age, sex and ethnicity (Dimakou et al., 2009).

Waiting time statistics differ across countries in the UK and hence policies informed by these need to be tailored to the specific country (Godden & Pollock, 2009). Here we focus on data from the NHS in England as this covers the majority of hospitals in the UK and for reasons of data collection mentioned above. The data are available for trusts and CCGs on a monthly basis for the years 2011-2017.[52] Aggregates for England as a whole date back to 2007. Due to the reporting of the data by the NHS in England the data before April 2016 cannot be easily compiled and hence we decided to focus on the period from April 2016 to November 2017. In Table 24 we provide some key definitions of patient pathways that are available in the data. We focus on the mean, median and 95th percentile as they all hold different pieces of information. While the mean and proportion of very long waiters will be more easily understood by the general public, median times should be used for overall representability of the data (Siciliani et al., 2014).

Table 30. Description of different patient pathways in the NHS

Pathway type	Description
Incomplete pathways	Waiting times for patients still waiting to start treatment at the end of the month. Published since August 2007. The NHS standard target is 92% but there are discussions to drop it.
Admitted pathways	Waiting times (total time waited) for patients whose treatment started during the month and involved admission to hospital (until September 2015 adjustments were made to admitted pathways for clock pauses, where a patient had declined reasonable offers of admission and chose to wait longer). The NHS standard target was 90% but this standard was dropped on the 4. June 2015.
Non-admitted pathways	Waiting times (time waited) for patients whose treatment started during the month and did not involve admission to hospital. Published since August 2007. The NHS standard target was 95% but this standard was dropped on the 4. June 2015.

[51] In practice one can also be used to approximate the other (Dixon & Siciliani, 2009).
[52] https://www.england.nhs.uk/statistics/statistical-work-areas/rtt-waiting-times/

Waiting times in the NHS

This section will explore the hospital waiting times based on patient pathways in different UK countries. After looking at general hospital waiting times for patients that are admitted for treatment and those still on the waiting list we will examine AE waiting times. Finally, we conduct a statistical analysis of hospital staff turnover and nationality and hospital waiting times in England.

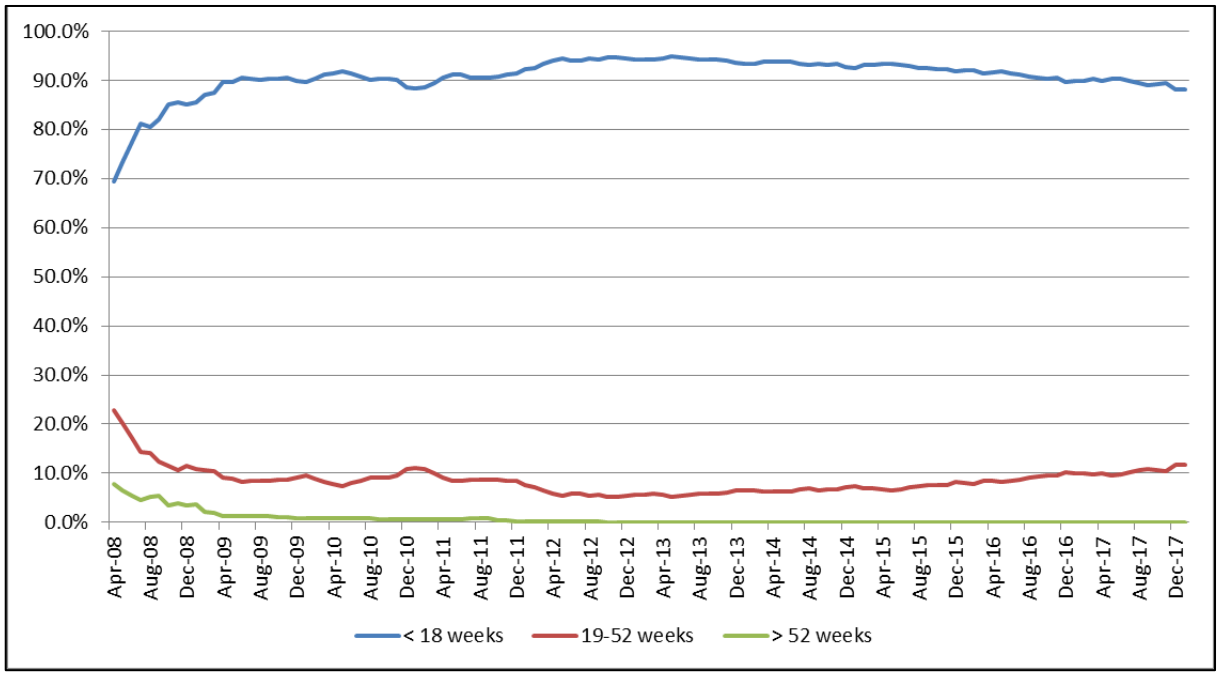
Waiting times in England

NHS England publishes several patient Referral to Treatment (RTT) pathways. Admitted pathways (inpatient waiting times), show the full waiting times from referral to the start of the treatment. The NHS standard target of 90% of patients waiting less than 18 weeks was dropped in June 2015. On the other hand, incomplete pathways show the waiting time of patients before starting treatment, i.e. the 'waiting list' or 'inpatient' waiting times. The official target is to have 92% of patients on the waiting list for less than 18 weeks, though there are discussions to drop it. The difference between both pathways is highlighted by Siciliani et al. (2014) who compare waiting times across OECD countries. They conclude that waiting list times (incomplete pathways) should be preferred to monitor the performance of hospitals as it is a more 'up-to-date' indicator. For patients on the other hand the admitted pathways matter more as they are interested in the time it takes until their treatment commences.[53] Finally there are also non-admitted pathways, referring to the waiting time for patients whose treatment started during the month and did not involve admission to hospital. These are also referred to as outpatients and the official target of 95% of patients seen within 18 weeks has been dropped in June 2015.

In Figure 53 and Figure 54 we plot the incomplete and admitted RTT pathways by different waiting time bands. For incomplete pathways, i.e. the time patients are spending from referral to treatment but before starting treatment, it is clear that the "waiting list" is getting longer in recent years. By January 2018 around 88% of patients started treatment in less than 18 weeks, well below the official target of 92%. In 2013 the share was still above 94%, though it has been steadily declining since then. Regarding admitted pathways, i.e. waiting times of patients that started treatment after all, the picture is similar. In January 2018 the share of patients waiting less than 18 weeks was close to 76% and hence also well below the previous target of 90% which was last met in December 2012. Since then the share was declining continuously and more rapidly since 2015.

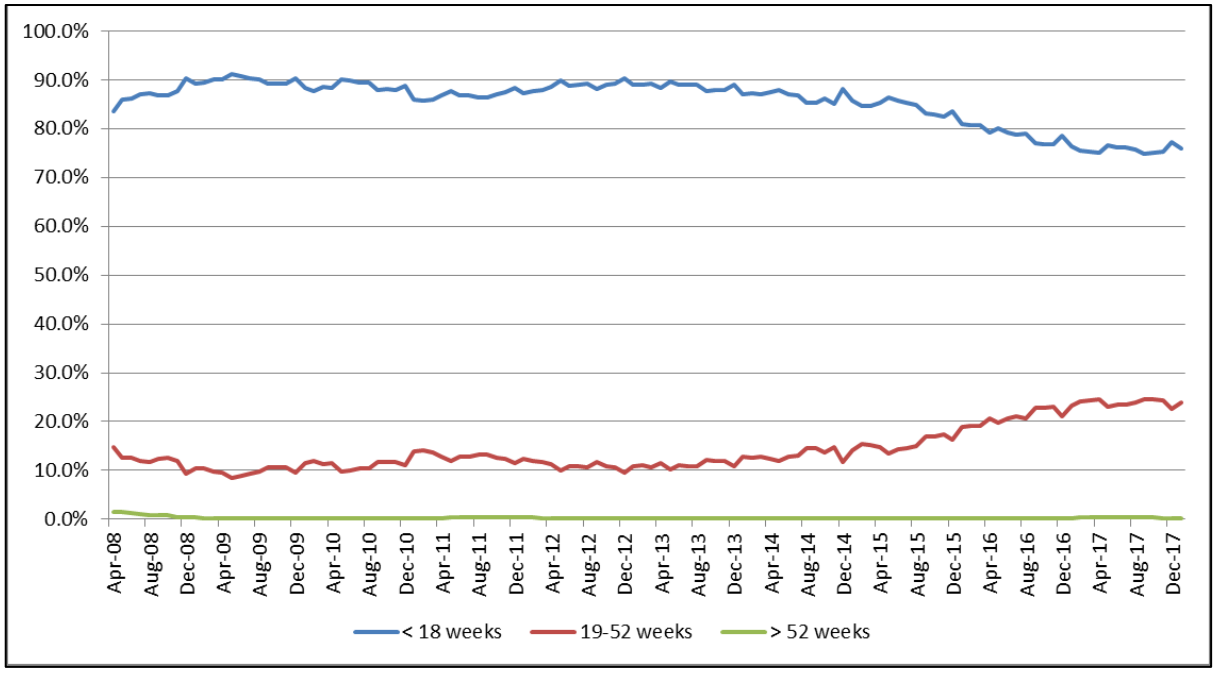
[53] In practice one can also be used to approximate the other (Dixon & Siciliani, 2009).

Figure 53. Incomplete RTT patient pathways, England, Apr 2008 – Jan 2018.



Source: NIESR Calculations based on NHS Digital data, 2018

Figure 54. Admitted RTT patient pathways, England, Apr 2008 – Jan 2018.



Source: NIESR Calculations based on NHS Digital data, 2018

Waiting times in Scotland

NHS Scotland publishes an 18 weeks RTT standard that measures the time between referral and treatment. This includes admitted (inpatient) as well as non-admitted (outpatient) treatment. Hence it is not directly comparable to the admitted RTT used in England. The Scottish government introduced a target of keeping 90% of patients below 18 weeks in January 2012 and it continues to apply. However, by December 2017 only around 82.5% of patients were seen with 18 weeks, representing a steady decline since June 2012 (Figure 55). The last time this target was met was in June 2014. When looking at admitted RTT pathways only as in Figure 56 we can see that also the share of these has been decreasing drastically since 2016 particularly to 74.3% in quarter 4 of 2017.[54] Note that the measure here looks at RTT within 12 weeks.

Figure 55. Share of patients below 18 week RTT target, Scotland, Jan 2011 – Dec 2017.

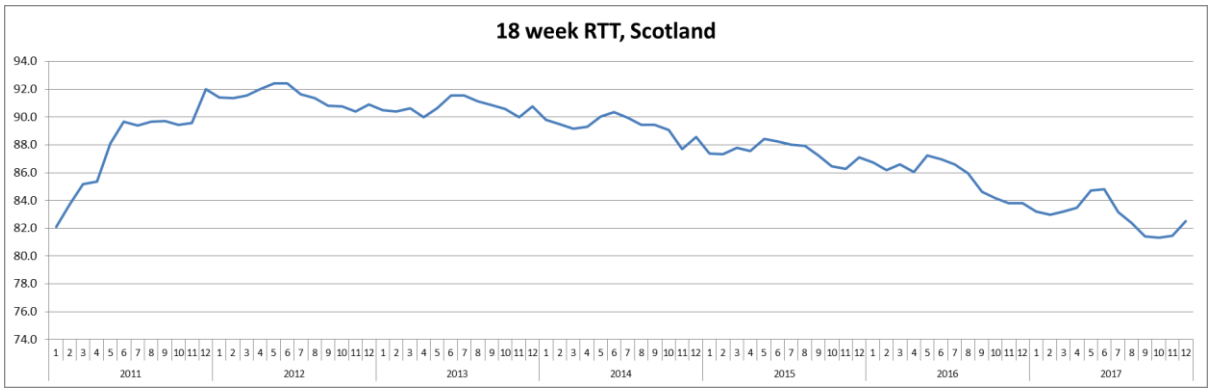
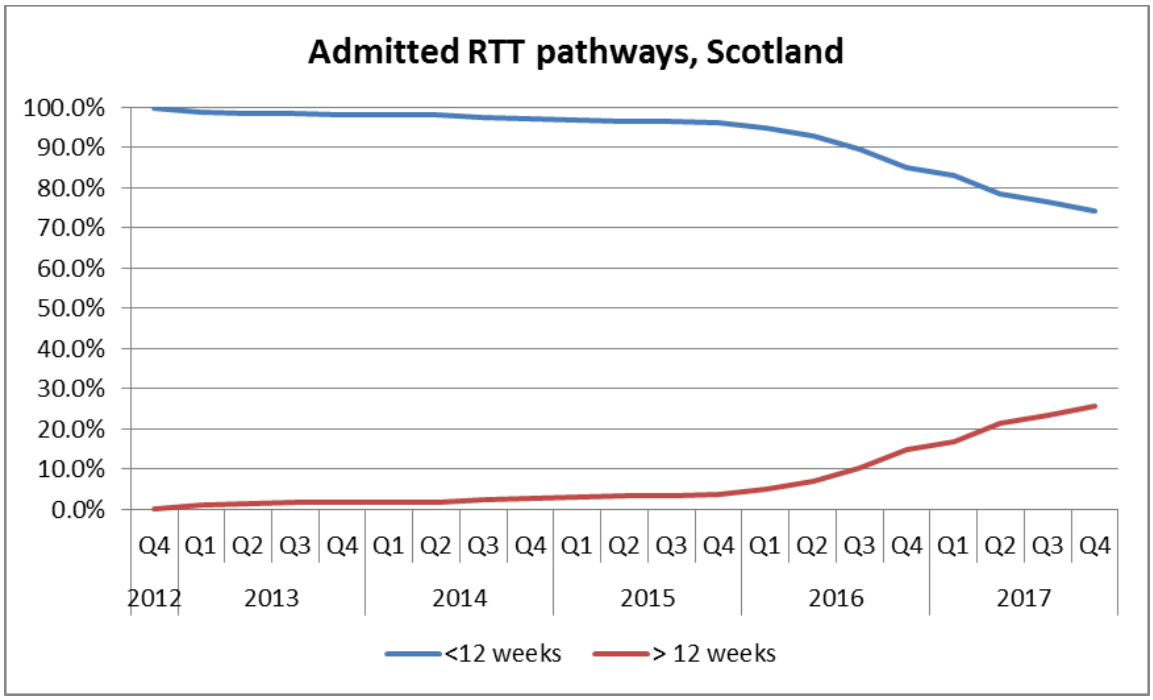


Figure 56. Admitted RTT pathways, % within 12 weeks. Scotland, Q4 2012 – Q4 2017.



[54] Data are provided by the Information Services Division (ISD) of NHS Scotland.

Waiting times in Wales

NHS Wales publishes monthly figures on the number of patients that are waiting to start treatment (pathways open) and the number of patient pathways closed. The latter includes patient pathways treated, patient pathways who no longer wanted to be seen and deceased patient pathways, but excludes closed patient pathways with unknown treatment start date. Data are available between September 2012 and December 2017.

In 2017, 86% of patients waited up to 26 weeks (i.e. 6 months) to start treatment, as shown in Table 31a. Almost 10% waited between 26 and 36 weeks and the remaining 4% even more than that. Figure 57 shows that the share of patients that are starting treatment within 26 weeks has been declining steadily since 2012. Conversely, the number that wait longer has increased. In 2012 on average 92.4% of patients waited less than 26 weeks, so 6.5 percentage points more than in December 2017. Similarly, while in 2012 only 0.9% of patients had to wait more than 36 weeks, this figure has since increased to 4.4%.

When we examine the percentage of closed patient pathways in Figure 58 and Table 31b a similar pattern of longer waiting times arises. Overall in 2017 76.5% of pathways were closed in 6 months, down from 82.3% in 2012.

Figure 57. Percentage of patient pathways waiting to start treatment by month and grouped weeks, Wales. Source: NHS Wales Informatics Services (NWIS)

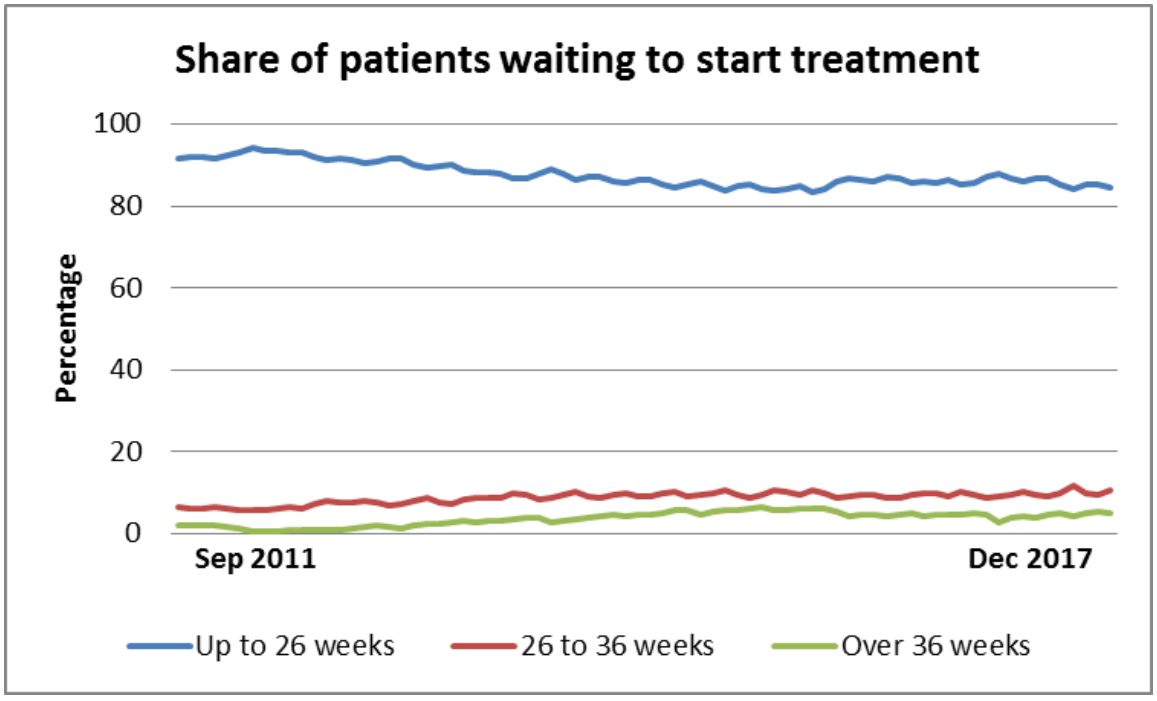


Table 31a. Percentage of patient pathways waiting to start treatment, average by year, Wales. Source: NHS Wales Informatics Services (NWIS)

	2012	2013	2014	2015	2016	2017
Up to 26 weeks	92.40%	89.40%	86.80%	84.50%	86.00%	85.90%
26 to 36 weeks	6.70%	8.10%	9.20%	9.70%	9.30%	9.70%
Over 36 weeks	0.90%	2.50%	4.00%	5.70%	4.60%	4.40%
	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Figure 58. Percentage of patient pathways closed by month and grouped weeks, Wales. Source: NHS Wales Informatics Services (NWIS)

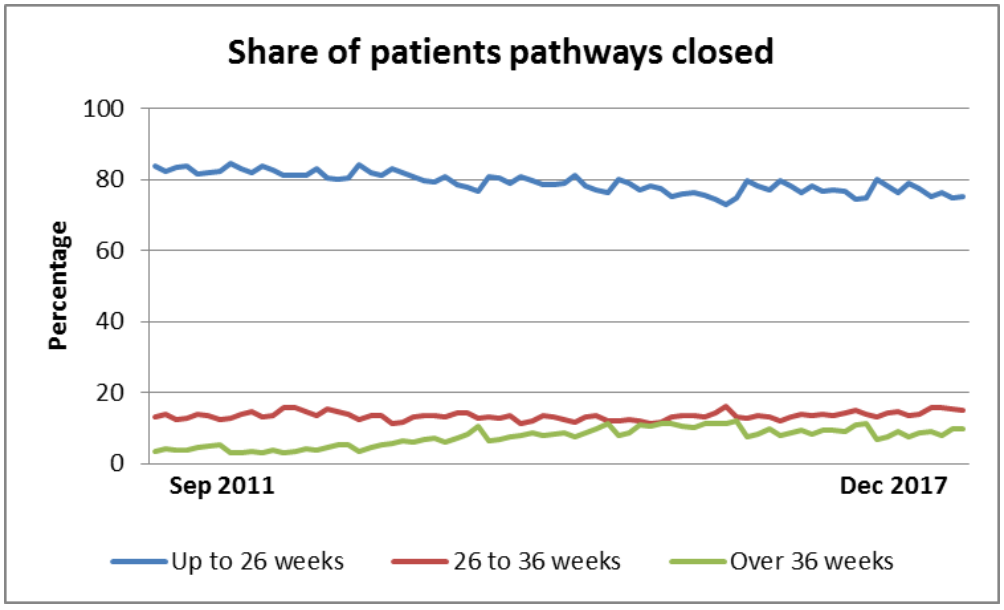


Table 31b. Percentage of patient pathways closed, average by year, Wales. Source: NHS Wales Informatics Services (NWIS)

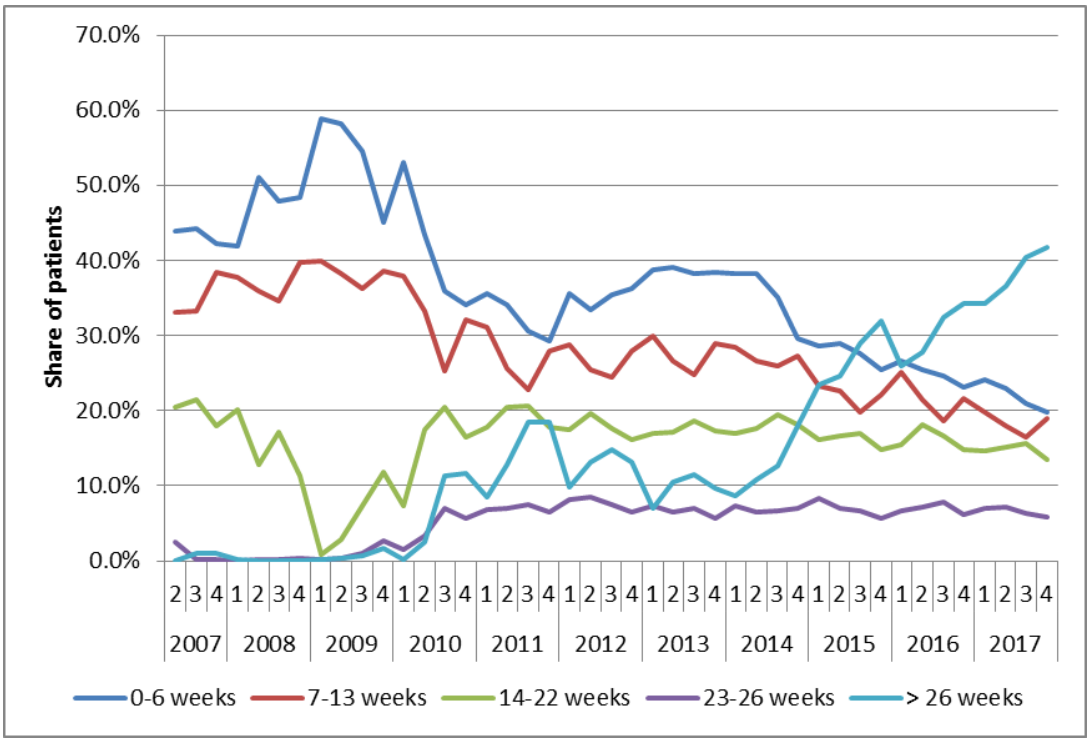
	2012	2013	2014	2015	2016	2017
Up to 26 weeks	82.3%	81.1%	79.2%	77.1%	76.9%	76.5%
26 to 36 weeks	14.0%	13.3%	12.9%	12.7%	13.6%	14.6%
Over 36 weeks	3.7%	5.6%	7.9%	10.2%	9.5%	8.9%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Waiting times in Northern Ireland

Northern Ireland collects and reports data on inpatient and outpatient waiting times.[55] For outpatients the states target is that 50% of patients should not have to wait longer than 9 weeks for their first appointment. For inpatients the country has set the target that 55% of patients should not wait more than 13 weeks for inpatient or day case treatment. At no point should a patient wait more than 52 weeks (12 months) and these targets are to be achieved by March 2018.

Based on data from the Department of Health we can compute the inpatient waiting times by time bands. Based on Figure 59 we can see that the share of patients that is waiting more than 26 weeks (6 months) is increasing for the first time in 2010 from close to 0% of patients to almost 20% in 2011. After a decrease to 10% until mid-2014 the share is rising again consistently until the last quarter in 2017. Most recently it exceeded 40% of patients waiting more than half a year from the date of decision to be admitted to hospital. At the same time the share of patients waiting less than 13 weeks (the official target) is declining from 2010 onwards (Figure 60). While the figure was close to 100% in the beginning 2009 it has declined to 39% by the last quarter of 2017. The current official target (red line in Figure 60) would have been last met in quarter 4 of 2014.[56]

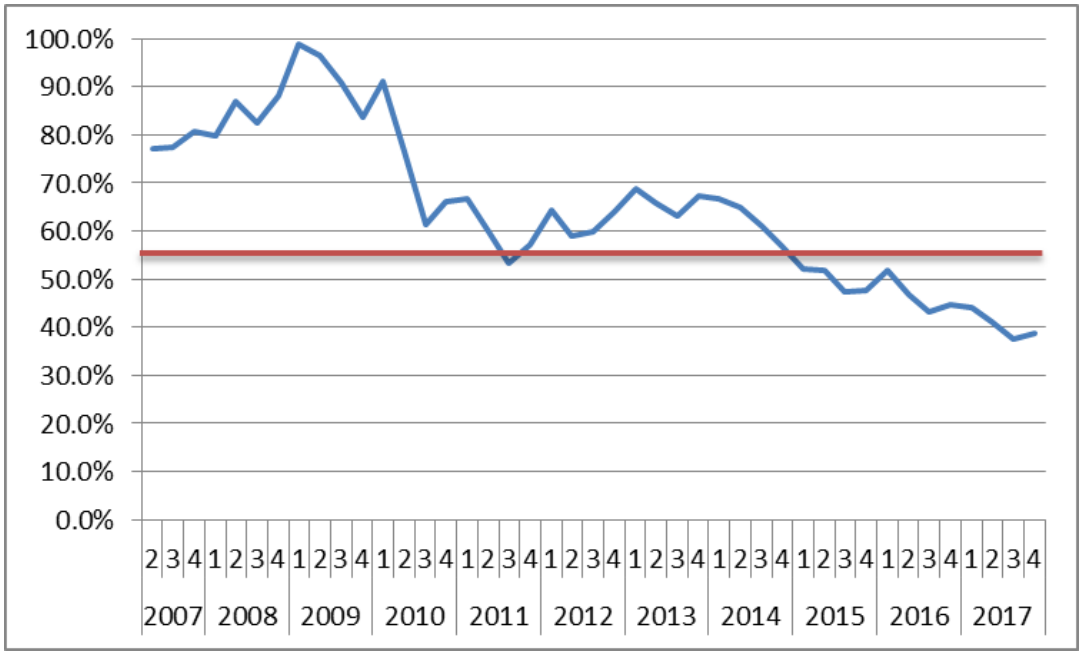
Figure 59. Inpatient waiting times by share of total patients and time bands, Northern Ireland. Source: Calculations based on data from Northern Ireland Department of Health.



[55] Inpatients are patients that are admitted to hospital and require at least 1 overnight stay. It can include day case admissions if the patient needs to stay overnight. Inpatient waiting times start from the day the clinician decided to admit the patient. An outpatient appointment enables a patient to see a consultant or member of their team. Outpatient waiters are still waiting for this first appointment at the end of the quarter. Source: Northern Ireland Department of Health, February 2018.

[56] All underlying data have been computed based on the most recent release of the Northern Ireland Department of Health Inpatient Waiting Times Dataset on the 22nd February 2018 (see Table 32).

Figure 60. Share of inpatients waiting less than 13 weeks for admission to hospital, Northern Ireland. Source: NIESR calculations based on data from Northern Ireland Department of Health.



Notes: Red line indicates 55% target

Table 32. Inpatient waiting times, Northern Ireland. Source: NI Department of Health

		Patient pathways						Share of patient pathways					
Year	Quarter	0-6	7-13	14-21	22-26	>26	Total	0-6	7-13	14-21	22-26	>26	Total
2007	2	15,572	11,759	7,242	870	-	**35,443**	43.9%	33.2%	20.4%	2.5%	0.0%	**100.0%**
	3	15,603	11,742	7,568	60	337	**35,310**	44.2%	33.3%	21.4%	0.2%	1.0%	**100.0%**
	4	16,095	14,623	6,861	82	373	**38,034**	42.3%	38.4%	18.0%	0.2%	1.0%	**100.0%**
2008	1	15,516	13,997	7,425	8	48	**36,994**	41.9%	37.8%	20.1%	0.0%	0.1%	**100.0%**
	2	18,517	13,043	4,658	53	2	**36,273**	51.0%	36.0%	12.8%	0.1%	0.0%	**100.0%**
	3	17,677	12,758	6,347	51	6	**36,839**	48.0%	34.6%	17.2%	0.1%	0.0%	**100.0%**
	4	17,877	14,725	4,209	144	17	**36,972**	48.4%	39.8%	11.4%	0.4%	0.0%	**100.0%**
2009	1	19,233	13,043	280	60	47	**32,663**	58.9%	39.9%	0.9%	0.2%	0.1%	**100.0%**
	2	18,868	12,405	923	98	96	**32,390**	58.3%	38.3%	2.8%	0.3%	0.3%	**100.0%**
	3	17,899	11,891	2,413	328	234	**32,765**	54.6%	36.3%	7.4%	1.0%	0.7%	**100.0%**
	4	16,604	14,194	4,362	1,011	637	**36,808**	45.1%	38.6%	11.9%	2.7%	1.7%	**100.0%**
2010	1	19,109	13,680	2,616	564	72	**36,041**	53.0%	38.0%	7.3%	1.6%	0.2%	**100.0%**
	2	17,724	13,572	7,155	1,400	1,024	**40,875**	43.4%	33.2%	17.5%	3.4%	2.5%	**100.0%**
	3	16,173	11,353	9,216	3,118	5,058	**44,918**	36.0%	25.3%	20.5%	6.9%	11.3%	**100.0%**
	4	17,325	16,288	8,372	2,869	5,915	**50,769**	34.1%	32.1%	16.5%	5.7%	11.7%	**100.0%**
2011	1	18,826	16,424	9,463	3,645	4,522	**52,880**	35.6%	31.1%	17.9%	6.9%	8.6%	**100.0%**
	2	19,307	14,559	11,569	4,007	7,247	**56,689**	34.1%	25.7%	20.4%	7.1%	12.8%	**100.0%**
	3	17,419	12,963	11,809	4,236	10,566	**56,993**	30.6%	22.7%	20.7%	7.4%	18.5%	**100.0%**
	4	16,521	15,781	10,074	3,700	10,394	**56,470**	29.3%	27.9%	17.8%	6.6%	18.4%	**100.0%**
2012	1	18,110	14,610	8,918	4,160	5,031	**50,829**	35.6%	28.7%	17.5%	8.2%	9.9%	**100.0%**
	2	17,626	13,453	10,337	4,491	6,919	**52,826**	33.4%	25.5%	19.6%	8.5%	13.1%	**100.0%**
	3	17,992	12,387	8,993	3,826	7,522	**50,720**	35.5%	24.4%	17.7%	7.5%	14.8%	**100.0%**
	4	18,558	14,299	8,313	3,309	6,732	**51,211**	36.2%	27.9%	16.2%	6.5%	13.1%	**100.0%**
2013	1	18,497	14,316	8,060	3,507	3,309	**47,689**	38.8%	30.0%	16.9%	7.4%	6.9%	**100.0%**
	2	19,324	13,117	8,483	3,201	5,203	**49,328**	39.2%	26.6%	17.2%	6.5%	10.5%	**100.0%**
	3	18,041	11,718	8,777	3,296	5,391	**47,223**	38.2%	24.8%	18.6%	7.0%	11.4%	**100.0%**
	4	18,680	14,078	8,440	2,790	4,685	**48,673**	38.4%	28.9%	17.3%	5.7%	9.6%	**100.0%**
2014	1	18,906	14,079	8,402	3,642	4,312	**49,341**	38.3%	28.5%	17.0%	7.4%	8.7%	**100.0%**
	2	19,295	13,411	8,889	3,250	5,485	**50,330**	38.3%	26.6%	17.7%	6.5%	10.9%	**100.0%**
	3	18,185	13,426	10,085	3,478	6,519	**51,693**	35.2%	26.0%	19.5%	6.7%	12.6%	**100.0%**
	4	16,040	14,776	9,861	3,766	9,766	**54,209**	29.6%	27.3%	18.2%	6.9%	18.0%	**100.0%**
2015	1	16,622	13,532	9,375	4,783	13,622	**57,934**	28.7%	23.4%	16.2%	8.3%	23.5%	**100.0%**
	2	17,455	13,644	10,039	4,212	14,777	**60,127**	29.0%	22.7%	16.7%	7.0%	24.6%	**100.0%**
	3	17,293	12,423	10,657	4,187	18,137	**62,697**	27.6%	19.8%	17.0%	6.7%	28.9%	**100.0%**
	4	17,063	14,850	9,897	3,803	21,413	**67,026**	25.5%	22.2%	14.8%	5.7%	31.9%	**100.0%**
2016	1	18,121	17,101	10,504	4,571	17,601	**67,898**	26.7%	25.2%	15.5%	6.7%	25.9%	**100.0%**
	2	17,842	15,093	12,705	5,076	19,527	**70,243**	25.4%	21.5%	18.1%	7.2%	27.8%	**100.0%**
	3	17,232	13,031	11,623	5,446	22,703	**70,035**	24.6%	18.6%	16.6%	7.8%	32.4%	**100.0%**
	4	16,356	15,303	10,541	4,337	24,245	**70,782**	23.1%	21.6%	14.9%	6.1%	34.3%	**100.0%**
2017	1	17,290	14,156	10,458	5,026	24,553	**71,483**	24.2%	19.8%	14.6%	7.0%	34.3%	**100.0%**
	2	16,686	13,062	11,043	5,165	26,524	**72,480**	23.0%	18.0%	15.2%	7.1%	36.6%	**100.0%**
	3	15,787	12,444	11,821	4,777	30,411	**75,240**	21.0%	16.5%	15.7%	6.3%	40.4%	**100.0%**
	4	15,527	14,910	10,643	4,623	32,737	**78,440**	19.8%	19.0%	13.6%	5.9%	41.7%	**100.0%**

Statistical analysis of waiting times and nationality of hospital staff

Summary of results

Our analysis of the underlying aggregate workforce data suggests that there have been systematic increases in EEA staff turnover, especially among nurses in the last 6 quarters. It would also seem as if there is considerable geographical variation in this turnover.

We have also found that the data available to us on patient outcomes suggests that there has been a deterioration of service to patients at least with respect to patient waiting times. It is natural to pose the question whether there may be any link between these two facts. The econometric identification of a 'causal' link between workforce turnover and patient outcomes is somewhat problematic as many factors could be inducing the simultaneous co-movement of the two trends. Nonetheless, exploiting the geographical variation of around 200 health trusts over 9 quarters we can investigate this statistical association further.

Crucial to this identification strategy is the assumption that there is no unobserved variation in trust turnover or performance due to systematic trust variability which is correlated with the random error in our model. To this end we control for trust size and overall staff turnover. This arguably enables us to identify the relationship between the share of EU leavers and waiting times over and above that due to regular staff turnover.

It is natural to suggest that if hospital staff are turning over more quickly, then we would expect that patient outcomes would deteriorate. This can be due to logistic, management, and delivery issues associated with the differences in care. This is similar to old staff leaving and new staff arriving, as well as the time taken for the new staff to become familiar with their roles. This effect is captures in the coefficient on turnover. Over and above this effect we are finding an effect from the changing share of EEA workers has an additional negative effect on patient outcomes.

In more detail, our analysis examines the relation between the share of leaving staff that comes from an EU country and the average number of patients that starts treatment within 18 weeks. It is conducted at the level of trusts in the English NHS between Q2-2015 to Q2-2017. The dataset and sources are summarised in Table 33 and the list of variables used is provided in Table 34.

Our analysis suggests that there is a negative and statistically significant association between the share of leaving hospital staff that comes from the EU and the share of patients that commence treatment within 18 weeks. More specifically the findings suggest that a 1 percentage point increase in the share of leaving staff that is from the EU, is associated with a 0.03 to 0.09 percentage point decrease in the number of patients treated within 18 weeks

(Table 35). Considering that for the average NHS trusts in our sample, the share of leavers is 4.82% and the share of patients treated within 18 weeks is 93%, this implies that an increase to 5.82% of EU leavers is related to a decrease of waiting times 92.97% to 92.01%. This appears to be quite small; however we also need to keep in mind that this is calculated for the average trust over the whole period of analysis. In fact, some trusts have a share of 30% of leavers from the EU, while others have none. Also, some trusts treat 100% of patients within 18 weeks and others only 47%.

Further, our findings suggest that this pattern is particularly driven by EU nurses and health visitors that are leaving (Table 37). On the background of the descriptive statistics we have seen in the previous sections this comes as no big surprise. If we only look at doctors the association is not significant for all types of treatments. It does hold if we look at trauma and orthopaedics though (Table 36). This is relevant as it is this specialty which is closest and most comparable to A&E where one might expect the most impact of higher staff turnover.

Econometric robustness

Our regression analysis controls for time-invariant differences between hospitals via fixed effects and we only compute robust standard errors for significance levels. We only include trusts which we observe for a minimum of 2 periods, though our results also hold if we restrict it to trusts for which we observe all periods. To alleviate simultaneity concerns we lag all explanatory variables by 1 quarter (further lags in Table 42). The statistical association furthermore becomes insignificant after 1 or more quarters, suggesting that the leavers from the EU do not have a contemporary effect but that the impact is only on the following quarter.

We further include a full set of time dummies to control for contemporary shocks that affect all trusts. This also controls for the seasonality of the data, across quarters in a given year. Finally, in our main set of regression models presented in Table 35 we also include a full set of patient treatment type dummies (e.g. trauma, cardiology, general surgery – see Table 39) to control for differences across specialties.

Table 33. List and coverage of datasets used in statistical analysis

Dataset	Timeframe	Coverage	Source
Waiting times	**2015 (Q1) – 2017 (Q4)** *Available from Q3-2007* *Available until Q4-2017*	Trusts, by treatment and type of patient pathway	NHS Digital
Joiners & leavers	**2015 (Q2) – 2017 (Q2)** *Available from Q2-2012* *Available until Q4-2017*	Trusts and CCGs, by specialisation and nationality	NHS Digital
Workforce	**2013 (Q4) – 2017 (Q3)** *Available from Q3-2010* *Available until Q1-2018*	Trusts and CCGs, by specialisation	NHS Digital

Table 34. List of variables used in regression analysis

Variable	Dimension	Description
Fraction of patients waiting less than 18 weeks	3 patient pathways 13 treatment types	Fraction of patients that are waiting less than 18 weeks within their pathway and treatment.
Share of leaving staff by nationality	4 nationalities	Share of leaving staff with a specific nationality
Staff turnover	7 staff categories	Share of staff that has left in a quarter over total staff in the same quarter.
Hospital size	13 staff categories	Total staff headcount in different staff categories.

Table 35. Regression results (preferred models). Q3-2015 – Q2-2017

	Complete pathways			Incomplete pathways		
	(1)	(2)	(3)	(4)	(5)	(6)
Share of leavers from EU	-0.0877**	-0.0891**	-0.0898**	-0.0300**	-0.0308**	-0.0326**
	(0.0381)	(0.0381)	(0.0381)	(0.0136)	(0.0135)	(0.0135)
Staff turnover		-0.253***	-0.264***		-0.103**	-0.129***
		(0.0968)	(0.0975)		(0.0401)	(0.0407)
Total employment			-0.00461			-0.0133***
			(0.00513)			(0.00261)
Constant	0.799***	0.808***	0.848***	0.907***	0.910***	1.024***
	(0.0101)	(0.0108)	(0.0450)	(0.00558)	(0.00567)	(0.0228)
Observations	15,168	15,168	15,168	18,596	18,596	18,596
# of panelvar	2,135	2,135	2,135	2,493	2,493	2,493
Hospital fixed effects	YES	YES	YES	YES	YES	YES
Time fixed effects	YES	YES	YES	YES	YES	YES
Specialty fixed effects	YES	YES	YES	YES	YES	YES
Time lag of regressors	1 quarter	1 quarter	1 quarter	1 quarter	1 quarter	1 quarter

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table 36. Regression results (doctors only, impact on trauma & orthopaedics). Q3-2015 – Q2-2017

	Complete pathways			Incomplete pathways		
	(1)	(2)	(3)	(4)	(5)	(6)
Share of leavers from EU	-0.0684*	-0.0617*	-0.0583*	-0.0287*	-0.0274*	-0.0272*
	(0.0348)	(0.0350)	(0.0342)	(0.0165)	(0.0165)	(0.0162)
Staff turnover		0.753***	0.335		0.164	0.0348
		(0.252)	(0.359)		(0.110)	(0.141)
Total employment			-0.251***			-0.0901***
			(0.0959)			(0.0305)
Constant	0.674***	0.645***	2.803***	0.884***	0.878***	1.651***
	(0.00380)	(0.0105)	(0.824)	(0.00175)	(0.00460)	(0.262)
Observations	1,043	1,043	1,043	1,094	1,094	1,094
R-squared	0.004	0.012	0.035	0.004	0.007	0.027
# of panelvar	131	131	131	138	138	138
Hospital fixed effects	YES	YES	YES	YES	YES	YES
Time lag of regressors	1 quarter	1 quarter	1 quarter	1 quarter	1 quarter	1 quarter

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table 37. Regression results (nurses & health visitors only, impact on all treatments). Q3-2015 – Q2-2017

	Complete pathways			Incomplete pathways		
	(1)	(2)	(3)	(4)	(5)	(6)
Share of leavers from EU	-0.164***	-0.165***	-0.152***	-0.0392***	-0.0392***	-0.0362***
	(0.0372)	(0.0373)	(0.0379)	(0.0127)	(0.0127)	(0.0126)
Staff turnover		0.382**	0.194		-0.0403	-0.0822
		(0.177)	(0.226)		(0.0603)	(0.0711)
Total employment			-0.122**			-0.0329*
			(0.0592)			(0.0177)
Constant	0.807***	0.793***	1.828***	0.933***	0.935***	1.212***
	(0.00394)	(0.00708)	(0.503)	(0.00121)	(0.00243)	(0.150)
Observations	1,173	1,173	1,173	1,368	1,368	1,368
R-squared	0.034	0.039	0.053	0.011	0.012	0.019
# of panelvar	147	147	147	171	171	171
Hospital fixed effects	YES	YES	YES	YES	YES	YES
Time lag of regressors	1 quarter	1 quarter	1 quarter	1 quarter	1 quarter	1 quarter

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Figure 61. Scatter plot of share treated within 18 weeks and share of leavers from the EU: trusts by quarter (complete and incomplete pathways), Q2-2015 to Q2-2017

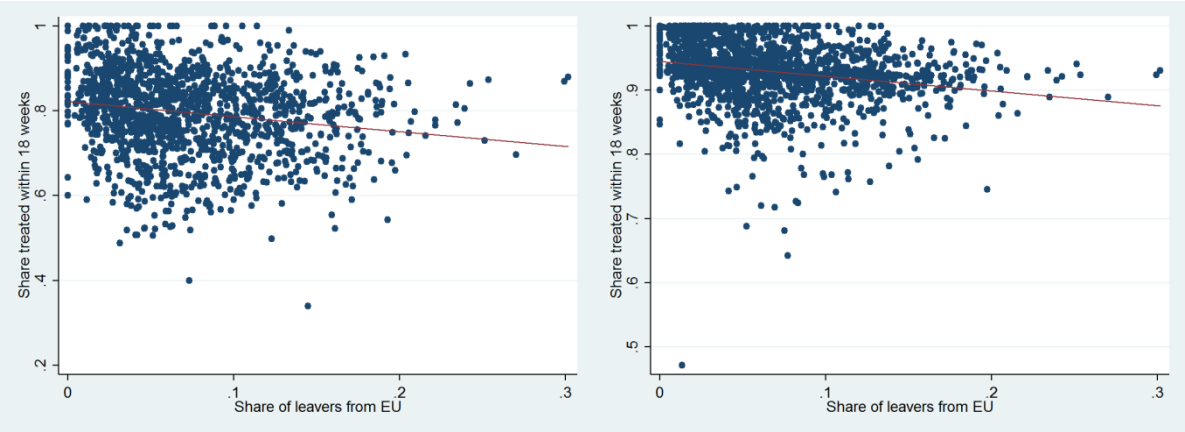


Figure 62. Scatter plot of share treated within 18 weeks and hospital size: trusts by quarter (complete and incomplete pathways), Q2-2015 to Q2-2017

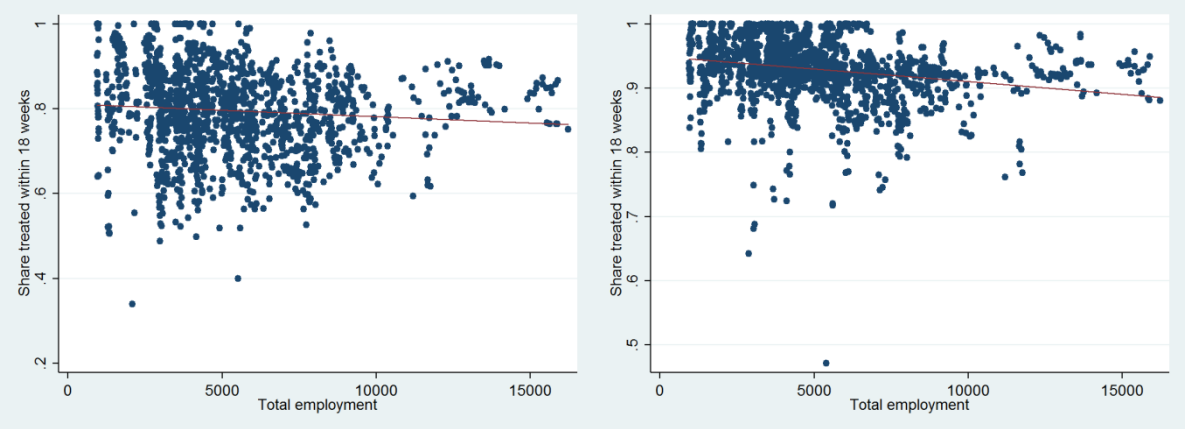


Figure 63. Scatter plot of share treated within 18 weeks and overall staff turnover: trusts by quarter (complete and incomplete pathways), Q2-2015 to Q2-2017

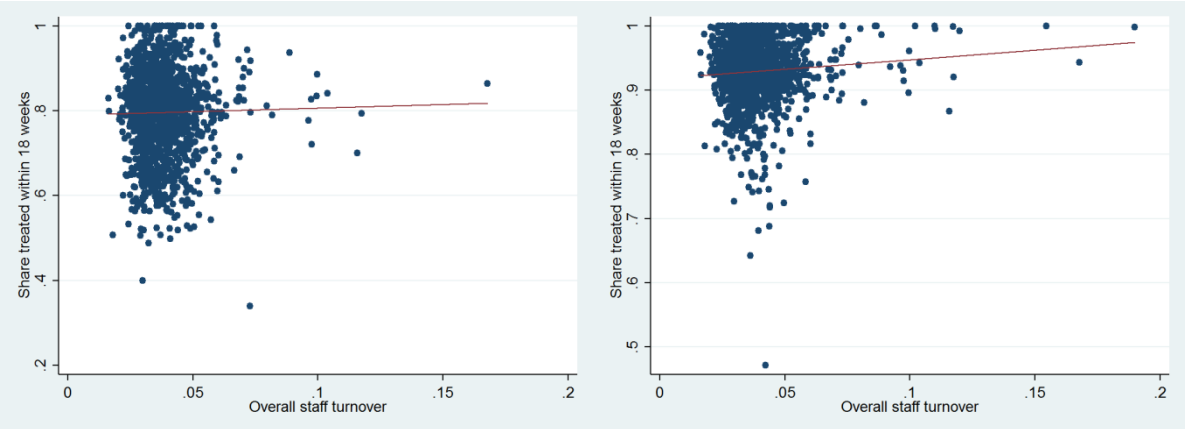


Table 38. Correlation matrix for variables used in regression analysis

		(1)	(2)	(3)	(4)
(1)	Share treated within 18 weeks	1			
(2)	Share of leavers from EU	-0.0771	1		
(3)	Staff turnover	0.0039	0.2656	1	
(4)	Total employment	-0.045	-0.0338	-0.0819	1

Table 39. List of treatments available in waiting times data

Treatment code	Treatment name
C_100	General Surgery
C_101	Urology
C_110	Trauma & Orthopaedics
C_120	ENT
C_130	Ophthalmology
C_140	Oral Surgery
C_150	Neurosurgery
C_160	Plastic Surgery
C_170	Cardiothoracic Surgery
C_300	General Medicine
C_301	Gastroenterology
C_320	Cardiology
C_330	Dermatology
C_340	Thoracic Medicine
C_400	Neurology
C_410	Rheumatology
C_430	Geriatric Medicine
C_502	Gynaecology
C_999	Total
X01	Other

Table 40. Detailed staff occupation categories in joiners-leavers data and workforce data

	Staff category
0	All Staff
1	Ambulance staff
2	Central functions
3	HCHS Doctors
4	Hotel, property & estates
5	Managers
6	Midwives
7	Nurses & health visitors
8	Scientific, therapeutic & technical staff
9	Senior managers
10	Support to ST&T staff
11	Support to ambulance staff
12	Support to doctors, nurses & midwives
13	Other staff or those with unknown classification

Table 41. Regression results (preferred models, showing time dummies). Q3-2015 – Q2-2017

	(1)	(2)	(3)	(4)	(5)	(6)
Share of leavers from EU	-0.0877**	-0.0891**	-0.0898**	-0.0300**	-0.0308**	-0.0326**
	(0.0381)	(0.0381)	(0.0381)	(0.0136)	(0.0135)	(0.0135)
Dummy Q4-2015	-0.0120***	-0.00936***	-0.00925***	-0.00412***	-0.00313***	-0.00290***
	(0.00208)	(0.00232)	(0.00232)	(0.000902)	(0.00103)	(0.00103)
Dummy Q1-2016	-0.0337***	-0.0338***	-0.0337***	-0.00695***	-0.00703***	-0.00692***
	(0.00279)	(0.00279)	(0.00279)	(0.00123)	(0.00123)	(0.00123)
Dummy Q2-2016	-0.0453***	-0.0461***	-0.0460***	-0.00820***	-0.00861***	-0.00840***
	(0.00300)	(0.00301)	(0.00301)	(0.00126)	(0.00124)	(0.00124)
Dummy Q3-2016	-0.0622***	-0.0620***	-0.0618***	-0.0143***	-0.0142***	-0.0138***
	(0.00330)	(0.00329)	(0.00331)	(0.00138)	(0.00138)	(0.00138)
Dummy Q4-2016	-0.0616***	-0.0589***	-0.0586***	-0.0175***	-0.0165***	-0.0159***
	(0.00338)	(0.00344)	(0.00347)	(0.00160)	(0.00173)	(0.00174)
Dummy Q1-2017	-0.0713***	-0.0709***	-0.0706***	-0.0186***	-0.0185***	-0.0180***
	(0.00349)	(0.00350)	(0.00351)	(0.00159)	(0.00159)	(0.00160)
Dummy Q2-2017	-0.0743***	-0.0752***	-0.0749***	-0.0193***	-0.0197***	-0.0192***
	(0.00372)	(0.00372)	(0.00375)	(0.00162)	(0.00162)	(0.00162)
Staff turnover		-0.253***	-0.264***		-0.103**	-0.129***
		(0.0968)	(0.0975)		(0.0401)	(0.0407)
Total employment			-0.00461			-0.0133***
			(0.00513)			(0.00261)
Constant	0.799***	0.808***	0.848***	0.907***	0.910***	1.024***
	(0.0101)	(0.0108)	(0.0450)	(0.00558)	(0.00567)	(0.0228)
Observations	15,168	15,168	15,168	18,596	18,596	18,596
# of panelvar	2,135	2,135	2,135	2,493	2,493	2,493
Hospital fixed effects	YES	YES	YES	YES	YES	YES
Specialty fixed effects	YES	YES	YES	YES	YES	YES
Lags	1 quarter	1 quarter	1 quarter	1 quarter	1 quarter	1 quarter

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table 42. Regression results (additional lags). Q3-2015 – Q2-2017

	(1)	(2)	(3)	(4)	(5)	(6)
Share of leavers from EU	-0.0876**	-0.0672*	-0.0680*	-0.00166	0.00133	0.000119
	(0.0387)	(0.0374)	(0.0375)	(0.0149)	(0.0150)	(0.0150)
Dummy Q1-2016	-0.0205***	-0.0228***	-0.0228***	-0.00245***	-0.00232**	-0.00248***
	(0.00243)	(0.00257)	(0.00257)	(0.000802)	(0.000902)	(0.000904)
Dummy Q2-2016	-0.0326***	-0.0356***	-0.0356***	-0.00351***	-0.00357***	-0.00364***
	(0.00281)	(0.00310)	(0.00310)	(0.00101)	(0.00114)	(0.00114)
Dummy Q3-2016	-0.0490***	-0.0517***	-0.0516***	-0.0101***	-0.0105***	-0.0103***
	(0.00333)	(0.00357)	(0.00358)	(0.00120)	(0.00125)	(0.00125)
Dummy Q4-2016	-0.0500***	-0.0501***	-0.0498***	-0.0133***	-0.0140***	-0.0136***
	(0.00336)	(0.00336)	(0.00338)	(0.00151)	(0.00153)	(0.00153)
Dummy Q1-2017	-0.0586***	-0.0607***	-0.0604***	-0.0143***	-0.0145***	-0.0142***
	(0.00340)	(0.00351)	(0.00352)	(0.00141)	(0.00144)	(0.00144)
Dummy Q2-2017	-0.0599***	-0.0636***	-0.0633***	-0.0160***	-0.0163***	-0.0160***
	(0.00362)	(0.00388)	(0.00391)	(0.00157)	(0.00163)	(0.00163)
Staff turnover		-0.161	-0.176*		-0.00434	-0.0357
		(0.102)	(0.102)		(0.0400)	(0.0407)
Total employment			-0.00726			-0.0149***
			(0.00536)			(0.00270)
Constant	0.786***	0.792***	0.855***	0.902***	0.901***	1.029***
	(0.0106)	(0.0114)	(0.0471)	(0.00562)	(0.00591)	(0.0238)
Observations	13,152	13,026	13,026	16,106	16,061	16,061
# of panelvar	2,113	2,101	2,101	2,477	2,472	2,472
Hospital fixed effects	YES	YES	YES	YES	YES	YES
Specialty fixed effects	YES	YES	YES	YES	YES	YES
Time lag of regressors	2 quarter	2 quarter	2 quarter	2 quarter	2 quarter	2 quarter

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table 43. Regression results (support staff only, impact on all treatments). Q3-2015 – Q2-2017

	(1)	(2)	(3)	(4)	(5)	(6)
Share of leavers from EU	-0.0176	-0.0117	-0.00754	0.00920	0.00858	0.00911
	(0.0470)	(0.0475)	(0.0476)	(0.0188)	(0.0186)	(0.0186)
Staff turnover		0.374**	0.155		-0.0377	-0.0838
		(0.175)	(0.233)		(0.0584)	(0.0708)
Total employment			-0.143**			-0.0362**
			(0.0626)			(0.0182)
Constant	0.790***	0.776***	1.995***	0.929***	0.930***	1.236***
	(0.00189)	(0.00726)	(0.533)	(0.000723)	(0.00218)	(0.154)
Observations	1,173	1,173	1,173	1,368	1,368	1,368
R-squared	0.000	0.005	0.024	0.000	0.001	0.010
# of panelvar	147	147	147	171	171	171
Hospital fixed effects	YES	YES	YES	YES	YES	YES
Time lag of regressors	1 quarter	1 quarter	1 quarter	1 quarter	1 quarter	1 quarter

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1