Brexit, freedom of movement and the NHS workforce

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Abbreviations and definitions

EEA	European Economic Area that includes the 28 EU nations, and Iceland, Liechtenstein and Norway.
EFTA	European Free Trade Association of which Switzerland is a member.
EU	European Union
EU27	The member states of the European Union, excluding the UK.
HEE	Health Education England. NHS England consists of 13 HEE regions.
ROW	Rest of the World. Used by NHS Digital to denote all staff who are known to be citizens of countries outside the UK, EU and EEA.

The researcher recognises that the UK is still a member of the EU at the time of writing, but for this research it is necessary to distinguish between UK citizens and citizens of other EU nations. Therefore 'EU citizens' will be used as shorthand for citizens of the EU27, the EEA, and Switzerland, whose right to live and work in the UK will be affected by Brexit. NHS Digital, the official publisher of the NHS workforce data that will be analysed in this research, usually counts EU and EEA staff separately. It includes Swiss citizens in its EEA figures even though Switzerland is in EFTA, not the EEA. Where data sources do not include numbers for EEA staff – which are very small compared with numbers for EU27 countries – this will be pointed out.

Abstract

Withdrawal from the European Union and growing demand on the National Health Service are two of the greatest challenges facing the United Kingdom. This research addresses the hypothesis that ending the freedom of movement will exacerbate an existing understaffing crisis in NHS England through a combination of quantitative and qualitative research, including the analysis of workforce and vacancy data and interviews with EU citizens working for NHS England. Most significantly it reveals that if the freedom of movement ends on the 29 March 2019, and no compensatory staff supply measures are put in place, NHS England could lose all EU nurses and health visitors by the middle of June 2021, and all EU hospital doctors by the end of May 2024.

Introduction

On 23 June 2016, the UK narrowly voted to leave the European Union after four decades as a member. The current UK government has pledged to leave the single market and end the free movement of people, creating an uncertain future for EU citizens living and working in the UK, and UK citizens living and working on the continent. The freedom of movement has given UK employers – from farmers and manufacturers, to universities and the City – frictionless access to a labour source rich in skills and plentiful in numbers. With low unemployment in the UK, insufficient skilled labour in some sectors, and restrictions on international immigration, ending the freedom of movement could make it more difficult for employers to fill vacancies. The UK's largest employer, the NHS, is already facing an understaffing crisis, and has relied on international staff since it was founded. This reliance will increase in the future as the UK population ages and patient demand increases, so assessing the potential impact of Brexit on the NHS and its workforce should be a priority for the UK government. Focusing on NHS England because of the rich source of national and regional level data, this research investigates this timely and urgent issue by identifying the scale of the current understaffing crisis, the current extent to which the NHS relies on EU staff, trends in EU staff turnover, and ultimately the potential impact on staffing numbers if the freedom of movement ends. Using quantitative and qualitative research methods, this research analyses NHS workforce data in detail and provides an insight into the anxieties of EU citizens working in the NHS and the concerns of their representative organisations.

Why this issue deserves attention

The NHS is the UK's largest employer and Brexit could exacerbate an existing understaffing crisis by ending the ease with which staff can be recruited from the EU, with stark consequences for patient care. The NHS and Brexit are also the two issues of greatest concern to the UK electorate (Ipsos MORI, 2017). Nearly one in ten nursing posts were unfilled in 2016 (Migration Advisory Committee, 2016) and by 31 March 2017, 15 per cent of nurses and health visitors were from outside the UK, including 7 per cent from the EU[1]. The UK faces a 'double whammy' of 'an ageing nursing workforce, caring for an ageing population' (Buchan, 2001, p.66), so international nurses who tend to be younger than UK trained nurses are filling the gaps (Buchan, 2003). The Secretary of State for Health, Jeremy Hunt, said, 'we would fall over without their help' (House of Commons Health Committee, 2017, p.13).

The details of EU citizens' right to remain in the UK after Brexit are being negotiated, but it is unlikely that the UK government will eject EU citizens because it would tear families apart,

[1] According to unpublished data received from NHS Digital via a freedom of information request.

destroy any chance of a new trade with Europe, and the UK has no database of EU citizens living and working in the UK with which to facilitate such a process. EU citizens already living in the UK might leave of their own volition if the details of the UK government's proposed 'settled status' deal disappoint them, so the government cannot assume that UK employers can continue to rely on EU workers who are already in the country. The government has said Brexit must mean the end of the freedom of movement but has not published a strategy for dealing with the potential impact this will have on the UK labour market, although a leaked report suggests they are aware of the significant impact it could have on the NHS (Lintern and Ford, 2017). The Conservatives have pledged to reduce net immigration to the tens of thousands (Conservative manifesto, 2017), without making a commitment that essential public services like the NHS would be protected from the consequences. Even if the healthcare sector has a protected quota of visas after Brexit, the country might struggle to attract EU applicants because they can continue to work without visas on the continent, the UK has gained a reputation for being anti-immigration, and the poor performance of sterling and improving economies in other EU nations make the UK a less attractive place to work.

The hypothesis for this research is that the NHS understaffing crisis will be exacerbated if Brexit causes existing EU staff to leave the UK, and the supply of new EU staff is cut off by ending the freedom of movement – and that the resulting pressure will be greater for some regions than others. Solutions might include improving staff retention and greater investment in training UK citizens to work in healthcare roles, but an ageing UK population will see the workforce reduce while patient demand increases, so NHS England's need for immigrant labour could increase in the future. For these reasons Brexit poses a threat to the NHS.

Literature review

The freedom of movement and its centrality to the European project

The Treaty of Paris in 1951 established the right to freedom of movement of labour in the coal and steel industries within the European Coal and Steel Community (ECSC) (Recchi, 2015), and the Treaty of Rome in 1957 affirmed this right within the ECSC's successor union, the European Economic Community (EEC) which the UK joined in 1973. The right of freedom of movement of people is enshrined in the Citizens' Rights Directive 2004/38/EC (EUR-Lex, 2004) or Free Movement Directive and is one of four freedoms inextricably linked with membership of the single market – freedom of movement of capital, goods, services and people. According to Recchi (2015), 'It is not the euro, nor democracy, nor peace among nations, but rather free movement which epitomizes the EU in the minds of Europeans' (p.1). Freedom of movement of people is often referred to as freedom of movement of labour but it also has social and cultural benefits (Minderhoud and Trimikliniotis, 2009).

When the right to freedom of movement was extended to more nations 'the UK government was the strongest advocate in the European Council and Council of Ministers for moving forward at a rapid pace' (Bache and Nugent, 2007, p.536). In 2003 the Treaty of Accession paved the way for eight more countries to join the EU the following year – the so-called A8 nations. The existing 15 members were given the option to restrict access to citizens from accession states for up to seven years, but the UK chose not to exercise this right (European Commission, 2006) and instead to have no restrictions (Bache and Nugent, 2007). By May 2003, the Department of Health had begun talks about NHS recruitment with accession states (O'Dowd, 2003) and annual immigration from the EU doubled from 66,000 in 2003 to 130,000 in 2004 (Vargas-Silva, 2016). Migration from the accession countries in 2004 'may turn out to be New Labour's most significant legacy' (Goodhart, 2010) with former Prime Minister Tony Blair described as 'the key architect of Brexit' (Evans et al., 2017, p.387).

British party-political attitudes towards the EU and freedom of movement

Former Conservative Prime Minister Edward Heath took the UK into the EEC in 1973, and the UK voted to remain in the 1975 referendum called by former Labour Prime Minister Harold Wilson (Butler and Kitzinger, 1999; Wall, 2013). The decision to call the 1975 referendum was an attempt to hold the Labour Party together (Miller, 2015, p.20). Europe has even more divisive power within the Conservative Party and some believe it has the potential to 'destroy it for good' (Major, 1999, p.584). Former Conservative Prime Minister David Cameron's commitment to an in/out referendum on Europe in his party's 2015 general election manifesto (Conservative Party, 2015) was intended to lay the issue of EU membership to rest and heal splits in the party that were being exploited by UKIP (Watt, 2011; Shipman, 2017). UKIP was the highest polling party in the UK during the EU elections the previous year (European Parliament, 2014) and two MPs had defected from the Conservative backbenches.

The four freedoms have been criticized in Marxist discourse as means of extending exploitation (Recchi, 2015) by allowing EU member states to import cheap labour and drive down the wages of native low skilled workers. The Bennite Left campaigned to leave the EU in the 1975 referendum and during the 2016 referendum the Left were critical of EU regulations that they claimed prevent state aid and nationalisation, and the pursuit of neoliberal free trade ventures like TTIP (Pickard, 2016). British Labour Party leader Jeremy Corbyn views the EU as 'an exclusive club, rather than a democratic forum for social progress' (Shipman, 2017, p.78) and leaving the EU as a way of ending 'the wholesale importation of underpaid workers from central Europe' (Lewis, 2017). However, there are many on the Left including the Green Party and a large proportion of the Labour Party grassroots who wish to remain in Europe, and even those who have witnessed at first hand the imposition of austerity on Greece still believe in the European project (Varoufakis, 2016 and 2017). For those at both ends of the UK political spectrum, Brexit is about reclaiming sovereignty, but the intended beneficiaries would be different depending on whether the Right or Left were in power.

In January 2013, Mr Cameron made a speech pledging a referendum on EU membership but did not mention freedom of movement or immigration (Cameron, 2013). However, two months later he said net migration needed to 'come down radically' (Thielemann and Schade, 2016, p.139), in 2014 he set out plans for curtailing EU citizens' access to benefits (Cameron, 2014), and following the 2015 election immigration became the focus of his attempts to negotiate a new deal with the EU. He campaigned for an 'alert and safeguard mechanism' (commonly referred to as an 'emergency brake') that would allow the UK to halt EU migration for an initial seven years (Helm, 2016; Shipman, 2017). There have been attempts in the past to identify alternatives to unfettered freedom of movement (Pisany-Ferry et al., 2016) and it has been argued that a seven-year emergency brake could be granted to an existing member state, matching the length of the 'temporary derogations' allowed for existing members when the A8 joined the EU in 2004 (Helm, 2016). Cameron eventually secured an agreement with Brussels that the UK could restrict access to in-work benefits (Rankin, 2016 and d'Ancona et al., 2016) but after the referendum the EU 'declared the deal null and void' (Helm, 2016). Some scholars argue that benefit curtailment is unlikely to have reduced EU immigration because the UK's relatively high wages and low unemployment are more significant factors in migrants' decision making (Thielemann and Schade, 2016).

UKIP, whose mission was to extract the UK from Europe, successfully pushed immigration into the heart of the EU debate and set the agenda that other parties had to respond to. During the referendum campaign, then UKIP leader Nigel Farage unveiled his notorious 'Breaking Point' poster claiming that membership of the EU was preventing the UK from protecting its borders (Dathan, 2016). The official 'leave' campaign, Vote Leave, claimed 'we

can expect to see an additional million people added to the UK population from Turkey alone within eight years' (Boffey and Helm, 2016), a spurious claim bearing in mind that Turkey is nowhere near fulfilling the conditions of membership. Leading the 'remain' campaign to defeat, Mr Cameron failed to challenge the anti-immigrant narrative of 'leave' campaigners, focusing instead on the economic and financial implications of leaving the EU.

The impact of the freedom of movement on the UK

In 2004, migration into the UK from the A8 nations was predicted to be relatively low, with a cautious estimate of 'between 5,000 and 13,000 immigrants per year up to 2010' (Dustmann, 2003) but EU immigration doubled from 66,000 in 2003 to 130,000 in 2004 (Vargas-Silva, 2016). By 2015 nearly half of all immigrants in the UK were from other EU countries, and half of them came from the A8 nations (Vargas-Silva, 2016). This put unanticipated pressure on areas of the country 'lacking experience of migration' (Spencer, 2007, p.352). A trend was identified between local authority areas that had experienced the most rapid increase in immigration (not necessarily the largest numbers) and those that voted heavily for Brexit (The Economist, 2017).

However, in 2016, net migration from the A8 nations dropped to 5,000 – its smallest level since 2004 (ONS, 2017a). 43,000 emigrated while immigration fell by 25,000 to 48,000. The margin of error is 14,000 which could mean net migration from the A8 nations was negative (Migration Observatory, 2017). In total in 2016, 117,000 EU citizens emigrated: an increase of 31,000 and the highest figure since the year ending June 2009 (ONS, 2017a). There were 2.2 million EU citizens working in the UK in the last quarter of 2016, representing seven per cent of all employees (House of Lords Economic Affairs Committee, 2017). EU immigrants have made a net financial contribution to the UK which is particularly notable for citizens of countries that acceded in 2004 (Dustmann and Frattini, 2014). However, the benefits of this net contribution have not been felt across the UK (IPPR, 2014) and this is believed to be a reason why many areas in economic decline voted for Brexit.

Meanwhile, around 900,000 UK nationals are resident in other EU countries, one third of whom are in Spain, and one third of whom are aged 65 or over (ONS, 2017b). The United Nations estimates the figure is 1.2 million (United Nations, 2015). Assuming the figure is around one million, this means roughly three times as many EU citizens are living in the UK as UK citizens living in other EU nations.

The historical role of migrant staff in the NHS

The UK has a history of attracting medical staff from across the globe, including West Indian nurses in the late 1940s and 1950s and Asian doctors in the 1960s (Butler, 2008; Snow and Jones, 2011; Bivins, 2015). By the early 1970s, one third of doctors were from outside the UK (Snow and Jones, 2011). In the early 1990s, one in ten new entrants to the nursing register were from outside the UK and by the late 1990s the proportion was one in three (Buchan et al., 2002). In 2001, the number of overseas recruits outnumbered UK recruits for the first time (Buchan and Dovlo, 2004; Batata, 2005). As mentioned above, by May 2003, the Department of Health had begun talks about NHS recruitment with the A8 nations before they officially joined the EU the following year (O'Dowd, 2003). Without overseas recruitment 'the staffing crisis' would have been exacerbated 'particularly in high vacancy areas' (Batata, 2005, p.1) including geographical locations and medical specialities that were unpopular among UK citizens (Snow and Jones, 2011).

Historically, there has been a cycle of overseas recruitment campaigns compensating for reductions in UK-based training places (Buchan and Dovlo, 2004; Batata, 2005; Nichols and Campbell, 2010; Young et al., 2010). International recruitment has been a flexible solution capable of supplying staff quickly (Young et al., 2010) but equally could end 'almost

immediately' (Nichols and Campbell, 2010, p.2815). While freedom of movement within the EU has made it easier for the NHS to recruit from overseas, it is still reliant on staff from beyond the EU. However, international recruitment campaigns are expensive and not sustainable (Young et al., 2010). The Migration Advisory Committee, responsible for deciding how many visas should be issued for specialist jobs, has been critical of the 'automatic presumption that non-EEA skilled migration provides the sector with a "Get out of jail, free" card' (Migration Advisory Committee, 2016).

The current situation in the NHS

The NHS's reliance on international staff continues to the present day. 'The UK has one of the highest levels of reliance on internationally trained health professionals of any OECD country' (Buchan et al., 2016, p.16) and some health care operators in the private sector would 'cease to function without international nurses' (Buchan, 2003, p.13). At 31 March 2017, 25 per cent of hospital doctors and 15 per cent of nurses and health visitors were from outside the UK, including 9.5 per cent and 7 per cent respectively from the EU[2]. Between 2013 and 2017 there was an 85 per cent increase in the number of EU nurses and health visitors working in the NHS, and only a three per cent increase in UK and non-EU staff (Health Foundation, 2017). In 2015/16, 32 per cent of entrants to the Nursing and Midwifery Council register were from the EEA and only 8 per cent from outside the EEA (Royal College of Nursing, 2016). Between July and December 2016, the number of EU nurses registering to work in the UK fell from 1,304 to 96 (Boffey, 2017) and while this has been attributed in large part to the introduction of a language test for EU staff in July 2016 (Donnelly, 2017) the trend has continued into the middle of 2017, showing a 96 per cent drop over a 12-month period (Health Foundation, 2017). The number of UK born nurses and midwifes joining the register has declined since March 2015 (Nursing and Midwifery Council, 2017a) and over the past year the number of registrants leaving, including UK nationals, has outnumbered the number joining (Nursing and Midwifery Council, 2017b; NHS Providers, 2017).

In 2013, a freedom of information request by the Royal College of Nursing showed an average six per cent vacancy rate across NHS Trusts – up to 16 per cent in some areas (Royal College of Nursing, 2013). The clinical staff shortfall in 2014 was 50,000, equivalent to 5.9 per cent (National Audit Office, 2016). Nearly one in ten nursing posts were unfilled in 2016 (Migration Advisory Committee, 2016). The Department of Health estimates a shortage of up to 20,000 nurses by 2025/26 if freedom of movement ends (Dayan, 2017; Lintern, 2017) while other estimates predict a shortfall of 42,000 nurses (12 per cent) by 2020 (Buchan et al., 2017). Following the scrapping of the nursing and midwifery training bursary in September 2017, nursing applications fell by 23 per cent overall (UCAS, 2017) and by 25 per cent among EU applicants (Health Foundation, 2017). The need to recruit more nurses was acknowledged when the Migration Advisory Committee recommended that the profession should be added to the Tier 2 visa Shortage Occupation List and 5,000 visas made available to recruit from outside the EU (Royal College of Nursing, 2016). However, nursing will be removed from the list in 2019, the same year Brexit is due to happen.

There is an 'underfunded, under-doctored, overstretched workforce' according to the president of the Royal College of Physicians (Rimmer, 2017). EU doctors and medical students are 'frightened and anxious' (British Medical Journal, 2017). Eleven per cent of respondents to a British Medical Association survey said they know colleagues who had already left following the EU referendum (British Medical Association, 2017), and a separate survey of EU doctors found 42 per cent were 'considering leaving' and 23 per cent were 'unsure whether to stay' (Torjesen, 2017). NHS Employers point to the declining value of

[2] According to unpublished data received from NHS Digital in response to a freedom of information request.

sterling and recovering economies in Europe, and the fact that 'employers don't feel able to go and recruit, because they can't answer the questions about leave to remain' (Mulholland, 2017). There are similar challenges in the social care sector which the NHS relies upon to relieve bed blocking in hospitals. In 2016, seven per cent of the adult social care workforce in England (12 per cent in London) were EU citizens, and the proportion of carers from the rest of the world is declining. There is a high turnover rate of 27.3 per cent in the care sector (Skills for Care, 2016) and there could be a shortfall of 70,000 workers by 2025/26 following Brexit (Dayan, 2017).

Regarding solutions, the 2017 Conservative Party manifesto promised more home-trained doctors, and NHS England is to undertake an 'industrial scale' campaign to recruit an additional 2,000 overseas GPs in autumn 2017 – four times as many as the original target (Thomas, 2017). The government justified axing the nursing bursary as a means of saving money that could then be invested in nurse training places, but according to university vice chancellors no new money has been made available for training (Fazakerley, 2017). Another solution would be to expand the number of visas available to health care workers. Currently, the annual quota for Tier 2 visas covering all shortage occupations is only 20,700 (Royal College of Nursing, 2016, p.13) and nursing is due to be removed by 2019. One of the problems with restriction on visa numbers is having to choose between nurses and other staff (CASE, 2016, p.75). The House of Lords Health Committee recommend a recruitment process that is 'streamlined to reduce both delays and cost' (2017, p.46). The King's Fund propose that health and social care providers should be allowed to continue to recruit EU staff despite Brexit (McKenna, 2016).

Post-referendum, pre-Brexit

The details of right to remain or 'settled status' are being negotiated at the time of writing (European Commission, 2017; Home Office, 2017). The EU proposed that EU citizens in the UK and UK nationals in the EU should continue to enjoy the same rights and that the European Court of Justice (ECJ) should maintain jurisdiction to ensure that the UK can be challenged if it changes the rules after Brexit (European Commission, 2017). The UK government has proposed 'settled status' for EU citizens who have lived in the UK for five years or more, while those who have been here for less time will be allowed to stay until they are eligible for settled status. This will replace the Permanent Residency system (O'Carroll, 2017a). The government is intending to undertake a 'stocktaking exercise' soon by asking EU citizens in the UK to register their interest in staying after Brexit, to 'prevent an overwhelming avalanche of applications on Brexit day' (O'Carroll, 2017b). The proposals have been criticised because the rights enjoyed by EU citizens living in the UK at the time of Brexit will not be preserved for life, and they will have no recourse to the ECJ to enforce their rights (Verhofstadt, 2017; Yeo, 2017).

The EU has described claims that the UK can continue to enjoy some of the benefits of single market membership while ending the freedom of movement as the country wanting to 'have its cake and eat it' (Tusk, 2016). However, counter to what political leaders are saying, there is evidence that people are more concerned about their economic well-being than immigration, would prefer a deal to no deal, and want a referendum on a final deal (Survation, 2017). There is greater concern about 'managing demand for public services than simply restricting freedom of movement' (Rohr et al., 2017, p.1).

According to those who campaign on behalf of EU citizens, there is evidence that they are planning to leave the UK without waiting for the outcome of Brexit negotiations (Remigi et al., 2017). According to the House of Lords Economic Affairs Committee (2017), 27 per cent of EU citizens are considering leaving, while Deloitte (2017) claim that more than one in three non-British workers are considering leaving in the next five years, with high-skilled EU

workers most likely to leave (47 per cent over the next five years). They identified regional variances in attitudes, with 59 per cent of non-British workers in London considering leaving compared with 21 per cent in the so-called Northern Powerhouse region.

Critics of Brexit warn that ending the freedom of movement could cripple some sectors because of their reliance on migrant labour. Food production is the UK's largest manufacturing sector but one in three workers are from overseas (Lang et al., 2017) and the impact is already being felt by the soft fruit industry which has long struggled to recruit UK workers (BBC, 2017; Nye, 2017). In meat manufacturing 96 per cent of hygiene vets, without whom abattoirs cannot operate, were trained in the EU because British born vets do not want to perform the grim task (Dunt, 2016).

Prime Minister Theresa May has reaffirmed Cameron's target of reducing immigration from hundreds of thousands to 'tens of thousands' (Conservative manifesto, 2017, p.54) but to meet this target ending the freedom of movement of EU citizens would not be enough. Non-EU migration would need to fall too, and the UK would no longer have Brussels to blame for failing to meet its self-imposed migration targets (Portes, 2015). The Conservative manifesto also anticipated setting aside 'significant numbers of visas for workers in strategically-important sectors, such as digital technology, without adding to net migration' (Conservative Party, 2017, p.20) but within the bounds of the current Tier 2 visa system other sectors would lose out by necessity, potentially including health and social care. Unemployment is very low, suggesting that ending the freedom of movement could result in a shortage of labour. Professor Sarah Harper of the Institute for Population Ageing said, 'The message from Brexit is if you don't want immigrants, you're going to have to work longer. That's how the sums work' (Lyons and Hill, 2017).

Related areas of research

Other issues examined in existing literature about international staff in the NHS include the ethical implications of recruiting staff from overseas, thereby passing on the cost of training to other nations and denying them their home-trained staff (Buchan and Dovlo, 2004), and the value for money of recruiting overseas compared with domestic recruitment (Young et al., 2010). Other studies examine the personal motivations and experiences of nurses recruited from overseas (Daniel et al., 2001; Nichols and Campbell, 2010), and the racism they have encountered (Buchan, 2013; Bivins, 2015). There are also studies that examine the impact of NHS efficiency savings on nursing levels (Buchan et al., 2015; RCN, 2013), and staffing cut backs caused by the on-going costs of repaying Private Finance Initiative (PFI) hospital building schemes (Pollock, 2005).

Methodological approaches in existing literature

Buchan (2003) analyzed postcode data for nurses and conducted ten case studies to compare the proportions of international nurses in the NHS and private sector. Batata (2005) used the NMC register and the residency postcodes of international nurses and found that there was a correlation between high vacancy rates and high numbers of international nurses. Buchan and Dovlo (2004) analyzed data from the General Medical Council, Nursing and Midwifery Council, and Work Permits UK; conducted interviews with government representatives, health sector managers, regulators, recruitment agencies, and professional associations; and facilitated group discussions with doctors and nurses.

Young et al. (2010) used a postal survey of all pre-2006 NHS providers, Strategic Health Authorities and Deans of Postgraduate Medical Education, and eight subsequent case studies based on interviews with people responsible for recruitment. NHS Employers (2016) used a survey of NHS Trusts to investigate demand and supply of nurses. Freedom of information requests have been used to obtain unpublished data (Royal College of Nursing,

2013; Hughes and Clarke, 2016; Nash, 2017). The National Audit Office (NAO) examined data from NHS Digital, Health Education England and NHS Professionals about demand and supply of temporary staff, and undertook case studies that included looking at recruitment plans and conducting interviews (NAO, 2016).

Research questions and methodology

To test the hypothesis outlined above, this research examines the scale of understaffing in NHS England, the extent to which it relies on EU staff, and whether there is a relationship between regions with high vacancy rates and high reliance on EU citizens. It examines whether there has been a noticeable change in the number of EU staff joining and leaving NHS England since the EU referendum, and calculates the rate of EU staff turnover to determine how quickly the EU workforce might decline after Brexit and whether some regions would experience this more quickly than others. The concerns of EU citizens working in NHS England and their representative organisations are investigated using interviews. The research questions are:

- What is the scale of understaffing in NHS England and are there regional variations?
- How reliant is NHS England on EU staff and are there regional variations?
- Is there a relationship between understaffing and the extent to which a region relies on EU staff?
- Has there been a noticeable impact on the number of EU staff joining and leaving NHS England since the EU referendum?
- Is EU staff turnover higher than 'all staff' turnover?
- What are the implications for NHS England if freedom of movement ceases?
- What are the concerns of NHS staff and their representative organisations about the right to remain and freedom of movement, and what do they think about possible solutions?

The first six questions will be answered using quantitative research based on NHS workforce data and the final question using qualitative research based on interviews.

Quantitative research

This dissertation analyzes NHS England workforce and vacancy data published online by NHS Digital. The NHS in Scotland, Wales and Northern Ireland are separate entities and fall under the jurisdiction of the devolved governments. Workforce data has been analysed at a national, regional and NHS Trust level, including the number of staff, their role and nationality, and the numbers who leave and join. Some sources break down data by staff group but not nationality, and others by nationality but not staff group, so gaps have been filled with freedom of information (FOI) requests to NHS Digital. Vacancy statistics are only available at a national and regional level and count 'advertised vacancies' rather than actual vacancies, so FOI requests were sent to more than 90 NHS trusts to obtain a more accurate insight. NHS Digital also publishes FOI responses, some of which include data relevant to this research. Most tables and graphs are of the researcher's own design rather than reproduced from other sources, but their provenance is detailed under each one.

This research focuses on hospital doctors, nurses and health visitors, and midwives (sometimes these groups are counted together and sometimes separately, which has added to the difficulty of extracting comparable data) but there are many non-medical areas of the NHS such as catering that are staffed by high proportions of EU citizens (House of Commons Health Committee, 2017, p.13). The number of GPs is a cause for concern because of the ageing workforce but they will not be a focus of the quantitative research in

this dissertation because reliable data about nationality is not available[3]. It would have been interesting to investigate medical specialists – for example oncology or geriatrics – bearing in mind the increasing challenges posed by cancer and age-related conditions. However, the numbers of EU staff working in each specialism are very small, running the risk of percentages sounding more significant than they really are (General Medical Council, 2017b, p.10).

An online survey of EU citizens working for NHS England could have provided quantitative data about their attitudes towards Brexit, but this was not possible because of lack of access to contact databases.

Qualitative research

Qualitative research methods included 'snowballing' or 'referral' sampling (Burnham et al., 2008), and semi-structured interviews (Bryman, 2008; Burnham et al., 2008). The researcher conducted interviews with spokespeople from the Royal College of Nursing, Royal College of Midwives, the trade union Unison, NHS Providers (a trade association for NHS foundation trusts), and NHS Employer's Cavendish Coalition (which represents health and social care organizations that are concerned about the impact of Brexit). The General Medical Council and two Health Education England regions declined an interview. The British Medical Association, Nursing and Midwifery Council, campaign group The Three Million that represents the interests of EU citizens currently living in the UK, trade union Unite, and 11 Health Education England regions did not respond to an invitation to be interviewed.

EU citizens working for NHS England were interviewed, including two nurses, two midwives and one GP. Unfortunately, there was no interest from hospital doctors, however one GP was interviewed about his views on Brexit. Several other EU staff members expressed interest and were sent the participant information form and consent form but did not respond. Scores of vocal NHS and Brexit campaigners were contacted asking for their assistance in publicizing the research among EU staff in the NHS but very few responded. This was disappointing given the heat and light around Brexit, and people's desire to be heard, but perhaps reflects the fact that online and social media allow people to express their concerns instantaneously, while research takes time and might never be published.

Interviews took place between 5 July and 8 August 2017. Each interview was conducted over the phone and lasted between 20 and 30 minutes. The interviews were recorded with the interviewees' permission and verbatim transcriptions and consent forms have been stored securely by the researcher. Interviews were semi-structured to allow interviewees to focus on the issues that most concerned them, and to talk about things that did not arise directly from the questions. Organisations were asked about recruitment and retention in the NHS; the potential implications of Brexit for the NHS workforce; whether they were monitoring EU staff arrivals and departures since the referendum; what response they had received from lobbying UK government departments; and the relative benefits of possible solutions including creating more UK training places and making more international visas available. Individual EU staff were asked about the impact of the referendum result on their lives, whether they were planning to stay in the UK or leave, and their views about the potential impact of Brexit on NHS England.

[3] The General Medical Council records where doctors acquired their primary medical qualification, but their data about nationality is less reliable by their own admission (GMC, 2017a; GMC, 2017b).

Limitations and ethical considerations

This is not an exercise in crystal ball gazing. It is not possible to predict what will happen after Brexit, or whether it will even happen at all, but it is possible to identify the scale of understaffing in NHS England and how reliant it is on EU staff, how these two factors vary across the regions, and the likely scale of the challenge if the freedom of movement ceases. Knowing the answers to these questions is essential if the UK government is to protect NHS England from any Brexit fall-out.

In interviews EU citizens working for NHS England expressed their views about Brexit and whether they intended to stay in the UK or leave, but it is not possible to predict in any quantifiably satisfactory way what will happen because there is no significant sample size and the details of 'settled status' – a factor that will influence many people's decision – are not yet known.

Some NHS Digital sources compare data annually, some quarterly, and some monthly, which has enabled the researcher to compare data from before and after the EU referendum. However, at the time of writing, data is not available beyond the end of March 2017. Data for the end of June will not be published until the end of September, which prevents the analysis of a full year's worth of data since the EU referendum. This research has the potential to be continued, to observe what happens to the statistics while Brexit negotiations are ongoing, and following their conclusion.

National data about leavers and joiners is more reliable than regional data because the latter does not distinguish between staff who leave the NHS altogether and those who transfer between regions. However, it is still useful for calculating whether the turnover of EU staff is disproportionately high in some regions, and therefore whether they might face a greater challenge if freedom of movement ends. NHS Digital collects data about the reasons why people leave NHS England, including retirement, redundancy and dismissal, but not emigration.

NHS Digital publishes data for the number of 'advertised vacancies' during any given period, but adverts are counted the same regardless of whether they are for one vacancy or many, making the data wholly unfit for purpose. Consequently, this researcher has followed the path of others before her (Royal College of Nursing, 2013; Nash, 2017; Younger, 2017) in submitting FOI requests to individual NHS trusts. More than 90 FOI requests were submitted to obtain a more accurate picture of vacancies, asking for the number of established posts that are vacant regardless of whether they are being advertised. However, even this detailed information does not paint an accurate picture of the understaffing crisis because it does not include the number of posts that have been axed despite growing patient demand.

All NHS Digital sources that include nationality data come with the caveat 'as nationality is self-reported the value entered by an individual may reflect their cultural heritage rather than their country of birth'. Regions vary in the reliability of their nationality data because staff are not required to state their nationality. For example, at 31 December 2016, one in five doctors in the Thames Valley were of unknown nationality. This could cause regions to underestimate the scale of the challenge that might confront them if the freedom of movement ends.

Correlations between the date of the EU referendum and changes in NHS data about the number of joiners and leavers do not mean it was the cause. For example, many interviewees from organizations that represent NHS staff said that the sharp decline in EU nurses and midwives registering to work in the UK in mid-2016 was likely to have been caused by the introduction of a new language test for registrants in July 2016 rather than the EU referendum result.

The identities of EU citizens interviewed for this dissertation are protected. All interviewees were provided with a participant information sheet and consent form approved by the Ethics Committee of the Department of International Politics, and copies of interview transcripts and consent forms are held securely by the researcher.

Research findings

The research findings answer each of the research questions in turn by analysing data from NHS Digital and responses to FOI requests sent to individual NHS trusts. NHS Digital data sources and FOI responses have been analysed and cross referenced in the quest for comparable data that answers the research questions. Tables and graphs are presented within the research findings but bulky data and lengthy calculations are presented in appendices. To answer the final research question regarding stakeholders' concerns about Brexit, interviews were conducted with EU staff working for NHS England and their representative organisations including the Royal Colleges, NHS Providers and Unison.

Question 1: What is the scale of understaffing in NHS England and are there regional variations?

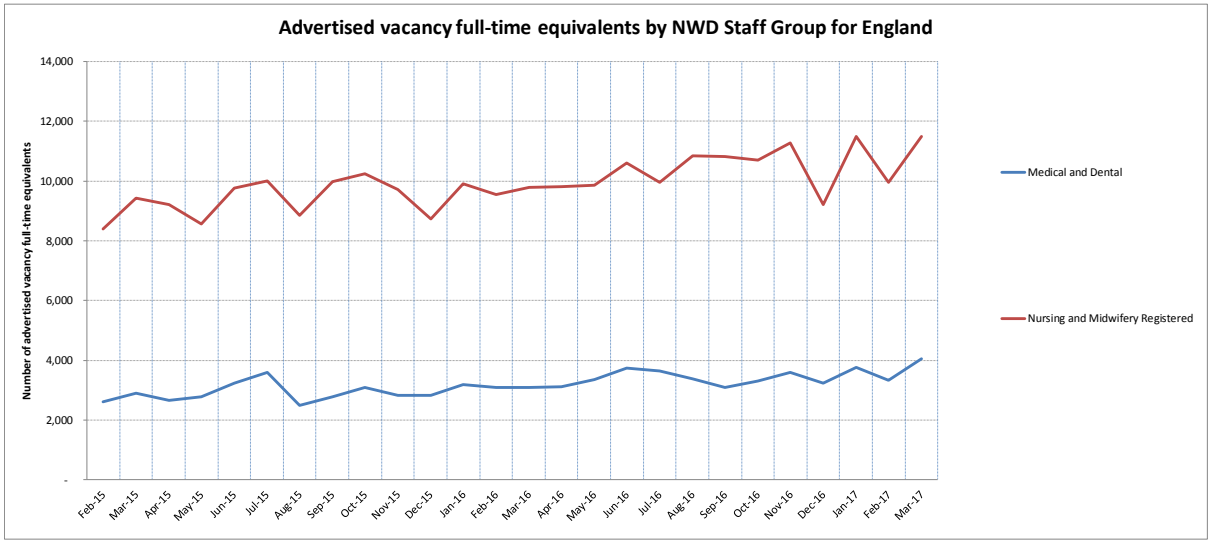
Nearly one in ten nursing posts were unfilled in 2016 (Migration Advisory Committee, 2016), and the Royal College of Midwives told the researcher that NHS Digital vacancy figures provide an 'unduly rosy picture of the situation' and NHS England has approximately 3,500 less midwives than it needs – equivalent to 12 per cent. NHS England is divided into 13 Health Education England (HEE) regions. HEE's definition of a vacancy is 'the difference between the number of established posts and current contracted employment, regardless of whether there is an active attempt to hire staff to fill the excess posts' (Migration Advisory Committee, 2016, p.41). Despite the HEE definition, NHS Digital counts 'advertised vacancies' regardless of whether an advert is for one vacancy or many (NHS Digital, 2017a). Therefore, while their data reveals changes in the number of national and regional vacancy adverts each month, it provides little insight into the actual level of understaffing.

To illustrate, Graph 1 demonstrates that there were more 'advertised vacancies' in March 2017 than two years previously, but there was also an increase in the number of staff posts over the same period, so an increase in vacancies does not necessarily mean the vacancy rate is getting worse. It is the proportion of HEE's 'established posts' that are vacant that is important. The fact that Graph 1 shows there were two significant dips in advertised vacancies for nursing and midwifery in December 2016 and February 2017 does not necessarily mean there were fewer empty posts – it might simply mean they were not advertised.

NHS Digital workforce data includes full time equivalent (FTE) staff in post and not the number of 'established posts' regardless of whether they are occupied, so a true vacancy rate cannot be calculated. The best one can do is compare the number of 'advertised vacancies' in March 2017 with FTE staff in post at 31 March 2017 (NHS Digital, 2017a and 2017b). This is highly unreliable, but demonstrates the lack of fitness for purpose of NHS Digital vacancy data. Using this calculation for the North, Central and East London region, there were 401 advertised vacancies for doctors and 9,253 doctors in post, and 922 advertised vacancies for nurses and midwives and 21,325 in post – 4.3 per cent for both groups. However, in early 2016, the Department of Health told the Migration Advisory Committee that the nursing vacancy rate in North, Central and East London region was 18 per cent (Migration Advisory Committee, 2016). This is borne out when comparing NHS Digital workforce data (NHS Digital, 2017b) with FOI data acquired by ITN (Nash, 2017; Younger, 2017) and shared with the researcher, about nurse vacancies at Barts Health NHS

Trust, the largest trust in the region. Furthermore, reducing this vacancy rate is unlikely to be possible because hospital leaders in the region have been told to '"think the unthinkable" in their quest for savings' during 2017-18 (Campbell and Hopkins, 2017).

Graph 1: National 'advertised vacancies' between February 2015 and March 2017



Graph produced using graphing tool in NHS Digital (2017a)

Another example is in the South London region, where the above formulation using NHS Digital 'advertised vacancy' data produced a figure of 3.9 per cent for doctors and for nurses and midwives. To obtain a more accurate picture, the researcher sent FOI requests to more than 90 NHS hospital trusts enquiring about vacant posts at 31 March 2017, regardless of whether they were being advertised, and this was compared with NHS Digital data about FTE staff in post (NHS Digital, 2017b) to calculate a more accurate vacancy rate. Responses from the South London region[4] revealed a vacancy rate of 13.3 per cent for doctors and 18.4 per cent for nursing and midwifery. Figures obtained from Guy's and St Thomas's NHS Foundation Trust, the largest employer in the South London region, showed even greater vacancy rates of 19.8 per cent for doctors and 22.6 per cent for nursing and midwifery.

In the North West[5], the NHS Digital figures are 3.8 per cent for doctors and 3.3 per cent for nursing and midwifery, but FOI responses revealed a vacancy rate of 10.9 per cent for doctors and 8.8 per cent for nursing and midwifery. This demonstrates that NHS Digital statistics create the impression that vacancies are significantly lower than they are. National Institute for Health and Care Excellence (NICE) guidelines recommend the vacancy rate should not exceed five per cent and in 2016 the Department of Health confessed that all regions exceeded this figure, reaching as high as 18 per cent in South London and North, Central and East London (Migration Advisory Committee, 2016, p.40). NHS Digital data suggests that NICE guidelines are being met, while responses to this researcher's FOI requests and Department of Health evidence to the Migration Advisory Committee suggest that they are not. The Department of Health is clearly using other measurements, so it is difficult to see what purpose the NHS Digital 'advertised vacancy' statistics serve, and they risk misleading people who use the data without reference to alternative sources.

[4] Seven of eight NHS trusts responded.
[5] Eleven of 18 NHS trusts responded.

Question 2: How reliant is NHS England on EU staff and are there regional variations?

The most recent data available (see Table 1) shows that at 31 March 2017, 5.3 per cent of all NHS England employees were from the EU, including 9.5 per cent of doctors, 7 per cent of nurses and health visitors and 5.3 per cent of midwives (NHS Digital, 2017c). The table shows that the number of EU staff working in NHS England continued to rise nine months after the EU referendum, but the numbers of nurses and health visitors has levelled off, and the proportion of midwives has declined. It is not compulsory for NHS England staff to indicate their nationality. Five per cent of hospital doctors, 6.5 per cent of nurses and health visitors, and 7 per cent of midwives were of unknown nationality at the end of March 2017. If a significant proportion of these staff are from the EU, NHS England's reliance on EU staff could be greater than the figures in the table suggest.

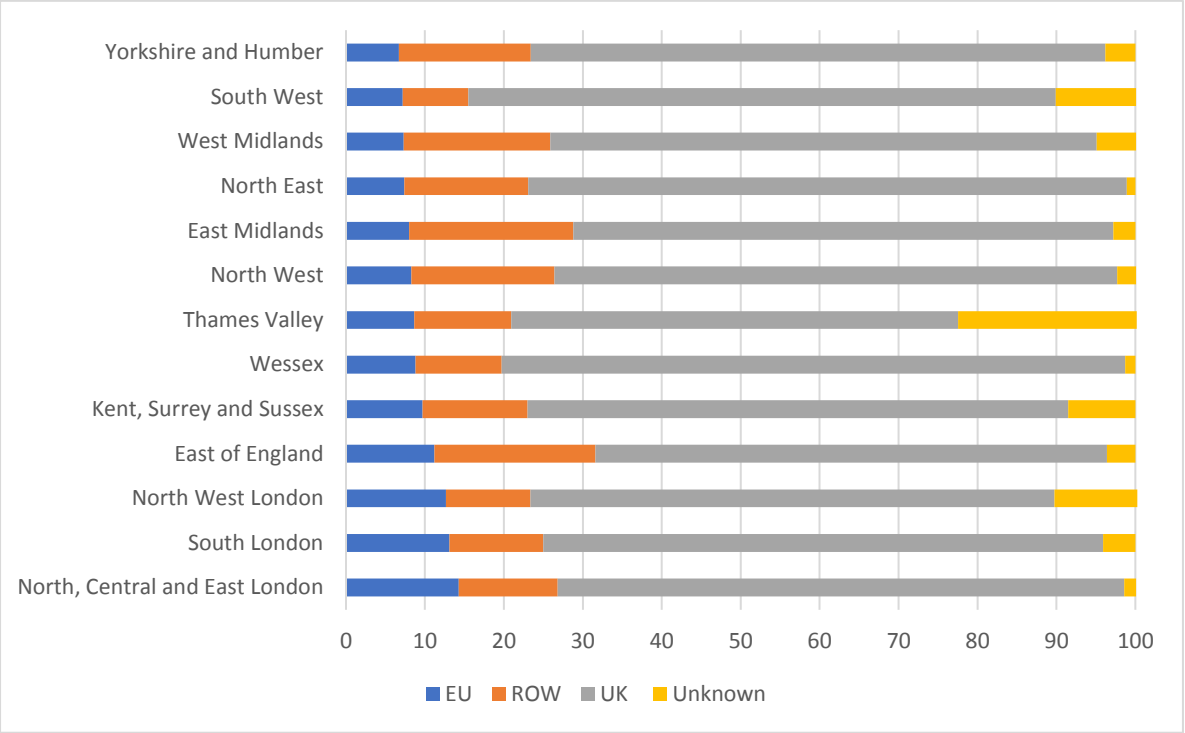
Table 1: Changes in the number and percentage of EU staff working in NHS England, between 30 September 2015 and 31 March 2017

EU staff	30 Sept 2015	31 March 2016	30 Sept 2016	31 March 2017
All EU staff regardless of occupation	53,179	57,975	60,197	62,352
Percentage of EU staff in the NHS England workforce	4.6 per cent	5 per cent	5.1 per cent	5.3 per cent
EU hospital doctors	9,955	10,260	10,506	10,793
Percentage of all doctors	9 per cent	9.3 per cent	9.3 per cent	9.5 per cent
EU nurses and health visitors	18,870	21,132	22,336	22,338
Percentage of all nurses and health visitors	6 per cent	6.6 per cent	7 per cent	7 per cent
EU midwives	1,260	1,340	1,363	1,393
Percentage of all midwives	5 per cent	5.2 per cent	5.4 per cent	5.3 per cent

Original table produced using data from NHS Digital (2017c)

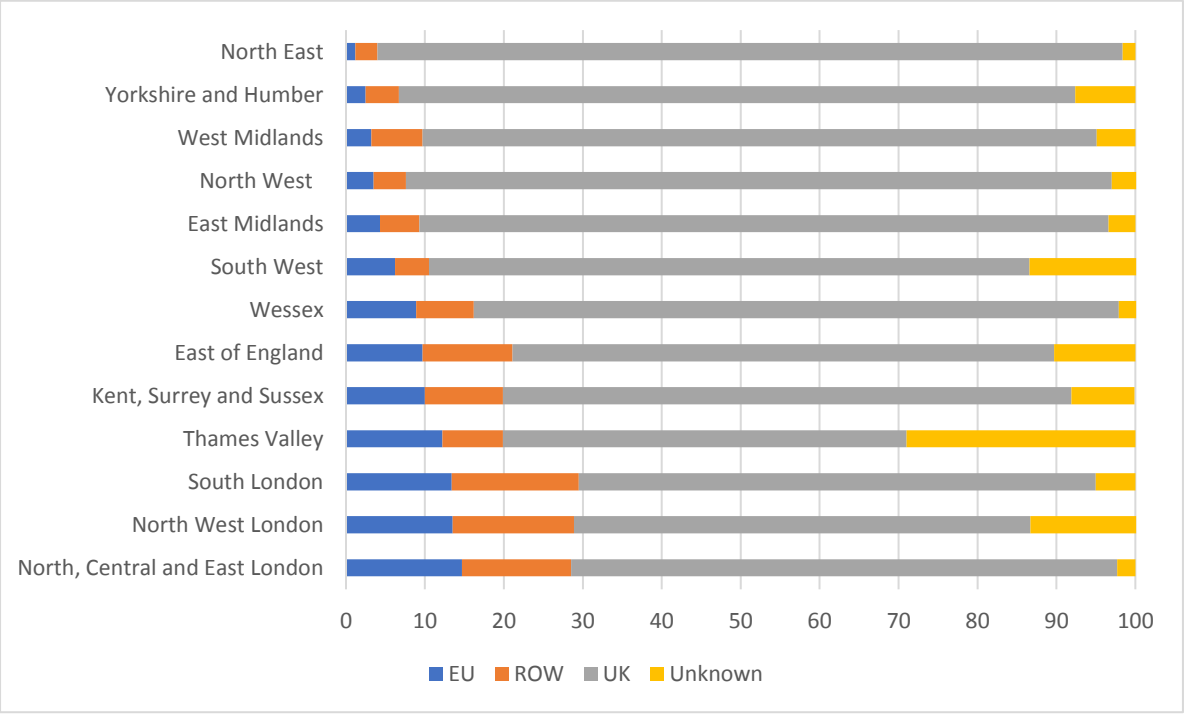
Graphs 2 and 3 show the proportions of staff in each nationality group in each region at 31 December 2016 (NHS Digital, 2017d), and reveal that regions vary in their reliance on EU staff, and indeed in their dependence on overseas staff in general. The three London regions are most reliant on both categories of EU staff. Unpublished data received by the researcher in response to an FOI request to NHS Digital shows that the situation had changed very little by the end of March 2017.

Graph 2: Nationality of doctors for each region of NHS England, at 31 December 2016



Original graph produced using data from NHS Digital (2017d)

Graph 3: Nationality of nurses, health visitors and midwives for each region of NHS England, at 31 December 2016



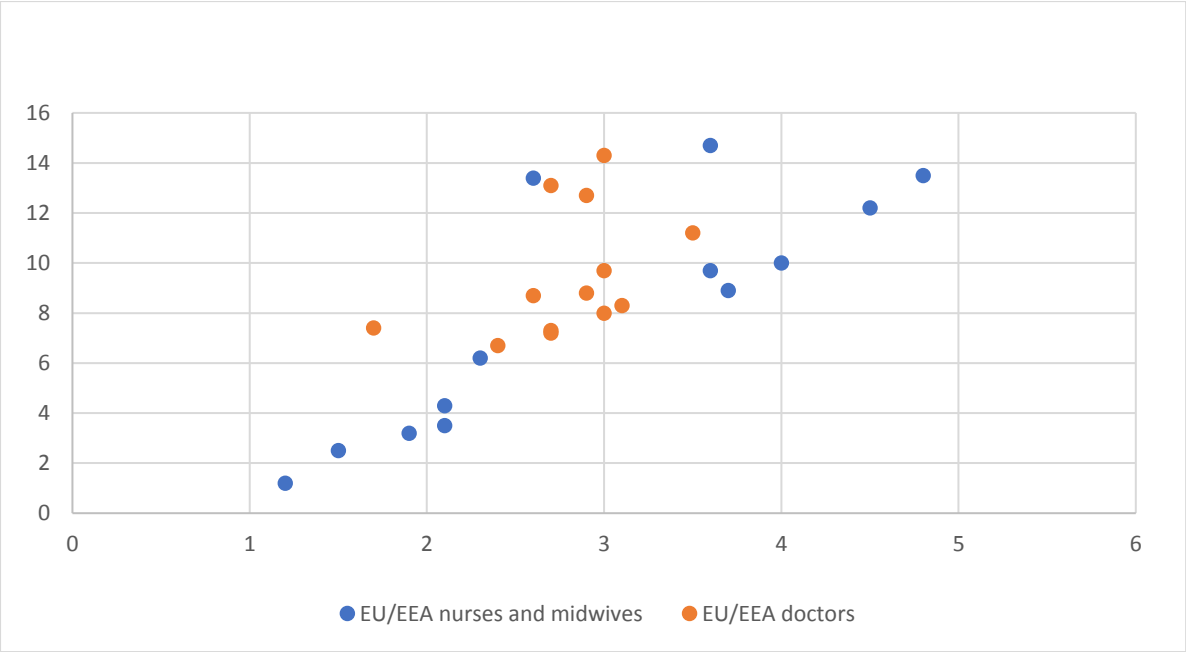
Original graph produced using data from NHS Digital (2017d)

Published data for 31 March 2017[6], shows that 5.3 per cent of NHS England staff were from the EU (NHS Digital, 2017e). Seven regions employed a higher proportion of EU staff than the national average, including the three London regions, Wessex, Thames Valley, East of England and Kent, Surrey and Sussex. The highest proportion of EU staff was in the North, Central and East London region where 11.3 per cent of staff were from the EU, whereas in the North East the figure was only 1.8 per cent. During the year to 31 March 2017, all 13 regions saw increases in the number of EU staff they employed.

Question 3: Is there a relationship between understaffing and the extent to which a region relies on EU staff?

Acknowledging the caveat that NHS Digital 'advertised vacancy' data cannot be used to calculate the real level of understaffing, the only way one can answer this question using its data is to compare advertised vacancies as a proportion of headcount[7] (horizontal axis) with the proportion of EU staff in each region (vertical axis) (see Graph 4). Each dot represents a region. This shows a rough correlation with some exceptions, suggesting that regions with relatively high numbers of 'advertised vacancies' are making greater use of EU staff.

Graph 4: 'Advertised vacancies' as a percentage of headcount compared with the percentage of EU staff per region, at 31 December 2016



Original graph produced using data from NHS Digital (2017a and 2017d)

As outlined in the answer to Question 1, FOI responses from South London revealed vacancy rates of 13.3 per cent for doctors and 18.4 per cent for nursing and midwifery at 31 March 2017. According to the data used in Graph 4, the region's reliance on EU staff at 31 December 2016 was 13.1 per cent for doctors (third highest region) and 13.4 per cent for nursing and midwifery (second highest region). Without EU staff, there would be a vacancy

[6] Which is not broken down by staff group.
[7] There is no FTE data available for this date.

rate of 24.6 per cent[8] for doctors and 29.3 per cent[9] for nursing and midwifery. Using the same approach for the North West region, where EU reliance levels are lower, without EU staff there would be a vacancy rate of 18.3 per cent for doctors and 12 per cent for nursing and midwifery. For the North East[10], the figures are 14.6 per cent and 9.5 per cent respectively. Insufficient numbers of NHS trusts responded in other regions for a reliable figure to be calculated.

This shows that higher vacancy figures tend to correlate with higher EU reliance figures, but to obtain an accurate answer to this question data would be needed from all NHS trusts. Attempting to answer this question using NHS Digital data, and incomplete FOI data, demonstrates how difficult it is to obtain a clear picture about the challenges facing each region, and begs the question whether NHS England and the UK government have the data necessary to measure the potential impact of Brexit on existing understaffing levels.

Question 4: Has there been a noticeable impact on the number of EU staff joining and leaving NHS England since the EU referendum?

Before examining the period directly before and after the referendum, a slightly longer-term perspective shows that between 2014 and 2016, the period for which comprehensive data is available, there has been an annual increase in EU staff leaving NHS England (see Table 2). This is true of all staff groups in the table (data is not available for midwives). In 2016, the number of all EU staff joining decreased, but they continued to outnumber leavers so there were annual net increases for all categories. However, in 2016 the annual net figure for all categories declined compared with 2015, and most significantly the figure for nurses and health visitors halved. The introduction of a language test in July 2016 for EU nurses wishing to register to work in the UK might account for the decline in nurses joining, but the number of leavers increased by 38 per cent compared with 2015 so the lower net figure cannot be accounted for by the language test alone. The number of nurses and health visitors leaving doubled between 2014 and 2016.

Table 2: EU citizens joining and leaving NHS England over a three-year period

EU staff	2014	2015	2016
All joiners	12,939	15,440	14,467
All leavers	6,095	7,477	9,023
Net figure	+6,844	+7,963	+5,444
Hospital doctors joining	2,295	2,248	2,249
Hospital doctors leaving	1,582	1,693	1,753
Net figure	+713	+555	+496
Nurses and health visitors joining	5,487	6,770	5,628
Nurses and health visitors leaving	1,753	2,526	3,482
Net figure	+3,734	+4,244	+2,146

Original table produced using data from NHS Digital (2017f)

To add some context, one can examine how figures for UK staff and those from beyond the EU – referred to as 'rest of the world' (ROW) by NHS Digital – have changed over the same period, to see whether there is anything significant about the EU data. Table 3 shows the

[8] Number of vacant doctor posts plus the number of EU doctors in post, as a proportion of all established doctor posts. Using HEE's definition of 'established posts'.
[9] Number of vacant nursing and midwifery posts plus the number of EU nurses and midwives in post, as a proportion of all established nursing and midwifery posts.
[10] Responses were received from four of eight NHS Trusts in the North East.

number of UK staff leaving and joining has increased year-on-year but the net figure remains positive. Comparing 2014 and 2016, the annual net figure for doctors, nurses and health visitors reduced significantly. For doctors, the 2016 figure was 37 per cent of the 2014 figure, and for nurses and health visitors it was 40 per cent. Clearly, UK staff are not affected by the language test and their rights to work in the UK will not be threatened by Brexit, so this suggests that other factors are affecting the figures, potentially including pay restraint, workload, training and budget squeezes (RCN, 2015 and RCN, 2016).

Table 3: UK citizens joining and leaving NHS England over a three-year period

UK staff	2014	2015	2016
All joiners	121,089	124,944	131,847
All leavers	96,445	104,412	109,492
Net figure	+24,644	+20,532	+22,355
Hospital doctors joining	13,671	12,889	12,831
Hospital doctors leaving	10,851	11,938	11,785
Net figure	+2,820	+951	+1,046
Nurses and health visitors joining	27,831	27,845	28,368
Nurses and health visitors leaving	23,947	25,629	26,819
Net figure	+3,884	+2,216	+1,549

Original table produced using data from NHS Digital (2017f)

Table 4 shows that the annual net figure for ROW staff kept increasing, unlike for UK and EU staff. It increased nearly six-fold between 2014 and 2016. The large increase in nurses and health visitors joining in 2016, and its transformative effect upon the net figure, might be accounted for by the addition of nursing to the UK's Tier 2 visa Shortage Occupation List which made it easier for the NHS to recruit from outside the EU. More EU citizens join NHS England each year than ROW citizens, but for the past two years the reverse has been true for doctors. In 2016, despite the introduction of the language test for EU nurses, the increase in Tier 2 visas for ROW nurses, and the result of the EU referendum, nearly twice as many EU nurses joined NHS England compared with ROW nurses.

Table 4: ROW citizens joining and leaving NHS England over a three-year period

ROW staff	2014	2015	2016
All joiners	8,966	9,822	11,499
All leavers	8,417	8,690	8,225
Net figure	+549	+1,132	+3,274
Hospital doctors joining	2,092	2,474	2,889
Hospital doctors leaving	2,360	2,388	2,369
Net figure	-268	+86	+520
Nurses and health visitors joining	1,755	2,007	2,866
Nurses and health visitors leaving	2,518	2,620	2,165
Net figure	-763	-613	+701

Original table produced using data from NHS Digital (2017f)

Table 5 compares data for the last quarter of 2016 with the first quarter of 2017, and shows a decline in the number and rate of all EU staff and all EU nurses, health visitors and midwifes[11] leaving (the reverse is true for doctors), while the number and rate of joining increased. This suggests Brexit is not causing an exodus, and perhaps the new EU staff joining the NHS want to arrive before the cut-off date to qualify for 'settled status'. However,

[11] The source for Table 5 includes midwives, unlike the source for Table 2.

the fact that the figures paint a relatively healthy picture right now is no cause for complacency because we do not know how EU citizens will react to the outcome of the Article 50 negotiations, and the inflow of EU staff is threatened if freedom of movement ceases.

If the net increase in all EU staff (1,437) and all EU doctors (142) during the first quarter of 2017 continues at the same rate throughout this year, the figures will be higher compared with 2016, which according to Table 2 were 5,444 and 496 respectively. However, as Table 2 shows, during 2016 there was a net increase in EU nurses and health visitors of 2,146, while Table 5 shows that in the first quarter of 2017 the net increase was only 59. Unless the effect of the language test continued to be felt at the end of March 2017 – nine months after it was introduced – there could be other factors involved. Comparing the figures in Tables 2 and 5, a significant 37 per cent of all EU staff (3,303 out of 9,023) and 40 per cent of all EU nurses and health visitors (1,400 of 3,482) who left NHS England during 2016 did so in the final quarter of the year – after the EU referendum. However, there is no recorded evidence of their reasons for leaving. Emigration is not a category listed on NHS England exit surveys. Apart from retirement, the most common reasons given for staff leaving are 'employee transfer' and 'relocation' but the data does not specify whether this is within the UK or involves leaving the UK (NHS Digital, 2017g).

Table 5: EU[12] staff leaving and joining NHS England, compared with leavers and joiners of all nationalities, in the final quarter of 2016 and first quarter of 2017

Leavers

	30 September 2016 to 31 December 2016				31 December 2016 to 31 March 2017			
	EU staff	**Rate**	**All staff**	**Rate**	**EU staff**	**Rate**	**All staff**	**Rate**
All roles	3,303	5.5 per cent	45,229	3.9 per cent	2,840	4.7 per cent	38,903	3.3 per cent
Hospital doctors	496	4.8 per cent	4,197	3.7 per cent	519	4.9 per cent	4,469	4 per cent
Nurses and health visitors	1,400	6.3 per cent	12,486	3.9 per cent	1,114	5.1 per cent	10,088	3.2 per cent
Midwives	100	7.4 per cent	1,051	4.1 per cent	56	4.1 per cent	801	3.1 per cent

Joiners

	30 September 2016 to 31 December 2016				31 December 2016 to 31 March 2017			
	EU staff	**Rate**	**All staff**	**Rate**	**EU staff**	**Rate**	**All staff**	**Rate**
All roles	3,763	6.3 per cent	46,880	4 per cent	4,277	7 per cent	48,622	4.1 per cent
Hospital doctors	597	5.8 per cent	4,227	3.8 per cent	661	6.3 per cent	5,009	4.5 per cent
Nurses and health visitors	1,030	4.7 per cent	10,404	3.3 per cent	1,173	5.3 per cent	10,503	3.3 per cent
Midwives	83	6.2 per cent	1,576	6.1 per cent	85	6.2 per cent	791	3 per cent

Tables reproduced from NHS Digital (2017h)

[12] Excluding EEA.

Tables 6 and 7 compare figures for the periods of time directly before and after the EU referendum. Unfortunately, data for the second quarter of 2017 will not be published until after the deadline for this research so it is not possible to compare data for the 12-month periods before and after the referendum. Table 6 shows a significant decline in the net figures for EU nurses and health visitors, and midwives, but the net figure for EU doctors doubled. According to Table 7 there were some negative figures in the second half of 2016, when those leaving outnumbered those joining.

Table 6: Net effect of EU joiners and leavers, during the nine-month periods prior to and following the EU referendum

EU staff	30 September 2015 to 30 June 2016	30 June 2016 to 31 March 2017
EU staff	+5,905	+3,268
EU hospital doctors	+265	+573
EU nurses and health visitors	+3,060	+408
EU midwives	+129	+4

Original table produced using data from NHS Digital (2017c)

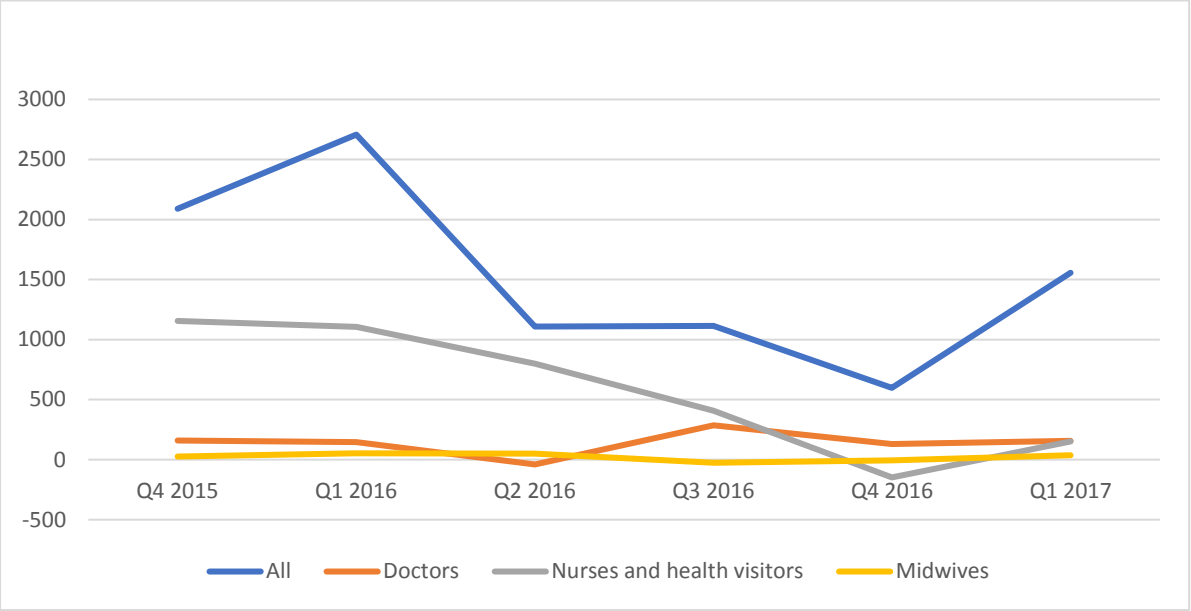
Table 7: Net effect of joiners and leavers, comparing EU staff with all staff regardless of nationality, between 30 September 2015 and 31 March 2017

Staff category	Fourth quarter 2015	First quarter 2016	Second quarter 2016	Third quarter 2016	Fourth quarter 2016	First quarter 2017
All EU staff	+2,089	+2,707	+1,109	+1,113	+598	+1,557
All staff	+5,524	+7,809	+525	+10,672	+1,701	+9,756
EU hospital doctors	+159	+146	-40	+286	+130	+157
All hospital doctors	+107	-502	-648	+2,791	+45	+588
EU nurses and health visitors	+1,155	+1,107	+798	+406	-148	+150
All nurses and health visitors	+2,703	+1,243	-1,484	+676	+741	+1,000
EU midwives	+27	+53	+49	-26	-7	+37
All midwives	+635	-82	-139	-366	+597	+18

Original table produced using data from NHS Digital (2017c)

Graph 5 shows a downward trajectory for EU nurses and health visitors. This could be accounted for by the introduction of the language test, but the result of the EU referendum might also be a factor. To determine the causes, one would not only need an exit survey for EU nurses leaving NHS England, but also research into the relative impact of the language test and the EU referendum result on qualified EU nurses' decision not to come to work in the UK. It would be very difficult to research because there is no reliable and quantifiably robust means of identifying qualified EU nurses living on the continent who were considering moving to the UK, but who have now decided not to do so. Perhaps more positively, Graph 5 shows that the net figure for EU staff started to climb again during the first quarter of 2017, which, judging by the figures in Table 7, must have occurred chiefly among categories of staff not included in this research.

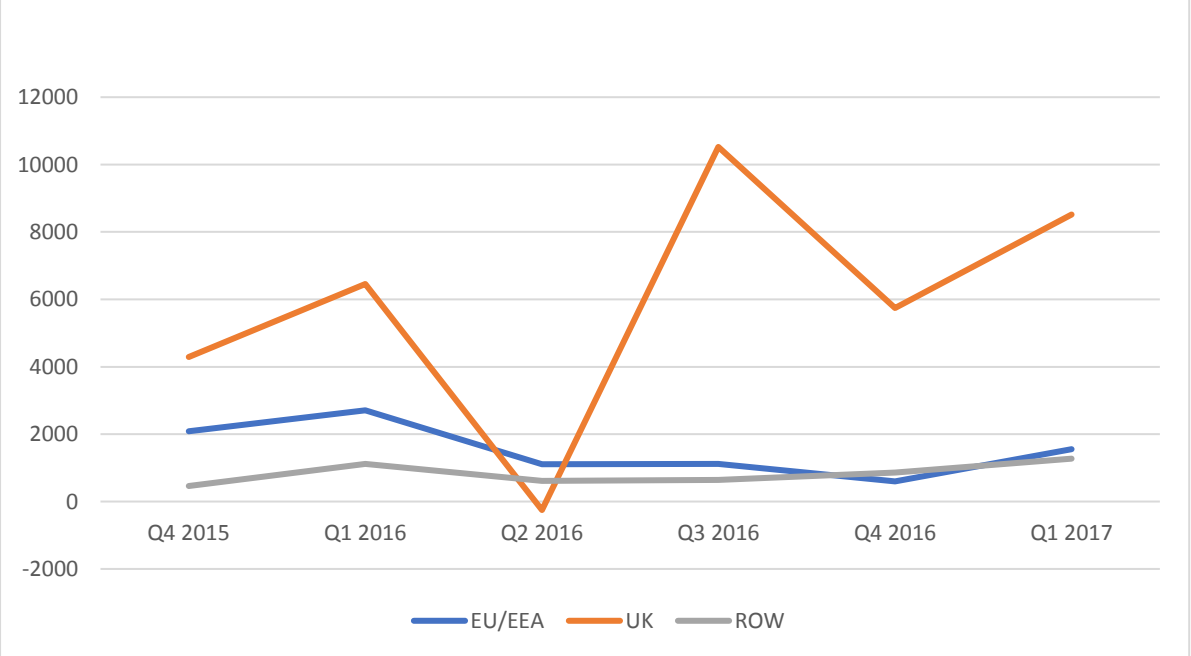
Graph 5: Quarterly net effect of EU joiners and leavers in each staff category



Original graph produced using data from NHS Digital (2017c)

Perhaps of greater concern are the erratic net figures for UK staff, shown in Graph 6, including a negative figure at the end of June 2016. This volatility suggests that the NHS faces considerable workforce management challenges, which could be exacerbated if the supply of EU staff ends.

Graph 6: Quarterly net effect of joiners and leavers for each nationality group



Original graph produced using data from NHS Digital (2017c)

The response to this question has not analyzed data for the 13 regions because regional statistics do not specify whether a member of staff is joining NHS England for the first time, leaving for good, or simply transferring between regions. An individual member of staff

transferring from one region to another would be counted twice in the statistics – as a leaver from one region and a joiner to another region – so the data does not help to answer this question.

To summarize, it is possible that the introduction of the language test is the most significant factor in deterring qualified EU nurses from joining NHS England, but it is also possible that the EU referendum result has reinforced their decision not to seek employment in the UK. Four in ten EU staff who left NHS England during 2016 left in the final quarter of the year, suggesting a speeding up of the rate of departure as that year progressed, which the result of the EU referendum might have contributed to, but net figures for EU staff started to recover in the first quarter of 2017 as the number of leavers fell and the number of joiners increased, so the referendum result has not put a halt to EU staff joining NHS England.

Question 5: Is EU staff turnover higher than 'all staff' turnover?

Staff 'turnover' is commonly understood as a measurement of how many people leave a workplace during a calendar or financial year, but here it will be defined as a measurement of the net effect or 'churn' of joiners and leavers on workforce numbers. For example, if 200 employees leave a workforce of 1,000 people during a 12-month period, and 300 employees join, there is a net increase of 100 people and an apparently healthy ten per cent increase in the workforce. But scratch the surface and one sees that a significant 20 per cent of the workforce left. Turnover is important in the context of Brexit because if the supply of EU staff ceases, without compensatory staff supply measures being put in place, it will no longer compensate for those leaving. Using the figures above, and assuming employees continued to leave at the same annual rate, after one year the workforce would be reduced by 20 per cent and after five years there would be no workers left.

Table 5 includes data for a six-month period between 30 September 2016 and 31 March 2017, and shows that EU staff join and leave NHS England at a higher rate than all staff regardless of nationality, and therefore the turnover or 'churn' of EU staff is greater than that of all staff. Unpublished NHS Digital data received by the researcher in response to an FOI request shows that EU staff leave and join at a higher rate than ROW staff too, apart from ROW doctors who join at a higher rate than EU doctors. Assuming the supply of EU staff ceased, and the rate of departure remained the same (an average 5.1 per cent per quarter according to Table 5), it would take just under five years for EU staff to reduce to zero. This assumes that there is not an increase in the rate of EU staff leaving in the future, but there might be if EU citizens dislike the final 'settled status' deal. The answer to Question 7 will reveal that the speed of the impact of Brexit on the NHS England workforce could be even more serious than Table 5 suggests.

The regions facing the greatest challenge if the freedom of movement ceases are the ones with higher than average EU staff as a proportion of the workforce, high turnover among EU staff, and where EU staff represent a high proportion of all joiners and leavers compared with their representation in the workforce. Appendices 1a and 1b focus on regional staff turnover. Columns one to four demonstrate that turnover rates are greater for EU staff than for all staff, except for doctors in the East Midlands. Comparing the final three columns, the representation of EU staff among both joiners and leavers exceeds their representation within the workforce, except for doctors in the East Midlands. We cannot say for certain that the higher leaving rates among EU staff, and their over-representation among all leavers, is attributable to Brexit because we do not know whether they are transferring between regions or emigrating. However, the higher rates of joining among EU staff compared with all staff, and their over-representation among all joiners, suggests that the result of the referendum has not deterred them from joining or transferring within NHS England. The greater volatility

of turnover among EU staff might suggest they have less secure contracts or greater flexibility to relocate than their colleagues.

Question 6: What are the implications for NHS England if freedom of movement ceases?

If freedom of movement ends and no system is put in place to compensate – for example by making more visas available for healthcare workers from overseas – the inflow of EU staff will end while the outflow of EU staff will continue, thereby eroding the number of EU staff in NHS England. One can assess the potential impact of Brexit by calculating how long it would take NHS England to lose all existing EU staff if the rate of leaving continues at the same pace as that shown in recent years. Assuming freedom of movement ends when the Article 50 negotiation period ends on 29 March 2019, calculations outlined in Appendix 2a[13] show that by the middle of June 2021 there might be no EU nurses and health visitors left in NHS England. This assumes that the average net annual increase in their number during 2014-16 continues until the end of March 2019, and the average annual increase in numbers leaving during 2014-16 remains the same and does not decrease or speed up. Appendix 2b repeats the exercise for EU hospital doctors and shows that their number would erode to zero by the end of May 2024. It is possible that a transition period after 29 March 2019 could see the date pushed back when freedom of movement ends, but nevertheless these calculations provide an insight into how rapidly the impact of Brexit could be felt.

The fact that EU staff leaving rates are higher in some regions than others could accelerate this process, adding to their understaffing challenges. For example, the highest EU leaving rates between March 2016 and March 2017 were in North West London where 21.9 per cent of EU doctors left, and in the South West where 20 per cent of EU nurses and health visitors left. As seen in the answer to Question 3, a region like South London that is heavily reliant on EU staff would have had vacancy rates of 24.6 per cent[14] for doctors and 29.3 per cent[15] for nursing and midwifery at the end of March 2017 if it had not had access to EU workers.

If existing EU staff adopting a wait and see approach decide they do not like the final terms of 'settled status' the numbers leaving might speed up, but likewise if EU healthcare workers observing Brexit negotiations from the continent decide to come to the UK before it is too late, thereby qualifying to work towards 'settled status', there could be an increase in the numbers arriving before Brexit. It is possible that a significant proportion of EU staff are joining and leaving within a 12-month period. If they are prevented from joining by Brexit, it follows that they cannot then be leavers within the same 12-month period, so the leaving figures might fall. To make more accurate calculations about the potential numbers leaving after Brexit, one would need to know what proportion of EU staff joining the NHS take a role lasting less than 12 months and then leave. It is not possible to predict with precision the impact of ending the freedom of movement because we do not know whether more visas will be made available for overseas healthcare workers, or when the date of Brexit might be, but we do know how many EU staff are here now, the rate at which they leave and join, and regional variations. If the government wants to lessen the impact of Brexit on NHS England it

[13] Based on data for staff leaving and joining NHS England – not simply transferring regions (NHS Digital, 2017f).
[14] Number of vacant doctor posts plus the number of EU doctors in post, as a proportion of all established doctor posts.
[15] Number of vacant nursing and midwifery posts plus the number of EU nurses and midwives in post, as a proportion of all established nursing and midwifery posts.

could use this data to determine how many international visas might be needed, and how quickly.

Question 7: What are the concerns of staff and their representative organisations about the right to remain and freedom of movement, and what do they think about possible solutions?

All the organisations interviewed for this research support the preservation of existing rights for EU citizens working in the UK and the principle of the freedom of movement, and are concerned about the potential impact of Brexit on NHS England and its workforce. The Royal College of Midwives was part of the Stronger In campaign in the lead up to the EU referendum and Public Affairs Advisor Stuart Bonar said it has 'consistently argued that we need to make clear to NHS staff that their right to stay in the country will be maintained'. Allison Roche, Policy Officer for Unison, said the union supports the European Commission's proposal to preserve bilateral rights for EU citizens living in the UK and UK citizens living in the EU, and opposes the UK government's 'settled status' proposal. The union fears that EU citizens will not be allowed to bring parents to the UK to be child carers for their grandchildren or to be cared for in old age, and that if they leave the country for more than two years they will lose their rights.

All interviewees are concerned that Brexit will have a significant impact on the NHS workforce, but several cautioned that the significant reduction in EU nurses registering with the Nursing and Midwifery Council in 2016 was likely to have been caused by the introduction of the language test in July 2016. Requests for application packs increased prior to a January 2016 deadline and applicants had until mid-July to register without having to take the test. After that, there was a significant reduction in registrations. Paul Myatt, Policy Adviser for NHS Providers, pointed out that the same thing happened when the General Medical Council introduced tests for doctors.

All organisations interviewed are engaged in long term campaigns to tackle high staff turnover, describing the causes as the pay cap, lack of opportunities for training and development, burnout, and disillusionment because staff feel they cannot provide the quality of care that they aspire to. Christian Beaumont, International Adviser for the Royal College of Nursing, likened high turnover in the NHS to a 'leaky bucket' and expressed concern that rather than tackling the challenges outlined above, international recruitment is a 'diversionary tactic' and regarded as a 'magic bullet' – mirroring the Migration Advisory Committee's criticism of the 'automatic presumption' that international recruitment provides a '"Get out of jail, free" card' (2016). Mr Bonar said there is an annual spike in midwives joining the NHS after completing their training, and then 'a slump during the year almost wiping out the increase'. A demographic challenge lies ahead because one third of employed midwives are aged 50 or above, and the number of midwives aged under 50 has fallen since 2010.

Mr Bonar explained that the figures for the total number of all EU staff in the NHS hide the numbers of joiners and leavers – the turnover or 'churn' evidenced in the quantitative section of this research – and warned that without a continuing supply of suitably qualified people the NHS will see 'a very rapid tailing-off of the EU workforce'. He said there are 1,500 EU midwives, leaving at a rate of 200 per year. Mr Myatt said the challenge is not only about the right to remain for EU citizens already living and working in the UK, but the 'pipeline' supplying new EU staff.

All organisations interviewed are members of the Cavendish Coalition of health and social care organisations which, according to their website, 'influences and lobbies on post-EU referendum matters'. The Coalition is working with NHS Providers and the Shelford Group of

university hospitals to conduct quarterly surveys of NHS trusts to monitor workforce, turnover and vacancy statistics with a view to identifying where Brexit might create challenges. Amarjit Matharoo, Senior Programme Officer for NHS Employers and a spokesperson for the Cavendish Coalition, agreed with Mr Myatt's assessment that the Department of Health is 'sympathetic' to its arguments, but ultimately responsibility for immigration and Brexit policy is in the hands of other departments including the Home Office and Department for Exiting the EU. Ms Roche from Unison – also a member of the Coalition – provides an interesting insight into what is happening behind the scenes in government:

> 'The Home Office says to provide three million existing EU workers with the right paperwork they will have to set up a new nationality checking service at local government level because the Home Office won't be able to cope. They'll have to employ and train new people to oversee this. To get [settled status] you'd have to go in person to prevent fraud. That has to be rolled out before anything else can happen. The Home Office hasn't even got this far.'

Ms Roche also said Unison believes it is 'absolutely ludicrous' that the government plans to publish a migration bill before the Migration Advisory Committee reports back to the Home Secretary in September 2018 about the impact of migration on the UK. She said, 'It all seems ad hoc, illogical, incoherent and none of the agencies are working together. Civil servants don't seem any wiser than us'.

The future of the UK's border with the Republic of Ireland is unknown, including whether there might be a deal whereby Irish nurses working in NHS England would not be affected by Brexit. They are the second largest group of nurses in NHS England, after Spanish nurses. It is not yet clear whether, after Brexit, EU citizens seeking employment in the UK would be treated as a separate group or as part of the NHS's ROW category. Ms Roche said that treating future EU workers better than non-EU workers would be 'introducing institutional racism indirectly'. Ms Matharoo said, 'We want one system for everyone. This is an opportunity for us to change this migration system we have which is very difficult to work through sometimes'.

The consensus was that Brexit will pose a massive challenge for the NHS and there should be a transition period between the end of the Article 50 negotiations and the date of Brexit. Asked whether a long-term solution would be to recruit more staff from beyond the EU, organisations pointed to the difficulties of recruiting from ROW countries because of the restrictions on visas, and the ethical implications of continuing to expect other, often poorer, countries to pay to train staff for the UK's benefit.

A long-term solution would be to increase the number of UK-based training places. A Spanish nurse said, 'The amount of money [the NHS] spent bringing people from abroad was a short-term solution. You are not spending money on a long-term solution'. However, Ms Matharoo said, 'Because of the ageing population we're never going to have enough people domestically to fill roles'. Mr Beaumont pointed out that EU citizens working for the NHS 'tend to be much younger [and] overqualified for the roles that they take'. Organisations pointed to the reduction in UK citizens applying for nurse training after the nursing bursary was abolished, questioned what has happened to the extra degree course places the government promised, and made the point that even if there were extra degree course places there would need to be enough hospital training places to match, and hospitals with staff shortages must prioritise care over training. They also said that unless low pay and morale are tackled people will not choose nursing when deciding what university course to take. Mr Beaumont said, 'It's not only about access, it's the image of nursing. Nursing's reputation has been significantly battered and bruised when it comes to issues around pay.

When it comes to a UK audience I'm not sure nursing would come across as career option of choice for a lot of people'.

Asked whether ending the freedom of movement might bring benefits including lower patient demand, Mr Bonar dismissed news stories about 'health tourism' for 'taking an anomaly and pretending it's a norm', and said, 'study after study show that [EU citizens] contribute more than they take out and all that extra tax revenue helps pay for the NHS'. Ms Matharoo said, 'We shouldn't be saying to someone "we want to see your passport" in an emergency. The needs of the patient come first'. Mr Myatt said, 'People are living longer; people have more long-term health conditions so they require more care on an ongoing basis. People's expectations are going up. They're much bigger factors than the number of people here from the EEA'. Mr Beaumont said pressure on the NHS is not caused by migration, but by the lack of integration with social care. Some interviewees suggested that the greater challenge for the NHS if Brexit negotiations break down is that UK citizens living in the EU return to the UK, because they tend to be older and have more health problems than the relatively young and healthy EU citizens living here.

The consensus among interviewees was that there is little evidence that significant numbers of EU citizens are already leaving the NHS, but instead they are waiting to see the outcome of the negotiations. This was borne out by interviews with individual EU citizens working in the NHS. None of the interviewees were planning to leave the UK in the immediate future, but many said they now feel like foreigners in a country that they regard as home. A nurse said, 'I came to England because it was liberal and open minded. Now I dare not speak Spanish with my children. I don't think people are more racist. The problem is because of the economy – the people are trying to blame someone for their problems'. A German GP said, 'The attitude of some of the British media is extremely reminiscent of Germany between 1930 and 1933 in the run up to a totalitarian system. The choice of words, imagery, relentless untruths directed towards certain population groups is unworthy of a democratic, liberal country'. Interviewees said some of their friends had voted for Brexit to reduce immigration, but tried to reassure their EU friends by saying "it's not you, it's the others". This has caused anger and incredulity. A Spanish nurse said, 'It's like the government has created a migrant ghost and put all the faults onto this ghost but nobody knows who this is'.

A lengthy compilation of testimonies from EU citizens living and working in the UK, including current and retired NHS staff, was published this summer, entitled *In Limbo*. The German GP used the same phrase, 'We feel in limbo. I don't know what the residency rights are going to be. Are we going to continue investing in our house? Are we going to have to look for work elsewhere? We don't know whether we will get our pension because once we fall outside the legislation of the ECJ, British legislation can be changed at will'. Some interviewees were concerned about what would happen in the future if their parents want to visit them and need visas, or if they leave the UK for a while and then try to return. Some EU citizens are carefully monitoring developments with the Brexit negotiations while others appear to have little interest in the details, preferring to wait for the outcome. Some interviewees were relatively young, have no children, rent their home, and have always planned to move on one day because they want to experience other countries. A Hungarian midwife said, 'I'm planning to leave maybe next year. It's good experience if I've worked in the NHS at least two or three years, but I want to discover the world'. A Spanish nurse said, 'I work with Portuguese and Italians. The general feeling is one day they will go back'. Interviewees talked about the possibility of moving to the Middle East, Australia or South America. EU citizens without commitments like mortgages could leave the UK quickly if they do not like the outcome of the Article 50 negotiations, so we might not see significant changes in the number of EU staff leaving the NHS until closer to March 2019.

There is defiance among EU citizens who have lived in the UK for many years. The German GP said, 'We have skills that are sought in other countries too. We are not dependant on the UK'. A Spanish nurse said, 'If I was ten or 15 years younger I would probably have packed. As a nurse, I can go anywhere in the world'. There is also determination. The nurse continued, 'I decided to stay here and fight. This is my country; the country I love. I have paid my tax, I've never claimed benefits, and I feel part of the community'.

Motivations for working in the UK, which might remain pull factors even if EU citizens must apply for a visa post-Brexit, are better pay and conditions compared with other countries, and the fact that the NHS is viewed as a better health service than in other EU nations. A Polish midwife said, 'The NHS is amazing. In Poland, it's very poor. I worked in maternity and I was shocked by how people are treated there. We are very lucky and spoilt here by the NHS. In my opinion, the pay here is amazing'. Another midwife said, 'I came from Hungary and I know what it means to have no money. So many people are leaving the country because the government doesn't look after us'. A nurse said, 'In Spain, you don't have any kind of security with work'.

Ms Matharoo and Ms Roche also highlighted the reliance of the NHS on EU staff working in other roles including administrators and caterers, and Unison said the social care sector, which the NHS relies on to reduce patient demand at hospitals, relies even more heavily on EU staff than the health sector. Interviewees were opposed to the government's pledge to reduce immigration to the tens of thousands, and sceptical about the target because future trade deals are likely to be conditional on agreeing quotas of UK work visas for the citizens of trading partner nations.

Conclusion

This research has shown how reliant NHS England and its 13 regions are on EU staff, focusing on doctors, nurses, health visitors and midwives. At 31 December 2016, 9.4 per cent of doctors and 6.8 per cent of nurses, health visitors and midwives were from the EU. While relatively small numbers, their absence would exacerbate existing understaffing, and using FOI requests this research has demonstrated that the reality of understaffing is more concerning than NHS Digital 'advertised vacancy' data would suggest. If the researcher can extract data about vacant 'established posts' from NHS trusts it must be possible for NHS Digital to do the same.

The fact that EU staff have continued to join NHS England since the EU referendum, and that joiners continue to outnumber leavers, can be considered good news but if freedom of movement ceases and the supply of EU staff ends, and they continue to leave at the same average rate seen in recent years, the number of EU nurses and health visitors in NHS England could disappear by the middle of June 2021 – just two years and three months after Brexit – and EU doctors could be absent by the end of May 2024. This assumes the average net increase in staff of recent years continues between now and the end of March 2019 and does not reduce, and the average annual leaving rate does not increase as EU staff learn more about the details of 'settled status'. Interviews with EU staff indicate that they are adopting a wait and see approach, so the fact there is not a 'Brexodus' now does not mean there will not be one further down the road. The NHS should consider adding 'emigration' to its exit survey as one means of monitoring the situation.

This research has the potential to be extended into the future by monitoring the numbers of EU staff in the NHS England workforce to see whether the above calculations about the speed of attrition are correct, and monitoring the impact on staff numbers of the government's immigration policy post-Brexit.

At the time of writing there is radio silence from the government about how the NHS – or any other sector – will be protected if the freedom of movement ceases. In addition to 'settled status', clarity is also needed about how major employers like the NHS will gain sufficient access to new staff after the date of Brexit. After all, nurses were only added to the Tier 2 visa Shortage Occupation List for a period of three years, and the government has committed to reducing net immigration to tens of thousands. To mitigate the impact of Brexit on the NHS there would need to be sufficient visas set aside for health care workers, and a low salary threshold to qualify for a visa to ensure nurses are not excluded. It would also need to be as frictionless an application process as possible, or workers might spurn the UK in favour of countries where they can still move freely. Ironically, rather than 'taking back control', the situation might already be beyond the UK's control because of sterling's weakness and recovering economies in other EU nations.

The greatest challenges will be faced by regions of NHS England where understaffing and reliance on EU staff is disproportionately high, and EU turnover is disproportionately rapid, because they could be more severely affected when the supply of staff ends, and the number of existing staff could erode more rapidly. The three London regions are likely to be affected most severely because of their relatively high levels of understaffing and reliance on EU staff, and the high turnover of their EU staff, whereas regions in the north of England have lower vacancy rates, a lower proportion of EU staff in the workforce, and their turnover rates are relatively low. The UK government must not repeat the mistake of failing to support regions disproportionately affected by the pressure of increased migration – a failure which boosted the Leave vote – by failing to support the regions of NHS England disproportionately affected if immigrant labour slumps.

Tackling recruitment and retention and investing in training might be long-term solutions, but training takes time and money, and meanwhile demographic ageing will reduce the working age population while increasing patient demand. The UK needs relatively young, working age immigrants to care for the sick and elderly and pay the taxes that fund public services. Those in favour of Brexit argue that it will enable the UK to take back control of immigration, but the country has little control over demand for NHS services – which under current conditions can only be met with immigrant staff. Ultimately the UK has a choice: welcome the contribution of immigrant workers, and find ways to deal with any associated pressures on housing and school places, or accept that increasing patient demand on the NHS cannot be met. We cannot have our cake and eat it.

Appendices

Appendix 1a: Turnover of EU doctors, compared with all doctors regardless of nationality, between 31 March 2016 and 31 March 2017

	Joining doctors[16] as a percentage of all doctors[17]	Leaving doctors[18] as a percentage of all doctors	EU doctors joining as a percentage of all EU doctors[19]	EU doctors leaving as a percentage of all EU doctors	EU doctors joining as a percentage of all doctors joining	EU doctors leaving as a percentage of all doctors leaving	EU doctors as a percentage of all doctors[20]
North West	2,538/15,461 (16.4 per cent)	2,174/15,461 (14.1 per cent)	258/1,239 (20.8 per cent)	187/1,239 (15.1 per cent)	258/2,538 (10.2 per cent)	187/2,174 (8.6 per cent)	8 per cent
North East	985/6,297 (15.6 per cent)	883/6,297 (14 per cent)	83/463 (17.9 per cent)	84/463 (18.1 per cent)	83/985 (8.4)	84/883 (9.5)	7.4
Yorkshire and the Humber	1,779/10,518 (16.9)	1,550/10,518 (14.7)	131/691 (19)	103/691 (14.9)	131/1,779 (7.4)	103/1,550 (6.6)	6.6
West Midlands	1,758/ 11,141 (15.8)	1,472/ 11,141 (13.2)	169/793 (21.3)	122/793 (15.4)	169/1,758 (9.6)	122/1,472 (8.3)	7.1
East Midlands	1,362/7,590 (17.9)	1,150/7,590 (15.2)	126/637 (19.8)	93/637 (14.6)	126/1,362 (9.3)	93/1,150 (8.1)	8.4
East of England	1,993/9,848 (20.2)	1,316/9,848 (13.4)	251/1,088 (23.1)	188/1,088 (17.3)	251/1,993 (12.6)	188/1,316 (14.3)	11
South West	1,386/8,535 (16.2)	1,272/8,535 (14.9)	148/622 (23.8)	120/622 (19.3)	148/1,386 (10.7)	120/1,272 (9.4)	7.3
Wessex	808/5,439 (14.9)	756/5,439 (13.9)	99/468 (21.2)	80/468 (17.1)	99/808 (12.3)	80/756 (10.6)	8.6
Thames Valley	661/3,876 (17.1)	629/3,876 (16.2)	87/337 (25.8)	64/337 (19)	87/661 (13.2)	64/629 (10.2)	8.7

[16] Between 31 March 2016 and 31 March 2017.
[17] All doctors at 31 March 2016.
[18] Between 31 March 2016 and 31 March 2017.
[19] All EU doctors at 31 March 2016.
[20] At 31 March 2016.

Kent, Surrey and Sussex	1,479/8,532 (17.3)	1,338/8,532 (15.7)	158/820 (19.3)	139/820 (17)	158/1,479 (10.7)	139/1,338 (10.4)	9.6
North West London	1,014/5,909 (17.2)	901/5,909 (15.2)	183/702 (26.1)	154/702 (21.9)	183/1,014 (18)	154/901 (17.1)	11.9
North, Central and East London	1,620/9,640 (16.8)	1,464/9,640 (15.2)	321/1,350 (23.8)	244/1,350 (18.1)	321/1,620 (19.8)	244/1,464 (16.7)	14
South London	1,444/8,229 (17.5)	1,205/8,229 (14.6)	262/1,028 (25.5)	196/1,028 (19.1)	262/1,444 (18.1)	196/1,205 (16.3)	12.5

Original table based on data from NHS Digital (2016a, 2016b, 2017b and 2017i)

Appendix 1b: Turnover of EU nurses and health visitors (NHV), compared with all NHV regardless of nationality, between 31 March 2016 and 31 March 2017

	Joining NHV[21] as a percentage of all NHV[22]	**Leaving NHV[23] as a percentage of all NHV**	**EU NHV joining as a percentage of all EU NHV[24]**	**EU NHV leaving as a percentage of all EU NHV**	**EU NHV joining as a percentage of all NHV joining**	**EU NHV leaving as a percentage of all NHV leaving**	**EU NHV as a percentage of all NHV[25]**
North West	4,706/51,292 (9.2)	4,866/51,292 (9.5)	342/1,735 (19.7)	316/1,735 (18.2)	342/4,706 (7.3)	316/4,866 (6.5)	3.4
North East	1,807/20,731 (8.7)	1,762/20,731 (8.5)	53/182 (29)	27/182 (14.8)	53/1,807 (2.9)	27/1,762 (1.5)	0.9
Yorkshire and the Humber	2,950/32,215 (9.2)	3,384/32,215 (10.5)	190/741 (25.6)	146/741 (19.7)	190/2,950 (6.4)	146/3,384 (4.3)	2.3

[21] Between 31 March 2016 and 31 March 2017.
[22] All doctors at 31 March 2016.
[23] Between 31 March 2016 and 31 March 2017.
[24] All EU doctors at 31 March 2016.
[25] At 31 March 2016.

West Midlands	3,463/35,210 (9.8)	3,637/35,210 (10.3)	204/1,132 (18)	224/1,132 (19.8)	204/3,463 (5.9)	224/3,637 (6.2)	3.2
East Midlands	2,470/25,313 (9.8)	2,537/25,313 (10)	241/1,023 (23.6)	197/1,023 (19.3)	241/2,470 (9.8)	197/2,537 (7.8)	4
East of England	3,243/28,436 (11.4)	3,070/28,436 (10.8)	523/2,802 (18.7)	478/2,802 (17.1)	523/3,243 (16.1)	478/3,070 (15.6)	9.9
South West	3,298/23,683 (13.9)	2,961/23,683 (12.5)	332/1,508 (22)	302/1,508 (20)	332/3,298 (10.1)	302/2,961 (10.2)	6.4
Wessex	1,601/15,816 (10.1)	1,723/15,816 (10.9)	238/1,382 (17.2)	184/1,382 (13.3)	238/1,601 (14.9)	184/1,723 (10.7)	8.7
Thames Valley	1,052/10,433 (10.1)	1,282/10,433 (12.3)	235/1,269 (18.5)	179/1,269 (14.1)	235/1,052 (22.3)	179/1,282 (14)	12.2
Kent, Surrey and Sussex	2,225/22,229 (10)	2,585/22,229 (11.6)	403/2,106 (19.1)	337/2,106 (16)	403/2,225 (18.1)	337/2,585 (13)	9.5
North West London	1,531/14,832 (10.3)	1,804/14,832 (12.2)	286/1,957 (14.6)	334/1,957 (17.1)	286/1,531 (18.7)	334/1,804 (18.5)	13.2
North, Central and East London	2,414/20,525 (11.8)	2,448/20,525 (11.9)	505/2,793 (18.1)	475/2,793 (17)	505/2,414 (20.9)	475/2,448 (19.4)	13.6
South London	2,222/18,312 (12.1)	2,228/18,312 (12.2)	386/2,405 (16)	437/2,405 (18.2)	386/2,222 (17.4)	437/2,228 (19.6)	13.1

Original table based on data from NHS Digital (2016a, 2016b, 2017b and 2017i)

Appendix 2a: Timescale for the post-Brexit departure of all EU nurses and health visitors (NHV) from NHS England

These calculations assume that the freedom of movement ends when the Article 50 negotiation period ends on 29 March 2019. At 31 December 2016, there were 22,188 EU NHV working for NHS England (NHS Digital, 2017d) and according to Table 2 above (NHS Digital, 2017f), over the three previous calendar years there was an average annual net increase of 3,375. Assuming this trend continues, by 31 March 2019 there would be a 'peak' figure of 29,782 EU NHV in NHS England: 22,188 at end of 2016 + 3,375 in 2017 + 3,375 in 2018 + 844 during 1 January to 31 March 2019.

On 29 March 2019, the supply of EU staff would end. According to Table 2, 3,482 EU NHV left during 2016, and between 2014 and 2016 there was an average 41 per cent annual increase in the number leaving. Using these figures, here is the potential scenario that faces the NHS:

3,482 leave in 2016 x 1.41 = 4,910 leave in 2017

4,910 x 1.41 = 6,923 leave in 2018

6,923 x 1.41 = 9,761 leave in 2019

7,321 (three quarters of the 9,761) leave between 31 March 2019 and 31 December 2019

29,782 'peak' at 31 March 2019 – 7,321 = 22,461 EU NHV by end of 2019

9,761 x 1.41 = 13,763 leave in 2020 → 8,698 by end of 2020

13,763 x 1.41 = 19,406 leave in 2021 (1,617 per month) → zero by middle of June 2021

Appendix 2b: Timescale for the post-Brexit departure of all EU hospital doctors from NHS England

Using the same formula as Appendix 2a, by 31 March 2019 there would be 11,959 EU hospital doctors. There was an average 5.3 per cent annual increase in leavers between 2014-2016. Therefore:

1,753 leave in 2016 x 1.053 = 1,846 leave in 2017

1,846 x 1.053 = 1,944 leave in 2018

1,944 x 1.053 = 2,047 leave in 2019

1,535 (three quarters of the 2,047) leave between 31 March 2019 and 31 December 2019

11,959 'peak' at 31 March 2019 – 1,535 = 10,424 EU hospital doctors by end of 2019

2,047 x 1.053 = 2,155 leave in 2020 → 8,269 by end of 2020

2,155 x 1.053 = 2,269 leave in 2021 → 6,000 by end of 2021

2,269 x 1.053 = 2,389 leave in 2022 → 3,611 by end of 2022

2,389 x 1.053 = 2,516 leave in 2023 → 1,095 by end of 2023

2,516 x 1.053 = 2,649 leave in 2024 (221 per month) → zero by end of May 2024

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