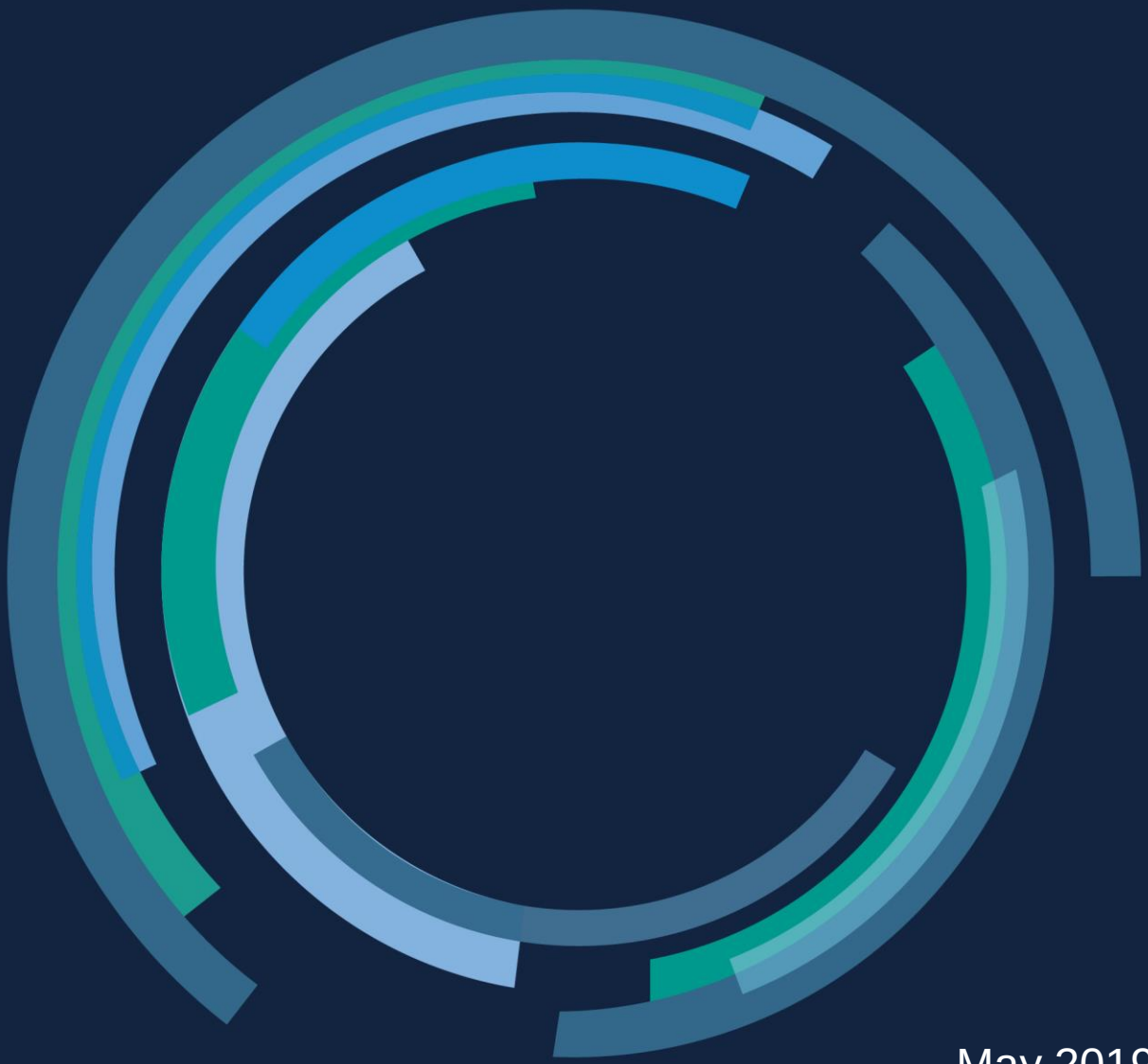
MIGRATION ADVISORY COMMITTEE

Full review of the Shortage Occupation List



May 2019

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Migration Advisory Committee

May 2019

Chair's Foreword

This is the first full review of the Shortage Occupation List (SOL) the Migration Advisory Committee (MAC) has been asked to conduct since 2013.

Being on the SOL conveys certain advantages – not having to conduct a Resident Labour Market Test (RLMT), exemption from the £35,000 minimum income threshold for settlement, lower visa fees and priority in the event the cap binds. The last of these is the most important but it has only been an advantage twice since 2008: in 2015 for two months when it precipitated the review of whether nurses should be on the SOL, and for eight months in 2017/18 when it precipitated the current review.

The labour market is very different now from the last SOL review in 2013. Unemployment is lower, vacancies higher and free movement no longer providing the ready supply of workers it once did for some employers. In addition, there is considerable uncertainty surrounding Brexit and the future immigration system. Together these factors lead to a high level of employer concern, reflected in the large number of responses to our Call for Evidence.

Understandably, many of these stakeholders expressed concerns about the future immigration system: which skills will be included and what will be the salary thresholds. These wider issues are important and our next report will look at these areas. However, there is a current system that needs updating and this report is about which occupations we recommend for the SOL in Spring 2019, in the current Tier 2 system, for which only high-skilled occupations are eligible.

The SOL is a way of prioritising some jobs over others, based on where the shortages are most severe and where the consequences of those shortages are most serious. We had at least one response for 96 out of 108 occupations eligible for Tier 2. To put all jobs on the SOL would not prioritise any of them when the cap binds. Non-EEA migrants can still be recruited into graduate-level jobs through Tier 2 even if the job is not on the SOL.

To be placed on the SOL, a job must meet three requirements: skilled (are the jobs skilled to the required level?), shortage (is the job in shortage?), and sensible (is it sensible to try to fill those shortages through migration?). Using these criteria our recommendation is to expand the SOL to cover a wider range of occupations in health, information technology and other STEM fields and to simplify the eligibility criteria where possible. Our recommendations imply an expansion of the SOL from about 1 per cent of total employment to around 9 per cent.

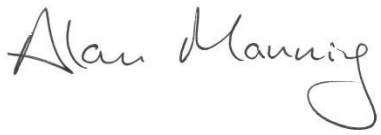
There is also the Scotland-only SOL, in addition to the UK-wide list. The Immigration White Paper last year asked us to consider additional lists for Wales and Northern Ireland. We recommend having the option of additional lists for all countries of the UK but most of the shortages we identified seem UK-wide. The number of occupations on the shortage list increased substantially in all countries of the UK.

The report also discusses the potential role of the SOL in the future immigration system when the range of eligible jobs is likely to be expanded. Given that the Government's Immigration White Paper in December 2018 accepted the MAC recommendation to

abolish the cap and the RLMT, we believe there might be a case for replacing the SOL with a different approach for assessing whether and how immigration policy should vary by occupation. However, in case the SOL does continue in some form our report outlines the medium-skill jobs – science and technology technicians; construction workers; social care professionals – where we think shortages may be emerging but specific recommendations should wait until nearer the time when the new immigration system is clearer and about to be implemented.

Employers are concerned about their jobs being on the SOL mainly because they want to have priority if the cap binds so they can be sure they can hire migrants. The removal of nurses and doctors when the cap was binding in 2018 and the removal of PhD-level occupations in the Chancellor's Spring Statement means the cap is not currently binding but it might be in the future. It is unclear to us whether the Government intends to let the cap bind if it is met before its proposed abolition in 2021. If the Government has no intention of allowing the cap to bind, it would be advantageous to business to remove this uncertainty now rather than engage in ad hoc fixes to ensure it does not bind in practice whilst still retaining the cap on paper.

As always, I would like to thank the other members of the Committee – Brian Bell, Jennifer Smith, Madeleine Sumption, Jo Swaffield and Jackline Wahba – as well as the Secretariat for their work, and all those who submitted evidence and spoke to us, without whom it would have been impossible to write this report.



Professor Alan Manning

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Introduction

MAC Commission to Review the Shortage Occupation List

1.1 On 14 June 2018, the Government commissioned the Migration Advisory Committee (MAC) to undertake a full review of the Shortage Occupation List (SOL). It was requested that the Migration Advisory Committee report by Spring 2019. The Commissioning Letter from the Home Secretary is at Annex A.

What is the SOL?

1.2 The job titles on the SOL are listed in Appendix K of the Immigration Rules[1] . To be eligible for the SOL, a job title has to be eligible for Tier 2 (General) route of the Points-Based System, which only applies to non-EEA citizens. Jobs on the SOL must be skilled to the required standard, currently RQF 6 and above (or the equivalent in the Devolved Administrations) and be paid at a salary level indicated in the Immigration Rules Codes of Practice Appendix J[2].

1.3 Jobs on the SOL have certain advantages in using Tier 2 (General) visas;

- First, there is no need to pass the resident labour market test, i.e. to demonstrate that an attempt has been made to recruit domestically. Not having to undertake this is a saving for the employer in terms of vacancy advertising and recruitment time.

- Second, roles on the SOL are prioritised if the Tier 2 (General) limit of 20,700 is reached[3]. Jobs on the SOL are automatically granted 320 points, a higher level of points than could possibly be achieved by occupations not on the SOL. In practice, this means that jobs on the SOL cannot be turned down when the cap binds.

- Third, there is no requirement to meet the £35,800 salary threshold required for settlement after five years. This requirement is waived if the job title has been on the SOL at any point in those five years.

[1] https://www.gov.uk/guidance/immigration-rules/immigration-rules-appendix-k-shortage-occupation-list
[2] https://www.gov.uk/guidance/immigration-rules/immigration-rules-appendix-j-codes-of-practice-for-skilled-work
[3] Only certain types of Tier 2 (G) application, known as 'restricted CoS', count towards the annual limit: new overseas hires earning less than £159,600; and people applying from within the UK to 'switch' into the Tier 2 (G) category from Tier 4 (Dependent), i.e. family members of international students, earning less than £159,600.

- And finally, applicants (and their families) face lower visa application fees if their occupation is on the SOL[4].

1.4 Of these advantages, the priority when the cap is hit (as the migration limit for Tier 2 certificate of sponsorships is commonly known) is likely to be the most important benefit of being on the SOL. However, the cap has only been reached on two separate periods: once in 2015 for two months, and again in December 2017 until July 2018. The Home Secretary in his commissioning letter to the MAC said the increased pressure on the Tier 2 (General) route was in part due to increased recruitment for overseas health professionals. In June[5], he took the decision to remove doctors and nurses from the cap on a temporary basis though he has since stated that he has no intention to reverse this decision.

1.5 Jobs on the SOL have to meet the same salary thresholds as Tier 2 (General). These salary thresholds are laid out in Appendix J of the Immigration Rules. For experienced workers, the current salary threshold is £30,000 or the 25th percentile of the relevant occupational pay distribution, whichever is higher. New entrants have a lower salary threshold which can be as low as £20,800 for some occupations, and the salary thresholds for workers in health and education are based on the national pay scales.

1.6 The SOL also has another less widely known application within the UK. Asylum seekers who are generally not allowed to work in the UK, can apply for permission to work in occupations which are represented on the SOL after 12 months in the UK (within certain parameters)[6]. We tried to obtained data on the extent to which the SOL is being used for these purposes but the Home Office does not keep any records. This data needs to be collected and the use needs to be evaluated.

Previous reviews of the SOL

1.7 The MAC's role in determining the SOL dates from the founding of the MAC in 2007 and the introduction of the Points-Based System. Prior to the establishment of the MAC, a list of occupations in shortage similar to the SOL was produced by officials from the Migration Policy team in the Home Office via Sector Advisory Panels with representatives from interested sectors. The MAC has reviewed the SOL on 10 different occasions, three full reviews of the whole UK labour market, and seven partial reviews of specific parts of that market – see Table 1.1. In its early years, updated SOL lists were produced regularly. The MAC initially envisaged reviewing the SOL every other year with the "fallow" year used to do other work. Over time, the MAC's other commissions took up an increasing

[4] https://www.gov.uk/Government/publications/visa-regulations-revised-table/home-office-immigration-and-nationality-fees-29-march-2019
[5] https://www.gov.uk/Government/news/doctors-and-nurses-to-be-taken-out-of-tier-2-visa-cap
[6] https://www.gov.uk/guidance/immigration-rules/immigration-rules-part-11b

proportion of its time and SOL-related commissions became less frequent. The last full review of the SOL by the MAC was published in February 2013, and the last partial review in January 2017. It is timely to undertake one now.

Table 1.1: Previous MAC reviews of the SOL

No.	Title	Date of publication
1	"Skilled, Shortage, Sensible: First review of the recommended shortage occupation lists for the UK and Scotland: Spring 2009"	April 2009
2	"Skilled, Shortage, Sensible: Second review of the recommended shortage occupation lists for the UK and Scotland"	October 2009
3	"Skilled, Shortage, Sensible: Third review of the recommended shortage occupation lists for the UK and Scotland: Spring 2010"	March 2010
4	"Skilled, Shortage, Sensible: Review of Methodology"	March 2010
5	"Analysis of the Points Based System: Revised UK shortage occupation list for Tier 2 comprising jobs skilled to NQF level 4 and above"	March 2011
6	"Skilled, Shortage, Sensible: Full review of the recommended shortage occupation lists for the UK and Scotland"	September 2011
7	"Skilled, Shortage, Sensible: Full review of the recommended shortage occupation lists for the UK and Scotland, a sunset clause and the creative occupations"	February 2013
8	"Partial review of the Shortage Occupation Lists for the UK and for Scotland"	February 2015
9	"Partial review of the Shortage Occupation List: Review of nursing"	March 2016
10	"Partial review of the Shortage Occupation List: Review of teachers"	January 2017

1.8 The MAC has also published a number of reviews of the methodology used to inform the SOL, the last undertaken in 2017[7]. As part of this commission we have reviewed the methodology to ensure it is fit for purpose; this is detailed in chapter 2.

Our approach

1.9 The MAC combines quantitative evidence with evidence from stakeholders to make a decision of whether an occupation is in shortage. Our quantitative

[7]https://assets.publishing.service.gov.uk/Government/uploads/system/uploads/attachment_data/file/586110/2017_01_26_MAC_report_Assessing_Labour_Market_Shortages.pdf

approach is based on 9 top-down indicators, which combined give an indication of labour market shortage. Chapter 2 explains this in detail.

1.10 Alongside our analysis of the top-down indicators, we carried out a call for evidence (CfE) to ask questions about labour market shortages. For the first time, we produced an online form (see Annex D) to gather the responses to the CfE , this allowed us to assess and analyse the information in a more structured way and carry out a more detailed level of quantitative analysis of the responses and reported labour market shortages.

1.11 The CfE was launched on 9 November, it was open for a period of 9 weeks, closing in January 2019, over which time we received 558 unique responses via the online form and a further 15 organisations provided evidence through other means[8]. We also carried out a number of stakeholder events (see Annex F for a list of events held) throughout the country where we gathered invaluable insights.

1.12 Chapter 3 gives a summary of the call CfE responses and chapter 4 combines the stakeholder evidence gathered through the CfE and stakeholder engagement with quantitative data on shortages for each of the occupations currently eligible for Tier 2 visas.

The Immigration White Paper

1.13 The MAC has been commissioned to review the SOL for the current system which is for high-skilled occupations which are qualified at RQF level 6 and above. Since the commission the Home Office White Paper; The UK's future skills-based immigration system has been published[9]. The Home Office has indicated that it accepts the MAC's recommendation to lower the skills threshold for Tier 2 (General) to RQF 3 and above. In our Call for Evidence for the SOL we invited evidence from all occupations and job titles at RQF 1 (the lowest skill-level) and above to ascertain what national shortages there are within the UK at present. In this report we make recommendations about the SOL based on the current system (RQF 6 and above). Any such changes could take effect as soon as the Government chooses to act after receiving our report. We also discuss the potential role of the SOL in the future immigration system, as outlined in the White Paper. These changes are unlikely to be made until the new immigration system is introduced, but we do try to give some indication of what job titles and occupations would likely be consider for the list if the current system were open to RQF 3 and above, as per the MAC recommendations accepted in the White Paper. We expect to review these again before the new immigration system outlined in the White Paper is introduced.

[8] Primarily by emailing the MAC inbox

[9] https://assets.publishing.service.gov.uk/Government/uploads/system/uploads/attachment_data/file/766465/The-UKs-future-skills-based-immigration-system-print-ready.pdf

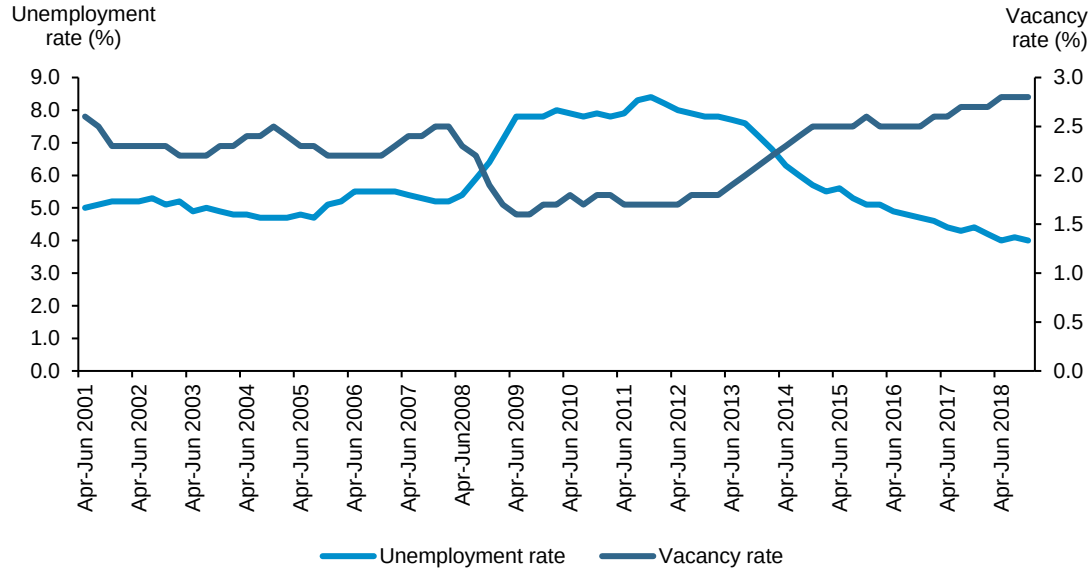
1.14 The White Paper invited the MAC to compile a separate SOL for Northern Ireland and to consider whether the composition of the SOL needs to be different for Wales. Scotland already has its own SOL. We see no reason why these extended regional SOLs should not be implemented now if thought desirable.

1.15 The rest of this chapter looks at the labour market context in which we will be making recommendations and historical data on the use of Tier 2 General and the SOL.

Labour Market context

1.16 Many of the UK's labour market key indicators have either seen or are fast approaching record levels. The UK's unemployment rate is at its lowest level since the early 1970s despite the recent slow-down in GDP growth, whilst vacancy rates are the highest since the current series started in 2001 (figure 1.1).

Figure 1.1 – Unemployment and Vacancy rate over time



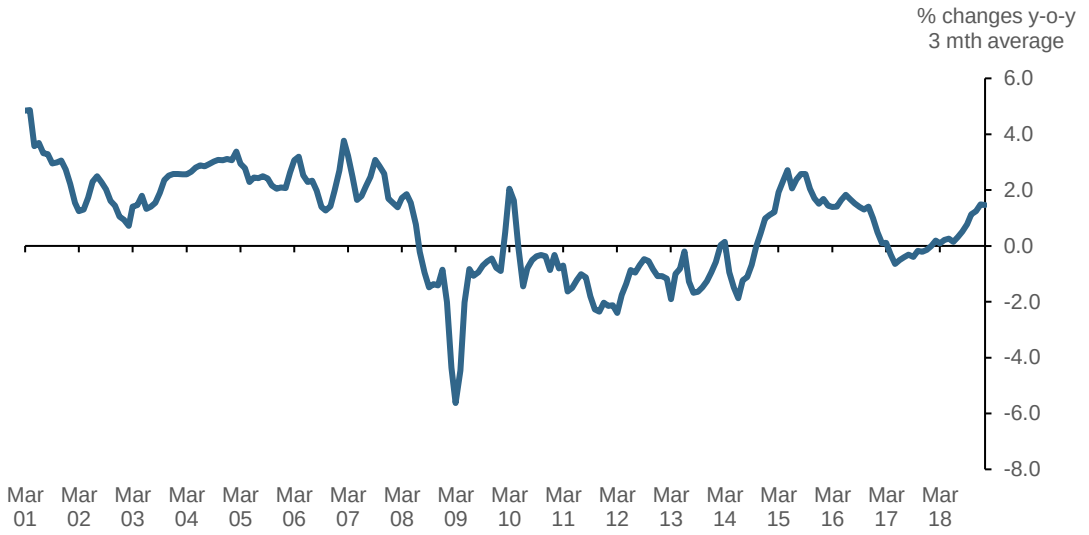
Source: ONS

1.17 The low unemployment rate combined with the elevated vacancy rate (figure 1.1) suggests that demand for labour remains strong and is at levels last seen in the early 2000s.

1.18 However, despite tight labour market conditions, real wages were £28 per week (or 5 per cent) lower in January 2019 compared to their 2008 pre-crisis peak. The UK has a lower than average unemployment rate by international standards and is one of the few OECD countries to have experienced negative wage growth

in the last decade (together with Greece, Italy, Portugal and Mexico[10]). Weak wage growth (see figure 1.2) has largely been blamed on low inflation expectations and weak productivity growth. Despite recent signs of improvement, the OBR suggests that the UK is unlikely to return to the pre-crisis wage peak in the forecast period.

Figure 1.2 – Average real weekly earnings % changes year on year, 3 month average



Source: ONS

1.19 The number of EU and Non-EU born migrants in employment has increased significantly, from about 2 million in 1997 (7.5 per cent of the total employment) to over 5.6 million (or 17.3 per cent) at the end of 2018. The EU-born share increased almost three-fold since 1997 to 7 per cent, whilst the share of the rest of the world workers doubled over the same period. Table 1.2 shows that whilst there was a significant growth in the employment of EU-born between 2004 and July 2016, the growth slowed dramatically since, and there has been a slight reduction in the number of EU-born in the workforce since the referendum (of around 70,000 people[11]). The UK also experienced rapid growth in share of non-EU migrants in employment, the growth rate was twice as fast as that of EU-born migrants in the early period (1997-2003) but it slowed (relatively and absolutely) between 2004 and 2016. Since mid-2016 the growth rate of non-EU born migrants in the workforce remained comparatively high. The average quarterly growth of the UK-born in employment on the other hand was negligible between 2004 and July 2016 but has experienced a 0.3 per cent average growth since July 2016.

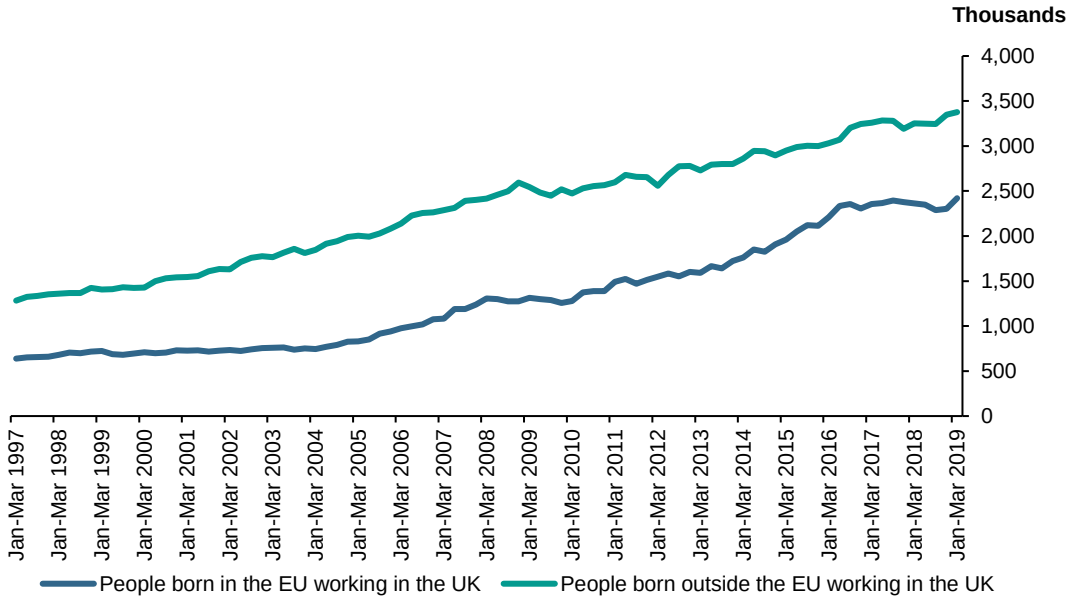
[10] https://data.oecd.org/earnwage/average-wages.htm
[11] Q3 2016 compared to Q3 2018

Table 1.2 – Employment growth by Country of Birth (1997-2018)						
	Average quarterly employment growth (%)				Employment share Q4-1997 (%)	Employment share Q4-2018 (%)
	1997-2003	2004-Jun2016	Jul2016 - 2018	1997-2018		
UK	0.2	0.0	0.3	0.1	92.5	82.7
EU	0.6	2.3	-0.1	1.5	2.5	7.0
Non-EU	1.3	1.1	0.9	1.1	5.1	10.3

Source: ONS

1.20 The latest labour market statistics[12]show that the number of EU-born working in the UK reached a record high. The growth experienced in the last quarter has reversed the flat-lining seen since the 2016 referendum. The number of non-EU born workers also reached record levels, continuing the growth rate experienced since 2016 – see Figure 1.3.

Figure 1.3 – The number of EU and Non-EU born people working in the UK



Source: ONS

[12]https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/articles/ukandnonukpeopleinthelabourmarket/may2019

Data context

1.21 This section uses Restricted Certificate of Sponsorship (RCoS) data to document the current usage of Tier 2 (General) and the SOL and how it has changed over time. The data contains information on the RCoS used by sponsors seeking to hire skilled foreign workers using the Tier 2 (General)[13] work route from 2009-2018. This captures new hire migrants coming to work in the UK from overseas who are earning less than £159,600 per year as well as dependents of migrants grated leave under a Tier 4 student visa who wish to switch to Tier 2 (G) and will be paid less than £159,600 per year. These are the migrants subject to the annual cap of 20,700 RCoS. The sample therefore excludes in country migrants extending their stay in Tier 2 (G), changing employers, switching migrants categories (with the exception of Tier 4 dependents as previously mentioned) and those earning more than £159,600 (or equivalent in previous years). We include doctors and nurses even though they were removed from the cap in June 2018, and hence the need to make use of RCoS. Sponsors will request a certificate of sponsorship for a position, then once they receive it they assign it to a migrant. Once the certificate has been assigned and the migrant has used this in their visa application the certificate is described as "used". All the data in this section refers to "used" RCoS. A RCoS is valid for 3 months from when it is issued and a migrant can apply for a visa up to 3 months before the start date. That means that when we look at 2018 used RCoS, they might include some RCoS that were applied for and granted in 2017. The dataset contains information on annual salary, job title, whether the occupation is on the SOL as well as details on the applicant and their employer. The data made available to the MAC does not capture whether the applicant was actually granted a visa or whether they entered the country, as we were unable to obtain this information. The RCoS data is not perfect and will not be directly comparable with NHS digital data, for example, but it is the best we have available.

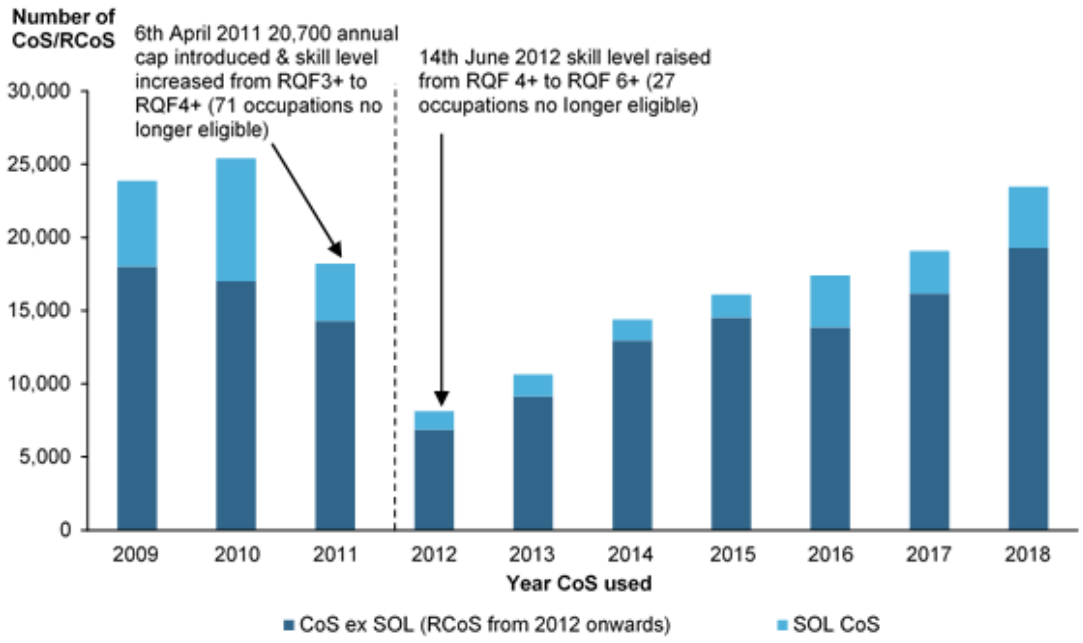
Use of Tier 2 (General) and the Shortage Occupation List

1.22 The job titles on the SOL are listed in Appendix K of the Immigration Rules14 . To be eligible for the SOL, a job title has to be eligible for Tier 2 (G) route of the Points-Based System, which only applies to non-EEA citizens. Jobs on the SOL must be skilled to the required standard, currently RQF 6 and above (or the equivalent in the Devolved Administrations) and be paid at a salary level indicated in the Immigration Rules Codes of Practice Appendix J15.

[13] The rest of this report will refer to Tier 2 (General) as Tier 2 (G).
[14] https://www.gov.uk/guidance/immigration-rules/immigration-rules-appendix-k-shortage-occupation-list
[15] https://www.gov.uk/guidance/immigration-rules/immigration-rules-appendix-j-codes-of-practice-for-skilled-work

1.23 Chart 1.4 shows the total number of RCoS used both on and off the SOL since 2009[16]. The introduction of the current restriction for jobs to be skilled at RQF6 level or above in 2012 resulted in a significant reduction in the number of used RCoS, from around 18,200 in 2011 to around 8,100 in 2012. Some of the variation in the share of RCoS sponsoring jobs on the SOL is the result of changes in the composition of the SOL, especially chefs and cooks which were reclassified in 2011 (due to the increase in the skill requirement of Tier 2 (G) eligible workers from NQF3+ to NQF4+), causing a sharp reduction in the number of chefs that were eligible for the SOL.

Figure 1.4 – Tier 2 (G) over time



Source: Home Office management information

1.24 Currently, there are 34 occupations with 143 job titles on the Shortage Occupation List. The SOL accounted for 18 per cent of the 23,446 RCoS used for Tier 2 (G) in 2018. Tier 2 (G) accounted for 19 per cent of all work-related visas in 2018[17], other work routes like Intra-Company Transfers are larger[18] (24 per cent in 2018) though have no path to settlement. Tier 2 (G) is the most important work-route with a path to settlement but family reunification is the largest immigration route leading to permanent residency.

[16] Even if an occupation is on the SOL, it is down to employers to indicate in the RCoS form whether the individual they are sponsoring is coming in to fil a SOL occupation.

[17] This is greater than the 20,700 annual cap on RCoS as we have included doctors and nurses excluded from the cap in 2018 and potentially due to the timing issues noted in paragraph 1.21.

[18] Tier 5 Youth Mobility and Domestic workers in Private Households make up the bulk of the remaining main applicant work visas granted in 2018 after Tier 2 (G) & Tier 2 (ICT).

1.25 2018 was an unusual year because the cap was binding for a significant part of the year[19], which resulted in the Government's decision to exclude doctors and nurses from the cap. In the first half of the year many applications were refused.

1.26 Table 1.3 shows the number of RCoS used in 2018 under T2(G), for jobs on and off the SOL[20]. Top of the list are nurses and doctors who, combined, represent 39 per cent of used RCoS in 2018[21]. Other big users were science professionals (mostly researchers in universities), IT professions, some types of business analysts and teachers. Some of these occupations are intensive users of T2(G) because the occupation is large – the share of total employment among RQF 6+ occupations is included as a reference. The use of T2(G) by nurses is about three times its share of employment amongst RQF 6+ occupations and for doctors it is 6 times. Some of the heavy users of T2(G) are in occupations that are not on the SOL, illustrating the point that not being on the SOL does not eliminate access to migrants.

Table 1.3: RCoS used in 2018, most used occupations

SOC	SOC Name	Overall Number	Share of T2 (G)	Share of SOL	Share of employment (RQF6+ occupations)
2231	Nurses	5,106	21.8%	26.7%	6.6%
2211	Medical practitioners	3,988	17.0%	25.3%	2.9%
2119	Natural and social science professionals n.e.c.	2,137	9.1%	x	0.6%
2136	Programmers and software development professionals	2,014	8.6%	4.9%	3.4%
2423	Management consultants and business analysts	1,112	4.7%	x	1.8%
2135	IT business analysts, architects and systems designers	839	3.6%	0.2%	1.3%
3534	Finance and investment analysts and advisers	727	3.1%	x	2.1%
2311	Higher education teaching professionals	581	2.5%	x	1.8%
3545	Sales accounts and business development managers	564	2.4%	x	4.6%
2421	Chartered and certified accountants	517	2.2%	x	2.0%
2126	Design and development engineers	429	1.8%	8.1%	0.7%

[19] From December 2017 until June 2018

[20] In many cases it is only some job titles within 4-digit occupations that are on the SOL, so the total CoS used for the occupation can exceed the total flagged as SOL.

[21] Reduces to 32% if we do not include (from numerator and denominator) the unrestricted CoS that became available to sponsor nurses and doctors after June 2018 when they were removed from the RCoS cap.

2314	Secondary education teaching professionals	317	1.4%	6.2%	4.0%
2217	Medical radiographers	295	1.3%	6.7%	0.3%
2413	Solicitors	249	1.1%	x	1.2%
2134	IT project and programme managers	241	1.0%	x	0.8%
2139	Information technology and telecommunications professionals n.e.c.	241	1.0%	0.2%	2.0%
2424	Business and financial project management professionals	210	0.9%	x	2.6%
1132	Marketing and sales directors	205	0.9%	x	2.4%
1131	Financial managers and directors	162	0.7%	x	3.4%
2133	IT specialist managers	149	0.6%	0.5%	1.9%

x – Not eligible for the SOL
Source: Home Office management information

1.27 There are some occupations on the SOL for which hardly any RCoS were used in 2018. Table 1.4 shows 11 occupations on the SOL with the lowest usage in 2018. Some of these are for small occupations and some are only partially eligible to use the SOL.

Table 1.4: Number of RCoS used for SOL eligible jobs 2018, least used occupations

SOC	SOC Name	Overall Number	Share of SOL	Share of T2 (G)
3414	Dancers and choreographers	11	0.3%	0.1%
2139	Information technology and telecommunications professionals n.e.c.	9	0.2%	1.0%
5235	Aircraft maintenance and related trades	9	0.2%	0.0%
2135	IT business analysts, architects and systems designers	8	0.2%	3.6%
3415	Musicians	6	0.1%	0.0%
3113	Engineering technicians	4	0.1%	0.0%
2461	Quality control and planning engineers	4	0.1%	0.1%
1123	Production managers and directors in mining and energy	4	0.1%	0.0%
2142	Environment professionals	3	0.1%	0.0%
3541	Buyers and procurement officers	2	0.0%	0.0%
5215	Welding trades	1	0.0%	0.0%

Source: Home Office management information

Regional use of Tier 2 (General) and the SOL

1.28 Employers based in London and the South East are by far the biggest users of both T2(G) and the SOL, accounting for 57 per cent of T2(G) and 42 per cent of the SOL (see table 1.5). This is higher than their overall employment share. but lower than their Tier 2 (G) usage. Scotland, Wales and Northern Ireland stand out as having a very low share of T2(G) usage compared to their shares of total employment.

Table 1.5: SOL usage by UK region and Devolved Administration 2018

Region	Share of used RCoS (%)	Share of SOL (%)	Share of employment (%)
Rest of England	**36.4**	**51.7**	**56.0**
North East	1.5	1.9	3.7
North West	5.6	8.0	10.7
Yorkshire and the Humber	2.5	3.2	7.9
East Midlands	4.4	6.6	7.1
West Midlands	6.1	10.4	8.4
East of England	12.1	15.1	9.5
South West	4.2	6.3	8.6
London and South East	**56.6**	**41.9**	**28.4**
London	43.7	25.7	14.3
South East	12.9	16.2	14.1
Scotland	3.2	2.4	8.2
Wales	1.7	2.5	4.7
Northern Ireland	2.0	1.4	2.6

Source: Home Office management information; ONS LFS Q4 2018

1.29 We investigated the reasons for these differences. To do that, we appended data from the Annual Survey of Hours and Earnings (ASHE) to the RCoS data. Using London as the benchmark, we estimate the likelihood of an individual being a Tier 2 (G) worker in each region.

1.30 Table 1.6.a shows the odds ratio for a worker being a Tier 2 (G) worker in each region compared to London, which is by far the largest user of Tier 2. The odds ratio is the probability a worker is T2(G) in, say, Scotland, divided by the same probability in London. The first two columns show the raw estimates from the two datasets with the third column, using the first two, calculates the odds ratio[22]. It shows, in line with table 1.5, that 44 per cent of RCoS in 2018 were used to sponsor migrants into jobs based in London. The odds ratio can be interpreted

[22] Example: Odds ratio for East of England = (12%/8%) / (44%/21%) = 0.71

as a measure of relative use of the Tier 2 (G) system (or at least that part associated with the use of RCoS) compared to London. An odds ratio less than one implies that that region makes less use of Tier 2 (G) given its share of total UK employees compared to London. An odds ratio greater than one implies the opposite.

Table 1.6.a: Distribution of RCoS and employees by nation/region of the UK

Region	Share of Used RCoS 2018 (%)	Share of all UK employees % (ASHE 2018)	Odds ratio compared to London, no controls 2018
	(1)	(2)	(3)
North East	2	3	0.23
North West	6	10	0.27
Yorkshire and The Humber	3	7	0.17
East Midlands	4	6	0.35
West Midlands	6	8	0.38
East of England	12	8	0.71
London (benchmark)	*44*	*21*	*(1.00)*
South West	4	8	0.26
South East	13	15	0.40
Scotland	**3**	**9**	**0.17**
Wales	**2**	**4**	**0.22**
Northern Ireland	**2**	**3**	**0.35**

Notes: Observations without positive salaries, below 16 years old or with missing information on region of work or occupation were excluded. In addition, observations from ASHE where the individual was not on adult pay rates were excluded.

1.31 Some of these differences in the use of Tier 2 (G) relative to London may be the result of differences in age, gender, occupation, salary, industry, firm size etc. We often hear that the national salary thresholds give London a relative advantage compared to other areas. Column (4) of Table 1.6.b shows how the odds ratios change when controlling for these factors. Although the differences are reduced somewhat, the changes are generally small. For example, the odds ratio for Scotland rises from 17 per cent to 20 per cent. These results suggest that workers of the same age, in the same job and with the same salary (etc.) are much more likely to be a Tier 2 (G) migrant in London than in most other parts of the UK. The one region that appears in 2018 to have a similar use of Tier 2 (G) as London is the East of England, which is possibly due to the influence of Cambridge.

1.32 We were concerned that 2018 might be an unusual year because the cap was binding resulting in higher levels of salaries. However, column (5) performs the same exercise for 2017 with very similar results – although with the East of England no longer sees such an increase in its odds ratio as in 2018. The reasons for these differences across the regions and countries of the UK are unclear but it is not confined to T2(G). The last column of Table 1.6.b uses the Annual Population Survey to estimate the share of those employed within nations/regions that were born outside of the UK. This can be thought of as the probability a worker is a migrant in general, not a T2(G) migrant in particular (who comprise a small share of total migrant workers). These results are to show that being a migrant is much more likely in London than in other parts of the UK. It may be the case the disproportionate use of Tier 2 (G) by London is just a reflection of the choices migrants.

Table 1.6.b: Regional analysis of Tier 2 (G)

Region	Odds ratio compared to London, no controls 2018 (3)	Odds ratio compared to London, with controls (2018) (4)	Odds ratio compared to London, with controls (2017) (5)	Share of non-UK born employment APS % (Oct17-Sep18) (6)
North East	0.23	0.22	0.21	8
North West	0.27	0.31	0.26	12
Yorkshire and The Humber	0.17	0.21	0.20	13
East Midlands	0.35	0.56	0.48	16
West Midlands	0.38	0.57	0.52	18
East of England	0.71	1.05	0.74	16
London (benchmark)	*(1.00)*	*(1.00)*	*(1.00)*	*45*
South West	0.26	0.36	0.30	17
South East	0.40	0.56	0.44	12
Scotland	**0.17**	**0.20**	**0.20**	**8**
Wales	**0.22**	**0.31**	**0.32**	**11**
Northern Ireland	**0.35**	**0.41**	**0.31**	**10**

Notes: Observations without positive salaries, below 16 years old or with missing information on region of work or occupation were excluded. In addition, observations from ASHE where the individual has not been in their job for a year and who were not on adult pay rates were excluded. The controls used included ln(salary), ln(salary)^2, gender, a series of age categories, employer size (by number of employees), industry and an indicator for full-time work. Odds-ratios calculated using a logistic regression utilising ASHE sampling weights. All regional coefficients were significant at the 5% level or lower.

1.33 Scotland has its own Shortage Occupation List (SSOL), which contains all of the jobs in shortage in the UK SOL, with additional job titles that are only in shortage in Scotland. In 2018, only jobs within two SOC codes (Medical Practitioners and Medical Radiographers) were unique to the SSOL and only 19 RCoS were used for these occupations, accounting for just under three per cent of the overall RCoS used in Scotland in 2018. Employers in Scotland can of course make use of Tier 2 (General) but as discussed above, usage is comparatively lower than other regions and nations of the UK.

1.34 Wales and Northern Ireland share the same list as the whole of the United Kingdom. Their usage is lower than London's but not as low as Scotland's when controlling for observable characteristics.

The SOL and salary thresholds

1.35 All jobs eligible for Tier 2, whether on the SOL or not, are required to meet a salary threshold, these are detailed in Appendix J of the Immigration rules. For most occupations applications must meet the minimum annual salary requirement of £30,000 or the 25th percentile for that particular occupation (whichever is highest). There are exceptions to this rule for new entrants and health and education occupations that use the national pay scales. These salary thresholds are intended to prevent under-cutting in the domestic labour market.

1.36 If the SOL is being used to address shortage in the labour market, then it is important that there is upward pressure on wages. To assess the effectiveness of salary thresholds, previous reports compared salaries of those on Tier 2 with salaries of workers in the same occupation and region, controlling for gender and age[23].

1.37 Table 1.7 update this analysis using 2017 and 2018 data – 2017 is included as 2018 was an unusual year as the minimum effective salary thresholds for jobs off the SOL increases when the cap binds (although the actual results are quite similar). On average we find that RCoS users earned around 5[24] per cent more in 2018 than full-time employees of the same age, in the same region, occupation, industry and working for an employer of the same size (by employee count). There is no significant difference in 2017.

1.38 The estimated pay gap varies quite a lot by occupation. Table 1.7 also shows that migrant nurses on Tier 2 (G) earn around 20 per cent less than other nurses controlling for characteristics. This result is much the same as we found in earlier

[23]https://assets.publishing.service.gov.uk/Government/uploads/system/uploads/attachment_data/file/493039/Tier_2_Report_Review_Version_for_Publishing_FINAL.pdf
[24] 95% confidence interval of 0.08%-9.7%

reports. This probably results from the practice of placing some migrant nurses on the lowest pay point irrespective of their experience, we heard evidence from the sector that this is normal practice. We also find a negative differential after controlling for characteristics when looking at Doctors (SOC 2211).

Table 1.7: Percentage difference in earnings between RCoS and ASHE observations controlling for characteristics

	2018 (%)	2017 (%)
All occupations	4.8	None
2231 - Nurses	-20.0	-18.5
2314 -Teachers	None	None
2211 - Doctors	-12.8	-16.5
All occupations excluding nurses, teachers and doctors	11.3	9.5

Notes: All differentials significant at the 5% level and below. "None" indicates no statistically significant difference at the 5% level or below. Models estimated over Tier 2 (G) eligible occupations, with salaries greater than £15k and less than or equal to £150k, individuals working full-time, aged over 15 years old. In addition, observations from ASHE where the individual has not been in their job for a year and who were not on adult pay rates were excluded. Controls used include gender, age categories, region, industry and employer size.

1.39 Table 1.7 also shows that migrant teachers recruited through T2 seem to be paid no less than other teachers, controlling for characteristics.

The SOL and crowding-out

1.40 When the cap binds, RCoS allocations are distributed based on a points scale, with the applicants with the highest number of points (based on salary, level of qualifications, and whether a job is on the SOL) being prioritised. This process continues until either all allocations are assigned for the month, or there are no more applications left (whichever occurs first). The monthly cap can be exceeded by 100 applications each month. Applicants with the same score are treated the same. An occupation on the SOL will always achieve a higher number of points than a non-SOL occupation as they get awarded 320 points[25]. This could cause Tier 2 workers who would have received the allocation when the cap is not binding to be crowded out by SOL applicants. The salary used to ration can rise very sharply as several applicants compete for the few remaining allocations[26].

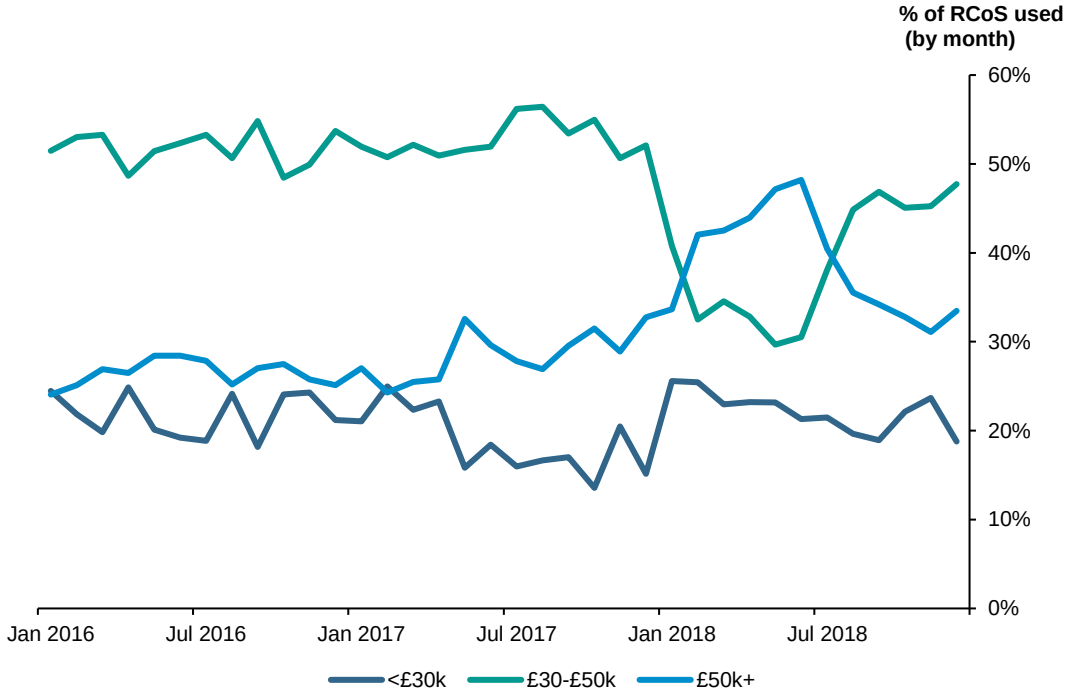
[25] See table on page 133 https://assets.publishing.service.gov.uk/Government/uploads/system/uploads/attachment_data/file/792725/Tier-2-5-sponsor-guidance_Mar-2019_v1.0_FINAL.PDF

[26] Applicants get awarded one extra point for each £1,000 of gross annual salary, up to a maximum of £160,000

For example, in the first half of 2018, an application that was not on the SOL required over 40 points to succeed. Applicants are granted 20 points for passing the resident labour market test, but they would require a salary above £50,000 to be granted a restricted certificate of sponsorship. This resulted in a significant reduction in the number of RCoS used by individuals whose salary was between £30,000-50,000 in the months when the cap did bind, and a comparatively higher use by those paying above £50,000 – see figure 1.5.

1.41 At the same time as the headline salary threshold was rising the fraction of T2(G) users paid less then £30,000 was slightly higher. These were jobs on the SOL, primarily nurses. This illustrates that when the cap binds, jobs on the SOL paying lower salaries may crowd out higher-paid applications. This may be desirable but this crowding-out feature of the SOL needs to be borne in mind.

Figure 1.5 – Monthly proportion of RCoS used by salary – Tier 2 (G)

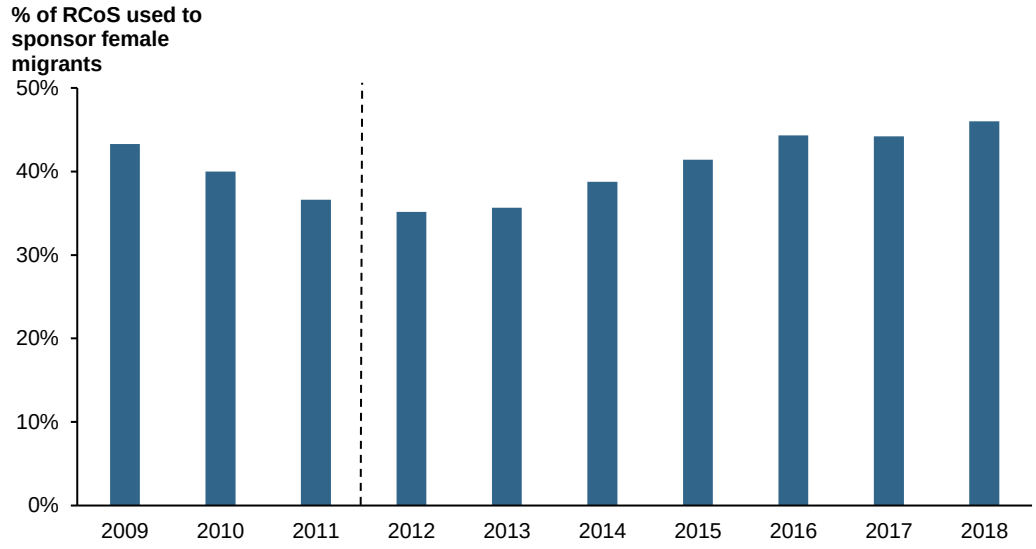


Source: Home Office management information

Users of the SOL

1.42 In 2018, the gender split of all used RCoS was in line with that of the overall UK labour market (54 per cent male; 46 per cent female) – see figure 1.6. There is considerable variation over time, possibly reflecting the occupational mix of Tier 2 (G). As would be expected some occupations are disproportionally female workers (e.g. nursing) whilst others (e.g. IT jobs and doctors) are disproportionally male.

Figure 1.6 – Share of women in Tier 2 (G)



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Source: Home Office management information

1.43 Table 1.7 shows that almost 80 per cent of all nurses were female; whilst IT professionals and doctors are more likely to be male.

Table 1.7: Gender differences by occupation – used RCoS 2018

	Tier 2 G) – All (%)	SOL Only (%)	Nurses (%)	IT Professionals (%)	Doctors (%)
Female	46	47	78	25	36
Male	54	53	22	75	64

Source: Home Office management information

1.44 Indian nationals have been the largest user of Tier 2 (G) since 2009, receiving around a quarter of used RCoS every year and they account for a similar share of the SOL. Filipino nationals accounted for around 10 per cent of used RCoS but a much higher proportion of SOL usage (17 per cent). Table 1.8 shows that some countries also dominate in some occupations, the Philippines accounted for over half of all RCoS used for nurses; whilst Indian IT professionals accounted for almost half of all IT RCoS used.

Table 1.8: Tier 2 (G) usage by nationality and selected occupations – used RCoS 2018					
	Share of T2 (G) (%)	Share of SOL (%)	Share of Nurses (%)	Share of IT Professionals (%)	Share of Doctors (%)
India	26	27	29	48	23
USA	10	5	1	8	1
Philippines	10	17	54	1	0
Australia	7	7	1	3	3
China	5	1	0	4	0
Pakistan	4	5	0	1	15

Source: Home Office management information

Chapter 2: The SOL Methodology

Introduction

2.1 The MAC methodology, first described in 2008[27], uses three criteria to decide which occupations should go onto the shortage occupation list. It asks whether the occupation is skilled at a required level set by the Government, whether it is in shortage and whether it is sensible to fill this shortage with migrant workers.

2.2 The skilled criterion places occupations into skill groups based on a combination of national datasets and evidence from stakeholders. To decide whether an occupation is in shortage we use nine indicators which look at wages, vacancies and employment. The shortage indicators have been reviewed several times, most recently in 2017[28]. These indicators are combined with evidence from stakeholders to arrive at a decision about whether a job or occupation is in shortage. The sensible criterion then considers whether putting the job on the SOL is likely to be the most effective and appropriate response to shortage.

Skilled

2.3 Currently, jobs have to be skilled to RQF 6 and above (or the equivalent in the Devolved Administrations) to be eligible for Tier 2 (General) and the SOL. RQF6+ are 'graduate-level' occupations though also include higher-level vocational qualifications deemed equivalent to a degree. The occupations at RQF6+ are listed in Appendix J[29] of the Immigration Rules. The skill categories are designed to reflect how much training and experience is required for someone to do a job. They are not a reflection of the value of the work being done.

2.4 The shortage analysis uses 4-digit SOC codes as this is the lowest level of aggregation giving consistency across the datasets we use. However, more specific job titles have been previously added onto the SOL rather than entire SOC codes. The majority of these are from high-skilled SOC codes i.e. RQF 6+. Because a single SOC code sometimes contains job titles with very different levels of skills there are some exceptions. For example, the SOC code for chefs is RQF 4 but chefs paid at least £29,570 per year and with some additional restrictions on the level of the role and experience are on the SOL as they are deemed sufficiently highly-skilled. Another example of an occupation on the SOL in a lower-skilled SOC group is high-integrity pipe welders who need three or more years on-the-job experience to be considered.

[27]https://assets.publishing.service.gov.uk/Government/uploads/system/uploads/attachment_data/file/343325/Migration-shortage.pdf
[28]https://assets.publishing.service.gov.uk/Government/uploads/system/uploads/attachment_data/file/586110/2017_01_26_MAC_report_Assessing_Labour_Market_Shortages.pdf
[29] https://www.gov.uk/guidance/immigration-rules/immigration-rules-appendix-j-codes-of-practice-for-skilled-work

2.5 In 2012, the minimum skill requirement for Tier 2 occupations was raised to RQF 6 and above, previously being set at RQF 4 and above in 2011, and before that RQF 3 and above. This report will recommend occupations to go onto the SOL under current rules, i.e. RQF6+. However, given the significant expected changes to the immigration system after then end of the implementation period (2021 at the earliest), we made the decision to gather evidence from all. Our findings on medium- and lower-skilled occupations are summarised in Chapter 5.

2.6 The MAC last recommended an update to occupations to be included in RQF6+ in October 2012, which updated the list to SOC2010 classifications. The MAC has not considered the skill level of occupations formally since then. More details of the skilled methodology can be found in one of our earlier reports[30].

2.7 Using the latest data available we have updated the three indicators of skill used to help determine which occupations meet the RQF6+ requirement. These are: (further details on the skilled indicators can be seen in Annex B.1.):

- The skill level defined in the SOC2010 hierarchy provided by the ONS
- Formal qualifications
- Earnings

2.8 There is one occupation, "Chartered architectural technologists", where we recommend re-classifying as being skilled to RQF 6 (currently classified as RQF 4) and therefore become eligible for Tier 2(G). This is because, using the latest data, the occupation now passes the thresholds associated with all three of the skilled indicators.

Shortage

2.9 To assess whether an occupation is in shortage we use several national datasets to create economic indicators of labour market conditions. These indicators are motivated by what we would expect to observe in a labour market in shortage. The economics of labour market shortages are discussed in Boxes 2.1-2.3. These discuss the questions:

a. What is a shortage?
b. What are the consequences of a shortage?
c. Why do shortages occur?

[30]https://assets.publishing.service.gov.uk/Government/uploads/system/uploads/attachment_data/file/257273/Tier2-codesofpractise.pdf

Box 2.1: What is a labour market shortage?

Put simply, an occupation is in shortage if the demand for labour exceeds the supply at the offered terms and conditions. Consider Figure 2.1 below where LD represents the demand for labour at different wages and LS the supply of labour. At wage W1 the demand for labour is greater than the supply of labour. The gap, S1, is the labour shortage. Employment will be at E1 so employers will report a shortage of labour.

Figure 2.1: Supply and demand curve showing labour shortage.

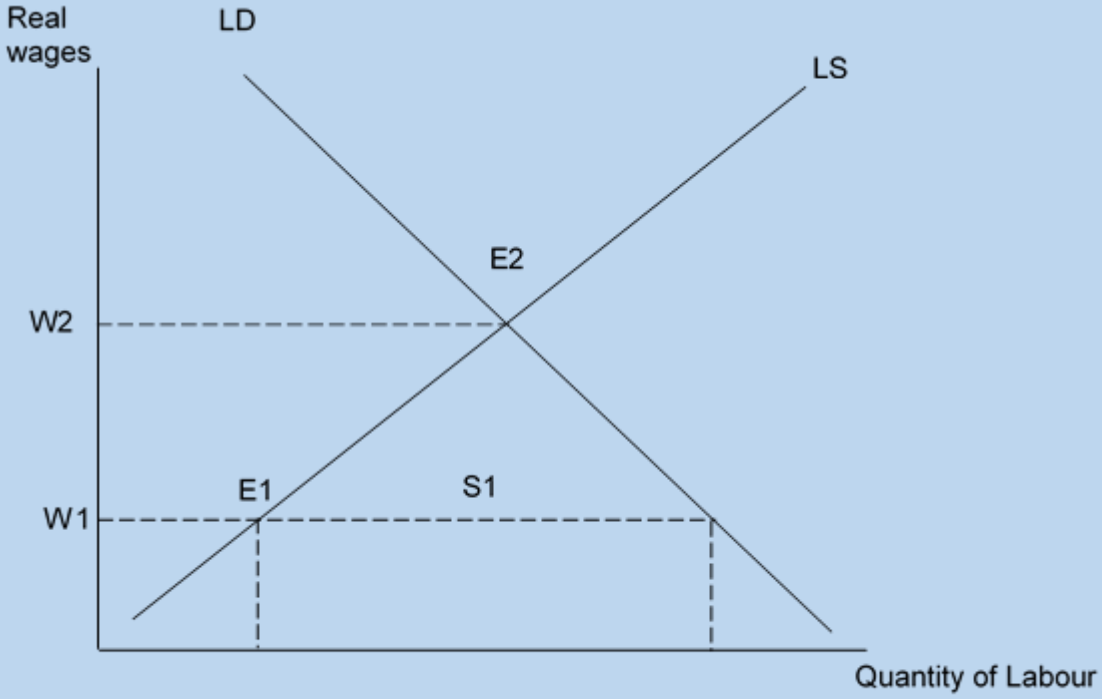


Figure 2.1 also shows that shortages can be caused by wages being lower than the market-clearing level, W2. In a well-functioning labour market, wages adjust to bring demand and supply into line but this process takes time and there may be institutional impediments to this adjustment process.

Box 2.2: The consequences of shortage

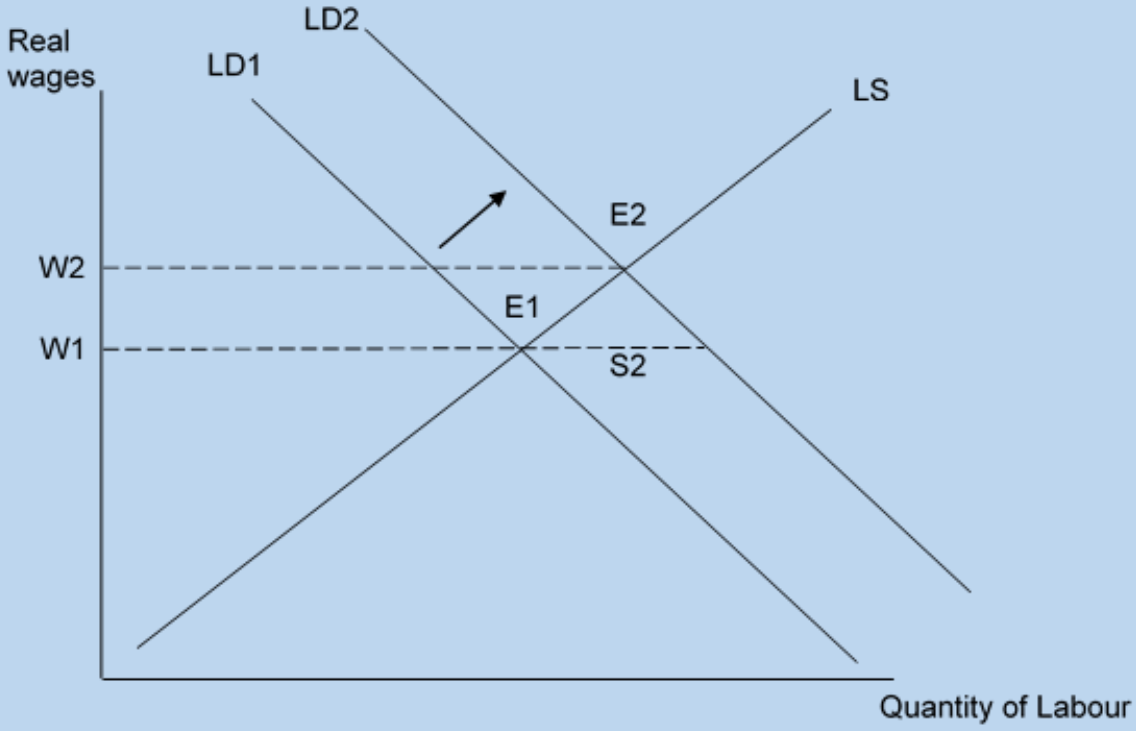
The consequence of shortage is that there is less employment than if the market cleared: in terms of Figure 2.1 E1 is less than E2. This would mean a lower provision of goods and services and/or they are more expensive than they might otherwise be because they are scarce. There may also be undesirable spillovers to other labour markets; the low level of employment in some occupations may constrain output and reduce the demand for other occupations. These bottlenecks may cause widespread problems. For example, demand for labourers in construction may fall if there is a shortage of the more skilled trades.

Box 2.3 The causes of shortage

There are 3 main reasons why a shortage (demand for labour ahead of supply) may exist (a) if the demand for labour is increasing faster than supply (and wages fail to adjust to the growing imbalance between demand and supply) (b) if the supply of labour falls but demand remains high (c) if there are longer-term structural factors that prevent wage adjustment. In this case a shortage may persist even if demand and supply are stable.

(a) The case of demand running ahead of supply is illustrated in Figure 2.2. Labour demand is initially at LD1 and wages are initially at market-clearing levels at W1. Labour demand rises from LD1 to LD2, leads to an increase in the market-clearing wage to W2. If wages remain at W1 a shortage of S2 will emerge. If wages rise but not to the new market-clearing level, there will be a shortage at a lower level than S2.

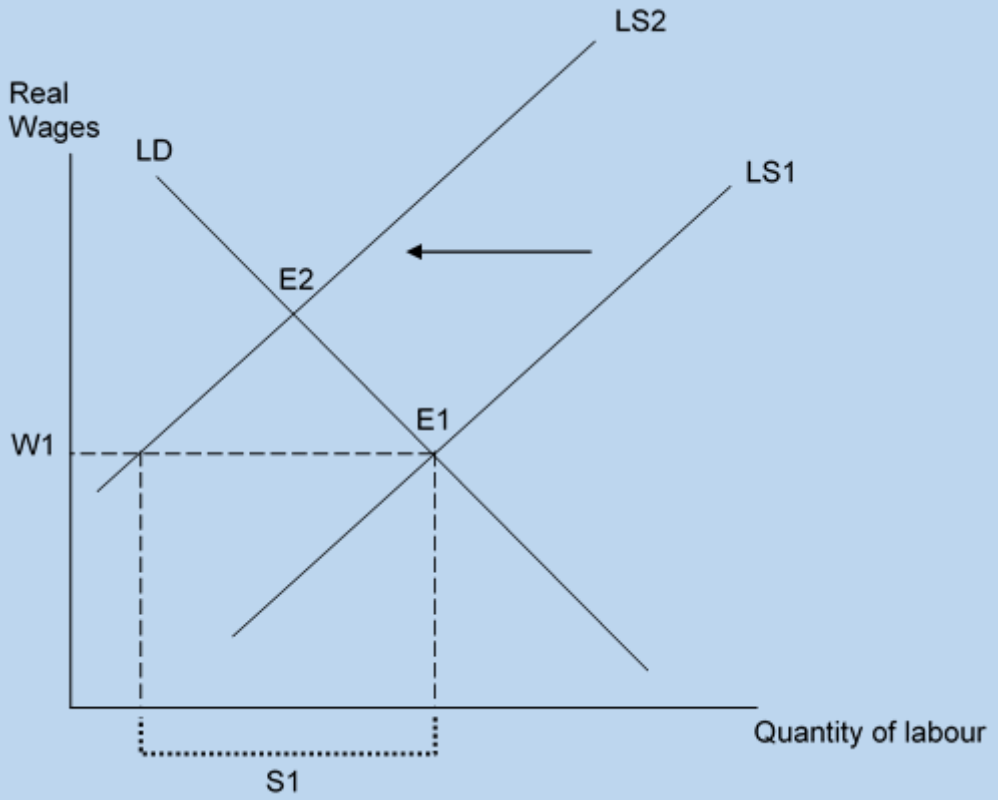
Figure 2.2: An increase in demand leading to shortage.



(b) Figure 2.3 illustrates how a shortage can occur when supply falls. Figure 2.3 shows an initial equilibrium at E1, with labour demand LD, labour supply LS1 and real wage W1. If the labour supply curve falls to LS2, the market-clearing level of wages rises to W2. If wages remain at W1 a shortage of S1 would emerge.

Shortages of labour from falling supply could arise due to increasing retirements or a decrease in the desirability of the job compared to alternatives, or, perhaps a fall in the availability of EEA migrants following the EU referendum.

Figure 2.3: A decrease in supply leading to shortage



(c) Shortages can arise due to structural problems within the labour market that prevent wages from rising to clear the labour market. This type of shortage could occur where, as in Figure 2.1, labour demand and supply are stable. In the case of structural shortages there is no upward pressure on wages or changes in employment and the vacancy rate, while high, is also likely to be static over time.

2.10 At its simplest, a shortage occurs when the demand for labour is higher than the supply at existing terms and conditions. This situation can emerge either when demand increases, or supply falls and wages do not change fast enough to equilibrate the labour market. Shortages can also be more structural, occurring when demand and supply are stable but wages are below market-clearing levels.

2.11 A labour market in shortage would be expected to show some symptoms and the shortage indicators are intended to pick them up. The methodology report in 2017[31] looked in detail at the indicators and methodology behind them and so for this report, we have updated the data with the latest available to re-run the methodology.

2.12 One change was forced on us. The old V1 indicator considered the percentage change in the number of job-seekers in the claimant count looking for work in that occupation. However, as part of the changes with Universal Credit, this information on occupation sought is not currently available.

[31]https://assets.publishing.service.gov.uk/Government/uploads/system/uploads/attachment_data/file/586110/2017_01_26_MAC_report_Assessing_Labour_Market_Shortages.pdf

2.13 Given this we use a new V1 indicator, derived from the APS as a ratio of the available weighted stock of unemployed or inactive people in a SOC code over the total number of employed, unemployed and inactive in that SOC code. This uses APS data on previous occupation for those who are not currently in work. A low value of this indicator suggests a small pool of workers in the resident labour force for those occupations to hire from and hence could indicate shortage. The weighted stock is calculated by investigating how likely different groups of inactive or unemployed are to move into employment over one year. Further details are in Annex B.

2.14 Table 2.3 below summarises the nine indicators of shortage we use including the new temporary indicator A V1 to replace the old V1. The indicators are grouped into three categories; price-based indicators, volume-based indicators and employment-based indicators. The table describes each indicator and the datasets we use for them. Also included is the sample size criteria we view as sufficient in order to report a value for a certain SOC code. If the criteria were not met for a certain indicator for a SOC that value of the indicator would be set as missing.

Table 2.3: Summary of the shortage indicators			
Indicator	**Data set(s) used**	**Description**	**Current sample size criteria**
P1: Percentage change of median real pay (1 year)	ASHE & CPIH	Percentage change in inflated median pay over one year	ASHE sets its own publishing criteria.
P2: Percentage change of median real pay (3 years)	ASHE & CPIH	Percentage change in inflated median pay over three years	ASHE sets its own publishing criteria.
P3: Return to occupation	APS	Predicted hourly wage for a set of reference characteristics relative to the average predicted wage for the same characteristics over all SOC codes. Separately calculated for all three skill levels.	APS raw numbers under 25 are not reported.
E1: Vacancies/Employment	ESS & APS	$\frac{Total\ vacancies\ (ESS)}{Total\ employment\ (APS)}$	ESS raw numbers under 30 are not reported. APS raw numbers under 25 are not reported.
E2[32]: Vacancy postings/Employment	Burning Glass & APS	$\frac{Number\ of\ job\ postings\ (Burning\ Glass)}{Total\ employment\ (APS)}$	APS raw numbers under 25 are not reported. Burning Glass is admin data so no minimum sample size required.
V2: Percentage change of employment level (1 year)	APS	Percentage change of employment over one year	APS raw numbers under 25 are not reported.
V3: Percentage change of median paid hours worked (3 years)	ASHE	Percentage change of median paid hours worked over three years	ASHE sets its own publishing criteria.
V4: Change in new hires (1 year)	APS	$\frac{New\ Hires\ 2017}{Employment\ 2017} - \frac{New\ Hires\ 2016}{Employment 2016}$	APS raw numbers under 25 are not reported.
A V1: Weighted stock of unemployment & inactive/Employment, unemployment and inactive	APS	$\frac{Weighted\ stock\ of\ unemployed\ and\ inactive}{Employed, unemployed\ and\ inactive}$	APS raw numbers under 25 are not reported.

[32] This indicator was known at I1 in the 2017 methodology paper. Changed to E2 in this report as it is classed as an indicator of employment.

2.15 Further reasoning and theory behind each of the indicators, other than the new A V1, can be found in more detail in our 2017 methodology report[33]. Details on the specifications for the indicators can be seen in Annex B.

2.16 Not all the indicators are equally effective in diagnosing the different sources of shortage. Table 2.4 shows which indicators are expected to be effective for the different types of shortage.

Table 2.4: Effectiveness of the indicators in diagnosing different types of shortages

	Rising Demand	Falling Supply	Structural
P1	+	+	0
P2	+	+	0
P3	+	+	-
E1	+	+	+
E2	+	+	+
V2	+	-	0
V3	+	+	0
V4	+	-	0
A V1	+	+	+

A "+" indicates that one would expect the indicator to be satisfied for that cause of shortage, "-" that it would not be expected to be satisfied and a "0" that there is no expectation.

2.17 Only if the source of shortage is rising demand would all the indicators be effective. When first designed it probably was expected that rising demand would be the most common source of shortage but it is not clear that is the case now. Many of the occupations presented to us as being in shortage today were also described as being in shortage ten years ago (and for the same reasons) perhaps suggesting that there are more structural reasons for shortage. Many other countries have something like a SOL and the occupations on those lists are similar across countries[34]. These pieces of evidence suggest structural shortages are quite common, though the cause is often unclear.

2.18 The recent fall in EEA migration may mean that the falling supply scenario is relevant to some sectors.

2.19 We investigated the effectiveness of the shortage indicators in predicting shortage – this is reported in Annex C. The main conclusion is that the vacancy rate is the most consistent predictor of shortage consistent with the fact that in Table 2.4 these are the indicators that would be expected to indicate shortage for all types of shortage.

2.20 It is important to consider sample sizes of datasets when using these numbers to influence decisions on which occupations should go onto the SOL. Therefore,

[33]https://assets.publishing.service.gov.uk/Government/uploads/system/uploads/attachment_data/file/586110/2017_01_26_MAC_report_Assessing_Labour_Market_Shortages.pdf

[34] For this report, we looked in detailed at Australia, New Zealand, Canada, France, Ireland and Japan

we set strict criteria for each dataset on minimum sample sizes in which we would report an indicator value for each SOC. These criteria can be seen in Table 2.3. Furthermore, in table B.2 in Annex B, we show the number of available SOC codes for each indicator once sample size criteria are taken into account. This highlights which indicators suffer most from small sample size issues, namely V4 and A V1.

2.21 Previous MAC reports have extensive discussion of the value of each indicator to be used to indicate shortage. For this review we settled on a relative approach, based on comparing occupations against each other to provide a ranking of shortage rather a measure of the absolute level of shortage. The nature of the SOL is that it prioritises some occupations over others so that a relative approach seemed most appropriate.

2.22 For each indicator the occupation seeming to be most in shortage is ranked 1st, the second most 2nd etc. Each SOC is ranked for each indicator and then an average of the ranks is calculated. Finally, these averages are ranked to give an ordered list from 1, most in shortage, to the highest number being least in shortage. This gives a value of shortage for the list of SOC codes relative to all other SOC codes.

2.23 Table 2.5 demonstrates this new methodology with three created SOC codes and using just a subset of the indicators for illustration. In this example SOC code 1002 has the smallest average rank and therefore the shortage indicators deem this to be most in shortage out of the three SOC codes.

Table 2.5: Demonstration of new ranking methodology

SOC code*	P1-% change in median hourly pay (1 year)	Rank	E1-Vacancies/ Employment	Rank	V2-% change of employment level	Rank	Average rank	Overall rank
1001	5.4	2	0.06	1	-1.3	3	2	2
1002	6.7	1	0.04	2	3.7	1	1.3	1
1003	2.1	3	0.01	3	0.4	2	2.7	3

*These SOC codes do not exist and are for illustration purposes only

2.24 Some analysis on the new ranking methodology including a comparison with the old thresholds methodology can be seen in Annex B.1. Also, in Annex B.2 is a correlation analysis between the overall rankings and granted CoS applications, as well as how the overall rankings change over times.

2.25 Table B.3 in the Annex presents the average and overall rank for each high-skilled SOC. Our analysis shows that the occupations most in shortage are programmers and software development professionals, IT business analysts, architects and systems designers and electrical engineers. The occupations least

in shortage by our analysis are librarians, paramedics and welfare professionals n.e.c.

Limitations of the shortage methodology

2.26 While the shortage indicators are useful and it would be odd to consider shortages without looking at vacancies, employment and wages, they do have limitations which mean they cannot be used to diagnose shortage in isolation.

2.27 First, the data we use from sources such as the APS and ASHE give us data at 4-digit occupational code whereas in the past we recommended job titles for the SOL. Our methodology cannot say anything about the shortage of individual job titles within a 4-digit SOC.

2.28 A second limitation is the timing of our data sources. Currently for this report our shortage indicators use data from 2017 to 2018 depending on the dataset to inform shortages for the SOL in 2019. This lag in data is not ideal but is the most recent data available to us across all our datasets.

2.29 As seen in some of the figures in this chapter and the annex, despite trying to mitigate the effect of small sample sizes, there is still volatility within the indicators and within movement of the ranks of SOC codes over years. This volatility means that the timing of the data sources and timing we do the analysis plays an influencing role in deciding which SOC codes are in shortage.

2.30 Critically, many of these indicators are and will be affected by other conditions other than job shortages. Pay, vacancies and employment will all be affected by a number of factors and not just job shortages, but our indicators do not try to pick out these different factors in our analysis. For example, public sector pay restraint may limit wage increases but might occur alongside shortages.

2.31 The shortage indicators present valuable information and context to the situation within the labour market with respect to wages, employment, unemployment and vacancies. However, they suffer from serious limitations and thus we do not solely rely on this evidence to inform the decisions on which occupations should go onto the SOL. We use stakeholder evidence from businesses, sector bodies and Government departments, based on their own first-hand experiences and their in-house data, to try and gather a fuller picture of shortages in the labour market. The stakeholder evidence is discussed and analysed in more detail in Chapter 3 and the qualitative and quantitative evidence combined in Chapter 4 to provide an assessment of shortage for all eligible occupations.

The Sensible Criterion

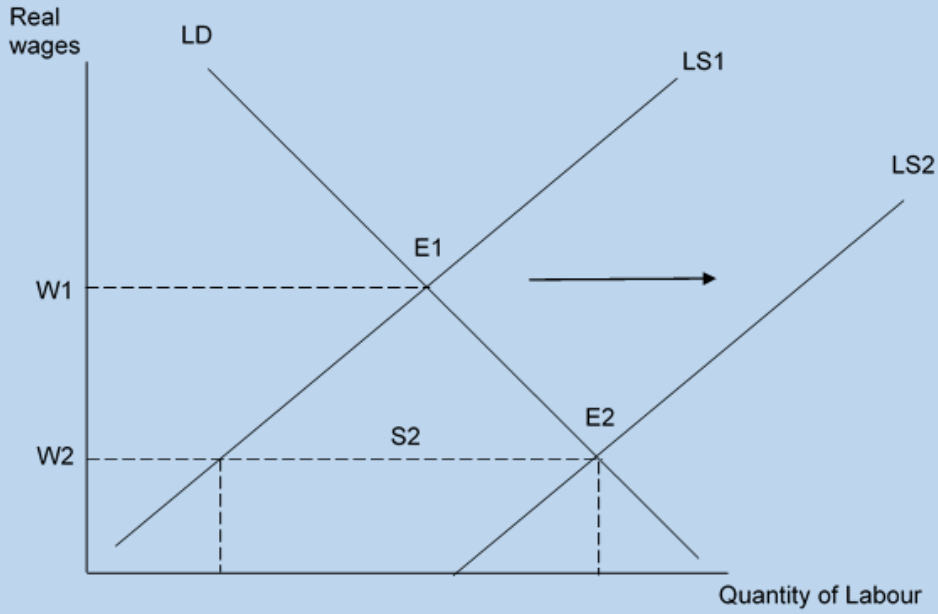
2.32 The sensible criterion asks whether it is sensible to fill shortages with migrant workers. Evaluation requires an assessment of the causes of shortage how

serious are the problems caused by shortages, the possible solutions to shortage and how effective are they in solving the problems. The economics behind this is discussed in Box 2.4. An important distinction is between where a shortage occurs because of a low supply of workers able to do the job compared to a situation where the shortage occurs because of a low supply of workers willing to do the job.

Box 2.4 Solutions to Shortage

As previously discussed, shortages occur when real wages (W2) are below the market-clearing value (W1), causing there to be a gap (S2) between the labour demand and supply as seen in Figure 2.4.

Figure 2.4: Supply and demand curve showing outward expansion in labour supply.



There are 3 broad solutions to addressing labour market shortages:

- Increase wages. A laissez-faire approach would be to simply wait for real wages to increase to the market-clearing level but more concerted action may be needed if the shortage is structural. Both wages and employment would rise in this case.
- Decrease labour demand. An inward shift in the demand curve would bridge the shortage gap. This would turn the current real wage into the market-clearing real wage. One way in which this might happen is if employers find a way to raise productivity, getting the same output from fewer workers. Neither employment nor wages would change in this case.
- Policies for increasing labour supply. Immigration is one way to do this, but increased training is another. Employment would rise but wages would not in

this case. As this solution does not increase wages, we would expect it to be particularly attractive to employers.

Raising wages and increasing labour supply may both reduce shortages but may differ in how they resolve the problems caused by shortages.

The extent to which rising wages lead to rises in employment depends on how sensitive is the supply of labour to the wages offered. If supply is fixed, perhaps because the job requires specific skills that cannot be quickly or easily obtained, the rise in wages will equalise demand and supply only because demand falls. This will benefit the workers concerned but will do nothing to increase the output of the sector. In a scenario where it is important to increase employment in the sector, an increase in supply may be the only sensible solution in this case. It is likely that the supply of labour is more constrained in the short-run than the long-run. Increasing labour supply to deal with short-run shortages without raising wages does little to attract more people into the occupation that may be a better longer-run solution to shortage.

The SOL in a Tight Labour Market

2.33 This review of the SOL is, as described in Chapter 1, against the background of the lowest unemployment rate for 40 years and a fall in EEA net migration following the 2016 EU referendum. At the same time, wage growth still seems surprisingly weak though is rising slowly. This means that many sectors are currently reporting shortages and want their jobs to be on the SOL to help alleviate those shortages.

2.34 We do not think it is a sensible use of the SOL to deal with generalised shortages of labour for two reasons. First, the SOL is about giving priority to some jobs over others. To put all occupations on the SOL would be equivalent to putting none on. The SOL should be used to address damaging shortages in specific parts of the labour market.

2.35 Second, we are sceptical about the effectiveness of immigration as a solution to generalised shortages of labour. Immigration raises the supply of labour but as those new workers earn and spend money they raise the demand for labour in other parts of the labour market[35]. In a specific occupation in shortage, this extra demand will almost all be outside of the sector in which they work so employing migrants will reduce the gap between demand and supply in that job. In the labour market as a whole, the increase in demand is roughly in line with the increase in supply. This is why we think immigration is not a cause of unemployment when the supply of labour is ahead of demand, but equally this means that vacancies would not be lowered by more immigration. The argument that immigration can be used to address generalised imbalances between demand and supply in the labour market is an example of the 'lump of labour fallacy', that evidence strongly suggests is a fallacy. Some commentators who argue strongly against the view

[35] See, for example our discussion in the EEA-workers in the UK: Interim Update https://assets.publishing.service.gov.uk/Government/uploads/system/uploads/attachment_data/file/694494/eea-workers-uk-labour-market-interim-update.pdf

that reduced immigration would reduce unemployment in recessions, seem to argue that increased immigration can reduce the demand-supply gap in a boom. We think this is an inconsistent position; our view is that the impact is small in both cases.

Conclusions

2.36 The shortage indicators are useful in assessing whether there is shortage in some occupations but not others. However, they cannot be relied on exclusively in making those assessment for the reasons described in this chapter; for that reason we also rely heavily on information from stakeholders. A summary of that evidence is in the next chapter.

Chapter 3: Call for Evidence responses

Introduction

3.1 For the first time, we produced an online form (see Annex C) to gather the responses to our Call for Evidence (CfE). This allowed the MAC to assess and analyse the information in a more structured way and carry out a more detailed analysis of the responses and reported labour market shortages.

3.2 The CfE form was open for over nine weeks, closing on 14 January 2019, over which time we received 558 unique responses via the online form[36] and a further 15 organisations provided evidence through other means[37] and are published alongside this report. We also carried out a number of stakeholder events throughout the country where we gathered invaluable insights. See Annex D for a list of events held and the organisations we met.

3.3 In this chapter, we give a brief overview of the responses to the CfE (for a more detailed analysis of the representativeness of the responses see Annex E) and look at the reported reasons for shortage and measures being taken to address those shortages. We also identified other cross-cutting themes mentioned to us in our stakeholder events.

Characteristics of respondents

3.4 The sets of questions that respondents faced diverged depending on the answer provided to Q6 of the online form. Respondents were asked to choose which of the following three options best described their reason for completing the form:

a. *I would like to provide evidence on recruitment shortages within my organisation/business.*
b. *I would like to provide evidence on sector/wider shortages on behalf of members or as a recruitment business.*
c. *I would like to provide academic/research evidence on occupational shortages.*

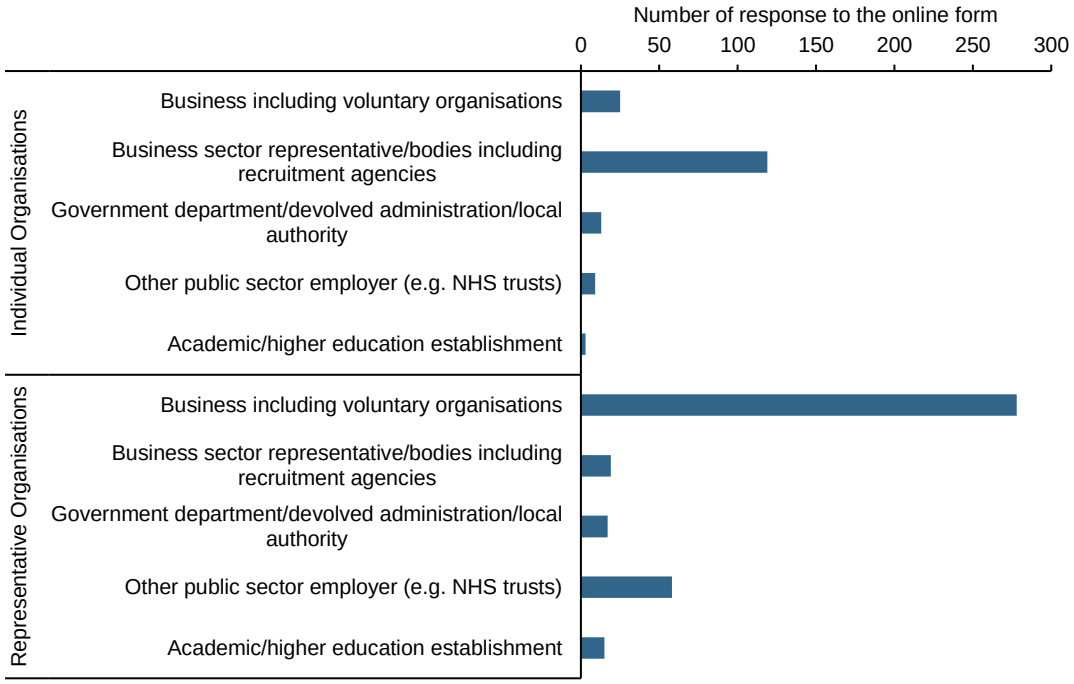
3.5 Those selecting option (a) went on to receive a different set of questions to those selecting options (b) or (c). In the rest of this chapter we will often present results separately for these two groups. In total 74 per cent of respondents selected option (a), for simplicity we refer to these respondents as “individual organisations”, while the remainder (26 per cent) chose options (b) or (c) and we refer to these respondents as “representative organisations”.

3.6 The majority of the individual organisations identified themselves as a business/voluntary organisations while the majority of representative organisation respondents identified themselves as business sector representative bodies, see figure 3.1.

[36] Of which 519 provided at least one job title in the ten spaces provided to do so.

[37] Primarily by emailing the MAC inbox

Figure 3.1: Number of responses by respondent and organisation type



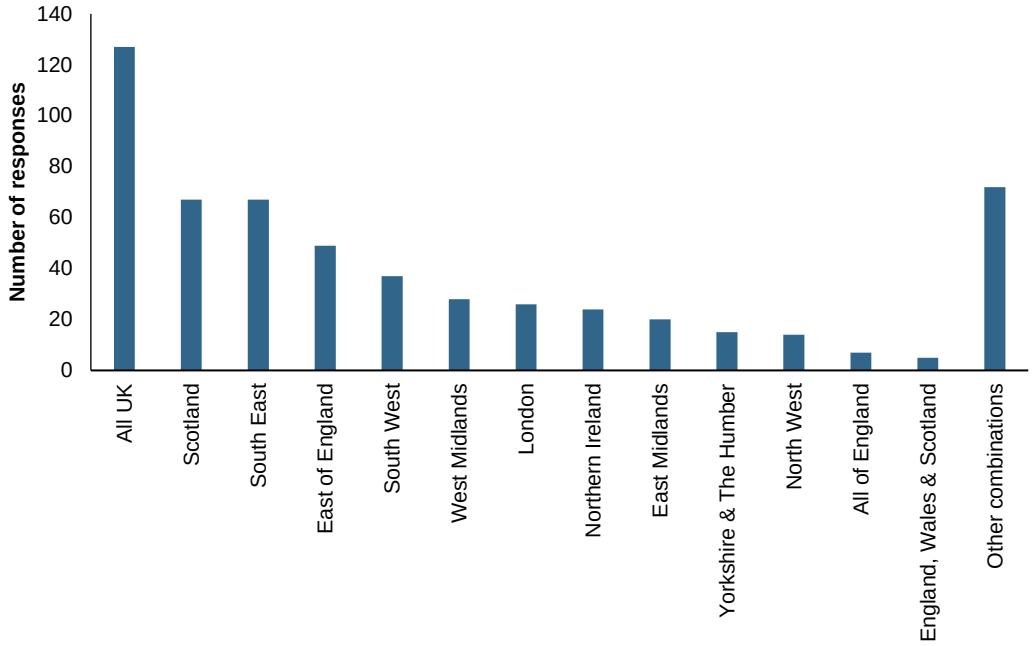
Source: MAC Call for Evidence online form

3.7 Our sample is significantly skewed towards large organisations (by employment). Over half of respondents (only individual organisations were asked about size) were large firms, this is perhaps expected given the resources available to larger organisations to respond to consultations of this kind. On further investigation however, the sample appears to be much more representative compared to the proportion of Tier 2 (G) users, see Annex E for a more detailed discussion of the representativeness of the sample.

3.8 Agriculture and health sectors were the two sectors with the most responses to the online form. Figure E.2 in Annex E suggests that we received a higher response than could be expected from the Agricultural sector given both its share of employment and use of Tier 2. We also received a higher proportion of respondents from the Health sector relative to its employment share, but it is under-represented compared to its usage of Tier 2 (see figure E.3 in Annex E).

3.9 Respondents were asked to indicate the location of their organisation by region, they were given the option of choosing multiple locations. The most common answer was “UK-wide”, followed by the South East and Scotland. The CfE received a proportional higher number of responses from Scotland, Northern Ireland and the North East compared their employment and business shares and a smaller number of responses from London, the North West and Yorkshire and Humber (see figure 3.2 below). This contrasts with the regional usage of Tier 2 (G) described in Chapter 1.

Figure 3.2: Number of Call for Evidence responses by region/country or region/country combination (for those options with five or more responses)

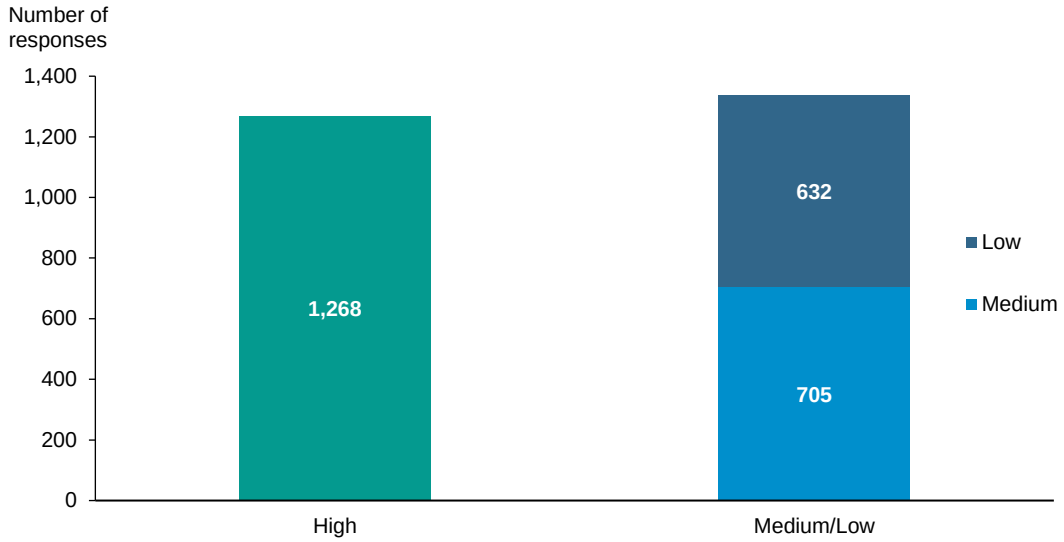


Source: MAC Call for Evidence

3.10 All respondents were asked to outline up to 10 job titles for which they believe were suffering from shortage of labour. In total, we received 2,692 job titles (an average of just over 5 per respondent). When compared to the overall employment share, Health professionals, Science and Research professionals and Elementary Trades and related occupations seem to be over-represented in our sample. Administrative occupations and Sales occupations on the other hand appear to be under-represented (see figure E.7 in Annex E).

3.11 In our call for evidence, we deliberately asked for information of shortages across the whole of the UK labour market and at all skill levels. Figure 3.3 shows that around 49 per cent of the jobs mentioned were associated with occupations deemed by the current immigration rules to be high skilled (RQF 6 and above), 27 per cent medium skilled and 24 per cent lower-skilled.

Figure 3.3: Proportion of jobs mentioned in online form by RQF level of SOC



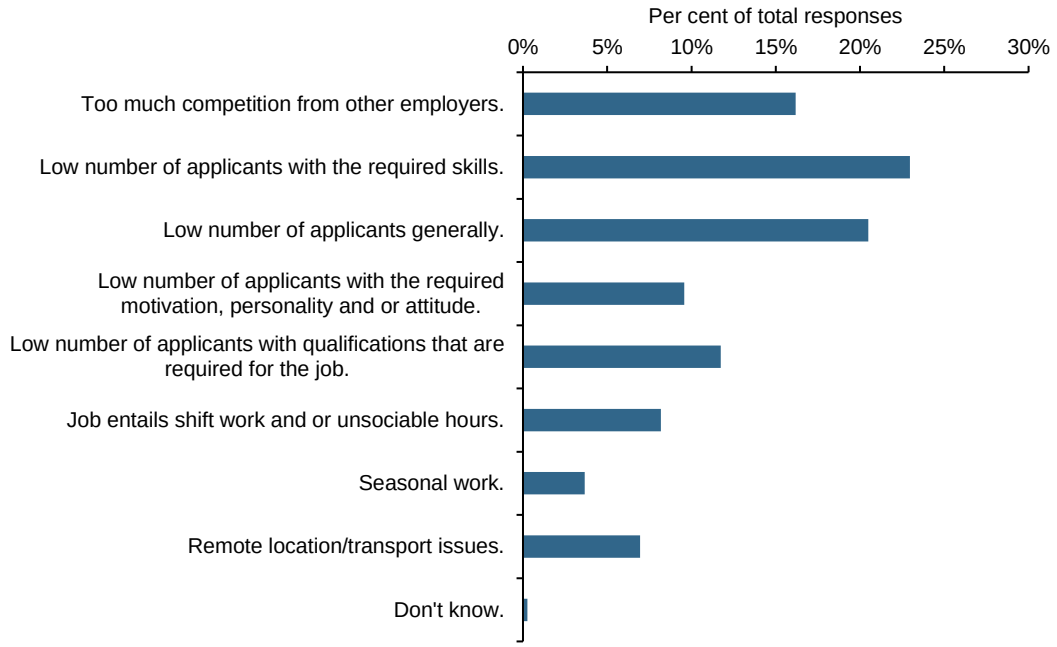
Source: MAC Call for Evidence online form(does not sum to 2,692 as not all job titles were matched to 4 digit occupation codes and therefore could not be assigned a skill level)

3.12 Respondents were also asked to provide an indication of the salaries of the jobs in shortage. To test the representativeness of the salary data, we compared it to the salaries associated with the RCoS used in 2018 and the stock of jobs in the UK labour market (as measured using the Annual Survey of Hours and Earnings 2018). The results suggest that, once controlling for occupation and industry and employer size, the salaries reported to us through the call for evidence are around 5% lower on average and those of jobs sponsored through Tier 2 (G) and associated with a used RCoS. However, the jobs outlined in the responses have salaries that are not significantly different the UK labour market as a whole, again controlling for occupation, industry and employer size.

Reasons for shortage

3.13 The online form varied in the way it asked questions about shortage. Individual organisations were asked to outline the main reasons for their recruitment difficulties for each of the up to 10 job they mentioned using a list of options (based on questions asked in the Employer Skills Survey) and were also given the option to add additional information. Of the list of options, nearly all organisations reported that there was a general *lack of applicants for the roles that they had advertised for*. The responses show that low number of applicants with the required skills and too much competition were the most common reasons for shortages – see figure 3.4.

Figure 3.4: Reported reasons for recruitment difficulties – Individual Organisations

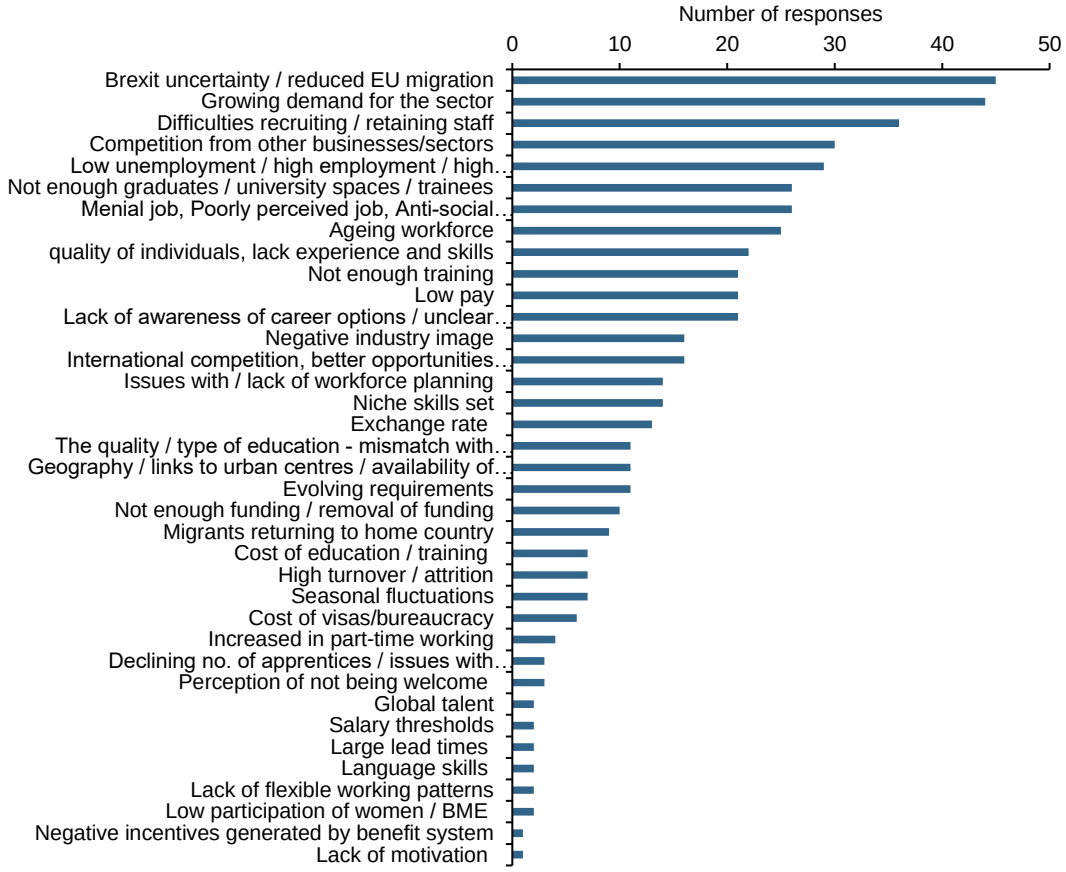


Source: MAC Call for Evidence online form

3.14 The majority of respondents did not provide any additional information. Those that did largely reflected the reasons outlined by representative organisations below.

3.15 Representative organisations responded to the question of shortage in an open-ended manner (up to 500 words). We analysed the responses and classified them into broad themes – see figure 3.4. Brexit uncertainty and the resulting reduction in EU migration together with growing demand for the sector are the two most common reasons for shortage given by representative organisations, with a quarter of the respondents citing one or both of these reasons – see figure 3.5.

Figure 3.5: Reported reasons for recruitment difficulties – Representative Organisations



Source: Manual classification of free-text responses to MAC Call for Evidence

Reasons for shortage by sector

3.16 Responses varied greatly by sector, especially when respondents made use of the free-text box (largely representative organisations). For individual organisations, most sectors (except agriculture) reported that the main reasons for shortage was a lack of applicants with the required skills.

3.17 Respondents in the Agriculture sector were most likely to say that Brexit uncertainty/ reduced EU migration was one of the main reasons why they experienced shortage. Individual organisations also reported *low number of applicants with the required motivation, personality and/or attitude* as the main reason. A large number of respondents suggested that jobs were poorly perceived. Tight labour market conditions and competition from other sectors were also mentioned as reasons behind the difficulties faced by the sector

> *"The work is hard, outdoors (which is perceived as predominantly cold and rainy in the UK), unsociable hours, remote locations and remote working conditions"*
>
> HOPS Labour Solutions Limited, response to the MAC Call for Evidence

"There is not the availability or willingness locally or nationally in the UK to fulfil these low-skilled roles proven by advertising strategies locally and nationally"

Cornwall Area Bulb Growers Association (CABGA), response to the MAC Call for Evidence

3.18 Respondents from the Construction sector were most likely to cite the growing demand for the sector as well as the lack of applicants with the necessary skills and insufficient training.

"These pressures are first and foremost a consequence of the 78% increase in output in the industry over the last 5 years and the loss of skills capacity suffered prior to that due to the financial recession of 2008 and its severe impact on the housing market"

Home Builders Federation, response to the MAC Call for Evidence

3.19 The majority of respondents from the Education sector mentioned difficulties recruiting and retaining staff. The relatively lower pay as well as the evolving requirements and increasing pressures were other main reasons attributed to the shortages seen in the sector.

"Less people are joining the teaching profession in light of a number of changes: increased contribution to pensions, changes to specifications - harder for students (particularly from disadvantaged backgrounds) to succeed, relatively poor pay considering level of qualification needed, increased workload and working hours"

Allerton Grange School, response to the MAC Call for Evidence

"Huge amounts of school teachers are leaving the profession, especially within the first 5 years of starting their first teaching position"

REd Teachers (Recruitment for Education), response to the MAC Call for Evidence

"Only 60% of teachers remained in state-funded schools five years after starting"

Association of School and College Leaders, response to the MAC Call for Evidence

3.20 Growing demand and little workforce planning in the past are the two most common reasons given for shortage in the Health sector. A significant number of respondents also highlighted issues around recruiting and retaining staff, suggesting that this might become more of an issue in the future, some attributed this to the removal of bursaries. This coupled with a growing demand from an aging population, alongside other health challenges have resulted in severe shortages in the Health sector.

"In the past there has been little medical workforce planning meaning that the current supply of doctors simply does not match exacerbating job shortages".

Recruitment into medicine as a whole is declining. Although medicine remains highly competitive, applications to UK medical schools have decreased for the third year in a row in 2017. The number of people applying to UK medical schools from England has decreased by more than 15% since 2013"

British Medical Association, response to the MAC Call for Evidence

3.21 The majority of respondents in the Manufacturing sector mentioned Brexit uncertainty and reduced EU migration as the reason for their shortages. An ageing workforce was also mentioned amongst the "Other Manufacturing" sector, whilst respondents in the "Food and Beverage Manufacturing" sector were more likely to cite factors like the exchange rate, the job being poorly perceived and the general labour market conditions as the main reasons for shortage.

3.22 Respondents in the Residential and Social Care sector were overwhelmingly more likely to report difficulties in recruiting and retaining staff, this is coupled with a growing demand for the sector and a tight labour market.

"Recruitment and retention in the social care sector continue to be worse, extending beyond those roles known to be challenging to fill in the social care sector such as nurses into all categories of care staff, management and domestic and ancillary worker"

Scottish Care, response to the MAC Call for Evidence

"Social care wages remain relatively low, which can make it an unattractive industry for UK-born workers to join. In 2018, over 500,000 jobs in social care were paid below the real living wage. Low pay inevitable results in the sector struggling to recruit and retain workers. It leads to a dependence on migrants who may have fewer work opportunities".

Independent Age, response to the MAC Call for Evidence

3.23 Respondents from the Creative Arts and Entertainment sector suggested that growing demand for the sector combined with not being able to access talented individuals are the main reasons for shortage. Some respondents suggested that the Governments refocus on core subjects has led to a decline in students taking up arts GCSEs at school, this in turn leads to a shortage of workers with the necessary skills to take up roles in the creative industries. Our stakeholder events also suggest that the lack of Government investment in the relevant disciplines limits the pipeline of creative skills in the UK.

3.24 Those in Accommodation and Hospitality cited the growing demand for the sector combined with the lack of skills/experience of the applicants as the key issues.

"The steady, progressive decline in the status of vocational education over the last 20 years is a hugely important factor"

UK Hospitality, response to the MAC Call for Evidence

3.25 Respondent in the Media and Communications sector agreed that the growing demand for the sector was one of the reasons for shortage. Growing international competition for talent and the niche nature of the skills requirements means that there is fierce competition for individuals. Evidence from our stakeholder events also suggests that there has been significant growth in job titles requiring workers with IT skills and indicate that the supply has not kept pace with the growing needs for digital skills.

3.26 Representatives from the "Non-professional administrative and support service activities" sector suggested that the tight labour market conditions and the Brexit uncertainties/reduced EU migration are the reasons behind shortages in their businesses.

3.27 Professional services' representatives suggested that the low number of applicants with the required skills was the main reason behind shortages, followed by a growing demand for the sector. In some cases, the skill requirements are very niche (e.g. artificial intelligence) and the shortages are more global in nature.

"Shortages are sometimes seen as a result of insufficient rates of qualification in STEM subjects in the UK (compared to other countries)"

Deloitte, response to the MAC Call for Evidence

3.28 Respondents from the Transport sector suggested that a lack of training / investment in skills in the sector combined with the high-cost of training were the main reasons for shortage.

With regards to HGV driving, training is expensive. Although there is now an apprenticeship option, it doesn't fully cover the cost of training and some businesses find the off the job training requirement restrictive"

Freight Transport Association, response to the MAC Call for Evidence

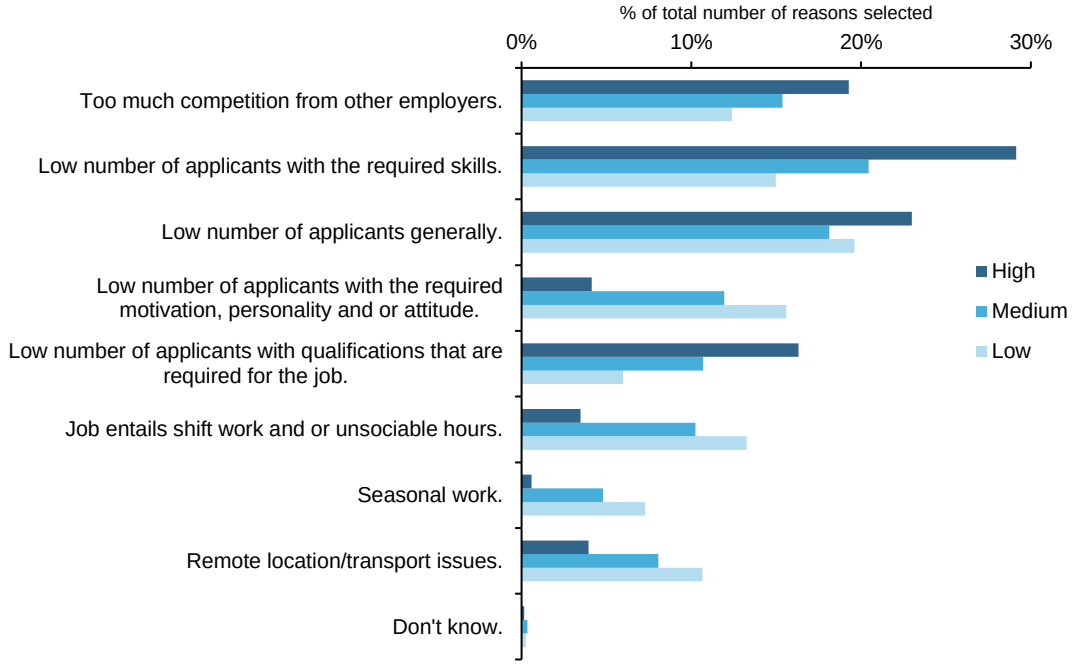
Reasons by region

3.29 Responses from representative organisations varied marginally by region, although this may be due to differences in sectoral composition. Respondents in Northern Ireland and Scotland suggested that Brexit uncertainty and reduced EU migration together with the low attractiveness of the jobs on offer were the main reasons for shortage. Respondents in Northern Ireland suggested that tight labour market conditions also made it difficult to fill vacancies, whereas respondents in Scotland cited difficulties in recruiting and retraining staff. There appears to be little difference by devolved administration when it comes to the reasons reported by individual organisations.

Reasons by skill level

3.30 As individual organisations were asked to provide the reasons for shortage against each of the (up to) 10 job titles they highlighted, we can split the reasons by the skill level of the job to which they refer. This shows that shortages amongst higher-skilled jobs are more likely to be related to competition from other employers, low number of applicants with the required skills and low number of applicants with the required qualifications. For medium and lower-skilled roles the reasons for shortage are more likely to be associated with characteristics to do with the job such as unsociable hours, seasonal work and remote location/transport issues as well as a low number of applicants with the required "motivation, personality and/or attitude" – see figure 3.6.

Figure 3.6: Reported reasons for recruitment difficulties by skill level of job – Individual Organisations

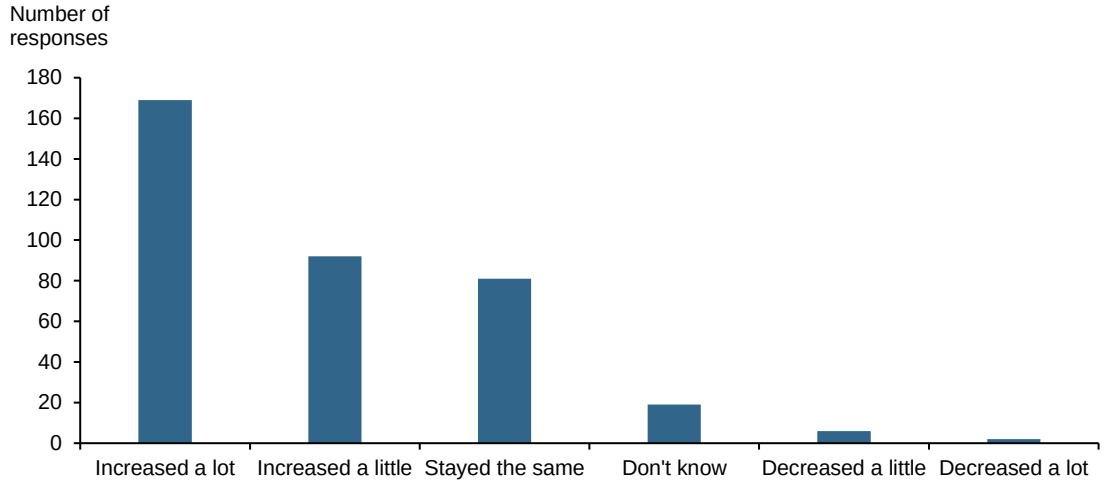


Source: MAC Call for Evidence online form

Impacts of shortages

3.31 Individual organisations were also asked whether the recruitment time had changed within the last 12 months. The majority (48 per cent) reported that recruitment time had 'increased a lot' see figure 3.7. There responses are broadly similar by sector, although respondents from Public administration (SIC division O) were least likely to report an increase in the time it takes to fill a job.

Figure 3.7: Change in the time it took to fill a job in the last 12 months – individual organisations



Source: MAC Call for Evidence

3.32 Individual organisations were also asked about the impact recruitment shortages have had on their organisation. Figure 3.8 summarises these responses by classifying the common answers given in the free text provided. The majority reported that shortages had impacted the quality of service that they provided, followed by an impact on productivity.

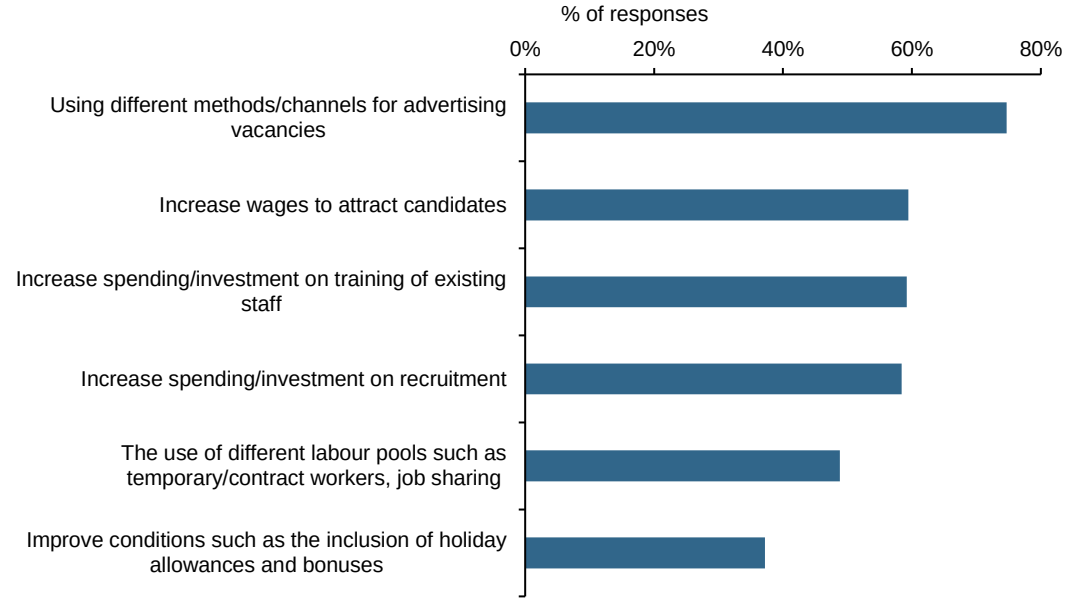
Figure 3.8: Impact of recruitment difficulties – individual organisations

Source: Manual classification of free-text responses to MAC Call for Evidence

Measures taken to address shortages

3.33 Individual Organisations were asked to indicate what measures they were taking to reduce shortages from list of options and were given the space to report additional measures. The most common measure was the use of different methods/channels for advertising vacancies, followed by increasing wages as well as investment on training and recruitment – see figure 3.9

Figure 3.9: Measures to address shortage reported by Individual organisations



Source: MAC Call for Evidence

3.34 Individual organisations also reported working with schools/higher education establishments to encourage interest in the profession. Another common way of dealing with immediate recruitment shortages was to advertise or recruit EEA and non-EEA workers. Organisations are also changing the entry/qualification requirements for the roles as one organisation stated.

> We are "working with schools on STEM subjects to try to encourage and increase interest in these areas in order to increase the potential talent pool"
>
> Cummins, response to the MAC Call for Evidence
>
> "We have reduced the experience requirement and appointed to "trainee" positions in expectation that the new employee will be trained up to standard"
>
> Queen's University Belfast, response to the MAC Call for Evidence

3.35 Representative organisations were asked what measures were taken to reduce shortages, again using a free-text box. The most common responses were training and upskilling; the use of Apprenticeships; and promoting/increasing awareness of careers in the sector. A number of respondents have increased pay in an attempt to become more attractive – see figure 3.10.

Figure 3.10: Measures taken to reduce shortage reported by representative organisations

Source: Manual classification of free-text responses to MAC Call for Evidence

3.36 Most sectors within the representative organisations said they were increasing training and upskilling their existing staff to manage shortages. This was especially the case in the Accommodation and hospitality industry and Media and communications. Some sectors (including Manufacturing, Construction and Media and communication) said they were using apprenticeships as a way of addressing shortages and working with universities and colleges to better define their needs. A significant number of respondents in the Agricultural sector state they are increasing pay to attract more workers, this measure is also being used by the Manufacturing sector. The Education sector has increased bursaries and implemented media campaigns to increase the attractiveness of the sector. Whilst the Health sector is increasingly recruiting overseas as well as making use of apprenticeships.

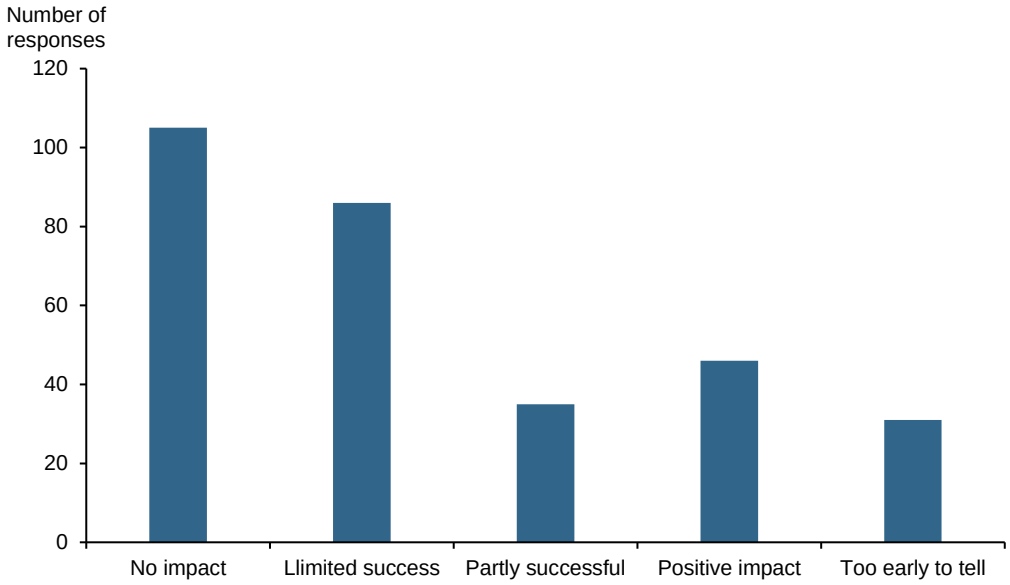
3.37 The most common measure reported by individual organisations in Agriculture, forestry and farming, Wholesale and retail trade; Repair of motor vehicles and motorcycles and the Information and communication sectors was to increase wages to attract candidates. This was also frequently mentioned by attendees at stakeholder events across all skill levels from lower-skilled to high-skilled, and all industries that were not restrained by public sector pay.

3.38 Increase spending/investment on recruitment was most likely to be reported by respondents in the Education sector. Whilst increase spending/investment on training of existing staff was most commonly reported by respondents in the Construction sector.

Impact of measures

3.39 The impact of these measures varies for each organisation. 35 per cent reported no impact, whilst 40 per cent reported "limited" or partly "successful", only 15 per cent said they had been successful, and for 10 per cent it was too early to tell, see figure 3.11.

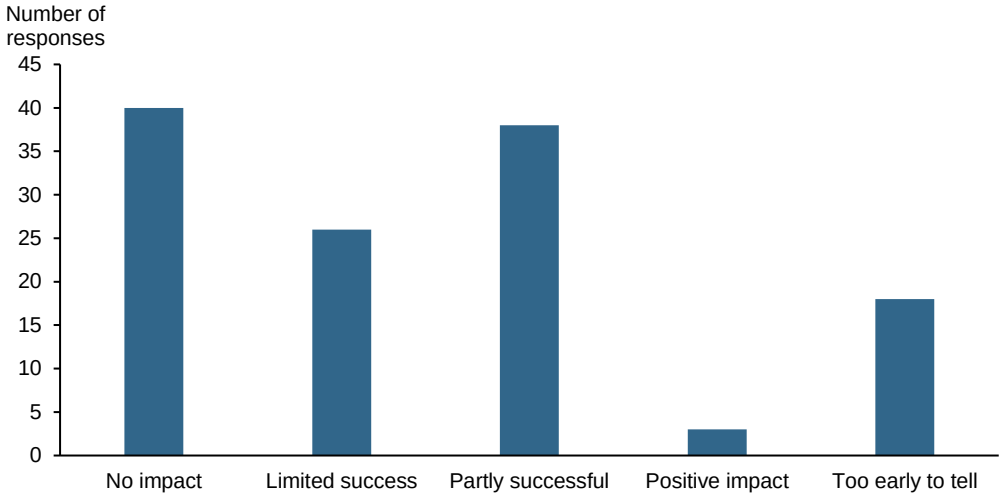
Figure 3.11:– Impact of measures – individual organisations



Source: Manual classification of free-text responses to MAC Call for Evidence

3.40 Representative organisations also reported varying degree of success. 49 per cent said that the measures had "limited success" or were "partially successful" in addressing shortage. 31 per cent said they did not have any impact and only 2 per cent said it had had an impact – see figure 3.12.

Figure 3.12: Impact of measures - representative organisations



Source: Manual classification of free-text responses to MAC Call for Evidence

3.41 The reported level of success does vary by sector with around 40 per cent of respondents in the Agriculture sector reporting that the measures taken had no success. We were told by some that even when pay has increased, it has done little to attract staff. Over 50 per cent of the respondents in the Education sector said the measures were not having any impact on reducing shortage, the highest of all sectors. Around 60 per cent of respondents from the Health sector said that measures were having some degree of success (though the majority said "limited").

"Even raising pay rates so far did not allowed us to find enough local staff to fulfil all the orders".

Connect Personnel Ltd, response to the MAC Call for Evidence

"Pay increases have mostly led to companies and sectors recruiting staff from each other, with limited success in increasing the overall number of workers in these areas".

Food and Drink Federation, response to the MAC Call for Evidence

"DfE has failed to fully grasp the interconnectedness of recruitment and retention. A strong focus on recruiting teachers through bursaries and other incentives has led DfE to neglect the retention of existing school leaders and teachers"

NAHT, response to the MAC Call for Evidence

"Despite the various Government initiatives to promote teaching as a career and improve the retention of teachers, chemistry teacher shortages remain an issue".

Royal Society of Chemistry, response to the MAC Call for Evidence

"International recruitment campaigns have not been as successful as initially hoped. In England, an international recruitment programme to recruit 2,000 additional GPs to *address these shortages has, as of November 2018,*

successfully recruited only 11 GPs from non-EEA countries (including 5 GPs returning to the NHS) since the scheme began, 46 from EEA and 2 UK nationals returning from overseas".

The General College of General Practitioners, response to the MAC Call for Evidence

3.42 The Media and Communications sector and the Utilities sector mentioned how the pace of technological change made it difficult for them to say which jobs / occupations may be in shortage in the future.

Other Cross-Cutting themes

3.43 In addition to the online form, we gathered evidence from a number of stakeholder events across the country. This section captures some of the additional themes not highlighted above.

Frequency of the SOL

3.44 A number of stakeholders mentioned the need for more frequent SOL reviews to ensure it remains up to date and relevant. The Association of British Pharmaceutical Industry told us that a more regular review of shortages would help emerging, innovative industries tackle shortages faster than they were able to train and upskill workers.

"The Shortage Occupation List be reviewed annually on a more dynamic basis. Given the pace of economic, political and technological shifts, the new UK immigration policy needs to be far more responsive to changes than previously. It is essential that the SOL is responsible to changing business needs, including from overseas investors".

Scottish Enterprise, response to the MAC Call for Evidence

Regional difference

3.45 Many regions and countries of the UK saw their requirements as unique to their geographic areas and there were concerns over having to compete with salaries from London and the South East. There were a range of suggestions to reduce the salary thresholds and lower the skills requirements of migrants to meet the labour market demand in particular areas including Northern Ireland, Scotland and Wales.

Skill requirements

3.46 Some stakeholders felt the Government did not focus enough on the skills they required, this range from STEM skills through to the Arts and Creative occupations.

"Scholarships and Government schemes help but without significant and prolonged Government investment, the limited supply of British dancers will continue"

SOLT and UK Theatre, response to the MAC Call for Evidence

3.47 Many organisations emphasised Government's role in helping to provide workers with the skill-set that industry requires. It was argued that if there was a shortage of workers within the UK then the sectors should not be penalised by having to pay the immigration skills charge, or costly visa fees. A lower salary threshold was seen as compensation for the occupation being in shortage.

3.48 Investment in training and upskilling seems to be variable (as highlighted in the measures section above). A range of sectors suggested graduates are not work ready when they leave university whereas migrant workers tend to be better qualified and more "job-ready", possibly as many would have been employed before.

3.49 A significant number of stakeholders pointed to the growth in job titles requiring workers with IT skills. They indicate that all levels of education have not kept pace with the growing needs for digital skills.

Demographic changes

3.50 There were concerns over population decline and ageing population, particularly where this is more pronounced in some regions/countries than others. There is also the related but distinct issue of remote areas, where migrant workers can help to sustain communities, e.g. teachers on remote islands.

3.51 A number of sectors indicated that the proportion of their workforce was nearing retirement age, particularly those with experience in the industry. Within construction, engineering and manufacturing, one fifth of the workforce is estimated to retire in the next 10 years. However, this is not too dissimilar to the rest of the working population.

Lower-skilled

3.52 Many companies were concerned about the potential loss of access to lower-skilled workers with the ending of freedom of movement. Companies indicated that they were already struggling to recruit into roles below RQF3 and that they were experiencing a greater turnover of staff as a result of Brexit and the devaluation of the pound. This was mainly a concern for Horticulture, Food manufacturing, Hospitality, Tourism and Care sectors.

3.53 Some high-skilled organisation indicated that while they can access migrant workers as most of their requirements are for high-skilled occupations, they also rely on operational roles at the lower end of the skills spectrum which are necessary for the functioning of the business.

3.54 A number of companies indicated that often managers started “on the shop floor” and worked their way up the business. There was concern that without access to lower-skilled workers, companies would not have a pipeline of higher-skilled staff with a good understanding of the business.

Supply chain

3.55 Some stakeholders (from universities, agriculture, food manufacturing, construction and road haulage) expressed a concern that their supply chain included a range of low and medium-skilled roles, which could impact on the functioning of their business.

Desire to future proof

3.56 A range of businesses indicated that while there were not currently experiencing any shortages, their situation is likely to change when freedom of movement ends, and they would like some certainty about their ability to access workers at all skill levels.

Conclusions

3.57 This call for evidence exercise was one of the most successful we have undertaken to date in terms of number, breadth and utility of the responses. Together with the shortage indicators and other information from stakeholder meetings, they inform our analysis of specific occupations in the next chapter.

Chapter 4: Bringing the Evidence Together

4.A. Introduction

4A.1 In this chapter we bring together all the evidence available to us into one place to make a set of recommendations for the list of occupations, which are currently eligible for sponsorship via Tier 2(G), that should be added, removed or kept on the SOL. These recommendations are applicable to the Tier 2(G) system as it currently operates.

The scope of investigation

4A.2 There are 95 four-digit occupations that meet the skills requirements of the current Tier 2(G) system (and aren't excluded for some reason other than skill). There are a further five creative occupations eligible for Tier 2(G) despite not meeting the skill threshold. Furthermore, there is one occupation identified earlier in chapter 2 as likely meeting the Tier 2(G) skilled criteria given the latest data. Finally, there are nine occupations that – while they do not meet the skill requirements – contain individual job titles that are currently on the SOL (see table 6.1 in Annex C6). Two of these SOL occupations overlap with the occupations covered by the creative exemption. Therefore, in total there are 108 occupations that are, or should be, eligible for Tier 2 (G) and are therefore potential candidates for the SOL.

4A.3 Across the stakeholder evidence we received via the online form we were able to find direct mentions[38] to 96 of these 108 occupations. We also received evidence via direct submissions. Where we received no evidence from our engagement process we do not make any recommendation. This is because stakeholder evidence is an essential source of information for us to be able to come to informed conclusions.

4A.4 We group these 108 occupations into the broad categories below and use these headings to structure the rest of this chapter.

(b) Health occupations
(c) Engineering occupations
(d) Science professionals
(e) Digital and IT occupations
(f) Education occupations
(g) Business, finance and legal occupations
(h) Artistic and creative occupations
(i) Managers and directors
(j) Other occupations

4A.5 Each heading will form a sub-section within which we discuss the evidence of shortage for each of the 4-digit occupation that sits under that heading.

[38] That is the 4-digit standard occupation was mentioned explicitly or a job title that fits within that 4-digit occupation was mentioned within the 10 text boxes provided in the online form.

4A.6 Not all 108 occupations will necessarily warrant the same level of detailed discussion. For example, some occupations may make little or no use of Tier 2(G) and so would not likely benefit from being on the SOL. In other cases, we may have received very little evidence or our shortage indicators may suggest there is very little evidence of shortage. We take a case-by-case approach, where we have not been provided with sufficient evidence or justification for a detailed discussion we do not provide one. Furthermore, there are three occupations for which we were unable to calculate a sufficient number of the shortage indicators, due to small sample sizes, and therefore do not receive a value in the shortage ranking.

Nature of recommendations

4A.7 The current SOL, with some exceptions, specifies individual jobs rather than entire occupations as being in shortage. For some jobs additional qualifiers are imposed. This includes specifying the industry in which the job is in shortage, the length of experience the candidate needs and in two cases (line erectors and chefs) specific salary requirements.

4A.8 The specificity of the jobs on the SOL creates several problems. First, it requires us to engage in detailed assessments of very particular parts of the labour market. This can be a time and resource intensive process and so limits the frequency with which we can review shortages across the labour market. Second, it means that some elements of the SOL can become out of date relatively quickly. For example, in industries such as digital and IT job titles can frequently change and can therefore render items on the SOL outdated.

4A.9 Overall the use of potentially outdated job titles as well as a range of caveats creates a complex system to navigate for both sponsors and the Home Office. In our EEA report we suggested that the immigration system should be simplified where possible. Specifically, we said that consideration should be given "*as to whether the bureaucratic requirements of the current sponsorship and sponsor licensing processes can be reduced in order to facilitate high-skilled migration*". Given the current complexity of the SOL we believe there is room to act on this point and simplify the nature and description of the jobs deemed in shortage.

4A.10 In practice this means setting our default recommendation to be that we include an entire occupation, not just a subset of jobs within it, and to only apply further caveats where we believe doing so is acutely important. This might be judged by considering whether employers sponsor migrants into an occupation via the Tier 2(G) route in large numbers already. Where this is the case, expanding the eligibility of an occupation to the SOL is more likely to have consequences for the functioning of the existing system, where it is not the impact is likely to be much less. We also pay attention to those occupations containing jobs that are "not elsewhere classified". These occupations often cover a diverse range of roles and so we take particular care to understand the implications of including the entire occupation code.

The approach

4A.11 While recommendations are made on a case-by-case basis there are similarities in the way we approach generating a conclusion. This reflected in the summary boxes provided at the start of each occupation. These boxes contain the following information:

- An occupation's share of total employees in the UK.
- An occupation's share of the total number of restricted certificates of sponsorship (RCoS) used over the period 2015 to 2018.
- The share of employees within an occupation that were born in the EEA (excluding the UK and Republic of Ireland).
- The share of employees within an occupation that were born outside the EEA.
- The median annual wage of full-time employees.
- Chart showing the evolution of the job posts to employment ratio for an occupation between 2012/13 and 2017/18 relative to the median value of that ratio calculated over all occupations eligible for Tier 2(G).
- The overall rank of an occupation calculated using the top down indicators of shortage, measured out of 105 (for three occupations less than five out of nine indicators could be calculated and so where not given an overall rank).

4A.12 A table showing the number of certificates of sponsorship (CoS) used by employers to sponsor migrants into particular occupations is also provided in each case. As with the summary table this measure refers to "used" restricted CoS (RCoS). Employers must apply for an RCoS if they intend to use Tier 2(G) to sponsor a migrant from outside the UK to come and work in a job which pays less than £159,600 or to sponsor a Tier 4 dependent. These are allocated subject to a monthly cap with a points system used to prioritise applications when the cap binds. Once applied for, and if granted, the sponsor then assigns the RCoS to a particular migrant who uses the certificate's unique number in order to make their application to enter the UK. It is at this point that the RCoS is considered "used". We measure RCoS at this point as this was the data we were able to access.

4A.13 All this analytical information is then combined with the evidence provided by stakeholders in order to make a recommendation. To give a flavour of how this is done laid out below are the sorts of questions we ask ourselves when interpreting and combining these sources of evidence.

- What is the nature and volume of the evidence we received from stakeholders? If the volume of submissions was high or low does this reflect something about the nature of the submissions e.g. many individuals responses versus a small number of responses from bodies representing many individuals?

- Are stakeholders able to point to specific barriers that limit recruitment from the existing workforce, such as regulatory barriers and pipeline problems? If so can stakeholders also convincingly argue that these

barriers are largely external to their own actions and policies? If not, or additionally, can they articulate what actions are being taken to alleviate these barriers, the likelihood they will be successful and over what time period?

- Do the shortage indicators rank the occupation near the top or near the bottom of the list of all occupations? If so, is there anything about the occupation that may make us think the shortage indicators may not work well in this case (e.g. in the case of the public sector)? If its rank is closer to the middle, is there any reason to still give this piece of evidence much weight (perhaps by looking at the individual indicator components)?

- What is the nature and extent of this occupations use of the Tier 2(G) system? If employers have made little/decreasing use of Tier 2(G), does this reflect that they have been successful in hiring their labour from elsewhere or that their occupation not being on the SOL has limited the attractiveness of using Tier 2(G)? If employers have made significant/increasing use of Tier 2(G) does this indicate shortages of suitable candidates from the existing workforce or (perhaps and) a failure to resolved structural barriers limiting recruitment from within the UK?

- How reliant in the occupation on labour from outside the UK? If the share of workers born outside the UK is low what evidence is there that employers will be able to attract migrants into these roles? If the share of workers born outside the UK is high which migrant routes have employers been reliant on historically?

- What does the evolution of job posts to employment ratio relative to other occupations tell us? If it's above the median and/or increasing this might indicate high/growing demand over supply, if below the median and/or falling this might imply the opposite. Is there any reason to think the Burning Glass data may be subject to unusually high measurement error for this occupation?

4A.14 By no means are the above question exhaustive or prescriptive but hopefully give some insight into how it is we come to the judgements we do.

4.B. Health occupations

Introduction

4B.1 The health sector covers a number of occupations and job titles. Many health-related occupations have already featured on the SOL, and nurses and doctors were recently removed from the Tier 2 (G) cap altogether.

4B.2 The following sub-section presents an overview of the sector, highlights some of the issues it faces and reports on Government policy aimed at improving the situation. It concludes by providing a detailed occupation by occupation analysis of labour shortages using our data analysis and stakeholder evidence.

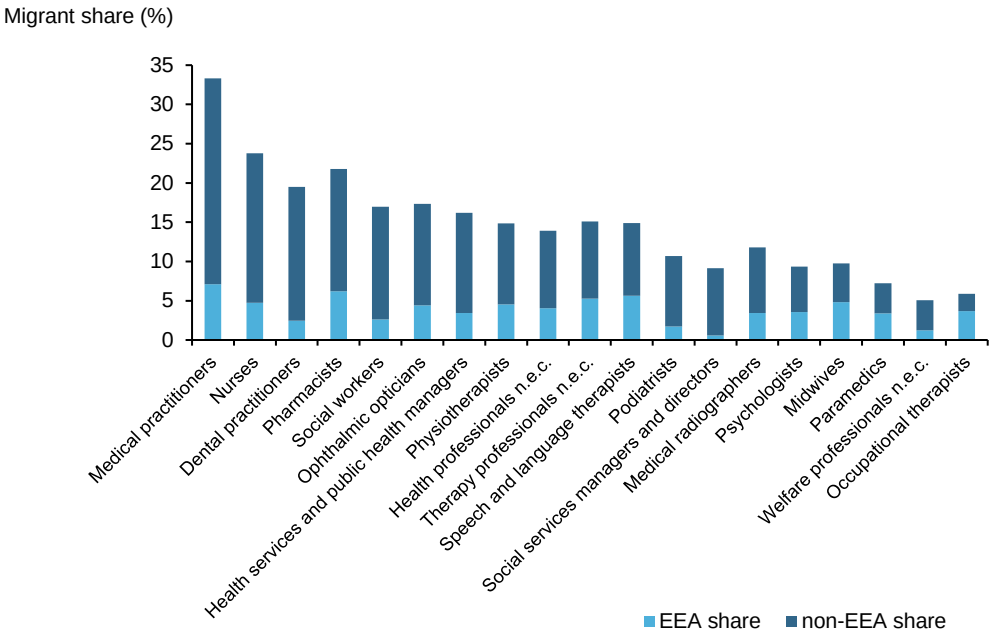
4B.3 Data from NHS Digital[39] and the ONS[40] allowed us to compare the nationality composition of the whole UK employed workforce and the workforce of the English NHS. These sources tell us that as of September 2018, 6.9 per cent of the UK workforce were nationals of one of the EU27 countries compared to 5.2 per cent for NHS England. In contrast, the share of the NHS workforce who were non-EU nationals was higher than the UK workforce overall, at 6.8 per cent compared to 3.8 per cent. This shows workers from the rest of the world, excluding EU countries, are over-represented within the NHS and hence the importance of the Tier 2 (G) system as well as the SOL for healthcare professions.

4B.4 Figure 4.b.1 shows the EEA and non-EEA migrant share contributions to the health care SOC codes we consider in this sub section. Medical practitioners and nurses have the largest shares of migrant workers and nearly all the SOC codes have a larger share of non-EEA workers than EEA workers.

[39]https://digital.nhs.uk/data-and-information/publications/statistical/nhs-workforce-statistics/september-2018

[40]https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/datasets/employmentbycountryofbirthandnationalityemp06

Figure 4.b.1: Migrant share in health care occupations, Oct 2017-Sep 2018



Source: Annual Populaiton Survey

Sector Overview

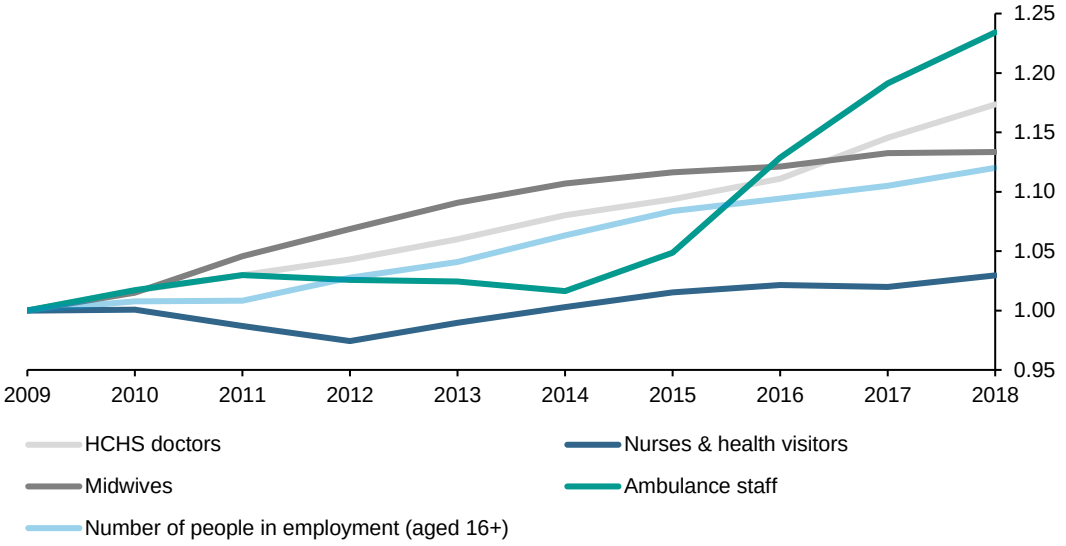
4B.5 Recent trends in the workforce composition and struggles within the health sector are widely reported. In our report on the impact of EEA migration in the UK[41] we looked at the health sector and the significant role migrants play in the workforce, concluding that EEA migrants likely contribute more to the provision of healthcare services than they consume. There are also reports from bodies like The Health Foundation[42] which offer detailed analysis on workforce trends and pressures.

4B.6 Figure 4.b.2 shows the full-time equivalent headcount of some healthcare professions indexed to 2009 across England as well as the numbers of people in employment generally in the workforce across the UK. Growth in the numbers of ambulance staff, doctors and midwives has outpaced the growth in overall employment while the numbers of nurses and health visitors employed has grown more slowly – with only around a three per cent growth since 2009. In numeric terms this equates to, in November 2018, there being approximately 112,000 doctors, 290,000 nurses and health visitors, 22,000 midwifes and 21,000 ambulance staff in England.

[41] https://assets.publishing.service.gov.uk/Government/uploads/system/uploads/attachment_data/file/741926/Final_EEA_report.PDF

[42] https://www.health.org.uk/sites/default/files/upload/publications/2019/A%20Critical%20Moment_1.pdf

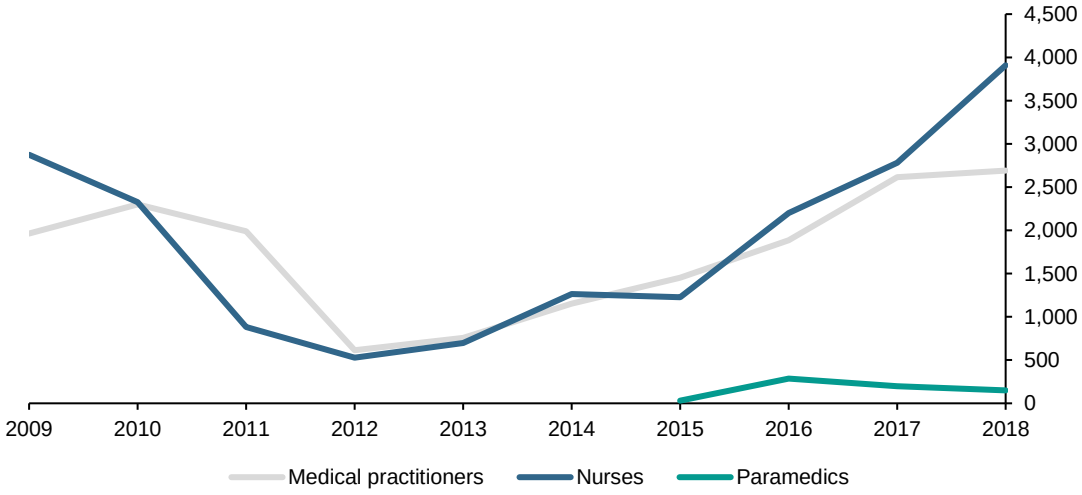
Figure 4.b.2: Index of number of FTE workers in a number of healthcare professions and overall employment 2009-2018



Source: NHS digital[43] and ONS[44]

4B.7 Figure 4.b.3 shows the number of RCoS used for three different SOC codes. It shows a dip in number of RCoS used of medical practitioners and nurses in the middle of the decade, but numbers have risen again and now are exceeding application numbers in 2009 for these two occupations. Paramedics were added onto the SOL in 2015 which is perhaps why we see Tier 2 being used from this year even though it is possible to use Tier 2 without being on the SOL.

Figure 4.b.3: Number of Restricted Certificate of Sponsorship used for some professions 2009-2018



Source: Home Office management information data

[43] https://digital.nhs.uk/data-and-information/publications/statistical/nhs-workforce-statistics/november-2018, NHS Workforce Statistics, November 2018 National and HEE, England FTE.
[44]https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/timeseries/mgrz/lms

4B.8 Table 4.b.1 shows mean salaries for some occupations within the NHS. Obviously, these will vary greatly on specific role and experience within the job. For example, an F1 doctor's mean pay is £26,586 whereas a consultant earns £90,855. These numbers are roughly in line with recent 2018 ASHE data[45] which puts the mean pay of nurses and midwives at £27,777 and £29,283 respectively.

Table 4.b.1: Mean annual basic pay per FTE, 12-month period April 2017 to March 2018

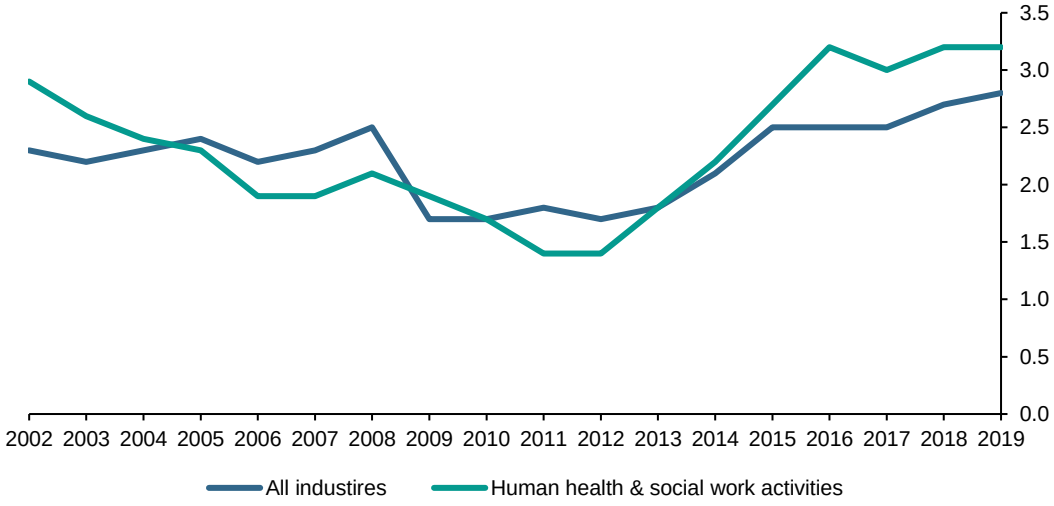
Profession	Mean pay (£)
HCHS Doctors	63,628
Nurses and health visitors	31,519
Midwives	33,160
Ambulance staff	27,632
Scientific, therapeutic and technical staff	35,158

Source: NHS Digital[46]

4B.9 The number of vacancies within the NHS is widely reported and poor workforce planning is an often-reoccurring theme from our call for evidence responses as a reason for labour shortages.

4B.10 Figure 4.b.4 shows the ratio of vacancies per 100 employee jobs for the human health and social work activities sector compared to the rate for all sectors together. We can see from that about 2015 the vacancy ratio has increased for the health sector more severely than for the labour market overall. Despite increasing employment as seen in Figure 4.b.2, vacancy rates continue to rise given the ever-increasing demand for healthcare services.

Figure 4.b.4: Ratio of vacancies per 100 employees by industry, UK 2002-2019



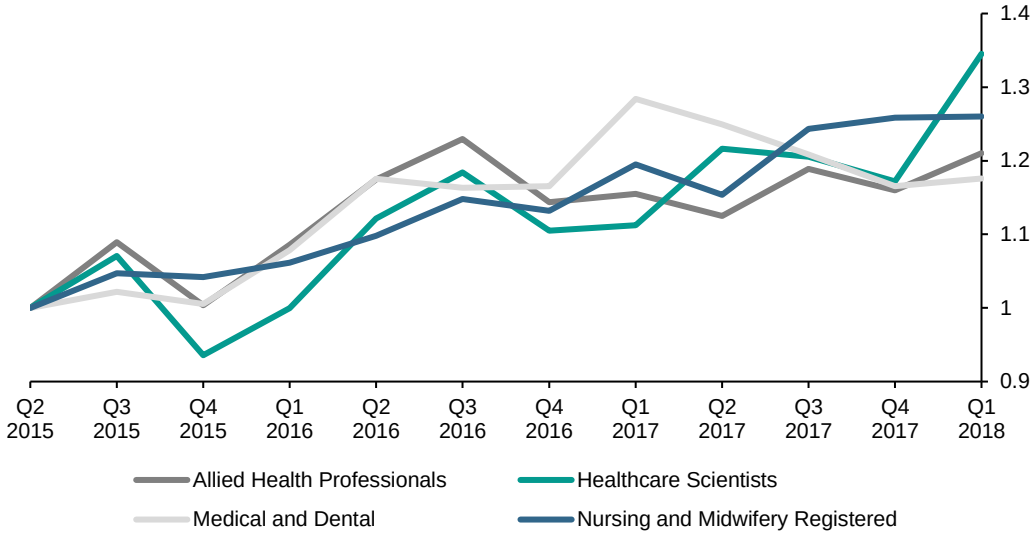
Source: ONS

[45]https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/datasets/occupation4digitsoc2010ashetable14, Table 14.7a

[46] https://digital.nhs.uk/data-and-information/publications/statistical/nhs-staff-earnings-estimates/nhs-staff-earnings-estimates-march-2018-provisional-statistics, NHS Staff Earnings Estimates to March 2018 in NHS Trusts and CCGs in England – Provisional Statistics: Tables, Table 1

4B.11 Figure 4.b.5 shows indexed vacancy rates for some professions over the last few quarters from NHS England. There has been growth in the vacancy rate over the last few quarters with nursing and midwifery vacancies increasing by over 20 per cent from Q2 2015 to Q1 2018.

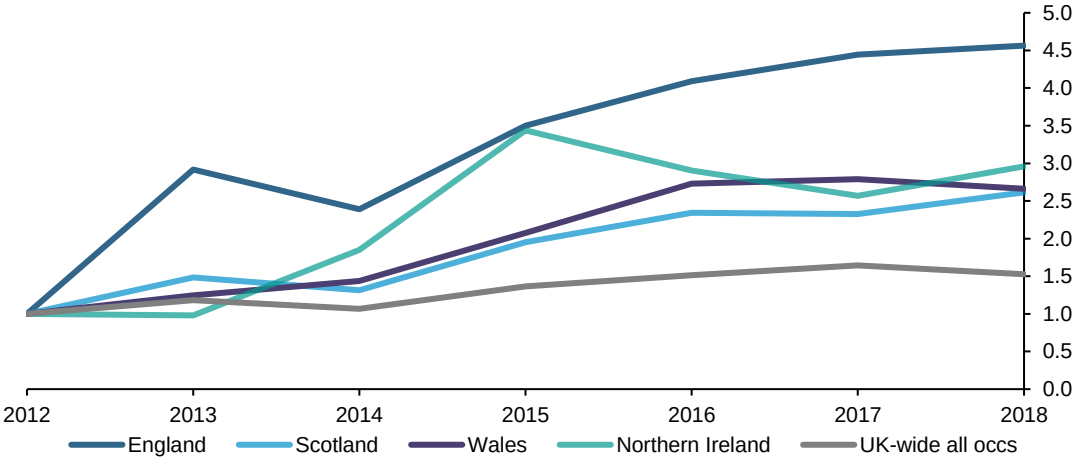
Figure 4.b.5: Indexed vacancy rates for some selected professions 2015- 2018



Source: NHS Digital

4B.12 Figure 4.b.6 shows indexed job postings from Burning Glass data using a taxonomy of health care professions created by Burning Glass. We can see that in all four devolved nations job postings for healthcare professions have grown faster than for all occupations over the entire UK. The increase has been particularly stark in England with a spike in Northern Ireland health job postings in 2015.

Figure 4.b.6: Job postings for healthcare professions by nation in UK, indexed to 2012



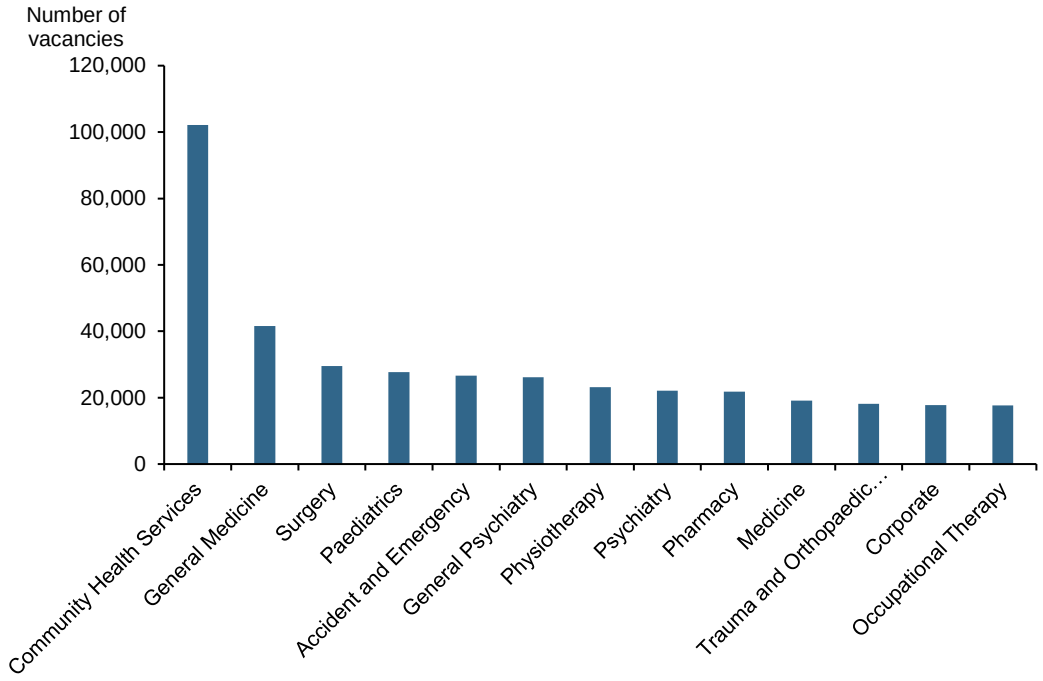
Source: Burning Glass

4B.13 Looking at data from the Department of Health in Northern Ireland[47], the number of vacancies as at December 2018 for healthcare professions were highest for registered nurses followed by social care workers/domiciliary care workers and admin & clerical staff respectively. In terms of the largest increases in vacancies in Northern Ireland from 2017 to 2018, social worker vacancies increased by over 100 per cent, followed by social care workers at 85 per cent and clinical psychologists at 57 per cent.

4B.14 The Scottish Government Response for Health and Social Care pointed to the highly competitive global market for consultants. They suggest the SOL should also include training and staff grade posts within the same speciality to provide flexibility to health boards to reconfigure existing services. The Executive Office in Northern Ireland suggested that Health and Social Care are particular areas of vulnerability in Northern Ireland, where there are occupation shortages right across the public and independent sectors.

4B.15 Figure 4.b.7 shows the top 13 professions for number of vacancies over the past three years in total, excluding administration type roles. Community health services far outweigh the number of vacancies in the next highest categories.

Figure 4.b.7: Top 13 professions with most total vacancies in NHS England, 2015-2018



Source: NHS Digital

[47] https://www.health-ni.gov.uk/publications/northern-ireland-health-and-social-care-hsc-workforce-vacancies-december-2018

Challenges for the sector

4B.16 The most common response given in the call for evidence from the healthcare sector when asked about the reasons for labour shortages was that there is low number of applicants with required skills. This was followed by too much competition from other employers and the off-putting nature of shift work and unsociable hours.

4B.17 We also gathered evidence from sector representatives such as NHS Employers and the Royal College of Nursing. Of all the reasons listed for difficulties in recruitment, the most common were growing demand in the sector, not enough graduate or university spaces and a lack of workforce planning.

4B.18 The NHS is coming under increasing pressure from a growing and ageing population. The number of NHS inpatient elective admissions has increased by around 20 per cent from the second quarter in 2010 to the last quarter in 2018. This equated to 1,482,278 admissions in the last quarter of 2018[48].

4B.19 Clearly this rising demand for healthcare needs to be met and matched with an adequate supply of workers as well as funding for this increased supply. As seen in our report on the impact of EEA migration in the UK, UK spending on health in real terms has grown at an average of 4 per cent per year between 1955/56 and 2015/16[49].

4B.20 Many employers state that not enough applicants with required skills are applying to health sector jobs. HESA data shows there has been a decrease in student enrolments in medicine and dentistry of 2 per cent from 2012/13 to 2016/17. There has been an increase in enrolments to subjects allied to medicine of 3.9 per cent in this same time period[50]. UCAS data shows the numbers of acceptances to all courses over the same period has increased by 15 per cent.

4B.21 Another common problem we heard about was retention within the health industry. Looking at data from NHS Digital we can see that the share of those who voluntarily resigned because of work life balance has increased from 9 per cent to 16 per cent between 2011/12 and 2017/18.

[48] https://www.england.nhs.uk/statistics/statistical-work-areas/hospital-activity/quarterly-hospital-activity/qar-data/
[49] IFS, 2017, https://www.ifs.org.uk/publications/9186
[50] https://www.hesa.ac.uk/news/11-01-2018/sfr247-higher-education-student-statistics/subjects

Government Policy

NHS Long Term Plan[51]

4B.22 NHS England recently revealed their long-term plan. On the basis of this, the Government have committed to invest a £20.5 billion budget into the service over five years.

4B.23 The document notes the strain on staff due to the number of vacancies across many roles in England and outlines some steps being taken to improve the pipeline of new NHS workers[52]. For example, the plan includes a commitment to fund an increase in nurse undergraduate places and, from 2020/21, fund clinical placements for as many places as universities fill - up to a maximum 50 per cent increase. A separate Interim People Plan is being published imminently.

4B.24 The document also highlights that training needs to be made more accessible. It contains a commitment to establish a new online nursing degree, with guaranteed placements at NHS trusts and within primary care.

4B.25 Furthermore, the plan sets out the continuation of investing in the growth of nursing apprenticeships with the aim of 7,500 new nursing associates starting in 2019, a 50 per cent increase on 2018.

4B.26 There are also plans on how to increase the medical workforce generally[53]. The number of medical school places are growing from 6000 to 7500 per year and could grow further depending on budget outcomes from the Spending Review. There is also a desire to shift from a dominance of highly specialised roles to a better balance with more generalist ones.

4B.27 The plan includes a section on international recruitment[54]. They plan to set out new national arrangements to support NHS organisations in recruiting overseas. The plan notes the changes made to immigration rules in 2018 which exempted all doctors and nurses from the immigration cap which has led to a vast increase of Tier 2 RCoS applications being given to nurses and doctors as seen in Figure 4.b.3.

Summary

4B.28 The demand for workers to fill vacancies in healthcare occupations is set to continue to grow as the demand for healthcare services continues to grow.

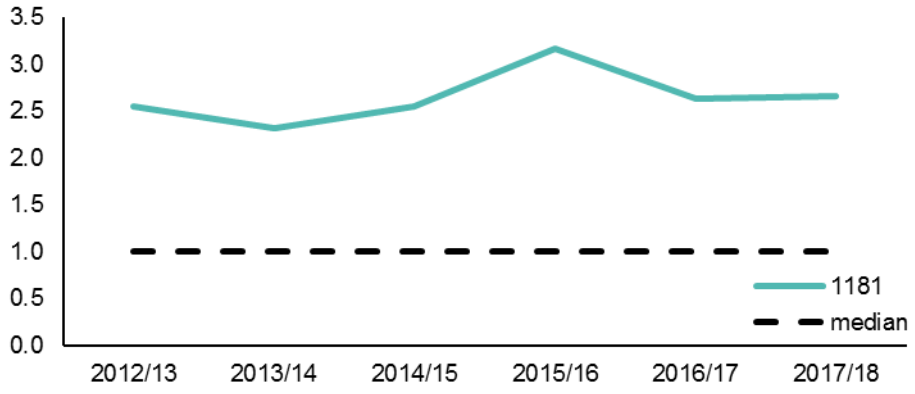
[51] https://www.gov.uk/Government/news/nhs-long-term-plan-launched
[52] https://www.longtermplan.nhs.uk/online-version/chapter-4-nhs-staff-will-get-the-backing-they-need/2-expanding-the-number-of-nurses-midwives-ahps-and-other-staff/
[53] https://www.longtermplan.nhs.uk/online-version/chapter-4-nhs-staff-will-get-the-backing-they-need/3-growing-the-medical-workforce/
[54] https://www.longtermplan.nhs.uk/online-version/chapter-4-nhs-staff-will-get-the-backing-they-need/4-international-recruitment/

Migration has made an important contribution to the sectors workforce and no doubt will continue to do so. However, the rise in vacancies and concern over lack of staff has occurred under freedom of movement and during a period when many health occupations have been on the SOL. Ultimately it will take more effective workforce planning and efforts to increase the flows into health professions (and decrease flows out) to meet growing demands.

Occupations under consideration

4B.29 In this section we will consider each SOC code, skilled to the required criteria, within the health sector. We will provide the quantitative evidence and stakeholder evidence we have on the occupation and conclude on whether they should be added to the SOL.

SOC 1181 – Health services and public health managers and directors

Summary table: SOC 1181 Health services and public health managers and directors	
Employment	
Share of UK employees (%, APS, 2017/18)	0.3%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.0%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	3.4%
Share of employees born outside the EEA (%, APS, 2017/18)	12.8%
Wages	
Median full-time annual wage (ASHE 2018)	£48,760
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	5
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder Evidence

4B.30 We received no stakeholder evidence for occupations under this SOC code.

Use of the SOL

4B.31 Job titles under this SOC code have never been included on the SOL.

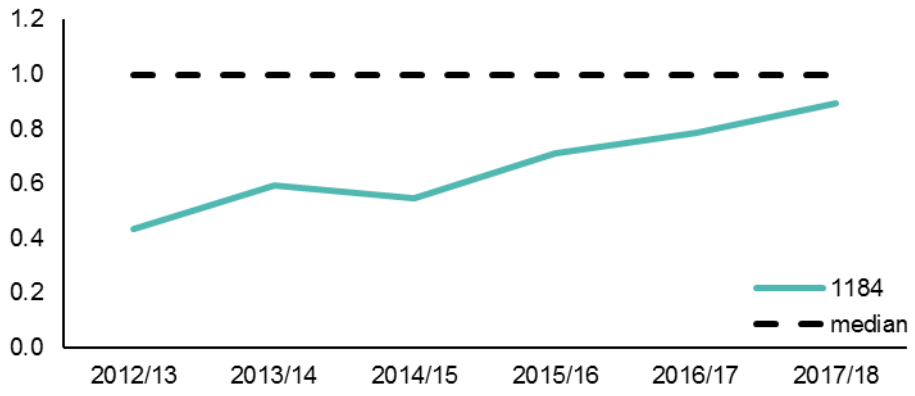
Use of Tier 2 (General)

Year	2014	2015	2016	2017	2018
RCoS Used	12	11	9	7	5

Recommendation

4B.32 We do not recommend including SOC code 1181 (health services and public health manages and directors) on the SOL despite a high ranking in the shortage indicators due to insufficient evidence from stakeholders of national shortage and low usage of Tier 2 (General) in recent years.

SOC 1184 – Social services managers and directors

Summary table: SOC 1184 Social services managers and directors	
Employment	
Share of UK employees (%, APS, 2017/18)	0.1%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.0%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	0.6%
Share of employees born outside the EEA (%, APS, 2017/18)	8.5%
Wages	
Median full-time annual wage (ASHE 2018)	£40,005
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	60
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder Evidence

4B.33 One local council said they had difficulties recruiting a social work manager.

Use of the SOL

4B.34 Job titles under this SOC code have never been included on the SOL.

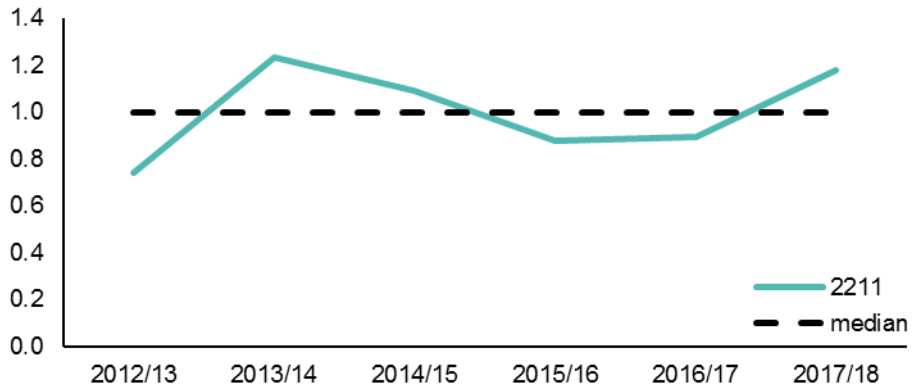
Use of Tier 2 (General)

Year	2014	2015	2016	2017	2018
RCoS Used	0	1	0	0	1

Recommendation

4B.35 We do not recommend adding social service managers and directors to the SOL. There is very limited evidence from stakeholders for a UK-wide labour shortage in this occupation. This SOC code also does not rank highly in the shortage indicators and the use of Tier 2 (General) in the past few years has been minimal.

SOC 2211 – Medical practitioners

Summary table: SOC 2211 Medical practitioners	
Employment	
Share of UK employees (%, APS, 2017/18)	0.9%
Share of Tier 2 (% total RCoS Used 2015-2018)	11.8%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	7.1%
Share of employees born outside the EEA (%, APS, 2017/18)	26.2%
Wages	
Median full-time annual wage (ASHE 2018)	£75,855
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	26
Recommendation	
Recommend expanding to include entire occupation	

Stakeholder Evidence

4B.36 A common theme given for the reasons behind shortage in this SOC code and in the wider health sector is seen in the call for evidence responses; a lack of sufficiently qualified applicants due to too few people studying medicine. High vacancy numbers, poor workforce planning and high leaving rates are also often mentioned. Combined with this, increasing demand from a growing and ageing population is creating a widening labour shortage.

4B.37 The British Medical Association (BMA) response stated that fewer people are applying to medical school, this includes both domestic students and international students. From 2013 to 2017 the number of UK applicants for medicine courses has decreased by 15 per cent and EU (excluding UK) applicants has decreased by 13.6 per cent over the same period. They claim that the factors behind this could be the rising costs of medicine courses as well as the medicine profession becoming a less attractive career path as work pressures increase.

4B.38 The BMA welcomes the Government's intention to increase medical school places. However, it can take 10 years from starting a medicine degree to get to a specialised post and so increased applicants will not solve the labour shortage in the short-term.

4B.39 This sentiment is reiterated by the Royal Colleges of Physicians who state that whilst the number of consultants increased by over 70 per cent between 2007 and 2017, the number of advertised consultant posts that were successfully filled in 2007 was 80 per cent whereas in 2017 it was 55 per cent. They suggest adding all physician posts to the SOL for a defined period of time helping stability for NHS recruitment during a potentially turbulent time.

4B.40 The Academy of Medical Royal Colleges and Faculties in Scotland further reiterate the issues with recruitment and retention and highlight the importance of international migration being a part of the solution. They suggest adding roles to the SOL within this SOC such as acute internal medicine, geriatric medicine, old age psychiatry, general psychiatry, psychiatry of learning disability, child and adolescent psychiatry and oral and maxillofacial surgery posts.

4B.41 Psychiatry roles were reported numerous times in the call for evidence responses. The Royal College of Psychiatrists say that 83 per cent of trusts stated they had experienced recruitment difficulties for these types of roles and were forced to advertise posts multiple times to fill roles. In Child and Adolescent Mental Health Services around half of vacancies are unfilled which has meant that in some parts of England up to three quarters of children and young people are denied access to treatment.

Use of the SOL

4B.42 Currently the following roles within this SOC code are on the UK-wide SOL:

- Consultants in the following specialities:
  - Clinical radiology
  - Emergency medicine
  - Old age psychiatry
  - Ct3 trainee and ST4 to ST7 trainee in emergency medicine
  - Core trainee in psychiatry
- Non-consultant, non-training, medical staff posts in following specialities:
  - Emergency medicine (including specialist doctors working in accident and emergency)
  - Old age psychiatry
  - Paediatrics

4B.43 Further the following roles only appear on the Scotland SOL:

- Non-consultant, non-training, medical staff posts in clinical radiology
- CT3 trainee and ST4 to ST7 trainee in clinical radiology
- All grades except CPT1 in psychiatry

- All grades in anaesthetics, paediatrics, obstetrics and gynaecology

Use of Tier 2 (General)

Year	2014	2015	2016	2017	2018
RCoS Used	1,156	1,464	1,893	2,635	3,987*

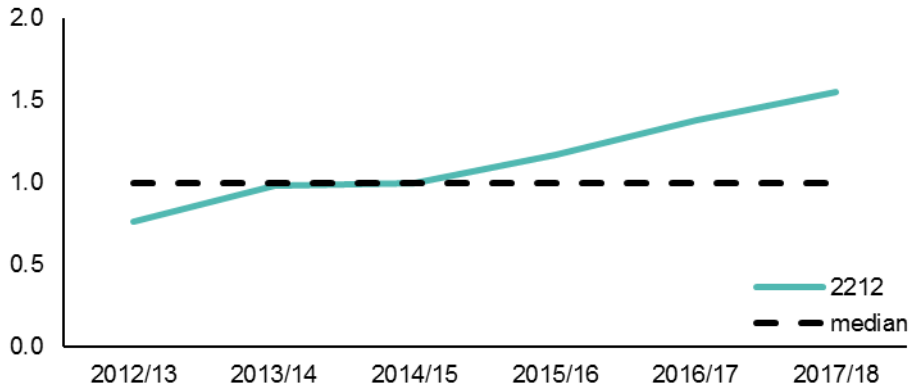
*We include RCoS used even after removal of medical practitioners from the cap.

4B.44 Medical practitioners are currently exempt from the Tier 2 cap.

Recommendation

4B.45 We recommend including SOC code 2211 (medical practitioners) on the SOL as there is sufficient and overwhelming evidence of a UK-wide shortage. This occupation ranks fairly high (26th) in our shortage indicators. We recognise that many of those who responded to the call for evidence admit that migration is not the sole nor the long-term solution to shortages but that in the short-term their inclusion on the SOL can alleviate some difficulties. Clearly there are significant and increasing number of Tier 2 (G) visas being used under this SOC code.

SOC 2212 – Psychologists

Summary table: SOC 2212 Psychologists	
Employment	
Share of UK employees (%, APS, 2017/18)	0.1%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.0%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	3.6%
Share of employees born outside the EEA (%, APS, 2017/18)	5.8%
Wages	
Median full-time annual wage (ASHE 2018)	£41,784
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	34
Recommendation	
Recommend adding this occupation to the SOL	

Stakeholder Evidence

4B.46 DHSC state there is a need for clinical psychologists to go onto the SOL due to limited increases in supply and significant increases in demand as well as high vacancy rates. They highlight the importance of psychologists for the Five Year Forward View for Mental Health[55] which requires greater expansion of psychologists to deliver greater access to psychological healthcare. The response gives the number of vacancies for psychologists over the past two years at 698 in 2016 and 694 in 2017. The number of psychologists in the NHS has remained largely stable since 2009 with an increase of over 700 more psychologists from September 2009 to August 2018. The response from DHSC highlights the use of the Tier 2 (G) system by psychologists being very low over the past few years, roughly ten certificates a year are granted.

4B.47 Other organisations stated that psychologists were in shortage such as the Cambridge University Hospitals NHS Foundation Trust and Aberdeen City

[55] https://www.england.nhs.uk/wp-content/uploads/2016/02/Mental-Health-Taskforce-FYFV-final.pdf

Council said that too much competition from other employers and low number of applicants were reasons for difficulties in recruitment. Both organisations increased spending on recruitment, increased spending on training of existing staff as well as using different labour pools such as temporary or contract workers.

Use of the SOL

4B.48 Psychologists are not currently on the SOL. They were on the SOL between September 2008 and October 2009.

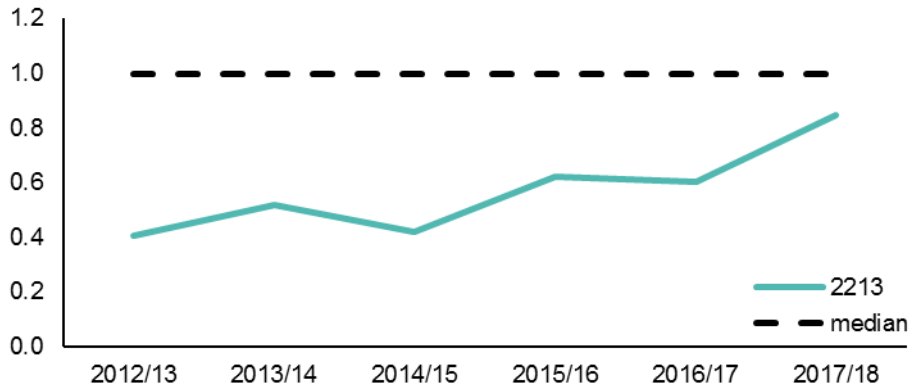
Use of Tier 2 (General)

Year	2014	2015	2016	2017	2018
RCoS Used	6	5	7	7	13

Recommendation

4B.49 We recommend including SOC code 2212 (psychologists) on the SOL. There is considerable evidence amongst the stakeholder responses of a nationwide shortage. In addition, the occupation ranks fairly highly on the shortage indicators (34th) and the vacancy rate has been rising in recent years. On balance, there is sufficient evidence to suggest a nationwide shortage.

SOC 2213 – Pharmacists

Summary table: SOC 2213 Pharmacists	
Employment	
Share of UK employees (%, APS, 2017/18)	0.2%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.5%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	6.2%
Share of employees born outside the EEA (%, APS, 2017/18)	15.6%
Wages	
Median full-time annual wage (ASHE 2018)	£41,002
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	67
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder Evidence

4B.50 Boots UK are looking to recruit different types of pharmacists, including pre-registration pharmacists and experienced pharmacists. They say they are struggling to recruit because of the level of competition and low number of applicants. They also state that the job entails shift work or unsociable hours which is why they are struggling to recruit. To deal with the shortages Boots have increased the number of recruitment resource specialists and invested in attraction methods. They have also been working to advertise roles globally.

4B.51 Boots also suggested that due to the cap binding between late 2017 and the first half of 2018, they did not get any successful CoS sponsorships for pharmacists during this period which further exacerbated shortages.

4B.52 The National Pharmacy Association agree that the long hours including weekends and evenings are making it difficult to recruit pharmacists. They also stress that there is difficulty employing in remote locations where commuting

times are very long. Their members stated they had increased using the Tier 2 visa system which did help to some degree as well as increasing wages and using recruitment websites. They also claim there is a chronic shortage of community pharmacists in Northern Ireland.

4B.53 Many of these concerns are relayed by the Royal Pharmaceutical Society. They especially emphasise the difficulty in recruitment of community pharmacists as the desire to work in the NHS as a hospital pharmacist has increased. Community pharmacists are independent health professionals who provide services for dispensing of prescriptions together with advice on treating common illnesses. They also state there has been a 43 per cent decrease in applications from 2016 to 2018 from EU citizens. Despite many community pharmacies increasing wages they are struggling to attract students outside of cities.

Use of the SOL

4B.54 Pharmacists were put on the SOL in 2008 but were removed in 2011.

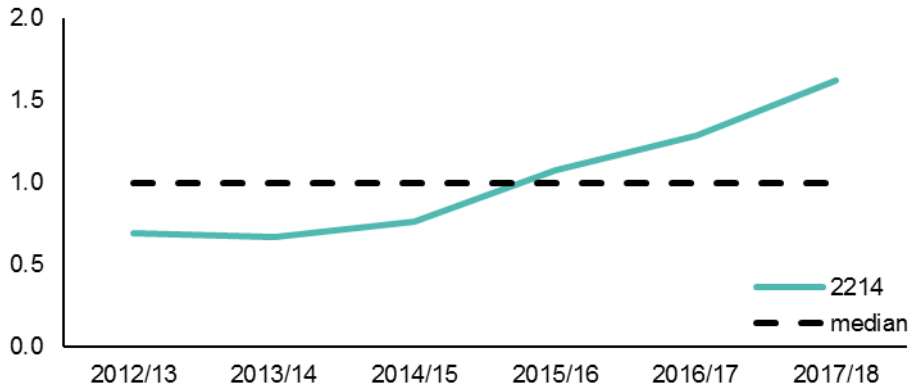
Use of Tier 2 (General)

Year	2014	2015	2016	2017	2018
RCoS Used	56	99	162	79	51

Recommendation

4B.55 We do not recommend including SOC code 2213 (pharmacists) on the SOL, given the low overall rank, falling use of Tier 2 (General) and below average vacancy rate over the past five years. The stakeholder evidence does highlight some difficulties in recruiting pharmacists especially in remote locations. However, on balance there was insufficient stakeholder evidence.

SOC 2214 – Ophthalmic opticians

Summary table: SOC 2214 Ophthalmic opticians	
Employment	
Share of UK employees (%, APS, 2017/18)	0.0%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.1%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	4.4%
Share of employees born outside the EEA (%, APS, 2017/18)	12.9%
Wages	
Median full-time annual wage (ASHE 2018)	£43,396
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	68
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder Evidence

4B.56 Boots state that on average they have ongoing optometrist vacancies of 170 but they are becoming increasingly aware of some vacancies in some areas never being filled and thus relying on locum support.

Use of the SOL

4B.57 Ophthalmic opticians have never featured on the SOL.

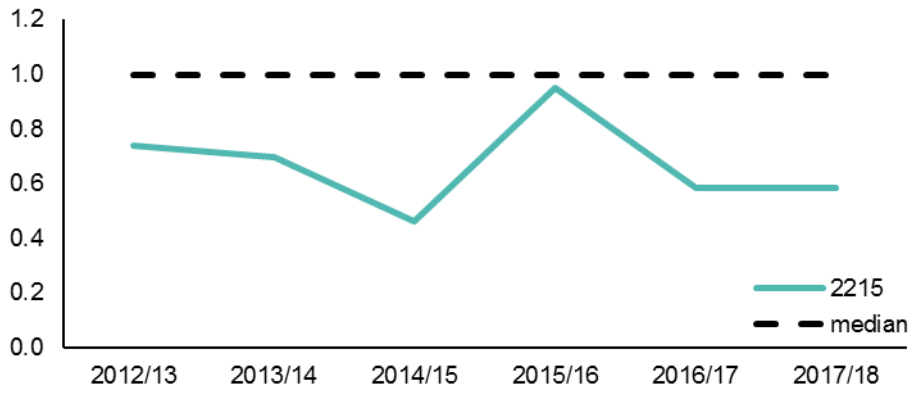
Use of Tier 2 (General)

Year	2014	2015	2016	2017	2018
RCoS Used	13	24	37	24	23

Recommendation

4B.58 We do not recommend including SOC code 2214 (ophthalmic opticians) on the SOL due to insufficient stakeholder evidence that this occupation is in shortage, as well as a low overall ranking in the shortage indicators.

SOC 2215 – Dental practitioners

Summary table: SOC 2215 Dental practitioners	
Employment	
Share of UK employees (%, APS, 2017/18)	0.0%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.1%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	2.4%
Share of employees born outside the EEA (%, APS, 2017/18)	17.1%
Wages	
Median full-time annual wage (ASHE 2018)	x
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	50
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder Evidence

4B.59 The British Dental Association state that many providers of dentistry are having trouble in recruiting. They claim participation rates appear to be dropping in all four countries of the UK and that with an ageing population the need for complex treatments is increasing. A survey of general dental practices found that 63 per cent of dental practices have had trouble recruiting in recent years naming working conditions in the NHS as a reason for this.

4B.60 The Association also tell us that around 16 per cent of dentists qualified in EEA countries. Research undertaken by the General Dental Council suggests that almost a third of EEA registrants are considering leaving the UK in the next five

years. In addition, significant numbers of currently registered dentists are likely to retire over the next few years.

4B.61 They state that there has been difficultly in predicting long-term dental demand and graduate numbers have not kept up with this. There have been plans to alleviate this issue by growing dental care professionals who include dental hygienists and dental therapists, but there is a limit to what could and should be expected from these says the British Dental Association.

Use of the SOL

4B.62 Dental practitioners featured on the UK-wide SOL between 2008 and 2011.

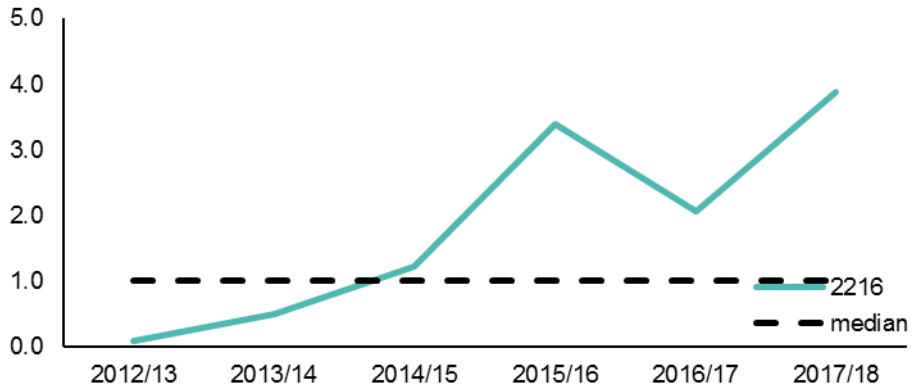
Use of Tier 2 (General)

Year	2014	2015	2016	2017	2018
RCoS Used	6	8	16	31	35

Recommendation

4B.63 We do not recommend including SOC code 2215 (dental practitioners) on the SOL despite the evidence received from stakeholders as the relative vacancy rate is below average and the ranking of the shortage indicators is middle of the range.

SOC 2216 – Veterinarians

Summary table: SOC 2216 Veterinarians	
Employment	
Share of UK employees (%, APS, 2017/18)	0.1%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.2%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	15.7%
Share of employees born outside the EEA (%, APS, 2017/18)	8.7%
Wages	
Median full-time annual wage (ASHE 2018)	£39,190
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	44
Recommendation	
Recommend adding entire occupation to the SOL	

Stakeholder Evidence

4B.64 The British Veterinary Association presented a report conducted by the Veterinary Profession Panel in Spring 2018 which surveyed over 800 vets. They asked questions of all veterinarian employers who had advertised vacancies in the last twelve months and asked how many applications they received for these vacancies. The percentage of advertised vacancies receiving no applications has increased from 1 per cent in 2015 to 5 per cent in 2018. Similar adverts receiving 1-3 applicants has increased from 31 per cent in 2015 to 44 per cent in 2018.

4B.65 The survey also included a question about time taken to fill an advertised role. Those filling roles within a month has fallen from 10 per cent in 2015 to 5 per cent in 2018 and within 1-3 months from 50 per cent to 33 per cent.

4B.66 The top reasons given for obstacles for recruitment from the survey were lack of applications, no suitable applications at CV/application stage and no suitable applications at interview stage.

4B.67 A more recent survey, in Autumn 2018, carried out by the same group asked about the impact of Brexit on the veterinary profession. Many said it had made recruitment harder but there were many respondents who said the recruitment issues within the profession have been going on longer than the Brexit decision and lack of trained veterinarians within the UK is a deeper issue.

4B.68 The Royal College of Veterinary Surgeons and the British Veterinary Association also gave a detailed response to our call for evidence. They explain how the UK has taken steps in recent years to expand capacity within veterinary educations for example, the University of Nottingham officially opened the first purpose-built new veterinarian school in the UK in 50 years in 2007. The University of Surrey started admitting veterinarian students in October 2014.

4B.69 However, they say there are concerns about how quickly the capacity of UK universities could be further expanded at short notice. Increasing capacity takes time, money and personnel and it takes many years to train veterinarians.

4B.70 At one of our regional round table events in Liverpool we heard from a poultry factory who were having difficulties recruiting veterinarians and meat standard checkers to fill posts despite a range of methods used to try and attract candidates.

4B.71 The Food Standards Agency said that in the meat hygiene sector, estimates suggest that 95 per cent of the veterinary workforce graduated overseas, with the clear majority of these coming from the EU. They state that working in UK slaughterhouses is not generally considered attractive to UK citizens qualified as veterinarians. Quality Meat Scotland concur with these sentiments. They state that there is a shortage of people being trained at universities to carry out these roles and those that do veterinary science, do not chose abattoirs for their career route.

Use of the SOL

4B.72 Veterinary surgeons were added onto the SOL in 2008 and removed in 2011. They were originally added onto the SOL due to passing 50 per cent of the shortage indicators and receiving significant evidence of shortage from the Royal College of Veterinary Surgeons. In 2011 the decision to remove this job from the SOL was taken because it was deemed the supply and demand gap had closed and due to the recruitment channel available within the EEA.

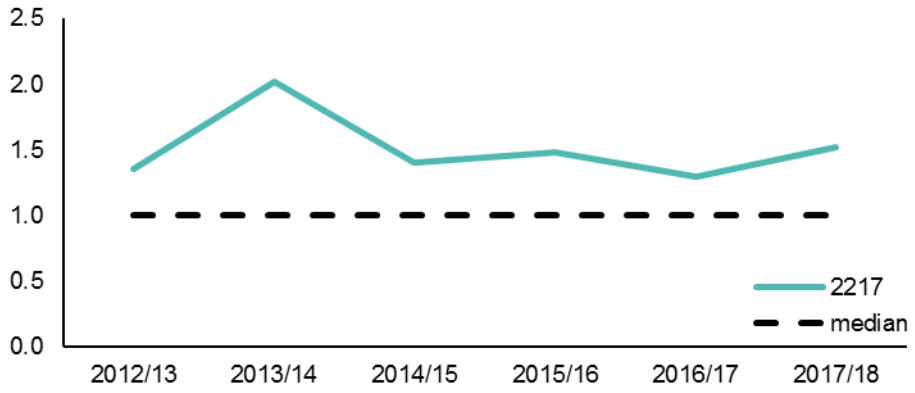
Use of Tier 2 (General)

Year	2014	2015	2016	2017	2018
RCoS Used	12	33	31	35	43

Recommendation

4B.73 We recommend including SOC code 2212 (veterinarians) on the SOL. It is clear from the stakeholder evidence that they are facing significant recruitment difficulties. Furthermore, the SOC code ranks 44th in the shortage indicators which indicates it is in relative shortage compared to other occupations. The vacancy rate has been increasing over recent years, apart from a dip in 2016/17, however, still above average.

SOC 2217 – Medical radiographers

Summary table: SOC 2217 Medical radiographers	
Employment	
Share of UK employees (%, APS, 2017/18)	0.1%
Share of Tier 2 (% total RCoS Used 2015-2018)	1.1%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	3.4%
Share of employees born outside the EEA (%, APS, 2017/18)	8.4%
Wages	
Median full-time annual wage (ASHE 2018)	£35,717
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	41
Recommendation	
Recommend expanding to include entire occupation	

Stakeholder Evidence

4B.74 The response from the Royal College of Radiologists informed us that the UK is currently short of more than 1000 consultant radiologists and this is forecast to increase to 1600 within five years. Demand is growing for these services due to an ageing and increasing population as well as greater emphasis on early diagnosis and screening programmes. They suggest adding an extensive range of job titles from within the SOC code onto the SOL such as medical physicists for imaging, medical oncologists and sonographers.

4B.75 The College or Radiographers conducted a survey of imaging centres across the UK, covering both independent and public sectors. Vacancy rates as percentage of whole time equivalent posts for therapeutic radiographers and diagnostic radiographers were 6 per cent and 9 per cent respectively across the UK. Particularly stark was a vacancy rate of 12 per cent in Northern Ireland of therapeutic radiographers.

4B.76 Many of the respondents said they had increased spending and investment on recruitment as well as using different methods and channels for advertising vacancies. Only some increased wages to attract workers however. As is common to many of the health occupations, many organisations said too much competition and low number of applicants generally were the reasons why it is difficult to recruit radiographers.

Use of the SOL

4B.77 The following job titles under this SOC code have been on the SOL since 2013:

- HPC registered diagnostic radiographer
- Nuclear medicine practitioner
- Radiotherapy physics practitioner
- Radiotherapy physics scientist
- Sonographer

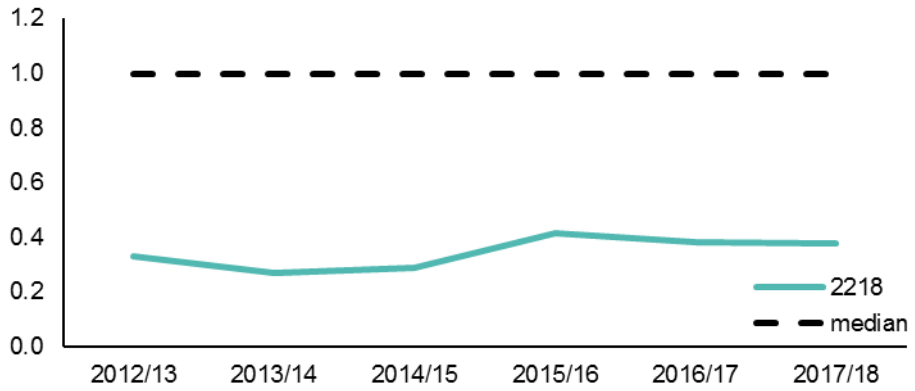
Use of Tier 2 (General)

Year	2014	2015	2016	2017	2018
RCoS Used	108	95	192	251	295

Recommendation

4B.78 We recommend including SOC code 2217 (medical radiographers) on the SOL. This is due to the extensive feedback from stakeholders and clear evidence of recruitment difficulties in this occupation. This, coupled with a clear increase in the use of Tier 2 (General) in the past four years and a relatively high ranking in the shortage indicators suggests there is overwhelming evidence to put this occupation on the SOL.

SOC 2218 – Podiatrists

Summary table: SOC 2218 Podiatrists	
Employment	
Share of UK employees (%, APS, 2017/18)	0.0%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.0%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	1.7%
Share of employees born outside the EEA (%, APS, 2017/18)	9.0%
Wages	
Median full-time annual wage (ASHE 2018)	£35,577
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	88
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder Evidence

4B.79 The four NHS Trusts that reported shortages of podiatrists indicated that they were trying to attract staff through new methods of advertising, using social media and attending events.

4B.80 There are attempts to improve staff retention through offering training and development opportunities to staff. One NHS Trust indicated it was working with the college of Podiatry (COP) and BAPO to undertake marketing of the profession. Another said it was working with university providers to explore apprentice route to grow our own. It was said that agency staff have been used where there was a critical need, but the availability and calibre of these staff has reduced significantly in the last 12 months.

Use of the SOL

4B.81 Podiatrists have never featured on the SOL.

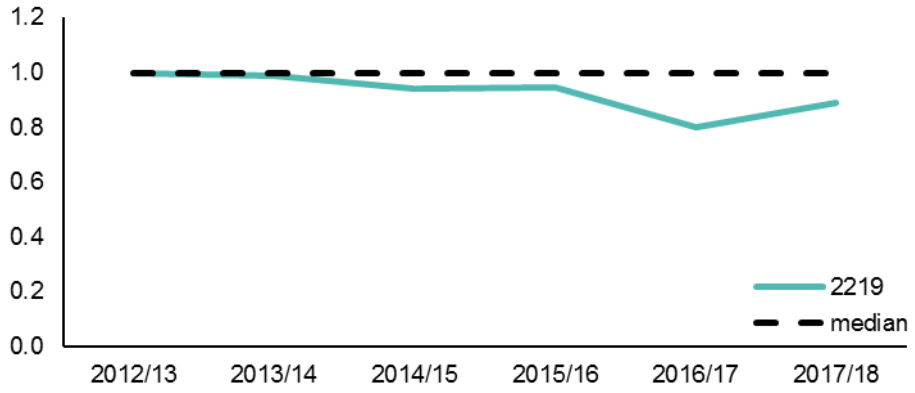
Use of Tier 2 (General)

Year	2014	2015	2016	2017	2018
RCoS Used	0	0	2	0	2

Recommendation

4B.82 We do not recommend including SOC code 2218 (podiatrists) on the SOL. There are a handful of trusts stating they are struggling to recruit but there is no evidence of a nationwide shortage. This occupation is not ranked highly in the shortage indicators, the vacancy rate is below average and the current usage of the Tier 2 (G) is also negligible.

SOC 2219 – Health professionals n.e.c.

Summary table: SOC 2219 Health professionals n.e.c.	
Employment	
Share of UK employees (%, APS, 2017/18)	0.2%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.5%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	4.1%
Share of employees born outside the EEA (%, APS, 2017/18)	9.9%
Wages	
Median full-time annual wage (ASHE 2018)	£35,307
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	44
Recommendation	
Recommend removing from SOL	

Stakeholder Evidence

4B.83 There are a range of job titles highlighted to us under this occupation code. The most common were orthotist/prosthetist and dietician.

4B.84 Livewell Southwest said that for prosthetists and orthotists especially there is a very small pool of qualified staff to draw upon and therefore a limited number of options for improving recruitment. They say they have competitive salaries and advertise via professional body, but these have not been successful in filling vacancies due to the small pool of labour.

Use of the SOL

4B.85 The following job titles under this SOC code have been on the SOL since 2015:

- Neurophysiology healthcare scientist
- Neurophysiology practitioner
- Nuclear medicine scientist
- Orthotist
- Prosthetist

Use of Tier 2 (General)

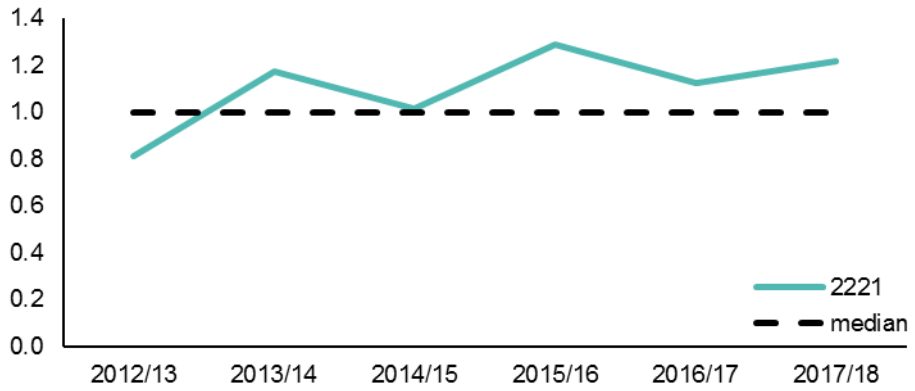
Year	2014	2015	2016	2017	2018
RCoS Used	31	95	132	79	49

4B.86 There was a varied mix of job titles that came under this SOC code using the Tier 2 (G) system in 2018. The most common was paramedic which has its own SOC code. There was a handful of dieticians and orthotists but no evidence of widespread use of the Tier 2 (G) system for these jobs. Similarly, there was a handful of neurophysiology- type roles using Tier 2 (G) but not to a large extent.

Recommendation

4B.87 We do not recommend including SOC code 2219 (health professionals n.e.c) on the SOL. There was limited evidence from stakeholders of a nationwide shortage of dieticians and orthotists. There was almost no indication of continuing recruitment difficulties for the neurophysiology job titles that are currently included on the SOL. The occupation ranks relatively highly in our shortage indicators; however, the vacancy rate has been marginally below average over the last few years. This, combined with decreasing use of Tier 2 (G) in recent years leads us to believe that this occupation should not be put on the SOL and that the job titles currently listed on the SOL should be removed.

SOC 2221 – Physiotherapists

Summary table: SOC 2221 Physiotherapists	
Employment	
Share of UK employees (%, APS, 2017/18)	0.2%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.3%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	4.5%
Share of employees born outside the EEA (%, APS, 2017/18)	10.3%
Wages	
Median full-time annual wage (ASHE 2018)	£31,875
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	62
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder Evidence

4B.88 Many of the respondents said that low number of applicants with the required skills were the reasons for shortage. Many of the responses said it can take many months to fill vacancies for this occupation and that some had used the Tier 2 (G) system in the past to recruit into these roles.

4B.89 The Scottish Government Response for Health and Social Care stated that, "the number of physiotherapists working in NHS Scotland has remained fairly static over the last five years but the demand for this role is increasing dramatically as services are transformed across Scotland."

Use of the SOL

4B.90 Physiotherapists have never appeared on the SOL.

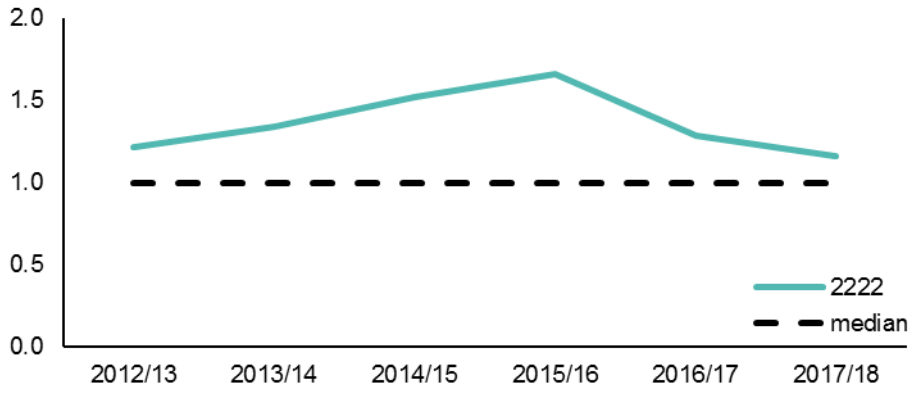
Use of Tier 2 (General)

Year	2014	2015	2016	2017	2018
RCoS Used	23	33	76	47	42

Recommendation

4B.91 We do not recommend including SOC code 2221 (physiotherapists) on the SOL. We did receive some evidence from stakeholders of shortage although this does not appear to be nationwide. The SOC code has a low overall ranking in the shortage indicators, a marginally above average vacancy rate and a declining usage of Tier 2 (G) suggesting there are no nationwide shortages in this occupation.

SOC 2222 – Occupational therapists

Summary table: SOC 2222 Occupational therapists	
Employment	
Share of UK employees (%, APS, 2017/18)	0.2%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.2%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	3.7%
Share of employees born outside the EEA (%, APS, 2017/18)	2.2%
Wages	
Median full-time annual wage (ASHE 2018)	£29,967
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	19
Recommendation	
Recommend adding entire occupation to the SOL	

Stakeholder Evidence

4B.92 Many NHS trusts gave evidence of a shortage of occupational therapists as well as sector representatives.

4B.93 A significant report on the workforce of occupational therapists in London was published in December 2016 by authors at London South Bank University. They carried out an extensive information gathering exercise surveying the London occupational therapy workforce. They presented vacancy rate by different bands which included 20 per cent vacancy rate at Band 6 and 14 per cent at Band 8a.

4B.94 Data from NHS Digital on vacancies in occupational therapy show consistently high levels of vacancies over the past few years. There were 1287 advertised full-time equivalent vacancies between April 2005 and June 2015 which had increased to 1446 between January 2018 and March 2018.

4B.95 These increasing vacancy numbers correspond with our stakeholder evidence who nearly all tell us too much competition for occupational therapists are making it difficult to hire.

Use of the SOL

4B.96 Occupational therapists have never appeared on the SOL.

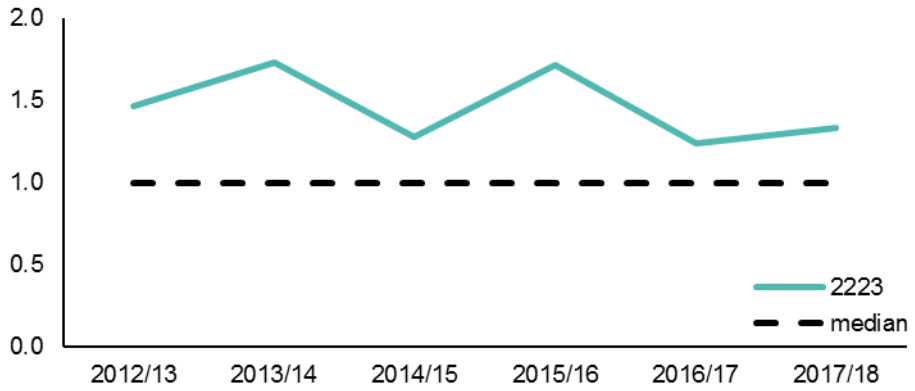
Use of Tier 2 (General)

Year	**2014**	**2015**	**2016**	**2017**	**2018**
RCoS Used	21	25	31	41	19

Recommendation

4B.97 We recommend including SOC code (2222) occupational therapists on the SOL. There is significant stakeholder evidence of recruitment difficulties, including a significant workforce report published by London South Bank University. The occupation ranked 19th in the shortage indicators and the vacancy rate is above average (despite a fall in recent years). Overall, quantitative evidence combined with the significant stakeholder evidence suggest that this occupation should be included on the SOL.

SOC 2223 – Speech and language therapists

Summary table: SOC 2223 Speech and language therapists	
Employment	
Share of UK employees (%, APS, 2017/18)	0.1%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.1%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	5.6%
Share of employees born outside the EEA (%, APS, 2017/18)	9.3%
Wages	
Median full-time annual wage (ASHE 2018)	£28,879
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	14
Recommendation	
Recommend adding entire occupation to the SOL	

Stakeholder Evidence

4B.98 We received information from 12 NHS Trusts and hospitals concerning shortages of speech and language therapists. They indicated that they had tried to widen their recruitment campaigns with limited success. Alternative methods have also been used to encourage applications. It was noted that a number of factors such as holiday allowance, bonuses or financial remuneration were not within their control.

4B.99 DHSC say that speech and language therapists should be added to the SOL because the profession is facing a range of pressures including increasing demand, mental health in particular, and limited education and training course output. They show numbers from NHS Digital which show that the number of speech and language therapists have increased continuously from September 2012. They also show vacancy numbers have fallen from 208 in 2016 to 82 in 2017.

Use of the SOL

4B.100 Speech and language therapists have never appeared on the SOL.

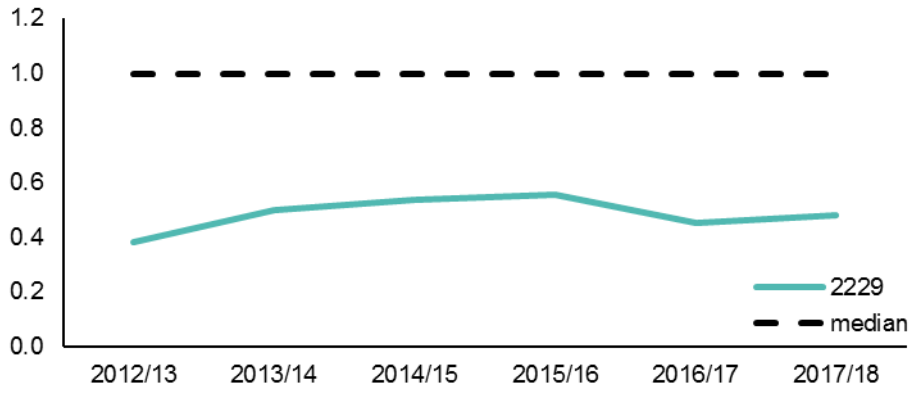
Use of Tier 2 (General)

Year	2014	2015	2016	2017	2018
RCoS Used	7	11	9	19	10

Recommendation

4B.101 We recommend including SOC code 2223 (speech and language therapists) on the SOL. This is because they have a marginally higher than average vacancy rate and rank highly (14th) in the shortage indicators. The Tier 2 (General) usage is low, but we feel the quantitative evidence plus the considerable stakeholder evidence justify the inclusion.

SOC 2229 – Therapy professionals n.e.c.

Summary table: SOC 2229 Therapy professionals n.e.c.	
Employment	
Share of UK employees (%, APS, 2017/18)	0.1%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.1%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	5.3%
Share of employees born outside the EEA (%, APS, 2017/18)	9.8%
Wages	
Median full-time annual wage (ASHE 2018)	£34,507
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	82
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder Evidence

4B.102 Stakeholder evidence indicated that there were low numbers of applicants generally and also low number of applicants with the required skills and qualifications to do the job. To compensate for this, employers are having to use agencies and head hunters to fill vacancies as well as arranging recruitment trips overseas. One Trust indicated they were using alternative recruitment websites to advertise their posts to target overseas candidates rather than just BMJ, Nursing Times or professional journals, as well as attending more Job Fairs and undertaking medical training initiatives with Royal Colleges.

Use of the SOL

4B.103 SOC 2229 has never appeared on the SOL.

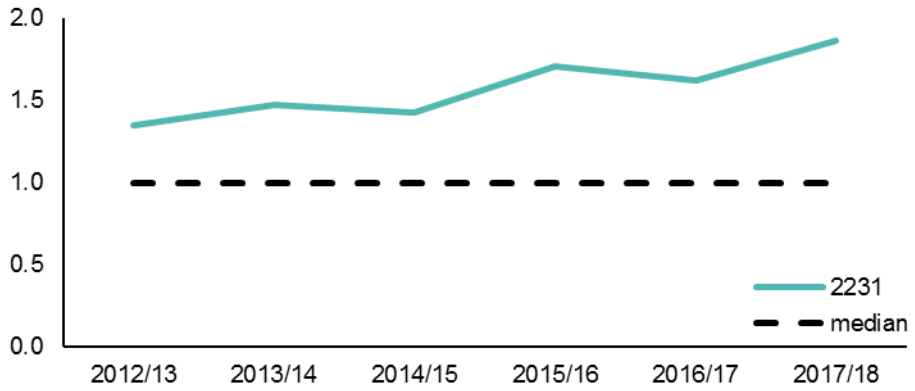
Use of Tier 2 (General)

Year	**2014**	**2015**	**2016**	**2017**	**2018**
RCoS Used	26	14	18	14	8

Recommendation

4B.104 We do not recommend including SOC code 2229 (therapy professionals) on the SOL. This is due to a low overall ranking (82nd) in the shortage indicators, low vacancy rate and limited use of Tier 2 (General). Furthermore, there is limited evidence from stakeholders for a UK-wide labour shortage. Orthotists and prosthetists are discussed in health professionals n.e.c.

SOC 2231 – Nurses

Summary table: SOC 2231 Nurses	
Employment	
Share of UK employees (%, APS, 2017/18)	2.3%
Share of Tier 2 (% total RCoS Used 2015-2018)	13.8%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	4.7%
Share of employees born outside the EEA (%, APS, 2017/18)	19.1%
Wages	
Median full-time annual wage (ASHE 2018)	£32,451
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	47
Recommendation	
Recommend no change to existing SOL eligibility	

Stakeholder Evidence

4B.105 The Royal College of Nursing gave a detailed response about the situation for nurses within the four Nations of the United Kingdom. They provided statistics on the nursing workforce reporting an increase of over 3,000 registered nurses in September 2018 compared to 2017. However, when this is measured by full-time equivalent the latest figures actually show a much smaller increase of just over 1,500. Social care-registered nurse numbers continue to fall, in England there has been an 18 per cent decline since 2012.

4B.106 They attribute these shortages to increasing demand for care, falling student numbers and the collapse of the European nursing supply. They state that in the last 12 months the number of new registered nurses joining the UK workforce from the EEA has fallen by 20 per cent, but also state there has been an increase in non-EEA registered nurses by 47 per cent since 2016.

4B.107 They also mention some policies that national Governments have introduced in order to try and tackle nursing shortages. In England two new routes for nurses have been introduced following the removal of the nursing bursary. These are Nursing Degree Apprenticeships and Nursing Associates. In the 2017/18 academic year there have been only 260 apprenticeships recorded for registered nurse positions. Nursing associates are regulated nursing support roles, with approximately 2,000 pilot positions currently active and a further 5,000 starting in 2018 and 7,500 in 2019. However, both of these routes will take time to increase the registered nursing workforce supply and will take longer than the established three-year degree route.

4B.108 In 2018 the Scottish Government announced plans to increase the bursary for nursing students entering undergraduate courses from £6,578 in 2018 to £8,100 in 2019 and to £10,000 in 2020. The Royal College of Nursing welcomes the overall tone of the Scottish Government on emphasising the importance of EU nursing staff.

4B.109 The Welsh Government has committed to maintaining the bursary for nursing students for 2019/20. They also launched a new recruitment campaign in 2017 to try and increase the number of registered nurses coming to train and work in Wales.

4B.110 In Northern Ireland the number of commissioned pre-registration nursing education places has increased by 40 per cent since 2015/16 however it is too early to evaluate the full impact of these increases upon the size and composition of the nursing working in Northern Ireland.

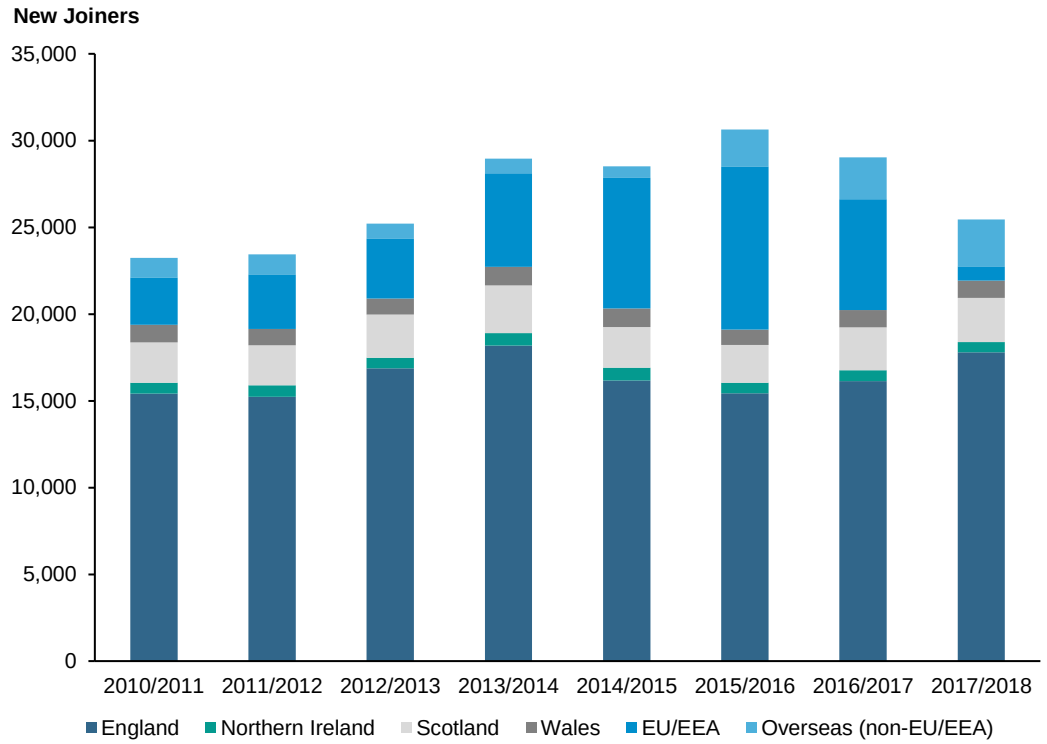
4B.111 The Royal College acknowledge that whilst international recruitment of nurses is vital to the workforce in the short-term, however in the long-term effective workforce planning, training and recruitment needs to improve to solve shortage issues.

4B.112 Scottish Partnership for Palliative Care say that shortages are caused from inadequate UK training numbers, high attrition and the prospect of Brexit given the ease for EEA citizens to currently take up roles in the UK labour market currently and the fear of this arrangement changing. In addition, the Scottish Government Response for Health and Social Care indicated that an ageing population with a significant proportion of the workforce approaching retirement, will inevitably increase turnover, and is expected to exacerbate exiting vacancy issues.

4B.113 Breast Cancer Care share the concerns raised from a number of other stakeholders about the importance of filling nursing shortages. They say the reasons there are shortages in the workforce are due to an ageing workforce, increased demand, bursary cuts effects and career progression prospects not being good.

4B.114 Figure 4.b.8 below shows the numbers of initial registrants to nursing and midwifery by country of initial registration. We can see an increase in EEA nurses in the middle of the period with significant falls from 2015/16. Whilst these numbers have fallen there have been small increases in English and non-EEA initially registered nurses. The number of Northern Irish, Scottish and Welsh nurses have remained fairly stable over the whole period.

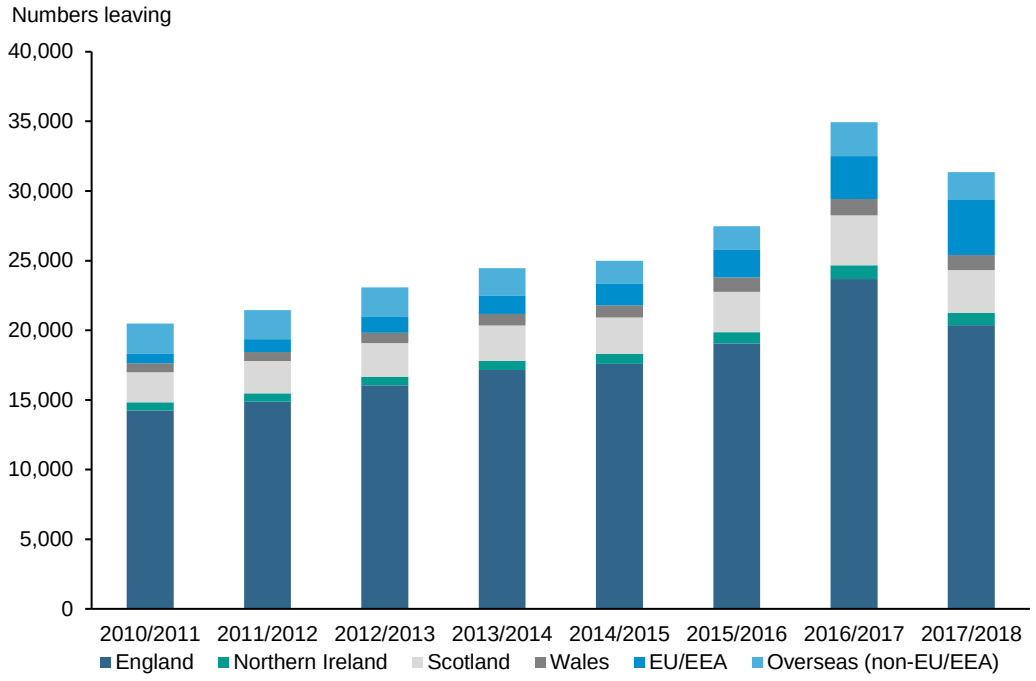
Figure 4.b.8: Nurses and midwives joining the register for the first time by country of initial registration, 2010/11-2017/18



Source: Nursing and Midwifery Council

4B.115 Figure 4.b.9 on the other hand shows the leavers from the register by country of initial registration. What we see is in the 2016/17 year an increase in English and EEA leavers. The number of EEA leavers increased again in the 2017/18 session.

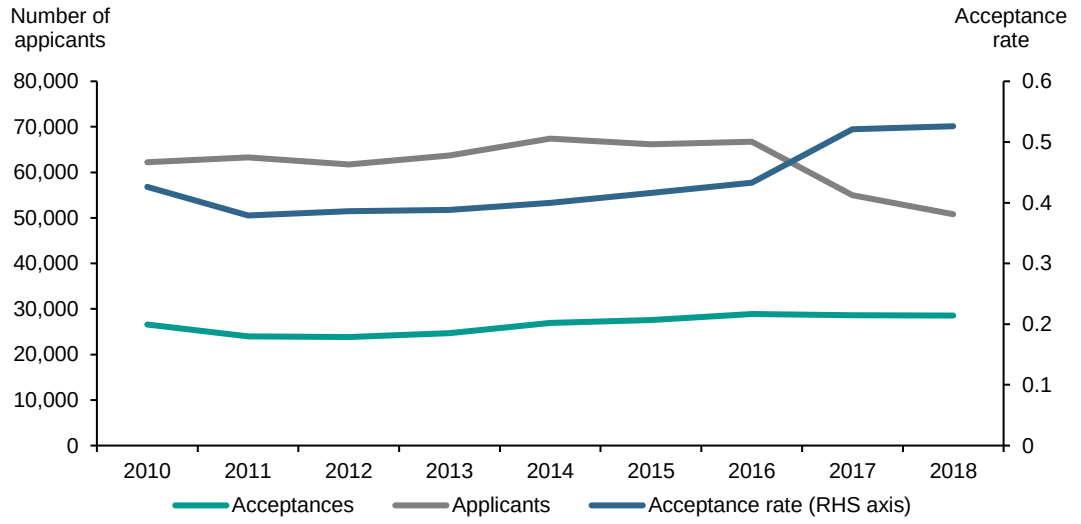
Figure 4.b.9: Nurses and midwives leaving the register by country of initial registration, 2010/11-2017/18



Source: Nursing and Midwifery Council

4B.116 Figure 4.b.10 shows the number of applicants and acceptances to study nursing at university as well as the acceptance rate. We can see that the number of acceptances has remained broadly stable over the period, but the number of applicants has fallen since 2016. The nursing bursary was scrapped in 2017.

Figure 4.b.10: Applicants, acceptances and acceptance rate onto nursing course at university, 2010-2018



Source: UCAS[56]

[56] https://www.ucas.com/file/136531/download?token=A0UpZoEd

Use of the SOL

4B.117 Nurses have been on the SOL since 2013. In 2018 nurses were also removed from the Tier 2 cap. However, employers seeking jobs under this occupation code must still carry out a resident labour market test.

Use of Tier 2 (General)

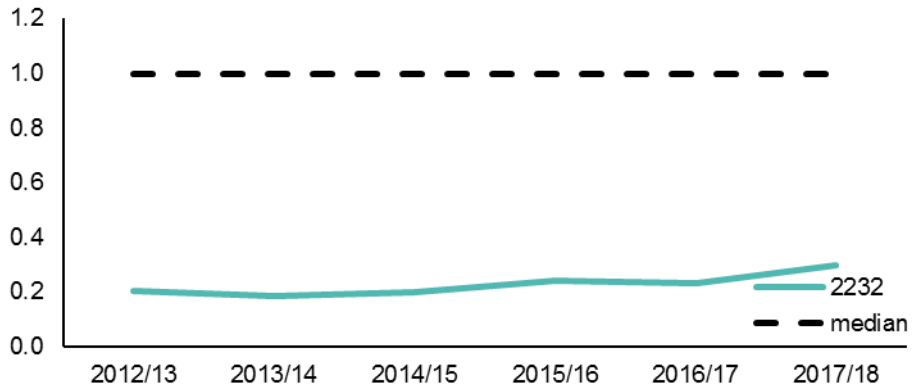
Year	2014	2015	2016	2017	2018
RCoS Used	1,259	1,229	2,204	2,780	5,106*

*We include RCoS used even after removal of medical practitioners from the cap.

Recommendation

4B.118 We recommend including SOC code 2231 (nurses) on the SOL. Nurses are the single largest user of Tier 2 (General). A significant number of stakeholders reported difficulties in the recruitment of nurses. Vacancy rates have been rising, even with increased employment and they ranked relatively highly in the shortage indicators (47th), therefore, we recommend retaining nurses on the SOL. Employers should continue to do the RLMT.

SOC 2232 – Midwives

Summary table: SOC 2232 Midwives	
Employment	
Share of UK employees (%, APS, 2017/18)	0.2%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.0%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	4.8%
Share of employees born outside the EEA (%, APS, 2017/18)	4.9%
Wages	
Median full-time annual wage (ASHE 2018)	£36,685
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	101
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder Evidence

4B.119 The Department of Health and Social Care response recommends that midwives be added onto the SOL. They present data that show the number of qualified registered midwives employed in NHS hospitals in England increased by 12 per cent in the last 9 years. Furthermore, they argue whilst the birth rates have declined in the last few years, women are now giving birth later in life, which is likely to lead to more complicated labour and increased demand for midwives. This view is consistent with evidence presented to us from the Royal College of Paediatrics and Child Health which presents data from NHS Digital showing that the number of birth complications has increased from just over 237,000 in 2012/13 to just over 336,000 in 2016/17.

4B.120 They also present statistics from Health Education England which states there was a 6.1 per cent vacancy rate in 2016 which decreased to 5.1 per cent in 2017 equating to 1213 full-time equivalent vacancies.

4B.121 Data from the Nursing and Midwifery Council[57] show that the number of midwives on the register has increased by 8 per cent between September 2016 and September 2018. There has been an increase in the number of registered nurses and midwives over the same period of 5 per cent from nationals outside the EEA. Whilst there has been a fall in EEA registered nurses and midwives over the same period of 13 per cent.

4B.122 DHSC also say that the Government plans to increase the number of midwifery places at universities by 3000 over the next four years, with 650 available this year.

Use of the SOL

4B.123 Midwives have never been on the SOL.

Use of Tier 2 (General)

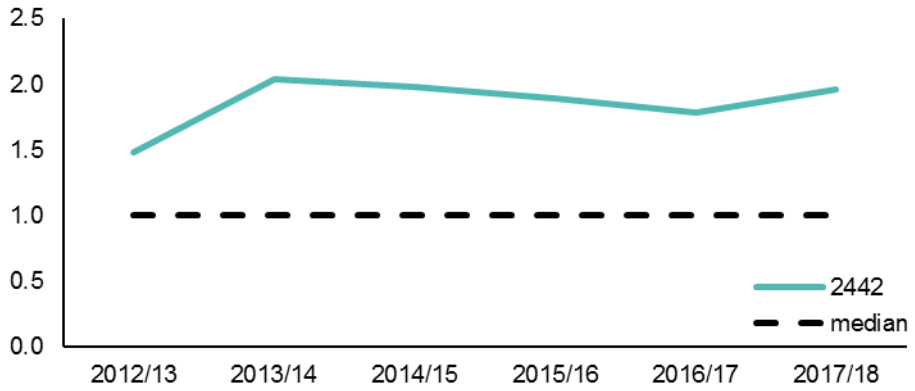
Year	2014	2015	2016	2017	2018
RCoS Used	0	0	0	0	1

Recommendation

4B.124 We do not recommend including SOC code 2232 (midwives) on the SOL. Whilst some stakeholders provided evidence of recruitment difficulties for midwives, very few midwives have been recruited using Tier 2 (General) in the past five years showing almost no use of the current work migration route to employ migrants. Whilst EEA midwives' numbers are decreasing, non-EEA registered midwives are increasing as well as the number of UK midwives. Furthermore, midwives rank as one of the least in shortage (101st) occupations under the shortage indicators. On balance, we do not recommend adding midwives to the SOL.

[57] https://www.nmc.org.uk/about-us/reports-and-accounts/registration-statistics/

SOC 2442 – Social workers

Summary table: SOC 2442 Social workers	
Employment	
Share of UK employees (%, APS, 2017/18)	0.3%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.5%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	2.6%
Share of employees born outside the EEA (%, APS, 2017/18)	14.4%
Wages	
Median full-time annual wage (ASHE 2018)	£34,213
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	87
Recommendation	
Recommend expanding to include entire occupation on the SOL	

Stakeholder Evidence

4B.125 The Department for Education (DfE) replied to the call for evidence arguing that social workers remain on the SOL. They note increasing demands and high turnover rates as reason for shortage in this occupation.

4B.126 DfE present some statistics for the social worker workforce as of September 2017 with a vacancy rate of 17 per cent and a turnover rate (defined as numbers of leavers divided by the number of workers in place at 30 September 2017) was 15 per cent. Vacancy rates were highest in London and the East Midlands and highest in children's social work when compared to adult social work and health and social care.

4B.127 The Department carried out a survey in October and November 2017 of local authorities asking how confident they were that they would have sufficient permanent, well qualified child and family social workers to meet their needs

over the following 12 months with 76 per cent saying they were confident and 25 per cent were not confident of achieving this.

4B.128 They forecast an increase in demand for social workers based on growing number of children in the population over the coming years and generally more children being referred to social services. The number of referrals to children's social care grew by 1.5 per cent between March 2017 and March 2018. The number of children in need increased over the same period by 4 per cent.

4B.129 DfE state that the majority of social workers enter the profession through traditional higher education social work courses. Skills for Care estimate that 89 per cent of social work graduates had found employment 6 months after graduating with a qualification (69 per cent as social workers, 16 per cent in health and social care related roles and 4 per cent in non-social care related roles). This suggests social care remains an attractive profession for students.

4B.130 Skills for Care also show that the number of enrolments to social work courses have remained at a similar level since 2012/13 to what they were in 2016/17[58].

4B.131 It is unclear why, given being a social worker seems to be a popular career choice for those who graduate, why the UK is not getting more people to study this course and therefore enter the workforce.

4B.132 The Government have introduced several initiatives in the last couple of decades to increase recruitment such as social work bursaries and fast-track recruitment. More recently, in 2014, Frontline was introduced as a 2-year, fast track training programme targeted at bringing high performing graduates with leadership potential into child and family social work. The Institute for Apprenticeships have also recently approved the standard and assessment plan for a new graduate apprenticeship in social work with first people to qualify from this route in 2022.

4B.133 Fife Council reported difficulties in recruiting social care workers. They said they have tried several new methods to attract people into the profession such as partnership working with local colleges and schools, partnerships with the Job Centre and social media campaigns. They say they have recently introduced these methods, so it is too early to say how effective they have been.

4B.134 The Scottish Social Services Council estimate the vacancy rate averages 5.7 per cent across all types of practising social workers, and they think the main reason for this is the closure of two undergraduate social work training courses in Scotland leading to falls in the numbers being trained and graduating.

[58] https://www.skillsforcare.org.uk/NMDS-SC-intelligence/Workforce-intelligence/documents/Social-Work-Education-in-England.pdf

4B.135 The Scottish Government response for health and social care said NHS Scotland and social care services are challenged with growing demand resulting from an ageing population, alongside other population health challenges, including an increase in the numbers of young adults living with disabilities.

Use of the SOL

4B.136 Social workers have been on the SOL since 2009.

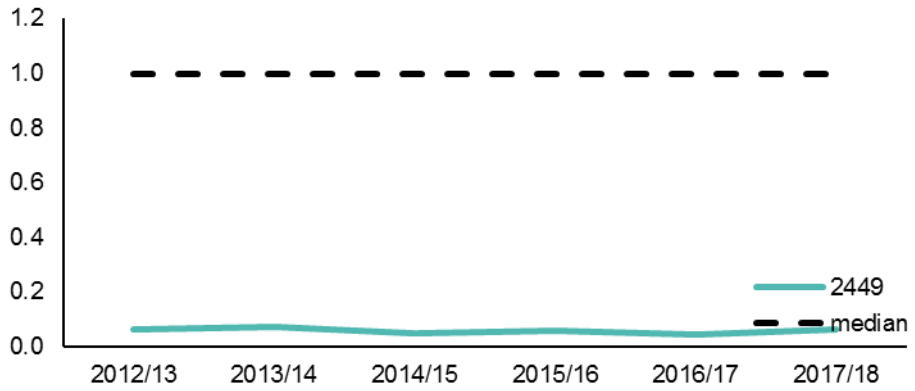
Use of Tier 2 (General)

Year	2014	2015	2016	2017	2018
RCoS Used	68	92	89	101	97

Recommendation

4B.137 We recommend including SOC code 2442 (social workers) on the SOL. The use of Tier 2 (General) has been significant in the past five years. Stakeholder evidence also shows strong evidence for this occupation to remain on the SOL. Although the occupation ranks low (87th) on the shortage indicators, the vacancy rate is above average, and the stakeholder evidence strongly suggests shortage for this occupation.

SOC 2449 – Welfare professionals n.e.c.

Summary table: SOC 2449 Welfare professionals n.e.c.	
Employment	
Share of UK employees (%, APS, 2017/18)	0.1%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.0%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	1.2%
Share of employees born outside the EEA (%, APS, 2017/18)	3.8%
Wages	
Median full-time annual wage (ASHE 2018)	£34,200
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	103
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder Evidence

4B.138 We received no stakeholder evidence relating to this SOC code.

Use of the SOL

4B.139 This occupation has never appeared on the SOL.

Use of Tier 2 (General)

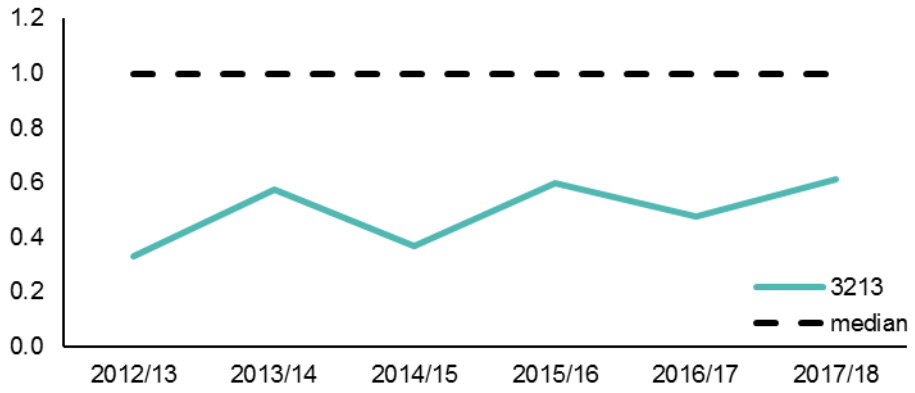
Year	2014	2015	2016	2017	2018
RCoS Used	1	3	4	1	2

Recommendation

4B.140 We do not recommend including SOC code 2449 (welfare professionals n.e.c) on the SOL. There was no stakeholder evidence mentioning this occupation,

the use of Tier 2 (General) is minimal, it ranks as one of the indicators least in shortage (104th) and the vacancy rate is below average.

SOC 3213 – Paramedics

Summary table: SOC 3213 Paramedics	
Employment	
Share of UK employees (%, APS, 2017/18)	0.1%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.9%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	3.4%
Share of employees born outside the EEA (%, APS, 2017/18)	0.0%
Wages	
Median full-time annual wage (ASHE 2018)	£37,880
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	104
Recommendation	
Recommend no change to existing SOL eligibility	

Stakeholder Evidence

4B.141 The North East Ambulance service indicated that they have actively been trying to recruit from UK universities and from the EU, but this has not filled vacancies. They are now applying to become Tier 2 (G) sponsors to recruit migrants from non-EEA countries.

4B.142 The London Ambulance Service NHS Trust also agree that it has been difficult to recruit from other markets and whilst acknowledging that university places for paramedics are increasing, note that these will not be realised until 2021.

4B.143 Only two ambulance trusts reported difficulties in recruiting paramedics, but this is out of only 11 ambulance trusts in England and so a fairly high proportion of

trusts responded with difficulties. Another reason why not many trusts responded may be due to the trusts being more operationally focussed.

4B.144 DHSC also argue that paramedics should remain on the SOL due to a rapid growth in demand for ambulance services, recruitment and retention issues leading to high vacancy rates. They present data from Health Education England showing the vacancy rate to be 9.9 per cent in 2017, a fall from 13.1 per cent in 2016.

Use of the SOL

4B.145 The entire SOC code for paramedics have been on the SOL since 2015.

Use of Tier 2 (General)

Year	2014	2015	2016	2017	2018
RCoS Used	0	31	286	197	149

Recommendation

4B.146 We recommend including SOC code 3213 (paramedics) on the SOL. They remain significant users of Tier 2 (General) despite a decrease in numbers over the past few years. Despite the occupation ranking very low (104th) in our shortage indicators and the below average vacancy rate, we are being more risk averse in this occupation given its importance. We are also aware of the volatility in the shortage indicators and how they can disadvantage public sector jobs in their nature, as discussed in Chapter 2. We acknowledge there is a clear contradiction here between the shortage indicators and the stakeholder evidence and Tier 2 (General) usage and so we need to use wider context and sensible criteria to come to a decision. We believe the current usage and the evidence we received justifies retaining paramedics on the SOL.

4.C. Engineering Occupations

Introduction

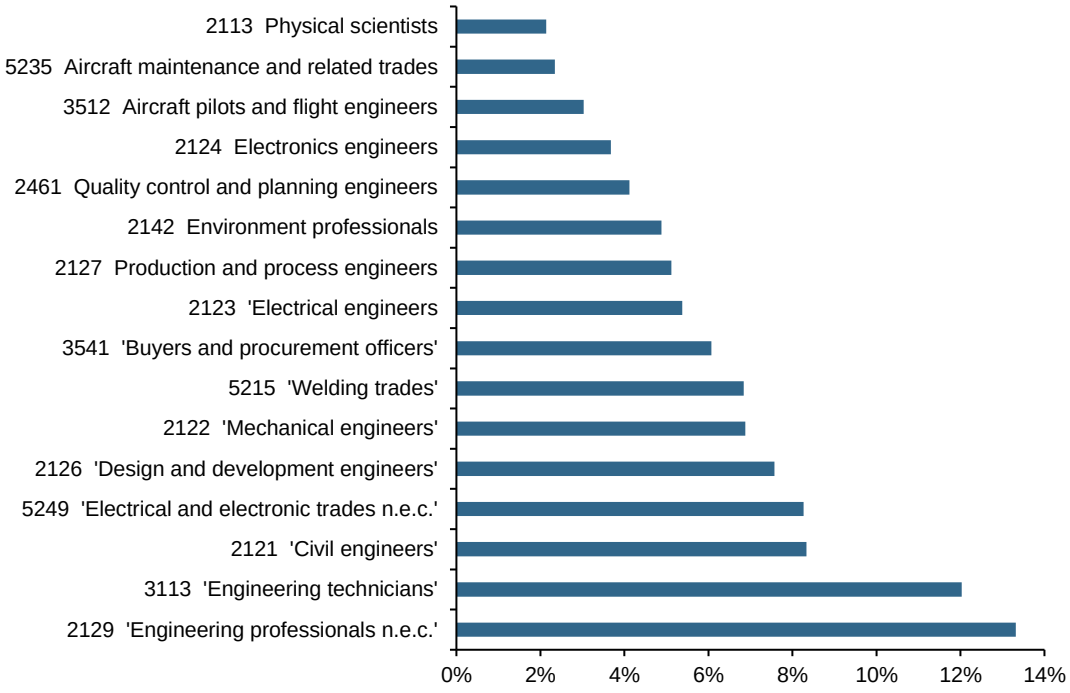
4C.1 There In this section we cover all engineering-related occupations, presenting analysis by SOC code.

Sector overview

4C.2 There are 16 engineer-related SOC codes that are potentially eligible for inclusion on the SOL[59]. Using data from the Annual Population Survey (APS, 2017/18)60 it is possible to paint a general picture of the engineering sector. In this report, we define the engineering sector as the group of the 16 engineer-related SOC codes that we are considering.

4C.3 These 16 SOC codes represent 4.6 per cent of the full-time, working age employees (APS 2017/18). Figure 4.c.1 shows the percentage share of full-time employees in the engineering sector for each of its SOC codes.

Figure 4.c.1: Share of employment in each engineering SOC code as a percentage of total engineering sector, (2017/18)



Source: APS 2017/18

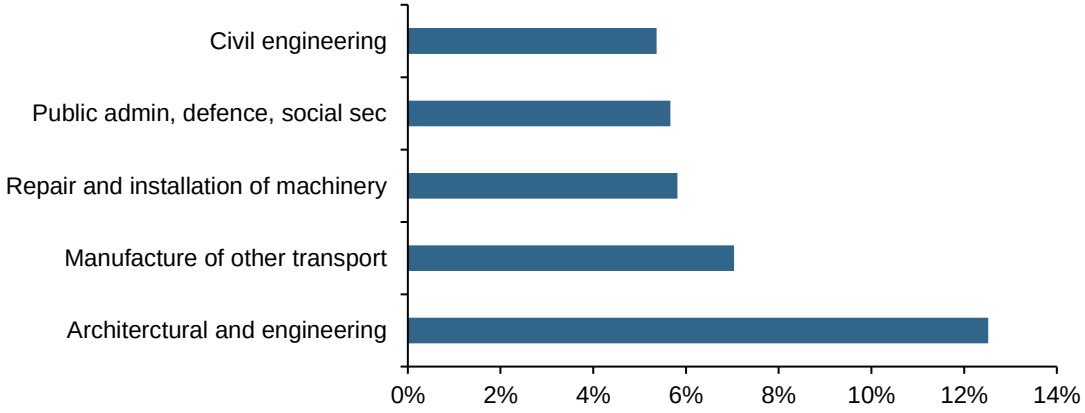
4C.4 Figure 4.c.1 shows SOC 2129, Engineering professionals not elsewhere classified, as being the largest component of the engineering sector, making up 13.3 per cent of the engineering sector. This is unsurprising as this SOC code is a miscellaneous code, intended to classify engineers that do not fit into the other

[59] Two SOCs; 2113 and 2142 are engineering related but are considered for the SOL elsewhere in Chapter 4c – Science professionals.
[60] The APS used ran from October 2017 to September 2018 and is the latest we have available.

SOC codes. The next highest SOC code, 3113; Engineering technicians is similar, being a very general SOC code that would span across industries. Of the more specialised SOC codes, 2121, Civil Engineers makes up the largest proportion of workers in the engineering sector we've defined, with 8.3 per cent of workers in the engineering sector being civil engineers.

4C.5 Figure 4.c.2 shows the top 5 industries that engineers work in, 36 per cent of UK engineers work in these industries. This is compared to just 13 per cent of the UK workforce. What is not shown by the figure is the sheer diversity of industries that engineers work in; out of the 88 industries coded in the APS data, only 2 contained no engineers working in the 16 engineering-related SOC codes that we are considering for the SOL.

Figure 4.c.2: Distribution of engineers by industry, top 5 shown, (2015 - 17)



Source: APS 3-year dataset

4C.6 Using APS (2017/18) data, we are able to paint a more detailed picture of the engineering industry by contextualising it against the regular UK workforce, table 4.c.1 shows a comparison for a selection of labour market statistics.

Table 4.c.1: Comparison between engineering occupations and the UK workforce, (2017/18)

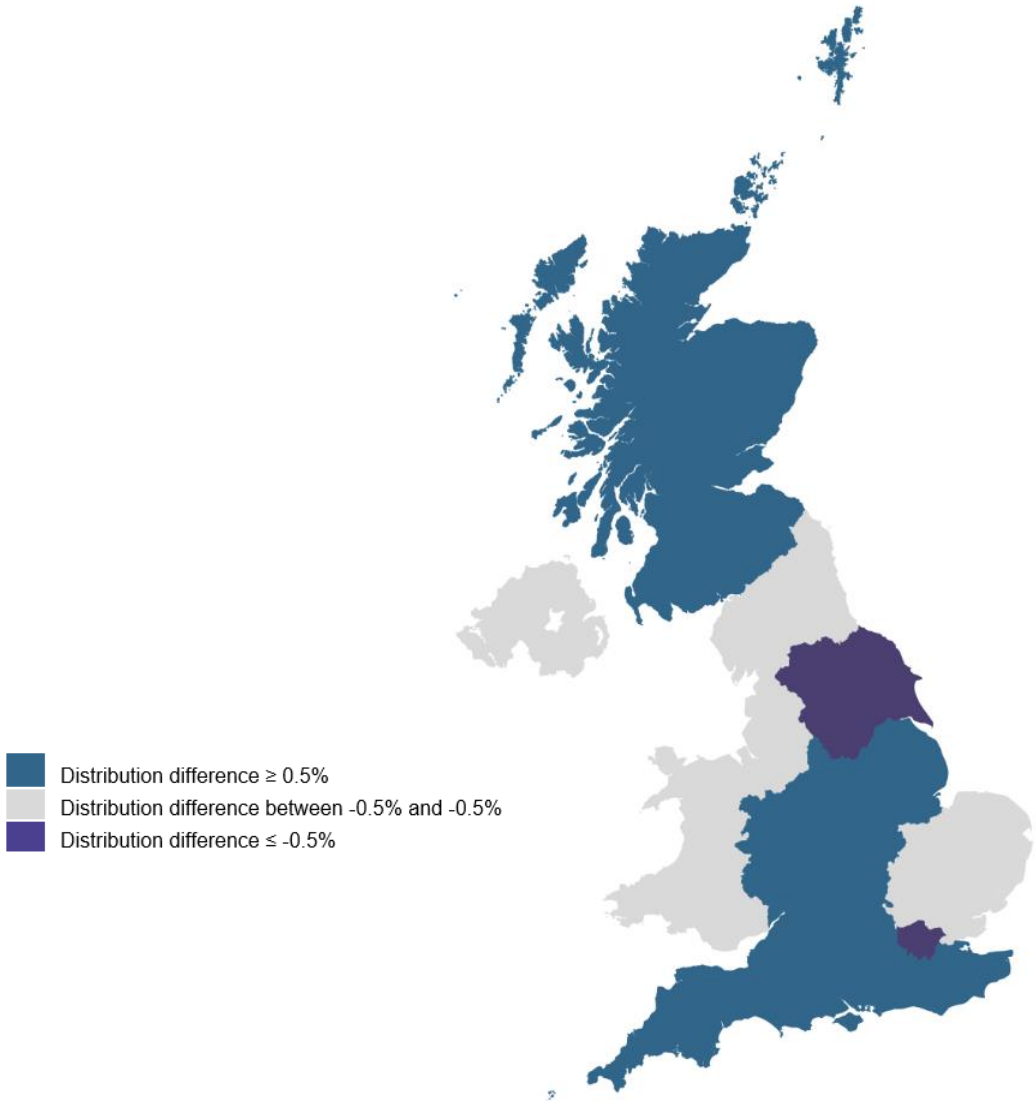
	Engineer occupations	UK workforce
Median annual full-time earnings	£39,431	£29,574
% of employees that are male	87.6%	59.9%
% that had job-related training or education in the last 3 months	28%	27.2%
% that are British	87.9%	85.3%
Median total actual hours, including overtime	40	39

Note: Statistics represent individuals working full-time, (not self-employed) and aged between 16 and 64. Occupations are based off self-reported main job.
Source: APS (2017/18), ASHE (2018)

4C.7 The table above highlights some key differences between engineers and the UK workforce, especially the differences in median earnings and the gender ratio. Engineers earn around 50 per cent more at the median, however nearly 9 in every 10 engineers are male, compared to 6 in every 10 workers in the workforce. Compared to the UK workforce, engineers are more likely to be British and have marginally higher work hours and job-related training.

4C.8 In terms of geographic dispersion Figure 4.c.3 shows the difference in regional distribution of engineers compared the UK workforce. We see a higher density of engineers in Scotland, South East, South West and in the Midlands than the UK workforce distribution. While Yorkshire and the Humber have a slightly lower density of engineers (1 percentage point difference), there appears to be a dearth of engineers within London, with a difference of 6 percentage points versus the UK workforce distribution.

Figure 4.c.3 difference in geographic dispersion between engineering occupations and the UK workforce, (2017/18)



Note: A positive percentage indicates there is a higher proportion of engineers in that region compared to all occupations. For example, 10 per cent of engineers work in Scotland compared to 8 per cent of the UK workforce. Source: APS (2017/18), mapchart.net

4C.9 Figure 4.c.4 below shows that engineers are more likely to work for larger firms. 12 per cent of workers in the engineering sector said that the firm they worked in had between 1-10 people compared to 17 per cent of the UK workforce. This trend continues up to the 250-499 workers per firm category, whereby engineers are more likely to work in these firms than a given worker in all occupations. The gap grows larger for those saying they work in a firm that employs 500 or more workers; 32 per cent of engineers say that they work in such a firm, compared to 24 per cent of UK workers).

Figure 4.c.4: Percentage of respondents reporting the size of the firm they work for[61], (2017/18)

Source: APS (2017/18)

4C.10 Research by the Centre for Economics and Business Research (Cebr, 2015) found that the engineering sector has a strong multiplier effect on the UK economy: For every £1 Gross Value Added (GVA) by the engineering sector, a further £1.45 GVA was generated. For every 1 person employed by the industry, a further 1.7 jobs will be created further down the supply chain. Cebr (2015) estimated that 27 per cent of the UK's GDP in 2015 was generated by the engineering sector.

4C.11 EngineeringUK (2018a)[62], made use of a bespoke extension of Working Futures 2014-2024[63] to calculate the annual shortfall in engineers. Using this data, EngineeringUK (2018a) found that over the next 10 years, on average 93,000 engineers will enter the labour market achieving a Level 3+ engineering-related qualification[64]. This is small compared to the predicted 203,000 core and

[61] Note: Responses saying that they didn't know were excluded.

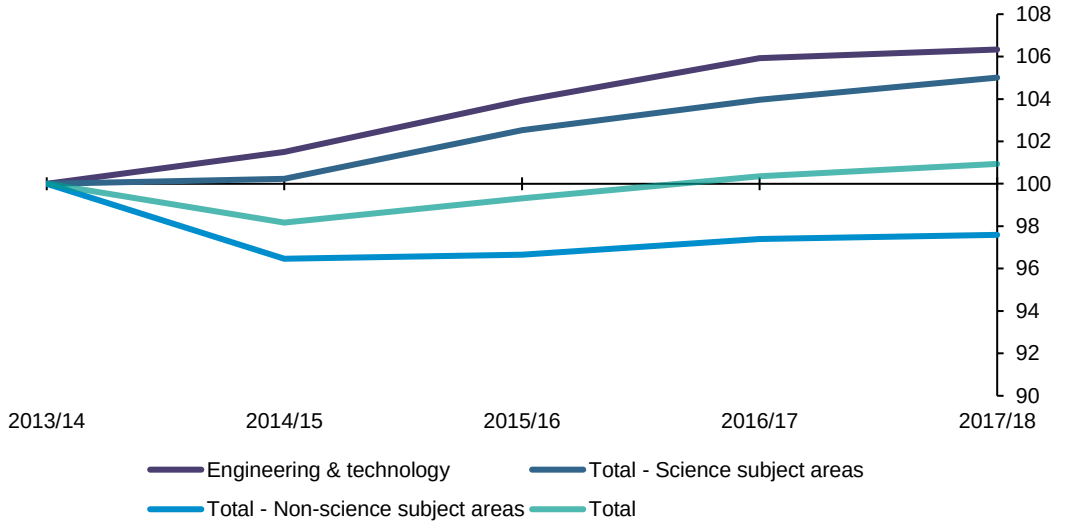
[62] https://www.engineeringuk.com/media/1576/7444_enguk18_synopsis_standalone_aw.pdf

[63] For more information, see: https://assets.publishing.service.gov.uk/Government/uploads/system/uploads/attachment_data/file/514285/Working_Futures_Headline_Report_final_for_web__PG.pdf

[64] This would be equivalent to an A level.

"related"[65] engineering roles educated to Level 3+ that will be required. Overall, EngineeringUK (2018a) estimates that there will be an annual shortfall of up to 110,000 in meeting demand. As part of this, EngineeringUK (2018a) states that there will be an average annual shortfall in engineering graduates of around 22,000.

Figure 4.c.6: Index of higher education enrolments by subject in UK higher education institutions, 2013/14 – 2017/18, (2013/14 = 100)



Source: HESA (2019)[66]

4C.12 The above figure shows that the previously mentioned shortfalls in engineering graduates may ease over time. Compared to the base year of 2013/14, the number of higher education enrolments in engineering and technology has steadily increased over time at a much greater pace than for all subjects or even all science-based subjects. Despite this, even with the 6 per cent increase in engineering and technology enrolments, shortfalls are likely to remain if the demand for engineering graduates also increases. Even if demand for the graduates remained constant, shortfalls may take a number of years to decline as there would be a time lag between an engineering student enrolling at a higher education institution and then graduating and entering the workforce.

4C.13 In addition to this, data from the APS (2015-17) show that only 29 per cent of individuals that studied an engineering-related subject as a first degree at undergraduate level work in a main job that falls into the 16 engineering-related SOCs eligible for the SOL. This highlights that increasing enrolment rates may not necessarily solve any shortfall if a significant proportion of graduates do not become engineering professionals.

4C.14 As a result of these shortfalls, EngineeringUK (2018a) states that engineering graduates find it easier to find full-time employment compared to their

[65] EngineeringUK (2018a) define this as "roles requiring a mixed application of engineering knowledge and skill alongside other skill sets."
[66] https://www.ons.gov.uk/employmentandlabourmarket/peoplenotinwork/unemployment/datasets/vacanciesbyindustryvacs02

contemporaries. Engineering graduates are also higher paid; the average starting salary for an engineering and technology graduate was 18 per cent higher than the average graduates' starting salary 6 months after leaving full-time education.

4C.15 Table 4.c.2 backs this up, highlighting how those that studied Engineering as a first-degree level earned the most 1 year after graduation, behind only Medicine and Dentistry. However, over time, it is overtaken by those that have studied Economics as a first degree with the gap between Engineering and Mathematical sciences narrowing from 1 year to 10 years after graduation. This may adversely affect the decision of potential students to train to become engineers at university.

Table 4.c.2: Total median earnings after graduation, by subject of first degree, 2005/06, 2010/11, 2012/13, 2014/15 (£)

Subject	One year after graduation	Three years after graduation	Five years after graduation	Ten years after graduation
Medicine and dentistry	36,600	43,000	47,100	53,300
Economics	26,000	32,000	40,200	49,800
Engineering	26,500	30,800	34,300	41,200
Mathematical sciences	24,000	28,300	33,900	40,400
Physics and astronomy	24,400	29,800	32,900	39,200
Average	20,800	24,806	27,742	32,052

Source: Graduate outcomes (LEO): Outcomes in 2016-17 (2019)[67]

Why is the sector experiencing shortage?

4C.16 Engineering-related occupations are consistently recommended for inclusion on the SOL in our reports. It is likely that this will be the case for this report. We have sought to understand the underlying structural reasons why there appears to be a perpetual shortage of engineers. We identify four core reasons why shortages appear to arise in this profession, most of which manifest early in the educational pipeline but are still present while individuals are in employment.

Gender disparity

4C.17 EngineeringUK (2018b) published a report[68] that specifically covered this issue. According to the report, only 12 per cent of engineers are female, whereas 47 per cent of the UK workforce are. From GCSE to A-Level, female academic performance exceeds that of their male counterparts in STEM-related subjects. Despite this, female students become less and less likely to be studying STEM-related subjects the higher-up the education levels we look.

[67] https://www.gov.uk/Government/statistics/graduate-outcomes-leo-outcomes-in-2016-to-2017
[68] https://www.engineeringuk.com/media/1691/gender-disparity-in-engineering.pdf

4C.18 Following education, these disparities continue, according to the report; women are less likely to join the engineering profession after completing an engineering and technology-related degree than men are. Pay gaps exist in all but two core engineering SOC groups, however the pay gap is smaller than elsewhere in the economy.

4C.19 Closing the gender gap by employing more women would provide a solution to some of the shortages experienced within the profession, leading to an increase in UK economic growth: According to McKinsey's report[69], it would be possible to add £150 billion to GDP by 2025 if the UK labour market gender gap was closed. As the engineering sector accounts for approximately 27 per cent of UK GDP output (Cebr, 2015)[70], we would expect that an additional £40.65bn could be added to UK GDP if the gender gap in the engineering sector was closed.

Social mobility and engineering.

4C.20 A report[71] by EngineeringUK on this issue highlighted that only 24 per cent of the engineering workforce stems from a low socio-economic background[72]. This stems from poor representation and performance by these groups in the educational pipeline. For instance, only 1 in 10 of engineering and technology graduates come from the lowest POLAR4[73] quintile. Furthermore, those from advantaged socio-economic backgrounds were 4 times more likely to work in an intermediate, professional or managerial role compared to those from a disadvantaged background. These differences persist even when one accounts for educational qualifications attained. This implies that individuals from disadvantaged backgrounds have to overcome more obstacles to progress their career compared to those from more advantaged backgrounds.

4C.21 These socio-economic attainment gaps widened even further especially for Black and Minority Ethnic (BME) individuals. The report states that BME women were 70 per cent more likely to achieve intermediate, professional or managerial roles from the age of 30-39 if they were from a high socio-economic background compared to BME women from a low socio-economic background.

4C.22 Only 10 per cent of first degree undergraduates from POLAR4 quintile 1 (most disadvantaged) studied Engineering and technology according to EngineeringUK (2018c), compared to 12 per cent for all higher education subjects. According to this metric, engineering has social mobility issues at undergraduate level.

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[69] McKinsey and Company. 'The power of parity: advancing women's equality in the United Kingdom,' September 2016.
[70] https://www.engineeringuk.com/media/1323/jan-2015-cebr-the-contribution-of-engineering-to-the-uk-economy-the-multiplier-impacts.pdf
[71] https://www.engineeringuk.com/media/1762/social-mobility-in-engineering.pdf
[72] This was derived by Engineering UK based on an individual's ONS National Statistics Socio-Economic Classification and their parents' occupation.
[73] POLAR stands for: "The participation of local areas", local areas are classified into 5 quintiles based on the proportion of 18 year olds that enter into higher education. See: https://www.officeforstudents.org.uk/data-and-analysis/polar-participation-of-local-areas/

Engineering and technology does perform better than all subjects for postgraduate courses however.

Perception of engineering

4C.23 EngineeringUK runs an 'Engineering Brand Monitor'[74] (2015) which reports on the perception of engineering of a group of students aged 7-19, teachers and the public aged 20+. The findings show that around half of pupils aged 11-16 would consider a career in engineering, but this decreases as the pupils age. Aside from STEM teachers, the public and pupils are more knowledgeable in what technology professionals do than engineering or science professionals.

4C.24 Findings from the Engineering Brand Monitor (2015) show that, while over 60 per cent of people aged 11-19 thought that engineers were well paid, only 20 per cent were able to accurately guess the correct broad salary range that a graduate engineer may expect to earn. Just over half of teachers said that in the past year, at least 1 student aged 14-19 had enquired about a career in engineering. However, while the majority of teachers would recommend a career in engineering, only 37 per cent of all teachers felt confident giving such advice.

4C.25 Again, gender bias is apparent: Male pupils, parents and non-parents are more likely to consider a career in engineering. These gender differences appear at a young age; boys aged 7-11 are more likely to use positive words when describing engineering compared to girls of the same age band. Male teachers are more likely to, and are more confident in giving, engineering career-related advice.

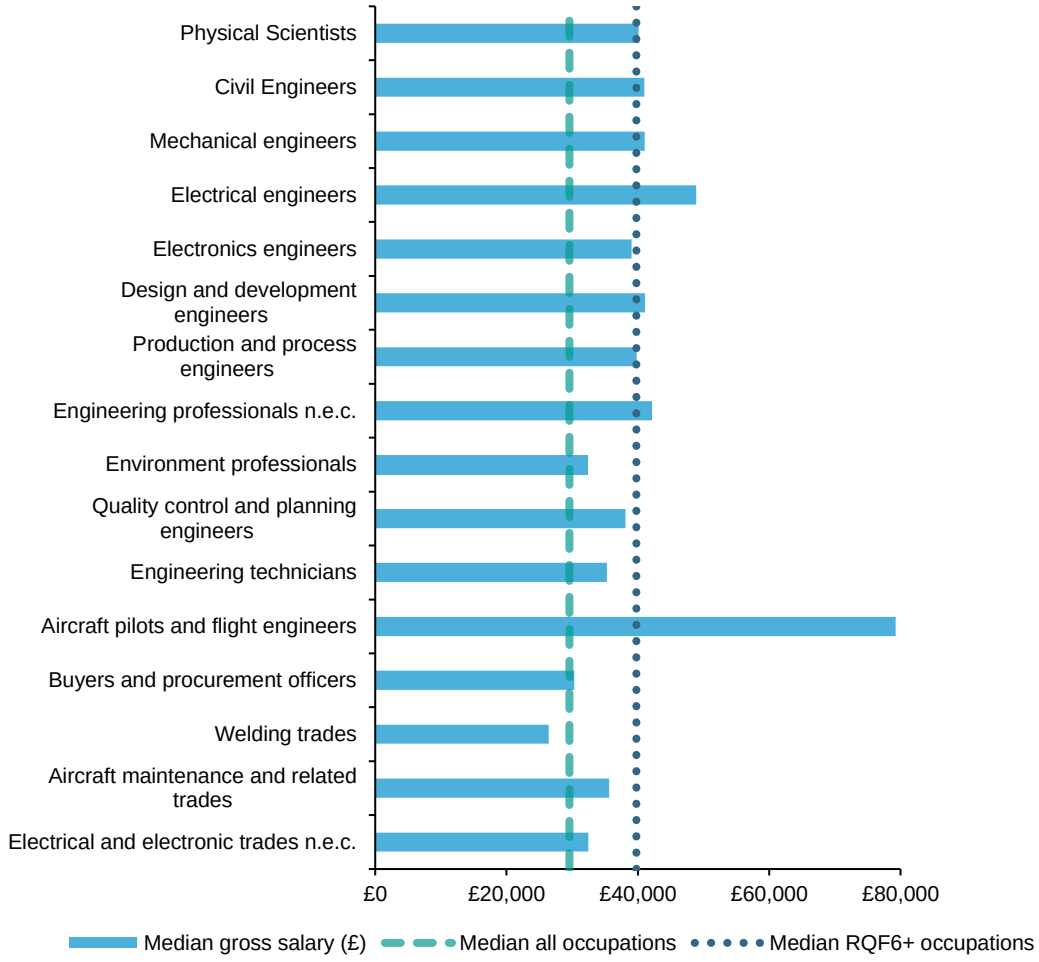
4C.26 Results from the Engineering Brand Monitor (2015) highlight the need to improve information about engineering careers being delivered to individuals at an early stage in their education. In addition to this, the issue of gender bias in this area seems to be rooted deep leading to talented individuals turning away from the profession due to poor support and perceptions. Implementing such policies may be able to alleviate the shortages suffered in the profession.

Engineer's pay

4C.27 While EngineeringUK (2018a) state that graduate engineers are highly paid, the latest ASHE (2018) data hints that engineers are not paid as well relative to rivalrous occupations.

[74] https://www.engineeringuk.com/media/1325/sep-2015-engineers-and-engineering-brand-monitor-2015-1.pdf

Figure 4.c.7: Median full-time annual gross salaries by engineering occupation, (2018)



Source: ASHE (2018)

4C.28 Figure 4.c.7 shows the median gross salary for the engineering occupations compared to the median gross salary for all occupations and the median gross salary for all occupations skilled at RQF6+. The RQF6+ occupations are assumed to be rivalrous occupations as they require the same level of education to be completed as these engineering occupations do.

4C.29 Whilst all engineering occupations shown in figure 4.c.7 enjoy a higher gross salary compared to the average occupation, 8 out of 16 engineering occupations are paid a salary below the RQF6+ average. STEM students may shy away from engineering occupations as they could be earning higher salaries in different jobs. This is backed up by data from the APS (2015-17), showing that, if an individual studied an engineering-related subject as a first degree at undergraduate level they could earn a 9 per cent greater gross weekly pay in their main job if they do not currently work as an engineer[75]. In a sense, potential engineers are not earning as much as they could if they decide to work as

[75] We define 'not working as an engineer' as: An individual's main job is not one of the 16 engineering-related SOCs that is eligible for the SOL.

engineers – financially they are better off switching professions, this may be driving shortages.

Steps being taken to tackle labour shortages

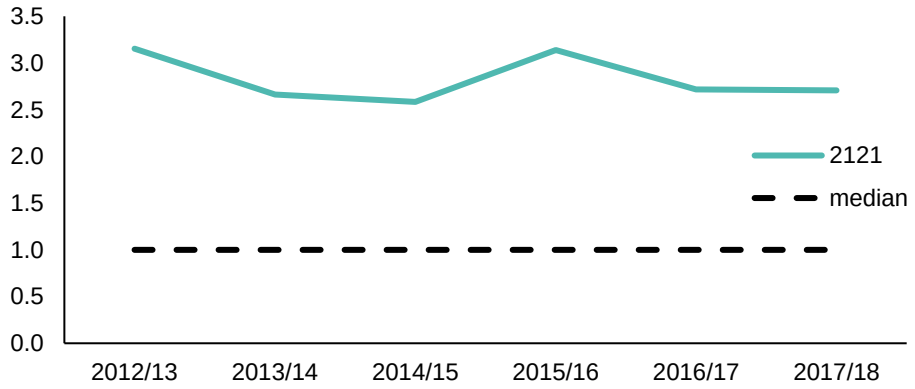
4C.30 In addressing these issues, the Government has recently implemented the Post-16 Skills Plan[76]. The plan targets an increase the number of women starting apprenticeships in male-dominated fields, such as engineering. It also highlighted the need to for the Government to tackle skill-shortages within the economy, particularly in STEM subjects, by encouraging under-represented groups to join the STEM workforce. In November 2017, the Government announced that 2018 would be the Year of Engineering, a flagship announcement of a year-long campaign aimed to inspire and make young people, teachers and parents more aware of what engineers do (GOV.UK, 2017)[77].

4C.31 Further to these plans, the November 2017 Industrial Strategy[78] pledged to invest an additional £406 million in maths, digital and technical education. It is hoped that this will help address the shortage of STEM skills. This is a significant sum: A National Audit Office report on delivering STEM skills for the economy (2018) found that between 2007 and 2017, the UK Government spent around £990 million on initiatives to enhance STEM skills.

[76]https://assets.publishing.service.gov.uk/Government/uploads/system/uploads/attachment_data/file/536043/Post-16_Skills_Plan.pdf
[77] https://www.gov.uk/Government/news/2018-will-be-the-year-of-engineering
[78]https://assets.publishing.service.gov.uk/Government/uploads/system/uploads/attachment_data/file/730048/industrial-strategy-white-paper-web-ready-a4-version.pdf

Occupations under consideration

SOC 2121 – Civil engineers

Summary table: SOC 2121 Civil engineers	
Employment	
Share of UK employees (%, APS, 2017/18)	0.2%
Share of Tier 2 (General) (% total RCoS Used 2015-2018)	0.7%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	7.6%
Share of employees born outside the EEA (%, APS, 2017/18)	7.6%
Wages	
Median full-time annual wage (ASHE 2018)	£41,014
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2 (General))	
	
Shortage indicator rank	
Shortage overall rank /105	69
Recommendation	
Recommend expanding to include entire occupation on the SOL	

Stakeholder evidence

4C.32 Stakeholders told us that the cause of their recruitment difficulties within this occupation was due to a lack of candidates applying for roles. Of those that did apply, many candidates were reported to be lacking the necessary skills to perform the role. The Civil Engineering Contractors Association argue that shortages stem from a historic lack of recruitment and poor perceptions of the industry by school-leavers. This is also being exacerbated by ageing workforce that will be looking to retire in the coming years. The Federation of Piling Specialists suggested that recruitment difficulties were caused by wages not compensating individuals for the work-life balance the job demands. They said that work involved long hours, being away from home and working in adverse weather conditions.

4C.33 Large infrastructural projects stemming from heavy investment in the rail industry has also contributed to shortages, according to NSAR Ltd. The Department for

Business, Energy and Industrial Strategy (BEIS) informed us that demand for civil engineers has increased recently due to the Nuclear New Build project.

4C.34 Evidence from our online form indicates that the respondent businesses are attempting to upskill their current staff and are using different channels to advertise vacancies to cope with recruitment difficulties. Many businesses appear to also be using temporary/contract workers to deal with the problem. Aside from this, stakeholders told us that they are actively increasing working benefits such as increasing holiday entitlement and maternity pay. Various efforts are also being made to encourage graduates and apprentices to join. The Civil Engineering Contractors Association told us that they are actively engaging with schools to encourage young people to join the sector. Work has also been done to make the recruitment and career progression process clearer under the Construction Sector Deal.

4C.35 Overall, these measures are reported to have worked in mitigating recruitment difficulties, however their impact is small in scale, stakeholders told us that a concerted, industry-wide effort is required to truly deal with the shortages.

4C.36 These recruitment difficulties are reported to be impacting business targets, meaning firms are unable to meet customer demand and are struggling to build their business within the UK. Current workers are having to cover for vacancies, this is increasing workloads and stress.

Use of the SOL

4C.37 SOC 2121 has been on the SOL since 2011. Job titles from the electricity generation and the mining industries had appeared on the SOL however were removed in 2011 and 2013, respectively.

Use of Tier 2 (General)

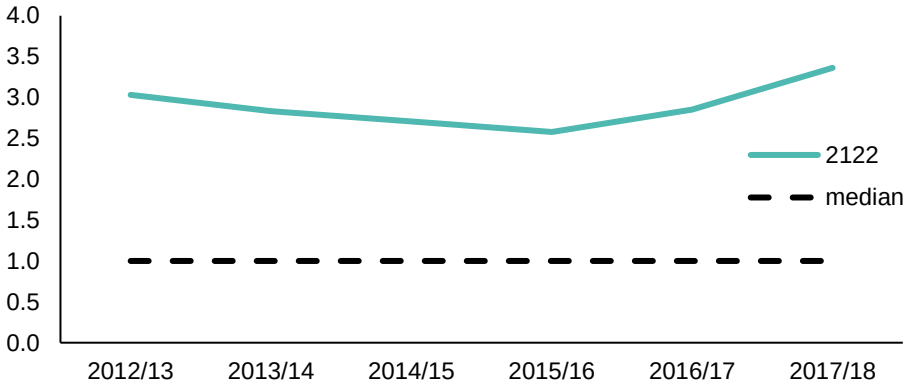
Year	2014	2015	2016	2017	2018
RCoS Used	169	152	127	102	98

4C.38 The table above shows the number of individuals receiving CoS working for a job title under SOC 2121 has declined from 2014. Despite this, the share of use of Tier 2 (General) for this SOC is greater than its share of UK employment, suggesting that using Tier 2 (General) to fill roles is a popular strategy for employers of this SOC code, but perhaps decreasingly so.

Recommendation

4C.39 We recommend including SOC code 2121 (civil engineers) on the SOL. The occupation ranks relatively low (69th) in the shortage indicators but the vacancy rate data is above average suggesting that there is at least some degree of shortage in SOC 2121. This, alongside the stakeholder evidence and the relatively high usage of Tier 2 (General) suggests shortage in this occupation.

SOC 2122 – Mechanical Engineers

Summary table: SOC 2122 Mechanical engineers	
Employment	
Share of UK employees (%, APS, 2017/18)	0.2%
Share of Tier 2 (General) (% total RCoS Used 2015-2018)	0.3%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	6.1%
Share of employees born outside the EEA (%, APS, 2017/18)	10.3%
Wages	
Median full-time annual wage (ASHE 2018)	£41,042
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2 (General))	
	
Shortage indicator rank	
Shortage overall rank /105	24
Recommendation	
Recommend expanding to include entire occupation on the SOL	

Stakeholder evidence

4C.40 In responses to our call for evidence online form, we were told that business had difficulty recruiting job titles within SOC 2122. Most of the job titles mentioned were mechanical engineers and service engineers.

4C.41 Stakeholders told us that a low number of applicants with the required skills were driving these shortages, because of this, many stakeholders told us that they were having to compete with other businesses to attract workers. Unsociable hours and/or shift work were also contributory factors in reported shortages for the service engineers. Engineering UK and the Engineering council also point to the stagnating number of STEM specialist teachers which is leading to a low number of potential workers coming through the UK educational pipeline.

4C.42 Responding to these shortages, employers told us they have increased their wages and have invested in their recruitment methods. Many stakeholders are also using different methods of advertising for vacancies. Some stakeholders are also attempting to upskill current staff to fill these roles and improving working conditions to attract external workers. These methods include offering improved

maternity pay and flexible working arrangements. One stakeholder told us that they were working on their branding and marketing, hoping that this would attract more people into the profession.

4C.43 The institute of engineering and technology also told us that they were working on supporting current engineers, giving them access to knowledge resources and allowing their members to develop their careers, they also work with schools to attempt to attract young people into the profession

4C.44 We have been told that the impact of these shortages has caused stakeholders to turn down work from clients and delay projects. The shortages have also increased workloads and pressure on current workers.

Use of the SOL

4C.45 SOC 2122 has been on the SOL since 2011. Job titles from the electricity generation and the aerospace industries were removed in 2011 and 2013, respectively.

Use of Tier 2 (General)

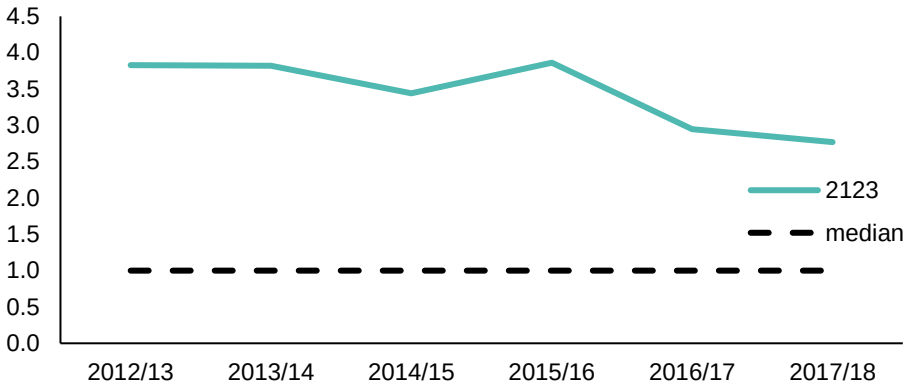
Year	2014	2015	2016	2017	2018
RCoS Used	144	63	46	48	50

4C.46 The table above shows the number of individuals receiving CoS working for a job title under SOC 2122 has declined sharply from 2014. A few stakeholders provided evidence that they were still using Tier 2 (General) to fill vacancies within SOC 2122.

Recommendation

4C.47 We recommend including SOC code 2122 (mechanical engineers) on the SOL. The occupation ranked fairly high in the shortage indicators (24th); the vacancy rate has been consistently above average; however, the use of Tier 2 (General) declined since 2014 but has been relatively constant since. Stakeholders also reported recruitment difficulties and a number of them are launching various schemes to tackle shortages. Some stakeholders reported that the shortages stemmed from a lack of women and BAME students opting for engineering and technology-based careers. Representative bodies have also identified these problems and are setting up various initiatives as part of a long-term solution. Given the available evidence, we recommend retaining the entire occupation on the SOL.

SOC 2123 – Electrical Engineers

Summary table: SOC 2123 Electrical engineers	
Employment	
Share of UK employees (%, APS, 2017/18)	0.2%
Share of Tier 2 (General) (% total RCoS Used 2015-2018)	0.3%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	3.8%
Share of employees born outside the EEA (%, APS, 2017/18)	7.0%
Wages	
Median full-time annual wage (ASHE 2018)	£48,893
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2 (General))	
	
Shortage indicator rank	
Shortage overall rank /105	3
Recommendation	
Recommend expanding to include entire occupation on the SOL	

Stakeholder evidence

4C.48 In responses to our call for evidence online form, we were told that business had difficulty recruiting for job titles within SOC 2123. Most of the job titles mentioned were electrical engineers with other miscellaneous job titles related to electrical engineers.

4C.49 Stakeholders said that a low number of applicants with the required skills were driving these shortages, some employers told us that they were having to compete with other businesses to attract workers. Stakeholders also told us that the historical lack of investment in skills coincided with an ageing workforce and investment into digital and infrastructural projects; shifting the demand for skills within the workforce. In the educational pipeline, a lack of diversity and inclusion initiatives and a failure to promote STEM-related career paths is reducing the number of potential workers. Energy & Utility told us that the devolved nature of the utility sector makes it difficult to build a resilient workforce.

4C.50 In managing these shortages, stakeholders have told us that they are increasing wages, upskilling the current workforce, investing in their recruitment channels through the establishment of talent acquisition teams and looking at sourcing

from different labour pools, such as job sharing or contract workers. Some stakeholders are also looking to bring in more apprentices to mitigate shortages.

4C.51 Energy & Utility Skills told us that they had helped launch a Talent Source Network, which encourages employers to work together to compete for skilled and diverse talent, this generated 5,900 job applications.

4C.52 These measures are reported to be working, however nearly all stakeholders said that these were not solving the sector-wide issues that were still present and driving shortages.

> *Only a concerted, industry-wide focus will be the only way to increase the labour pool in the way that it is required"*
>
> BuroHappold Engineering response to MAC call for evidence

4C.53 Stakeholders told us that the impact of these shortages have resulted in turning down work from clients and delaying projects; shortages have also increased workloads and pressure on current workers. One stakeholder within the utility sector told us that the impact of shortages has been minimal so far as they are able to use the SOL to continue to bring in migrant workers.

Use of the SOL

4C.54 SOC 2123 has been on the SOL since 2011. Some job titles from the electricity transmission and distribution industry were removed in 2011.

Use of Tier 2 (General)

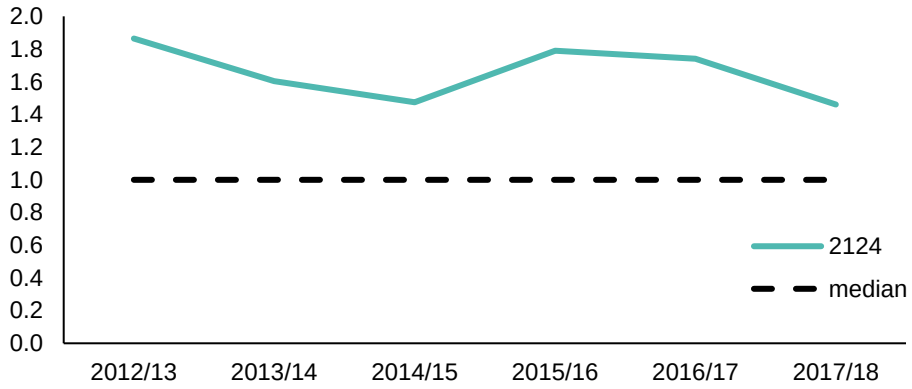
Year	2014	2015	2016	2017	2018
RCoS Used	98	69	67	54	57

4C.55 The table above shows the number of individuals receiving CoS working for a job title under SOC 2123 has been trending downward from 2014. Despite this, stakeholders provided evidence that they were still using Tier 2 (G) to fill vacancies for a variety of roles within SOC 2123.

Recommendation

4C.56 We recommend including the entire SOC code 2123 (electrical engineers) on the SOL. The occupation ranked very highly in our shortage indicators (3rd); had a vacancy rate consistently above average; however, the use of Tier 2 (G) has been trending downwards since 2014. Stakeholders also provided evidence of recruitment difficulties for several job titles spanning many industries. Some stakeholders are launching various schemes aimed to tackle shortages, however, shortages are often underpinned by sector-wide issue and any firm-level effort is likely to have limited impact. Given this, we recommend including the entire occupation on the SOL.

SOC 2124 – Electronics Engineers

Summary table: SOC 2124 Electronics engineers	
Employment	
Share of UK employees (%, APS, 2017/18)	0.1%
Share of Tier 2 (General) (% total RCoS Used 2015-2018)	0.4%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	6.0%
Share of employees born outside the EEA (%, APS, 2017/18)	14.9%
Wages	
Median full-time annual wage (ASHE 2018)	£39,047
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2 (General))	
	
Shortage indicator rank	
Shortage overall rank /105	8
Recommendation	
Recommend expanding to include entire occupation on the SOL	

Stakeholder evidence

4C.57 We were informed about the lack of individuals with the required skills and qualifications within the UK and the level of competition for those workers, these were the reasons given for why stakeholders had difficulty recruiting. We were we also told by representative bodies that there was a lack of women and BAME individuals entering an engineering and technology-based career, this is similar to what we were told elsewhere and seems to be a general problem with the engineering profession as a whole. A representative from the motor manufacturing industry also told us that some skills they required to fill vacancies could not be found in the UK.

4C.58 To compensate for shortages companies indicated a variety of methods to recruit including using contractors whilst they recruited for permanent staff. It was said that internal recruitment has increased in recent years due to shortages of external candidates with the right skills. One global organisation indicated it recruited heavily from Europe. Companies and sector bodies told us that they undertake a range of campaigns to increase awareness of engineering as a career opportunity.

4C.59 Stakeholders told us that while they continue to invest heavily into recruitment campaigns, they continue to experience difficulties which is impacting their ability to remain competitive. Awareness campaigns, while reportedly effective, are costly for businesses to maintain.

Use of the SOL

4C.60 SOC 2124 has been partially on the SOL since 2013.

Use of Tier 2 (General)

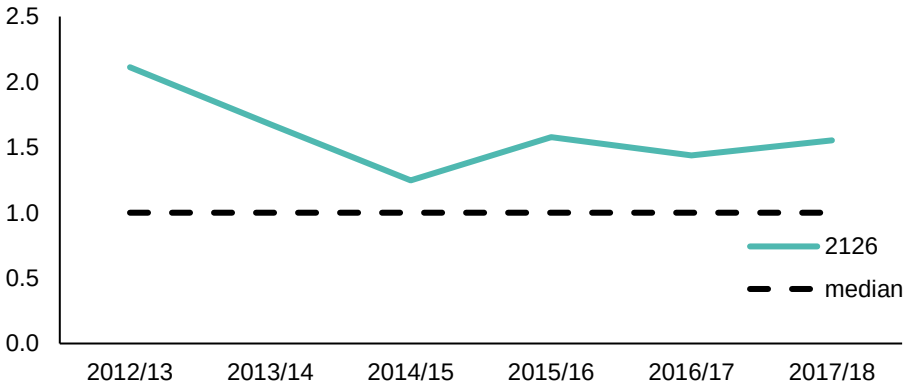
Year	2014	2015	2016	2017	2018
RCoS Used	57	108	71	77	61

4C.61 The table above shows the number of individuals receiving CoS working for a job title under SOC 2124 has hit a downward trend from 2015. Despite this, the share of use of Tier 2 (G) for this SOC is greater than its share of UK employment, suggesting that using Tier 2 (G) to fill roles is a popular strategy for employers of this SOC code, but perhaps decreasingly so.

Recommendation

4C.62 We recommend including the entire SOC code 2124 (electronics engineers) on the SOL. The occupation ranked very highly in our shortage indicators (8th); the vacancy rate is above average, although not as high as those experienced by other engineering occupations; and the use of Tier 2 (General) has been moderate. The evidence from stakeholders appears to show that too few people are deciding to take an engineering-related career, while representative bodies are aiming to tackle this, it is a costly endeavour for firms to undertake, particularly for SMEs. Some stakeholders said that there were no UK-based workers with the required skills needed to fill some vacancies. Given this, we recommend including the entire occupation on the SOL.

SOC 2126 – Design and Development Engineers

Summary table: SOC 2126 Design and development engineers	
Employment	
Share of UK employees (%, APS, 2017/18)	0.2%
Share of Tier 2 (General) (% total RCoS Used 2015-2018)	1.9%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	8.4%
Share of employees born outside the EEA (%, APS, 2017/18)	9.1%
Wages	
Median full-time annual wage (ASHE 2018)	£41,071
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2 (General))	
	
Shortage indicator rank	
Shortage overall rank /105	39
Recommendation	
Recommend expanding to include entire occupation on the SOL	

Stakeholder evidence

4C.63 In our call for evidence online forms, we were told that business had difficulty recruiting a wide variety of job titles within SOC 2126.

4C.64 We were told that recruitment difficulties have stemmed from a low number of applicants for vacancies applying with the required qualifications or skills, this was leading to competition between businesses to attract candidates. In addition to this, we were told by representative bodies that few young people choose engineering and technology-based careers. This is in tandem with an ageing and increasingly retiring workforce, especially in the railway industry. We were also told that a lack of diversity and inclusion initiatives were inhibiting new entrants from becoming engineers.

4C.65 Companies indicated they paid competitive wages to recruit externally promoted within their current workforce in order to combat recruitment difficulties. Organisations worked with schools on STEM subjects to try to encourage and increase interest in these areas in order to increase the potential talent pool.

4C.66 We have received mixed evidence regarding the efficacy of these strategies in reducing recruitment difficulties. While measures taken by companies have reported to have helped, shortages remain.

Use of the SOL

4C.67 SOC 2126 has been on the SOL since 2011. Simulation development engineers were removed in 2013.

Use of Tier 2 (General)

Year	2014	2015	2016	2017	2018
RCoS Used	259	277	318	383	429

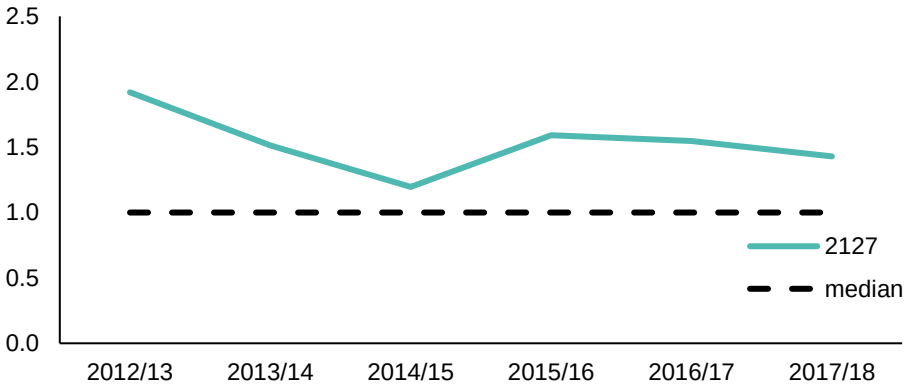
4C.68 The table above shows the number of individuals receiving CoS working for a job title under SOC 2126 has increased from 2014 to 2018. Even though SOC 2126 represents 0.2 per cent of UK employees, it made up 1.9 per cent of all restricted CoS usage from 2015-18, indicating that using Tier 2 (General) to fill roles is a popular strategy for employers of this SOC code, and perhaps increasingly so.

4C.69 Stakeholder evidence backed this up, we were told that a variety of roles were being filled via use of Tier 2 (General).

Recommendation

4C.70 We recommend including SOC code 2126 (design and development engineers) on the SOL. The occupation ranked highly (39th) in the shortage indicators; the vacancy rate has been consistently above average and the use of Tier 2 (General) has been increasing over time. The stakeholder evidence suggests that too few people are opting for an engineering-related career, while representative bodies told us that they were aiming to tackle this, any improvement is likely to take some time. Overall, the evidence suggests that there is nationwide shortage of design and development engineers.

SOC 2127 – Production and Process Engineers

Summary table: SOC 2127 Production and process engineers	
Employment	
Share of UK employees (%, APS, 2017/18)	0.2%
Share of Tier 2 (General) (% total RCoS Used 2015-2018)	0.3%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	6.0%
Share of employees born outside the EEA (%, APS, 2017/18)	9.1%
Wages	
Median full-time annual wage (ASHE 2018)	£39,815
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2 (General))	
	
Shortage indicator rank	
Shortage overall rank /105	38
Recommendation	
Recommend expanding to include entire occupation on the SOL	

Stakeholder evidence

4C.71 In responses to our call for evidence online form, we were told that business had difficulty recruiting a wide variety of job titles within SOC 2127.

4C.72 We were told that recruitment difficulties have stemmed from a low number of applicants for vacancies applying with the required qualifications or skills, this was leading to competition between businesses to attract candidates. Representative bodies informed us that there were a low number of graduates available for the roles, this is exacerbated by competition for candidates from abroad. The relatively low number of graduates that have studied relevant degrees was a result of a lack of STEM teachers in schools, poor understanding of the engineering profession and a lack of knowledge on the different pathways to becoming an engineer.

4C.73 A range of different organisations from different sectors indicated they were promoting and using degree-level apprenticeships or are currently developing apprenticeships. There are also a range of national campaigns to address

engineering shortages, and sectors have their own specific campaigns to draw workers into their specific sector.

4C.74 We were told that these strategies have mostly been unsuccessful in dealing with recruitment difficulties. We were told that there are simply not enough potential candidates within the UK to meet demand. Projects dedicated towards expanding the candidate pool via outreach programmes are being aimed at young people with results likely to be long-term.

Use of the SOL

4C.75 SOC 2127 has been on the SOL since 2011. Plant process engineers in the electricity transmission and distribution industry were removed in 2011.

Use of Tier 2 (General)

Year	2014	2015	2016	2017	2018
RCoS Used	101	74	49	53	71

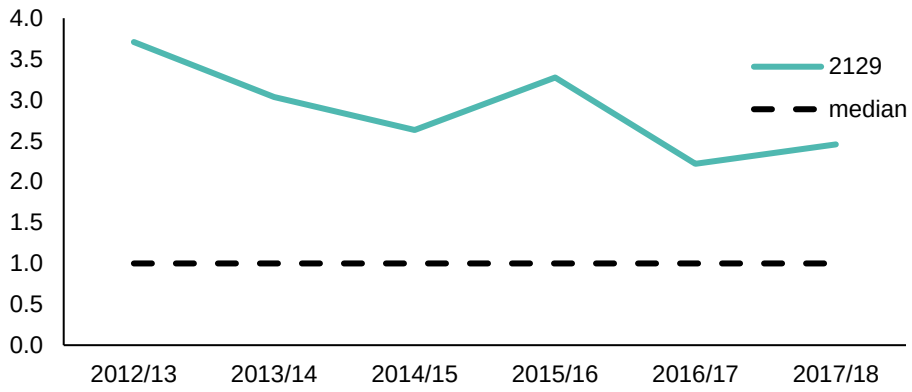
4C.76 The number of individuals receiving CoS working for a job title under SOC 2127 had fallen from 2014 to 2016, since 2017 there has been an upswing in the use of Tier 2 (General) to fill roles classified within SOC 2127, however this is still below the 2014 numbers.

4C.77 Evidence from stakeholders indicated that Tier 2 (General) was commonly-used to fill roles under SOC 2127.

Recommendation

4C.78 We recommend including SOC code 2127 (production and process engineers) on the SOL. The occupation ranked highly (38th) in the shortage indicators and the vacancy rate has been consistently above average. The use of Tier 2 (General) has also increased in the last few years. The stakeholder evidence suggests that there are not enough candidates in the UK to meet demand. In the short-term, it seems sensible to enable firms to fill remaining vacancies using overseas workers. In the medium to long-term, UK firms and industry representatives are looking to expand the talent pool and promote the occupation to young people. Given this, we recommend including the entire occupation on the SOL.

SOC 2129 – Engineering professionals not elsewhere classified

Summary table: SOC 2129 Engineering professionals n.e.c.	
Employment	
Share of UK employees (%, APS, 2017/18)	0.4%
Share of Tier 2 (General) (% total RCoS Used 2015-2018)	0.7%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	6.9%
Share of employees born outside the EEA (%, APS, 2017/18)	8.3%
Wages	
Median full-time annual wage (ASHE 2018)	£42,146
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2 (General))	
	
Shortage indicator rank	
Shortage overall rank /105	51
Recommendation	
Recommend expanding to include entire occupation on the SOL	

Stakeholder evidence

4C.79 Due to the nature of the SOC being a miscellaneous ‘catch-all’ occupation code, there were a variety of job titles mentioned as being in shortage. Despite this, acoustic engineers and food technologists were frequently mentioned as being in shortage.

4C.80 The cited causes of these shortages were the lack of applicants with the required skills however some respondents also told us that there were a low number of applicants generally; skilled or otherwise. This was compounded by increased competition between firms trying to attract suitable workers. The Food and Drink Federation (FDF) told us that they had trouble recruiting engineers due to the lack of food-science education in the UK. We were also told that the food and drink industry also suffer from a poor image, members of the FDF said that UK engineers preferred to work in the automotive or aerospace industries, despite the fact that the food and drink industry uses very similar robots in their manufacturing process.

4C.81 In response to these shortages, a wide range of measures have been used by businesses, the most popular methods were to increase wages, use different methods to advertise vacancies and upskill the current workforce. A few businesses also told us that they were working on building/improving their brand to combat the poor perception of their industry and offering flexible working conditions to current workers. In terms of upskilling the current workforce, while workers may already be familiar with the culture and practices of their company, it often takes 6-12 months to train someone up to be a competent food technologist.

4C.82 In tackling the poor industry image, the FDF told us that they were tackling this through coordinated careers activity alongside engagement with schools and universities. Automation of processes has also been implemented to tackle the shortages, however this can be unfeasible for SMEs due to costs. The Northern Ireland Food and Drinks Association told us of a programme called Harvesting Tomorrow's Skills which focused on improving knowledge, addressing the skills gap and making the sector more appealing to young people. The programme has targeted SMEs in particular to encourage them to engage more with educational bodies and other stakeholders.

4C.83 There is a high variance in the reported success of the various measures used. While some businesses found that recruitment difficulties had eased as a result of their actions others are finding that recruitment difficulties are increasing despite the actions they're taking to mitigate this. Many of our stakeholders argue that any success they have had is as a result of being more attractive compared to rival firms within their market, any long-term success in reducing shortages requires that the talent pool within the industry be expanded.

4C.84 Impacts from these shortages have adversely affected business growth as stakeholders are unable to complete contracts as they lack the necessary staff to do this. Recruitment efforts are also costly endeavours for businesses. In addition to this, current workers are being overworked attempting to cover for these vacancies, this is leading to retention problems.

Use of the SOL

4C.85 SOC 2129 has been on the SOL since 2011. Metallurgical / mineral processing engineers were removed in 2013. There are 18 job titles under SOC 2129 listed on the current SOL.

Use of Tier 2 (General)

Year	2014	2015	2016	2017	2018
RCoS Used	163	136	115	117	129

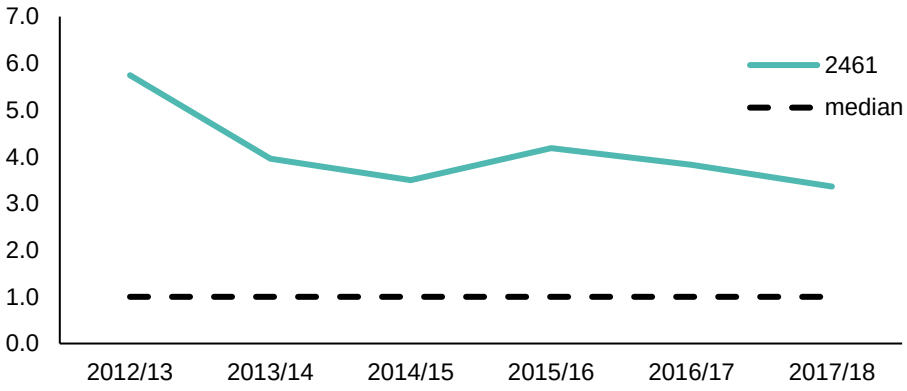
4C.86 The table above shows the number of individuals receiving CoS working for a job title under SOC 2129 had fallen from 2014 to 2016, since 2017 there has been a small upswing in the use of Tier 2 (General) to fill roles classified within SOC 2129.

4C.87 Stakeholder evidence backed this up, we were told that a variety of roles were being filled via use of Tier 2 (General).

Recommendation

4C.88 We recommend including SOC code 2129 (engineering professionals n.e.c) on the SOL. The quantitative evidence however gives mixed evidence as it ranks mid-table in our shortage indicators (51st), but it has an above average vacancy rate. The use of Tier 2 (G) has been significant and consistent. Stakeholders provided evidence of shortages across a number of job titles, (some already on the SOL). The stakeholder evidence suggests insufficient availability of engineers; it therefore seems sensible to enable firms to fill remaining vacancies using overseas workers. Given this, we recommend including the entire occupation on the SOL.

SOC 2461 – Quality control and planning engineers

Summary table: SOC 2461 Quality control and planning engineers	
Employment	
Share of UK employees (%, APS, 2017/18)	0.1%
Share of Tier 2 (General) (% total RCoS Used 2015-2018)	0.2%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	6.2%
Share of employees born outside the EEA (%, APS, 2017/18)	7.9%
Wages	
Median full-time annual wage (ASHE 2018)	£38,102
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2 (General))	
	
Shortage indicator rank	
Shortage overall rank /105	31
Recommendation	
Recommend expanding to include entire occupation on the SOL	

Stakeholder evidence

4C.89 Stakeholders told us a low number of applicants with the required skills were driving these shortages, however some indicated that it was a low number of applicants generally that were a problem, indicating that shortages may not be

necessarily skill-shortages. EngineeringUK and the Engineering Council suggest that this may derive from limited access to STEM careers activity and a poor understanding of the different pathways into the engineering. For example, we were informed that the Engineering Brand Monitor (2017) found that just over a third of respondents felt that apprenticeships were a desirable pathway into engineering.

4C.90 In managing these shortages, businesses have used a range of measures, overall it appears that they have been increasing wages, upskilling their current staff and looking to use different sources of labour. A few stakeholders told us that they are sourcing labour from abroad. Representative bodies are working on awareness and outreach campaigns, however, as these are aimed at young people, any outcomes from this are likely to be long term.

4C.91 These strategies have appeared to have yielded minor success, though some stakeholders told us that their measures had not worked at all. Some stakeholders are concerned that shortages will worsen in the long-term. The outreach campaigns have seen attitudes towards engineering become more positive amongst young people: according to EngineeringUK and the Engineering Council the Engineering Brand Monitor (2017) shows that the proportion of young people aged 11 to 16 who would consider a career in engineering has risen 11 per cent from 2012 to 17.

4C.92 We have been told that the impact of these shortages caused stakeholders to turn down work from clients and delay projects. The shortages have also increased workloads and pressure on current workers. One stakeholder within the utility sector told us that the impact of shortages has been minimal so far as they are able to use the Tir 2 (G) route to continue to attract migrant workers.

Use of the SOL

4C.93 SOC 2461 has been on the SOL since 2011.

Use of Tier 2 (General)

Year	2014	2015	2016	2017	2018
RCoS Used	27	37	27	28	21

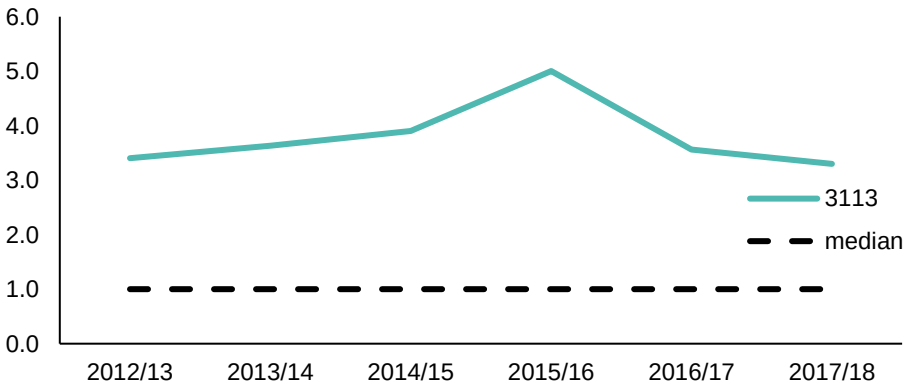
4C.94 The table above shows the number of individuals receiving CoS working for a job title under SOC 2461 has fluctuated around the high 20’s since 2014 with a peak in 2015.

4C.95 Some stakeholders expressed a desire to recruit from abroad in the future to mitigate skill shortages, however one firm mentioned that they struggled to obtain restricted CoS meaning that that route could not be relied upon.

Recommendation

4C.96 We recommend including SOC code 2461 (quality control and planning engineers) on the SOL. The occupation ranked highly (31st) in our shortage indicators and has experienced a high and above average vacancy rate. Stakeholder evidence also highlighted that shortages come from educational pipeline issues, while employers told us that they are attempting to fix this, this is likely to be a long-term solution. Given this, we recommend placing the entire occupation on the SOL.

SOC 3113 – Engineering technicians

Summary table: SOC 3113 Engineering technicians	
Employment	
Share of UK employees (%, APS, 2017/18)	0.4%
Share of Tier 2 (General) (% total RCoS Used 2015-2018)	0.0%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	5.7%
Share of employees born outside the EEA (%, APS, 2017/18)	5.5%
Wages	
Median full-time annual wage (ASHE 2018)	£35,295
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2 (General))	
	
Shortage indicator rank	
Shortage overall rank /105	26
Recommendation	
Recommend removing occupation from the SOL	

Stakeholder evidence

4C.97 ECITB pointed us towards a report by Pye Tait (2019)[79] which looked at the labour market outlook of the engineering construction industry. The report found that 49% of employers that were surveyed said that they had trouble recruiting engineering-related technicians.

[79] https://www.ecitb.org.uk/wp-content/uploads/2019/04/LMI-2019_LabourMarketOutlook.pdf

4C.98 We were told by a representative body of the energy and utility sector that shortages within this sector stemmed from the lack of a workforce resilience strategy, this was coupled with the increase in workforce needed to meet a growing projected demand.

4C.99 In responding to these shortages, we were told that the UK gas, power, water and waste management sectors were collaborating through the 'Energy & Utilities Skills Partnership'. The purpose of this partnership is address the respective sectors' workforce recruitment challenges, it launched a 'Talent Source Network', encouraging firms and stakeholders to compete for emerging talent. The representative body also told us that they were aiding firms in making the most out of the Apprenticeship Levy.

4C.100 These measures are reported to have had an impact, but shortages remain and are reported to be worsening in the energy and utilities sector.

Use of the SOL

4C.101 SOC 3113 has been on the SOL since 2011.

Use of Tier 2 (General)

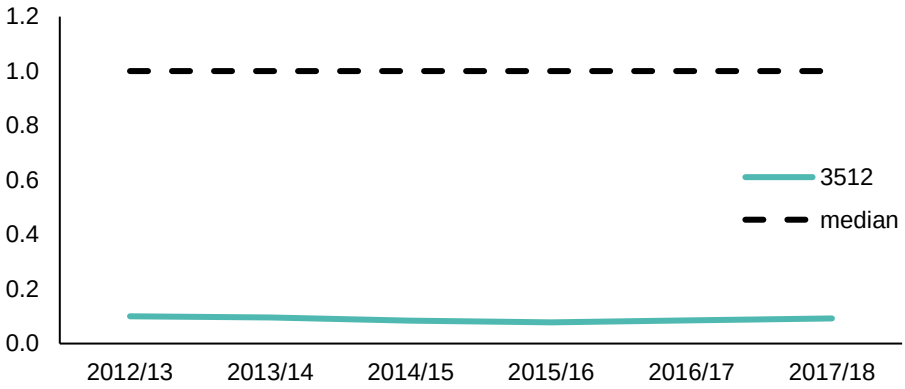
Year	2014	2015	2016	2017	2018
RCoS Used	2	1	6	1	4

4C.102 The number of individuals receiving CoS working for a job title under SOC 3113 has been low in absolute terms from 2014-18, possibly reflecting the small share of UK employees that SOC 3113 represents.

Recommendation

4C.103 We do not recommend including SOC code 3113 (engineering technicians). Note that only jobs in commissioning engineers and substation electrical engineer in the electricity transmission and distribution industry are currently classed as RQF6+, the remaining job-titles under this code are ineligible for Tier 2 (General) and thus for the SOL. The occupation ranked fairly high in our shortage indicators (26th) and the vacancy rate has been consistently above average. The quantitative evidence also appears to suggest the presence of shortage within this SOC code, however, despite this, the use of Tier 2 (General) remains one of the lowest amongst all occupations suggesting that migrant labour is not being used to fill in shortages.

SOC 3512 – Aircraft pilots and flight engineers

Summary table: SOC 3512 Aircraft pilots and flight engineers	
Employment	
Share of UK employees (%, APS, 2017/18)	0.1%
Share of Tier 2 (General) (% total RCoS Used 2015-2018)	0.0%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	4.8%
Share of employees born outside the EEA (%, APS, 2017/18)	7.1%
Wages	
Median full-time annual wage (ASHE 2018)	£79,258
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2 (General))	
	
Shortage indicator rank	
Shortage overall rank /105	75
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder evidence

4C.104 We received evidence on one job title (experienced pilots) within SOC 3512. The stakeholder told us that a low number of applicants with the requisite skills and qualifications were the cause of the recruitment difficulties. In tackling the recruitment difficulties, we were told that the stakeholder was increasing wages offered while trying to upskill current staff and use other methods of advertising for vacancies. As a long-term strategy, the stakeholder has established an apprenticeship programme for licensed aircraft engineers. These strategies have reportedly mitigated recruitment pressures, but not completely addressed them.

Use of the SOL

4C.105 This occupation has not been on the SOL.

Use of Tier 2 (General)

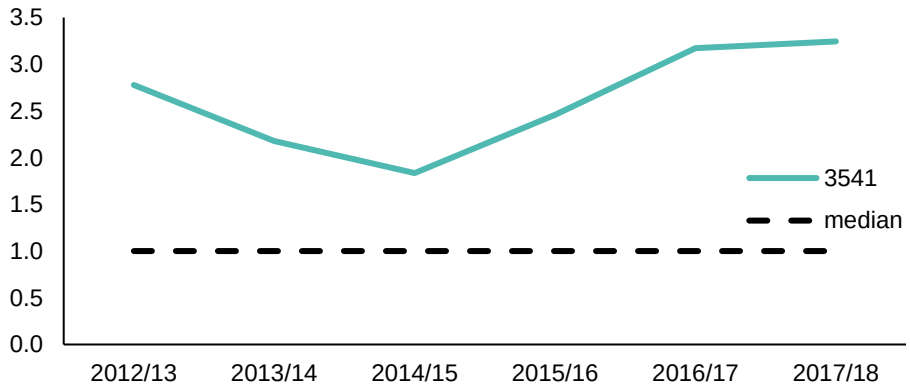
Year	2014	2015	2016	2017	2018
RCoS Used	0	9	0	0	18

4C.106 The data show intermittent spikes in the use of Tier 2 (General) to fill vacancies.

Recommendation

4C.107 We do not recommend including SOC code 3512 (aircraft pilots and flight engineers) on the SOL. The occupation ranks low in our shortage indicators (75th) and the vacancy rate is significantly below average. While we received some stakeholder evidence suggesting recruitment difficulties, the overall evidence is not sufficient to indicate a nationwide.

SOC 3541 – Buyers and procurement officers

Summary table: SOC 3541 Buyers and procurement officers	
Employment	
Share of UK employees (%, APS, 2017/18)	0.2%
Share of Tier 2 (General) (% total RCoS Used 2015-2018)	0.0%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	3.4%
Share of employees born outside the EEA (%, APS, 2017/18)	6.1%
Wages	
Median full-time annual wage (ASHE 2018)	£30,320
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2 (General))	
	
Shortage indicator rank	
Shortage overall rank /105	33
Recommendation	
Recommend removing from SOL	

Stakeholder evidence

4C.108 We received no stakeholder evidence relating to the relevant job title skilled at RQF6+ for this SOC.

Use of the SOL

4C.109 SOC 3541 has partially (manufacturing engineer (purchasing) in the aerospace industry) been on the SOL since 2011.

Use of Tier 2 (General)

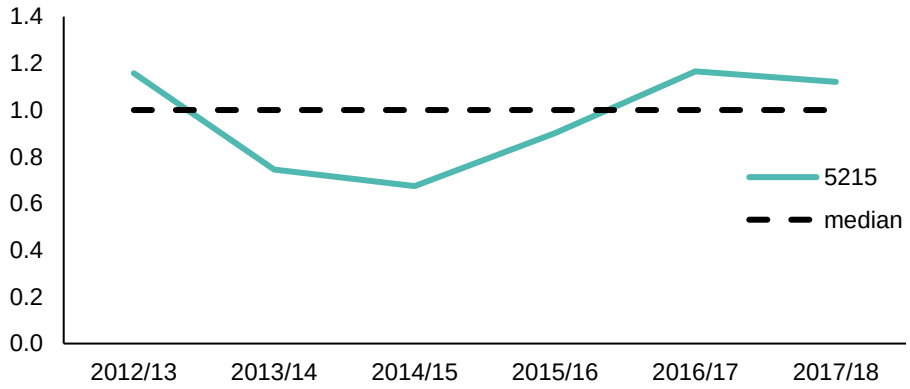
Year	2014	2015	2016	2017	2018
RCoS Used	1	2	1	3	2

4C.110 The table above shows that the number of individuals receiving CoS working for a job title under SOC 3541 has been consistent, yet low in absolute terms from 2014-18, possibly reflecting the small share of UK employees that SOC 3541 represents.

Recommendation

4C.111 We do not recommend including SOC 3541 (buyers and procurement officers) on the SOL. Note that only jobs in manufacturing engineer (purchasing) in the aerospace industry are currently classed as RQF6+, the remaining job-titles under this SOC code are ineligible for Tier 2 (General) and thus the SOL. The occupation as a whole ranks highly in our shortage indictors (33rd) and the vacancy rate is above average. However, this could be a reflection of the remaining job-titles in this SOC code. We received no evidence from stakeholders of shortages of manufacturing engineer (purchasing) in the aerospace industry and usage of Tier 2 (General) has been almost negligible. Therefore, we recommend its removal from the SOL.

SOC 5215 – Welding trades

Summary table: SOC 5215 Welding trades	
Employment	
Share of UK employees (%, APS, 2017/18)	0.2%
Share of Tier 2 (General) (% total RCoS Used 2015-2018)	0.0%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	12.8%
Share of employees born outside the EEA (%, APS, 2017/18)	4.2%
Wages	
Median full-time annual wage (ASHE 2018)	£26,423
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2 (General))	
	
Shortage indicator rank	
Shortage overall rank /105	53
Recommendation	
Recommend no change to existing SOL eligibility	

Stakeholder evidence

4C.112 We received evidence from one stakeholder indicating that they were having difficulty recruiting high integrity pipe welders. The reasons given for these shortages were due to a low number of applicants with the required skills applying which was leading to competition between firms for applicants. We were told that shortages may also be occurring as the work entails working unsociable hours in remote locations.

4C.113 In combatting these shortages, we were told that the stakeholder was increasing wages and having to collaborate with their competitors in order to smooth demand for workers. The stakeholder told us that they have looked to increase training of new workers with the Engineering Construction Industry Training Board, however this has been curtailed by the uncertainty over the contractual nature of work. We were also told that there is a lag of 2-3 years to train someone new up to being competent in their role.

4C.114 These shortages are expected to exacerbate from 2020-25 due to the Nuclear New Build projects which will increase demand for high integrity pipe welders.

Strategies implemented to mitigate recruitment difficulties have not been successful as the pool of potential applicants is so small.

4C.115 We were told that these recruitment difficulties were having an adverse effect on revenues as recruitment costs have been increasing while projects have been overrunning. Clients have been commissioning work from European-based competitors as their pool of labour is larger.

Use of the SOL

4C.116 SOC 5215 has been on the SOL since 2011.

Use of Tier 2 (General)

Year	2014	2015	2016	2017	2018
RCoS Used	1	5	15	0	1

4C.117 The table above shows the number of individuals receiving CoS working for a job title under SOC 5215 fluctuating from 2014-18, possibly reflecting the seasonal and commission-based nature of the role.

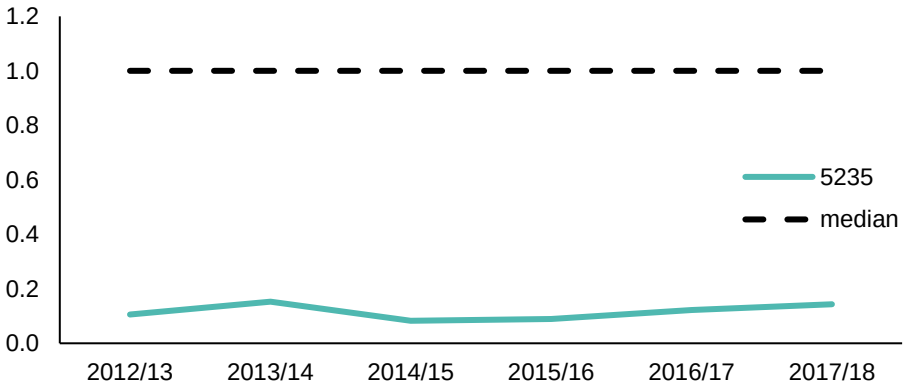
4C.118 While the stakeholder stated that they had not made use of Tier 2 (General) to address shortages in 2018, they admitted that this was an error as they had not "anticipated the depth and duration of the skills shortage". We were told that the stakeholder is planning to make use of Tier 2 (General) in 2019.

Recommendation

4C.119 We recommend including high integrity pipe welders within SOC code 5215 (welding trades) on the SOL80.The occupation ranks middle of the range in our shortage indicators (53rd) and the vacancy rate has been average. While the quantitative data does not appear to suggest there is a shortage, we are only considering one job title within the occupation, therefore the data may not be entirely representative of high integrity pipe welders. Stakeholder evidence suggests that they face difficulties recruiting high integrity pipe welders, while they are trying to train new recruits to fill roles, this is long-term process. Given this, we recommend the retention of high integrity pipe welders where the job requires three or more years' related on-the-job experience.

[80] Note that only high integrity pipe welders under SOC code 5215 are eligible for Tier 2 (General) and thus the SOL

SOC 5235 – Aircraft maintenance and related trade

Summary table: SOC 5235 Aircraft maintenance and related trades	
Employment	
Share of UK employees (%, APS, 2017/18)	0.1%
Share of Tier 2 (General) (% total RCoS Used 2015-2018)	N/A
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	1.9%
Share of employees born outside the EEA (%, APS, 2017/18)	4.1%
Wages	
Median full-time annual wage (ASHE 2018)	£35,622
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2 (General))	
	
Shortage indicator rank	
Shortage overall rank /105	72
Recommendation	
Recommend removing from SOL	

Stakeholder evidence

4C.120 We received no stakeholder evidence relating to this SOC.

Use of the SOL

4C.121 This SOC code is currently on the SOL.

Use of Tier 2 (General)

Year	2014	2015	2016	2017	2018
RCoS Used	5	4	17	12	9

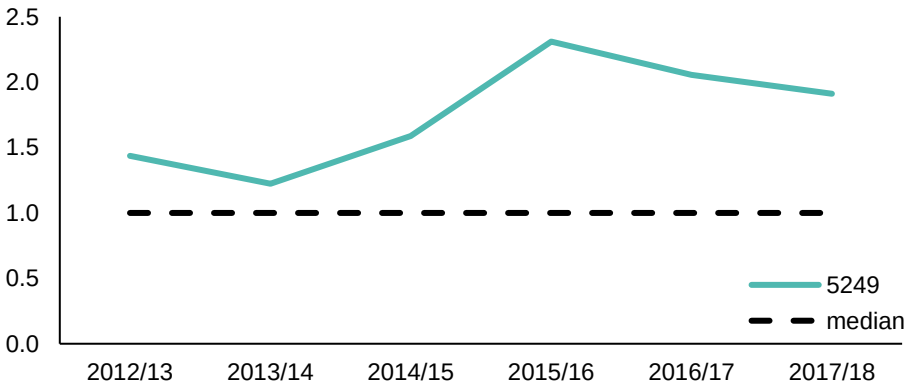
4C.122 Only a handful of individuals received a CoS to work for a job title under SOC 5235. Numbers peaked in 2016 but have fallen steadily since.

Recommendation

4C.123 We do not recommend including SOC code 5235 (aircraft maintenance and related trade) on the SOL. The occupation has a very low relative vacancy rate,

ranks quite low in shortage according to our indicator ranking (72nd), and we received no evidence from stakeholder related to this SOC code.

SOC 5249 – Electrical and electronic trades n.e.c.

Summary table: SOC 5249 Electrical and electronic trades n.e.c.	
Employment	
Share of UK employees (%, APS, 2017/18)	0.3%
Share of Tier 2 (General) (% total RCoS Used 2015-2018)	N/A
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	2.3%
Share of employees born outside the EEA (%, APS, 2017/18)	6.0%
Wages	
Median full-time annual wage (ASHE 2018)	£32,478
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2 (General))	
	
Shortage indicator rank	
Shortage overall rank /105	42
Recommendation	
Recommend removing from SOL but retain eligibility for Tier 2 (General)	

Stakeholder evidence

4C.124 In our call for evidence online forms, stakeholders stated that they were having difficulty recruiting overhead linesworkers.

4C.125 Stakeholders found that a low number of applicants were driving the shortages, this was not necessarily due to lack of suitable qualifications but that the job entailed shift work and/or unsociable hours. As the job was primarily an outdoors job, workers must be prepared to perform their role in all weather for long time periods. It also takes four years to train an individual to a level whereby they are deemed to be safe and proficient working alone at their role. In addition to this, shortages are exacerbated by shortages abroad, competition for workers is therefore international.

4C.126 In managing these shortages, stakeholders have told us that they are increasing wages, upskilling their current workforce and increasing holiday allowances and bonuses. Another stakeholder told us that they had focused on engaging with

potential candidates early on, to persuade them once they become an active candidate to approach the stakeholder for a job first.

4C.127 These measures are reported to be having mixed results, one stakeholder said that the impact of Brexit's uncertainty is making recruitment and retention more challenging, especially when the demands from the National Grid is reaching an all-time high. Another stakeholder reported more success, however they also state that they need more potential candidates coming through the educational pipeline as there is a net outflow of individuals moving from the profession.

4C.128 We have been told that the impact of these shortages have prevented businesses from growing as most efforts are being directed at retaining staff as much as possible. Delays that stem from worker shortages are also having knock-on effects on other infrastructural projects which rely on the work of overhead linesworkers.

4C.129 In our investigations into usage of the SOL as well as through stakeholder engagement it has become clear that power companies are using the route as the sole means of recruiting overhead lines workers. During round-table discussions we were told of a company that no longer attempted to recruit and train staff from within the UK and now recruits almost exclusively from the Philippines.

4C.130 Analysis of CoS data backs this up, furthermore, the data suggests that these Philippines workers are being paid the absolute minimum salary of £32,000 so that they can just about meet the SOL eligibility. All of this strongly suggests that the sector is abusing the SOL to provide cheap labour at the expense of UK workers.

4C.131 It is not the purpose of the Shortage Occupation List to provide the only means of recruitment for organisations, certainly not at the expense of UK labour market. Its purpose is to ensure sectors still have access to staff while giving them time to recruit and train up staff within the UK.

4C.132 Evidence points towards the sector making itself over reliant on labour from a very particular source which is overexposing the sector to vast risks. Should this pool of labour suddenly dry up or be closed off due to external factors then the sector is likely to experience operational difficulties. It is imperative that the sector does not solely rely on one source of labour and in the long-term trains up and sources labour domestically. Given the current incentives offered by the status quo, it is unlikely that this will be achieved.

Use of the SOL

4C.133 Overhead linesworkers have been on the SOL since 2011. It is one of the few occupations on the SOL despite not being skilled at RQF6+. An exception was made in 2013 (when the skill threshold for the SOL increased to RQF6+) to keep job titles skilled under RQF6+ on the SOL if they still passed our shortage and sensible criteria, which overhead linesworkers did.

Use of Tier 2 (General)

Year	2014	2015	2016	2017	2018
RCoS Used	1	0	21	65	68
RCoS Used by individuals from the Philippines	0	0	21	65	68

4C.134 The table above shows an upswing in the number of receiving CoS working for a job title under SOC 5249 from 2016. We were told by stakeholders that they commonly used Tier 2 (General) to recruit overhead linesworkers from the Philippines. Following this up, using CoS data we found that almost all Tier 2 (General) recruitment involved Philippines workers.

Recommendation

4C.135 We do not recommend including overhead linesworkers within SOC 5249 (electrical and electronic trades n.e.c) on the SOL but they should retain eligibility for Tier 2 (General). The occupation ranks fairly highly in our shortage indicators (42nd) and the vacancy rate has been consistently above average. Stakeholders suggested they were facing recruitment difficulties. However, data on the use of the SOL and evidence from stakeholders suggest that the current system is over-reliant on Filipino workers and the industry is not training workers, our recommendation for removal from the SOL reflects our concern about this.

4.D. Science professionals

Introduction

4D.1 This section covers eight science occupations which are: 2111 chemical scientists, 2112 biological scientists and biochemists, 2113 physical scientists, 2114 social and humanities scientists, 2119 natural and social science professionals not elsewhere classified (n.e.c), 2141 conservation professionals, 2142 environment professionals and 2150 research and development managers.

4D.2 It begins with an overview of the broad areas and examines recent Government policies and initiatives in dealing with possible shortages. This is followed by an assessment of the shortages for each of the eight occupations, from this we recommend whether the occupation should be included on the SOL.

4D.3 Most of the occupations highlighted above have a direct background in the STEM subjects (science, technology, engineering, and mathematics). Skilled workers who have qualifications and experience in the STEM subjects are highly sought after as the UK seeks to increase productivity and innovation levels. The Governments industrial strategy stated that "these skills are important for a range of industries from manufacturing to the arts. The number of STEM undergraduates has been increasing over the last few years, but there remains unmet demand from employers"[81].

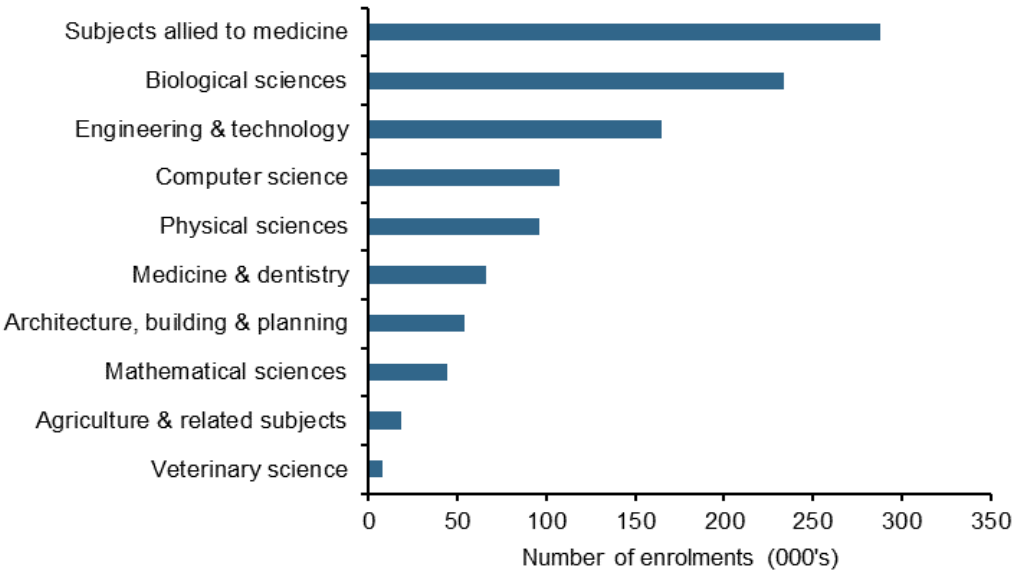
4D.4 A review by the National Audit Office reported that estimates of shortages in STEM skills vary due to differences in definitions and methodologies used. It was also reported that there is likely to be a misalignment between the skills needed in some areas and those available within the labour pool rather than a simple skills shortage[82].

Science subjects in higher education

4D.5 The number of enrolments for science subjects in higher education have generally been lower relative to non-science subjects (HESA, 2019)[83]. Some science subjects are more popular than others, from 2014/15 to 2017/18 subjects allied to medicine have consistently had the highest numbers of enrolment from all the science subjects, this is followed by biological sciences. Figure 4.d.1. provides a snapshot of student higher education enrolments in 2017/18.

[81] Industrial strategy building a future fit for the future, published in November 2017.
[82] Delivering STEM (science, technology, engineering and mathematics) skills for the economy, National Audit Office, published on 15th January 2018.
[83] https://www.hesa.ac.uk/data-and-analysis/students/table-9 (This refers to all levels of courses at higher education).

Figure 4.d.1: Number of students enrolled in Science subjects in Higher Education, 2017/18



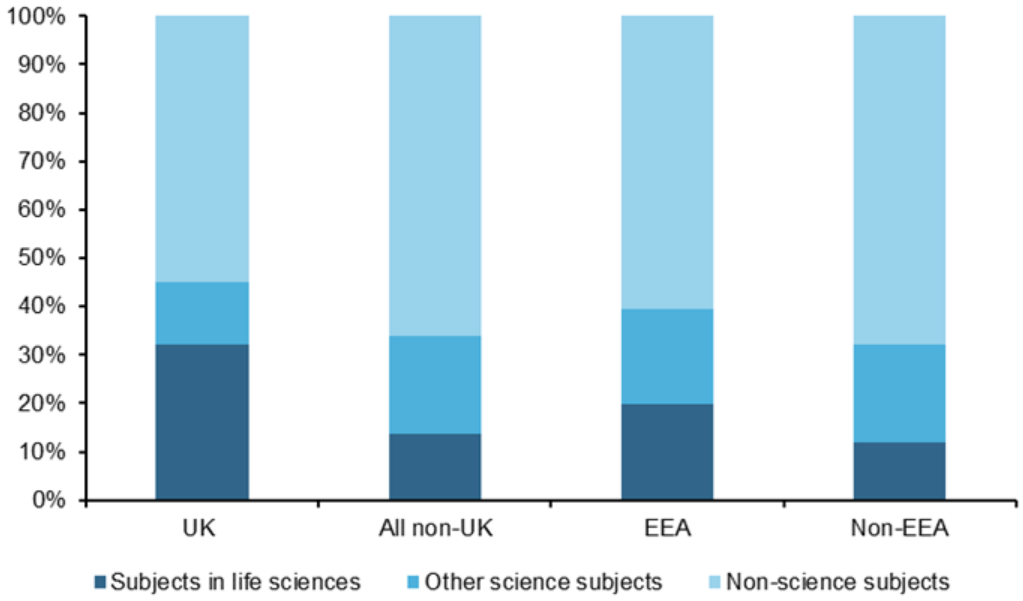
Source: HESA (2019)

4D.6 There has also been an increase in the number of enrolments in some science subjects, the biggest increase was for courses in veterinary sciences (see section 4.B above). Enrolment in these courses had increased on average by 10.1 per cent from 2014/15 to 2017/18. Enrolment in computer sciences had increased by 4.8 per cent and architecture, building & planning courses by 3.6 per cent for the same period. These experienced the second and third highest percentage enrolment increases.

4D.7 In 2017/18 the percentage of science qualifications obtained in higher education was 42.1 per cent of all qualifications obtained, for non-science subjects this was 57.9 per cent[84]. UK resident students achieved a higher percentage of qualifications in science subjects than EEA and non-EEA students as seen in figure 4.d.2.

[84] https://www.hesa.ac.uk/news/17-01-2019/sb252-higher-education-student-statistics/qualifications

Figure 4.d.2: The percentage of qualifications achieved in science and non-science subjects at higher education by residency, 2017/18



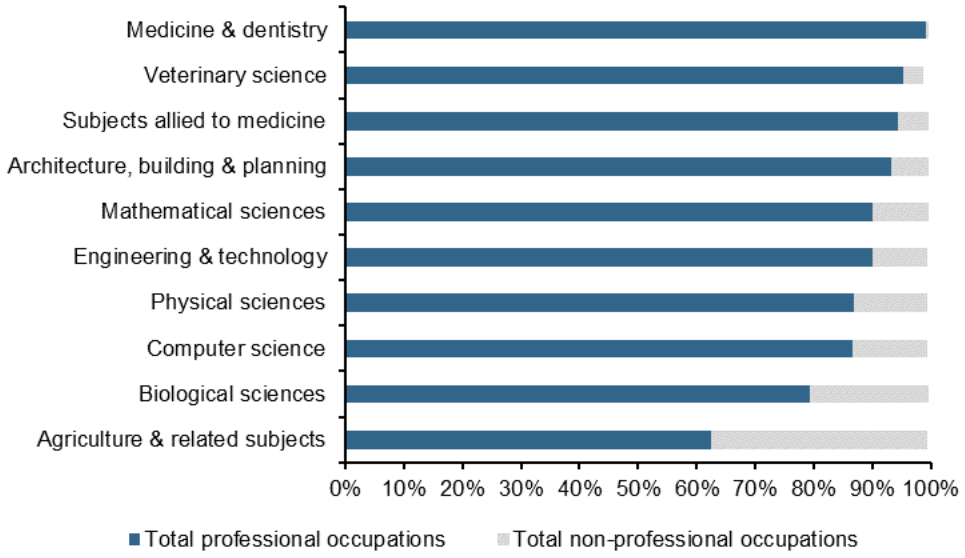
Source: HESA (2019)[85]

4D.8 Overall, the number of qualifications obtained in the science subjects increased by 4.1 per cent in 2017/18 in comparison to the previous year. Although, this increase was smaller for UK resident students (0.5 per cent) compared to Non-EEA students (2.5 per cent).

4D.9 In a longitudinal survey that tracked students three and a half years after leaving higher education, it was found that UK resident students who qualified in agriculture and related subjects and biological sciences were least likely to be employed in professional/graduate level occupations as seen in figure 4.d.3[86].

[85] Life sciences include the following subjects: medicine & dentistry, subjects allied to medicine, biological sciences, veterinary sciences, agriculture & related subjects and physical sciences. Other science subjects are: mathematical sciences, computer science, engineering & technology and architecture, building and planning.
[86] Students that had left higher education with science qualifications in 2012/13 were followed up three and a half years later in 2016/17.

Figure 4.d.3: Percentage of science students employed in professional or non-professional occupations in 2016/17



Source: Destination of leavers from Higher Education Longitudinal Survey (2016/17)[87].

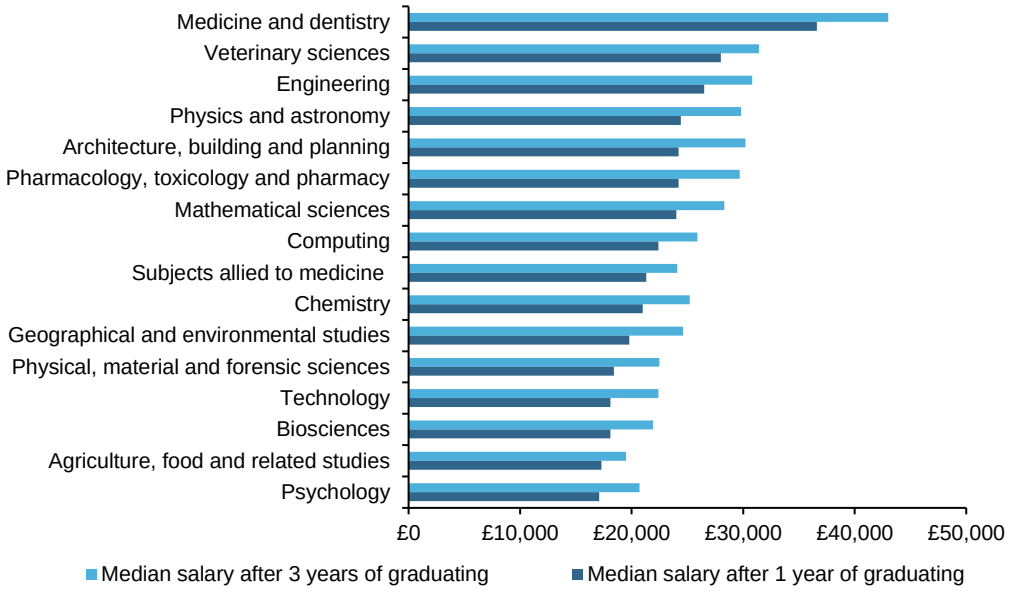
Median salaries for occupations under consideration

4D.10 Overall, the number of qualifications obtained in the science subjects increased by 4.1 per cent in 2017/18 in comparison to the previous year. Although, this increase was smaller for UK resident students (0.5 per cent) compared to Non-EEA students (2.5 per cent).

4D.11 Of the science subjects studied, by UK resident students, those that studied medicine and dentistry courses received the highest salaries 1 year after graduation with a median salary of £36,600 however this was significantly lower for psychology graduates who received a median salary of £17,100 as seen in see figure 4.d.4.

[87]https://www.hesa.ac.uk/data-and-analysis/publications/long-destinations-2012-13/employment

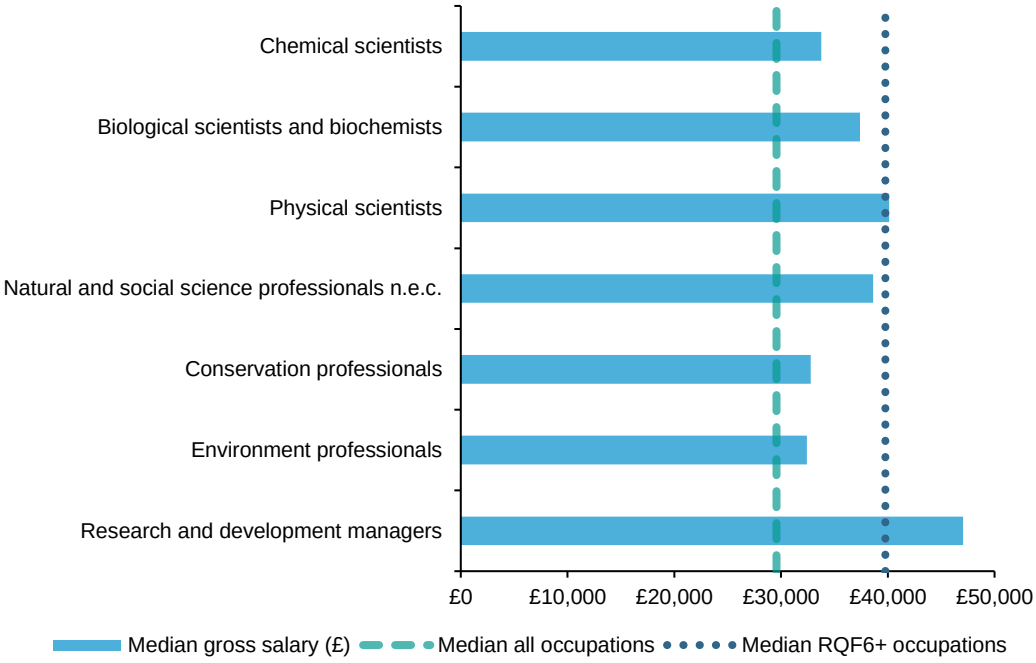
Figure 4.d.4: Median salaries reported by science students after graduation.



Source: Graduate outcomes (LEO): outcomes in 2016 to 2017, Department for Education

4D.12 Data from the ASHE (2018) show that all eight broad occupation areas had a median gross annual pay above £30,000 with research and development managers receiving the highest annual gross pay, see figure 4.d.5 below.

Figure 4.d.5: Median gross full-time annual pay for the science occupations, 2018



Source: Annual survey of hours and earnings 2018.

Steps being taken to tackle labour shortages

4D.13 A number of initiatives have been put in place by the Government as part of the industrial strategy to improve education and training in STEM subjects. Initiatives currently in place include the implementation of new employer- led apprenticeship schemes which are designed, delivered, partly funded and assessed by employers. These apprenticeships are funded by the apprenticeship levy which came into effect in April 2017[88].

4D.14 Following changes to the funding of the apprenticeship levy, the number of apprenticeship starts had slowed down[89]. The Government has introduced some further changes such as reducing the costs of training apprentices for non-levy paying employers from 10 per cent to 5 per cent in April 2019[90].

4D.15 The Department for Education are working more closely with industry experts such as STEM industry representative bodies, academic institutions and employers to feed views into cross-Government work. The aim of the new working group is to strengthen STEM education in the UK[91].

4D.16 A funding of £20 million was announced by the Government in January 2018 to set up Institutes for coding to address the digital skills gaps. This is aimed at higher education students and aims to boost graduate employability[92].

4D.17 The Scottish Government announced in November 2018, that they would be extending the funding for the number of STEM teachers funded by bursaries. The scheme would allow more people to retrain as secondary school teachers in the STEM subjects[93].

4D.18 In the Spring 2019 statement the Government also said that there would be an investment of £81 million in extreme photonics (a state of the art laser technology). Another £45 million will be invested in Bioinformatics research[94].

4D.19 Other strategies include the development of the Life Sciences 2030 Skills Strategy which will be led by the Science Industry Partnership (SIP), with others key partners which is funded by £100,000 from SIP, with further funding from trade associations and the Government[95].

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[88] Delivering STEM (science, technology, engineering and mathematics) skills for the economy, National Audit Office, published on 15th January 2018.

[89]https://assets.publishing.service.gov.uk/Government/uploads/system/uploads/attachment_data/file/774452/Apprenticeship-and-levy-statistics-January-2019_FINALv2.pdf

[90] https://www.gov.uk/Government/publications/apprenticeship-levy-how-it-will-work/apprenticeship-levy-how-it-will-work

[91] The Industrial Strategy, Life Sciences Sector Deal 2.

[92] https://www.gov.uk/Government/news/prime-minister-announces-20-million-institute-of-coding

[93]https://www.gov.scot/news/107-new-stem-teachers-funded-by-bursary/

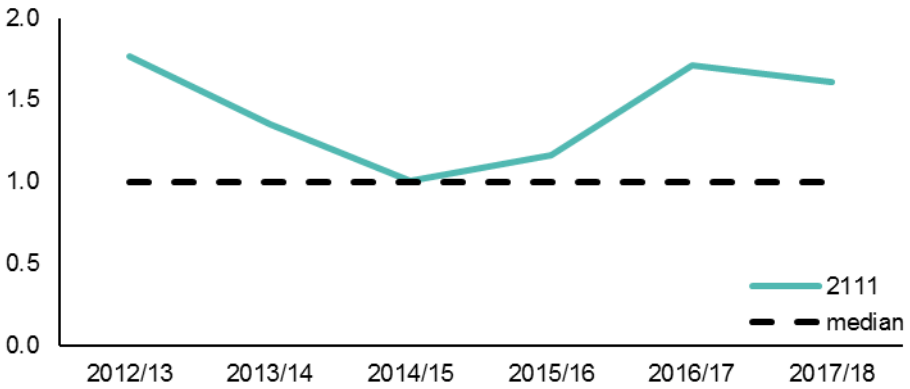
[94] https://www.gov.uk/Government/news/spring-statement-2019-what-you-need-to-know

[95] https://www.gov.uk/Government/publications/life-sciences-sector-deal

Occupations under consideration

4D.20 This section will consider eight SOC Codes under the science occupations, it provides the shortage indicators and stakeholder evidence we have on the occupation followed by a conclusion as to whether they should be on the SOL.

SOC 2111 Chemical scientists

Summary box: SOC 2111 Chemical scientists	
Employment	
Share of UK employees (%, APS, 2017/18)	0.1%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.2%
Share of workforce born in the EEA (ex.UK) (%, APS, 2017/18)	8.2%
Share of workforce born outside the EEA (%, APS, 2017/18)	12.4%
Wages	
Median full-time annual wage (ASHE 2018)	£33,767
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	95
Recommendation	
Do not recommend that this occupation be placed on the SOL.	

Stakeholder evidence

4D.21 Stakeholders said they were concerned about a shortage of occupations in the nuclear industry, these occupations were of different skill levels and occupations. BEIS stated that with the closure of nuclear reactors and with an increase in new build reactors there would be a requirement for nuclear scientists who possessed the experience and detailed understanding of this sector to fill the new roles. They estimated that it would take between 5-10 years to stabilise this occupational shortage.

4D.22 The Scottish Government stated that they were concerned with shortages of chemical scientists in nuclear decommissioning and radioactive waste management. They stated that the long-term decommissioning and decontamination projects were likely to continue within the next 20-30 years.

They reported that complex nuclear sites such as Dounreay had recruited non-EEA workers from Japan and Canada via the Euratoms common market which allows free movement of nuclear workers/professionals.

4D.23 BEIS told us that efforts were being made to mitigate shortages via nuclear graduate programmes, STEM engagement activities and women's returner schemes.

4D.24 Other jobs that stakeholders mentioned were industrial chemists, analytical chemists, bio-chemical scientists and chemical research associates however there was insufficient evidence for these occupations. One stakeholder operating in Northern Ireland told us that there is a small pool of Chemistry graduates in Northern Ireland. They said that of the 100 students that enrol on science courses approximately half of them graduate.

Use of the SOL

4D.25 This SOC Code has not been on the SOL previously.

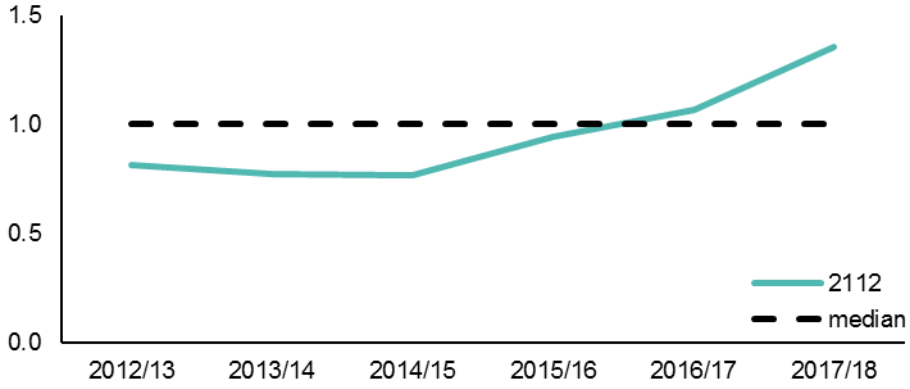
Use of Tier 2 (General)

Year	2014	2015	2016	2017	2018
RCoS Used	48	27	29	40	56

Recommendation

4D.26 We do not recommend including SOC code 2111 (chemical scientists) on the SOL. The occupation ranks fairly low (95th) in the shortage indicators, however, the vacancy rate is above average. There was insufficient stakeholder evidence of a nation-wide shortage, and therefore do not recommend adding this occupation to the UK SOL. However, we received compelling evidence of shortage in the nuclear industry in Scotland and recommend adding it to the Scotland list.

SOC 2112 Biological scientists and biochemists

Summary box: SOC 2112 Biological scientists and biochemists	
Employment	
Share of UK employees (%, APS, 2017/18)	0.3%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.6%
Share of workforce born in the EEA (ex.UK) (%, APS, 2017/18)	15.7%
Share of workforce born outside the EEA (%, APS, 2017/18)	9.0%
Wages	
Median full-time annual wage (ASHE 2018)	£37,392
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	59
Recommendation	
Recommend this occupation to be added onto the SOL.	

Stakeholder evidence

4D.27 A diverse number of jobs were mentioned by stakeholders, these include pathologist, histopathologist, physiologists, agronomist, entomologist, biomedical scientist, neuro-physiologist, clinical scientists, clinical research associate, the most commonly reported job title was clinical pharmacologists.

4D.28 The Clinical Pharmacology Skills Alliance told us that the UK has a shortfall of clinical pharmacologists, with both the private and public sector reporting serious challenges in recruiting. They referred to the ABPI skills survey (2018) which indicated that clinical pharmacology was a top priority. One of the reasons for shortfalls was a lack of awareness of this profession.

4D.29 Campaign for science and engineering stated that there is a chronic shortage of qualified clinical scientists due to insufficient training places. Training places on the scientists training programme are oversubscribed; demonstrating there isn't a shortage of talent, but a shortage of places provided by the NHS during a period of rapid service expansion.

4D.30 The Association for British pharmaceutical industry told us that they had identified new areas of rising challenges from their recent bi-annual survey which suggested that there were shortages within immunology and genomics in biological sciences. They stated that this was because of the rapid increases in the development of innovation in medicine which is changing the skills requirements. This impacts the ability to develop suitable training and qualifications to meet current needs. Immunology for example is becoming a priority area due to the increased interest in biological drugs such as antibodies.

4D.31 UK research and innovation told us that additional roles were in shortage or in vulnerability across all research fields. These were quantitative roles such as mathematics, statistics, data analytics, engineering skills, and interdisciplinary roles which combined expertise in two or more different fields e.g. in social science and medical research to address multi-faceted problems such as anti-microbial resistance or in natural and biological sciences to address food production.

4D.32 Stakeholders told us that a new training/apprenticeship programme was being developed to address shortages. A trailblazer group is developing a new level 7 clinical pharmacology scientist apprenticeship standard. The cost of the apprenticeship will be drawn from the apprenticeship levy and it will provide a recognised qualification for graduate entry and for established life scientists to convert to clinical pharmacology. However, stakeholders said that apprenticeships would not bridge the skills gap due to evolving nature of the skills required within the sector.

4D.33 Stakeholders also told us (in particular NHS Trusts) that they relied on agency/locum staff to recruit for biomedical scientists.

Use of the SOL

4D.34 This SOC was on the SOL from 2011 until 2013.

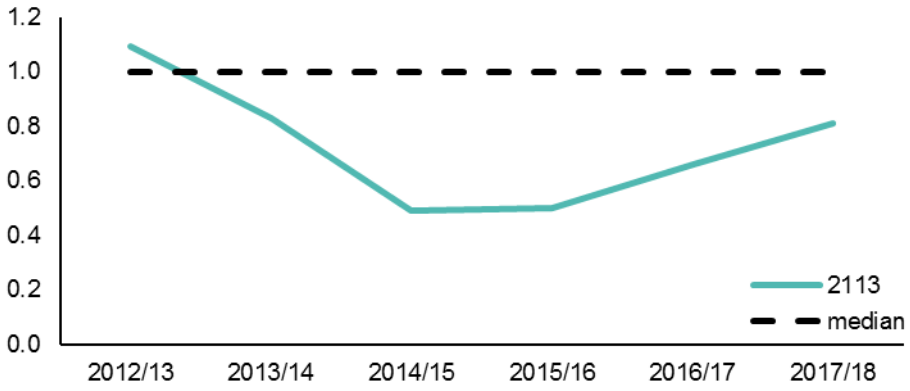
Use of Tier 2 (General)

Year	2014	2015	2016	2017	2018
RCoS Used	102	128	99	117	93

Recommendation

4D.35 We recommend including SOC code 2112 (biological scientists and biochemists) to the SOL. The occupation ranks relatively low (59th) in the shortage indicators whilst the vacancy rate has recently increased above average. The stakeholder evidence suggested a growing demand for this occupation, therefore on balance this occupation should be added to the SOL.

SOC 2113 Physical scientists

Summary box: SOC 2113 Physical scientists	
Employment	
Share of UK employees (%, APS, 2017/18)	0.1%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.3%
Share of workforce born in the EEA (ex.UK) (%, APS, 2017/18)	12.9%
Share of workforce born outside the EEA (%, APS, 2017/18)	14.3%
Wages	
Median full-time annual wage (ASHE 2018)	£40,131
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	30
Recommendation	
Recommend retaining this occupation on the SOL.	

Stakeholder evidence

4D.36 One stakeholder said that there were shortages in geochemists and hydrogeologist jobs because the UK mining sector had shrunk leading to a decline in the number of relevant courses at universities in the UK. They also said that there is a general absence of UK workers within this industry in addition to experts that have retired which has led to a loss of skills/knowledge. Other job titles that were mentioned by stakeholders were: physicists, geologist, petro-physicist, aerodynamicists, geochemist, hydrogeologist, geophysicist, physical science scientist and medical physicist.

4D.37 Campaign for Science and Engineering said there were difficulties in recruiting seismologists using the Tier 2 system because of the minimum salary and skill requirements and the lack of flexibility with the system. They also said that they were told by their members that there was a shortage of radio frequency and microwaves professionals within the UK – they are recruiting from outside of the EEA.

4D.38 One employer said that they were actively supporting UK and European mining education through a range of scholarships, bursaries and work experience schemes.

Use of the SOL

4D.39 This SOC has been on the SOL since 2011.

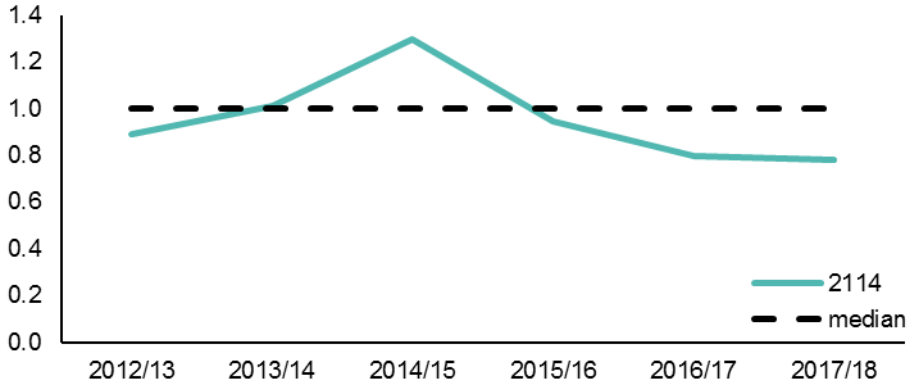
Use of Tier 2 (General)

Year	2014	2015	2016	2017	2018
RCoS Used	118	77	43	59	64

Recommendation

4D.40 We recommend including the job titles currently included in the SOL under SOC code 2113 (physical scientists). The occupation ranked fairly high (30th) in the shortage indicators despite having a lower average vacancy rate. The stakeholder evidence supported the inclusion of the occupation on the SOL.

SOC 2114 Social and humanities scientists

Summary box: SOC 2114 Social and humanities scientists	
Employment	
Share of UK employees (%, APS, 2017/18)	0.1%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.1%
Share of workforce born in the EEA (ex.UK) (%, APS, 2017/18)	7.7%
Share of workforce born outside the EEA (%, APS, 2017/18)	11.4%
Wages	
Median full-time annual wage (ASHE 2018)	£31,779
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	83
Recommendation	
Recommend Archaeologists on the SOL, no other occupations under this SOC Code are recommended.	

Stakeholder evidence

4D.41 The majority of stakeholders that reported shortages within this occupation code cited jobs in archaeology, some evidence was received for other job titles such as health researchers although the evidence was limited.

4D.42 Within the archaeological sector stakeholders said there were shortages in curatorial archaeologists, fieldwork skills and experience in artefact/ecofact conservation. Fieldwork skills and artefact/ecofact conservations were often 'bought in' from sub-contractors.

4D.43 The majority of stakeholders citing jobs in archaeology referred to the archaeological market survey 2017-18. The report stated that there is a growing demand for archaeologists since 2014 due to a number of projects which include Crossrail, EA, one cable route for North Sea wind farms, A14 improvements and High Speed 2. The report suggested that there are more archaeologists working in the commercial archaeology sector than ever before, with the workforce increasing by 12.8 per cent in 2017/18 alone.

4D.44 One stakeholder reported that many graduates lacked the practical skills and most graduates were pursuing archaeology because of a general interest rather than wanting to pursue archaeology as a career.

4D.45 Another stakeholder reported that the majority of archaeological businesses were small businesses who were unable to engage with Government training initiatives such as trailblazer.

4D.46 Stakeholders said that they were dealing with shortages by expanding the number of training programmes, a trailblazer apprenticeship such as the development of a level 7 archaeological specialist scheme. Another scheme was set up for recruiting workers in restoring historic vehicles.

4D.47 Other vocational graduate programmes were also set up to equip graduates with the right skills so that they could enter the workforce immediately. Stakeholders also reported offering more training to graduates and non-graduate trainees.

4D.48 However, the chartered institute for archaeologists stated that these measures led to meeting 65 per cent of the job demands and the remaining 35 per cent were covered by recruiting from the EEA.

4D.49 Stakeholders said they worked closely with universities to attract graduates and through targeted social media recruitment campaigns.

Use of the SOL

4D.50 This SOC Code has not been on the SOL previously.

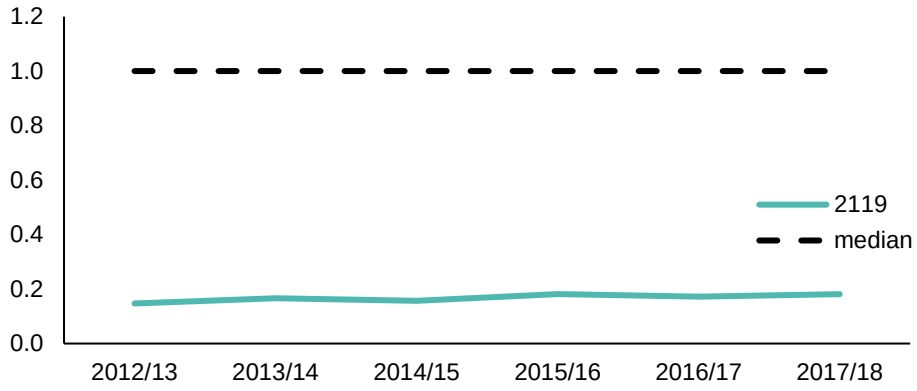
Use of Tier 2 (General)

Year	2014	2015	2016	2017	2018
RCoS Used	18	20	22	38	26

Recommendation

4D.51 We recommend including archaeologists within SOC code 2114 (social and humanities scientists) on the SOL. The occupation ranked fairly low (83rd) in the shortage indicators and the vacancy rate is below average. However, the quantitative evidence captures the entire SOC code and not individual job titles and we received compelling evidence suggesting there is a shortage of archaeologists.

SOC 2119 Natural and social science professionals n.e.c

Summary box: SOC 2119 Natural and social science professionals n.e.c.	
Employment	
Share of UK employees (%, APS, 2017/18)	0.2%
Share of Tier 2 (% total RCoS Used 2015-2018)	9.2%
Share of workforce born in the EEA (ex.UK) (%, APS, 2017/18)	23.0%
Share of workforce born outside the EEA (%, APS, 2017/18)	23.4%
Wages	
Median full-time annual wage (ASHE 2018)	£38,621
Vacancies (Burning Glass job posts/employment relative to median)	
	
Shortage indicator rank	
Shortage overall rank /105	43
Recommendation	
Do not recommend this occupation to be added to the SOL.	

Stakeholder evidence

4D.52 There was limited stakeholder evidence for occupations under this SOC Code, the occupations cited were: research associate in public health and post-doctoral research scientist. One stakeholder indicated that their organisation relied heavily on Tier 2 workers as they had recruited around 90 per cent of all jobs via the Tier 2 route.

Use of the SOL

4D.53 This SOC Code has not been on the SOL previously.

Use of Tier 2 (General)

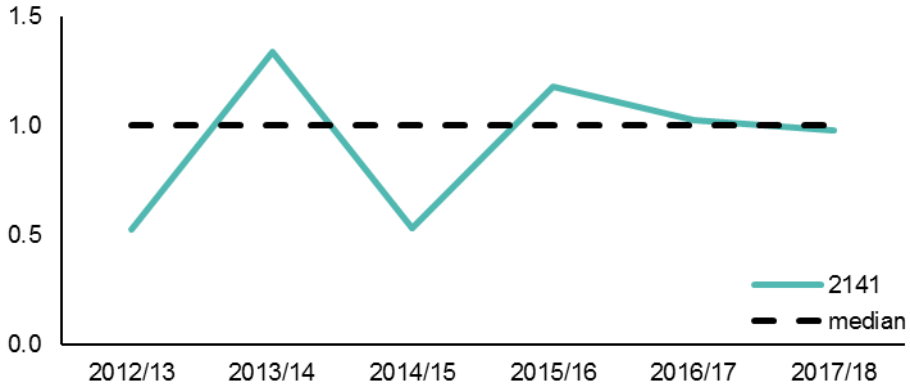
Year	2014	2015	2016	2017	2018
RCoS Used	1,445	1,437	1,490	1,693	2,137

4D.54 The data shows that a large number of workers under this occupation are sponsored through the Tier 2 route, the jobs mainly consist of researchers in universities.

Recommendation

4D.55 We do not recommend including SOC code 2119 (natural and social science professionals n.e.c) on the SOL. The occupation ranks fairly high (43rd) in the shortage indictors but the vacancy rate is below average. There was not sufficient stakeholder evidence to suggest a nationwide shortage and therefore recommend not adding this occupation to the SOL.

SOC 2141- Conservation professionals

Summary box: SOC 2141 Conservation professionals	
Employment	
Share of UK employees (%, APS, 2017/18)	0.1%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.0%
Share of workforce born in the EEA (ex.UK) (%, APS, 2017/18)	2.4%
Share of workforce born outside the EEA (%, APS, 2017/18)	6.4%
Wages	
Median full-time annual wage (ASHE 2018)	£32,786
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	65
Recommendation	
Do not recommend this occupation to the SOL.	

Stakeholder evidence

4D.56 There was limited evidence from stakeholders, the Royal Botanical Gardens Edinburgh reported that there was a workforce risk arising around its ability to recruit specialist scientific posts which may impact on their ability to undertake future research work. Another organisation reported that there was a lack of applicants with the required skills and qualifications.

Use of the SOL

4D.57 This SOC Code has not been on the SOL previously.

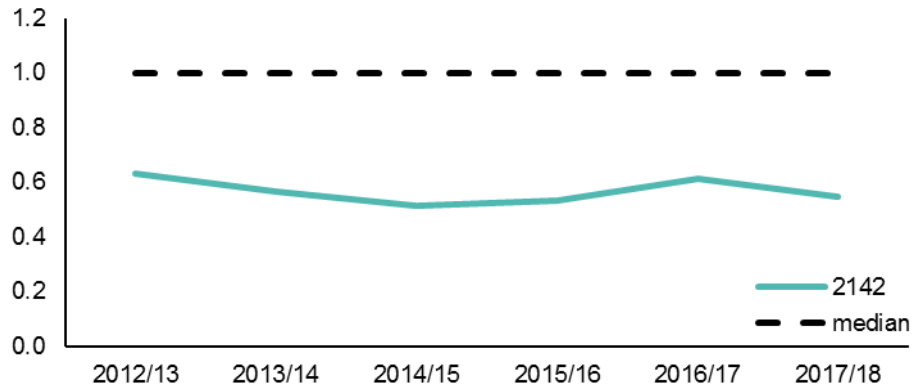
Use of Tier 2 (General)

Year	2014	2015	2016	2017	2018
RCoS Used	1	3	3	1	3

Recommendation

4D.58 We do not recommend including SOC code 2141 (conservation professionals) on the SOL. The occupation ranks fairly low (65th) in our shortage indictors and the vacancy rate is similar to the average of all occupations. We received limited evidence from stakeholders of a nation-wide shortage and on balance there is not enough evidence to suggest adding it to the SOL.

SOC 2142 Environment professionals

Summary box: SOC 2142 Environment professionals	
Employment	
Share of UK employees (%, APS, 2017/18)	0.2%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.1%
Share of workforce born in the EEA (ex.UK) (%, APS, 2017/18)	2.3%
Share of workforce born outside the EEA (%, APS, 2017/18)	9.5%
Wages	
Median full-time annual wage (ASHE 2018)	£32,427
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	57
Recommendation	
Do not recommend this occupation to the SOL.	

Stakeholder evidence

4D.59 As reported earlier in this sub-section, stakeholders had told us that there was a need for environment analysts and radioactive contaminated land specialists in the decommissioning of nuclear plants.

4D.60 Zero Waste Scotland had also highlighted that there was a shortage of environmental analysts reporting that there was a low number of applicants with the required skills and qualifications. They reported that they had recruited two non-EEA workers in the last 12 months using the Tier 2 route.

Use of the SOL

4D.61 SOC Code 2142 was added to the SOL in 2013. The following job titles in the construction related ground engineering industry were added: contaminated land specialist, geo-environmental specialist and landfill engineer.

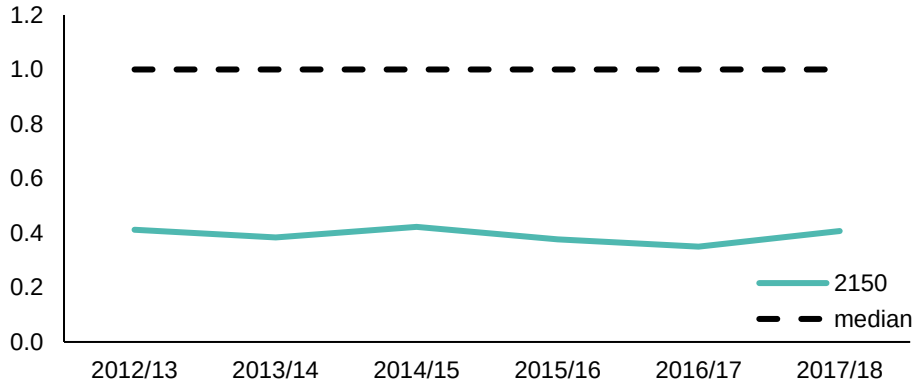
Use of Tier 2 (general)

Year	2014	2015	2016	2017	2018
RCoS Used	14	17	23	23	10

Recommendation

4D.62 We do not recommend including SOC code 2142 (environmental professionals) on the SOL. The occupation ranks fairly low (57th) in the shortage indicators and the vacancy rate is below average. There was insufficient stakeholder evidence that this occupation was in shortage and therefore we do not recommend keeping this occupation on the SOL.

SOC 2150 – Research and development managers

Summary box: SOC 2150 Research and development managers	
Employment	
Share of UK employees (%, APS, 2017/18)	0.2%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.2%
Share of workforce born in the EEA (ex.UK) (%, APS, 2017/18)	7.3%
Share of workforce born outside the EEA (%, APS, 2017/18)	9.7%
Wages	
Median full-time annual wage (ASHE 2018)	£47,044
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	52
Recommendation	
Do not recommend this occupation to the SOL.	

Stakeholder evidence

4D.63 Stakeholders said that there was a shortfall of laboratory manager roles. They also said that there is a lack of students taking up STEM courses at university and that there is intense competition nationally and from international organisations who are competing for skilled workers.

4D.64 The United Kingdom Lubricants Association said they were promoting degree level apprenticeships for their industry and were also offering practical applied training courses which delivered a number of modules to around 50 delegates annually.

Use of the SOL

4D.65 This SOC Code has not been on the SOL previously.

Use of Tier 2 (general)

Year	2014	2015	2016	2017	2018
RCoS Used	30	42	36	45	37

Recommendation

4D.66 We do not recommend including SOC code 2150 (research and development managers) on the SOL. The ranking of the shortage indicators is middle of the range (52nd) and the vacancy rate is below average. This, combined with insufficient stakeholder evidence suggests this occupation is currently not in shortage.

4.E. Digital and IT Occupations

Introduction

4E.1 This section covers the seven Digital and IT-related SOC 2010 codes. These SOC codes predominantly relate to the Digital sector, which will be examined below. However, it is also important to consider the wider context of these digital occupations. We are currently amidst an era of rapid technological advancement and the remit of digital occupations is expanding far beyond this sector. The diversification of these occupations across all industries will, therefore, also be reflected in the analysis.

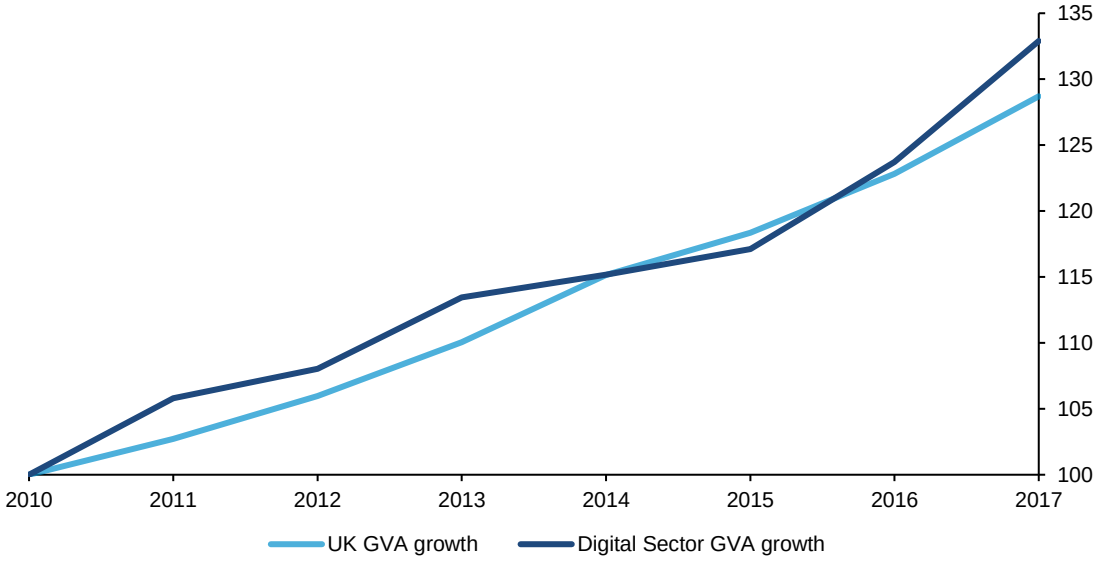
Sector Overview

Growth

4E.2 The digital sector in the UK has seen considerable growth in recent years and contributes substantial value to the economy. According to the DCMS Economic Estimates[96], the digital sector contributed £130.5 billion to the UK economy in 2017, accounting for 7.1 per cent of UK GVA.

4E.3 Figure 4.e.1 below shows the trend in GVA growth of the digital sector in comparison to the whole of the UK. As can be seen, digital sector GVA growth has overtaken UK GVA growth in recent years, with the sector having increased by 32.9 per cent from 2010 to 2017 compared to 28.7 per cent for the total UK economy.

Figure 4.e.1: Index of GVA growth for the digital sector and for the whole of the UK from 2010 to 2017 (2010=100)



Source: DCMS Sectors Economic Estimates 2017 (provisional): Gross Value Added

[96]https://assets.publishing.service.gov.uk/Government/uploads/system/uploads/attachment_data/file/759707/DCMS_Sectors_Economic_Estimates_2017__provisional__GVA.pdf

4E.4 The most recent data from the Tech Nation report (2018)[97] suggests that the UK tech sector is growing 2.6 times faster than the UK economy, indicating that the sector makes a strong positive contribution to overall economic growth.

Rapid technological advancement

4E.5 The rapid growth of the digital sector is a reflection of the advancements in technology and the changing digital landscape we are experiencing today. “The world is undergoing a technological revolution. Artificial intelligence (AI) will transform the way we live and work, from the way we diagnose and treat cancer to the security of online transactions. This fourth industrial revolution is of a scale, speed and complexity that is unprecedented” (BEIS Industrial Strategy, 2017)[98].

4E.6 This technological advancement has two big implications for the future of the economy. First, its impact is not limited to the digital sector but reaches across all sectors and industries. This will propagate a need for a future workforce equipped with basic digital skills as a minimum. “The rapid rate of technological innovations requires the current workforce to continually update their skills to equip them for emerging roles in the sectors in which they work, which have been influenced by new technologies” (DCMS Skills Report, 2016)[99].

4E.7 Adoption of new technologies in the UK is already well evidenced. The latest Eurostat data found that cloud adoption by enterprises in the UK is outpacing the EU average[100]. Furthermore, the Digital Disruption Index report (2019)[101] by Deloitte, discovered that 44 per cent of organisations have already invested in AI and 81 per cent expect to have invested in AI by the end of 2020.

4E.8 Second, this advancement will produce an array of job roles we could not have predicted some ten years ago, such as big data analysts, AI and machine learning specialists and human-machine interaction designers, and the UK will need workers with the relevant technical skills to fill these vacancies. The rapid development of fields such as cybersecurity and AI are prime examples of advancements which were previously unforeseeable. “A recent study found digital technologies including AI created a net total of 80,000 new jobs annually across a population similar to the UK” (BEIS Industrial Strategy, 2017).

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[97] https://35z8e83m1ih83drye280o9d1-wpengine.netdna-ssl.com/wp-content/uploads/2018/05/Tech-Nation-Report-2018-WEB-180514.pdf

[98] https://assets.publishing.service.gov.uk/Government/uploads/system/uploads/attachment_data/file/664563/industrial-strategy-white-paper-web-ready-version.pdf

[99] https://assets.publishing.service.gov.uk/Government/uploads/system/uploads/attachment_data/file/492889/DCMSDigitalSkillsReportJan2016.pdf

[100] https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Cloud_computing_-_statistics_on_the_use_by_enterprises#Use_of_cloud_computing:_highlights

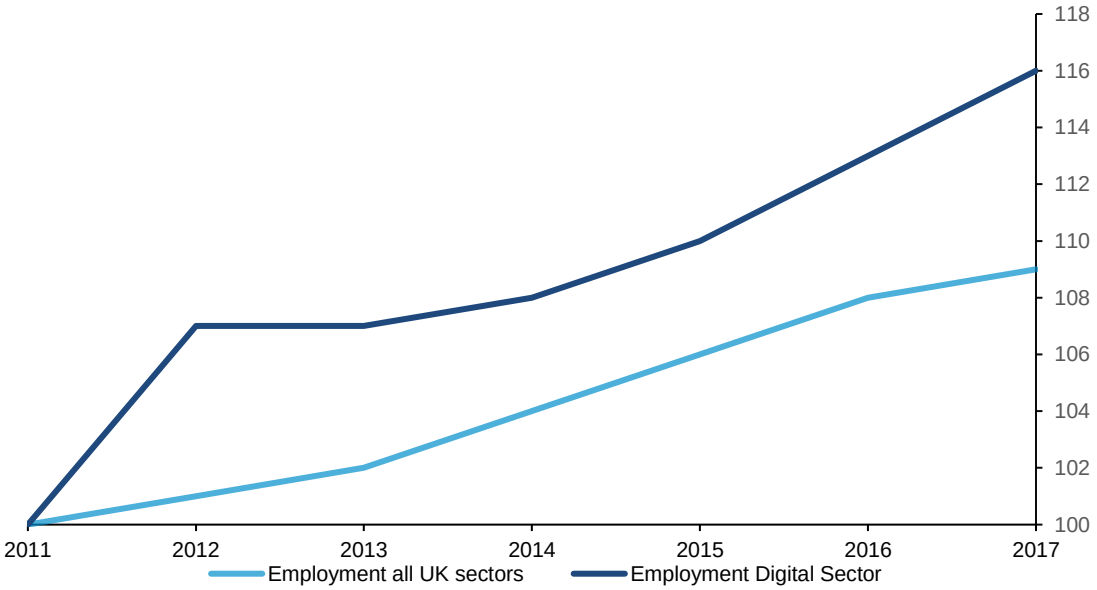
[101] https://www2.deloitte.com/content/dam/Deloitte/uk/Documents/consultancy/deloitte-uk-digital-disruption-index-2019.pdf

Employment

4E.9 The growth of the digital sector and the technological revolution has subsequently led to an influx in the number of jobs created in recent years. The Tech Nation report (2018) states that employment in the digital tech sector increased by 13.2 per cent between 2014 and 2017.

4E.10 Figure 4.e.2 below compares the employment growth for the Digital Sector compared to all UK sectors from 2011-2017. There is a clear distinction between the two trends with DCMS statistics reporting that the digital sector has seen 16 per cent employment growth over this period compared to just 9.3 per cent for all sectors of the UK[102].

Figure 4.e.2: Index of employment growth for the digital sector and for the whole of the UK from 2011 to 2017 (2011=100)



Source: DCMS Sectors Economic Estimates 2017 (provisional): Employment

4E.11 A common perception is that the digital industry in the UK is localised within big cities, especially London. The Tech Nation report (2018) explored the digital tech density in 'Travel to Work Areas' across the UK in 2017 and found that employment was actually distributed across suburbs; "Areas such as Guildford, Aldershot, Slough and Heathrow have significantly higher digital tech density and the highest levels of employment and tech turnover, suggesting that the UK has emerging digital suburbs. This finding challenges the conventional view that UK tech activity is based in large cities".

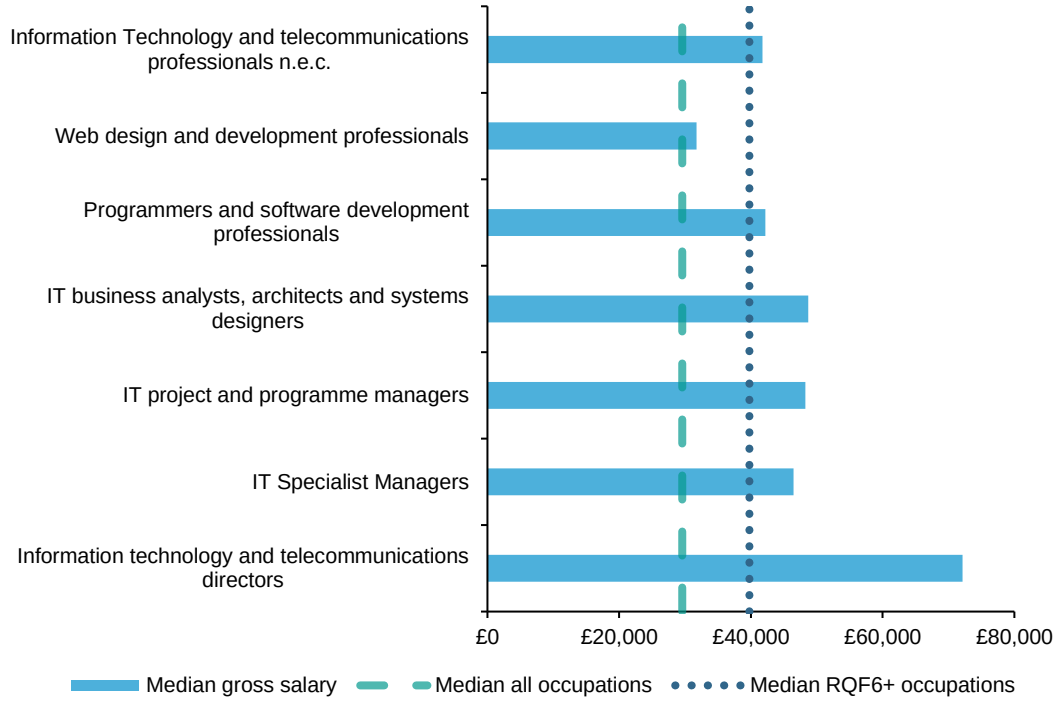
[102]https://assets.publishing.service.gov.uk/Government/uploads/system/uploads/attachment_data/file/726136/DCMS_Sectors_Economic_Estimates_2017_Employment_FINAL.pdf

Pay

4E.12 Strong growth and rising employment in the digital sector is paralleled with above median salaries for digital and IT occupations.

4E.13 Figure 4.e.3 below shows the median gross full-time annual pay for each of the Digital and IT SOC codes. As illustrated, the median salaries of each of these occupations fall well above the national median and all but one SOC code is above the median of those occupations classified at RQF6+.

Figure 4.e.3: Median gross full-time annual salaries of digital and IT occupations, 2018



Source: ASHE 2018

4E.14 Jobs requiring digital skills often pay more. “Jobs requiring digital tech skills command higher salaries, on average, £42,578 compared to £32,477 per year (non-digital), while digitally enabled jobs - those requiring only some engagement with digital tech - bring in £35,227”. (Tech Nation, 2018)

4E.15 Table 4.e.1 below illustrates the percentage change in median gross annual pay, of full-time employees, for digital and IT occupations over one and three-year periods, with reference to the change experienced across all occupations.

Table 4.e.1: Change in median gross annual full-time pay of digital and IT occupations			
SOC Code	**Description**	**Change over 1 year (2017-18)**	**Change over 3 years (2015-2018)**
1136	Information technology and telecommunications directors	2.4%	10.4%
2133	IT Specialist Managers	-1.4%	2.1%
2134	IT project and programme managers	-5.9%	-3.3%
2135	IT business analysts, architects and systems designers	7.2%	12.5%
2136	Programmers and software development professionals	2.1%	6.2%
2137	Web design and development professionals	4.5%	6.2%
2139	Information Technology and telecommunications professionals n.e.c.	6.0%	9.9%
All SOC codes	All UK employees	2.8%	7.1%

Source: ASHE 2018

4E.16 All but three SOC codes (2133, 2136 and 2134) have experienced pay growth in line with or above that of all UK employment. The period from 2015-2018 demonstrates considerable growth in pay for three of the occupations, outstripping that of the UK median.

Sector issues

4E.17 Although the digital sector has experienced substantial growth in the UK within the last few years, there still exist underlying issues, both within the sector and beyond, which are a cause for concern; these will be explored below.

Digital Skills gap

4E.18 Several sources amongst Government and the private sector have agreed that there is a shortage of digital skills within the UK. This is evidenced by consistent vacancies in digital occupations, growth in demand for digital skills as well as documented deficiencies across the population in terms of digital skill.

4E.19 The DCMS has reported widely on perceived shortages in the digital sector in the UK: “Continuing skill shortages threaten to hinder the achievement of the productivity gains expected through the use of digital technologies, in up to half of all companies, and particularly in areas such as advanced manufacturing and 3-D printing, as well as the need to progressively re-train employees whose jobs may be replaced through increasing automation of manual jobs, in areas such as logistics, or even brick-laying” (DCMS Skills Report, 2016).

4E.20 Research conducted by Deloitte earlier this year, emphasises the severity of the digital skills gaps in the UK. The Digital Disruption Index (2019) disclosed that only 18 per cent of business leaders believe that school leavers and graduates have the right digital skills and experience, up from 12 per cent six months earlier. Additionally, only 25 per cent of digital leaders in the UK believe their workforce has sufficient knowledge and expertise to execute their digital strategy.

4E.21 "Despite digital leaders' perception of skills amongst new and current workers improving, more needs to be done to keep up with the pace of the adoption of new technologies within the workplace. As many as three-quarters of digital leaders in the UK report that technologies such as artificial intelligence (AI), robotics and the Internet of Things, are fundamentally changing their organisation" (Deloitte, 2019)[103].

4E.22 This digital skills gap has considerable implications for the future UK economy. A report by Accenture[104] has calculated that the UK economy could forgo as much as £141.5 billion[105] of the GDP growth promised by investment in intelligent technologies by 2028, should the failure to close this digital skills gap continue.

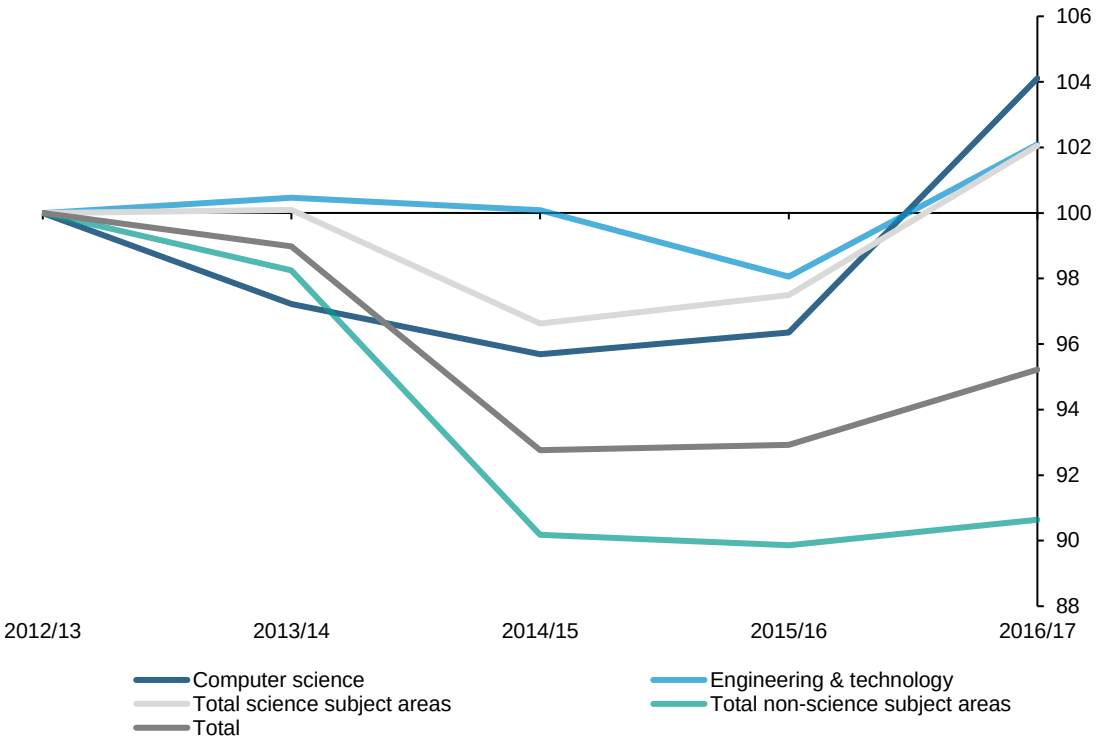
Misalignment of skills of UK computing graduates

4E.23 Figure 4.e.4 below shows the indexed growth in the number of graduates of computer science and engineering and tech related degrees in the UK, from 2013 to 2017. This has been benchmarked against the total graduates and the total graduates within science and non-science subject areas for comparison.

4E.24 In 2017 there was an increase in the number of those graduating in a computer science related degree, relative to 2013. This growth is slightly more than that experienced in engineering and tech related subjects and the total science subjects cohort. Interestingly, over the same period, the total number of graduates produced each year has been considerably lower than 2013 levels.

[103] https://www2.deloitte.com/uk/en/pages/press-releases/articles/digital-skills-gap-narrows-but-still-persists-from-classroom-to-boardroom.html
[104] https://www.accenture.com/t00010101T000000Z__w__/gb-en/_acnmedia/Thought-Leadership-Assets/PDF/Accenture-Education-and-Technology-Skills-Research.pdf#zoom=50
[105] https://www.consultancy.uk/news/18895/digital-skills-gap-could-cost-uk-1415-billion-in-gdp-growth

Figure 4.e.4: Index growth in number of graduates per subject area from 2012/13 to 2016/17 (2012/13=100)



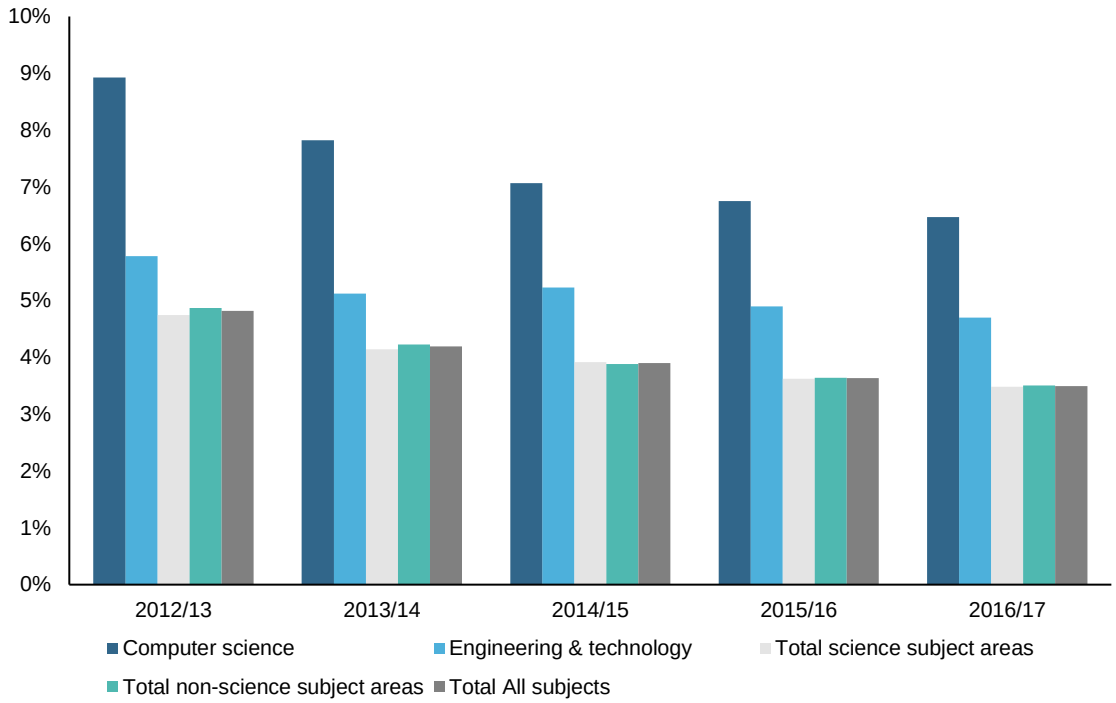
Source: Higher Education Statistics Agency

4E.25 The data suggests that computer science and engineering and tech graduates therefore increased as a proportion of the total graduate base over this 5-year period. This implies that the availability of those with a digital background within the UK is not the primary factor contributing to the digital skills gap.

4E.26 If graduate availability is not the primary contributing factor, then perhaps the digital skills learned in these degrees misaligns with employer's needs. This explanation may go some way to explain the high proportion of unemployed computer science and engineering and tech graduates, presented in figure 4.e.5 below, despite the notable shortage of digital skills in the economy.

4E.27 As displayed, there is a marked difference each year in the proportion of unemployed 'computer science' and 'engineering and tech' graduates, six months after graduation, relative to the total graduate base and graduates within science and non-science subject areas. Although the proportions have fallen slightly over the years, they remain two of the highest compared to all other subjects, with computer science ranked as the subject with the least employability prospects each year.

Figure 4.e.5: Proportion of graduates per subject area reported to be unemployed 6 months after graduation, from 2013 to 2017



Source: Higher Education Statistics Agency

4E.28 The Shadbolt Review of Computer Sciences Degree Accreditation and Graduate Employability[106], conducted in 2016, looked to explain the underlying reasons behind the high unemployment rates of 'computer science' graduates. The findings uncovered a multidimensional picture as the explanation could not be attributed to any one area. However, the evidence did point to a clear misalignment between the skills that graduates were equipped with and those demanded from employers. The differing range of expectations from employers added complexity, with disagreement on the necessary technical skills, but on balance there seemed to be a push for HE providers to teach the fundamental principles of computer science and to equip students with the ability to adapt to new technologies, in response to the fast-changing computer science landscape.

4E.29 The review highlighted the need for accreditation to adapt. "Accreditation should seek to support greater interaction between industry and HE, providing the mechanism to influence the design of degree programmes and an avenue for articulating the changing requirements of industry".

4E.30 Moreover, the importance of work experience was commonly cited in the evidence, with employers regarding it very highly for employability but graduates failing to recognise its benefits. The review pushed for more engagement from HE providers, employers and other various organisations to promote and remove barriers for computer science students to undertake work experience.

[106]https://assets.publishing.service.gov.uk/Government/uploads/system/uploads/attachment_data/file/518575/ind-16-5-shadbolt-review-computer-science-graduate-employability.pdf

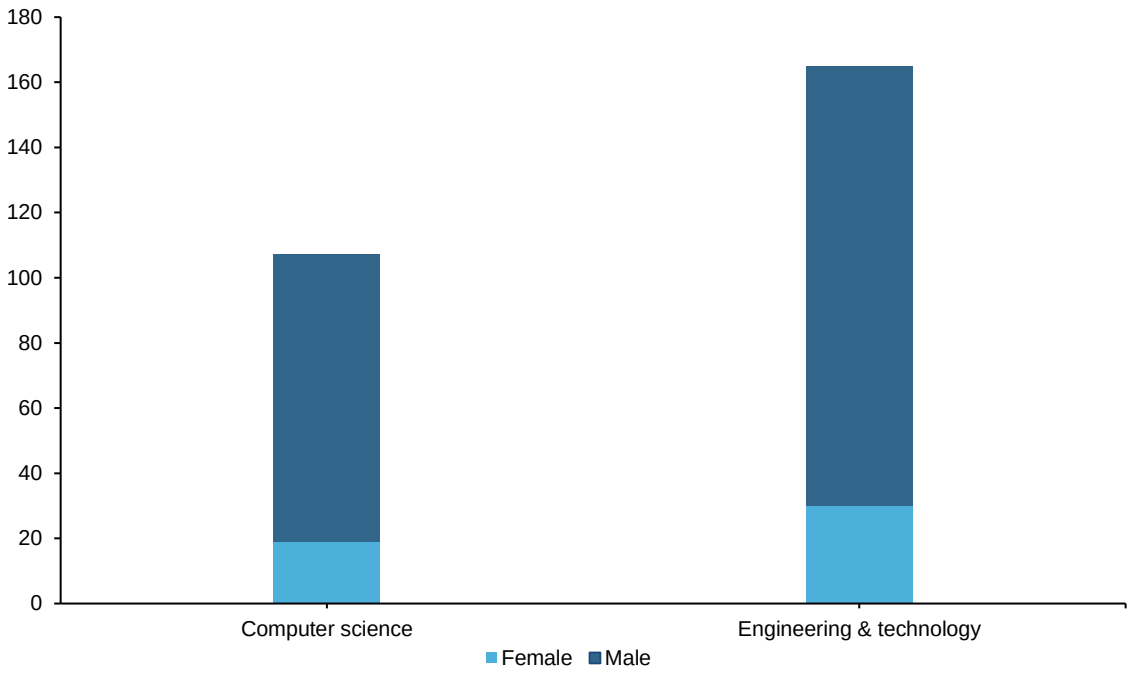
Gender disparity

4E.31 According to the Tech Nation Report (2018), only 19 per cent of the digital tech workforce is female, compared to 49 per cent across all UK jobs. The industry is very much underrepresented by females and this can lead to a perception that the digital industry is more geared towards men, deterring women from wanting to enter the industry all together.

4E.32 A substantial part of this gender disparity can be attributed to the educational pipeline and the difference between males and females studying digital and tech related subjects.

4E.33 Figure 4.e.6 below shows the proportion of male and female students who studied 'computer science' and 'engineering and tech' related degrees at University level in the UK from 2017 to 2018. There is a clear disparity between males and females in these subject areas which needs addressing.

Figure 4.e.6: Higher Educations students by subject area and sex in academic year 2017/18 (000s)



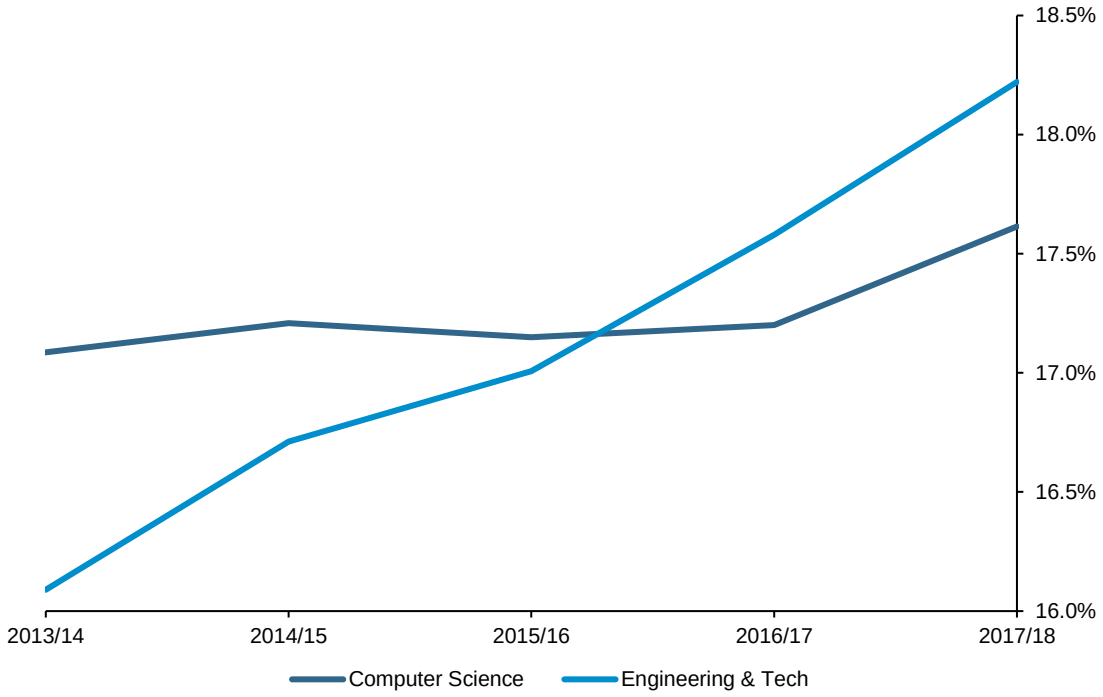
Source: Higher Education Statistics Agency

4E.34 One reason for the low proportion of female students in digital and IT related subjects is that occupations in these areas are widely perceived to be male orientated. For instance, a DCMS study, focusing on Cyber Security skills development, stated that "One important factor leading to the gender imbalance is the perception that cyber security is male-orientated and 'geeky'. The low participation of female students in courses relevant to cyber security and the low awareness of the career opportunities in the field (which affects both women and men), limits the flow of female recruits into cyber security roles" (Identifying the

Role of Further and Higher Education in Cyber Security Skills Development, 2018)[107].

4E.35 There have been recent improvements indicated by a rise in the proportion of females studying 'computer science' and 'engineering and tech' related subjects over the past five years, as shown in figure 4.e.7 below. However, this rise is somewhat modest in the context of the bigger picture. The proportion remains below 20 per cent signifying that there is a lot of progress to be made before parity is reached.

Figure 4.e.7: Percentage of females studying computer science and engineering & tech subjects



Source: Higher Education Statistics Agency

Steps being taken to tackle the issues

4E.36 The issues facing the digital sector are widely known and various provisions have been put in place by the Government and other organisations, in an attempt to tackle them. Some of the main strategies are summarised below.

UK Digital Strategy 2017[108]

4E.37 This is an in-depth strategy published by the DCMS to create a world-leading digital economy in the UK. It applies the framework used by BEIS in the aforementioned industrial strategy, to the digital economy specifically. The

[107]https://assets.publishing.service.gov.uk/Government/uploads/system/uploads/attachment_data/file/767425/The_role_of_FE_and_HE_in_cyber_security_skills_development.pdf

[108] https://www.gov.uk/Government/publications/uk-digital-strategy/uk-digital-strategy

strategy outlines a set of ambitions and the provisions that have been, or are to be, put in place to achieve these.

4E.38 Steps have already been taken to reach these targets. Over £9.5 million has been spent to support almost 800,000 people to gain basic digital skills, through the 'Future Digital Inclusion' and 'Widening Digital Participation' programmes. Furthermore, the 'Digital Skills Partnership'[109] was set up which brings together public, private and charity sector organisations to help increase the digital capability of individuals and organisations in England.

4E.39 There has been a significant focus on digital skills in the education space. Teaching coding to children in primary and secondary schools was mandated, as part of the national curriculum, in 2014. On the further education front, the DCMS introduced new 'digital degree apprenticeships' designed by groups of employers to ensure that apprentices are equipped with the relevant applicable skills for the occupation.

Cyber Security Skills Strategy (2019)[110]

4E.40 As part of the National Cyber Security Strategy (NCSS) published in 2016, the DCMS has extensively engaged with industries, professional organisations, students, employers, existing cyber security professionals and academics to gain an understanding of the challenges facing the cyber security space.

4E.41 Following the engagement, they found overwhelming evidence of skills shortages in this area and decided to implement a specific strategy to tackle this, in line with the strategic outcome set out in the NCSS: "to ensure that 'the UK has a sustainable supply of home-grown cyber skilled professionals to meet the growing demands of an increasingly digital economy, in both the public and private sectors, and defence"[111].

4E.42 The Cyber Security Skills Strategy does seek to go beyond this and address the broader cyber security capability gap across the UK as part of the objective to become the world's leading digital economy. This has been proposed through a range of channels, including shaping the education and training systems and taking steps to embed cyber security across all sectors and industries.

Athena SWAN

4E.43 Advance HE (previously the Equality Challenge Unit) established a charter in 2005 known as Athena SWAN. This was set up to "encourage and recognise commitment to advancing the careers of women in science, technology, engineering, maths and medicine (STEMM) employment in higher education and research"[112].

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[109] https://www.gov.uk/guidance/digital-skills-partnership

[110] https://www.gov.uk/Government/publications/cyber-security-skills-strategy/initial-national-cyber-security-skills-strategy-increasing-the-uks-cyber-security-capability-a-call-for-views-executive-summary#introduction

[111]https://assets.publishing.service.gov.uk/Government/uploads/system/uploads/attachment_data/file/567242/national_cyber_security_strategy_2016.pdf

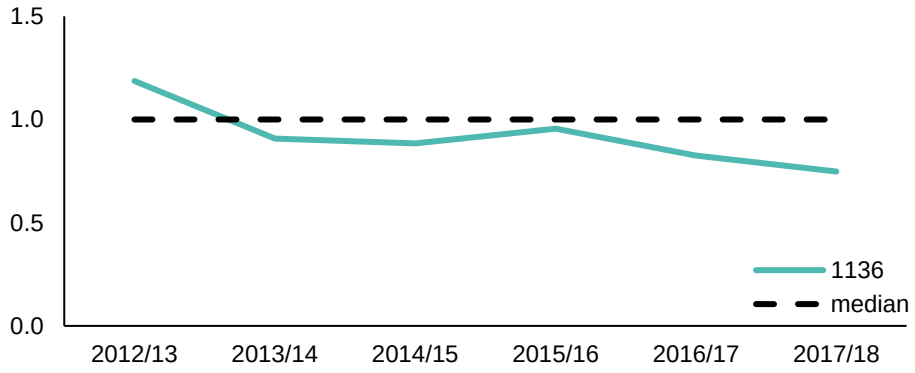
[112] https://www.ecu.ac.uk/equality-charters/athena-swan/

4E.44 The Athena SWAN Charter looks to promote 10 key principles which address issues surrounding female underrepresentation, discrimination and the gender pay gap and supports institutions to adopt these within their policies, practices and culture.

4E.45 The charter was expanded in 2015 to recognise a variety of occupations and industries beyond STEMM and now focuses on gender equality issues more broadly rather than focusing solely on barriers to progression that affect women.

Occupations under consideration

SOC 1136- Information technology and telecommunications directors

Summary table: SOC 1136 Information technology and telecommunications directors	
Employment	
Share of UK employees (%, APS, 2017/18)	0.3%
Share of Tier 2 (General) (% total RCoS Used 2015-2018)	0.2%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	6.2%
Share of employees born outside the EEA (%, APS, 2017/18)	9.8%
Wages	
Median full-time annual wage (ASHE 2018)	£72,109
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2 (General))	
	
Shortage indicator rank	
Shortage overall rank /105	25
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder evidence

4E.46 Stakeholders highlighted job shortages of IT and Assistant IT directors, Business Information Security Directors and Business & Finance System directors.

4E.47 Stakeholders outlined that the main reasons for these shortages can be attributed to the low quantity of applicants with the required skills and qualifications for the job.

4E.48 Increased recruitment activity through new channels, such as direct sourcing to reach passive candidates with the right skills and the use of agencies were a common strategy amongst the stakeholders, to mitigate these shortages.

4E.49 Wage increases to attract more people into these roles was also mentioned. This is very much in line with the data on wages reported at the beginning of this sub-chapter, which signified a considerable rise of 10 per cent in median gross annual pay over one year (2017-2018) for occupations falling under SOC 1136.

4E.50 The main concerns relayed by our stakeholders surrounded the issue of the length of time taken in filling these vacancies. This delay in recruitment incurred additional costs for these organisations, resulting from the increase in recruitment activity and loss of efficiency during this period.

Use of the SOL

4E.51 SOC 1136 is not currently on the SOL.

Use of Tier 2 (General)

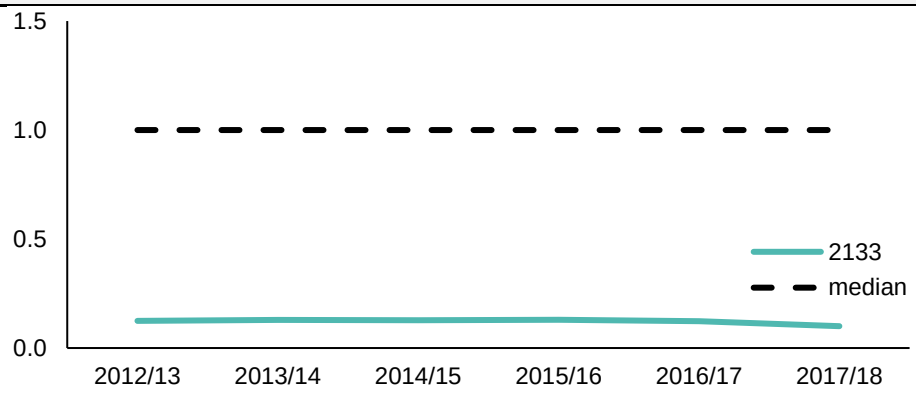
Year	2014	2015	2016	2017	2018
RCoS Used	21	26	42	27	37

4E.52 The data shows a general rise in RCoS usage over the years, despite some peaks and troughs. The RCoS usage between 2017-2018 saw a 37 per cent increase but, in terms of raw numbers, this is only an increase of 10. This SOC code accounts for only 0.2 per cent of the total Tier 2 (General) usage.

Recommendation

4E.53 We do not recommend including SOC code 1136 (information technology and telecommunications directors) on the SOL. Despite ranking highly on our shortage indicators (25th), the vacancy rate is below average and there was insufficient stakeholder evidence that this occupation was in shortage.

SOC 2133 - IT specialist managers

Summary table: SOC 2133 IT specialist managers	
Employment	
Share of UK employees (%, APS, 2017/18)	0.7%
Share of Tier 2 (General) (% total RCoS Used 2015-2018)	0.7%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	6.3%
Share of employees born outside the EEA (%, APS, 2017/18)	9.8%
Wages	
Median full-time annual wage (ASHE 2018)	£46,465
Vacancies Burning Glass job posts/employment relative to median of occupations eligible for Tier 2 (General))	
	
Shortage indicator rank	
Shortage overall rank /105	73
Recommendation	
Recommend removing from SOL	

Stakeholder evidence

4E.54 Stakeholders highlighted job shortages of various IT Managers, network engineers and network architects. They mentioned the main reason was that there was a low number of applicants generally for these roles.

4E.55 Expanding the scope of recruitment was a common tactic amongst the stakeholders when tackling shortages. They mentioned the increased use of social media channels such as LinkedIn and Facebook, as well as using recruitment agencies in sourcing potential candidates. These have helped to raise the visibility of these companies and have allowed them to promote their image to a wider talent pool.

4E.56 Two of our stakeholders also mentioned their long-term plans to launch recruitment campaigns in 2019. One mentioned a 'Recruitment and Resourcing Strategy', focusing on the measures above, in addition to, various other strategies such as benefits packages, family friendly policies, flexible working and generous pension schemes. Another mentioned a redesign of their marketing strategy which analyses problem shortage areas and looks to attract candidates

specifically to those roles. The impact of these will not be seen until further down the line however.

4E.57 Although these shortages have not been critically damaging to business, as our stakeholders have indicated, they have caused their current employees to be overloaded with work pressures and in some instances, led to a loss of business as there are not enough resources to take on the task.

Use of the SOL

4E.58 Currently, only the following job within SOC 2133, is present on the SOL: IT Product manager (someone who has oversight of the design and delivery of the product) employed by a qualifying company, where the job requires a person with a minimum of five years' relevant experience and demonstrable experience of having led a team.

Use of Tier 2 (General)

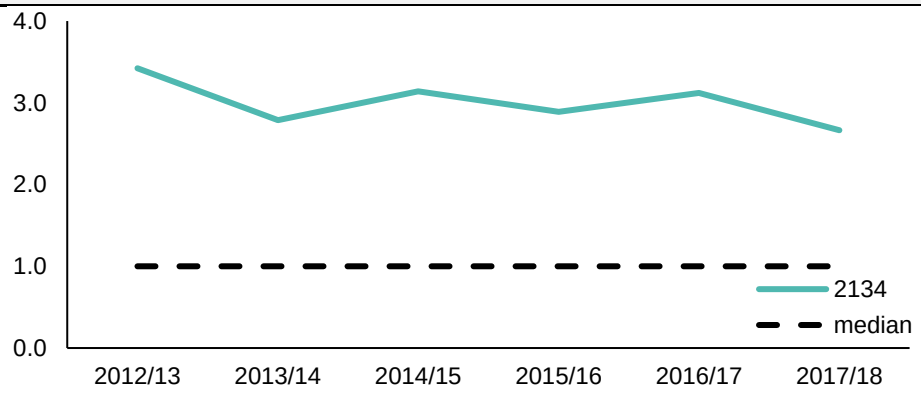
Year	2014	2015	2016	2017	2018
RCoS Used	100	89	135	110	149

4E.59 Much like for the previous SOC code, the data shows a rising trend in RCoS usage despite peaks and troughs through the years. The CoS usage saw a 35 per cent rise from 2017-2018.

Recommendation

4E.60 We do not recommend including SOC code 2133 (IT specialist managers) on the SOL. The occupation ranks fairly low in our shortage indicators (73rd), the vacancy rate is below average and stakeholders have told us of successful recruitment campaigns in the sector. Therefore, we do not recommend adding the occupation to the SOL and there is insufficient evidence to retain IT product managers on the SOL

SOC 2134 – IT project and programme managers

Summary table: SOC 2134: IT project and programme managers	
Employment	
Share of UK employees (%, APS, 2017/18)	0.2%
Share of Tier 2 (General) (% total RCoS Used 2015-2018)	1.1%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	3.9%
Share of employees born outside the EEA (%, APS, 2017/18)	20.0%
Wages	
Median full-time annual wage (ASHE 2018)	£48,262
Vacancies Burning Glass job posts/employment relative to median of occupations eligible for Tier 2 (General))	
	
Shortage indicator rank	
Shortage overall rank /105	22
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder evidence

4E.61 Stakeholders highlighted job shortages of IT project managers and advertising technology managers.

4E.62 Stakeholders outlined that the main reasons for these shortages can be attributed to the low quantity of applicants with the required skills, qualifications and attitude for the job. One of our stakeholders reported that these strategies, in conjunction with in-house technical upskilling and salary benchmarking, were successful in filling their roles.

Use of the SOL

4E.63 SOC 2134 is not currently on the SOL.

Use of Tier 2 (General)

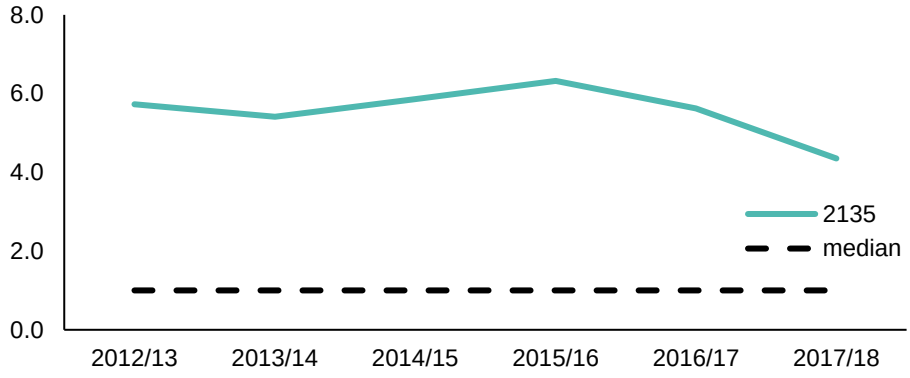
Year	2014	2015	2016	2017	2018
RCoS Used	143	199	184	206	241

4E.64 There has been rising trend in the RCoS used for SOC 2134 since 2016.

Recommendation

4E.65 We do not recommend including SOC code 2134 (IT project and programme managers) on the SOL. Although the occupation ranks highly in our shortage indicators (22nd) and the vacancy rate is above average, there was insufficient stakeholder evidence that this occupation was in shortage.

SOC 2135 – IT business analysts, architects and systems designers

Summary table: SOC 2135 IT business analysts, architects and systems designers	
Employment	
Share of UK employees (%, APS, 2017/18)	0.4%
Share of Tier 2 (General) (% total RCoS Used 2015-2018)	4.3%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	3.8%
Share of employees born outside the EEA (%, APS, 2017/18)	15.7%
Wages	
Median full-time annual wage (ASHE 2018)	£48,703
Vacancies Burning Glass job posts/employment relative to median of occupations eligible for Tier 2 (General))	
	
Shortage indicator rank	
Shortage overall rank /105	2
Recommendation	
Recommend expanding to include entire occupation	

Stakeholder evidence

4E.66 Stakeholders highlighted job shortages in roles such as: IT business analysts, systems engineers and user experience (UX) designers.

4E.67 All our stakeholders share the view that the main reason for shortage for these roles is that there is a lack of individuals with the required skills in the current talent pool. The sector overview above described how we are amidst an era of 'technological advancement' which has created, and continues to create, a need

for roles with specialist technical knowledge, such as within AI. The demand for these roles has outstripped supply, not just in the UK but globally.

> *Another important thing to note is that this is not a UK problem but a worldwide problem and without looking to include the global market as part of our talent pool (as many other countries are already doing) we will fall behind in this vital and evolving technology sphere"*
>
> Rolls Royce Plc, response to MAC SOL call for evidence

4E.68 In immediate response to these shortages, stakeholders reported an increase in their overheads through implementing additional marketing strategies and increasing salaries to attract the right candidates for these roles. However, there remain vacancies which have been unfilled for significant lengths of time, especially for those roles which are of a specialist nature. Whilst there is indication that there are strategies in place by our respondents to up-skill the current workforce, the common view is that these are simply not agile enough to keep up with the pace of technological change, especially when the current supply is in severe shortage.

4E.69 Stakeholders have indicated that these shortages have made it increasingly difficult to remain competitive. The evidence illustrates that there has been a trade-off between recruitment costs and investment in product development, with the latter taking a hit. This has made it increasingly difficult to remain globally competitive in an age of technological expansion.

Use of the SOL

4E.70 The 2013 full review of the SOL recommended the following job title within visual effects and 2D/3D computer animation for film, television or video games sectors: systems engineer.

4E.71 The 2015 partial review of the SOL recommended to retain the above and add the following job title: data scientist with five or more years documented evidence of related on-the-job experience and demonstrable experience of leading a team.

Use of Tier 2 (General)

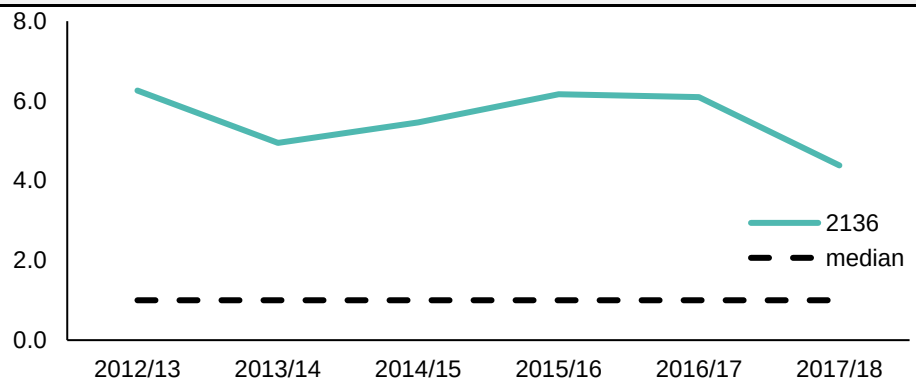
Year	2014	2015	2016	2017	2018
RCoS Used	679	811	756	765	839

4E.72 Following a fall from 2015-2016, usage is on the rise again, with a considerable increase from 2017-2018. This SOC code is one of the heaviest users of RCoS.

Recommendation

4E.73 We recommend including SOC code 2135 (IT business analysts, architects and systems) on the SOL. The occupation is one of the most in shortage according to our ranking (2nd) and its vacancy rate is above average. In addition, there is overwhelming stakeholder evidence of shortage. Applying conditionality to our recommendation (as we have done before) is no longer feasible as demand for these roles is significantly outstripping supply in the UK and there is clear evidence of competition for these skills across sectors. Furthermore, job titles in the digital and IT sector evolve very quickly; given this, recommending specific job titles would not be sensible. Therefore, we recommend including the entire occupation on the SOL.

SOC 2136 – Programmers and software development professionals

Summary table: SOC 2136 Programmers and software development professionals	
Employment	
Share of UK employees (%, APS, 2017/18)	1.1%
Share of Tier 2 (General) (% total RCoS Used 2015-2018)	8.7%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	6.9%
Share of employees born outside the EEA (%, APS, 2017/18)	23.0%
Wages	
Median full-time annual wage (ASHE 2018)	£42,173
Vacancies Burning Glass job posts/employment relative to median of occupations eligible for Tier 2 (General))	
	
Shortage indicator rank	
Shortage overall rank /105	1
Recommendation	
Recommend expanding to include entire occupation	

Stakeholder evidence

4E.74 Stakeholders highlighted job shortages in roles such as: programmers, software developers and software engineers.

4E.75 The reasons for shortage for this SOC code heavily resembles that which has been said for the previous SOC code, which is that there is severe shortage of applicants with the required skills. Our stakeholders have emphasised that jobs within this SOC code are vital in ensuring successful technological advancements and competitiveness.

4E.76 The basic mitigations used by employers and their limited impact again resemble those mentioned for the previous SOC code such as expanding recruitment channels and increasing wages. Many organisations have looked to seek skills across the border since there is fierce competition for a limited supply.

4E.77 There have also been mentions of many intra-industry strategies in attempting to plug skills gaps. For instance, UK Screen Alliance have outlined numerous apprenticeship developments for the animation and VFX industry, TIGA have developed an accreditation programme for the gaming industry and BEIS mentioned the Technician Commitment (a sector-wide initiative led by the Science Council, supported by the Gatsby Foundation to help address key challenges facing technical staff working in research)[113].

4E.78 Although these are long-term strategies and don't solve the immediate skills gap, there is a strong message relayed to us that these will prove to be essential in securing the future talent pool. This is in line with the suggestions in the aforementioned Shadbolt review (2016).

Use of the SOL

4E.79 The 2013 full review of the SOL recommended:

"*The following job titles within visual effects and 2D/3D computer animation for film, television or video games sectors:*
Software developer, Shader writer and Games designer.

The following job titles within the electronics system industry:
Driver developer and Embedded communications engineer."

4E.80 The 2015 partial review of the SOL recommended to retain the above and add the following job title:
"*Senior developer employed by a qualifying company, where the job requires a person with a minimum of five years' relevant experience and demonstrable experience of having led a team*"

Use of Tier 2 (General)

Year	2014	2015	2016	2017	2018
RCoS Used	1,246	1,537	1,302	1,581	2,014

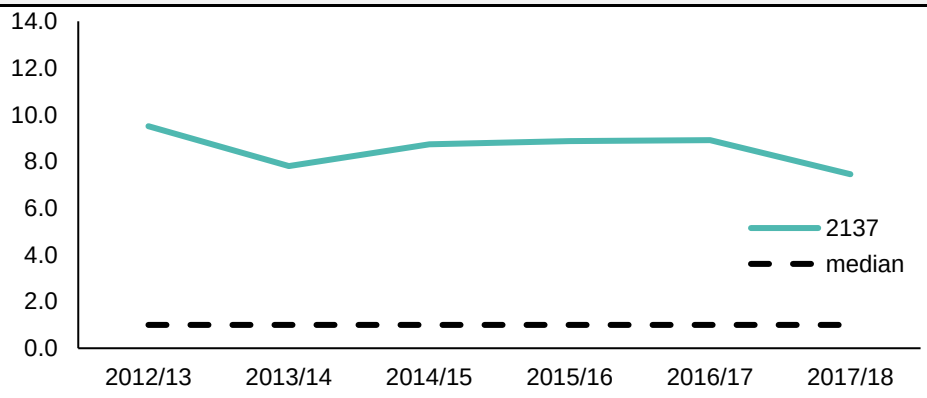
4E.81 RCoS usage is considerably high for this SOC code, reaching over 2000 in 2018. The period from 2016-2018 saw a considerable spike (50 per cent increase), in line with the evidence from our stakeholders who mentioned recruiting from abroad as a strategy to fill vacancies.

[113] https://sciencecouncil.org/employers/technician-commitment/

Recommendation

4E.82 We recommend including SOC code 2136 (programme and software development professionals) on the SOL. The occupation tops our shortage indicators' ranking and has had above average vacancy rate, The stakeholder evidence clearly reflected the increased and expanded remit of digital and IT occupations beyond the digital sector and their scope now reaches across all sectors and industries. This is evidently recognisable through the diversity in our call for evidence respondents. All indications point to a shortage of roles within this occupation, not just within certain industries but across the board.

SOC 2137 – Web design and development professionals

Summary table: SOC 2137 Web design and development professionals	
Employment	
Share of UK employees (%, APS, 2017/18)	0.2%
Share of Tier 2 (General) (% total RCoS Used 2015-2018)	0.7%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	10.5%
Share of employees born outside the EEA (%, APS, 2017/18)	7.5%
Wages	
Median full-time annual wage (ASHE 2018)	£31,732
Vacancies Burning Glass job posts/employment relative to median of occupations eligible for Tier 2 (General))	
	
Shortage indicator rank	
Shortage overall rank /105	35
Recommendation	
Recommend adding entire occupation to the SOL	

Stakeholder evidence

4E.83 Stakeholders highlighted job shortages in roles such as: Web designers & developers, UX designers and VFX designers.

4E.84 The evidence received pointed to two common reasons for shortage which are that there is fierce competition with other sectors and industries for people with

these skills, and, that there are very few candidates with the required skills applying. This combination has dampened recruitment.

4E.85 Stakeholders have indicated to us that they have expanded their recruitment channels and increased wages to attract more people into these roles. The latter is very much in line with the wage data at the beginning of this sub-chapter, which signified a 3.3 per cent rise in median gross annual pay over 1 year (2017-2018) for occupations falling under SOC 2137.

4E.86 The common view is that these mitigations have not really helped, and shortages have slowed business and cost potential profit. For those siting within the fast-paced tech industries, it has been difficult to keep up with demand and this has caused internal pressures due to increased workloads for existing employees.

Use of the SOL

4E.87 Currently, SOC 2137 is not present on the SOL. This report is the first to consider Web design and development professionals in detail.

Use of Tier 2 (General)

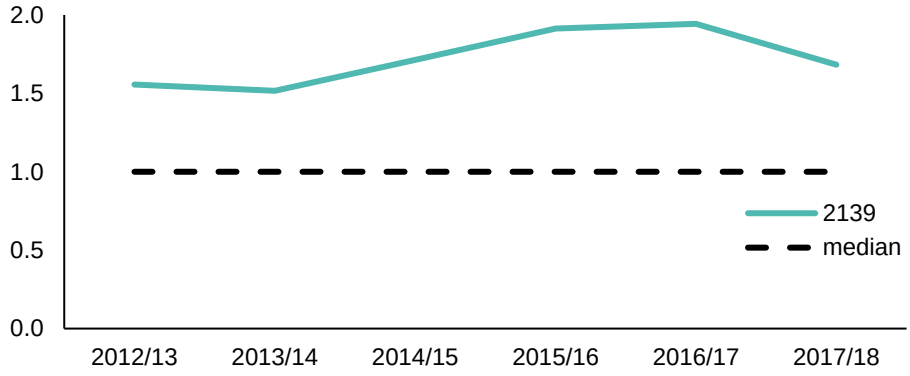
Year	2014	2015	2016	2017	2018
RCoS Used	140	152	103	114	110

4E.88 There was a drop in RCoS usage from 2015 to 2016, but the last two years have seen a stable trend.

Recommendation

4E.89 We recommend including SOC code 2137 (web design and development professionals) on the SOL. The occupation ranks fairly high (35th) in our shortage indicators and has an above average vacancy rate. The stakeholder evidence also highlighted shortages within the occupation.

SOC 2139 – Information technology and telecommunications professionals n.e.c.

Summary table: SOC 2139: Information technology and telecommunications professionals n.e.c.	
Employment	
Share of UK employees (%, APS, 2017/18)	0.5%
Share of Tier 2 (General) (% total RCoS Used 2015-2018)	1.6%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	4.6%
Share of employees born outside the EEA (%, APS, 2017/18)	22.0%
Wages	
Median full-time annual wage (ASHE 2018)	£41,778
Vacancies Burning Glass job posts/employment relative to median of occupations eligible for Tier 2 (General))	
	
Shortage indicator rank	
Shortage overall rank /105	11
Recommendation	
Recommend maintaining on the SOL but altering eligibility criteria	

Stakeholder evidence

4E.90 Stakeholders highlighted job shortages in roles such as: cyber security analysts/engineers and IT network engineers.

4E.91 Advancements in technology have propagated the need for roles relating to cyber security, as data handling and digital security becomes increasingly important. The need for these skills has peaked, yet as established previously in this chapter, there is not enough domestic supply of sufficiently skilled labour to fill this demand. This is heavily reflected by respondents in our call for evidence relating to this SOC code.

4E.92 The increasing use of contractors and recruitment agencies was a commonality, according to our responses, to fill gaps in the short term. Given the ever-increasing demand for these roles, a number of our stakeholders based in the IT and technology services industry have undertaken long-term internal up-skilling

strategies including, but not limited to, offering various technical apprenticeships, graduate programmes and specialist courses.

4E.93 The short-term mitigations have helped to fill shortages to some extent, but this has had limited impact as the skills required simply are not available. The long-term strategies also have their limitations; firstly, up-skilling staff is constrained by the lack of expertise in newer areas such as cyber security and secondly, these strategies are yet to mature, and so the scale of their impacts cannot truly be assessed until the future.

4E.94 The evidence demonstrates that the impacts of these shortages vary across the board. Stakeholders based in the IT and technology services industry have had to delay software improvements and features as they do not have the labour or expertise to fulfil demand. More generally, there has been an increasing reliance on workers from outside the UK and there is a growing concern surrounding the future skills base for roles within new technical areas.

Use of the SOL

4E.95 The 2015 partial review of the SOL recommended to add the following job title within SOC 2139 on the SOL: Cyber security specialist (someone who applies security measures to ensure the confidentiality, integrity and availability of data: this encompasses other roles such as security architect, information assurance consultant, security operational analyst and cyber security consultant) with a minimum of five years' relevant experience and who has demonstrable experience of having led a team.

Use of Tier 2 (General)

Year	2014	2015	2016	2017	2018
RCoS Used	328	328	271	300	241

4E.96 This the only SOC code within digital and IT occupations which has seen a fall in usage.

Recommendation

4E.97 We recommend including the following job title: cyber security specialist (someone who applies security measures to ensure the confidentiality, integrity and availability of data: this encompasses other roles such as security architect, information assurance consultant, security operational analyst and cyber security consultant) within SOC code 2139 (information technology and telecommunications professionals n.e.c) on the SOL. The occupation as a whole ranked highly in our shortage indicators and had an above average vacancy rate. The stakeholder evidence suggested that cyber security is growing remarkably

in the UK economy meaning new opportunities and roles are being created in this changing landscape. Unlike our previous 2015 partial review recommendation however, there will be no minimum experience requirement as applying an experience caveat could hinder the development of cyber security at all levels.

Implications of digital and IT recommendations on the Tier 2 system

4E.98 The recommendations outlined in this sub-chapter, particularly expanding SOC 2135 and SOC 2136 to include the entire occupations on the SOL, will have consequences on the Tier 2 system which we must recognise.

4E.99 First, there are implications for the Tier 2 (General) branch of the system. The relatively high CoS usage of these SOC codes means that if the current cap were to be hit, these occupations would be prioritised over other occupations due to the nature of the points-based system. The removal of nurses and doctors when the cap was hit in 2018 and the removal of PHD-level occupations mentioned in the Chancellor's Spring Statement, however, suggests that the Government has no intention of allowing the cap to be hit.

4E.100 Another implication for the Tier 2 (General) branch of the system is in relation to the different salary thresholds across occupation codes. The open description of these SOC codes could be utilised by employers through the recategorization of job titles to fall into SOC codes with lower salary thresholds. The Home Office does already carry out compliance checks to ensure that the responsibilities of the roles advertised by the company do appropriately suit the descriptions of the SOC codes they are categorised under. If the expansion of SOL eligibility within these occupations results in greater use by sponsors then these compliance mechanisms may be tested to a greater extent than currently.

4E.101 Currently, there are conditions that have been put in place by the Home Office for digital and IT related occupations on the SOL. One of these conditions is that the migrant must have "minimum 5 years' relevant experience and demonstrable experience of having led a team". The recommendations we have made in this sub-chapter suggest the removal of this caveat, in an aim to plug shortages which are evident at all levels, whilst the UK increases and up-skills its digital talent base. Should this be accepted, there will be an inevitable rise in pressure on the system, which would need to be dealt with through a more structured and streamlined process.

4E.102 Another of these conditions is that, in order to recruit these digital and IT related occupations on the SOL, the sponsor must be a 'qualifying company' needing

to meet certain criteria. According to appendix K of the immigration rules, a 'qualifying company' must:

- Obtain permission from the Home Office to issue a CoS for a job on the SOL
- Be a licensed sponsor for the purposes of Tier 2 of the Points Based System
- Employ between 20 and 250 employees (Or if they employ less than 20 employees they need to provide a letter from the Department of International Trade confirming the department has been working with the company and supports the application)
- Not be more than 25% owned by a company which has one or more establishments in the UK which employs more than 250 employees
- Not have been established in the UK for the purpose of supplying services exclusively to a single company or company group in the UK
- Must not have more than ten Tier 2 (General) migrants working for them at any one time in jobs which the 'qualifying company' requirement applies

4E.103 This 'qualifying company' provision exists because of concerns we raised during a partial SOL review in 2015. We noted that easing the terms of entry for Digital and IT jobs under Tier 2 (G), by adding them to the SOL, may increase the incentive for employers to switch away from using the intra-company transfer route towards using Tier 2 (G). This incentive already exists as Tier 2 (G) tends to be subject to lower salary requirements than Tier 2 (ICT). For example, an employer wanting to transfer an experienced migrant to the UK into a job falling under SOC 2135 would need to pay a minimum salary of £35,800 through the Tier 2 (G) route, compared to £41,500 through the Tier 2 (ICT) route. The scale of IT workers entering the UK through ICT's is substantial and if a portion of those inflows switched to using Tier 2 (G) this could increase the risk of the cap binding and thus crowd out other occupations. Additionally, it may affect future indefinite leave to remain (ILR) applications as migrants coming through Tier 2 (ICT) route are not eligible to apply for ILR after 5 years whereas those under Tier 2 (G) are.

4E.104 Naturally, should the Home Office accept our recommendations and expand eligibility for the SOL from select job titles to the entirety of three of the Digital and IT occupations (2135, 2136, 2127), then this concern comes to the fore. Despite this we recommend removing the 'qualifying company' requirement from occupations 2135, 2136, 2139 and not applying to the newly recommended 2137. Not do so would go against the principle of simplification and furthermore we have seen no evidence that eligibility for the SOL on its own would change sponsors behaviour to such a large extent as to be worrying.

4E.105 This change will require careful monitoring. Should there be a substantial and sustained rise in the use of these occupations while the cap is still in place, then the question of eligibility may need to be revisited.

4E.106 More generally there needs to be careful monitoring of how Tier 2 as a whole is being used by the Digital and IT sector, so that the correct mechanisms can implemented to deter manipulation, and to ensure fair and just use of the system.

4.F. Education Occupations

Introduction

4F.1 This section covers the 8 teacher-related SOC 2010 codes. While all 8 have been considered, the main focus of this chapter shall be on SOC codes 2314 (Secondary education teaching professionals) and 2315 (Primary and nursery education teaching professionals) as these are the SOC codes we received the most evidence of potential shortage. This section begins with an overview of the sector, highlighting issues that are leading to recruitment difficulty and recent Government policies which may act as an alleviation. This section ends by analysing shortages by SOC code.

Sector overview

4F.2 From the ages of 5 to 18, children in the UK are entitled to free education at state schools. Education is a devolved matter in the UK, with there being four main types of state schools[114]:

- Maintained schools are the most common type of state school with local authorities overseeing provision. These schools must follow the national curriculum but can also focus on teaching further subjects, teachers are paid according to national pay scales.

- Foundation/voluntary schools are more autonomous than maintained schools, these are overseen by the local authority but are partly-run by a governing body such as a religious foundation.

- Academies are exempt from following the national curriculum but with some restrictions; for instance, they must teach Maths, English and Science. They are publicly-funded but have a degree of freedom over staff pay.

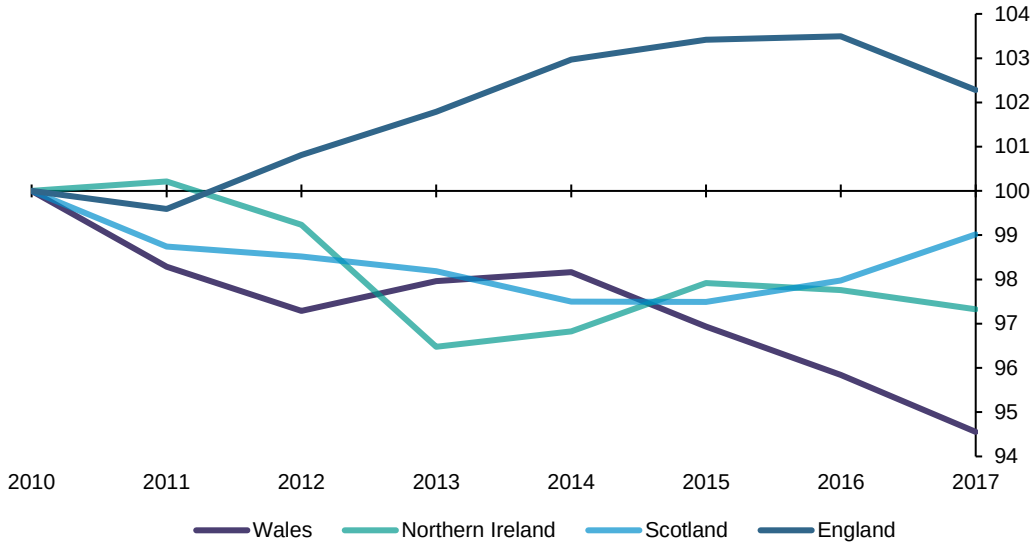
- Grammar schools select pupils based on academic ability and are state-funded.

4F.3 Following the age of 16 individuals become eligible to move on to further education, this can entail working towards earning academic or vocational qualifications at either colleges or a 6th form within a school. Upon completing their further education, individuals can choose to continue their education and attend universities for higher education.

[114] There are also independent schools in the UK, these charge fees to attend and aren't funded by the Government. There is no requirement to follow the national curriculum, but they are regularly inspected by the regulator OFSTED.

4F.4 To meet this need, newly qualified teachers are sourced from initial teacher training (ITT) programmes in England and Wales which can either be school or university-based. This pathway differs slightly in Scotland and Northern Ireland.

Figure 4.f.1: Index of Full-time equivalent (FTE) teachers for England, Scotland, Wales and Northern Ireland, 2010-17 (2010 = 100)



Source: England; School Workforce Census 2017 (published 2018)[115], Scotland; Teacher Census (2018)[116], Wales; Pupil Level Annual School Census (PLASC), Welsh Government (2018)[117], Northern Ireland; Teacher workforce statistics 2017/18 (2018)[118]

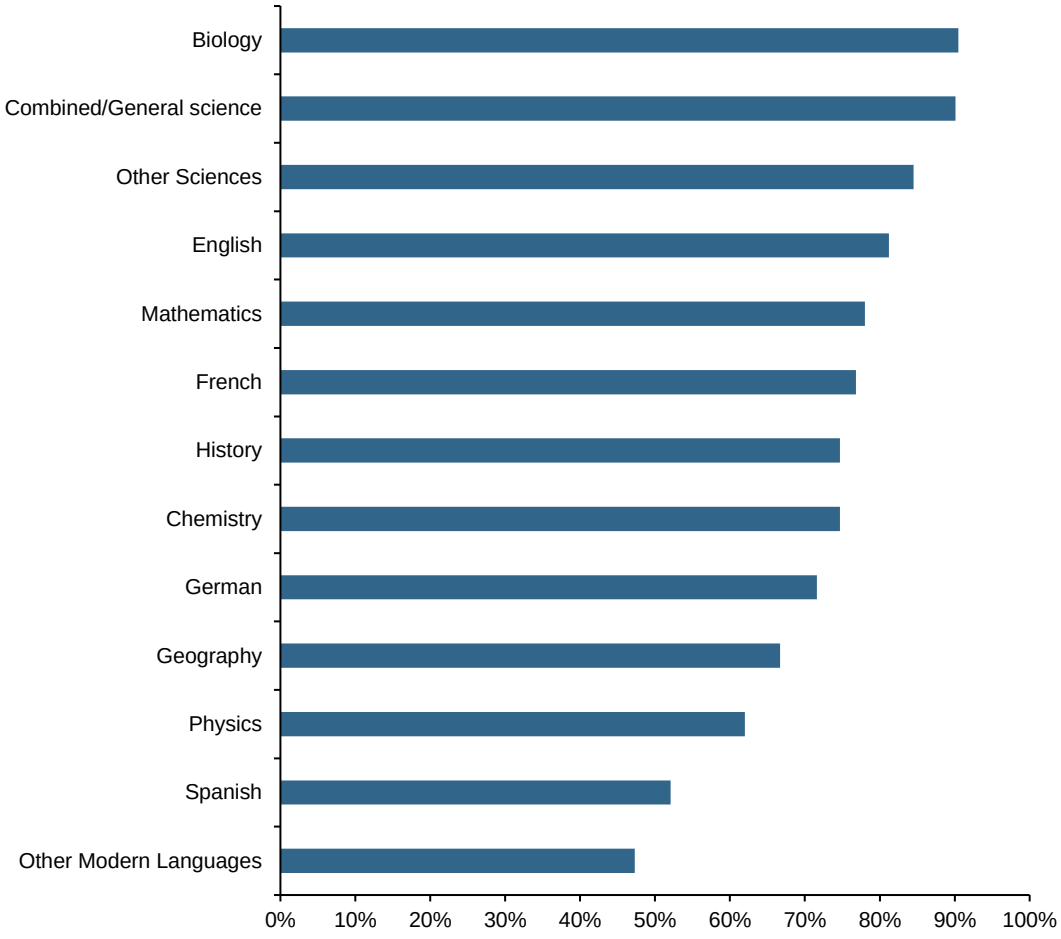
4F.5 Figure 4.f.1 shows a decreasing trend in the number of FTE teachers in Wales and Northern Ireland compared to the base year of 2010. Since 2010, Wales has lost the highest proportion of teachers, owing to a sharp decline in FTE numbers since 2014. Scotland showed a similar pattern in teacher numbers compared to Wales and Northern Ireland, with similar decreases in FTE teacher numbers between 2014/15 compared to base year 2010. However, from 2015 onwards, there has been a resurgence in the number of FTE teachers in Scotland, with a possible recovery to their 2010 number of FTE teachers by 2018, if their trend remains the same. As for England, following a minor dip in 2011, there was an expansion in FTE teacher numbers until 2016, when the numbers of teachers began to trend downwards.

4F.6 Data on state-funded secondary schools from the School workforce census (2018) highlights the disparity in the qualification levels of teachers across subjects. As highlighted in figure 4.f.2 below, around 91 per cent of Biology teachers had a relevant post A-level qualification, compared to 52 per cent of

[115] https://www.gov.uk/Government/statistics/school-workforce-in-england-november-2017
[116] https://www2.gov.scot/Topics/Statistics/Browse/School-Education/teachcenssuppdata/teasup2018
[117] https://statsWales.gov.Wales/Catalogue/Education-and-Skills/Schools-and-Teachers/teachers-and-support-staff/School-Staff/fteteachers-by-localauthorityregion-category
[118] https://www.education-ni.gov.uk/publications/teacher-workforce-statistics-201718

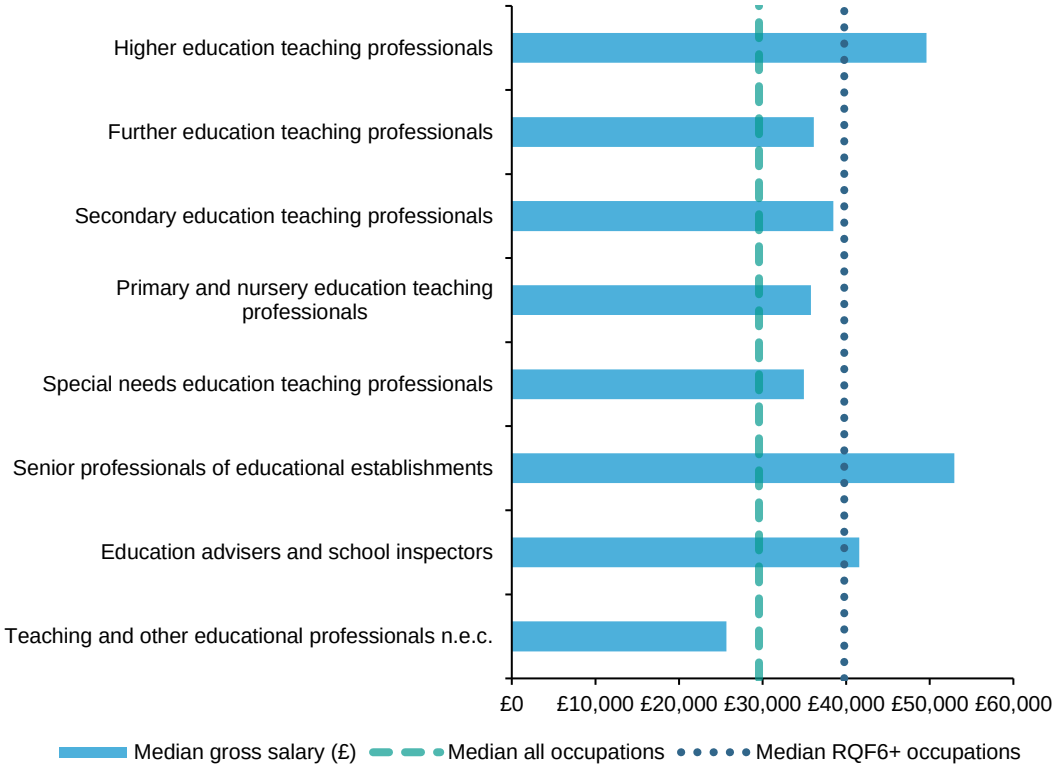
Spanish teachers. Qualification rates between subjects vary widely, as is showcased by the differing qualification rates of the science subjects: For example, Biology (91 per cent) exhibits the highest qualification rate whereas Physics (62 per cent) is in the bottom 3, while Chemistry (75 per cent) is near the middle of the distribution.

Figure 4.f.2: Percentage of teachers with relevant post A-level qualification in EBACC subjects, England (2017)



Source: School workforce census (2018)

Figure 4.f.3: Median full-time annual gross pay of the teaching SOC Codes, 2018



Source: Annual Survey of Hours and Earnings Table 14.7a (2018)

4F.7 Data from the Annual Survey of Hours and Earnings (2018)[119] show that, except for Teaching and other educational professionals n.e.c, teaching professions are well paid compared to the median for all employees. Secondary education teachers are the fourth highest paid teaching occupation category, being better paid than further education teachers. Three teaching occupations; higher education teaching professionals, senior professionals of educational establishments and education advisers and school inspectors earn more than the median of occupations skilled at RQF6+.

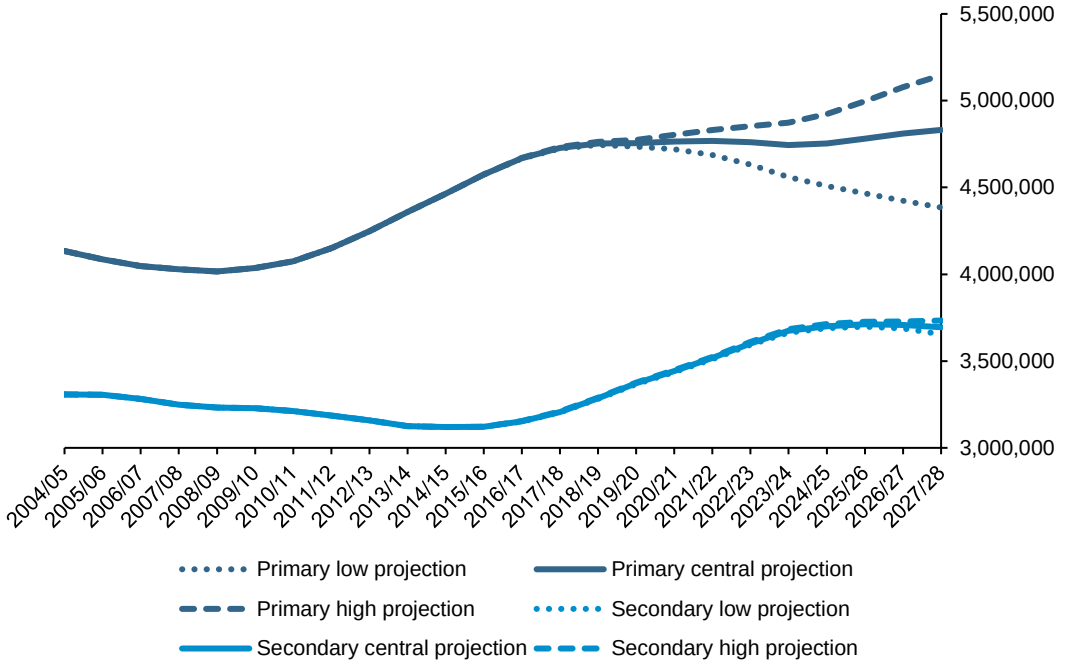
4F.8 The teacher supply model (TSM, 2017)[120] utilised by the Department for Education (DfE) estimates the number of new teacher trainees required annually in England. This estimate covers all schools, except special needs schools. The data that is inputted into the TSM contains information on the stock of teachers, anticipated changes in pupil numbers and an estimate of future leavers. The model also accounts for leakages (not finishing training) and teachers moving to

[119] Found at: https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/datasets/occupation4digitsoc2010ashetable14

[120] https://www.gov.uk/Government/statistics/teacher-supply-model-2017-to-2018

the private sector or leaving the profession[121]. Projections from the TSM model estimate future student numbers for both primary and secondary education, from this the number of teachers needed are calculated.

Figure 4.f.4: Projected number of pupils, primary and secondary education, England, 2004/05 – 2027/28



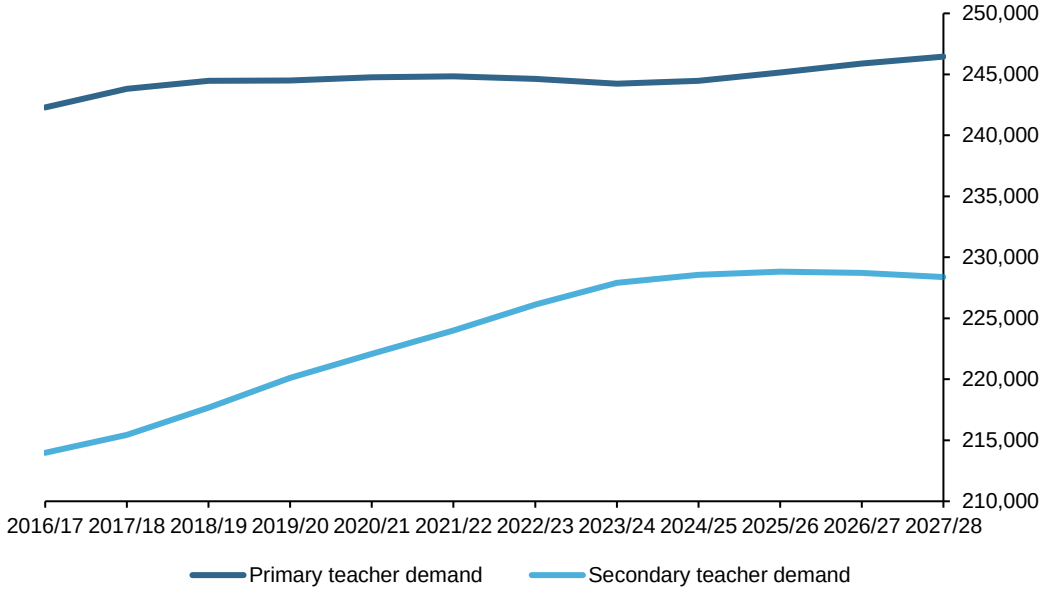
Note: low indicates lower bound projection, high indicates upper bound projection.
Source: Teacher Supply Model (2017)

4F.9 The model predicts that the number of primary and secondary students in England will increase from 2017/18 to 2027/28. The expected increase in primary school pupils is more moderate, with the lower bound projection predicting a fall in pupil numbers by 2020/21. All three projections for the number of secondary school pupils predict that their numbers will increase from 2017/18. This is a projected increase of around half a million extra students, from 3.2 million in 2017/18 to 3.7 million by 2027/28.

4F.10 Given this projection, it is unsurprising that the number of required teachers in England will also be increasing during this period, as can be seen in figure 4.f.5. Mirroring the projected increases in secondary education pupils, the increase in teacher need is concentrated amongst secondary education teachers, requiring around 15,000 new secondary education teachers by 2027/28 to deal with the increase in students.

[121] The TSM is not without its limitations; it does not factor in the needs of the independent sector and it does not try to account for 'lost ground' from previous years.

Figure 4.f.5: Projected demand for teachers, primary and secondary education, England, 2016/17 – 2027/28



Source: Teacher Supply Model 2017/18

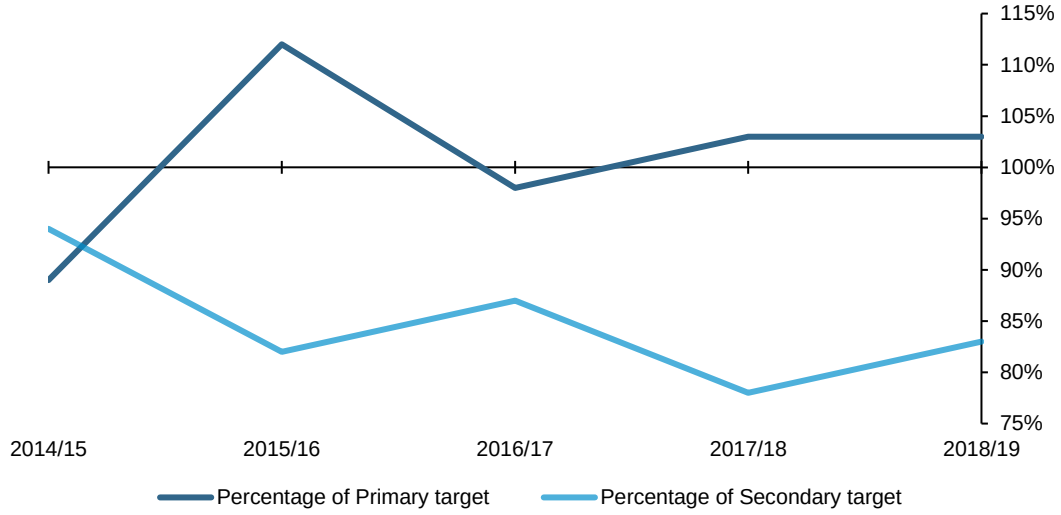
4F.11 While the TSM predicts increased demand for new teachers in England, there is reason to believe that the sector is already experiencing recruitment difficulties. Using data from DfE's Initial teacher training census (2018/19)[122] it is possible to see how many postgraduate ITT new entrants are coming through the teacher training pipeline compared to the projected targets[123] set by the TSM. It is worth noting that the TSM does not account for teacher deficits from previous years.

4F.12 From this it is possible to see whether there are enough new teachers being trained. Evidence from this data does not present a promising view; figure 4.f.6 shows the percentage of the TSM target met each year for primary and secondary education teachers. Figure 4.d.6 shows that, despite initially having difficulty recruiting primary education teachers in 2014/15, meeting only 89 per cent of the TSM target, there has been a resurgence with 103 per cent of the TSM target being met in 2018/19.

4F.13 In contrast, the trend for secondary education teachers appears to be worsening: In 2014/15, 94 per cent of the target amount of secondary education teachers finished their ITT, this has since deteriorated to 83 per cent in 2018/19 yet is an increase of 5 percentage points from the previous year.

[122] https://www.gov.uk/Government/collections/statistics-teacher-training#census-data
[123] These are set according to number of teachers required in each subject, accounting for leavers, retirees, pupil projections, etc.

Figure 4.f.6: Percentage of TSM target met in the primary/secondary education sector (2014/15 to 2018/19), England, 2014/15 – 2018/19

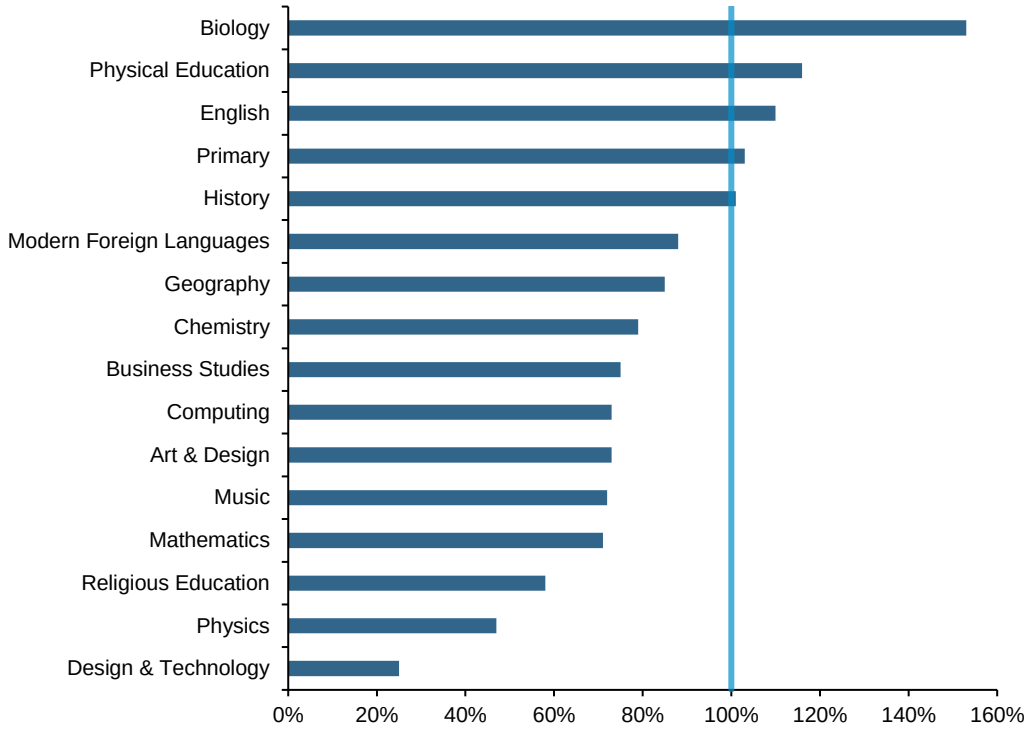


Source: ITT census (2018/19)

4F.14 Figure 4.f.7 shows the percentage of the TSM target met in England in 2018/19, broken down by subject. There appears to be a surplus of biology teachers, with there being 53 percentage points more of new biology teachers than the target amount. Physical education, English and history teachers likewise are in surplus for 2018/19.

4F.15 In contrast, there appears to be an undersupply of Design and Technology teachers relative to the TSM target, with only a quarter of it being met. Computing, mathematics and Physics, all of which are currently on the SOL are also failing to meet the TSM target.

Figure 4.f.7: Percentage of TSM target met by subject (2018/19), England

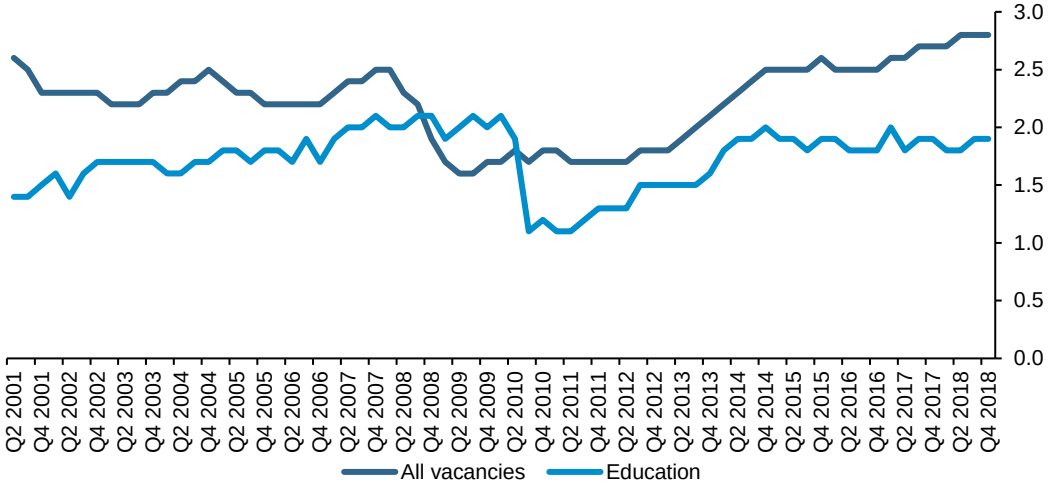


Source: ITT census (2018/19)

4F.16 Across the education industry, vacancy rates have fluctuated between 1.1 and 2.1 vacancies per 100 employees between Q2 2001 and Q4 2018 (see figure 4.f.8), compared to the whole economy, the education industry has experienced a lower vacancy rate, with the exception of the time period between Q4 2008 – Q3 2010. However, when broken down more granularly, we can see that the vacancy rate as a percentage of teachers in state-funded secondary schools in England has gradually increased from 0.4 per cent in 2010 to 1.1 per cent in 2017 (School workforce census, 2018)[124]. This has culminated in a steady rise in the pupil-teacher ratio (PTR), as demonstrated in figure 4.f.9:

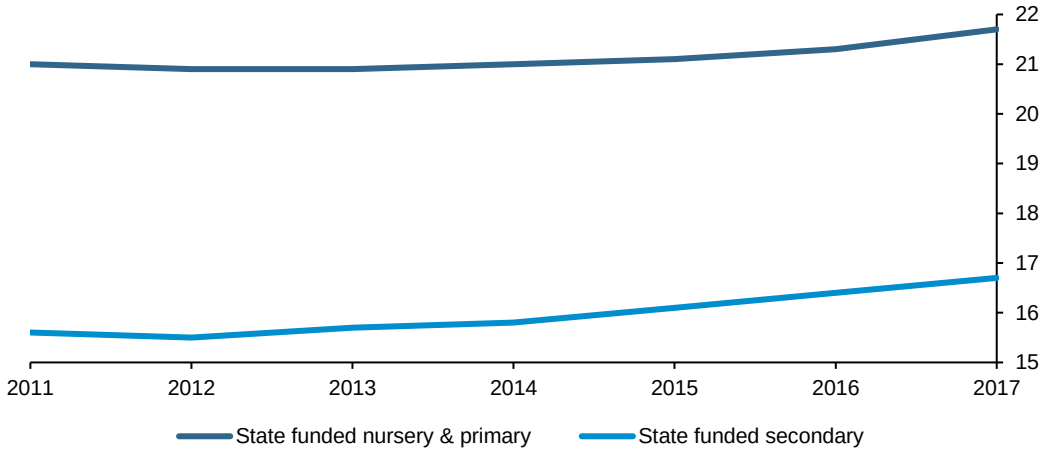
[124] https://www.gov.uk/Government/statistics/school-workforce-in-england-november-2017

Figure 4.f.8: Industry-wide vacancies per 100 employees, Q2 2001 – Q4 2018



Source: VACS02: Vacancies by industry (2019)[125]

Figure 4.f.9: Pupil-teacher ratio, nursery & primary and secondary education, England 2011-17

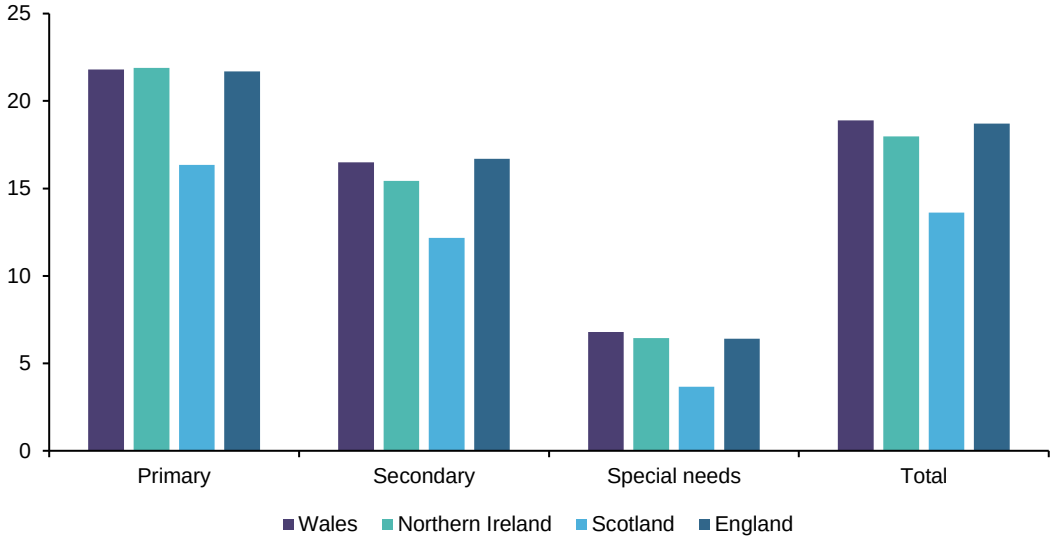


Source: School workforce census (2018)

4F.17 Figure 4.f.10 shows pupil-teacher ratios broken down by nation. Wales, Northern Ireland and England are consistent in their primary and nursery PTR, with minor differences in their secondary and special needs PTR. Scotland meanwhile, has a much lower PTR compared to all other UK nations with almost 5 pupils less per teacher in primary and nursery schools, for example.

[125]https://www.ons.gov.uk/employmentandlabourmarket/peoplenotinwork/unemployment/datasets/vacanciesbyindustryvacs02

Figure 4.f.10: Pupil-teacher ratios for state schools for England, Scotland, Wales and Northern Ireland, 2017



Source: School workforce census (2017), Teacher Census (2017)[126], School Census Results (2018)[127], Teacher workforce statistics (2018)[128]

Sector issues

4F.18 This section highlights sectoral issues which may be causing recruitment difficulties.

Pay

4F.19 In England and Wales, the School Teachers Review Body (STRB) examines and makes recommendations for the pay of teachers. While state school teacher salaries are centrally determined, they are in a band format; teachers can be paid any amount within their band. Because of this, there is less scope for pay to change organically as it would in the private sector. This has resulted in lower starting pay and slower growing pay, compared to rival jobs. This will make it harder for schools to recruit potential teachers as they will be unable to compete with the private sector.

4F.20 As can be seen in table 4.f.1, graduate teachers' median starting salaries are lower compared to the median graduate starting salary, with the occasional exception of London-based teacher starting salaries. The data shows that the earnings gap is particularly stark outside of inner London, with the exception of the HESA data, this gap has steadily widened over time.

[126] https://www2.gov.scot/Topics/Statistics/Browse/School-Education/teachcenssuppdata/TeaSup2017
[127] https://gov.Wales/schools-census-results-january-2018
[128] https://www.education-ni.gov.uk/publications/teacher-workforce-statistics-201718

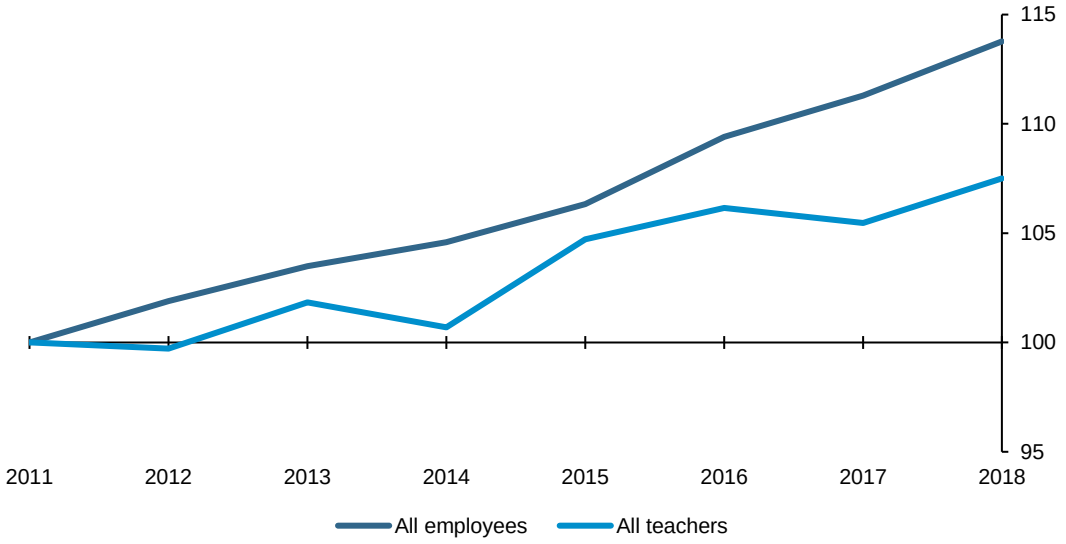
Table 4.f.1: Median graduate starting salaries (£, * indicates inner London pay rates), 2012-2017

	2012	2013	2014	2015	2016	2017
HESA	25,000 27,000*	25,000 26,000*	25,000 27,000*	25,000 27,000*	25,000 27,000*	-
Institute of student employers (previously AGR)	26,000	26,500	27,000	27,000 28,000*	27,500 29,500*	28,000 32,000*
High Fliers	26,000	29,000	29,500	30,000	30,000	30,000
Minimum of teachers' main pay range	21,588 27,000*	21,804 27,270*	22,023 27,543*	22,244 27,819*	22,467 28,098*	22,917 28,660*

Source: School Teachers Review Body (2018)
Note: The HESA starting salaries is based on the Office of Manpower Economics (OME) analysis of HESA's Destination of Leavers from Higher Education (DLHE) survey.

4F.21 Data from ASHE (2011-18), presented in figure 4.f.11, also show how average teacher wage growth[129] has compared to wage growth across the whole economy over time.

Figure 4.f.11: Average wage index for all employees and all teaching occupations, 2011-18 (2011 = 100)



Source: ASHE (2011-2018)

4F.22 The data show that teacher wage growth has been lagging behind economy-wide wage growth since 2011 with average teachers wages even falling in 2012. It appears that over time, wage growth rates between teachers and the rest of the economy are diverging. If SOC 2311, higher education teaching professionals, were to be removed from this average, then this wage growth gap grows.

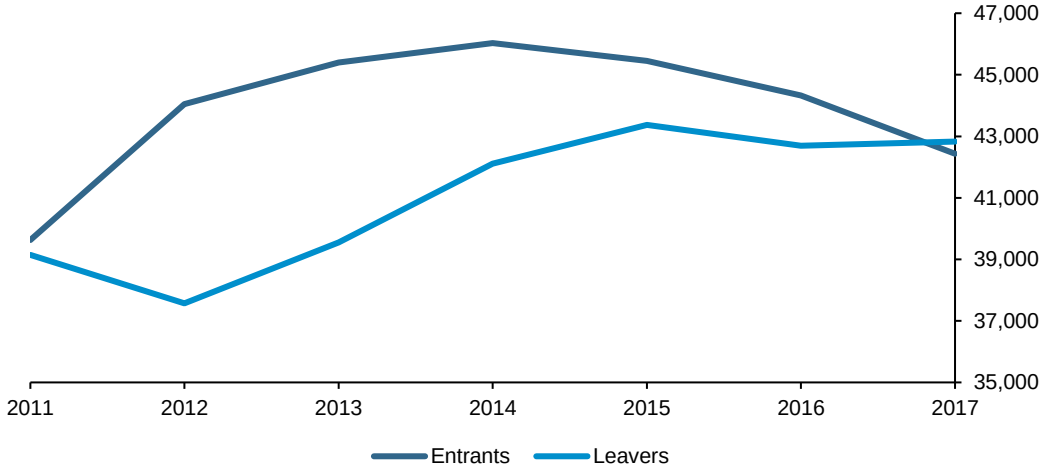
[129] Calculated by averaging the wages of all 8 teacher-related SOC codes

4F.23 It is very possible that poor wages are driving individuals away from teaching, which would lead to and compound recruitment difficulty. Responses from the Big Question Survey (2017)[130] showed that 69 per cent of teachers felt that current levels of pay put off individuals from pursuing a career in teaching. Around 79 per cent of teachers surveyed did not believe that teacher salaries were competitive compared to other professions, 66 per cent believed that they were not paid at a level that their skills merited and 59 per cent did not receive their entitled pay progression[131]. Given the evidence, it is possible that relatively poor starting wages are putting potential teachers off from joining the sector, while a lack of overall wage growth may be pushing current teachers into changing profession. Both scenarios would lead to the recruitment difficulty presented above.

Working conditions

4F.24 Aside from pay issues, teacher working conditions may be leading to an increase in the number of qualified teacher leavers, as figure 4.f.12 shows. According to the School workforce census (2018), the number of leavers eclipsed the number of qualified teacher entrants in 2017, which has been declining from 2014.

Figure 4.f.12: Full-time equivalent qualified teacher entrants and leavers in state-funded English schools



Source: School workforce census (2018)

4F.25 Reasons for this increase in leavers is likely to be varied, however answers to the Big Question Survey (2017) may provide some insights. 74 per cent of respondents believed that there was a widespread behavioural problem in

[130] https://www.nasuwt.org.uk/uploads/assets/uploaded/7649b810-30c7-4e93-986b363487926b1d.pdf
[131] Teacher pay progression is tied to performance, the criteria for meeting performance goals are set by the school governing body but these must be satisfy the provisions of the School Teachers' Pay & Conditions Document (https://www.gov.uk/Government/publications/school-teachers-pay-and-conditions, NEU (https://neu.org.uk/advice/understanding-pay-progression). Not being given their entitled pay progression means that teachers have met or exceeded these performance targets yet have yet to receive their entitled pay increase.

schools, with 46 per cent believing that problem behaviours were present in schools that they teach in. The majority of teachers (57 per cent) feel that they aren't supported by the senior management with student indiscipline.

4F.26 Workload problems also appear to be a major issue with current teachers, 84 per cent of respondents cited workload issues as their number one concern with the job. Assessing and marking was the largest driver of this workload stress. This culminates in a poor work-life balance; 69 per cent of respondents said that work prevented them from spending enough time with their friends and families. Around half of teachers in the survey said that their job adversely affects either their mental or physical health.

4F.27 Overall, 48 per cent of respondents were not looking forward to going to work and 61 per cent said that they were seriously thinking of quitting as teachers in the last 12 months.

4F.28 Compounding the issues above, in June 2015 the Government announced its intention that all pupils who start Year 7 in September 2015 take the English Baccalaureate (EBacc) subjects when they reach their GCSEs in 2020. The EBacc comprises of English, maths, history or geography, the sciences and a foreign language. This will drive up demand for teachers of these subjects, thus increasing the subject recruitment difficulties seen in figure 4.f.7.

Steps being taken to tackle labour shortages

Government Education Whitepaper

4F.29 In March 2016, the Department for Education published a white paper "Educational Excellence Everywhere" (Department for Education, 2016)132 which sets out the Government's plans for education for the next five years. This includes plans to reform the Initial Teacher Training courses and making it cheaper and easier for schools to advertise vacancies.

4F.30 This saw ITT providers being given permission to recruit above the number of training places they initially stated they had for postgraduate courses133 in 2018/19. The top performing 25 per cent of ITT providers were given multi-year allocations for postgraduate ITT places, a similar system is in place for 2019/20

[132]https://assets.publishing.service.gov.uk/Government/uploads/system/uploads/attachment_data/file/508447/Educational_Excellence_Everywhere.pdf

[133] With the exception of Early Years, postgraduate Physical Education and Primary School Direct courses

(DfE, 2017134 & 2018135). This policy will give ITT providers and schools more flexibility to meet local need (DfE, 2018) whilst incentivising quality teacher training.

Reducing Workload initiative

4F.31 In 2014, the DfE launched a Workload Challenge survey which asked teachers how to reduce unnecessary workload[136]. Findings identified 3 principal areas which cause an excessive workload: Marking, planning and data management.

4F.32 As a response to this the DfE launched a 'Reducing teacher workload' policy paper[137] which committed to: Moving to a simpler system of accountability, a period of stability with no new changes to the national curriculum. Following this, a Workload Advisory Group was created in May 2018 to tackle unnecessary workloads emerging from data collection and assessments. In November 2018[138] the group published a report on reducing workloads generated by data and evidence collection. Its recommendations were accepted by the Government.

School Teachers' Review Body, 28th Report (2018)[139]

4F.33 According to the report, several consultees raised concerns about the ability to attract teachers into leadership roles, there are emerging problems in recruiting and retaining school leaders. The recommendation of the report was to uplift all pay and allowances for teachers by 3.5 per cent for September 2018 onwards. However, the Government instead introduced a 2 per cent increase in the upper pay range and a 1.5 per cent increase in the leadership pay range (House of Commons Briefing Paper, 2019)[140].

Teacher recruitment and retention strategy (2019)[141]

[134]https://assets.publishing.service.gov.uk/Government/uploads/system/uploads/attachment_data/file/663192/SFR88_2017_TSM_ITT_Allocations_2018_to_2019_Main_Text.pdf
[135]https://assets.publishing.service.gov.uk/Government/uploads/system/uploads/attachment_data/file/739433/Initial_teacher_training_allocations_methodology_-_19-20.pdf
[136] https://www.gov.uk/Government/publications/reducing-teachers-workload/reducing-teachers-workload
[137] https://www.gov.uk/Government/publications/reducing-teachers-workload/reducing-teachers-workload
[138]https://assets.publishing.service.gov.uk/Government/uploads/system/uploads/attachment_data/file/754349/Workload_Advisory_Group-report.pdf
[139]https://assets.publishing.service.gov.uk/Government/uploads/system/uploads/attachment_data/file/728381/CCS207_CCS0518679568-1_STRB_Book_Web_accessible.pdf
[140] http://researchbriefings.files.parliament.uk/documents/CBP-7222/CBP-7222.pdf
[141]https://assets.publishing.service.gov.uk/Government/uploads/system/uploads/attachment_data/file/773930/Teacher_Retention_Strategy_Report.PDF.pdf

4F.34 This strategy aimed to support early career teachers with provisions included to manage and reduce workload stress, such as helping to ensure more flexible working practices in schools.

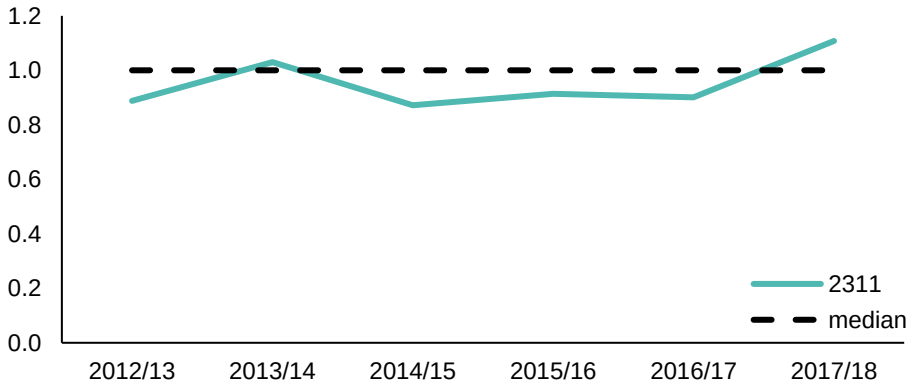
Now Teach

4F.35 Now Teach is a charity that was established in 2016 with the aim to retrain individuals who are in the middle of their careers to be maths, science and modern foreign language teachers. In January 2018, the Government announced a £350,000 investment in the charity to support its work142. It is hoped that this investment will help the charity further recruit leading professionals to share their knowledge and skills with pupils. This was done in tandem with the Maths and Physics Chairs Programme, a programme that recruits post-doctoral researchers into teaching.

[142] https://www.gov.uk/Government/news/boost-to-get-more-top-professionals-into-teaching

Occupations under consideration

SOC 2311 – Higher education teaching professionals

Summary table: SOC 2311 Higher education teaching professionals	
Employment	
Share of UK employees (%, APS, 2017/18)	0.6%
Share of Tier 2 (General) (% total RCoS Used 2015-2018)	2.8%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	10.7%
Share of employees born outside the EEA (%, APS, 2017/18)	19.0%
Wages	
Median full-time annual wage (ASHE 2018)	£49,602
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2 (General))	
	
Shortage indicator rank	
Shortage overall rank /105	76
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder evidence

4F.36 Stakeholder evidence highlighted shortages of lecturers in business-related subjects such as economics, accountancy, etc. Clinical, statistical, computer and data science were subjects that were also mentioned.

4F.37 Evidence from Imperial College London and the Campaign for Science and Engineering also drew our attention to the high proportion of non-UK nationals working in higher education institutions. According to DfE, nearly 30 per cent of all academic staff in the UK come from abroad, many of these individuals will be skilled to a high level and not be easily replaced.

4F.38 Universities mentioned that it can take 6 – 12 months to fill vacancies. In combatting this, we were told that they use a range of measures, such as increasing wages and investment on recruitment. One university has introduced

a “Search Committee” to “utilise all of our internal knowledge to try to fill a role beyond standard advertising and recruitment methods”, this is usually done with vacancies for more senior roles. Despite this, the university was still finding it difficult to recruit lecturers for economics subjects.

4F.39 Universities reported that because of these shortages, academic research had suffered.

Use of the SOL

4F.40 SOC 2311 has not been on the SOL since 2011.

Use of Tier 2 (General)

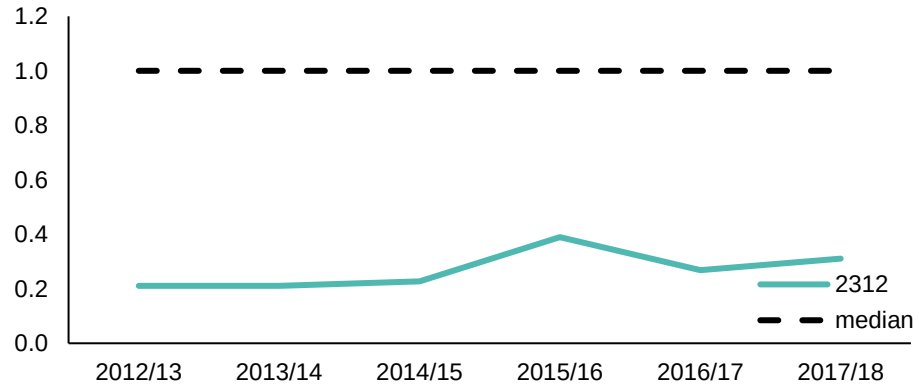
Year	2014	2015	2016	2017	2018
RCoS Used	447	426	495	526	581

4F.41 The table above showcases an increasing trend in recruitment via Tier 2 (General) from 2015, clearly showing that universities are substantial users of the Tier 2 (General) system to recruit from overseas. Stakeholder evidence backed this up.

Recommendation

4F.42 We do not recommend including SOC code 2311 (higher education teaching professionals) on the SOL. The occupation ranks fairly low (76th) in our shortage occupation indicators and the vacancy rate is around average. While there does appear to be shortages at the universities that submitted evidence, overall, the evidence does not seem to suggest that there is a nation-wide-shortage of higher education teaching professionals.

SOC 2312 – Further education teaching professionals

Summary table: SOC 2312 Further education teaching professionals	
Employment	
Share of UK employees (%, APS, 2017/18)	0.4%
Share of Tier 2 (General) (% total RCoS Used 2015-2018)	0.0%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	4.5%
Share of employees born outside the EEA (%, APS, 2017/18)	8.7%
Wages	
Median full-time annual wage (ASHE 2018)	£36,139
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2 (General))	
	
Shortage indicator rank	
Shortage overall rank /105	90
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder evidence

4F.43 We received no stakeholder evidence relating to this SOC code.

Use of the SOL

4F.44 SOC 2312 has not been on the SOL since 2011.

Use of Tier 2 (General)

Year	2014	2015	2016	2017	2018
RCoS Used	10	11	10	13	1

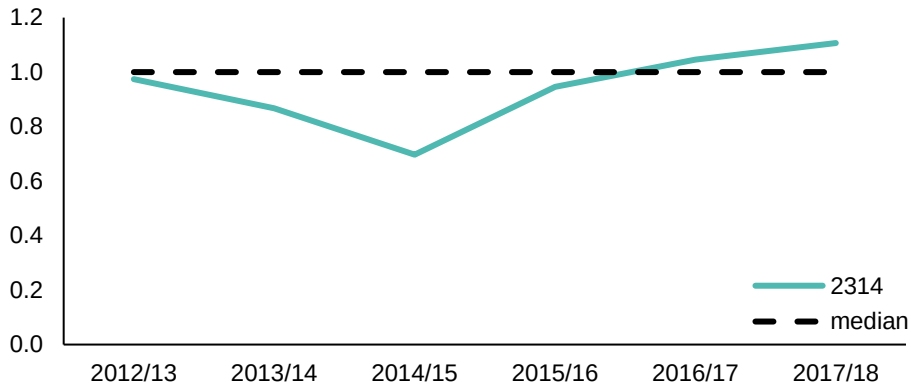
4F.45 The table above shows low usage and a large drop off in the use of Tier 2 (General) to fill vacancies in 2018.

Recommendation

4F.46 We do not recommend including SOC code 2312 (further education teaching professionals) on the SOL. The occupation ranks low (90th) in our shortage

occupation indicators and the vacancy rate is below average. There was insufficient stakeholder evidence that this occupation was in shortage,

SOC 2314 – Secondary education teaching professionals

Summary table: SOC 2314 Secondary education teaching professionals	
Employment	
Share of UK employees (%, APS, 2017/18)	1.4%
Share of Tier 2 (General) (% total RCoS Used 2015-2018)	1.8%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	4.3%
Share of employees born outside the EEA (%, APS, 2017/18)	6.9%
Wages	
Median full-time annual wage (ASHE 2018)	£38,473
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2 (General))	
	
Shortage indicator rank	
Shortage overall rank /105	93
Recommendation	
Recommend maintaining on the SOL but altering eligibility criteria	

Stakeholder evidence

4F.47 Stakeholders highlighted shortages of teachers in most, if not all, secondary education subjects. The Education Workforce Council told us that even Wales had begun to experience difficulty in recruiting teachers, this was not the case in our recent SOL review of teachers (2017).

4F.48 Stakeholders highlight many reasons which appear to be driving reported shortages, main themes highlight problems with recruitment and retention.

4F.49 The overwhelming majority of stakeholders told us that pay was a very large factor in why they were experiencing recruitment and retention problems. As pay in state schools is centrally determined, schools have a limited degree of flexibility when it comes to dealing with pay problems.

4F.50 NASUWT found that pay gaps between teachers and other graduate professions are not only large for recent starters but grow over time. NASUWT also highlight the gender pay gap in secondary education teaching; even though the majority of secondary education teachers are female (School workforce census, 2017) ASHE (2018) data show that male teachers earn 3.8 per cent higher gross hourly wages than female teachers.

4F.51 Many Scottish councils also gave the remoteness of posts as a reason why they were experiencing recruitment and retention problems.

4F.52 Some stakeholders cited a confusing and opaque teacher training system led to unclear career paths for potential new teachers.

4F.53 Poor working conditions were another highly cited reason for shortages, with increased workloads driving this, one stakeholder told us that Chemistry teachers are often required to also teach other science subjects which drastically increases their workload. Another stakeholder cited the DfE Workload Survey (2017)[143] which shows that teachers' average worktimes were 54 hours per week. Other stakeholders also told us that the increasingly bureaucratic nature of the profession further adds to workloads. This is exacerbated by what one stakeholder described as a "punitive and narrow school accountability system". One Scottish council stated that they had experienced a 23 per cent drop out rate of newly qualified teachers this year.

4F.54 This situation is expected to exacerbate over time as secondary education pupil numbers are forecasted to increase, as figure 4.f.4 shows. DfE told us that need for secondary teachers is growing significantly and is expected to continue to do so for a number of years.

4F.55 In dealing with these reported shortages, stakeholders said that they were increasing investment on recruitment and the upskilling of current staff. Some stakeholders were making use of technology such as E-classes to teach subjects to students that live in remote areas. Some stakeholders have had to introduce flexible retirement to cope with shortages. Others have tried to make use of programmes which train individuals from other career paths to be teachers, like Now Teach does. Media campaigns and overseas recruitment have also been attempted. For certain subjects in shortage, such as Science and Modern Foreign Languages (MFL) also attract generous training bursaries to increase the intake of graduates into these programmes.

4F.56 Few of the call for evidence respondents felt that the measures completely solved their shortage issue. Many say that these shortage reduction strategies have

[143] https://www.gov.uk/Government/publications/teacher-workload-survey-2016

helped, but most have only helped in a limited sense. The majority of stakeholders believe that, in order to fully tackle secondary education teacher shortages there needs to be sector-wide changes.

4F.57 NAHT told us that as a result of these shortages, schools often had to choose between ensuring stability but appointing poor quality applicants for roles or ensuring that the right candidates move into roles. However, this latter choice can be expensive and time-consuming task as agencies often have to be used. The lack of continuity in teaching staff also harms pupils' educational achievements and damages current staffs' work-life balance as they often have to cover these shortages.

Table 4.f.2: Data summary by subject

	Maths	English	All Science	Chemistry	Biology	Physics	MFL*	Design and Technology	Computer science	Geography	History	P.E.
Vacancies as a percentage of teachers in post (England) (2017)[1]	1.4	1.2	1.5	-	-	-	1	1.2	-	1.2	0.6	0.4
Percentage point change (2014-17)	0	-0.1	0.1	-	-	-	0.3	-	-	0	-0.2	0
TES Teacher Recruitment Index (2012 = 100, 2017, higher than 100 means a greater ease in recruiting teachers, compared to 2012)[2]	103	111	98	-	-	-	108	109	-	103	106	113
Number of CoS applications, new hires under £150k (2018)[3]	136	19	-	5	0	34	4	1	8	1	7	4
Burning Glass job postings as a proportion of all teacher postings per nation (2018)												
England	17%	16%	-	2%	2%	3%	4%	3%	3%	6%	4%	4%
Scotland	16%	18%	-	5%	5%	4%	6%	3%	1%	3%	3%	6%
Wales	15%	15%	-	2%	2%	2%	4%	3%	4%	4%	4%	6%
Northern Ireland	10%	18%	-	2%	3%	4%	4%	3%	3%	5%	4%	3%
ITT intake as % of target												
England (2018/19)[4]	71%	110%	-	79%	153%	47%	88%	25%	73%	85%	101%	116%
Scotland (2017-18)[5]	47%	63%	-	84%	91%	73%	64%	-	68%	96%	122%	104%
Wales (2016/17)[6]	66%	80%	-	-	-	-	47%	35%	50%	78%	119%	113%
ITT target for new teachers as a proportion of the number of postgraduates in domicile studying subject relevant degree[7]												
England	69.9%	37.8%	-	9.1%	9.7%	12.9%	42.1%	7.9%	3.8%	35.9%	12.1%	19.2%
Scotland	2.5%	2.4%	-	0.6%	0.2%	0.7%	2.4%	0.0%	0.2%	1.2%	0.7%	0.9%
Wales	0.5%	1.3%	-	0.0%	0.0%	0.0%	2.1%	0.3%	0.2%	0.8%	0.4%	1.0%

Note: *Stated as 'Languages' in the School Workforce census,
Source: [1]School Workforce Census (2018) [2]Found at: https://www.tes.com/tesglobal/articles/teacher-recruitment-most-challenging-core-ebacc-subjects, [3]Home Office data [4]ITT Census (2018) [5]Found at: https://www.gov.scot/publications/initial-teacher-education-figures-2016-2018/ , [6]Found at: https://gov.Wales/sites/default/files/statistics-and-research/2018-12/180510-initial-teacher-education-2016-17-en.pdf & https://www.hefcw.ac.uk/policy_areas/itt/itt_intake_targets.aspx, [7]Number of postgraduates found at: https://www.hesa.ac.uk/data-and-analysis/students/what-study

4F.58 Taking a subject-specific approach, table 4.f.2 showcases statistics that may indicate shortage, broken down by subject. Beginning with vacancies as a percentage of teachers in post in England for 2017, table 4.f.2 shows that All sciences have the largest vacancies as a percentage of teachers in post with 1.5 per cent, this is followed by maths with 1.4 per cent. However, between 2014-17 MFL experienced the greatest increase in the percentage of vacancies to teachers in post.

4F.59 These findings are also supported by the following row, which gives the TES teacher recruitment index, this shows the supposed difficulty of recruiting teachers by subject, compared to the base year of 2012. Again, all sciences have the lowest score, as this score is lower than 100 (at 98), the index indicates that the difficulty of recruiting science teachers has increased from 2012. Maths has the second lowest ranking, alongside geography teachers, while both these scores are above 100, indicating that recruitment has become easier since 2012, they have exhibited the smallest increase (aside from All sciences).

4F.60 Looking at the proportion of Burning Glass postings for each subject as a proportion of all teacher-related Burning Glass posting allows us to compare the relative demand for each subject in each country of the UK. As maths is a compulsory subject for GCSEs, we would expect a relatively high percentage of maths teacher postings, however when one compares maths teacher postings across the countries we can see that only 10 per cent of all teacher postings in Northern Ireland are related to maths, compared to 15-17 per cent in all the other countries; this indicates that there is relatively less demand for maths teachers in Northern Ireland. Looking at further subjects may also indicate a relatively higher demand for chemistry and biology teachers in Scotland; the percentage of postings in such subjects is around double that of all the other countries, while computer science and Geography in Scotland exhibit less of a relative demand.

4F.61 The percentage of teacher training targets reached for England, Scotland and Wales tells a different story across each country. In England (as can be seen in Figure 4.f.7) only English, Biology, History and P.E. teachers exceeded the teacher training targets for 2018/19. In 2017-18 for Scotland, only the targets for History and P.E. teachers were met or exceeded. Wales also exceeded recruitment targets for History and P.E.

4F.62 Breaking the number of CoS applications by subject shows that the majority of Tier 2 (General) usage appears to be maths teachers, with the next most popular subject being physics.

4F.63 The final three rows of table 4.f.2 show the teacher training target as a proportion of the number of postgraduates per subject for England, Scotland

and Wales. A higher proportion would indicate potentially greater difficulty in meeting recruitment targets. For example, in order to meet the initial teacher training target for maths teachers in England, it would require the recruitment of almost 70 per cent of maths postgrads, it is therefore unlikely that the UK educational pipeline will be able to service the demand for English maths teachers. Given the relatively high proportions in England for English, MFL, Geography and P.E, it may be difficult to meet the respective targets via the UK educational pipeline. The percentage of initial teacher training targets for Scotland and Wales does not exceed 2.5 per cent indicating that fulfilling their respecting teacher recruitment targets may be more achievable without the use of migrants.

4F.64 Taking data from the APS (2015-17), Table 4.f.3 gives the median weekly pay differences between individuals that currently work as secondary school teachers in their main job and those that don't by the subject of their first degree.

Table 4.f.3: Median pay differentials by subject, 2015-2017

Subject of first degree	Weekly pay if teacher	Weekly pay if not a teacher	Difference	Teaching professionals as a proportion of subject graduates
Mathematics	769	808	-39	17%
English studies	673	577	96	14%
Chemistry	769	769	0	10%
Biology	692	663	29	8%
Physics	635	865	-230	9%
Design and Technology	692	510	182	6%
Geography	673	692	-19	8%
History	750	615	135	7%
P.E.	750	500	250	12%

Note: 'if teacher' indicates that respondent stated that they currently worked as a secondary school teacher as their main job. Differences may not be statistically significant, point estimates used for illustrative purposes only. MFL and Computer science omitted due to small sample sizes.
Source: APS 3-year dataset (2015-17)

4F.65 Table 4.f.3 suggests why some subjects experience greater teacher recruitment difficulties compared to others. Given the median weekly salary, maths, physics and geography teachers could earn £39, £230 and £19 a week more if they did not work as teachers. In monetary terms, a graduate in maths, physics and geography are disincentivised to move into or even stay in the profession. On

the other-hand, design and technology, history and P.E. first-degree graduates seem to earn over £100 a week more in their weekly median pay by currently working as secondary school teachers compared to another job.

4F.66 In addition to the subjects covered above, we also found evidence of potential shortages in the subjects below:

4F.67 **Scottish Gaelic:** We received evidence from Bòrd na Gàidhlig, the executive non-departmental public body responsible for promoting Gaelic. Bòrd na Gàidhlig stated that Scottish Gaelic teachers are in shortage due to the recent increase in demand for Gaelic-medium education (GME). We were told that there are very few Gaelic speakers in Scotland meaning that the pool of potential Gaelic teachers is small, however this could be boosted by the population of Gaelic speakers in Nova Scotia, Canada. While there have also been additional training courses delivered by universities to train Gaelic teachers there is not enough new teachers to satisfy demand. Despite the recruitment target for Gaelic teachers being very low (5 in 2017/18), there was no intake for that year[144].

4F.68 **Mandarin**: We received evidence from DfE arguing for the retention of Mandarin teachers on the SOL: In its 2015 election manifesto the Government committed increase the number of Mandarin teachers in the UK, this is alongside the agreement by the Chancellor of the Exchequer in 2015 to provide £10m funding for the Mandarin Excellence Programme. This programme will require the training of an additional 80 Mandarin teachers by 2020, this will only be achievable by recruiting overseas Mandarin speakers. It is hoped that this will help forge closer economic and cultural ties between the UK and China. While DfE does not intend to rely on temporary teachers from China, this will be unavoidable in the short term and will help open the domestic pipeline for future Mandarin teachers.

Use of the SOL

4F.69 SOC 2314 has remained on the SOL with some changes to the eligible teaching subjects since 2011. Biology and chemistry teachers have previously been on the SOL but were removed in 2011 and 2017 respectively.

Use of Tier 2 (General)

Year	2014	2015	2016	2017	2018
RCoS Used	217	384	304	306	317

[144] https://www.gov.scot/publications/initial-teacher-education-figures-2016-2018/

4F.70 The table above shows that secondary education teacher recruitment on Tier 2 (General) has been relatively consistent since 2016, compared with year on year changes seen between 2014 – 2016. Clearly, educational establishments use the current Tier 2 (General) system to recruit teachers from abroad.

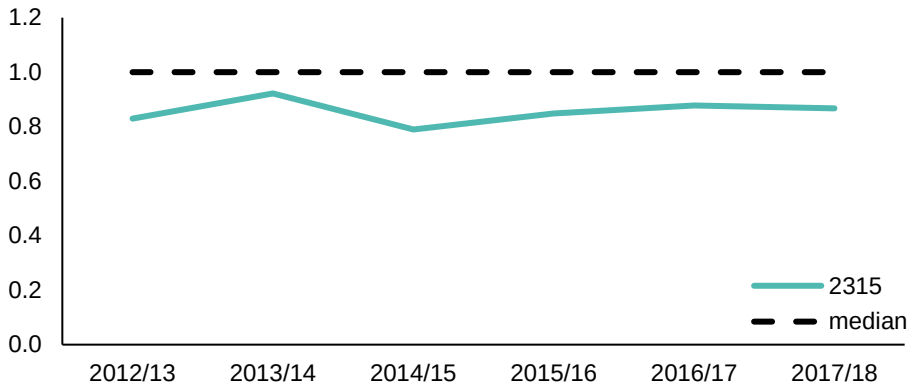
Recommendation

4F.71 We recommend including teachers in the subjects of maths, physics, science (where an element of physics will be taught), computer science and Mandarin within SOC code 2314 (secondary education teaching professionals) on the SOL. The occupation ranked low (93rd) in our shortage indicators and the vacancy rate was around average. Maths and physics were consistently highlighted as being in shortage. While computer science has performed better against the recruitment target in England since 2016/17, DfE told us that recruitment was still behind target (see table 4.f.2). Computer science is a national curriculum subject at all four key stages and the introduction of a new computer science curriculum from September 2014 resulted in an increase in the number of teachers needed with different knowledge and skills. We recommend the retention of Mandarin as DfE provided evidence of persistent shortages.

4F.72 We did receive some evidence of recruitment difficulties for teachers of MFL, however, we could not find much evidence of teachers being recruited from outside the EEA to teach MFL. Given this reliance on EEA recruitment, we do not believe it to be sensible to include MFL teachers on the SOL under the current system of free movement.

4F.73 We also recommend adding Scottish Gaelic language teachers to the Scottish SOL. While the numbers are admittedly small, we have received sufficient evidence of a shortage due to the low numbers of native speakers necessary to fill teaching roles. The addition of Scottish Gaelic teachers satisfies our sensible criteria as shortages could conceivably be mitigated via the overseas recruitment of individuals from the Scottish Gaelic speaking diaspora. While we also considered Welsh and Irish language teachers we received no evidence of shortage.

SOC 2315 – Primary and nursery education teaching professionals

Summary table: SOC 2315 Primary and nursery education teaching professionals	
Employment	
Share of UK employees (%, APS, 2017/18)	1.5%
Share of Tier 2 (General) (% total RCoS Used 2015-2018)	0.9%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	2.3%
Share of employees born outside the EEA (%, APS, 2017/18)	5.1%
Wages	
Median full-time annual wage (ASHE 2018)	£35,767
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2 (General))	
	
Shortage indicator rank	
Shortage overall rank /105	86
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder evidence

4F.74 Stakeholders report that shortages are stemming from poor pay relative to the demanding nature of working conditions. Using ASHE (2016) NASUWT stated that, for England in 2016, average gross earnings for comparator professions were 27.3 per cent greater than average earnings for primary school teachers. Welsh primary school teachers also had an earnings gap, although this was slightly smaller at 20.6 per cent. NASUWT also cites an ONS report which found significant gender pay gaps for primary and nursery teachers.

4F.75 COSLA stated that they had an 18 per cent drop out rate of newly qualified teachers in primary schools.

4F.76 In addition to poor working conditions, the relative attractiveness of teaching posts abroad mean that UK-born workers move abroad to teach, and overseas teachers are opting to stay abroad instead of coming over to the UK. Some

stakeholders from rural areas have cited their remoteness as a factor in failing to attract staff.

4F.77 As teaching salaries are centrally determined, there is a limited scope by which to reduce shortages. Most stakeholders appear to be using new methods and channels to attract more teachers. For example, some stakeholders report using campaigns aimed to retrain individuals interested in a career change as teachers, in a similar vein to NowTeach. One stakeholder said that they had been using social media as a cost-effective recruitment medium. Former teachers had also been contacted to reconsider going back into teaching. To overcome the remoteness problem, Aberdeenshire has promoted a relocation allowance. There has also been ongoing engagement with other teaching councils in order to recruit from talent pools across the UK/world. Media campaigns aimed to improve the perception of the teaching profession have been carried out according to stakeholders. DfE has told us that they are not planning on introducing any more tests or assessments for primary schools for the remainder of parliament.

4F.78 Overall, these shortage-reducing strategies appear to have had minimal impact on both the recruitment and retention of teachers. Some stakeholders stated that their local schemes had an impact, but this was small scale and limited to local areas. Overall, stakeholders argue that more must be done centrally to improve conditions and pay to attract and retain teachers, the actions of stakeholders can only partially mitigate these greater problems.

4F.79 As a result, stakeholders said that current staff workload has had to increase. This has led to decreases in educational attainment whilst increasing stress for current staff members. It was also suggested that local authorities are having to compete with one another for candidates.

Use of the SOL

4F.80 SOC 2315 has not been on the SOL since 2011.

Use of Tier 2 (General)

Year	2014	2015	2016	2017	2018
RCoS Used	111	151	253	199	68

4F.81 The table above shows a decline in the number of people working in SOC 2315 receiving CoS to enter the UK from 2016, a fall from 253 individuals down to 68 in 2018. This figure shows that educational establishments are not filling vacancies by recruiting teachers via Tier 2 (General) as much as they had in the past. Stakeholders did state that they were using Tier 2 (General) to recruit

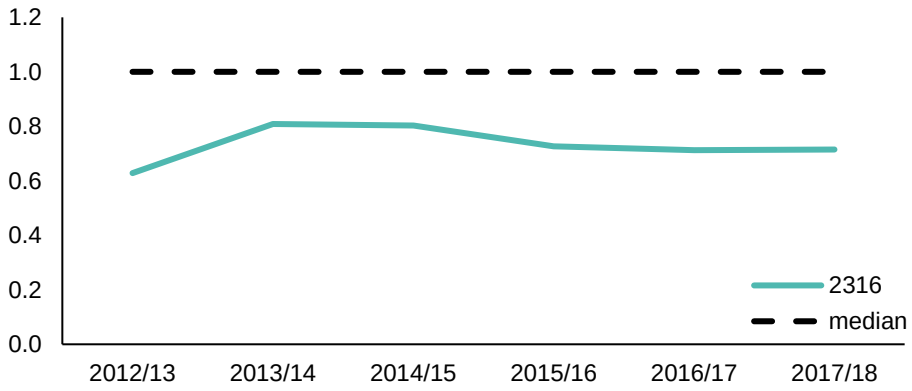
teachers, however these were predominantly secondary education teachers, not primary nor nursery.

Recommendation

4F.82 We do not recommend including SOC code 2315 (primary and nursery education teaching professionals) on the SOL. The occupation ranks fairly low (86th) in our shortage occupation indicators and the vacancy rate is below average. While there are clear problems with the occupation which may lead to shortages in the future. The evidence that we have received does not undeniably demonstrate the presence of a national shortage. This is supported by the ITT training targets, which for England, have primary school trainee numbers exceeding the target for every school year going back to 2015/16. Evidence on the use of Tier 2 (General) implies that nurseries and primary schools are not making use of migrant labour to fill vacancies.

4F.83 We recommend adding Scottish Gaelic-medium primary and nursery teachers to the Scotland SOL. While the numbers are admittedly small, we have received sufficient evidence of a shortage due to the low numbers of native speakers necessary to fill teaching roles. The addition of Scottish Gaelic teachers satisfies our sensible criteria as shortages could conceivably be mitigated via the overseas recruitment of individuals from the Scottish Gaelic speaking diaspora.

SOC 2316 – Special needs education teaching professionals

Summary table: SOC 2316 Special needs education teaching professionals	
Employment	
Share of UK employees (%, APS, 2017/18)	0.3%
Share of Tier 2 (General) (% total RCoS Used 2015-2018)	0.1%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	1.4%
Share of employees born outside the EEA (%, APS, 2017/18)	4.7%
Wages	
Median full-time annual wage (ASHE 2018)	£34,959
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2 (General))	
	
Shortage indicator rank	
Shortage overall rank /105	97
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder evidence

4F.84 Stakeholders reported that there were a low number of applicants with the required skills and qualifications applying for vacancies within this SOC. One representative body suggested that low pay, increasing workloads and the relative attractiveness of teaching overseas were reasons for these shortages. These were very similar to reasons given for the reported shortages of primary and secondary education teachers.

4F.85 These shortages were reported to increase current teacher workloads while also leading to a decrease in pupil teaching quality.

4F.86 We were told by stakeholders that they were using different methods of advertising for vacancies such as website overhauls, social media campaigns and informational leaflet publishing. One stakeholder told us that they were heavily engaged with local higher education institutions and were also offering

fully funded masters at a local university while others were looking to retrain individuals wanting a career change from other industries as teachers.

Use of the SOL

4F.87 All job titles within SOC 2316 were present on the SOL before 2013 but have not been on since.

Use of Tier 2 (General)

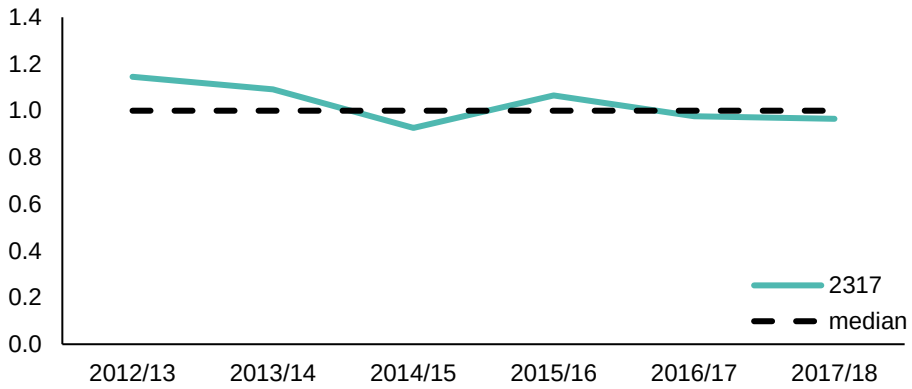
Year	2014	2015	2016	2017	2018
RCoS Used	15	12	16	13	6

4F.88 The table above shows low Tier 2 (General) usage to recruitment for roles within SOC 2316, with almost a third of Tier 2 (General) usage in 2018 compared to 2014. This is backed up by stakeholder evidence; they did not provide evidence of using Tier 2 (General) to address shortages in this SOC code.

Recommendation

4F.89 We do not recommend including SOC code 2316 (special needs education teaching professionals) on the SOL. The occupation ranks low (97th) in our shortage occupation indicators and the vacancy rate is below average. There was insufficient stakeholder evidence that this occupation was in shortage.

SOC 2317 – Senior professionals of educational establishments

Summary table: SOC 2317 Senior professionals of educational establishments	
Employment	
Share of UK employees (%, APS, 2017/18)	0.4%
Share of Tier 2 (General) (% total RCoS Used 2015-2018)	0.1%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	2.2%
Share of employees born outside the EEA (%, APS, 2017/18)	6.1%
Wages	
Median full-time annual wage (ASHE 2018)	£52,931
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2 (General))	
	
Shortage indicator rank	
Shortage overall rank /105	70
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder evidence

4F.90 Stakeholders highlighted shortages of headteachers in the primary and secondary education sector. According to 2018 Teacher Vacancy Survey[145] there were 102 primary education headteacher and depute headteacher vacancies and 25 secondary education headteacher and depute headteacher vacancies in Scotland. In addition to this, around 120 teachers in 2018 were acting-up to head teacher grade.

4F.91 According to the Education Workforce Council, there is a low number of applicants for headteacher positions, but this is less of a problem in the deputy and assistant head positions.

[145] https://news.gov.scot/resources/2018-teacher-vacancy-survey-publication-tables-3

4F.92 Stakeholders told us that shortages are driven by poor perceptions of the teaching profession, increased workloads, poor pay[146] and the existence of more attractive roles elsewhere, either in different countries or in different jobs. This has led to a low number of applications for jobs within this occupation code.

4F.93 To cope with shortages, stakeholders stated that they were increasing spending on recruitment and in upskilling current staff. In addition to this they reported that they were using different channels to advertise vacancies and were being forced to recruit from different labour pools. These strategies were reported to be successful, but only in a limited sense due to the "recognised national shortage of teachers" (West Dunbartonshire council).

4F.94 Stakeholders said that as a result of these shortages, productivity and pupil achievement are being affected. One argued that this was being driven by senior leaders having to spend more time teaching in class and less time managing the school effectively.

Use of the SOL

4F.95 SOC 2317 is not currently on the SOL.

Use of Tier 2 (General)

Year	2014	2015	2016	2017	2018
RCoS Used	19	17	8	10	12

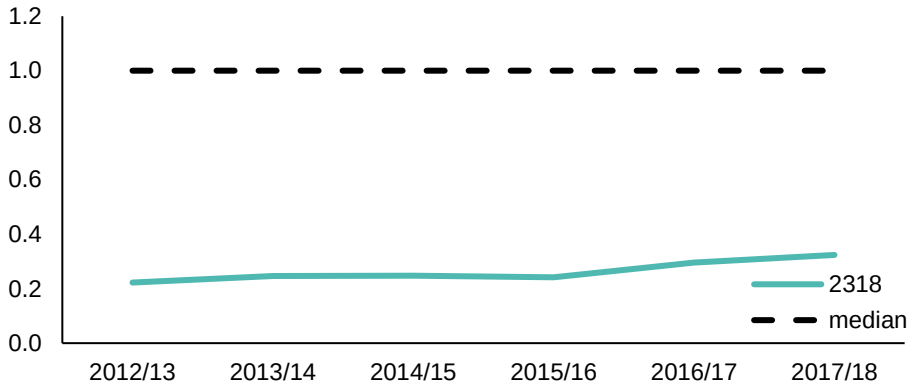
4F.96 The table above shows a decline in the use of Tier 2 (General) from 2014. These findings are up by stakeholder evidence; they did not provide evidence of using Tier 2 (General) to address shortages in this SOC code.

Recommendation

4F.97 We do not recommend including SOC code 2317 (senior professionals of education establishments) on the SOL. The occupation ranks fairly low (70th) in our shortage occupation indicators and the vacancy rate is around average. There was insufficient stakeholder evidence that this occupation was in shortage. In addition, there are relatively few Tier 2 (General) users of this occupation, suggesting low demand for overseas workers to fill headteacher vacancies.

[146] For example, NASUWT said that "22 per cent of headteachers had been informed that they were receiving no pay award for 2017/18."

SOC 2318 – Education advisers and school inspectors

Summary table: SOC 2318 Education advisers and school inspectors	
Employment	
Share of UK employees (%, APS, 2017/18)	0.1%
Share of Tier 2 (General) (% total RCoS Used 2015-2018)	0.0%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	2.9%
Share of employees born outside the EEA (%, APS, 2017/18)	10.7%
Wages	
Median full-time annual wage (ASHE 2018)	£41,560
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2 (General))	
	
Shortage indicator rank	
Shortage overall rank /105	77
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder evidence

4F.98 We received some evidence suggesting that stakeholders were having difficulty recruiting for jobs within this SOC code. We were told that the reason for these shortages were down to a low number of applicants with the required skills and qualifications applying for roles. In response to these shortages, stakeholders told us that they have been increasing investment on recruitment efforts and trying to recruit from within their organisation. These efforts are reportedly somewhat effective in combatting shortages.

Use of the SOL

4F.99 Currently SOC 2318 is not present on the SOL, nor has it been since at least 2011.

Use of Tier 2 (General)

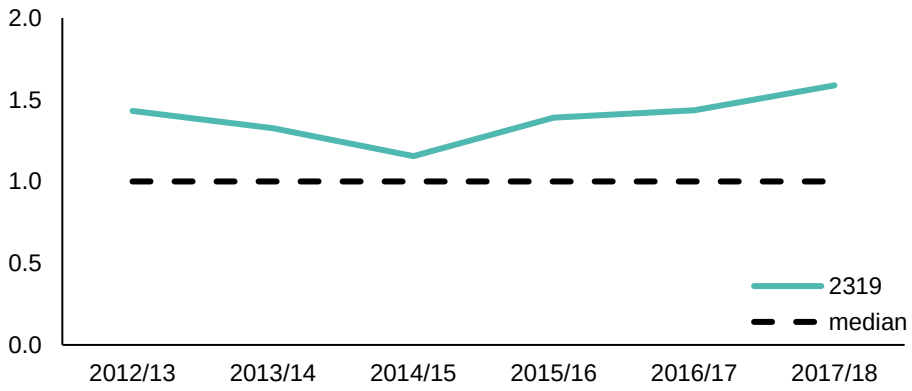
Year	2014	2015	2016	2017	2018
RCoS Used	2	6	0	0	1

4F.100 The table above shows a very low use of Tier 2 (General) to fill vacancies since 2014.

Recommendation

4F.101 Shortage We do not recommend including SOC code 2318 (education advisers and school inspectors) on the SOL. The occupation ranks fairly low (77th) in our shortage occupation indicators and the vacancy rate is below average. While we have received some stakeholder evidence stating that they had difficulty recruiting for vacancies within occupation, the evidence is insufficient to indicate a UK-wide shortage.

SOC 2319 – Teaching and other educational professionals n.e.c.

Summary table: SOC 2319 Teaching and other educational professionals n.e.c.	
Employment	
Share of UK employees (%, APS, 2017/18)	0.7%
Share of Tier 2 (General) (% total RCoS Used 2015-2018)	0.1%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	6.5%
Share of employees born outside the EEA (%, APS, 2017/18)	10.4%
Wages	
Median full-time annual wage (ASHE 2018)	£25,692
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2 (General))	
	
Shortage indicator rank	
Shortage overall rank /105	84
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder evidence

4F.102 We received some evidence suggesting that stakeholders were having difficulty recruiting for jobs within this SOC code. We were told that the reason for these shortages were down to a low number of applicants with the required skills, qualifications and/or motivation applying for roles. In response to these shortages, stakeholders told us that they have been increasing investment on recruitment efforts, using different channels of recruitment such as social media and making use of temporary workers. Some stakeholders reported that these efforts are reportedly effective in easing recruitment difficulties.

Use of the SOL

4F.103 Currently SOC 2319 is not present on the SOL, nor has it been since at least 2011.

Use of Tier 2 (General)

Year	2014	2015	2016	2017	2018
RCoS Used	35	23	33	19	12

4F.104 The table above shows a decreasing trend and low use of Tier 2 (General) to fill vacancies since 2014.

Recommendation

We do not recommend including SOC code 2319 (teaching and other education professionals n.e.c) on the SOL. The occupation ranks low (84th) in our shortage occupation indicators, although the vacancy rate is above average. While we have received some stakeholder evidence stating that they had difficulty recruiting for vacancies within SOC 2319, the evidence is insufficient to indicate a UK-wide shortage.

4.G. Business, finance and legal occupations

Introduction

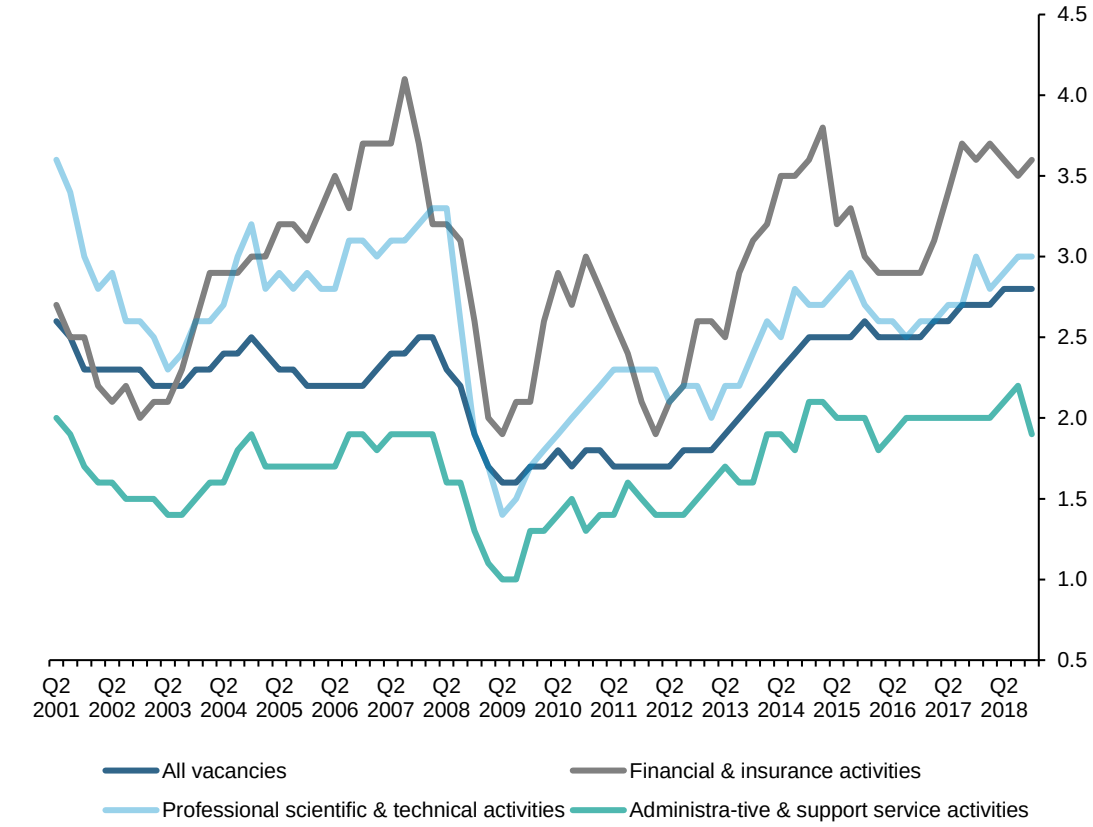
4G.4 In this section we cover 13 occupations relating to legal, business, research, finance and related associate professional occupations, where we consider and present analysis by SOC code.

4G.5 The occupations covered in this section are not confined to one sector, but work across almost all sectors, including manufacturing, medical, energy and transport.

Vacancies

4G.6 Figure 4.g.1 shows the vacancy rates for UK Standard Industrial Classification (SIC) code level occupations covered in this section, compared against all vacancies. The vacancy rate for financial and insurance activities, overall, remains consistently higher than the all vacancies rate.

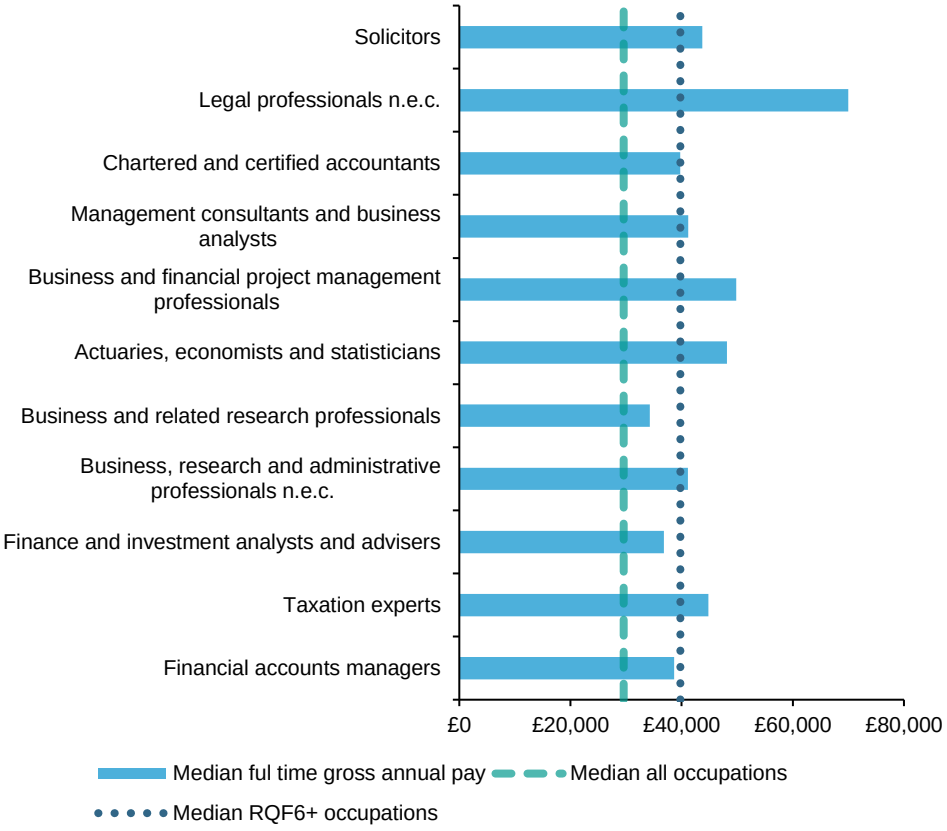
Figure 4.g.1: Industry-wide vacancies per 100 employees, Q2 2001 – Q4 2018



Source: VACS02: Vacancies by industry (2019)

4G.7 Data from the ASHE (2018) in figure 4.g.2 shows that the median gross salaries for the occupations in this section are generally around the median (£37,486) for all jobs at RQF6+ level. These occupations shown in figure 4.g.2 have a higher gross salary compared to the average occupation median wage (£24,006). The exception is SOC 2419, legal professionals n.e.c, which data shows is significantly higher, and is one of the highest compared to all occupations.

Figure 4.g.2: Median full-time annual gross salaries by business, finance and legal occupation, (2018)

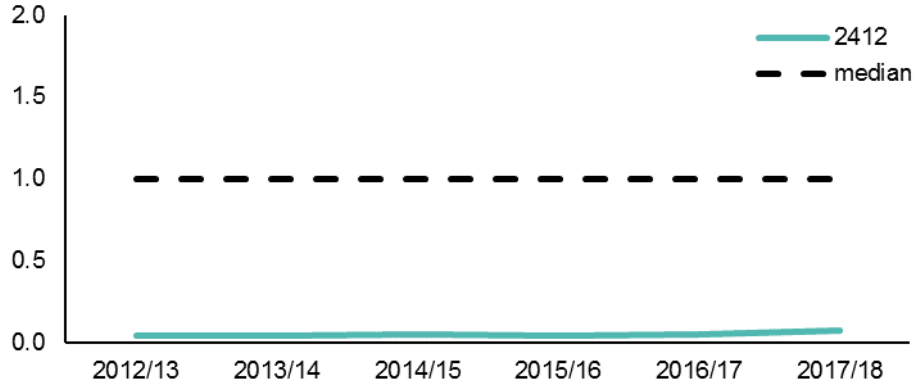


Note: Some SOCs were excluded due to sample size issues
Source: ASHE 2018

Occupations under consideration

4G.8 This section will consider the 13 SOC codes under the business, finance and legal occupations. It provides the shortage data calculated by our indicators in addition to the stakeholder evidence we have received on the occupation, followed by a conclusion as to whether they should be on the SOL.

SOC 2412 - Barristers and judges

Summary table: SOC 2412 Barristers and judges	
Employment	
Share of UK employees (%, APS, 2017/18)	0.0%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.0%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	8.7%
Share of employees born outside the EEA (%, APS, 2017/18)	7.8%
Wages	
Median full-time annual wage (ASHE 2018)	x
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	98
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder evidence

4G.9 There was insufficient stakeholder evidence provided for this SOC code to establish that this occupation was in shortage. We received one piece of evidence which incorrectly attributed a job title to this SOC.

Use of the SOL

4G.10 This SOC code has not been on the SOL previously.

Use of Tier 2 (General)

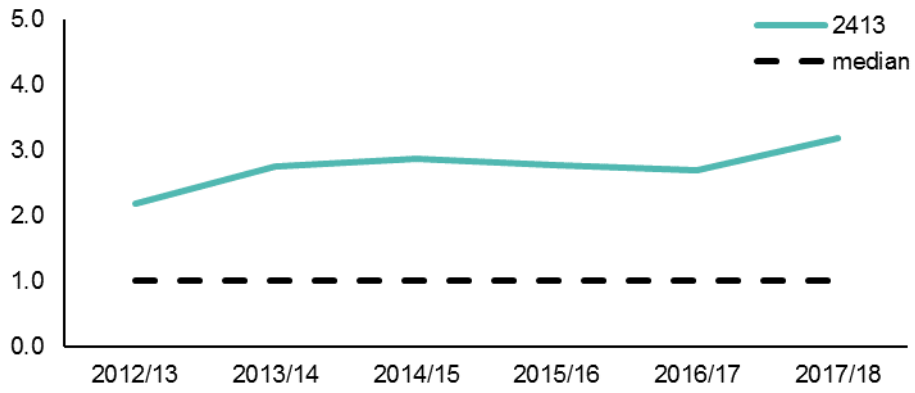
4G.11 There is low Tier 2 usage for this SOC code.

Year	2014	2015	2016	2017	2018
RCoS Used	1	3	3	5	4

Recommendation

4G.12 We do not recommend including SOC code 2412 (barristers and judges) on the SOL. The occupation ranks low (98th) in our shortage occupation indicators and the vacancy rate is below average. There was insufficient stakeholder evidence that this occupation was in shortage.

SOC 2413 - Solicitors

Summary table: SOC 2413 Solicitors	
Employment	
Share of UK employees (%, APS, 2017/18)	0.3%
Share of Tier 2 (% total RCoS Used 2015-2018)	1.4%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	1.7%
Share of employees born outside the EEA (%, APS, 2017/18)	5.8%
Wages	
Median full-time annual wage (ASHE 2018)	£43,725
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	9
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder evidence

4G.13 Although this is SOC ranked relatively high in our shortages indicators, there was insufficient stakeholder evidence presented for this SOC code to establish that this occupation was in shortage. We received evidence from Argyll and Bute Council who told us that they had difficulty in recruiting a solicitor, amongst other jobs.

4G.14 The Law Society produced a parliamentary campaign[147] in April 2018 to highlight the future shortage of criminal duty solicitors in the next five to ten years. They highlighted that across some areas of England and Wales, over sixty per cent of criminal law solicitors were aged over fifty years old. In other parts of England there are little or no criminal law solicitors aged under thirty-five.

4G.15 On the whole, we did not receive evidence of a UK-wide shortage in this occupation.

Use of the SOL

4G.16 This SOC Code has not been on the SOL previously.

Use of Tier 2 (General)

4G.17 The data show that there are relatively modest but consistent numbers of Tier 2 Certificates of Sponsorship. There was an increase in numbers in the 2018 figures, following a period of decline of usage since a peak in 2015.

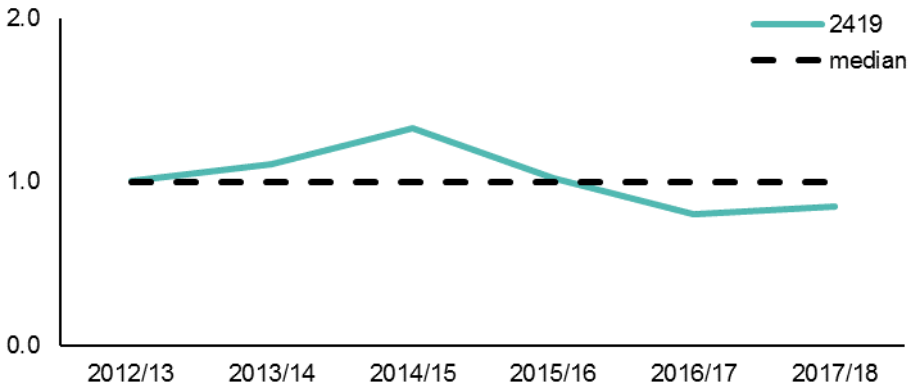
Year	2014	2015	2016	2017	2018
RCoS Used	227	291	255	203	249

Recommendation

4G.18 We do not recommend including SOC code 2413 (solicitors) on the SOL. Despite the occupation ranking highly (9th) in our shortage occupation indicators and the vacancy rate being above average, there was insufficient stakeholder evidence that this occupation was in shortage.

[147] https://www.lawsociety.org.uk/policy-campaigns/campaigns/criminal-lawyers/

SOC 2419 - Legal professionals n.e.c.

Summary table: SOC 2419 Legal professionals n.e.c.	
Employment	
Share of UK employees (%, APS, 2017/18)	0.2%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.4%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	2.2%
Share of employees born outside the EEA (%, APS, 2017/18)	14.7%
Wages	
Median full-time annual wage (ASHE 2018)	£69,992
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	54
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder evidence

4G.19 We received one piece of evidence for this SOC code from Dyson Ltd requesting the job title of patent attorney be added to the SOL.

Use of the SOL

4G.20 This occupation has not been on the SOL previously.

Use of Tier 2 (General)

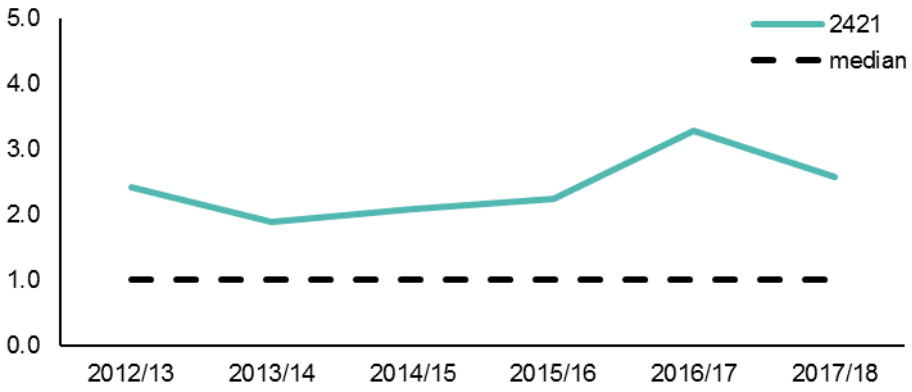
4G.21 The table below shows the number of Tier 2 certificate of sponsorship applications for legal professionals n.e.c. from 2014-2018. The data shows that there are relatively small but consistent numbers of Tier 2 Certificates of Sponsorship that have increased in 2018. APS data shows that the share of the workforce that is non-EEA is relatively high at 14.4%.

Year	2014	2015	2016	2017	2018
RCoS Used	106	78	87	64	91

Recommendation

4G.22 We do not recommend that this occupation be placed on the SOL. There was insufficient evidence to establish that this occupation was in national shortage from stakeholder evidence or shortage data, as it is ranked 54th in shortage out of 105 occupations.

SOC 2421 - Accountants, chartered and certified

Summary table: SOC 2421 Chartered and certified accountants	
Employment	
Share of UK employees (%, APS, 2017/18)	0.6%
Share of Tier 2 (% total RCoS Used 2015-2018)	3.7%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	5.2%
Share of employees born outside the EEA (%, APS, 2017/18)	16.0%
Wages	
Median full-time annual wage (ASHE 2018)	£39,730
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	23
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder evidence

4G.23 We received evidence from a few businesses, higher education establishment and the Recruitment and Employment Confederation, who included accountants as one of the occupations they considered to be in shortage.

4G.24 The main reasons for the shortages that were given, were the small number of applicants, with the correct skills or small number applying in general. This combined with there being too much competition among employers

Use of the SOL

4G.25 This occupation has not been on the SOL previously.

Use of Tier 2 (General)

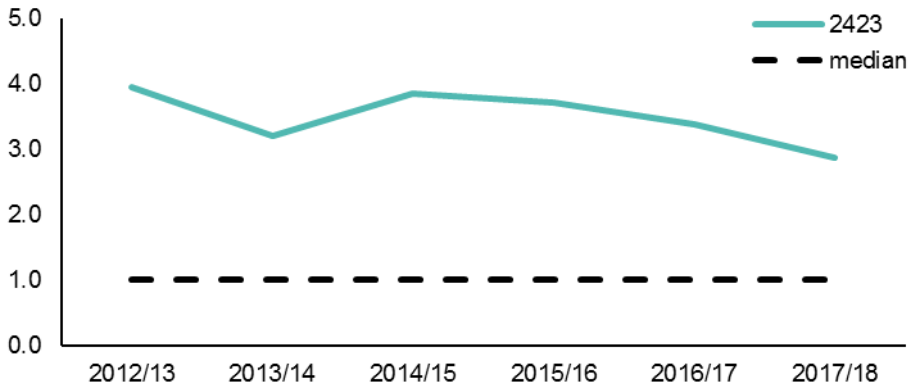
4G.26 There has been a decline in the usage of Tier 2 for this SOC code in the past two years. APS data shows that the share of the workforce that is non-EEA is relatively high at 15.9% and that is reflected in the moderate usage of Tier 2.

Year	2014	2015	2016	2017	2018
RCoS Used	562	861	732	580	517

Recommendation

4G.27 We do not recommend including SOC code 2421 (accountants, chartered and certified) on the SOL. Despite the occupation ranking highly (23rd) in our shortage occupation indicators and the vacancy rate being above average, there was insufficient stakeholder evidence that this occupation was in shortage.

SOC 2423 - Management consultants and business analysts

Summary table: SOC 2423 Management consultants and business analysts	
Employment	
Share of UK employees (%, APS, 2017/18)	0.5%
Share of Tier 2 (% total RCoS Used 2015-2018)	5.8%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	8.3%
Share of employees born outside the EEA (%, APS, 2017/18)	15.3%
Wages	
Median full-time annual wage (ASHE 2018)	£41,161
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	58
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder evidence

4G.28 We received evidence from stakeholders across all sectors, for instance; manufacturing, mining, transport and utilities, who told us that they were finding it difficult to recruit business (intelligence) analysts.

4G.29 The reasons for the difficulties are generally, a low number of applicants with the required skills or with qualifications that are required for the job and the level of competition from other businesses. National Grid told us that applicants have skills sets which are attractive to companies in all industries, who may offer higher wages and attractive roles. This results in competition for a smaller pool of talent in a reducing labour market.

Use of the SOL

4G.30 This SOC code was partly on the SOL prior to its reclassification (to SOC2010) when it included actuaries.

Use of Tier 2 (General)

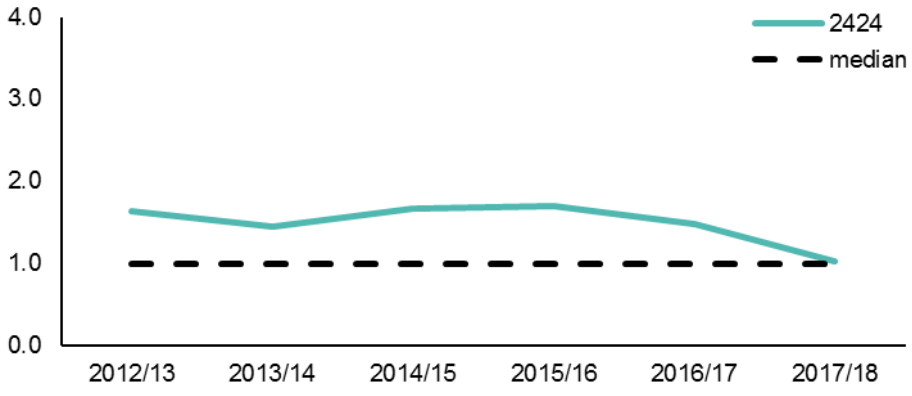
4G.31 The data show the SOC code is a high user of Tier 2 (General).

Year	2014	2015	2016	2017	2018
RCoS Used	984	1175	996	1013	1112

Recommendation

4G.32 We do not recommend including SOC code 2423 (management consultants and business analysts) on the SOL. The occupation ranks fairly low (57th) in our shortage occupation indicators, however, the vacancy rate is above average. There was insufficient stakeholder evidence that this occupation was in shortage.

SOC 2424 - Business and financial project management professionals

Summary table: SOC 2424 Business and financial project management professionals	
Employment	
Share of UK employees (%, APS, 2017/18)	0.8%
Share of Tier 2 (% total RCoS Used 2015-2018)	1.2%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	6.7%
Share of employees born outside the EEA (%, APS, 2017/18)	9.8%
Wages	
Median full-time annual wage (ASHE 2018)	£49,803
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	18
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder evidence

4G.33 We received stakeholder evidence for this SOC code from businesses in the construction, utilities and media and communications sectors for the job title of

project manager. The reasons for the shortages are due to a low number of applicants with the required skills or qualifications.

Use of the SOL

4G.34 This occupation has not been included in previous shortage occupation lists.

Use of Tier 2 (General)

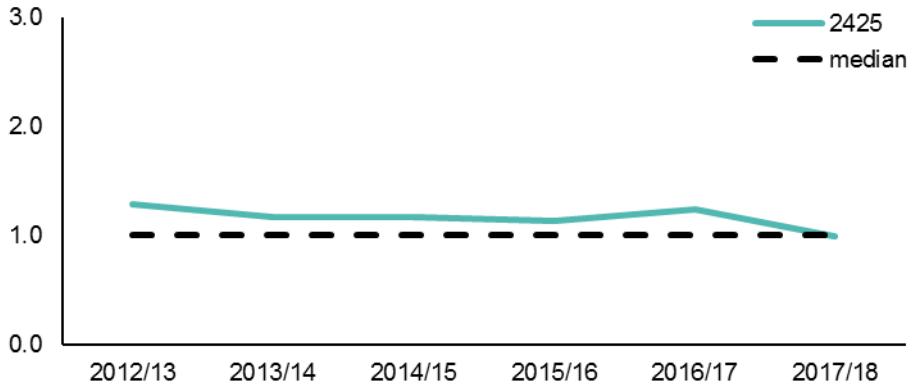
4G.35 The data show that there are relatively small but consistent numbers of Tier 2 Certificates of Sponsorship used.

Year	2014	2015	2016	2017	2018
RCoS Used	165	212	218	223	210

Recommendation

4G.36 We do not recommend including SOC code 2424 (business and financial project management professionals) on the SOL. Despite the occupation ranking highly (18th) in our shortage occupation indicators, the vacancy rate is around average and there was insufficient stakeholder evidence that this occupation was in shortage.

SOC 2425 - Actuaries, economists and statisticians

Summary table: SOC 2425 Actuaries, economists and statisticians	
Employment	
Share of UK employees (%, APS, 2017/18)	0.2%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.5%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	15.1%
Share of employees born outside the EEA (%, APS, 2017/18)	17.7%
Wages	
Median full-time annual wage (ASHE 2018)	£48,168
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	74
Recommendation	
Recommend no change to existing SOL eligibility	

Stakeholder evidence

4G.37 Most of the stakeholder evidence received in relationship to this SOC code relates to one job title, a small part of this occupation. Stakehodlers referred to bioinformatics specialists being in shortage. Bioinformatics specialists are computer and data professionals who work with biotechnology and other biological research areas. The rapid growth of recent technologies to sequence and characterise biological molecules has created exponential growth in biological data, all of which needs appropriate storage and analysis by bioinformaticians to answer these vital biological questions.

4G.38 Bioinformatics is a relatively new discipline and currently a small part of this SOC code, but demand is expected to rise as biopharmaceutical companies are increasingly shifting their emphasis from chemical to genomics-focused drug development. Anglia Ruskin University suggested that the sector is set to grow by around 56,000 jobs a year and supply is struggling to keep up with demand.

4G.39 The recruitment of bioinformaticians is particularly challenging and has been further impacted by the Tier 2 visa cap. Currently, 23 per cent of bioinformaticians at the Wellcome Sanger Institute (Genomics) in the Cambridge area are non-UK EEA citizens and 21 per cent are from the rest of the world. Degrees in bioinformatics are starting to yield graduates but as many of these are from overseas (many STEM MSc courses are 50 per cent overseas), the migration system will need to be practical to retain them.

4G.40 Businesses have told us that data science (bio or otherwise) is poorly catered for in the SOC codes, as their descriptions do not recognise the intersections between domain specific knowledge (biology, engineering) and data science. This is a significant developing area for research.

Use of the SOL

4G.41 This SOC code has partly been on the SOL since 2015. Bio-informaticians were previously classed as SOC 2119 but have been on the SOL since 2013

Use of Tier 2 (General)

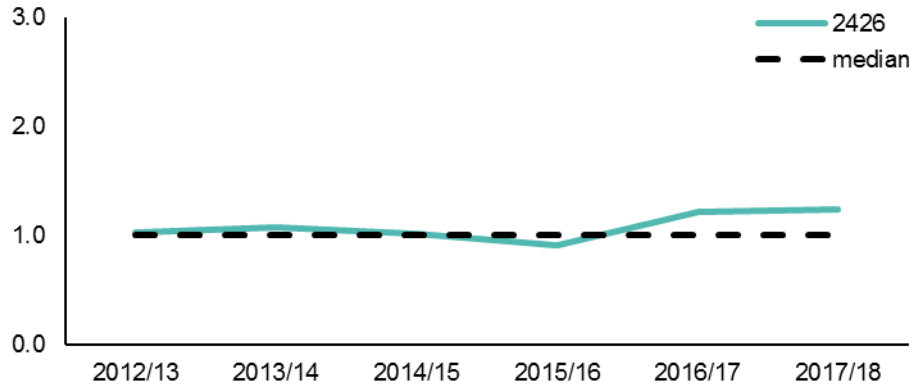
4G.42 The data show a low usage of Tier 2, but as previous paragraph states, the SOC 2119 is being utilised.

Year	2014	2015	2016	2017	2018
RCoS Used	57	69	105	77	100

Recommendation

4G.43 We recommend including bio-informaticians and informaticians under SOC code 2425 (actuaries, economists and statisticians) on the SOL. Despite the occupation ranking fairly low (74th) in our shortage occupation indicators and the vacancy rate being around average, there was compelling stakeholder evidence to retain these job titles.

SOC 2426 - Business and related research professionals

Summary table: SOC 2426 Business and related research professionals	
Employment	
Share of UK employees (%, APS, 2017/18)	0.2%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.2%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	13.0%
Share of employees born outside the EEA (%, APS, 2017/18)	11.1%
Wages	
Median full-time annual wage (ASHE 2018)	£34,270
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator	
Shortage overall rank /105	36
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder evidence

4G.44 We received evidence from several businesses that had a shortage of specialised researchers. We were told that recruitment for this type of specialist role is a constant challenge and due to the work arising in any part of the world, the specific requirements change with each new commission

Use of the SOL

4G.45 This occupation has not been included in previous shortage occupation lists.

Use of Tier 2 (General)

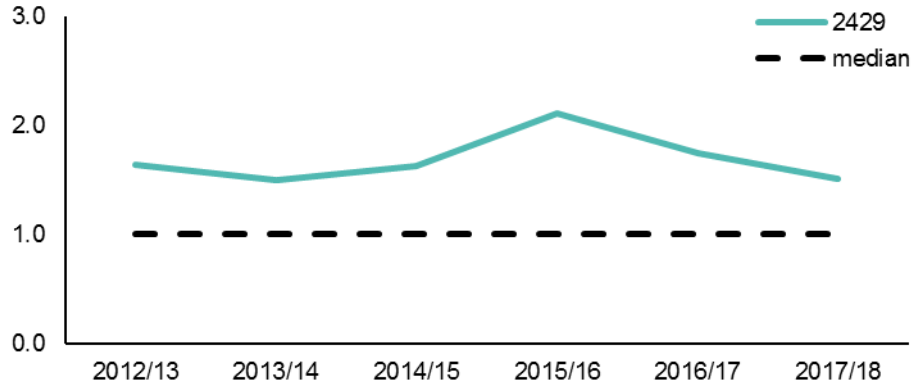
4G.46 This SOC code shows low usage of Tier 2.

Year	2014	2015	2016	2017	2018
RCoS Used	38	46	36	43	18

Recommendation

4G.47 We do not recommend including SOC code 2426 (business and related research professionals) on the SOL. Despite the occupation ranking fairly high (36th) in our shortage occupation indicators and the vacancy rate being around average, there was insufficient stakeholder evidence that this occupation was in shortage.

SOC 2429 - Business, research and administrative professionals n.e.c

Summary table: SOC 2429 Business, research and administrative professionals n.e.c.	
Employment	
Share of UK employees (%, APS, 2017/18)	0.2%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.3%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	2.5%
Share of employees born outside the EEA (%, APS, 2017/18)	9.1%
Wages	
Median full-time annual wage (ASHE 2018)	£41,113
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator	
Shortage overall rank /105	15
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder evidence

4G.48 We did not receive enough evidence for this SOC code to establish that this occupation was in shortage. This occupation includes include a wide-variety of job titles. We received one piece of stakeholder evidence from a higher education establishment that had difficulty recruiting a research manager.

Use of the SOL

4G.49 This occupation was not in previous shortage occupation lists.

Use of Tier 2 (General)

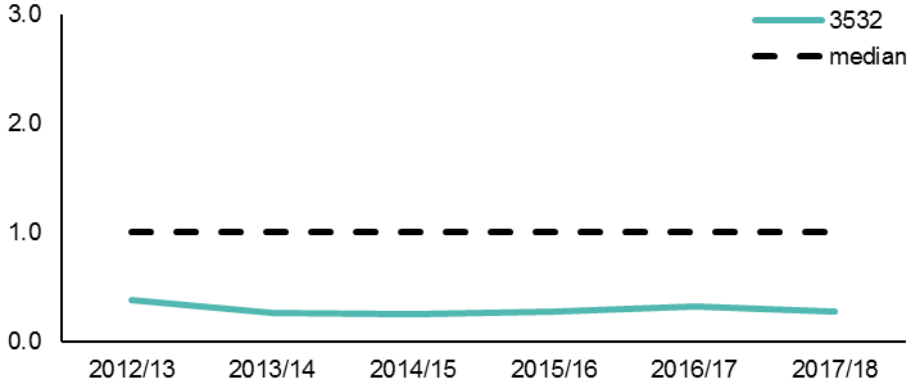
4G.50 The data show a low usage of Tier 2.

Year	2014	2015	2016	2017	2018
RCoS Used	62	59	71	66	37

Recommendation

4G.51 We do not recommend including SOC code 2429 (business, research and administrative professionals n.e.c.) on the SOL. Despite the occupation ranking highly (15th) in our shortage occupation indicators and the vacancy rate being above average, there was insufficient stakeholder evidence that this occupation was in shortage.

SOC 3532 - Brokers

Summary table: SOC 3532 Brokers	
Employment	
Share of UK employees (%, APS, 2017/18)	0.2%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.5%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	5.2%
Share of employees born outside the EEA (%, APS, 2017/18)	13.4%
Wages	
Median full-time annual wage (ASHE 2018)	x
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator	
Shortage overall rank /105	17
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder evidence

4G.52 We did not receive any evidence for this SOC code.

Use of the SOL

4G.53 This occupation has not been on previous shortage occupation lists.

Use of Tier 2 (General)

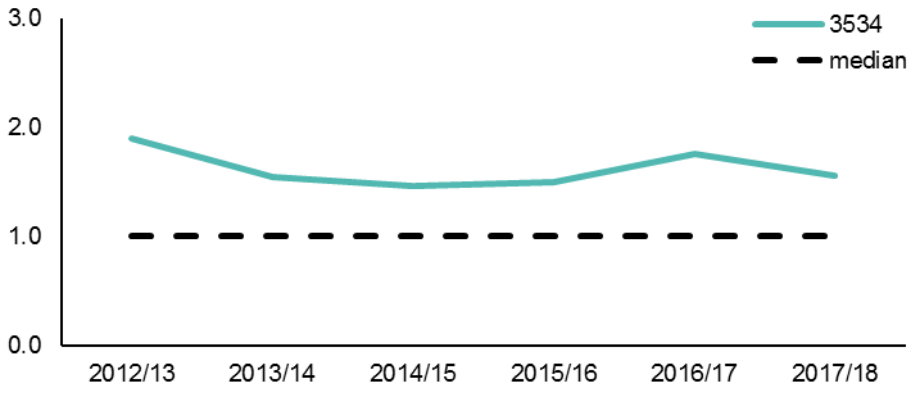
4G.54 The data show fairly low usage of Tier 2.

Year	2014	2015	2016	2017	2018
RCoS Used	108	97	78	91	90

Recommendation

4G.55 We do not recommend including SOC code 3532 (brokers) on the SOL. Despite the occupation ranking highly (17th) in our shortage occupation indicators, the vacancy rate is below average and there was insufficient stakeholder evidence that this occupation was in shortage.

SOC 3534 - Finance and investment analysts and advisers

Summary table: SOC 3534 Finance and investment analysts and advisers	
Employment	
Share of UK employees (%, APS, 2017/18)	0.6%
Share of Tier 2 (% total RCoS Used 2015-2018)	3.8%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	6.3%
Share of employees born outside the EEA (%, APS, 2017/18)	13.4%
Wages	
Median full-time annual wage (ASHE 2018)	£36,809
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator	
Shortage overall rank /105	6
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder evidence

4G.56 We received insufficient evidence from stakeholders of a national shortage. This occupation was mentioned in evidence from a utilities company and an employment sector body referring to the job titles finance business partner and financial control analyst.

Use of the SOL

4G.57 This occupation has not been included previous shortage occupation lists.

Use of Tier 2 (General)

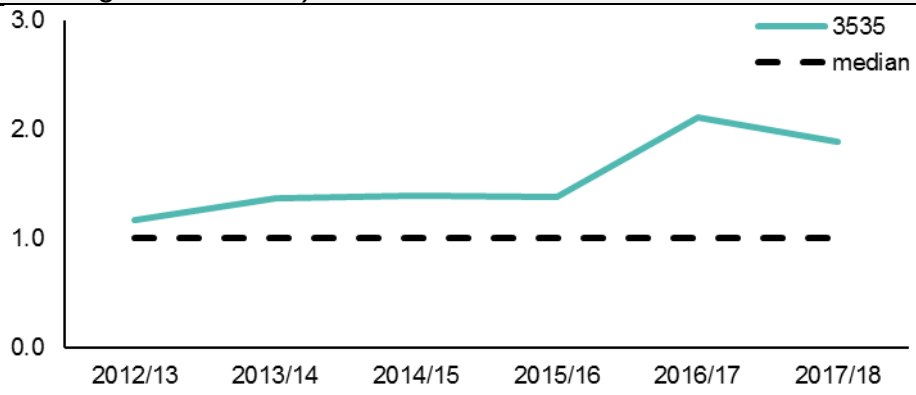
4G.58 The data shows that this SOC is in the top ten users of Tier 2.

Year	2014	2015	2016	2017	2018
RCoS Used	625	704	659	694	727

Recommendation

4G.59 We do not recommend including SOC code 3534 (finance and investment analysts and advisers) on the SOL. Despite the occupation ranking highly (6th) in our shortage occupation indicators and the vacancy rate being above average, there was insufficient stakeholder evidence that this occupation was in shortage.

SOC 3535 - Taxation experts

Summary table: SOC 3535 Taxation experts	
Employment	
Share of UK employees (%, APS, 2017/18)	0.1%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.3%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	4.4%
Share of employees born outside the EEA (%, APS, 2017/18)	5.3%
Wages	
Median full-time annual wage (ASHE 2018)	£44,818
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator	
Shortage overall rank /105	21
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder evidence

4G.60 We received mention from a manufacturer and a utilities sector body for this occupation SOC for the job title taxation experts, as part of their list of jobs in shortage.

Use of the SOL

4G.61 This occupation was not included in previous shortage occupation lists.

Use of Tier 2 (General)

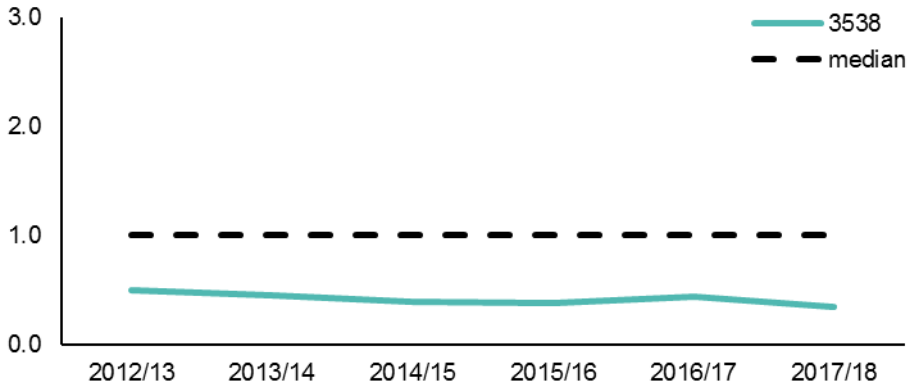
4G.62 The data show relative low use of Tier 2.

Year	2014	2015	2016	2017	2018
RCoS Used	64	55	57	62	72

Recommendation

4G.63 We do not recommend including SOC code 3535 (taxation experts) on the SOL. Despite the occupation ranking fairly highly (21st) in our shortage occupation indicators and the vacancy rate being above average, there was insufficient stakeholder evidence that this occupation was in shortage.

SOC 3538 - Financial accounts managers

Summary table: SOC 3538 Financial accounts managers	
Employment	
Share of UK employees (%, APS, 2017/18)	0.6%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.3%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	3.2%
Share of employees born outside the EEA (%, APS, 2017/18)	10.7%
Wages	
Median full-time annual wage (ASHE 2018)	£38,628
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator	
Shortage overall rank /105	32
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder evidence

4G.64 We received evidence from a utilities company, who told us there were shortages, amongst other occupations they listed, for planning projects and reporting managers.

Use of the SOL

4G.65 This occupation has not been on previous shortage occupation lists.

Use of Tier 2 (General)

4G.66 The data show low usage of the Tier 2 visas.

Year	2014	2015	2016	2017	2018
RCoS Used	61	78	49	64	50

Recommendation

4G.67 We do not recommend including SOC code 3538 (financial accounts managers) on the SOL. Despite the occupation ranking fairly highly (32nd) in our shortage occupation, the vacancy rate is below average and there was insufficient stakeholder evidence that this occupation was in shortage.

4.H. Artistic and Creative Industries

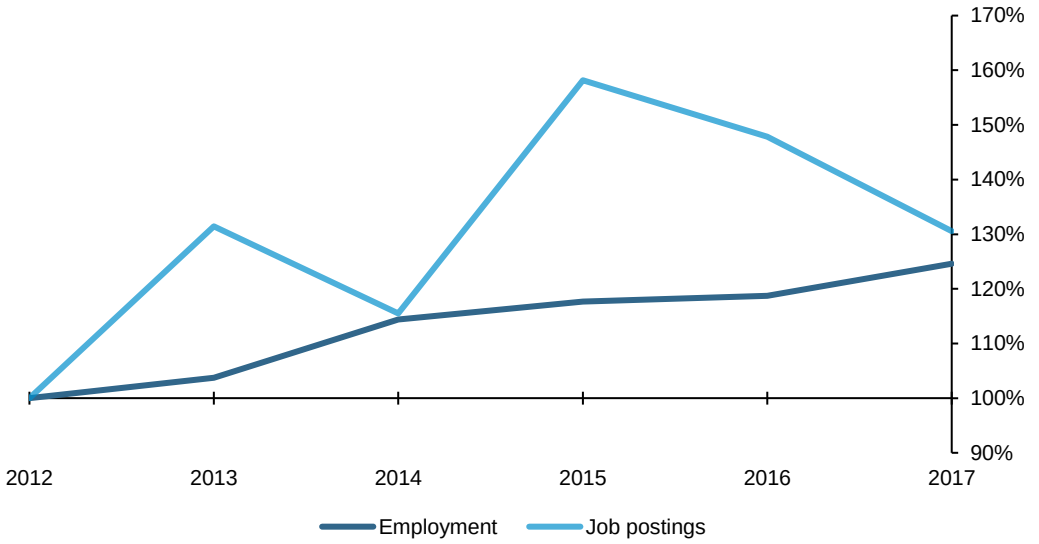
Introduction

4H.1 This section covers the eight creative industry-related SOC 2010 codes; 3411 Artists, 3412 Authors, writers and translators, 3413 Actors, entertainers and presenters, 3414 Dancers and choreographers, 3415 Musicians, 3416 Arts officers, producers and directors, 3421 Graphic designers and 3422 Product, clothing and related designers. It begins with an overview of the sector, highlighting issues that may be leading to shortages and how industry behaviour and recent Government policies may affect job titles within the creative industries. This section ends by analysing shortages by SOC codes.

4H.2 The creative industries are a very heterogeneous group, including the art, heritage, horse racing, museums and sport markets, however the users of the shortage occupation list are predominately in the film, television or video games sectors.

Sector overview

Figure 4.h.1: Indexed employment and job postings change compared to base year 2012 – Creative occupations, 2012-17 (2012 = 100)



Source: APS (2012-17), Burning Glass

4H.3 Figure 4.h.1 shows the indexed change in employment and job postings for the 8 creative occupations. These numbers are indexed to 2012. Overall, in terms of employment, there has been year on year growth from 2012.

4H.4 Breaking this down by occupation, there has been growth in most of the occupations in the past few years, especially for product, clothing and related designers where employment has grown by over 40 per cent between 2011 and 2017. There is also significant growth in the workforce of arts officers, producers

and directors. Actor, entertainers and presenters and musicians have had a steady trend over this time with small fluctuations in their employment levels each year.

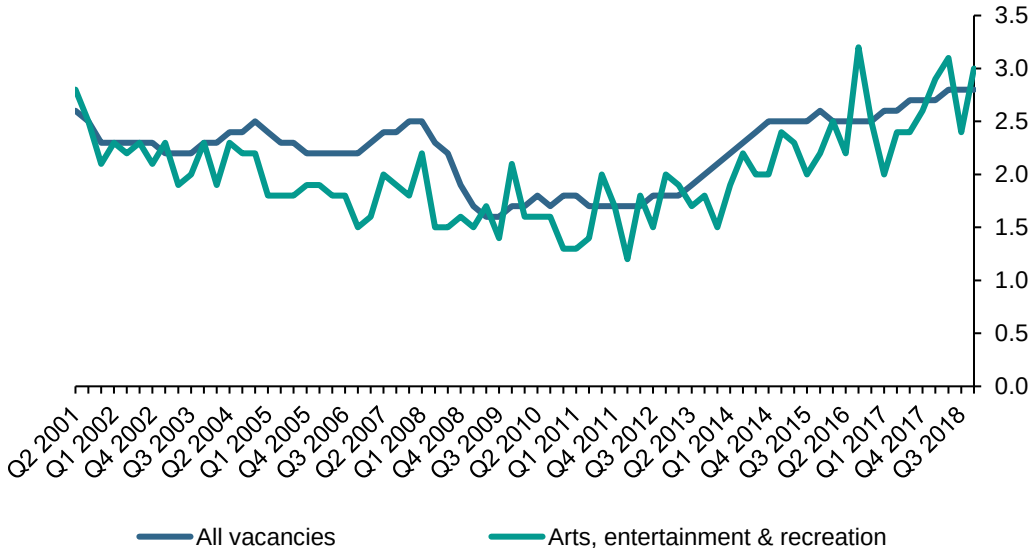
4H.5 The data on job postings is much more volatile compared to employment. During the period, the total number of job postings for the 8 creative occupations declined from 2013 to 2014, recovering in 2015, with another fall in 2016 and 2017. Despite this, the overall number of job postings within the 8 creative occupations was around 30 per cent greater in 2017 than it was in 2012.

4H.6 Breaking this down by the individual occupations, there has been significant growth in the number of job postings for authors, graphic designers, artists and product/clothing designers.

4H.7 However, during this period there has also been a drop of about 50 per cent in the number of postings for dancers and choreographers and musicians. This equates to about 500,000 job postings in 2017 for programme and software developers and 25,000 for graphic designers. Dancers and musicians represent much smaller numbers with the number of postings for these occupations in 2017 being 1,151 and 1,629 respectively.

Vacancy rates

Figure 4.h.2: Vacancy rates per 100 employees by industry, 2001-18



Source: VACS02: Vacancies by industry (2019)

4H.8 Figure 4.h.2 above shows the vacancy rates by industry per 100 employees. While being more erratic, the figure shows that the vacancy rate in the arts, entertainment and ration industry has closely mirrored the vacancy rate for all industries, being perhaps slightly lower during this period. This hints that the

arts, entertainment and recreation industry has not had a large problem recruiting workers compared to other industries.

Wages

Table 4.h.1: Change in median hourly pay

SOC title	SOC code	Change in median hourly pay 2016-2017 (%)	Change in median hourly pay 2014-2017 (%)
Artists	3411	2.86	7.21
Authors, writers and translators	3412	1.62	-0.08
Actors, entertainers and presenters	3413	N/A	N/A
Dancers and choreographers	3414	N/A	N/A
Musicians	3415	-2.32	10.62
Arts officers, producers and directors	3416	-0.76	-10.24
Graphic designers	3421	-0.93	-5.06
Product, clothing and related designers	3422	-0.52	-0.2

Source: ASHE (2014-17)

4H.9 Table 4.h.1 shows the change in the median hourly pay of the creative occupations over one year and over three years. We can see there has been large growth in the hourly pay of artists and musicians over three years. There has also been a decrease in the hourly pay for many of the sectors, with arts officers, producers and directors earning 10 per cent less at the median in 2017 than they did in 2014.

4H.10 In 2016 the EEA share of employment within the creative sector was 4.3 per cent of the total. This is significantly higher for a small number of sub sectors particularly the video games industry and VFX were, the industry argues, there is a global shortage of particular skills. In the MAC Interim Report DCMS indicated that there was a higher proportion of both EEA and non-EEA nationals employed in London than elsewhere in the country, averaging at 12 per cent for EEA nationals and 21 per cent for non-EEA nationals.

4H.11 The creative industries are the only SOC codes below RQF 6 to be allowed to use Tier 2 (General). This is partly due to the recognition of the difficulty in capturing all creative skill sets through the RQF framework, a number of these job titles demonstrate their skill level through means other than formal qualifications, such as industry recognised standards, i.e. ballet dancers who meet the standard required by internationally recognised UK Ballet companies.

There are currently 19 creative industries job titles on the SOL within five creative SOC codes (3411 artists, 3414 dancers and choreographers, 3415 musicians, 3416 arts officers, producers and directors and 3421 graphic designers) although it should be noted that SOC 2136 programmers and software development professionals includes a number of roles which are specific to the film, television and video games sectors.

4H.12 The artistic and creative sector employs a large proportion of freelance workers as well as those who are self-employed. Within our EEA Interim update (March 2018) we noted that "The Creative Industries Federation said that self-employed and freelance workers played a vital role in the creative industries and that freelancers accounted for half of creative jobs in the sector"[148].

Labour demand and supply in the artistic and creative sector

4H.13 The Independent Review of the Creative Industries by Sir Peter Bazelgette (2017) states that the Creative sector contributed £87.4bn in GVA in 2015, representing 5.3 per cent of the UK economy. The review also found that, between 2010 and 2015, the sector grew by 34 per cent, faster than any other sector within that period. They outperformed other sectors in terms of employment growth: between 2011 and 2016, employment in the sector increased by 25.4 per cent (circa 400,000 jobs) compared to 7.6 per cent average across the wider UK. By forecasting using DCMS Economic estimates (2016) and ONS labour statistics (2016) the review predicts that that the Creative Industries could deliver approximately 1 million new jobs by 2030. This expansion will lead to the increased demand for skilled workers in the sector.

4H.14 The UK Industrial Strategy has developed a Creative Industries Sector deal which is aimed at unlocking growth for the Creative Industries, part of the Industrial Strategy commitment is to provide people with the necessary skills and talent which are essential for the industry to grow. "Employment has increased in the sector by a quarter since 2011 and 3 times faster than the economy as a whole. Moreover, forecasts suggest that the digital and creative industries could need 1.2 million new workers between 2012 and 2022." Creative Industries: Sector Deal (March 2018).

Apprenticeships

4H.15 There are obstacles for the creative industries to get best use out of the apprenticeship levy. All employers with a paybill of over £3m must pay 0.5 per cent of this into the apprenticeship levy from April 2017. Organisations can then draw on these funds to pay for the training and assessment of apprentices. The

[148]https://assets.publishing.service.gov.uk/Government/uploads/system/uploads/attachment_data/file/694494/eea-workers-uk-labour-market-interim-update.pdf

aim is to provide employers with motivation to improve the number and quality of apprenticeships, strengthening vocational routes into professions.

4H.16 However, the sector has highlighted issues with take up of apprenticeships within the creative industries. There is a high percentage of SME's and micro-businesses who make up a significant proportion of the Creative Industries, who often work on short term projects. They are likely to have fewer employees who are eligible to be apprentices. There are further technical difficulties in accessing the levy funds and developing industry-led standards. SME's report that they lack the capacity or expertise to develop standards.

4H.17 The Creative Industries Council has proposed a national three-year pilot for this sector, to ensure that the £75 million of levy contributions from Creative Industries employers can be effectively reinvested in additional jobs in the sector. The pilot would allow unlimited transfer of levy funds to ATAs and placement of apprentices in supply chain businesses, as well as the use of these funds to invest in the development of standards and for data collection for evaluation purposes. (The Independent Review of the Creative Industries, 2017)

Diversity and the Creative Sector

4H.18 The workforce of the Creative Sector does not reflect the UK population; BAME, disability and gender balance are all under-represented in the creative sectors. More advantaged socio-economic groups hold 9 out of 10 creative industry jobs. Creative Industries: Sector Deal (2018). The Creative Industries Council's 2016 strategy Create Together has requested individual creative industries to set aspirational diversity targets.

Table 4.h.2: Creative industries employee characteristics, expressed as percentage total of the sector					
	Female	BAME	No degree	Less advantaged	Outside London
Advertising & marketing	45	12	37	10	51
Architecture	36	*7	28	*3	73
Crafts	-	*13	-	*14	-
Design (product, graphic & fashion)	43	9	49	9	75
Film, TV, video, radio & photo	37	11	44	14	62
IT, software & comp. services	22	18	36	3	73
Museums, galleries & libraries	66	*7	-	23	-
Music, performing & visual arts	47	7	37	11	66
Publishing	47	12	37	12	62
Total Creative Industries	37	13	38	8	68
Total UK Economy	47	12	66	33	83

Source: DCMS and Nesta (2017)
Note: * represents estimates from employment figures pre-dating 2016

4H.19 IT, software and computer services where the video games sector sits well below the average for gender and BAME representation. There are initiatives to tackle this, which are discussed below.

School Education and Creative Subjects

4H.20 The call for evidence responses said the difficulties facing the sector stem from a mix of inadequate provision in schools, an underdeveloped technical education system and a lack of awareness about careers that the sector has to offer. The number of people studying creative subjects is declining and call for evidence responses say this has been exacerbated due to the lack of importance that Government has placed on creative skills and subjects. 2016 saw the lowest number of entries for arts subjects in England and Wales for a

decade. (Johnes, Rebecca. “Entries to Arts Subjects at Key Stage 4.” Education policy institute, September 2017).

4H.21 The selection of subjects included in the English Baccalaureate (EBacc) – the subjects that the Government thinks is important for young people to study at GCSE – does not include any creative subjects. Entries for GCSE’s in creative subjects fell by 46,000 in 2016. (Hill, Liz. “arts in schools plummets, new figures show.” Arts Professional, July, 2016 n.d.)

4H.22 The Creative Industries Federation report “Growing the UK’s Creative Industries” (December 2018) highlights the significance Government focus has on its industries. “The importance of creative education in schools is seen as a litmus test for how seriously Government will support creative businesses and the sector more widely. One survey respondent noted: “Recent changes to the school curriculum, downgrading creative subjects such as art and drama and effectively forcing underfunded schools to choose more ‘academic’ subjects, are having a profound effect on the well-being of the creative industries in the UK […] We need to see a massive increase in Government spending and educational support for the creative industries, in line with recent advances in Governmental support of the tech industries and start-ups.”

Steps being taken to tackle labour shortages

4H.23 “The Government is making up to £2 million available, subject to business case, to support an industry-led creative careers programme aiming to reach at least 2,000 schools and 600,000 pupils in two years and industry development of apprenticeship standards. Industry will provide further leadership on diversity and scope expanding the voluntary Skills Investment Fund supporting on-the-job training.” Creative Industries: Sector Deal (2018).

4H.24 Government intervention in developing post-secondary education and training is undergoing reform at present, moving towards employer-led skills approaches and increased emphasis on regional strategies. There are already a range of specialist training centres and industry-led initiative to tackle skills gaps. The range of initiatives aimed at increasing the skills and awareness of jobs within the creative industries include:

i. The National College for Creative and Cultural Industries, managed by Creative & Cultural Skills on behalf of a consortium of employers and industry organisations (Bazelgette Review, 2017)
ii. The industry-led Next Gen Skills Academy for games, animation and visual effects (VFX) (Bazelgette Review, 2017)

iii. The Government-funded BRIT School of Performing Arts and Technology sponsored by the British Recording Industry Trust (Bazelgette Review, 2017)
iv. The Global Academy that partners with the University of the Arts, London to focus on broadcast and digital media skill (Bazelgette Review, 2017)
v. Digital Schoolhouse created by UKIE is an initiative led and funded by part of the creative sector. It aims to increase the digital computing skills of school age children for the benefit of the creative industries and wider economy. The programme, currently in 34 schools across the country, develops creative digital and critical thinking skills alongside core computer science and programming concepts amongst pupils[149].
vi. North East Futures University Technical College. Opened in September 2018 the school specialises in both academic and technical qualifications. Partners include Ubisoft, Accenture and the University of Sunderland, who have been involved in designing the curriculum to address skills gaps in the industry. Students work on projects developed by businesses to apply theory to the world of work and learn about the practical job roles in the creative industries. The school aims to ensure there are equal opportunities for girls to be inspired by roles in the digital and creative tech sectors.[150]
vii. Working Title Films, is establishing a new school for 16 to 19 year olds, the London Screen Academy, it will specialise in film, television and video-making skills from scriptwriting to post production. This will provide places for 1,000 students from a wide range of backgrounds.[151]
viii. The Saturday club trust Saturday Clubs are a national scheme that offers free Saturday classes to 13-16 year olds to develop creative talent, confidence and knowledge. It is aiming to expand five-fold to over 250 sites in the UK. (Bazelgette Review, 2017)

4H.25 The Bazelgette Review (2017) stressed the importance of building the domestic talent pipeline as well as continued access to world class talent, as the way to tackle current and emerging skills shortages. It recommended a campaign to alter the public perception of creative careers and inspire people within the UK to pursue a career in the Creative Industries. The aim would be to increase awareness of creative sector careers and provide information on how to pursue them as well as address common misconceptions about working in the sector.

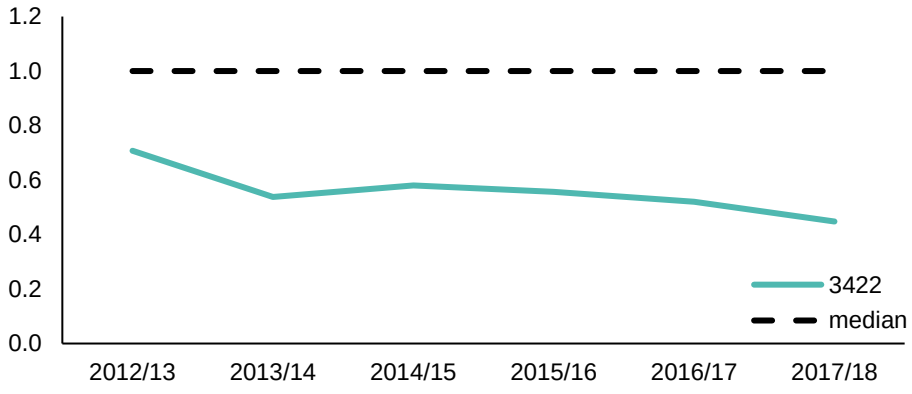
[149] http://www.digitalschoolhouse.org.uk/
[150] https://www.nefuturesutc.co.uk/employers/#pbl
[151] https://www.lsa.ac.uk/ & https://www.arts.ac.uk/about-ual/press-office/stories/ual-and-working-title-will-develop-next-gen-talent-at-london-screen-academy

In addition, it suggests an online Creative Careers gateway providing a single access point to existing and new material from across the creative sectors, showcasing the breadth of opportunities and paths of entry, as well as an industry-led online one stop shop for schools for teaching material and careers information underpinned by a business-led outreach programme.

4H.26 European Commission Research in 2015 suggested that the digital skills gap is larger in the UK than anywhere else in Europe, with 250,000 ICT job vacancies expected by 2020[152]. A large proportion of the job titles requesting to be put on the SOL for the Creative Industries are those which require STEM skills, for example within video gaming, VFX, and animation. Companies have to compete for high skilled roles which require IT skills with other higher paying industries, for example the financial sector.

Occupations under consideration

SOC 3411 - Artists

Summary table: SOC 3411 Artists	
Employment	
Share of UK employees (%, APS, 2017/18)	0.1%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.3%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	12.6%
Share of employees born outside the EEA (%, APS, 2017/18)	6.3%
Wages	
Median full-time annual wage (ASHE 2018)	£28,785
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator	
Shortage overall rank /105	29
Recommendation	
Recommend expanding to include entire occupation	

[152] http://coadec.com/news/life-after-brexit-from-the-coadec-community/

Stakeholder evidence

4H.27 Currently the only role on the SOL is Animator in VFX and 2D/3D computer animation for the film, television or video games sectors. It is within these industries that stakeholders say there are shortages. Whilst the numbers are small, there has been an increase in recruitment via Tier 2 from 2014, increasing from 23 in 2014 to 70 in 2018.

4H.28 The sector is well organised with a number of sector-based bodies, including Creative Industries Federation, UK Screen Alliance, The Independent Game Developers Association (TIGA) and The Association for UK Interactive Entertainment (UKIE), as well as DCMS. As such the requests for job titles to be put on the SOL was co-ordinated through these bodies, making the number of requests largely irrelevant. For example, The Association for UK Interactive Entertainment represented the views of 35 games businesses, from small developers to large, multinational companies.

4H.29 The majority of requests to be put on the SOL were within animation, VFX, SFX and the computer gaming industry. The list of job titles requested to be put on the SOL or to remain on the SOL were: 3D artist, technical artist, animator, art director, VFX artist, character artist, UI artist, lighting artist, technical animator, technical artist, character artist, concept artist, storyboard artist, previsualisation artist, layout artist and lead marketing artist.

4H.30 In the last full review of the SOL (February 2013) we said “Partners told us that innate ability is particularly important for these artistic roles and that during the recruitment process greater emphasis is often put on show reels and portfolio work rather than an individual’s qualifications and CV.”

4H.31 The current SOL contains the following roles for SOC 3411: Animator in VFX and 2D/3D computer animation for the film, television or video games sectors. The games industry along with VFX and other technologically driven organisations found the list did not allow for the creation of new roles within the industry.

Use of the SOL

4H.32 SOC 3411 has been on the SOL since 2011.

Use of 2 (General)

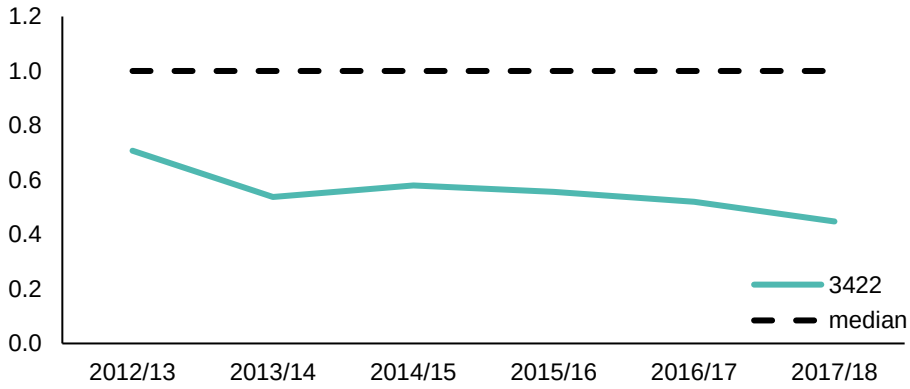
Year	2014	2015	2016	2017	2018
RCoS Used	23	41	34	50	70

4H.33 Usage of Tier 2 (General) has been low.

Recommendation

4H.34 We recommend including SOC code 3411 (artists) on the SOL. The occupation ranks fairly high in our shortage indicators (29th) and although its vacancy rate is below average, there has been an increase in Tier 2 (General) usage in recent years. The roles that they are recruited for are within the film, television and video games sector, the majority of job titles are for animators and or those within the VFX industry. The shortage indicators provide evidence of shortage with a score of 29 out of 105. We accept there is a national shortage within this SOC code and recommend the SOC code is retained on the SOL, to be expanded to include all job titles within this SOC code.

SOC 3412 - Authors, writers and translators

Summary table: SOC 3412 Authors, writers and translators	
Employment	
Share of UK employees (%, APS, 2017/18)	0.1%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.1%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	15.8%
Share of employees born outside the EEA (%, APS, 2017/18)	19.2%
Wages	
Median full-time annual wage (ASHE 2018)	£31,153
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator	
Shortage overall rank /105	40
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder evidence

4H.35 The list of job titles that stakeholders requested to be put on the SOL was: localisation testers in a variety of languages as well as requests for storyliner, interpreter, translator, screenwriter.

4H.36 The evidence told us that the localised tester roles are skilled to RQF 6 level, the interpreter and translator roles are skilled to RQF 4, the storyliner and screen writer do not require formal qualifications.

4H.37 There are no roles under 3412 on the current SOL.

Use of the SOL

4H.38 SOC 3412 has never been on the SOL.

Use of Tier 2 (General)

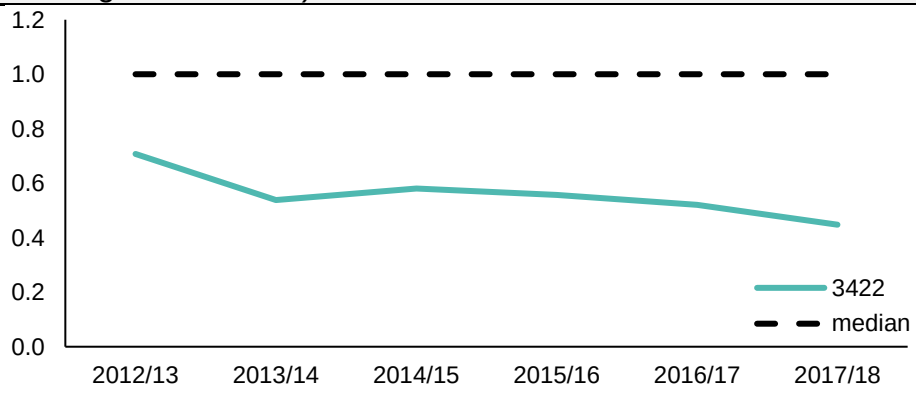
Year	2014	2015	2016	2017	2018
RCoS Used	8	14	19	17	12

4H.39 Usage of Tier 2 (General) has been low.

Recommendation

4H.40 We do not recommend including SOC code 3412 (authors, writers and translators) on the SOL. The occupation ranks fairly high in our shortage indicators (40th), however, its vacancy rate is below average and the use of Tier 2 (General) indicates reduced international recruitment in recent years, albeit from a very low base. There was also insufficient stakeholder evidence that this occupation was in shortage.

SOC 3413: Actors, entertainers and presenters

Summary table: SOC 3413 Actors, entertainers and presenters	
Employment	
Share of UK employees (%, APS, 2017/18)	0.1%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.0%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	2.7%
Share of employees born outside the EEA (%, APS, 2017/18)	5.4%
Wages	
Median full-time annual wage (ASHE 2018)	x
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator	
Shortage overall rank /105	x
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder evidence

4H.41 We received a small number of submissions requesting actors, actors with particular character traits and stunts persons to be put on the SOL.

Use of the SOL

4H.42 SOC 3413 has never been on the SOL.

Use of Tier 2 (General)

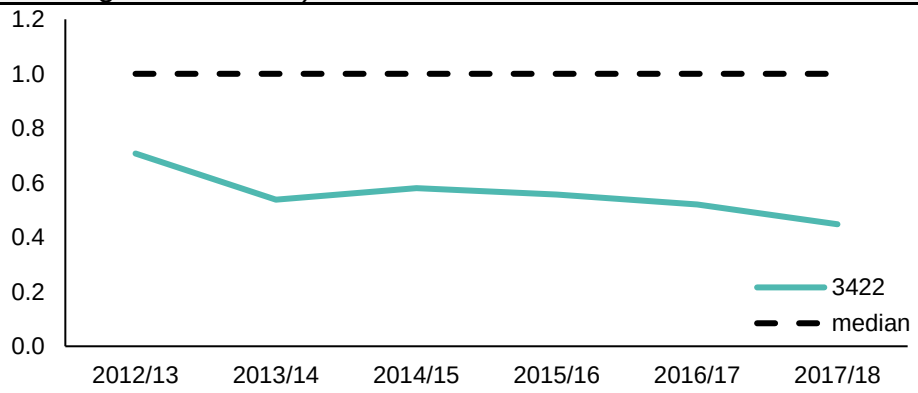
Year	2014	2015	2016	2017	2018
RCoS Used	18	5	9	6	3

4H.43 Usage of Tier 2 (General) has been very low.

Recommendation

4H.44 We do not recommend including SOC code 3413 (actors, entertaining and presenters) on the SOL. Although we do not have an overall rank for our shortage indicators for the occupation (due to low sample size), it had a below average vacancy rate and a very low usage of Tier 2 (General). There was also insufficient stakeholder evidence that this occupation was in shortage.

SOC 3414 - Dancers and choreographers

Summary table: SOC 3414 Dancers and choreographers	
Employment	
Share of UK employees (%, APS, 2017/18)	Not reported
Share of Tier 2 (% total RCoS Used 2015-2018)	0.1%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	7.0%
Share of employees born outside the EEA (%, APS, 2017/18)	5.4%
Wages	
Median full-time annual wage (ASHE 2018)	x
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator	
Shortage overall rank /105	x
Recommendation	
Recommend no change to existing SOL eligibility	

Stakeholder evidence

4H.45 The rules allowing dancers on the SOL are very specific – “only the following jobs in this occupation code: Skilled classical ballet dancers who meet the standard required by internationally recognised United Kingdom ballet companies (e.g. Birmingham Royal Ballet, English National Ballet, Northern Ballet Theatre, The Royal Ballet and Scottish Ballet). The Company must either: have performed at or been invited to perform at venues of the calibre of the Royal Opera House, Sadler’s Wells or Barbican, either in the United Kingdom or overseas; or attract dancers and/or choreographers and other

artists from other countries; or be endorsed as being internationally recognised by a United Kingdom industry body such as the Arts Councils (of England, Scotland and/or Wales). There are similar requirements for skilled contemporary dancers.

4H.46 We received evidence from the Royal Opera House, and the Society of London Theatre, and UK theatre. The requests were to retain the roles of ballet dancer and contemporary dancer on the SOL and to have one addition for the role of ballet benesh choreologist. Benesh Movement Notation is a form of dance notation system used to document dance.

4H.47 Use of the SOL for this SOC code is very low. The Royal Opera house response indicated they recruited six skilled classical ballet dancers with a tier 2 visa in the past 12 months for The Royal Ballet, Society of London Theatre and UK Theatre said that there are around 50 dancers currently employed from outside the EEA under Tier 2 across the UK's ballet and contemporary dance companies.

Use of the SOL

4H.48 SOC 3414 has been on the SOL since 2011.

Use of Tier 2 (General)

Year	2014	2015	2016	2017	2018
RCoS Used	22	16	10	5	18

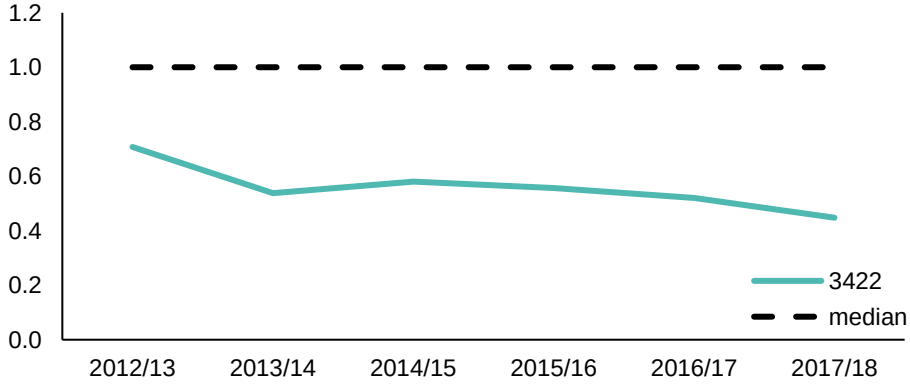
4H.49 Usage of Tier 2 (General) has been low.

Recommendation

4H.50 We recommend including SOC code 3414 (dancers and choreographers) on the SOL. Due to sample size issues, we do not have a ranking for the occupation in our shortage indicators. The vacancy rate is below average. Stakeholder argued that highly skilled dancers are in shortage as there is only a selected number of individuals worldwide who have the innate ability required by leading dance companies. Companies such as the Royal Opera house and others represented by the Society of London theatre and UK theatre want to retain access to worldwide talent to have the highest possible standard for their companies. There was a request to include the role of Benesh Choreologists on the SOL, however we received insufficient evidence of a shortage for this job title.

4H.51 The Home Office may wish to consider whether UK industry bodies such as the Arts Council might be better placed to provide an up to date description of the UKs internationally regarded institutions

SOC 3415 - Musicians

Summary table: SOC 3415 Musicians	
Employment	
Share of UK employees (%, APS, 2017/18)	0.1%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.0%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	5.8%
Share of employees born outside the EEA (%, APS, 2017/18)	1.8%
Wages	
Median full-time annual wage (ASHE 2018)	£38,791
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator	
Shortage overall rank /105	94
Recommendation	
Recommend no change to existing SOL eligibility	

Stakeholder evidence

4H.52 SOC 3415 is already on the SOL with particular restrictions meaning only Orchestral musicians in certain positions are able to use the SOL. The current requirements for musicians is; “only the following jobs in this occupation code: skilled orchestral musicians who are leaders, principals, sub-principals or numbered string positions, and who meet the standard required by internationally recognised UK orchestras (including London Symphony Orchestra, London Philharmonic Orchestra, Philharmonia Orchestra and Royal Philharmonic Orchestra).

4H.53 The number of COS issued for SOC 3415 are all in single figures.

4H.54 Historically roles for orchestral musicians were on the SOL, both principals and tutti (rank and file) musicians. In 2013 following a meeting with The Association

of British Orchestras and the Musicians Union it was agreed to retain principals on the SOL but to remove tutti musicans. We have received evidence that suggests that a lack of investment by the Government in children learning music ensures that there is only a small number of trained musicians within the UK. In addition, innate talent is not something you can teach.

4H.55 For this call for evidence we received evidence from the Association of British Orchestras, City of Birmingham Symphony Orchestra and Royal Opera House.

4H.56 There is requests to put the following roles in addition to these roles onto the SOL.

- Section leaders for the following instruments; bassoon, trumpet, cello, clarinet.
- Principals for the following instruments: piccolo and viola.
- Sub principal no 5 first violin leader, section principal, sub-principal.
- The following numbered roles; 1st violins, 2nd violins, violas, cellos, basses, woodwind, brass.
- Ballet pianist, orchestra concert master.

Use of the SOL

4H.57 SOC 3415 has been on the SOL since 2011.

Use of Tier 2 (General)

Year	2014	2015	2016	2017	2018
RCoS Used	3	1	5	1	6

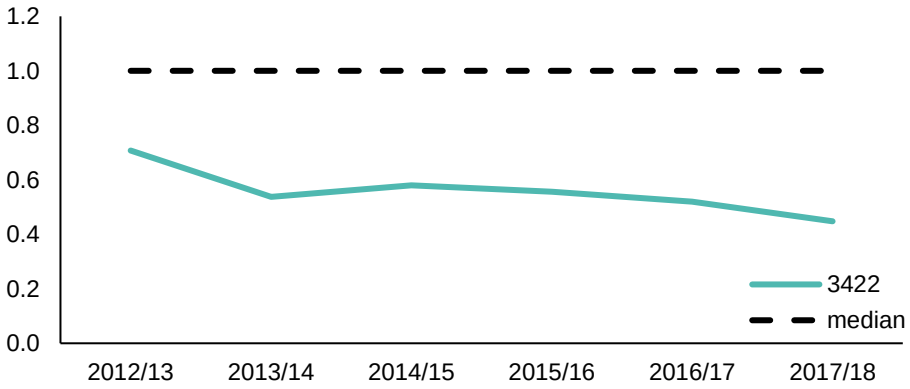
4H.58 Usage of Tier 2 (General) has been very low.

Recommendation

4H.59 We recommend including SOC code 3415 (musicians) on the SOL. Despite the occupation having a fairly low on our shortage indicators (94th) and a below average vacancy rate, the stakeholder evidence suggests that highly skilled musicians are in shortage as there is only a selected number of individuals worldwide who have the innate ability required to perform in orchestras. Orchestras want to retain access to worldwide talent to have the highest possible standard for their companies to compete as world class orchestras.

4H.60 The Home Office may wish to consider whether UK industry bodies such as the Association of British Orchestras might be better placed to provide an up to date description of the UKs internationally regarded institutions.

SOC 3416: Arts officers, producers and directors

Summary table: SOC 3416 Arts officers, producers and directors	
Employment	
Share of UK employees (%, APS, 2017/18)	0.2%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.5%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	0.7%
Share of employees born outside the EEA (%, APS, 2017/18)	7.8%
Wages	
Median full-time annual wage (ASHE 2018)	£37,830
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator	
Shortage overall rank /105	66
Recommendation	
Recommend adding entire occupation to the SOL	

Stakeholder evidence

4H.61 Computer Games, VFX and Animation are employers of high skilled workers with technical skills and creative abilities. The rapid development in technology can cause difficulties getting workers with the skills companies need to remain competitive. Gaming has a range of SMEs who struggle to compete on salary with larger organisations and other industries that require the same skill set (e.g. the financial sector) and so often offer shares in the company as an alternative incentive.

4H.62 The submissions listed the RQF level for all of these occupations as high skilled (RQF 6). UK Screen Alliance said "We estimate that between 175 and 200 new Tier 2 visas were issued to VFX and animation workers in 2018. We also estimate that a further 60 to 80 new Tier 5 visas were used. We estimate that in total there are about 400 workers on Tier 2 visas (5 per cent of the workforce) and about 80 (1 per cent) on Tier 5. However, we anticipate these numbers to rise rapidly after Brexit once EEA migration is included. Currently around 750 EEA workers are new hires each year."

4H.63 The number of COS issued has been steadily increasing since 2015 growing from 78 to 121. This is consistent with the evidence we have received from stakeholders.

4H.64 We received evidence from a range of companies as well as UK Screen Alliance and Screen Skills. There are currently seven job titles under SOC 3416 on the SOL, including 2D supervisor, 3D supervisor, computer graphics supervisor, producer, production manager, technical director, VFX supervisor. There have been requests for all of these to remain on the SOL.

4H.65 Job titles that were requested to be put on the SOL were; head of drama, series producer, production assistant, producer - German speaking, producer - French speaking, producer, director, assistant producer, animation editor, animation director, editor, location manager, post-production supervisor, line producer, production coordinator, head of production, senior artist/artist, senior producer, associate producer, Creative Director, Production Coordinator and Assistant Technical Director.

Use of the SOL

4H.66 SOC 3416 has been on the SOL since 2011.

Use of Tier 2 (General)

Year	2014	2015	2016	2017	2018
RCoS Used	84	74	91	104	113

4H.67 Usage of Tier 2 (General) has been moderate and increasing in recent years.
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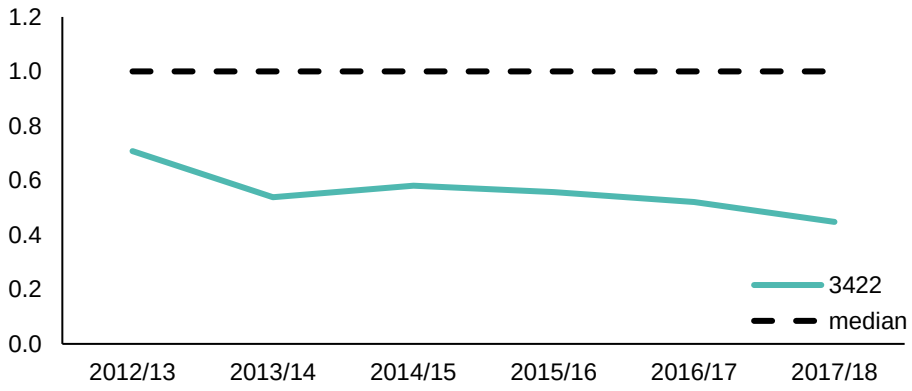
Recommendation

4H.68 We recommend including SOC code 3416 (arts officer, producers and directors) on the SOL. Despite the occupation ranking fairly low in our shortage indicators (66th) and a below average vacancy rate, use of Tier 2 (General) has been increasing in recent years. The stakeholder evidence highlighted shortages in technical skills which are ever developing and in shortage worldwide.

SOC 3421 - Graphic designers

Summary table: SOC 3421 Graphic designers	
Employment	
Share of UK employees (%, APS, 2017/18)	0.2%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.2%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	10.0%
Share of employees born outside the EEA (%, APS, 2017/18)	7.0%
Wages	
Median full-time annual wage (ASHE 2018)	£26,490
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator	
Shortage overall rank /105	61
Recommendation	
Recommend adding entire occupation to the SOL	

Stakeholder evidence

4H.69 The following jobs are currently on the SOL within SOC 3421 for VFX, animation, film, television or video games sectors; compositing artist, matte painter, modeller, rigger, stereo artist and texture artist. There were requests to retain these roles on the SOL as well as adding; Layout Artist, Pre-visualisation Artist and VFX Trainer, technical artist, animator, animators 2d, animators 3d, cad / graphics technician, animation designers, storyboard artists, 3d landscape modeller, VFX supervisor, VFX animator, senior animator, level designer and 3d game artist. The roles range from medium skilled to high skilled.

Use of the SOL

4H.70 SOC 3421 has been on the SOL since 2011.

Use of Tier 2 (General)

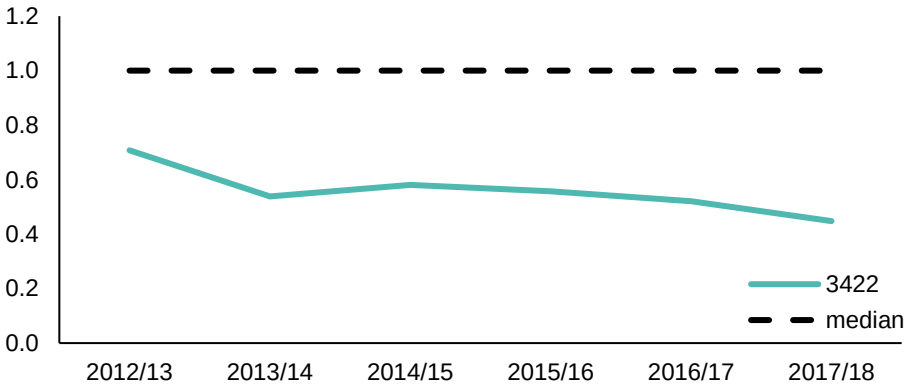
Year	2014	2015	2016	2017	2018
RCoS Used	28	19	35	45	46

4H.71 Usage of Tier 2 (General) has been low.

Recommendations

4H.72 We recommend including SOC code 3421 (graphic designers) on the SOL. Despite the occupation having a fairly low rank (61st) in our shortage indicators and having a below average vacancy rate, stakeholders convincingly argued there were global shortages for the technical skills captured by this SOC code.

SOC 3422 - Product, clothing and related designers

Summary table: SOC 3422 Product, clothing and related designers	
Employment	
Share of UK employees (%, APS, 2017/18)	0.2%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.2%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	7.9%
Share of employees born outside the EEA (%, APS, 2017/18)	7.7%
Wages	
Median full-time annual wage (ASHE 2018)	£29,788
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator	
Shortage overall rank /105	46
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder evidence

4H.73 There was a request to put costume designers and NPD assistant on the SOL.

Use of the SOL

4H.74 SOC 3422 has never been on the SOL

Use of Tier 2 (General)

Year	2014	2015	2016	2017	2018
RCoS Used	39	44	37	37	21

4H.75 Usage of Tier 2(General) has been low in recent years.

Recommendation

4H.76 We do not recommend including SOC code 3422 (product, clothing and related designers) on the SOL. The occupation has a middle-ranking in our shortage indicators (46th), a below average vacancy rate and the use of Tier 2 (General) has been declining in recent years. There was insufficient stakeholder evidence that this occupation was in shortage.

4.I. Managers and Directors

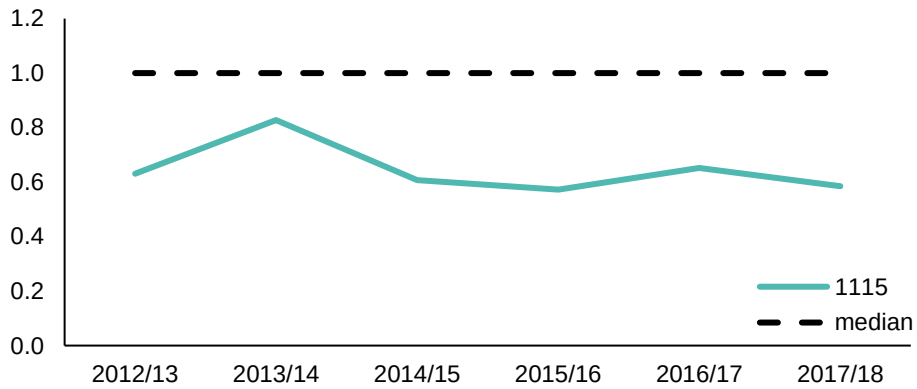
Introduction

4I.1 Managers and Directors covers 15 unique SOC codes, all are skilled at level RQF6+.

4I.2 As per the title of the chapter, this is not a group of occupations that fits into one industry and therefore we do not try to provide an analysis of one specific industry. However, we should note that these are the people within their respective industries that lead others. The people within these occupations drive development implement change and make key decisions for the future of others. Based on that, this group are deemed important to be analysed in a thorough manner.

Occupations under consideration

SOC 1115 – Chief Executives and senior officials

Summary table: SOC 1115 Chief executives and senior officials	
Employment	
Share of UK employees (%, APS, 2017/18)	0.3%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.3%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	6.9%
Share of employees born outside the EEA (%, APS, 2017/18)	16.4%
Wages	
Median full-time annual wage (ASHE 2018)	£97,083
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	16
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder evidence

4I.3 We received no stakeholder evidence regarding SOC 1115.

Use of the SOL

4I.4 SOC 1115 has never been on the SOL.

Use of Tier 2 (General)

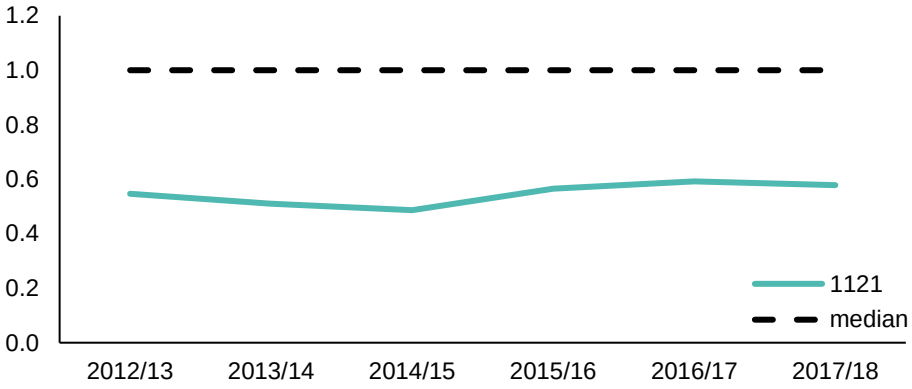
Year	2014	2015	2016	2017	2018
RCoS Used	60	58	54	50	60

4I.5 The use of Tier 2 (General) has been low but steady.

Recommendation

4I.6 We do not recommend including SOC code 1115 (chief executives and senior officials) on the SOL. Despite the occupation ranking highly (16th) in our shortage indicators and the vacancy rate being marginally above average, the occupation is well-supported by the immigration system due to their salary level.

SOC 1121 – Production managers and directors in manufacturing

Summary table: SOC 1121 Production managers and directors in manufacturing	
Employment	
Share of UK employees (%, APS, 2017/18)	0.9%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.4%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	3.8%
Share of employees born outside the EEA (%, APS, 2017/18)	4.9%
Wages	
Median full-time annual wage (ASHE 2018)	£47,616
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	63
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder evidence

4I.7 In our call for evidence online forms, most stakeholders state that they have had to increase salaries to attract more people into the occupation. This has not been fully successful.

4I.8 Increasing the number of apprenticeships and working with the academic sector to provide more focussed degree courses are other ways that are being tried by employers to entice more people in.

Use of the SOL

4I.9 SOC 1121 was partially on the SOL up to 2013. Only one job title was included, “project manager in the electricity transmission and distribution industry”.

Use of Tier 2 (General)

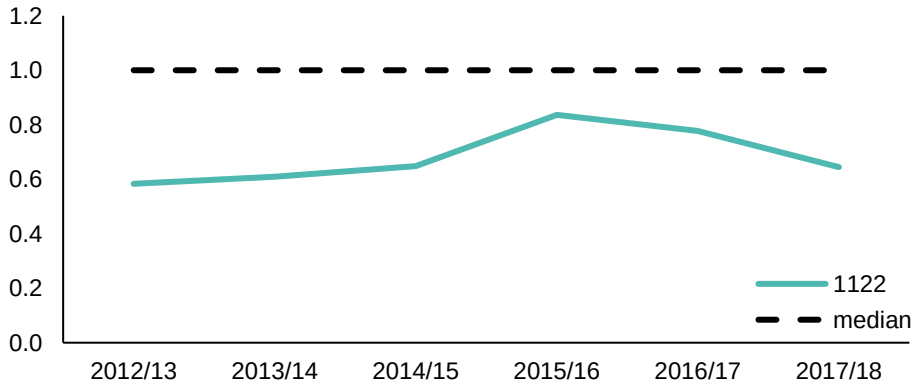
Year	2014	2015	2016	2017	2018
RCoS Used	67	55	77	84	77

4I.10 Usage of Tier 2 (General) has been low in recent years.

Recommendation

4I.11 We do not recommend including SOC code 1121 (production managers and directors in manufacturing) on the SOL. The occupation ranks fairly low (63rd) in our shortage indicators and the vacancy rate is below average. There was insufficient stakeholder evidence that this occupation was in shortage.

SOC 1122 – Production managers and directors in construction

Summary table: SOC 1122 Production managers and directors in construction	
Employment	
Share of UK employees (%, APS, 2017/18)	0.5%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.1%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	7.6%
Share of employees born outside the EEA (%, APS, 2017/18)	4.0%
Wages	
Median full-time annual wage (ASHE 2018)	£43,879
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	71
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder evidence

4I.12 Various techniques to ensure that enough skilled entrants enter this occupation have been highlighted by stakeholders and they appear to be having some

success. It is suggested that in the medium term, skill shortages could become an increasing issue.

Use of the SOL

4I.13 SOC 1122 has not been on the SOL since 2011.

Use of Tier 2 (General)

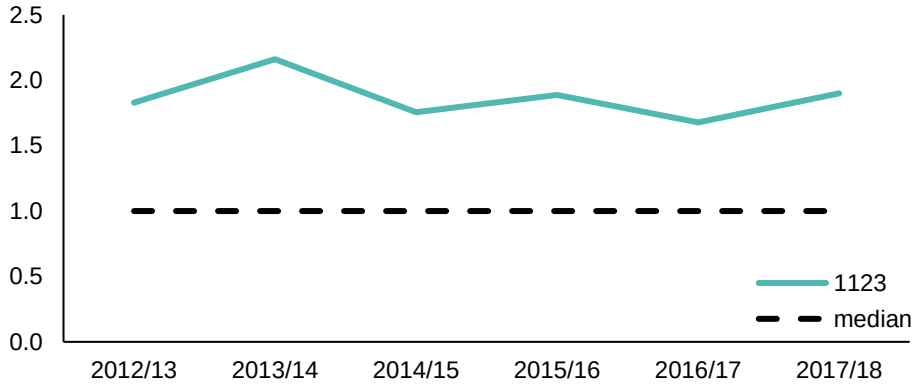
Year	2014	2015	2016	2017	2018
RCoS Used	17	16	3	10	11

4I.14 The use of Tier 2 (General) is very low.

Recommendation

4I.15 We do not recommend including SOC code 1122 (production managers and directors in construction) on the SOL The occupation ranked fairly low in our shortage indicators (71st) despite the vacancy rate being above average in the last year. There was insufficient stakeholder evidence that this occupation was in shortage.

SOC 1123 – Production managers and directors in mining and energy

Summary table: SOC 1123 Production managers and directors in mining and energy	
Employment	
Share of UK employees (%, APS, 2017/18)	0.0%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.0%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	0.0%
Share of employees born outside the EEA (%, APS, 2017/18)	0.7%
Wages	
Median full-time annual wage (ASHE 2018)	£45,033
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	88
Recommendation	
Recommend removing from SOL	

Stakeholder evidence

4I.16 There was very little in the way provided by stakeholders to support this position.

Use of the SOL

4I.17 SOC 1123, has partially been on the SOL since 2011. Only jobs in the decommissioning and waste management areas of the nuclear industry (managing director, programme director, site director) and also some jobs in the electricity transmission and distribution industry (project manager, site manager).

Use of Tier 2 (General)

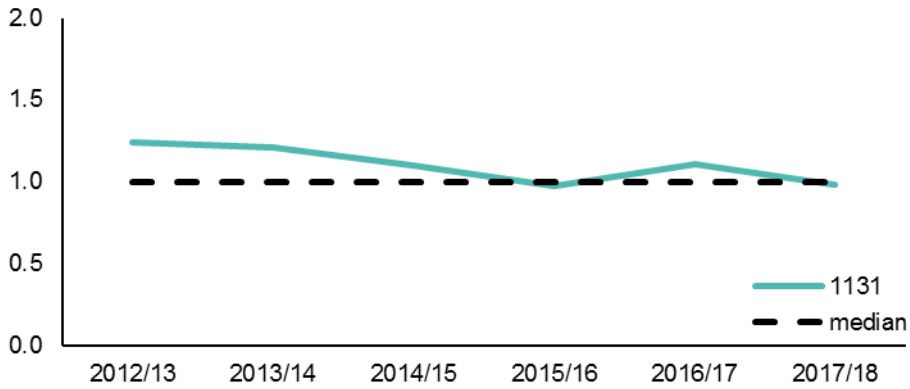
Year	2014	2015	2016	2017	2018
RCoS Used	5	7	5	12	6

4I.18 The usage of Tier 2 (General) has been very low over the period.

Recommendation

4I.19 We do not recommend including SOC code 1123 (production managers and directors in mining and energy) on the SOL. The occupation ranked fairly low (88th) in our shortage indicators despite the vacancy rate being above average. The stakeholder evidence does not point towards any form of skills shortage within this occupation

SOC 1131- Financial managers and directors

Summary table: SOC 1131 Financial managers and directors	
Employment	
Share of UK employees (%, APS, 2017/18)	0.9%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.8%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	4.6%
Share of employees born outside the EEA (%, APS, 2017/18)	10.4%
Wages	
Median full-time annual wage (ASHE 2018)	£67,593
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	64
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder evidence

4I.20 We received no stakeholder evidence regarding SOC 1131.

Use of the SOL

4I.21 SOC 1131 has not been on the SOL before.

Use of Tier 2 (General)

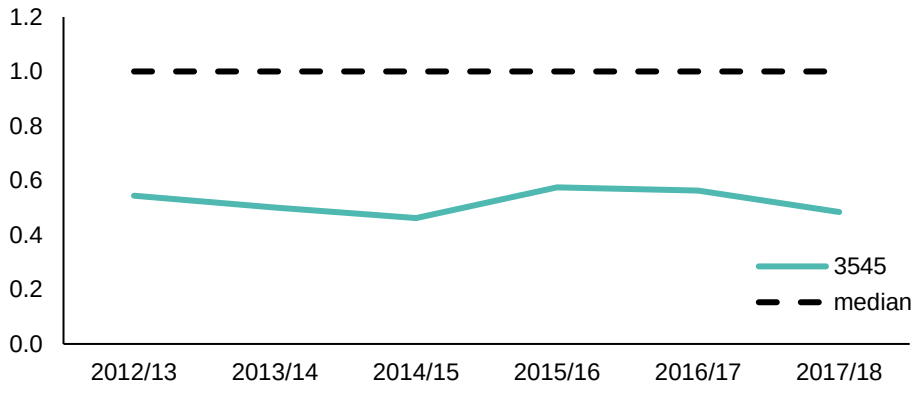
Year	2014	2015	2016	2017	2018
RCoS Used	117	144	130	135	162

4I.22 SOC 1131 has made moderate use of Tier 2 (General) in recent years.

Recommendation

4I.23 We do not recommend including SOC code 1131 (financial managers and directors) on the SOL. The occupation ranked fairly low (64th) in our shortage indicators and the vacancy rate was around average. There was no stakeholder evidence suggesting this occupation was in shortage.

SOC 1132 – Marketing and sales directors

Summary table: SOC 1132 Marketing and sales directors	
Employment	
Share of UK employees (%, APS, 2017/18)	0.7%
Share of Tier 2 (% total RCoS Used 2015-2018)	1.1%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	6.4%
Share of employees born outside the EEA (%, APS, 2017/18)	9.7%
Wages	
Median full-time annual wage (ASHE 2018)	£75,126
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	37
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder evidence

4I.24 There was no evidence provided by stakeholders.

Use of the SOL

4I.25 SOC 1132 has not been on the SOL before.

Use of Tier 2 (General)

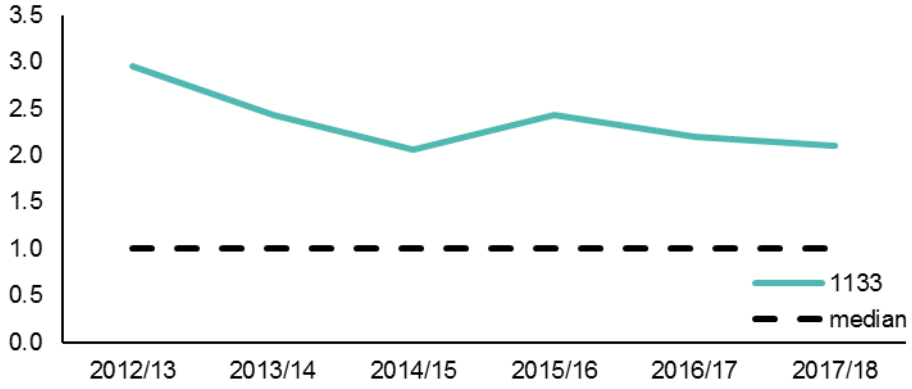
Year	2014	2015	2016	2017	2018
RCoS Used	183	194	224	206	205

4I.26 SOC 1131 has made moderate use of Tier 2 (General) in recent years.

Recommendation

4I.27 We do not recommend including SOC code 1132 (marketing and sales directors) on the SOL. Despite the occupation ranking fairly highly (37th) in our shortage indicators and having an above average vacancy rate, there was no stakeholder evidence suggesting this occupation was in shortage.

SOC 1133 – Purchasing managers and directors

Summary table: SOC 1133 Purchasing managers and directors	
Employment	
Share of UK employees (%, APS, 2017/18)	0.2%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.2%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	3.6%
Share of employees born outside the EEA (%, APS, 2017/18)	5.3%
Wages	
Median full-time annual wage (ASHE 2018)	£47,438
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	79
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder evidence

4I.28 In our call for evidence online forms, SOC code 1133 was highlighted only a handful of times, however there was a consistent message coming across highlighting the fact that jobs were becoming ever more difficult to fill with a lack of skilled people to enter the occupation.

Use of the SOL

4I.29 SOC 1133 has not been on the SOL before.

Use of Tier 2 (General)

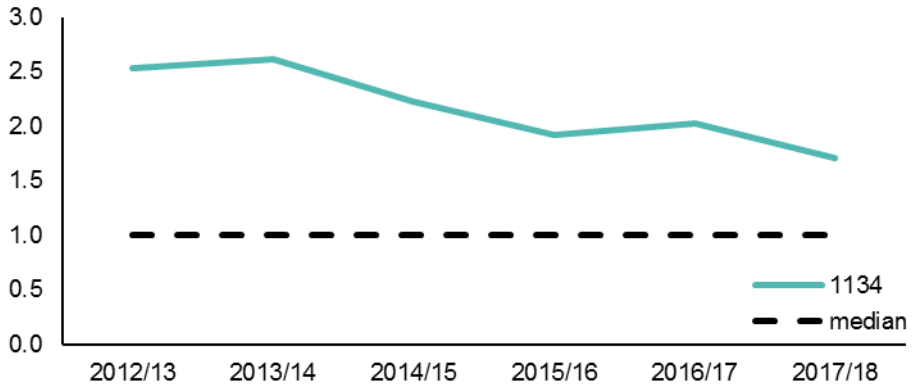
Year	2014	2015	2016	2017	2018
RCoS Used	57	47	36	42	54

4I.30 Tier 2 (General) usage is low but has been constant over recent years.

Recommendation

4I.31 We do not recommend including SOC code 1133 (purchasing managers and directors) on the SOL. The occupation ranks fairly low (79th) in our shortage indicators, however, the vacancy rate is above average. There was insufficient stakeholder evidence that this occupation is in shortage.

SOC 1134 – Advertising and public relations directors

Summary table: SOC 1134 Advertising and public relations directors	
Employment	
Share of UK employees (%, APS, 2017/18)	0.1%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.3%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	14.8%
Share of employees born outside the EEA (%, APS, 2017/18)	9.7%
Wages	
Median full-time annual wage (ASHE 2018)	£65,074
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	4
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder evidence

4I.32 There was no evidence provided by stakeholders.

Use of the SOL

4I.33 SOC 1134 has never been on the SOL.

Use of Tier 2 (General)

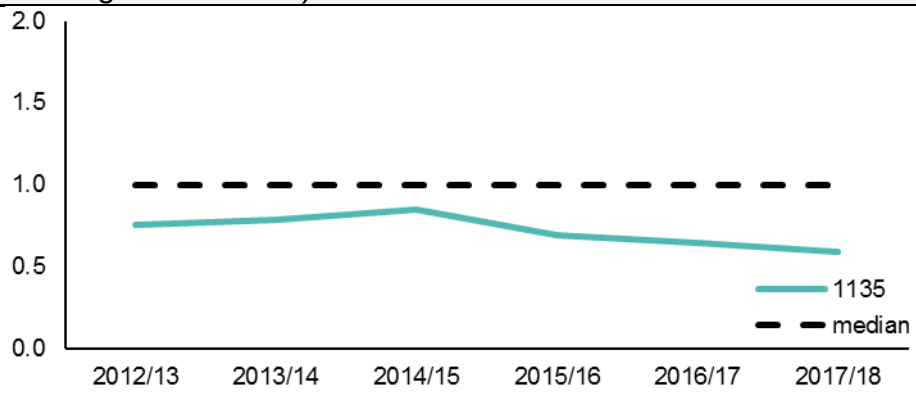
Year	2014	2015	2016	2017	2018
RCoS Used	55	52	40	42	76

4I.34 Tier 2 (General) usage is low but has increased in the last year.

Recommendation

4I.35 We do not recommend including SOC code 1134 (advertising and public relations directors) on the SOL. Despite ranking very highly (4th) in our shortage indicators and having an above average vacancy rate, we received no stakeholder evidence of this occupation being in shortage.

SOC 1135 – Human resource managers and directors

Summary table: SOC 1135 Human resource managers and directors	
Employment	
Share of UK employees (%, APS, 2017/18)	0.6%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.5%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	3.1%
Share of employees born outside the EEA (%, APS, 2017/18)	8.0%
Wages	
Median full-time annual wage (ASHE 2018)	£48,836
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	56
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder evidence

4I.36 There was little in the way of stakeholder evidence, however there was a sense that this occupation does not suffer significantly from skills shortages.

Use of the SOL

4I.37 SOC 1135 has never been on the SOL.

Use of Tier 2 (General)

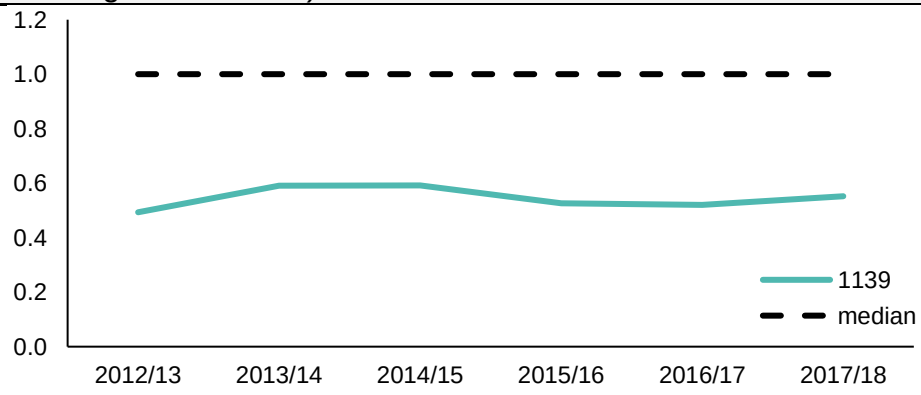
Year	2014	2015	2016	2017	2018
RCoS Used	89	93	111	96	98

4I.38 Tier 2 (General) usage has been low but has been constant over recent years.

Recommendation

4I.39 We do not recommend including SOC code 1135 (human resource managers and directors on the SOL. The occupation ranked relatively low (56th) in our shortage indicators and has a below average vacancy rate. There was insufficient stakeholder evidence to suggest that this occupation was in shortage.

SOC 1139 – Functional managers and directors n.e.c.

Summary table: SOC 1139 Functional managers and directors n.e.c.	
Employment	
Share of UK employees (%, APS, 2017/18)	0.4%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.3%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	6.1%
Share of employees born outside the EEA (%, APS, 2017/18)	6.1%
Wages	
Median full-time annual wage (ASHE 2018)	£57,098
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	92
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder evidence

4I.40 There was little in the way of stakeholder evidence, aside from the fact that some stakeholders had trouble recruiting for roles associated with SOC 1139.

Use of the SOL

4I.41 SOC 1139 has never been on the SOL.

Use of Tier 2 (General)

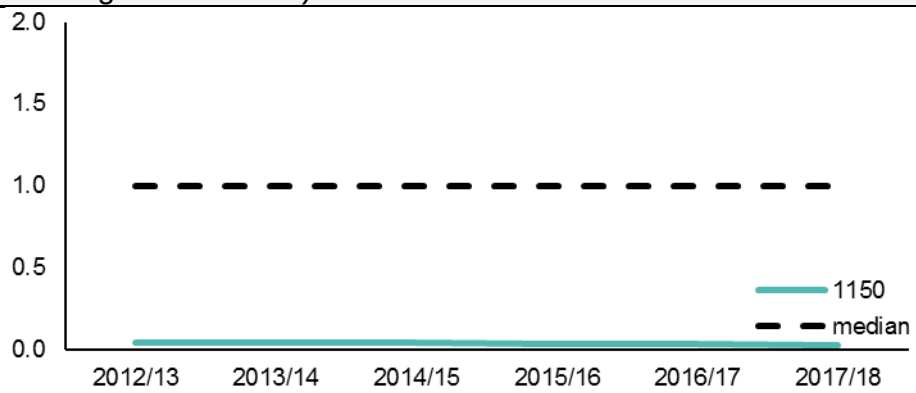
Year	2014	2015	2016	2017	2018
RCoS Used	62	48	57	47	34

4I.42 Tier (General) usage has been low and declining in recent years.

Recommendation

4I.43 We do not recommend including SOC code 1139 (functional managers and directors n.e.c.) on the SOL. The occupation ranked low (92nd) in our shortage indicators and had a below average vacancy rate. There was no stakeholder evidence to suggest this occupation was in shortage.

SOC 1150 – Financial institution managers and directors

Summary table: SOC 1150 Financial institution managers and directors	
Employment	
Share of UK employees (%, APS, 2017/18)	0.3%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.1%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	4.1%
Share of employees born outside the EEA (%, APS, 2017/18)	14.1%
Wages	
Median full-time annual wage (ASHE 2018)	£48,140
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	91
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder evidence

4I.44 There was no evidence provided by stakeholders.

Use of the SOL

4I.45 SOC 1150 has never been on the SOL.

Use of Tier 2 (General)

Year	2014	2015	2016	2017	2018
RCoS Used	9	10	14	9	9

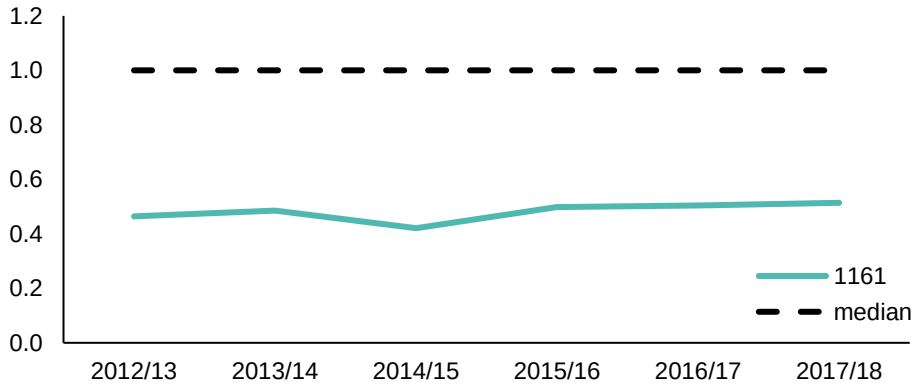
4I.46 The usage of Tier 2 (General) has been very low over the period.

Recommendation

4I.47 We do not recommend including SOC code SOC code 1150 (financial institution managers and directors). The occupation ranked low (91st) in our shortage

indicators and had a below average vacancy rate. There was no stakeholder evidence to suggest this occupation was in shortage.

SOC 1161 – Managers and directors in transport and distribution

Summary table: SOC 1161 Managers and directors in transport and distribution	
Employment	
Share of UK employees (%, APS, 2017/18)	0.2%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.1%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	6.5%
Share of employees born outside the EEA (%, APS, 2017/18)	6.1%
Wages	
Median full-time annual wage (ASHE 2018)	£38,945
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	80
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder evidence

4I.48 There was little in the way of stakeholder evidence, aside from the fact that some stakeholders had trouble recruiting for roles associated with SOC 1161.

Use of the SOL

4I.49 SOC 1161 has never been on the SOL.

Use of Tier 2 (General)

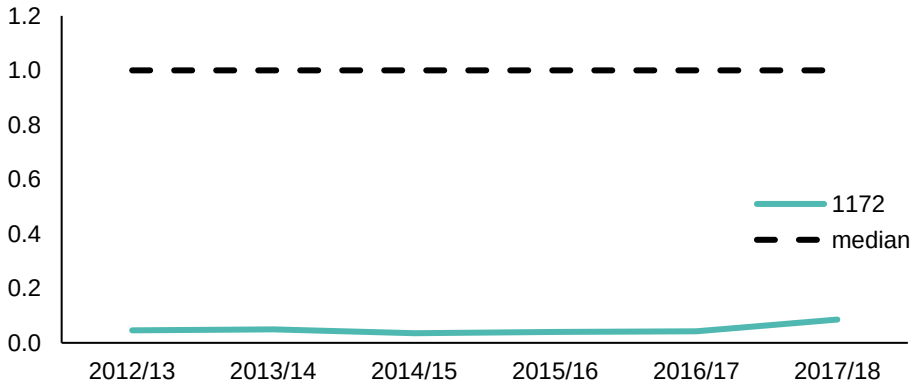
Year	2014	2015	2016	2017	2018
RCoS Used	24	26	25	24	13

4I.50 The usage of Tier 2 (General) has been low over the period.

Recommendation

4I.51 We do not recommend including SOC code 1161 (managers and directors in transport and distribution) on the SOL. The occupation ranked low (80th) in our shortage indicators and had a below average vacancy rate. There was no stakeholder evidence to suggest this occupation was in shortage.

SOC 1172 – Senior police officers

Summary table: SOC 1172 Senior police officers	
Employment	
Share of UK employees (%, APS, 2017/18)	0.0%
Share of Tier 2 (% total RCoS Used 2015-2018)	N/A
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	0.0%
Share of employees born outside the EEA (%, APS, 2017/18)	1.6%
Wages	
Median full-time annual wage (ASHE 2018)	£59,634
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	99
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder evidence

4I.52 There was no evidence provided by stakeholders.

Use of the SOL

4I.53 SOC 1172 has never been on the SOL.

Use of Tier 2 (General)

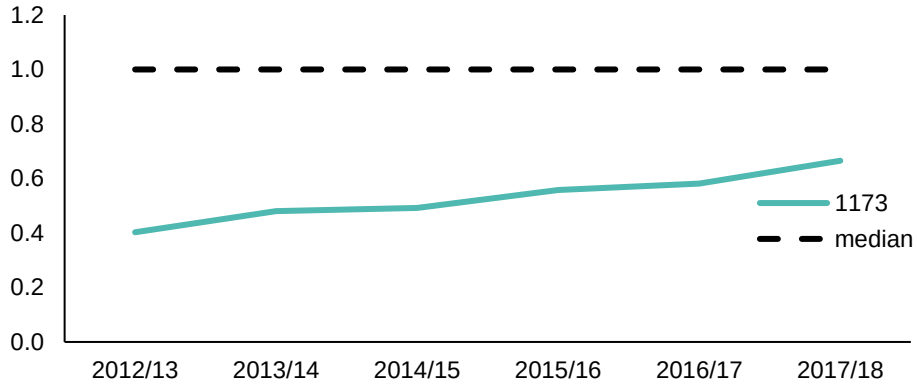
Year	2014	2015	2016	2017	2018
RCoS Used	N/A	N/A	N/A	N/A	N/A

4I.54 This information is not available for SOC 1172.

Recommendation

4I.55 We do not recommend including SOC code 1172 (senior police officers) on the SOL. The occupation ranked low (99th) in our shortage indicators and had a below average vacancy rate. There was no stakeholder evidence to suggest this occupation was in shortage.

SOC 1173 – Senior officers in fire, ambulance, prison and related services

Summary table: SOC 1173 Senior officers in fire, ambulance, prison and related services	
Employment	
Share of UK employees (%, APS, 2017/18)	0.0%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.0%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	2.8%
Share of employees born outside the EEA (%, APS, 2017/18)	2.3%
Wages	
Median full-time annual wage (ASHE 2018)	£45,125
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	100
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder evidence

4I.56 There was no evidence provided by stakeholders.

Use of the SOL

4I.57 SOC 1173 has never been on the SOL.

Use of Tier 2 (General)

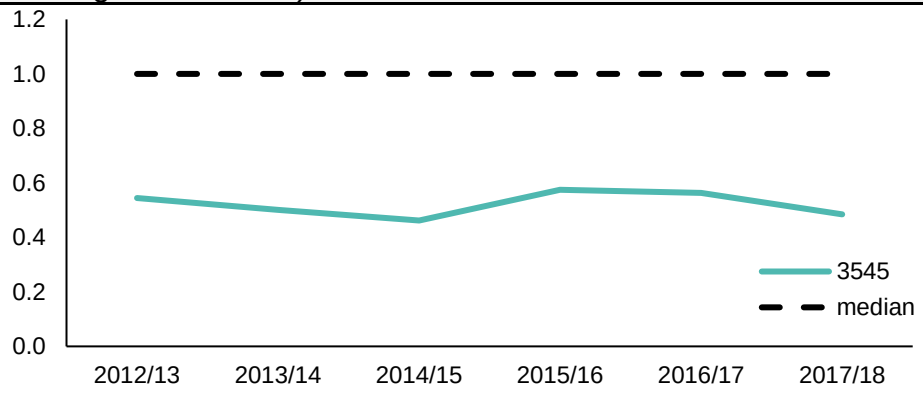
Year	2014	2015	2016	2017	2018
RCoS Used	0	1	0	0	0

4I.58 There has been no usage of Tier 2 (General) in recent years.

Recommendation

4I.59 We do not recommend including SOC code 1173 (senior officers in fire, ambulance, prison and related services) on the SOL. The occupation ranked low (100th) in our shortage indicators and had a below average vacancy rate. There was no stakeholder evidence to suggest this occupation was in shortage.

SOC 3545 – Sales accounts and business development managers

Summary table: SOC 3545 Sales accounts and business development managers	
Employment	
Share of UK employees (%, APS, 2017/18)	1.6%
Share of Tier 2 (% total RCoS Used 2015-2018)	3.5%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	6.4%
Share of employees born outside the EEA (%, APS, 2017/18)	6.5%
Wages	
Median full-time annual wage (ASHE 2018)	£46,000
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	55
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder evidence

4I.60 We received some evidence of shortages within this occupation with a low number of applicants with the required skills being cited as the main reason for these reported shortages. We were told that employers were using a wide range of strategies to combat these recruitment difficulties, examples include increasing wages and investment on recruitment initiatives.

Use of the SOL

4I.61 SOC 3545 has never been on the SOL.

Use of Tier 2 (General)

Year	2014	2015	2016	2017	2018
RCoS Used	642	626	657	692	564

4I.62 SOC 3545 is an active user of Tier 2 (General).

Recommendation

4I.63 We do not recommend including SOC code 3545 (sales accounts and business development managers) on the SOL. The occupation ranked middle of our shortage indicators and had a below average vacancy rate. There was no stakeholder evidence to suggest this occupation was in shortage.

4.J. Other Occupations

Introduction

4J.1 Other Occupations covers a wide range of occupations, all at RQF6+ level, with the exception of chefs that fall into RQF3&4. There are 14 unique SOC 2010 codes in the ONS SOC 2010 structure and coding index153.

4J.2 This is not one homogenous group of occupations, so unlike in other chapters, we do not try to provide an overarching review of the industry that the occupations fall into. Therefore, there is not one standard to measure these occupations by and each one is analysed independently.

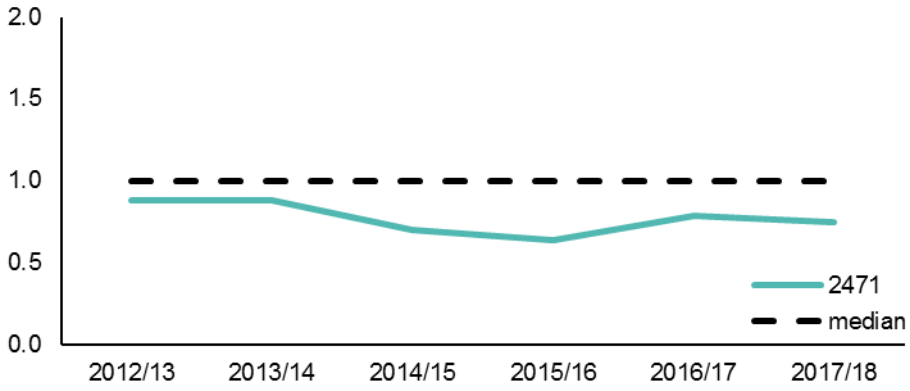
Occupations under consideration

4J.3 There are four main broad occupational categories that are included in our analysis in this chapter. They are as follows:

- Media professionals:
  - 2471 - Journalists, Newspaper and Periodical Editors
  - 2472 - Public Relations Professionals,
- Architecture professionals
  - 2431 - Architects
  - 2432 - Town Planning officers
  - 2433 - Quantity Surveyors
  - 2434 - Chartered Surveyors
  - 2435 - Chartered Architectural Technologists
  - 2436 - Construction Project Managers and related professionals
- 5434 - Chefs
- Other professionals (miscellaneous)
  - 2443 - Probation Officers
  - 2451 - Librarians
  - 2452 - Archivists and Curators
  - 2462 - Quality Assurance and Regulatory Professionals
  - 2463 - Environmental health professionals

[153]https://www.ons.gov.uk/methodology/classificationsandstandards/standardoccupationalclassificationsoc/soc2010/soc2010volume2thestructureandcodingindex

SOC 2471 – Journalists, Newspaper and Periodical Editors

Summary table: SOC 2471 Journalists, newspaper and periodical editors	
Employment	
Share of UK employees (%, APS, 2017/18)	0.2%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.4%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	6.2%
Share of employees born outside the EEA (%, APS, 2017/18)	11.5%
Wages	
Median full-time annual wage (ASHE 2018)	£37,377
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	20
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder evidence

4J.4 In our call for evidence online forms, SOC code 2471 was highlighted on two occasions. The job title mentioned on both occasions was Editor.

4J.5 Stakeholder responses suggest that any shortages that are present within the occupation has had little impact on the performance of their companies.

Use of the SOL

4J.6 SOC 2471 has not been on the SOL before.

Use of Tier 2 (General)

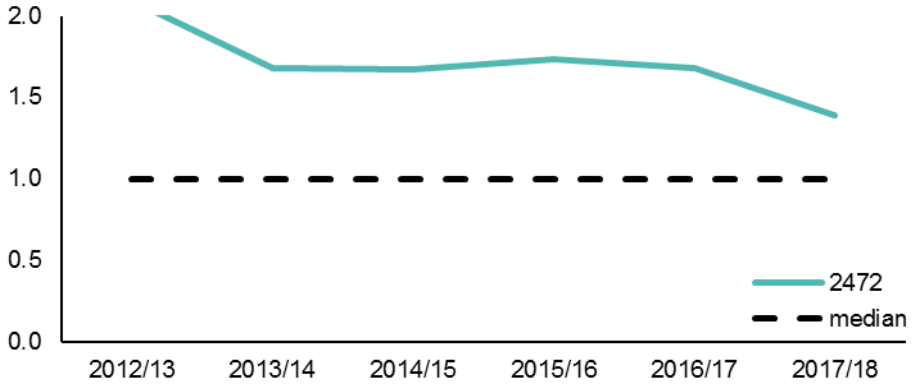
4J.7 Many stakeholders suggest usage of Tier 2 (General), however, usage has been low since 2014.

Year	2014	2015	2016	2017	2018
RCoS Used	62	65	73	74	66

Recommendation

4J.8 We do not recommend including SOC code 2471 (journalists, newspapers and periodical editors) on the SOL. Despite the occupation ranking fairly high (20th) in our shortage indicators, the vacancy rate was below average. There was insufficient stakeholder evidence that this occupation was in shortage.

SOC 2472 – Public Relations Professionals

Summary table: SOC 2472 Public relations professionals	
Employment	
Share of UK employees (%, APS, 2017/18)	0.2%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.4%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	5.9%
Share of employees born outside the EEA (%, APS, 2017/18)	4.6%
Wages	
Median full-time annual wage (ASHE 2018)	£32,148
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	28
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder evidence

4J.9 There is a significant proportion of people working in the occupation who were born outside of the UK.

4J.10 However, in our call for evidence online forms, SOC code 2472 was not mentioned as being in shortage.

Use of the SOL

4J.11 SOC 2472 has never been on the SOL before.

Use of Tier 2 (General)

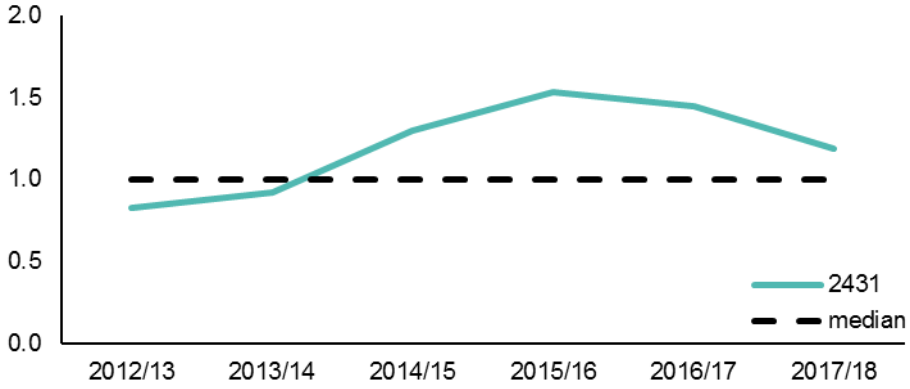
4J.12 Tier 2 (General) usage is low and declined in 2018.

Year	2014	2015	2016	2017	2018
RCoS Used	87	76	95	91	47

Recommendation

4J.13 We do not recommend including SOC code 2472 (public relations professionals) on the SOL. Despite the occupation ranking fairly high (28th) in our shortage indicators and the vacancy rate being above average. There was no stakeholder evidence to suggest this occupation was in shortage.

SOC 2431 – Architects

Summary table: SOC 2431 Architects	
Employment	
Share of UK employees (%, APS, 2017/18)	0.1%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.4%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	18.7%
Share of employees born outside the EEA (%, APS, 2017/18)	12.9%
Wages	
Median full-time annual wage (ASHE 2018)	£39,101
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	7
Recommendation	
Recommend adding entire occupation to the SOL	

Stakeholder evidence

4J.14 In our call for evidence online forms, shortages of architects were mentioned in 62 times. Almost all of the responses focussed on landscaping architects.

4J.15 Stakeholders explained that recruitment has become increasingly more difficult over the past few years. There have been various methods of trying to recruit more. A number of respondents mentioned that they have turned to freelancers and consultants to perform a proportion of the work, which is expensive and seen as not sustainable in the longer term.

4J.16 More creative ideas of partnering with local schools and universities appear to be fairly popular amongst stakeholders, although it is stated that most entrants don't have the actual skill-set required and therefore further training is required to ensure that they get up to standard for the workplace.

4J.17 Roles remain unfilled, and when filling roles, it can take many months, sometimes years to fill. Senior roles appear to be the most difficult to recruit for.

4J.18 The Royal Institute of British Architects (RIBA), stated that "The most frequent issues reported by practices to the RIBA for shortages are a low number of applicants for positions generally and a low number of applicants with the required skills..."

4J.19 Almost a third of all architects were born outside of the UK (18.7% EEA,12.9% non-EEA).

Use of the SOL

4J.20 SOC 2431 has never been on the SOL.

Use of Tier 2 (General)

4J.21 Usage of Tier 2 (General) is low. Stakeholders mentioned that there was a large refusal rate on applications. We were unable to obtain the data to verify this. However, "Data obtained from the Home Office by law firm Eversheds Sutherland showed that between November last year and April this year (2018) six architects were granted work visas under the Government's restricted certificates of sponsorship scheme. In that period 111 applications were made by architects."154

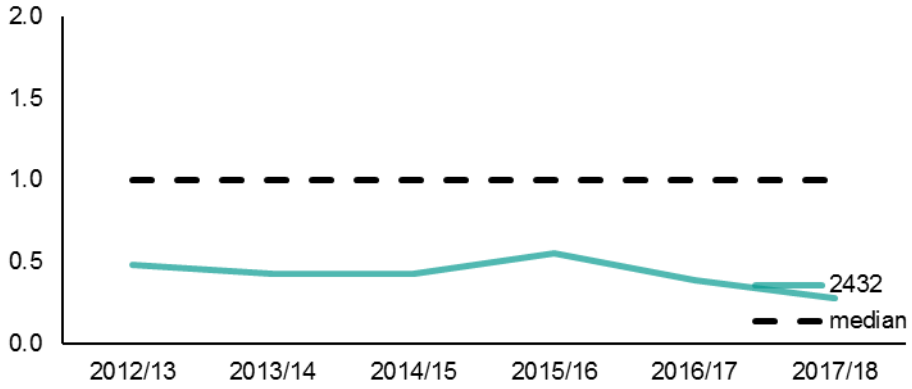
[154] https://www.building.co.uk/news/just-5-of-visa-applications-by-non-eu-architects-approved/5094382.article

Year	2014	2015	2016	2017	2018
RCoS Used	98	94	83	67	57

Recommendation

4J.22 We recommend including SOC code 2431 (architects) on the SOL. The occupation ranks high in our shortage indicators (7th) and the vacancy rate is above average. The stakeholder evidence suggests the occupation is facing shortages despite a variety of measures being undertaken to source new supplies of labour from within the UK. The Committee believes that placing the occupation on the SOL now will be able to alleviate temporary labour shortage, but that this shortage can be overcome in the foreseeable future by continued change in recruitment practices, pay and other measures to increase occupational attractiveness of the industry.

SOC 2432 – Town Planning Officers

Summary table: SOC 2432 Town planning officers	
Employment	
Share of UK employees (%, APS, 2017/18)	0.1%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.0%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	2.0%
Share of employees born outside the EEA (%, APS, 2017/18)	6.9%
Wages	
Median full-time annual wage (ASHE 2018)	£35,065
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	102
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder evidence

4J.23 Stakeholders stated that the role which was most difficult to fill was urban designer. With a change in recruitment practices that have included offering

better salaries and benefits, it appears that improvements in recruitment are starting to happen, however it was suggested that there remained a reliance on workers from outside the UK, which was expensive.

Use of the SOL

4J.24 SOC 2432 has never been on the SOL.

Use of Tier 2 (General)

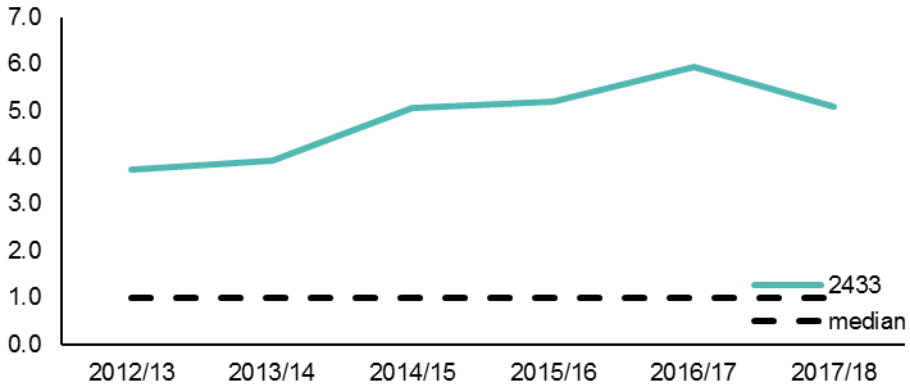
4J.25 Usage of Tier 2 (General) has been very low.

Year	2014	2015	2016	2017	2018
RCoS Used	2	9	5	11	11

Recommendation

4J.26 We do not recommend including SOC code 2432 (town planning officers) on the SOL. The occupation ranked low (102nd) in our shortage indicators and had a below average vacancy rate. There was insufficient stakeholder evidence that this occupation was in shortage.

SOC 2433 – Quantity Surveyors

Summary table: SOC 2433 Quantity surveyors	
Employment	
Share of UK employees (%, APS, 2017/18)	0.1%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.1%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	1.6%
Share of employees born outside the EEA (%, APS, 2017/18)	3.6%
Wages	
Median full-time annual wage (ASHE 2018)	£42,760
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	10
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder evidence

4J.27 In our call for evidence online forms, SOC code 2433 was highlighted 11 times as being in shortage.

4J.28 Most stakeholders talked about the issue of skills shortages within the wider industry of house building and construction. There have been some initiatives put in place by industry, including the Home Skills Building Partnership and Construction Sector Deal, which are aimed at alleviating the ongoing issue. There was little if any specific mention of quantity surveyors within their discussions and generally the issue of skills shortages within the wider industry were mentioned.

4J.29 The Home Builders Federation stated that the skills shortages being felt by the companies that they represent was caused, in part, due to the increase in house building over the past 5 years and the fact that there was a "loss of skills

capacity...due to the financial recession in 2008 and its severe impact on the housing market."

4J.30 Civil Engineers Contractors Association mention that older workers are being encouraged to remain in the industry to try to retain skills within the industry.

Use of the SOL

4J.31 SOC 2433 was present on the SOL for a few months from September 2008 to April 2009. It has not been on since.

Use of Tier 2 (General)

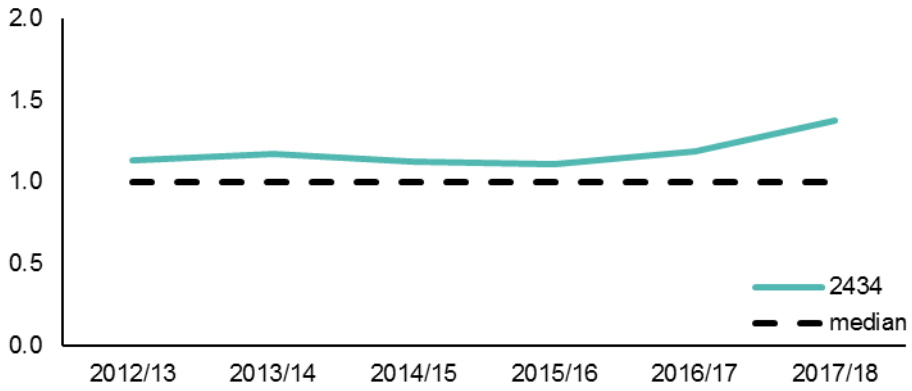
4J.32 Usage of Tier 2 (General) is low.

Year	2014	2015	2016	2017	2018
RCoS Used	7	22	29	18	28

Recommendation

4J.33 We do not recommend including SOC code 2433 (quantity surveyors) on the SOL. Despite ranking highly in our shortage indicators and having an above average vacancy rate, there was insufficient stakeholder evidence to suggest a shortage in the occupation.

SOC 2434 – Chartered Surveyors

Summary table: SOC 2434 Chartered surveyors	
Employment	
Share of UK employees (%, APS, 2017/18)	0.1%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.0%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	0.5%
Share of employees born outside the EEA (%, APS, 2017/18)	0.8%
Wages	
Median full-time annual wage (ASHE 2018)	£36,659
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	78
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder evidence

4J.34 Stakeholders stated that they had increased salaries, where possible, to attract more people and were also offering further training to promote from within their organisations.

Use of the SOL

4J.35 SOC 2434 has never been on the SOL.

Use of Tier 2 (General)

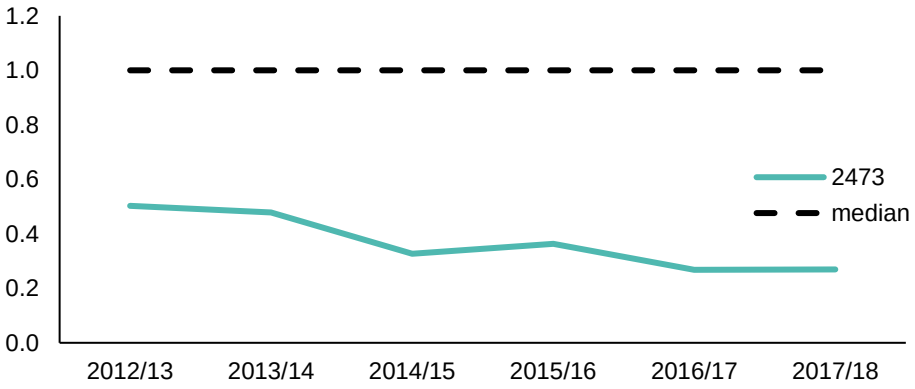
4J.36 Tier 2 (General) usage has been very low.

Year	2014	2015	2016	2017	2018
RCoS Used	4	9	10	11	5

Recommendation

4J.37 We do not recommend including SOC code 2434 (chartered surveyors) on the SOL. The occupation ranks fairly low (78th) in our shortage indicators, however the vacancy rate is above average. There was insufficient stakeholder evidence that this occupation was in shortage.

SOC 2435 – Chartered Architectural Technologists

Summary table: SOC 2435 Chartered architectural technologists	
Employment	
Share of UK employees (%, APS, 2017/18)	Not reported
Share of Tier 2 (% total RCoS Used 2015-2018)	Not reported
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	0.0%
Share of employees born outside the EEA (%, APS, 2017/18)	13.4%
Wages	
Median full-time annual wage (ASHE 2018)	Not reported
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	x
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder evidence

4J.38 In our call for evidence online forms, SOC code 2435 was highlighted only once as being in shortage and the response did not provide any supporting evidence of shortages in relation to the specific SOC code.

Use of the SOL

4J.39 SOC 2435 has never been on the SOL.

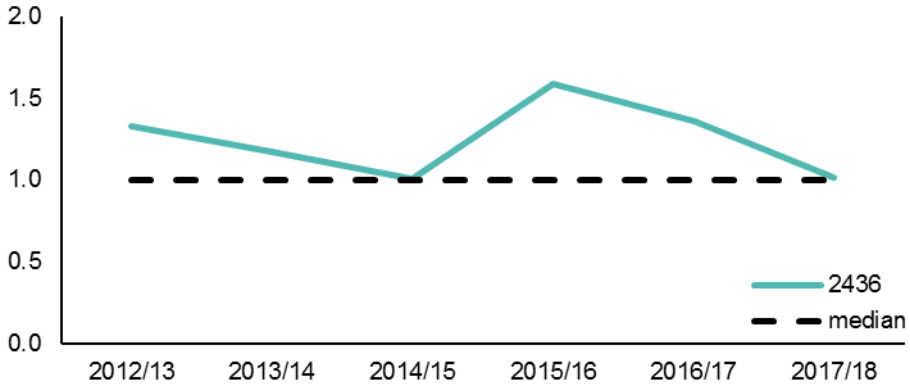
Use of Tier 2 (General)

4J.40 There has been no usage of Tier 2(General).

Recommendation

4J.41 We do not recommend including SOC code 2435 (chartered architectural technologists) on the SOL. Due to sample size issues, we do not have a ranking for the occupation, however, the vacancy rate is above average. There was insufficient stakeholder evidence that this occupation was in shortage.

SOC 2436 - Construction Project Managers and related professionals

Summary table: SOC 2436 Construction project managers and related professionals	
Employment	
Share of UK employees (%, APS, 2017/18)	0.3%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.3%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	5.6%
Share of employees born outside the EEA (%, APS, 2017/18)	6.1%
Wages	
Median full-time annual wage (ASHE 2018)	£37,841
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Top down shortage indicator	
Shortage overall rank /105	12
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder evidence

4J.42 There was relatively little evidence provided by stakeholders in relation to SOC 2436. One stakeholder did suggest that roles took over 12 months to fill in their business.

Use of the SOL

4J.43 SOC 2436 has never been on the SOL.

Use of Tier 2 (General)

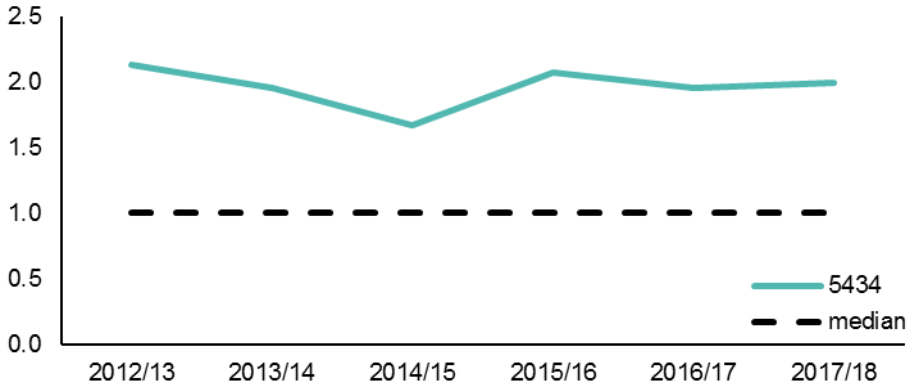
4J.44 Usage of Tier 2 (General) has been low.

Year	2014	2015	2016	2017	2018
RCoS Used	23	42	46	59	40

Recommendation

4J.45 We do not recommend including SOC code 2436 (construction project managers and related professionals) on the SOL. Despite the occupation having a high ranking (12th), and an average vacancy rate, there was insufficient stakeholder evidence that this occupation was in shortage.

SOC 5434 - Chefs

Summary table: SOC 5434 Chefs	
Employment	
Share of UK employees (%, APS, 2017/18)	0.8%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.2%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	16.7%
Share of employees born outside the EEA (%, APS, 2017/18)	29.6%
Wages	
Median full-time annual wage (ASHE 2018)	£21,403
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	47
Recommendation	
Recommend maintaining on the SOL.	

Stakeholder evidence

4J.46 There is a very significant amount of the workforce that was born outside of the UK (16.7 per cent EEA 29.6 per cent non-EEA)

4J.47 Stakeholder responses indicated that there were significant issues with recruiting and retaining good quality chefs, with the “take-away clause” (see paragraph 4I.122 for details) being viewed as a serious block to the industry.

4J.48 Vacancies remaining open for over 100 days are common. Employers reported difficulties in filling vacancies at all levels.

Use of the SOL

4J.49 SOC 5434 has been on the SOL, in part, since September 2008.

4J.50 Only the following job in this occupation code has been on the SOL. It is required that chefs earn at least £29,570 per year after deductions for accommodation, meals etc; and the job requires five or more years relevant experience in a role of at least equivalent status to the one they are entering; and the job is not in either a fast food outlet, a standard fare outlet, or an establishment which provides a take-away service

4J.51 Furthermore, the job needs to be within one of the following roles: executive chef (limited to one per establishment), head chef (limited to one per establishment), sous chef (limited to one for every four kitchen staff per establishment), specialist chef (limited to one per speciality per establishment).

Use of Tier 2 (General)

4J.52 Usage of Tier 2 (General) has been low.

Year	2014	2015	2016	2017	2018
RCoS Used	81	57	32	38	49

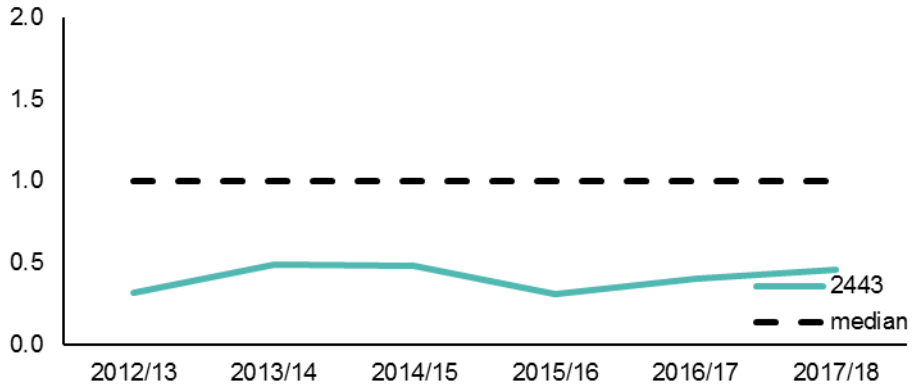
4J.53 Stakeholders commented that the criteria of requiring the chef not to work in a fast food establishment prevented them from making use of Tier 2 visas.

Recommendation

4J.54 We recommend the inclusion of skilled chefs within SOC code 5434 (chefs) on the SOL. The occupation ranks fairly highly (47th) in our shortage indictors and has an above average vacancy rate. Based on the stakeholder evidence, we recommend retaining chefs on the SOL. The MAC recommends the removal of the condition that establishments that offer a take-away service cannot use the

SOL, this rules out recruitment to parts of the industry with genuine shortages as most establishments will offer some level of take-away service. We do not wish to create a further compliance burden on UK Visas and immigrations and we recommend that the number and quality of applications is monitored closely and if it appears that usage of Tier 2 (General) increases considerably we will need to revisit the recommendation.

SOC 2443 - Probation Officers

Summary table: SOC 2443 Probation officers	
Employment	
Share of UK employees (%, APS, 2017/18)	0.0%
Share of Tier 2 (% total RCoS Used 2015-2018)	Not reported
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	0.0%
Share of employees born outside the EEA (%, APS, 2017/18)	7.8%
Wages	
Median full-time annual wage (ASHE 2018)	£32,688
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Top down shortage indicator	
Shortage overall rank /105	49
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder evidence

4J.55 We did not receive stakeholder evidence relating to this SOC.

Use of the SOL

4J.56 SOC 2443 has never been on the SOL.

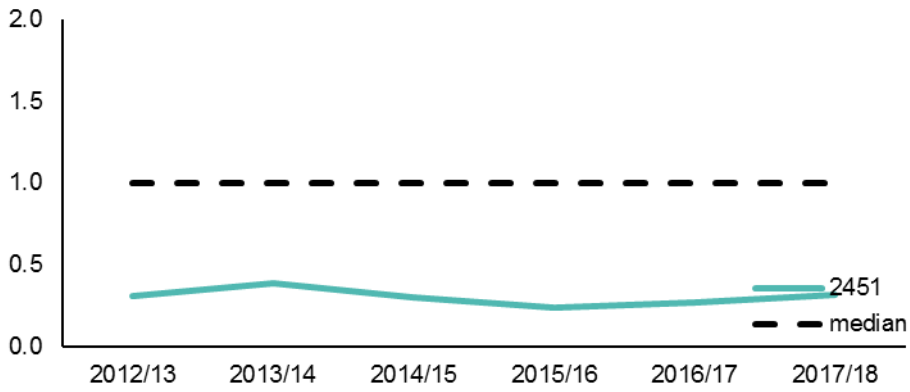
Use of Tier 2 (General)

4J.57 Since 2009, there has been no usage of Tier 2 (General).

Recommendation

4J.58 We do not recommend including SOC code 2443 (probation officers) on the SOL. The occupation ranks fairly high (49th) in our shortage indicators, however the vacancy rate is below average and there was no stakeholder evidence suggesting this occupation was in shortage.

SOC 2451 – Librarians

Summary table: SOC 2451 Librarians	
Employment	
Share of UK employees (%, APS, 2017/18)	0.1%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.0%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	3.8%
Share of employees born outside the EEA (%, APS, 2017/18)	6.1%
Wages	
Median full-time annual wage (ASHE 2018)	£29,093
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	105
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder evidence

4J.59 We did not receive stakeholder evidence relating to this SOC.

Use of the SOL

4J.60 SOC 2451 has never been on the SOL.

Use of Tier 2 (General)

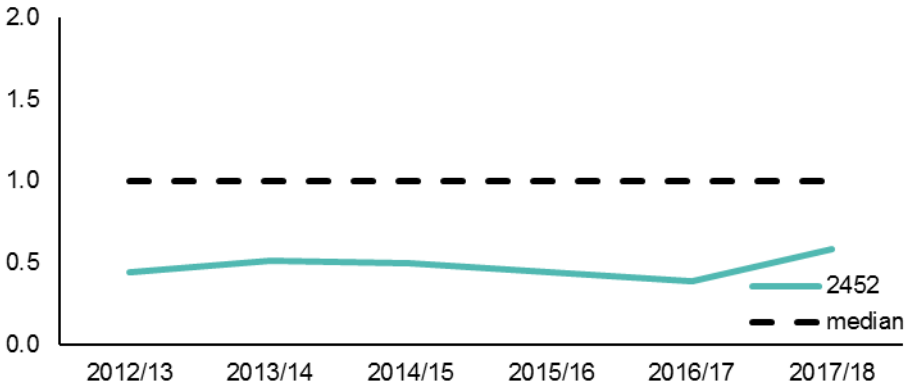
4J.61 Since 2009, 25 Librarians have used the Tier 2 route.

Year	2014	2015	2016	2017	2018
RCoS Used	0	2	2	4	2

Recommendation

4J.62 We do not recommend including SOC code 2451 (librarians) on the SOL. The occupation is the least in shortage (105th) and the vacancy rate is below average. There was no stakeholder evidence that this occupation was in shortage.

SOC 2452 – Archivists and Curators

Summary table: SOC 2452 Archivists and curators	
Employment	
Share of UK employees (%, APS, 2017/18)	0.1%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.0%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	5.7%
Share of employees born outside the EEA (%, APS, 2017/18)	7.0%
Wages	
Median full-time annual wage (ASHE 2018)	£27,254
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Top down shortage indicator	
Shortage overall rank /105	96
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder evidence

4J.63 We did not receive stakeholder evidence relating to this SOC.

Use of the SOL

4J.64 SOC 2452 has never been on the SOL.

Use of Tier 2 (General)

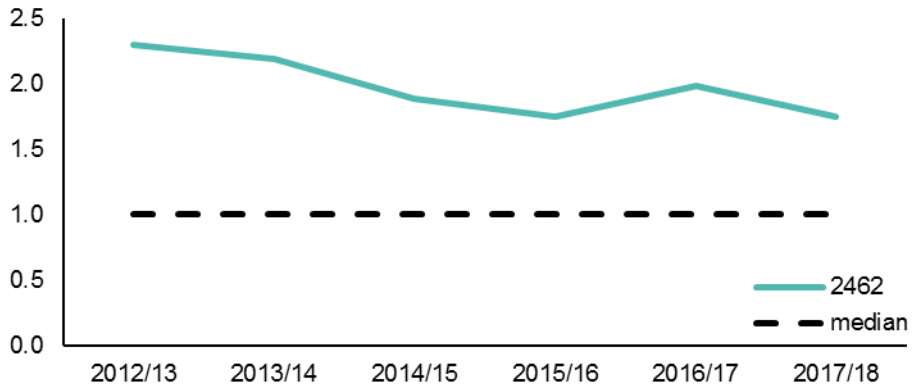
4J.65 Tier 2 (General) usage has been very low.

Year	2014	2015	2016	2017	2018
RCoS Used	10	8	10	4	3

Recommendation

4J.66 We do not recommend including SOC code 2452 (archivists and curators) on the SOL. The occupation ranked low (96th) in our shortage indicators and the vacancy rate is below average. There was no stakeholder evidence that this occupation was in shortage.

SOC 2462 – Quality Assurance and Regulatory Professionals

Summary table: SOC 2462 Quality assurance and regulatory professionals	
Employment	
Share of UK employees (%, APS, 2017/18)	0.4%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.6%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	5.3%
Share of employees born outside the EEA (%, APS, 2017/18)	8.3%
Wages	
Median full-time annual wage (ASHE 2018)	£42,549
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Shortage indicator rank	
Shortage overall rank /105	13
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder evidence

4J.67 Stakeholders suggest that the various methods that they have started to trial over the past few years are starting to have a positive impact with an increase in graduate and apprenticeship schemes.

4J.68 It is also mentioned that vacancies can remain open for significant period of times, many months, and sometimes longer. However, the industry appears to appreciate that these issues come from a state where the economy is at almost full employment and therefore do not suggest that it is a localised issue for the occupation.

Use of the SOL

4J.69 SOC 2462 has never been on the SOL.

Use of Tier 2 (General)

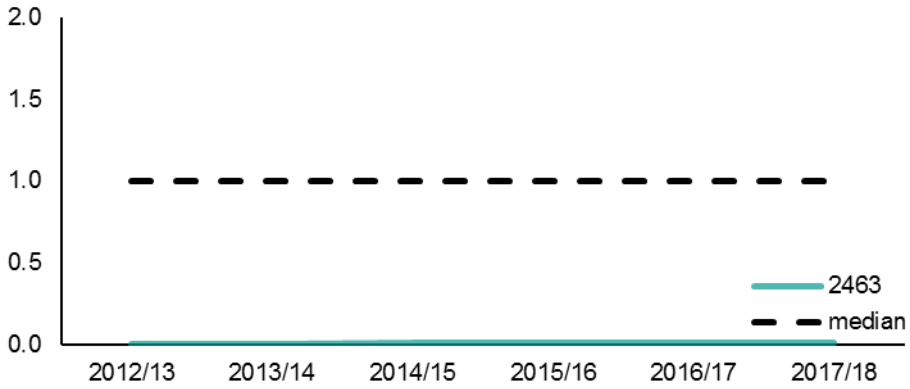
4J.70 In each year since 2015, there have been over 100 Tier 2 visas granted; with on average over the period 2013-2018, over 100 issued each year.

Year	2014	2015	2016	2017	2018
RCoS Used	87	125	114	100	99

Recommendation

4J.71 We do not recommend including SOC code 2462 (quality assurance and regulatory professionals) on the SOL. Despite the occupation ranking highly (13th) in our shortage indicators and having an above average vacancy rate, there was insufficient stakeholder evidence that this occupation is in shortage.

SOC 2463 – Environmental Health Professionals

Summary table: SOC 2463 Environmental health professionals	
Employment	
Share of UK employees (%, APS, 2017/18)	0.0%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.0%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	1.0%
Share of employees born outside the EEA (%, APS, 2017/18)	9.2%
Wages	
Median full-time annual wage (ASHE 2018)	£36,340
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Top down shortage indicator	
Shortage overall rank /105	85
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder evidence

4J.72 We did not receive stakeholder evidence relating to this SOC.

Use of the SOL

4J.73 SOC 2463 has never been on the SOL.

Use of Tier 2 (General)

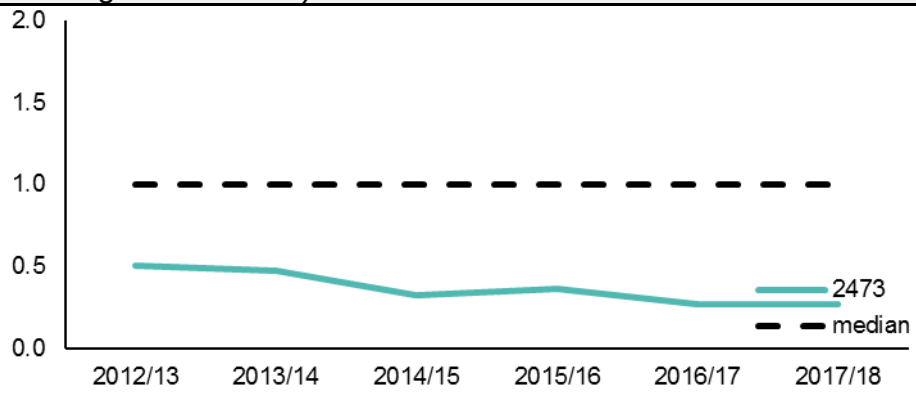
4J.74 Tier 2 (General) usage has been very low.

Year	2014	2015	2016	2017	2018
RCoS Used	3	2	0	3	0

Recommendation

4J.75 We do not recommend including SOC code 2463 (environmental health professionals) on the SOL. The occupation ranked low (85th) in our shortage indicators and the vacancy rate is below average. There was no stakeholder evidence that this occupation was in shortage.

SOC 2473 - Advertising accounts managers and creative directors

Summary table: SOC 2473 Advertising accounts managers and creative directors	
Employment	
Share of UK employees (%, APS, 2017/18)	0.1%
Share of Tier 2 (% total RCoS Used 2015-2018)	0.8%
Share of employees born in the EEA (ex.UK) (%, APS, 2017/18)	2.5%
Share of employees born outside the EEA (%, APS, 2017/18)	16.4%
Wages	
Median full-time annual wage (ASHE 2018)	£37,851
Vacancies (Burning Glass job posts/employment relative to median of occupations eligible for Tier 2)	
	
Top down shortage indicator	
Shortage overall rank /105	81
Recommendation	
Do not recommend adding occupation to the SOL	

Stakeholder evidence

4J.76 SOC 2473, Advertising accounts managers and creative directors, was ranked as 81st out of 105 occupations skilled at RQF6+ by our shortage indicators. This suggests that there are little in the way of shortages within the occupation.

Use of the SOL

4J.77 SOC 2473, never been on the SOL.

Use of Tier 2 (General)

4J.78 Usage of Tier 2 (General) has been low over the period.

Year	2014	2015	2016	2017	2018
RCoS Used	110	124	146	199	93

Recommendation

4J.79 We do not recommend including SOC code 2473 (advertising accounts managers and creative directors) on the SOL. The occupation ranked low (81st) in our shortage indicators and the vacancy rate is below average. There was no stakeholder evidence that this occupation was in shortage.

Chapter 5: Medium and Lower-Skilled Occupations

5.1 In response to the recommendations made in our report on EEA migration, the Home Office has committed in their White Paper on the future immigration system to lower the skill threshold for Tier 2(G) from RQF6+ to RQF3+ by the end of the EU exit implementation period.

5.2 This change will open Tier 2(G) up to a further 127 occupations and extend eligibility for those seven medium-skilled occupations currently on the SOL but which are limited to specific jobs and are not covered by the creative occupation exemption.

5.3 In this report we will not be providing detailed recommendations on which medium-skilled occupations might justify a place on an extended SOL. This report is about up-dating the current immigration system not the future one. The move to make medium-skilled occupations eligible for Tier 2(G) is only envisioned to come into effect as part of the future immigration system. While the principles of that future system have been articulated in the Immigration White Paper the precise detail has not and the Home Office are currently engaging with stakeholders on this. Crucially it is not yet clear what role there will be for a SOL. We do not feel able to make recommendations about which occupations should be placed on a future SOL when we do not know the purpose or function of that list, or even whether it will exist at all.

5.4 Despite not making recommendations we do seek to outline the broad areas of shortage amongst medium-skilled occupations highlighted to us through responses to the call for evidence as well as provide a review of the concerns raised regarding lower-skilled roles. In neither case do we pretend this represents a comprehensive discussion of shortages among every occupation currently ineligible for Tier 2(G).

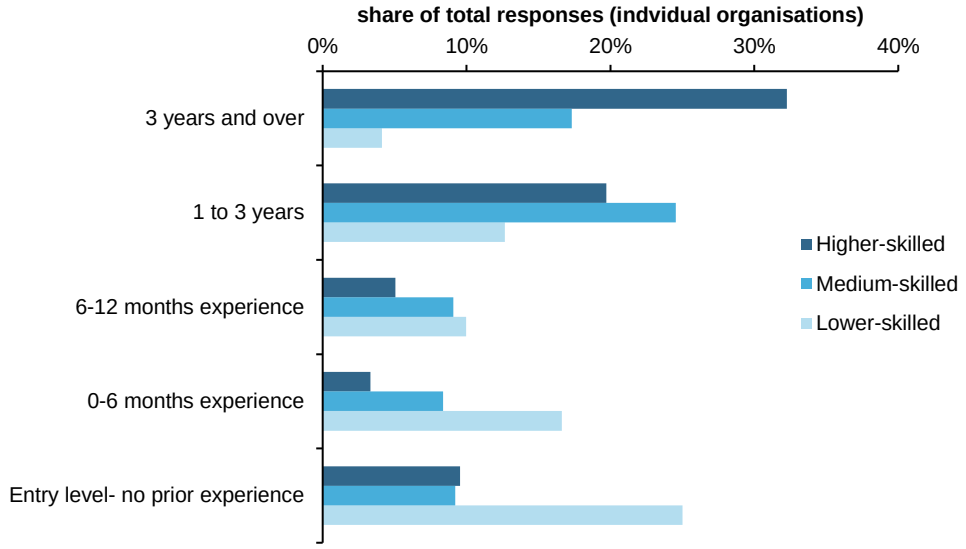
5.5 When we refer to medium or lower-skilled occupations we are referring to those occupations that are associated with skill-levels RQF3 to RQF4 and below RQF3 respectively; as set out in appendix J of the immigration rules (also known as the codes of practice for skilled work). These classifications are based on the methodology described in chapter 2 of this report and are design to reflect the training and experience necessary to do a job rather than any statement about the value of the work being done.

Nature of the shortages among medium and lower-skilled occupations

5.6 Individual organisations responding to the call for evidence were asked about the prior work experience and minimum qualification requirements for the jobs they identified as being in shortage. The response to these questions are summarised in figure 5.1 and 5.2 below.

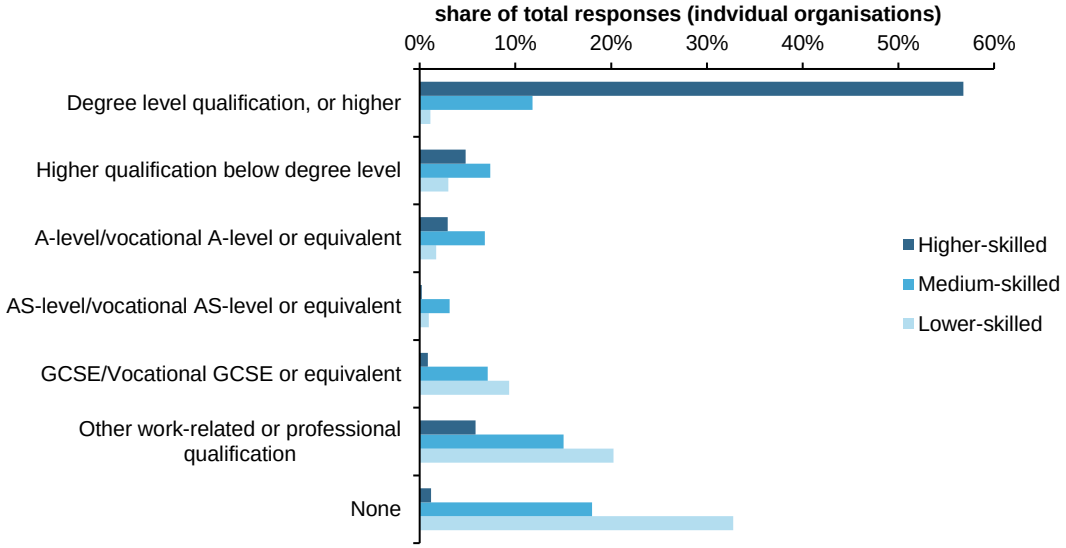
5.7 They show that medium and lower-skilled jobs[155] have significantly less stringent experience and qualification requirements compared to higher skilled jobs.

Figure 5.1: Expected work experience for jobs identified by stakeholders as in shortage by the skill level of the job



Source: MAC SOL Call for Evidence, "Individual Organisations" responses

Figure 5.2: Expected qualification level for jobs identified by stakeholders as in shortage by the skill level of the job



Source: MAC SOL Call for Evidence, "Individual Organisations" responses

5.8 Furthermore, as shown in figure 3.5 in chapter 3, we know that the reasons for shortages given by stakeholders are more focused on a lack of skilled applicants when considering higher-skilled jobs compared to medium and lower-skilled where the reasons given are more likely to be around the attractiveness of the job (such as having to work unsocial hours). All this points

[155]jobs that were matched to medium or lower-skilled four-digit occupation codes.

towards the shortages faced by employers looking to fill vacancies in medium and lower-skilled roles being less associated with a lack of people able to fill vacancies but rather a lack of people willing to do so. While this is clearly not a universal distinction it is an important difference when thinking about the role migration might be able to play in alleviating shortages.

Summary of evidence regarding medium-skilled occupation groups

5.9 There are 137 medium-skilled occupations ineligible for Tier 2(G) on the basis that they do not meet the current skills threshold, or they do not benefit from an exemption such as that given to certain creative occupations[156]. These occupations represent around 28% of all employees[157].

5.10 In this section we focus on a number of broad occupation groups/sectors that were brought to our attention through the call for evidence as potentially facing shortages of labour.

Butchers

5.11 While most occupations mentioned in the context of food processing and manufacturing tended to be lower-skilled there was one medium-skilled occupation that came up frequently, which was butchers (5431). In fact, it was the most mentioned medium-skilled occupation across all the responses to our call for evidence. The mentions were largely in the context of individuals working in processing factories as slaughtermen, boners and trimmers.

5.12 Evidence from organisations like the British Meat Processors Association and the Food and Drink Federation documented the increasing difficulty they/their members were having recruiting butchers. The reasons given for the deterioration in labour availability are similar to other sectors, with EU workers increasingly seeking employment in other EU member states as well as a generally tight labour market.

5.13 Certain structural trends in the market have exacerbated recruitment difficulties. For example, the growth of larger processing plants over individual butcher shops has concentrated the need for workers in increasingly few areas. These areas are often rural with poor transport and housing infrastructure making it a less attractive proposition for workers.

5.14 The job titles “skilled meat boner” and “skilled meat trimmer” were recommended for addition to the SOL in October 2009 but were then recommended for removal in March 2011 in response to the skill threshold for Tier 2(G) being increased from NQF3 to NQF4. Much of the evidence we received during those reviews echo the same concerns highlighted almost 10 years later in the responses to this most recent call for evidence.

5.15 Meat processing has been dependent on immigrant labour for a long time, and the experience is similar in many other comparable countries. The difficulty of

[156] 142 medium-skilled occupations as identified in the current Appendix J minus five creative occupations subject to skill threshold exemption results in 134 occupations.
[157] Annual Population Survey Oct17–Sep18, main and second occupation.

recruiting and retaining workers is a structural one, probably related to the relatively unattractive terms and conditions in the sector (e.g. repetitive work in cold temperatures). For the same reasons employers are struggling to recruit under the conditions of freedom of movement (migrants increasingly have better options elsewhere), it is likely they would eventually also struggle to attract sufficient non-EEA migrants. Until and unless the attractiveness of the jobs improves it will remain the case that employers of butchers will struggle to attract sufficient quantities of labour, especially under tight labour market conditions.

Science, engineering and technology technicians

5.16 This group of medium-skilled occupations (from SOC group 31) describes a group of professions who perform a variety of technical support functions to assist the work of other professionals, such as scientists and engineers, as well support the functioning and maintenance of systems (e.g. electrical systems).

5.17 This broad group of occupations came up in the call for evidence in several areas such as quality assurance and production technicians in the food and drink manufacturing sector, acoustic technicians providing services to the construction industry, haematologists and cytoscreeners in the health sector, computer aided design engineers in the automotive sector and laboratory technicians in the university and commercial settings.

5.18 Despite being part of a medium-skilled occupation code, technician roles can be highly specialised and are likely subject to similar workforce pressures faced by higher skilled STEM occupations. While a significant focus has been placed on growing the numbers of STEM graduates some, like the Gatsby Foundation[158], argue that less attention has been paid to ensuring a sufficient supply of technicians to enable these higher-end STEM roles. Respondents point towards a lack of students taking science qualifications and poor careers guidance as key factors stemming the flow of new workers into these types of roles from within the UK-born population.

5.19 Given this and given the prevalence of STEM occupations on the current SOL, it would be sensible to look towards technician roles as an area of likely shortage among medium-skilled occupations.

Skilled construction and building trades

5.20 There are relatively few construction occupations eligible for Tier 2(G) (quantity and chartered surveyors, production managers and directors and project managers and related professionals), and none are currently on the SOL.

5.21 The share of the construction[159] workforce born in the EEA (ex. RoI) is somewhat higher than average at around 8% compared to 7.3% across all sectors[160]. However, this hides significant variation, with the house building

[158] https://www.gatsby.org.uk/education/focus-areas/stem-skills-in-the-workforce
[159] SIC 41-43
[160] Annual Population Survey Oct 2017 – Sep 2018 (difference not clearly significant)

sector and the London construction labour market being much more reliant on EU nationals (particularly those from the newer member states). For example, a workforce survey by the Home Builders Federation conducted between September and October 2017[161] found that 17.7% of the house building workforce was from the EU with Romanians representing 7.3% alone. This survey also found that almost 50% of the housing building workforce in London was from the EU.

5.22 An industry run survey of 276 companies, representing 160,000 workers, conducted in response to the MAC call for evidence asked respondents from the construction industry which occupations they currently had "some" difficulties recruiting for and which they had "severe" difficulties and also asked respondents to identify those occupations they expected to have some/sever difficulties recruiting for after the UK has left the European Union.

5.23 This survey pointed to a mix of high, medium and lower-skilled occupations being currently in shortage. Bricklayers (5321) was the only medium-skilled occupation singled out as facing "severe shortages" by the report and was also highly mentioned when asked about potential recruitment difficulties after the UK has left the EU.

5.24 BEIS, in their response to our call for evidence, mentioned that the Construction Industry Training Board (CITB) were reporting shortages among steel fixers (5311), concreters (8142) and scaffolders (8141). Of which only steel fixers are classified as medium-skilled under the current Tier 2(G) codes of practice.

5.25 A report by the CITB[162], which attempts to forecast the labour requirements of the construction sector, estimates an average recruitment requirement for the sector of 33,700 per year between 2019 and 2023. The largest single component of this requirement comes from the need to employ non-construction professionals covering a wide range of occupations such as IT professionals and other office-based staff. After these it is "Other construction process managers" and "Other construction professionals and technical staff" that are forecast be highly in demand. These groups, defined by CITB by grouping several SOCs together, contain a number medium-skilled occupation[163]. Several manual trades also rank highly in their contribution to the sectors recruitment requirement, including "wood trades and interior fit-out", "electrical trades and installation" and "plumbing and HVAC trades".

5.26 The construction sector is seen as an important sector according to the current Governments Industrial Strategy, as recognised by the announcement of sector deal for construction last year[164]. This deal and the BEIS response to our call for evidence sets out the ways in which the sector is striving to improve its productivity, through greater use of offsite manufacturing and the development of more apprenticeship programs. However, it is argued, these actions are will

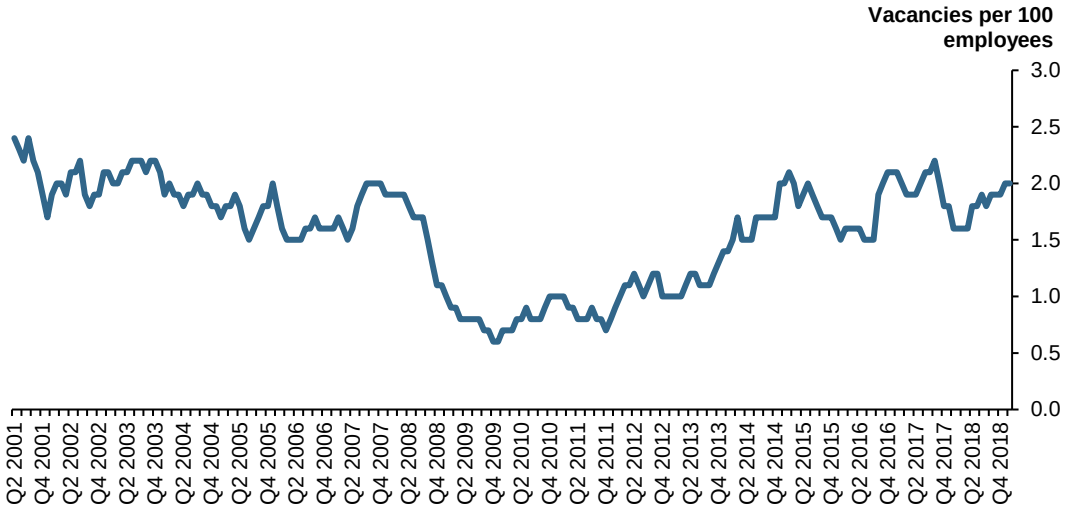
[161] https://www.hbf.co.uk/news/home-building-workforce-census-2017/
[162] https://www.citb.co.uk/about-citb/construction-industry-research-reports/search-our-construction-industry-research-reports/forecasts/csn-forecasts-2019-2023-uk/
[163] Medium-skilled occupations include 1255, 3567, 3550, 2435, 3116, 3121, 2531, 3112, 3113,3114,3115,3119,3122
[164] https://www.gov.uk/Government/publications/construction-sector-deal

not meaningfully reduce the sectors demand for lower and medium-skilled labour, at least in the short to medium term.

5.27 On the supply side stakeholders highlighted a number of barriers, including (i) a negative perception of the sector influencing school leavers choices, (ii) construction courses at FE colleges not always leading to individuals finding work in the roles they've trained for and (iii) some dissatisfaction with the take-up of apprenticeships and the functioning of the apprenticeship levy. Stakeholders pointed to the work being done to remedy these constraints on the supply side, such as the work of the Home Building Skills Partnership[165], but noted that it will be some time before these initiatives significantly alter the pipeline of new recruits.

5.28 As figure 5.1 shows, vacancy rates in the construction sector have increased in recent years and are near the highs seen before the financial crisis.

Figure 5.1: Vacancies per 100 employees in construction sector



Source: ONS vacancy survey

5.29 Overall, given the very significant reliance on EEA workers in some parts of the construction industry, increasing vacancy rates and the importance of the sector to the UKs infrastructure plans and industrial strategy, construction occupations will require careful consideration in a future immigration system.

Health and welfare associate professionals

5.30 There were several mentions of health and welfare related medium-skilled occupations amongst the call for evidence responses. These included cardiac physiologists, pharmacy technicians and housing support officers. Much like the previously discussed "Science, engineering and technology technicians", these roles broadly describe jobs that support the work of other professionals – in this case within the health and social work areas. The 4-digit occupations

[165] https://www.hbf.co.uk/news/quarterly-update-home-building-skills-partnership/

captured by these grouping include “medical and dental technicians” (3218), “pharmaceutical technicians” (3217), “health associate professionals n.e.c.” (3219), “housing officers” (3234) and “welfare and housing associate professionals n.e.c.” (3229).

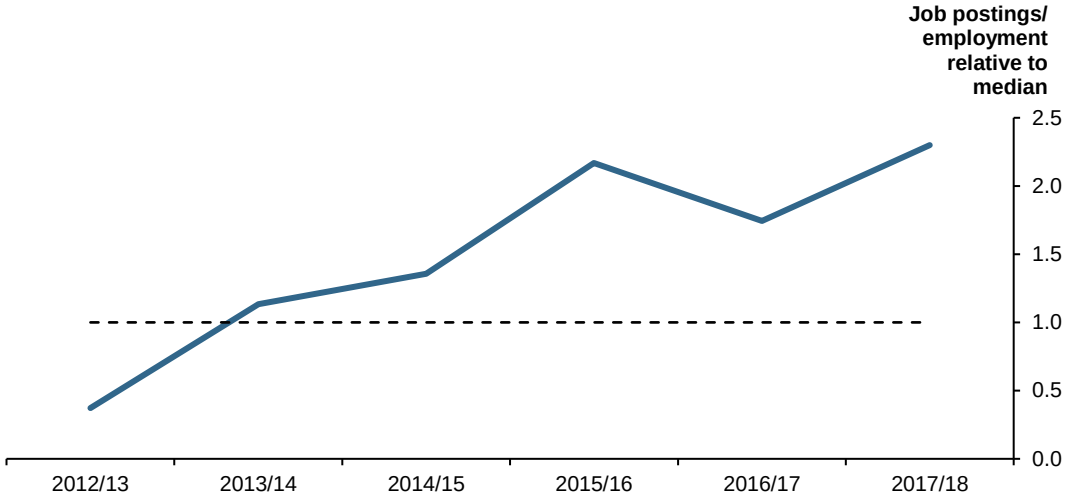
5.31 While entry requirements for these occupations are somewhat lower than those jobs whose work they support, they can still be highly specialised. Again, much like the other technician occupations, it would be a sensible to look at these types of health and welfare occupations for signs of shortage (if extending the SOL to medium-skilled occupations) given the shortages faced by other similar higher-skilled occupations in the same sectors.

Caring personal service occupations

5.32 This group of occupations (sub major group 61) covers roles from adult social care as well as early years care and veterinary care. The main shortage faced in adult social care are for care workers, which are a lower-skilled occupation. Later in this chapter we provide a deep dive into the adult social care workforce (see box 5.1), so here we focus on early years and veterinary roles.

5.33 “Veterinary nurses” is a medium-skilled occupation (RQF3) which the Royal college of Veterinary Surgeons (RCVS) and others highlighted as facing a shortage of labour. It is argued veterinary nurses share many of the same difficulties as veterinary surgeons (which were removed from the SOL in 2011), with the sector growing, too few practices offering training and a limited ability to attract candidates from outside a narrow demographic. The RCVS call for evidence submission cited a survey of UK veterinary business which estimated a 7.6% vacancy rate. Burning glass data also suggests a higher than average vacancy rate, as approximated by the ratio of job postings to employment relative to the median ratio calculated over all occupations (see fig 5.2 below).

Figure 5.2: Job posts / employment for Veterinary Nurses relative to the median† posts/employment ratio for all occupations



†Median calculated across all 4-digit occupations. A measure greater than one indicates job posts/employment ratio above the median, a measure less than one indicates a job posts/employment ratio below the median

Source: Burning Glass and Annual Population Survey

5.34 A joint report by RCVS and British Veterinary Association[166] sets out the steps being taken to improve the pipeline and offer of the veterinary nurse profession. Two of the recommendations from this report focus on improving the support for overseas trained veterinary nurses working in the UK, however generally migration is not a key topic of the report. The statistics show that migrants make up a relatively small fraction of the veterinary nurse's occupation at around 6%, compared to a share of around 30% for veterinarians (2216). Given the self-identified failure of employers to offer sufficient training places to meet demand and the relatively low share of migrants in the profession already it is not obvious that migration represents a long-term solution to any shortages the occupation is facing.

5.35 Another caring occupation mentioned in response to the call for evidence are "Nursery nurses and assistants" (6121) which encompasses job titles such as creche assistant, creche workers, nursery assistant, nursery nurse, pre-school assistant and pre-school teachers. A number of local authorities, particularly those from Scotland, pointed to increases in the number of hours of free child care being offered to parents of 3 and 4 year olds as a driver of demand for workers in this occupation.

5.36 In common with other caring professions, it is already the case that the share of workers born outside of the EEA in this occupation is larger than those born inside the EEA (ex UK & Ireland). The APS estimates approximately 3% of nursery nurses and assistants are EEA born while 6% are non-EEA born. Without a detailed assessment of what, if any, barriers there are to the recruitment of nursery nurses and assistants from the existing workforce it is

[166] https://www.vetfutures.org.uk/download/vn-futures-report-and-action-plan/?wpdmdl=3555&masterkey=

hard to conclude whether it would be an appropriate candidate for inclusion on an expanded SOL.

Skilled agricultural and related trades

5.37 There are two agricultural occupations classified at RQF4, these are managers and proprietors in agriculture and horticulture and managers (1211) and proprietors in forestry, fishing and related services (1213). There are also several occupations that straddle the lower to medium-skilled boundary[167], such as farmers (5111), horticultural trades (5112), agricultural and fish trades not elsewhere classified (51119) and fishing and other elementary agriculture occupations not elsewhere classified (9119).

5.38 The types of medium-skilled jobs highlighted to us through the call for evidence tended to be managers or supervisors, such as farm or herd managers in agriculture and operations or harvest managers in horticulture. The National Farmers Union response notes that roles such as herdsman "is a highly experienced one and involves a broad skill set and knowledge base".

5.39 While it is clear the sector has an overwhelming dependence of labour from the EU to fill seasonal vacancies in lower-skilled roles, particularly in horticulture[168], the data available for these medium-skilled management roles suggest that around 95% of workers were born in the UK (or Ireland) – though this is on the basis of relatively small sample sizes given overall employment in these two occupations is relatively low (≈30k jobs)[169].

5.40 We also have very little specific evidence about the recruitment difficulties employers are facing with respect to management roles in particular. From the evidence submitted and the discussions we've had during our regional engagements, the sector is more concerned with the impact the ending of FoM will have on their access to labour to fill lower-skilled vacancies.

5.41 Overall we don't feel we have the evidence to assess whether management roles in agriculture are facing particular shortages, and if they are whether migration is the solution for alleviating those shortages. We are aware that the NFU are planning to survey their members in 2019 to get a better understanding of the sector's workforce characteristics and dynamics. We would urge the NFU to use this as an opportunity to clarify the pressures facing occupations at all skill levels.

Business and public service associate professionals

5.42 This group of occupations covers a very wide range of jobs, with the broad theme that they have some specialised profession and domain specific expertise.

[167] Designated by the label "RQF3/Lower-skilled" in Tier 2(G) codes of practice (Appendix J to the immigration rules).
[168] Reference EEA report
[169] Annual Population Survey 2017

5.43 We received responses mentioning roles such as human resources officers, digital marketers, clinical coders, estimators in the housing industry, health and safety officers and sales executives to name just some. There is no obvious unifying theme between these roles and no overwhelming response from stakeholders directed towards one or some of these above others.

5.44 For example the response from the UK Lubricants Association (UKLA) noted with some surprise that when they asked their members where they felt skills shortages most acutely a majority pointed to roles such as sales, marketing and business development rather than more technical roles.

5.45 In general these commercial facing roles rely on transferable skills augmented with some profession specific knowledge learnt on the job or through qualifications offered by professional bodies. The pipeline of potential recruits is therefore not likely overly reliant on schools or other education institutions producing leavers with certain academic qualifications, as maybe the case for some of the more technical roles.

5.46 The UKLA response quotes one of their members arguing that employers can be too specific and narrow in their requirements and risk turning away good talent and transferable skills. Other stakeholders point to perception issues of their industry and poor careers guidance at schools.

5.47 Across most of the occupations within this sub-major (2-digit) group the share of migrants in the employee workforce is not out of line with their share amongst all employees in the UK. The one exception is that of "conference and exhibition managers and organisers" (3546) where around 12% of employees are EEA born compared to around 7% within the UK workforce generally[170]. We only identified one response that highlighted some difficulty in recruiting workers for this occupation.

5.48 Overall the evidence base on the extent and causes of recruitment difficulties amongst this diverse set of medium-skilled occupations is weak. While further exploration may be required the average or below average share of migrants in most these occupations, combined with the nature of skills and aptitudes required, do not immediately point towards inclusion on an expanded SOL.

Summary

5.49 The evidence we received does point to several medium-skilled occupations that face difficulties in recruiting labour, notably technician roles and occupations within construction. However, this discussion does not amount to a set of recommendations. The brief summaries provided should not be taken as necessarily indicative of any recommendations that we may be asked to make in the future.

[170] APS Oct 2017 – Sep 2018, country of birth share of employees by first and second jobs

Lower-skilled occupations – summary of key issues

5.50 Concerns about reductions in access to labour to fill vacancies in lower-skilled occupations were strongly expressed in a number of the responses to the call for evidence. It was also a recurring theme during the regional stakeholder events we attended. These concerns echoed those we heard during the evidence gathering exercise undertaken to inform our report on the impacts of EEA migration[171].

5.51 Figure 5.3 below shows the top 15 lower-skilled occupations by mentioned in the online form

Figure 5.3: Top 15 call for evidence lower-skilled occupation mentions

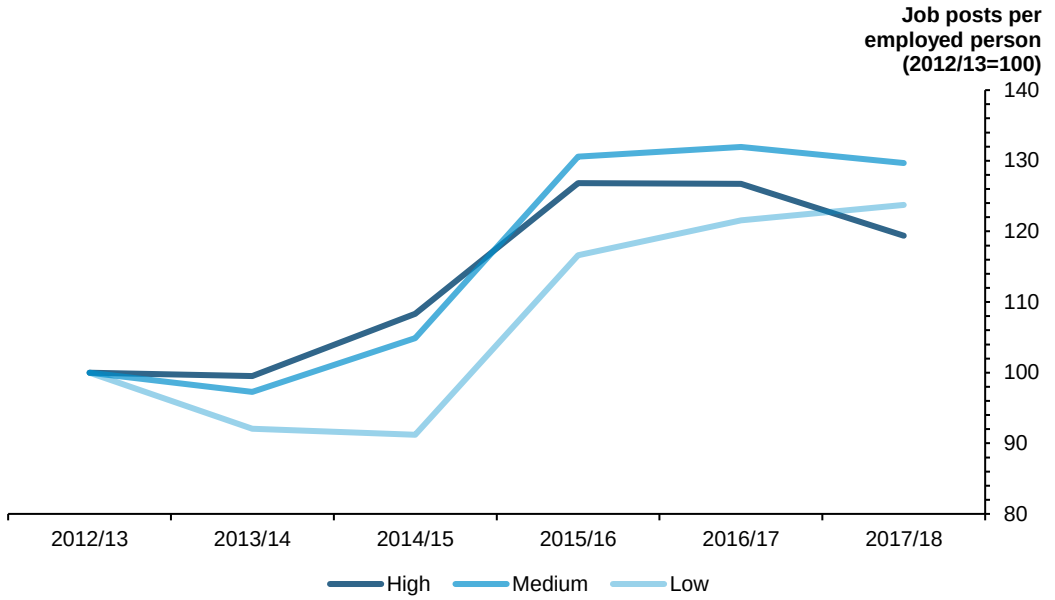
Source: MAC Call for Evidence online form

5.52 This figure gives some idea about the kinds of lower-skilled jobs stakeholders were highlighting to us as being in shortage. In our stakeholder engagement the sectors expressing concern were agriculture, food processing, warehousing hospitality, construction, transport, cleaning and social care.

5.53 Given the occupation-based nature of the skills measure we use, it is also possible to breakdown vacancy rates by skill-level. Figure 5.5 below presents the evolution of annual (Oct-Sep) job postings (Burning Glass) per employed person (APS) by skill level of the occupations of the jobs being posted.

[171] A sector by sector summary of the evidence we received during the EEA report, including concerns about access to lower-skilled labour, was made available in the interim EEA report.

Figure 5.5: Index of job posts per employed person by occupational skill level



Source: Job post counts from Burning Glass, employment from APS accessed via NOMIS, skill level as set out in current codes of practice for skilled work.

5.54 Postings per employed person has increased by similar amounts across the skills spectrum. Although not shown in the above figure, the absolute level of this ratio is much higher for high and medium-skill occupations than for lower-skilled occupations (on average). Given the nature of the Burning Glass data it is not clear how much a levels difference may just reflect different recruitment practices.

5.55 Across the range of lower-skilled occupations there were several common themes in the responses we received, these include:

- Employers found that there were a low number of applicants for their vacancies, particularly from the local workforce, as a result of a tight labour market with low unemployment and high employment rates.
- The availability of labour from the EU has reduced since the referendum result, likely reflecting the influence of the devaluation of sterling and improving economic conditions in countries of origin.
- A view that, on average, there has been a shift in the aspirations of the already resident workforce (particularly the young) who are now less willing to do manual repetitive roles.
- In some sectors, notably agriculture and horticulture, while employers felt they offer competitive wages they struggle to compete for labour from sectors, like retail, which offer with the more comfortable working conditions.

- Seasonality in sectors such as agriculture, fishing and hospitality generates a requirement for a flexible workforce which is difficult to access purely from the domestic labour supply.

- Some business models have become reliant on access to a flexible pool of high quality labour to fill lower-skilled positions. Moving to a situation where this access is restricted could pose risks to the sustainability of some businesses.

5.56 While it is undoubted true that employers of lower-skilled occupations are facing genuinely difficulties in attracting a sufficient quantity of labour, the problem may be a lack of workers willing to do the jobs at the current terms and conditions rather than a shortage of workers able to do the jobs.

5.57 The current Tier 2(G) system is not designed to deal with shortages among lower-skilled workers. It is a model with significant administrative and compliance costs, more easily borne by those sponsoring workers filling higher-skilled roles. It does not accommodate seasonal workers and it limits the ability of migrants to switch employer (their new employer must be a Tier 2(G) sponsor for example). The ability to easily switch employer is an important protection for workers against exploitation particularly in lower-paying occupations. Any lower-skilled work route would probably need an increased role for the Director for Labour Market Enforcement.

5.58 The inappropriate design of Tier 2(G) for lower-skilled work is well understood and employers would prefer to see an alternative route designed specifically for their needs. In our report on EEA migration we said that if a lower-skilled work route was required then, with the exception of seasonal agriculture, it should avoid being sector specific and have some of the flexibility of routes like the current Youth Mobility Scheme (YMS). A key reason that we do not support the idea of sector-specific routes is that we believe that in low-wage sectors employers should compete against each other for labour on a level playing field. We did recognize the particular problems faced by social care which are discussed in more detail in Box 5.1.

5.59 The evidence that we have received on shortages within lower-skilled occupations has been valuable in helping to build the evidence base about these occupations, and we are grateful to stakeholders for their contributions. While we are not recommending including jobs below RQF6+ on the SOL, for the reasons outlined earlier, the learning from this commission will be important in informing future work, when the shape of the new immigration system becomes clearer.

Box 5.1 – Social care

Our final report on EEA migration highlighted social care as an area of particular concern, one shared by many others.

Rising Demand

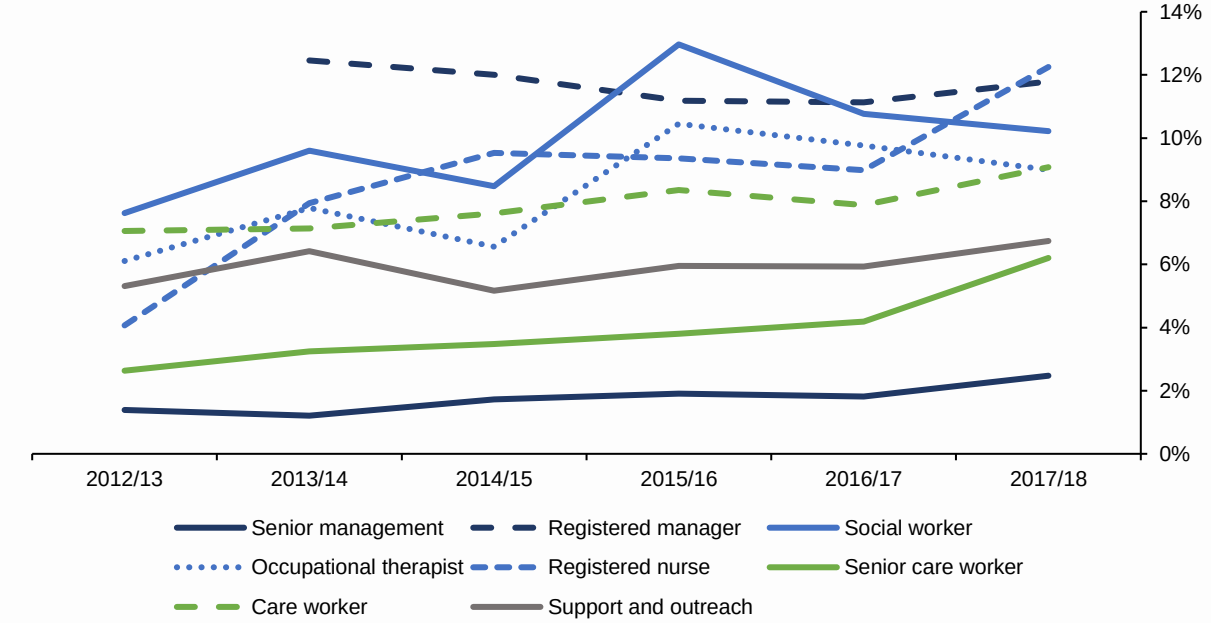
With an ageing population the social care sector will have to grow. Skills for Care estimate that there will need to be a 40-59% increase in social care jobs in England by 2035 to meet the increased demand resulting from more individuals aged 65+/75+[(1)]. These demographic pressures are shared across the UK, although some DAs and English regions face more rapid change than others. Furthermore, the Care Association Alliance in their evidence highlighted that the increasing move to community rather than residential based care would generate an even greater workforce requirement, suggesting the workforce requirement in a community setting is 25% greater than in a residential setting due to additional travel time.

Given the limited potential for labour-saving innovations in this area, it is likely that employment in social care will continue to grow.

Recruitment and Retention Problems

The social care sector is already experiencing difficulties in recruiting and retaining staff. The National Minimum Dataset for Social Care (NDMS-SC) shows that the English adult social care sector is experiencing high and increasing vacancy rates across a number of occupations and across all skill levels (see Fig 5.6 below). Evidence received from devolved administration (DA) stakeholders point to a similar picture outside of England. In volume terms it is the lower-skilled role of care worker that by far represents the largest component of the shortages the sector faces, with around 76,000 of the total 110,000 vacancies in the English adult social care sector relating to care workers.

Fig 5.6: Vacancy rate by role within English adult social care sector



Source: Skills for Care analysis of the NDMS-SC

(1)*"The state of the adult social care sector and workforce in England", Skills for Care Sep 2018*

Migrants in Social Care

The social care workforce currently has more non-EEA migrants (both in terms of nationality and country of birth) than EEA nationals. However, this gap has narrowed as the share of EEA migrants has been rising. For example, on a nationality basis, the NDMS-SC reports EU nationals share of the English adult social care workforce increasing from 5% in 2012/13 to 8% in 2017/18, while non-EU nationals share fell from 13% to 10% over the same period. On a country of birth basis however the gap is much larger (5% EEA vs 11% non-EEA), although this has also narrowed. Much discussion of lower-skilled migration focuses on social care however only around 8% of all migrants in lower-skilled work are in this sector(2).

There is currently no direct work route for non-EU workers to come and take up positions in medium or lower-skilled care occupations in social care. The relatively high share of the social care workforce comprised of those born outside the EU can be explained by in part by the ability of individuals to come to the UK through non-work routes, such as family or refugee routes, and still access the labour market. However, it's also likely the case that many non-UK born individuals currently working in social care came to the UK under previous, less restrictive, sets of immigration rules.

There is concern about how social care will be affected by changes to the future migration system. They will be able to employ the stock of EU nationals that apply for and are granted settled/pre-settled status through the EU settlement scheme, which will include migrants first coming to the UK up to the end of December 2020 (end of the expected transition period). In addition, social care may be able to make use of the temporary migration route proposed in the White Paper. Finally, they will continue to have access to workers who come to the UK through routes other than Tier 2(G), such as Tier 5 YMS, family, refugee etc. There is concern that these routes will be insufficient to meet the sectors needs and calls for some type of deal that ensures the sector can continue to have access to migrants.

Poor Terms and Conditions

The basic cause of the recruitment and retention problems in social care is that the terms and conditions offered in many of the jobs are unattractive. A recent newsletter from the Health Foundation wrote that "*Across the social care sector, recruitment and retention are affected by the perceived low status of the work, by low pay, training, and levels of in-work support. There is little career progression and that means it's hard to attract and retain people with the right skills and values.*"(3) The Low Pay Commission (LPC) highlight that 12.8% of workers aged 25 and over in social care were covered by the National Minimum/National Living Wage (NWM/NLW) in 2018 compared to 6.5% in the labour market as a whole(4). Skills for Care report that 25% of all workers in the English adult social care workforce were on ZHCs, with the share being highest amongst care workers (35%)(1).

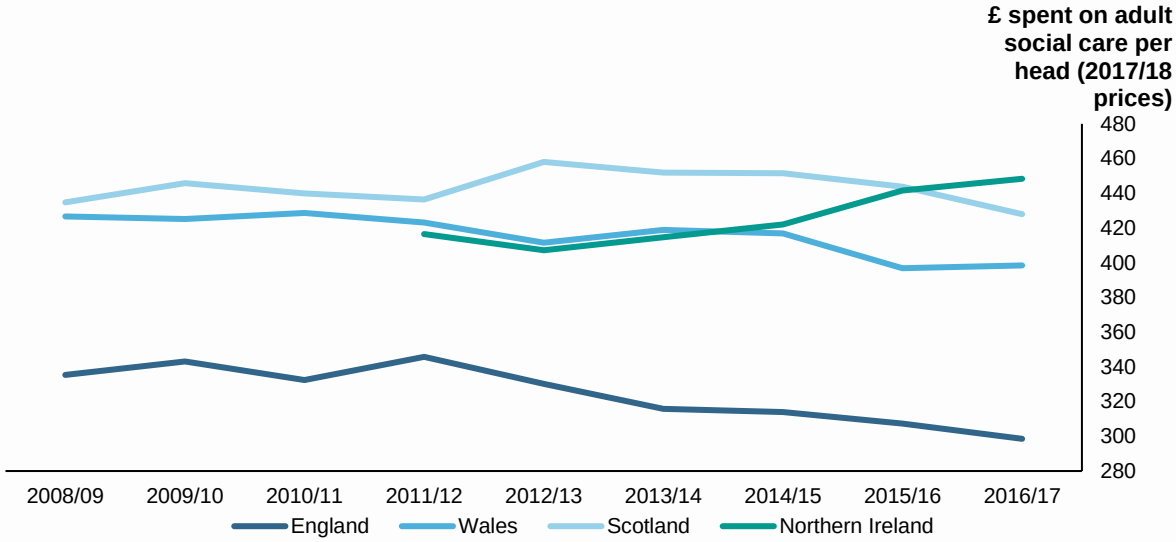
Social care contains a range of jobs of different skill levels but the key role of care assistant does not, as currently constituted, normally require a formal qualification or a great deal of experience: this is the sense in which we describe this job as lower-skilled, not as a statement about the value of the work being done. Shortages in this sector occur primarily because many workers do not want these jobs, rather than because there is no-one qualified to do them.

(2) Non-UK/Irish born working in lower-skilled occupations in social care industry (SIC 87 & 88) as percentage of total non-UK/Irish born working in lower-skilled occupations. APS Oct17 – Sep18.
(3) *"Stemming the tide: retaining the social care workforce", The Health Foundation April 2019*
(4) *National Minimum Wage: Low Pay Commission 2018 Report, Table 2.5*

Funding Problems

The root cause of the poor terms and conditions is in the funding problems faced by the sector. Figure 5.7 below shows the evolution of real spending per head on social care across the four nations of the UK. Funding has either only increased modestly, been largely flat or (particularly in the case of England) fallen. These figures do not account for an aging population meaning even rising real terms spending per head would not guarantee rising resources per user of social care.

Fig 5.7: Identifiable spending on adult social care per head (2017/18 prices)



Source: Source: Nominal spend per head from tables 10.5 to 10.8 from HM Treasury Public Expenditure Statistical Analyses (PESA) 2018, 2017, 2016, 2015 and 2014. Real spending refers to 2017-18 prices calculated using financial year GDP deflator published by HM Treasury on 1st November 2018. Adult social care spending defined as spending on personal social services minus personal social services spending on children and family minus personal social services spending on unemployment, in line with definition used in section 1.5 of IFS publication "*Securing the future: funding health and social care to the 2030s*". Series for Northern Ireland starts in 2011/12 due to a discontinuity in the PESA data.

While additional funding has been made in recent years (e.g. £2bn between 2017/18-2019/20), this has primarily been directed through the Better Care Fund (BCF). The BCF is a pooled budget between local authorities and the NHS and its primary purpose is to help shift resources out of hospitals and into social care and community settings. It is not clear how much this additional funding has helped LAs increase the rates they pay to social care providers.

The issue of funding is a long standing one. In the MAC's very first review of the SOL in 2008(5), when discussing the "care assistants and home carers" occupation we said that we had been told that "*increasing pay to reduce vacancies was not currently an option, as the expenditure of care providers is partially limited by local authority funding."*

However, we also noted back in 2008 that "*budgets are not set for all time. To the extent that any shortage turns on low pay and these services are a genuine priority, it is necessary for budgets to be larger so that the workers in the sector can be paid more."* This remains our view some 10 years later.

(5) *"Skilled, Shortage, Sensible: Recommended shortage occupation lists for the UK and Scotland", Migration Advisory Committee Sep 2018*

Possible Solutions to Shortage

Although a dedicated work route to employ migrants in social care could be established, given the political and financial pressures on the sector we are concerned that this would, at best, be a short-term fix and would perpetuate the poor terms and conditions that are the underlying cause of the shortages in the sector. The sector may be able to recruit migrants under a dedicated scheme but is likely to struggle to retain them when migrants are free to take other jobs (which they have to be if they are permanent). Shortages could therefore only be alleviated in perpetuity through a continual inflow of new migrants. Something like this seems to have happened in Canada where the Live-In Caregiver Program came to represent 10% of all new permanent residents in 2015 before the path to residency was made more difficult. Yet, a survey found that, of those individuals who arrived in Canada under the Live-in Caregiver Program and had become permanent residents over 10 years ago, only 16% were still working as a caregiver(6).

The Green Paper

The March 2017 Budget announced that a Green Paper on social care in England would be produced, which has yet to be published. We hope that the Government's forthcoming Green Paper on Social Care provides more clarity on the future of Social Care in the UK and contains concrete proposals to improve terms and conditions for the workers in the sector that do such an important job.

(6) for example see *"From Migrant to Citizen: Labor Market Integration of Former Live-In Caregivers in Canada", Banerjee et al.*

Chapter 6: Shortage Occupation Lists for the Devolved Administrations

Current policy

6.1 Currently, the UK-wide SOL is applicable to all regions and countries of the UK. In Table 2 of Appendix J to the Immigration Rules there is a Scotland-only Shortage Occupation List. The additional occupations on the Scotland-only list are; 2211 Medical practitioners and 2217 Medical radiographers which have several additional job titles. The number of visas issued on the Scotland-only list was 15 in 2018.

6.2 The Immigration White Paper invited the MAC to "compile such a list for Northern Ireland and consider whether the composition of the SOL needs to be different for Wales". The proposed timescale for these changes was not specified but this report is an appropriate place for its consideration as separate SOLs for Northern Ireland and Wales could easily be introduced into the current system separate from other proposed changes to the UK immigration system.

6.3 **The MAC recommends separate SOLs for Northern Ireland and Wales and the continuation of the Scotland-only SOL.**

6.4 This does not mean that there will be necessarily large differences in practice. The current Tier 2 visa system is for jobs skilled at RQF 6, (graduate-level jobs) which tend to have more of a national labour market than medium- and lower-skilled jobs. Graduate occupations which are in shortage in Scotland, Northern Ireland and/or Wales are therefore likely to be in shortage in the whole of the UK. A future SOL might have more regional variation if the range of occupations eligible for Tier 2 is expanded to include medium-skilled jobs -though see the discussion in Chapter 7 about the possible role of the SOL in the future immigration system.

Evidence from stakeholders

6.5 We received responses to our Call for Evidence from many individual employers in the Devolved Administrations. As summarised in Figure C.4 (Annex C), there were more responses from Northern Ireland and Scotland than is represented by their share of employment, though fewer from Wales. We also ran stakeholder events in all parts of the UK. In addition, we received evidence from the Devolved Administrations themselves and we summarize this here.

6.6 Much of the evidence from stakeholders and Devolved Administrations focussed on shortages of medium and lower-skilled occupations and how the future immigration system might address these. The occupations mentioned

are mostly common to the whole of the UK and this is given consideration in Chapter 5.

Scotland

6.7 The evidence from the Scottish Government expressed its concerns about the lack of specific Scottish input into migration policy (both inside and outside the MAC), its opposition to proposed changes to the future immigration system contained in the White Paper, its views on the positive contribution to Scotland of migrants in general and EU migrants in particular and concern about a declining working-age population. The issues raised are important in the wider context of discussion about the future immigration system (e.g. on salary thresholds and the range of jobs eligible). We have discussed many of the points raised in our Interim and Final Reports on EEA migration[172] and expect to return to these questions in our next report. This report focuses specifically on changes to the SOL within the current system.

6.8 The Scottish Government's evidence discussed shortages in many sectors: tourism and hospitality, cultural and creative, manufacturing and construction, financial services, digital and technology, the third sector, agriculture, seafood, environment and forestry, the nuclear industry, logistics and transport, and education. There was a separate submission from the Scottish Government on health and social care. Evidence on shortage in jobs at all skill levels was submitted. In some sectors, specific jobs were singled out as being in shortage while in others the discussion was more generic.

6.9 The submission expressed concern over the length of time given for responses to the Call for Evidence due to the events surrounding Brexit and the publication of the Immigration White Paper. We appreciate the challenge that these events presented and are grateful to colleagues in the Scottish Government in meeting the timeline for our Call for Evidence and for the work that went into their detailed submissions. We received a record number of submissions from stakeholders and feel that the evidence we received combined with other sources of information, gave us sufficient evidence to arrive at an informed decision.

6.10 For the most part, the sectors and occupations mentioned in the evidence were very similar to those mentioned in other parts of the UK. Shortages in these jobs would support them being placed on the SOL - as the shortages were UK-wide the occupations are placed on the SOL for the whole of the UK rather than a Scottish specific SOL. There were also some very specific requests: for

[172]https://assets.publishing.service.gov.uk/Government/uploads/system/uploads/attachment_data/file/694494/eea-workers-uk-labour-market-interim-update.pdf
https://assets.publishing.service.gov.uk/Government/uploads/system/uploads/attachment_data/file/741926/Final_EEA_report.PDF

leading Scottish orchestras to be referenced under the SOL rules for Musicians, for Gaelic teachers at all levels to be added to the Scottish SOL, for chemical scientists and chemical engineers within the nuclear industry and for chemistry teachers. We accept all of these except for chemistry teachers where we did not think the evidence (described in more detail in 4.F.47) supported the case.

> *"The Scottish Government is committed to supporting our indigenous languages, including Gaelic. Our principal aim is to increase the number of users of language and education is key in delivering this aim.*
>
> *We are seeing increased demand across Scotland for Gaelic education and to meet this demand we need to increase the number of teachers. Despite efforts to grow our own within Scotland there is a need to maximise the opportunities that exist to recruit Gaelic teachers from such areas as Canada or Ireland. At the moment, there remain difficulties in successful candidates from these areas being granted visas despite having a paid position."*
>
> Scottish Government response to MAC call for evidence

Wales

6.11 The submission of the Welsh Government also expressed concerns about some of the proposals for the future immigration system contained in the White Paper, notably the proposed salary thresholds.

6.12 It supported the introduction of a separate SOL for Wales and expressed uncertainty about the role that it might play in the future immigration system. We discuss our views on the future role of the SOL in Chapter 7.

6.13 The submission mentioned jobs at different skill levels as being of particular concern because of shortages: veterinarians, food processing, tourism, social care and higher education. With the exception of higher education, these were areas of shortage reported by other parts of the UK. In the case of higher education, we did not think the evidence (described in more detail in Chapter 4F) suggested a higher level of shortage in Wales than the rest of the UK.

Northern Ireland

6.14 In the absence of a sitting Executive, the submission from the Northern Ireland Civil Service did not express any political position, instead including statistical evidence and summarizing views from stakeholders.

6.15 It supported the introduction of a separate SOL for Northern Ireland though expressed concern about the appropriateness of salary thresholds in Northern Ireland both now and, potentially, in the future. It also pointed to evidence submitted in earlier reports about the unique concerns in Northern Ireland as

the only part of the UK with a land border with an EU country. Northern Ireland is keen to maintain access to migrant labour due to the land border it shares with the EU.

6.16 Shortages were identified in hospitality, agri-food, construction, financial services, advanced manufacturing, digital and creative, health and social care. The jobs mentioned spanned all skill levels and were similar to those reported from other parts of the UK.

> *"Our stakeholders have already made the point that, if Northern Ireland employers find themselves in a scenario where they had access to skills and labour on a more constrained basis than their Republic of Ireland counterparts, there is a very real risk that they would be forced to relocate activity south of the land border to protect their competitive position. I know this is a point that has been accepted by the MAC and by UK Government and I would urge you to consider it carefully as you take forward this particular review."*
>
> *Head of the Northern Ireland Civil Service*

Remote areas

6.17 The Immigration White paper briefly discussed the particular challenges faced by some remote communities, notably de-population, and the possible role for the immigration system in addressing those problems. We have also had responses highlighting these problems from the Scottish Government and some employers in these areas.

> *"There are specific challenges in filling headship posts, e.g. the small salary differential between deputy and headship posts, rurality of some schools, small schools, Welsh-essential posts, and posts that carry a significant teaching commitment.*
>
> Education Workforce Council Wales response to MAC call for evidence
>
> *"Although shortages are recognised as a national issue, many Scottish local authorities highlight clear challenges in particular geographical areas such as the North East of Scotland - the island authorities, Argyll and Bute and Dumfries and Galloway, despite the existence of additional pay allowances for teachers working in remote schools or Distant Islands."*
>
> Scottish Government response to call for evidence

6.18 We agree some of these problems are serious but are not convinced that separate SOLs at the level of countries of the UK is the right way to address them. The main concern is that migrants themselves are much less likely to move to remote and very rural areas. For example, a recent report for the Scottish Government[173] found that the international in-migration rate was much higher at 13 per 1000 population to large cities than remote and rural areas (Table 2.2).

Table 2.2: Rates of International In-Migration per 1,000 in Scotland

	2004-08	2013-17
Larger Cities	17.78	15.94
Urban with Substantial Rural	3.68	2.60
Mainly Rural	5.05	3.05
Islands and Remote Rural	3.97	2.85
Scotland	7.86	6.42

Source: NRS Local Area Migration 2017 [6]

6.19 This indicates that the current migration system is not very effective in dealing with the particular problems remote communities experience. Trying to address these problems through regional SOLs is unlikely to be successful. If these problems are to be addressed something more bespoke for these areas is needed. The international evidence suggests that such regional schemes can struggle to retain migrants in the areas they were recruited in once they have the freedom to move, so the key question is whether migrants into these remote areas settle there permanently or leave for other parts of the UK. The only way to address this question in the UK context would be to pilot a scheme that facilitated migration to these areas, then monitor what happens over several years and evaluate the outcomes. The MAC is willing to provide advice on the design of a pilot scheme for remote communities.

Recommendations

6.20 **We recommend the establishment of separate SOLs for Wales and Northern Ireland, alongside the existing Scotland-only SOL.**

6.21 With a few exceptions (discussed below) many of the occupations mentioned as being in shortage in Scotland, Wales and Northern Ireland were also

[173] https://www.gov.scot/publications/uk-immigration-policy-leaving-eu-impacts-scotlands-economy-population-society/

mentioned in evidence from the UK. Where the jobs are eligible for Tier 2 (General) we felt the evidence supported the case, we recommended placing these occupations on the UK-wide list. Those recommendations are set out in Chapter 7.

6.22 **We recommend the Scotland-only SOL should include the following occupations: workers in the nuclear industry in the occupations chemical scientists and chemical engineers; Gaelic teachers at all levels.**

6.23 We also recommend altering the list of leading orchestras for Musicians in a way that ensures premier orchestras from all parts of the UK are included, as such we ask the Home Office to consider using a UK industry bodies such as the Association of British Orchestras to provide an up-to-date description of the UKs internationally regarded institutions. This is a change to the UK list rather than to the lists for the Devolved Administrations.

6.24 We do not currently recommend adding any occupations to the Wales and Northern Ireland lists. We did not receive any evidence on languages though would be supportive to adding those to the list if there was a wish to do so.

6.25 We are conscious that we are not recommending large variation from the UK-wide SOL. While we support the idea of treating Wales and Northern Ireland in the same way of Scotland (i.e. by giving each an additional shortage list), in practice we were not able to identify any occupations where there was only a shortage in one of these countries. This was due both to a lack of stakeholder evidence provided and to the fact that (as in Scotland) the data at the sub-national level is more limited than at the national level."

6.26 We are increasing the list of occupations on the UK-wide SOL substantially. This increases the occupations available to all regions and countries of the UK.

Chapter 7: Summary of recommendations

The recommended Shortage Occupation Lists (SOLs)

7.1 **We recommend the following UK-wide Shortage Occupation List, to be implemented as soon as possible.**

Table 7.1: Proposed UK-wide Shortage Occupation List

Standard Occupational Classification (SOC) code and description	Job titles included on the United Kingdom Shortage Occupation List and further criteria
2112 Biological scientists and biochemists	All jobs in this occupation code
2113 Physical scientists	Only the following jobs in this occupation code: The following jobs in the construction-related ground engineering industry: engineering geologist hydrogeologist geophysicist The following jobs in the oil and gas industry: geophysicist geoscientist geologist geochemist technical services manager in the decommissioning and waste areas of the nuclear industry senior resource geologist and staff geologist in the mining sector
2114 Social and Humanities' Scientists	Only the following jobs in this occupation code: Archaeologists
2121 Civil engineers	All jobs in this occupation code
2122 Mechanical engineers	All jobs in this occupation code
2123 Electrical engineers	All jobs in this occupation code
2124 Electronics engineers	All jobs in this occupation code
2126 Design and development engineers	All jobs in this occupation code
2127 Production and process engineers	All jobs in this occupation code
2129 Engineering professionals n.e.c.	All jobs in this occupation code
2135 IT business analysts, architects and systems designers	All jobs in this occupation code
2136 Programmers and software development professionals	All jobs in this occupation code
2137 Web design and development professionals	All jobs in this occupation code

2139 Information technology and telecommunications professionals n.e.c.	Only the following jobs in this occupation code: Cyber security specialist
2211 Medical practitioners	All jobs in this occupation code
2212 Psychologists	All jobs in this occupation code
2216 Veterinarians	All jobs in this occupation code
2217 Medical radiographers	All jobs in this occupation code
2222 Occupational therapists	All jobs in this occupation code
2223 Speech and language therapists	All jobs in this occupation code
2231 Nurses	All jobs in this occupation code
2314 Secondary education teaching professionals	Secondary education teachers in the subjects of maths, physics, science (where an element of physics will be taught), computer science and Mandarin
2425 Actuaries, economists and statisticians	Only the following jobs in this occupation code: Bio-informatician and informatician
2431 Architects	All jobs in this occupation code
2442 Social workers	All jobs in this occupation code
2461 Quality control and planning engineers	All jobs in this occupation code
3213 Paramedics	All jobs in this occupation code
3411 Artists	All jobs in this occupation code
3414 Dancers and choreographers	Only the following jobs in this occupation code: Skilled classical ballet dancers who meet the standard required by internationally recognised United Kingdom ballet companies. The company must be endorsed as being internationally recognised by a United Kingdom industry body such as the Arts Councils (of England, Scotland and/or Wales) Skilled contemporary dancers who meet the standard required by internationally recognised United Kingdom contemporary dance companies. The company must be endorsed as being internationally recognised by a United Kingdom industry body such as the Arts Councils (of England, Scotland and/or Wales)
3415 Musicians	Only the following jobs in this occupation code: skilled orchestral musicians who are leaders, principals, sub-principals or numbered string positions, and who meet the standard required by

	internationally recognised UK orchestras. The orchestra must be endorsed as being internationally recognised by the Association of British Orchestras
3416 Arts officers, producers and directors	All jobs in this occupation code
3421 Graphic designers	All jobs in this occupation code
5215 Welding trades	Only the following jobs in this occupation code: High integrity pipe welders where the job requires three or more years' related on-the-job experience
5434 Chefs	Only the following job in this occupation job: Skilled chef where: The pay is at least £29,570 per year after deductions for accommodation, meals etc; and Job requires five or more years relevant experience in a role of at least equivalent status to the one they are entering; and the job is not in either a fast food or standard fare outlet; and The job is in one of the following roles: Executive chef - limited to one per establishment Head chef - limited to one per establishment Sous chef - limited to one for every four kitchen staff per establishment Specialist chef - limited to one per speciality per establishment

7.2 We recommend the following additional **Scotland-only Shortage Occupation List**.

Table 7.2: Proposed Scotland-only Shortage Occupation List

Standard Occupational Classification (SOC) code and description	Job titles included on the Scotland-only Shortage Occupation List and further criteria
2314 Secondary education teaching professionals	Only the following jobs in this occupation code: Gaelic Teachers
2315 Primary and nursery education teaching professionals	Only the following jobs in this occupation code:

	Gaelic-medium teachers
2111 Chemical scientists	Only the following jobs in this occupation code: Chemical scientists within the nuclear industry
2127 Production and process engineers	Only the following jobs in this occupation code: Chemical engineers within the nuclear industry

7.3 We note that a number of occupations, including doctors and nurses and PhD-level occupations have been removed from the cap, although these will still benefit from lower application fees and lower settlement thresholds. In addition, nurses are also still subject to the Resident Labour Market Test (RLMT).

7.4 The Immigration White Paper invited the MAC to create a SOL for Northern Ireland as well as consider one for Wales. In response the MAC recommends the establishment of separate SOLs for Wales and Northern Ireland and the continuation of the Scotland-only SOL. The current Tier 2 (General) system is for graduate level and above occupations which have a more national labour market than medium and lower-skilled jobs. Many of the occupations where we received evidence of shortage from Scotland, Northern Ireland and Wales were also shown to be in shortage in the UK as well. This means the occupations where there is evidence of shortage have been placed on the UK wide SOL rather than the SOLs specifically for Scotland, Northern Ireland and Wales.

7.5 The evidence from the devolved administrations often focused on lower-skilled and medium skilled occupations. The sectors and occupations mentioned in the evidence from Scotland, Northern Ireland and Wales was very similar to those mentioned in other parts of the UK. We outlined our recommended list for Scotland in Table 7.2. We have not recommended placing any occupations on the Northern Irish or Welsh SOLs. However, the lists remain an option for future shortages. While we did not receive any evidence of shortage in respect of local languages in Northern Ireland and Wales we would consider adding those to the list if there was a wish to do so. We are not recommending a lot of variation between the devolved administration SOLs to the UK-wide SOL. However, Scotland, Northern Ireland and Wales benefit from the increased list of occupations on the UK-wide SOL.

7.6 We do not believe that the separate devolved administrations SOLs would be effective in addressing the issues facing some remote communities, particularly de-population. Rather we would support a pilot scheme aimed at encouraging long-term migration into these remote areas. Internationally, the evidence suggests that such regional schemes often struggle to retain migrants in the areas for which they were recruited once they have the freedom to move. The MAC stands prepared to offer advice on the design of any such pilot.

7.7 Our last full review of the SOL estimated that the job titles and occupations covered by our recommendations employed approximately 180,000 people or less than 1 per cent of total UK employment. We estimate that our latest recommendations would place about 2.5m workers, around 9 per cent of total employment, on the SOL. The expansion comes mainly from the wider set of health and IT sector jobs included. There are risks with a large expansion and the Home Office should monitor how the new list works in practice and review in light of any problems that emerge.

7.8 A number of stakeholders have expressed concerns about the frequency with which the SOL is updated. Many were concerned that this resulted in the "SOL not keeping pace with the changing and flexible needs of the UK labour market"[174] and that the current SOL is static and backward looking and may not reflect future labour market needs. These issues were also reflected in the recent Government White Paper[175]. In addition, there is uncertainty about the role the SOL might play in the future immigration system, we discuss some of these issues below.

The role of the SOL in the future immigration system

7.9 As discussed throughout this report, being on the SOL currently confers certain advantages over other users of Tier 2 (General):

- There is no need to conduct the resident labour market test;
- Job titles and occupations on the SOL are prioritised if the Tier 2 (General) limit of 20,700 is reached;
- There is no requirement to meet the £35,800 salary threshold required for settlement after five years. This requirement is waived if the job title has been on the SOL at any point in those five years;
- Applicants (and their families) face lower visa application fees if their occupation is on the SOL.

7.10 The first two of these are currently the most significant advantages of being on the SOL.

7.11 In the White Paper – "The UK's future skills-based immigration system[176]", the Government accepted the MAC's recommendations to abolish both the cap on the number of migrants under Tier 2 (General) and the RLMT for the highest skilled workers. These measures are not likely to be introduced until after the implementation period, 2021 at the earliest.

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[174] BEIS response to the SOL Call for Evidence
[175]https://assets.publishing.service.gov.uk/Government/uploads/system/uploads/attachment_data/file/766465/The-UKs-future-skills-based-immigration-system-print-ready.pdf
[176]https://assets.publishing.service.gov.uk/Government/uploads/system/uploads/attachment_data/file/766465/The-UKs-future-skills-based-immigration-system-print-ready.pdf

7.12 If these proposals are taken forward, the only remaining benefits of being on the SOL in the future immigration system will be the lower salary requirement for settlement and the lower visa fees. The lower visa fees is a small benefit, the lower salary requirement for settlement potentially larger. This raises questions about the future purpose of the SOL.

7.13 The lower salary threshold for settlement offers an easier route to settlement for those on the SOL but we have very little information about how this is working as it has only recently started to take effect. The MAC would like further analysis (by us or others) on the costs and benefits of the settlement threshold before advising on it.

7.14 There may be a case for exempting some workers from the settlement income threshold e.g. in some public sector occupations where formal pay-scales limit possibilities for pay progression. If this is the case, it is not obvious that these exemptions should be linked to whether an occupation is in shortage. Currently, the use of public sector pay-scales for salary thresholds for issuing visas is not connected to whether those occupations are on the SOL.

7.15 When the shape of the new immigration system is clearer **we recommend a review of the role of the SOL**. It is possible that this review would conclude that the SOL is redundant and should be discontinued or replaced with an alternative method for assessing the needs of different occupations; this would be in line with our general recommendation to simplify the system wherever possible.

7.16 Abolishing the SOL would not imply that shortages cannot emerge or be damaging but because the SOL is about prioritising migrants in some jobs over others. Establishing priority may not be as important if the cap is abolished.

7.17 However, there may be new ways in which occupations on the SOL may be given preferential treatment in the future immigration system. For example, in New Zealand, migrants coming in to work in shortage occupations have a faster pathway to permanent residency. The White Paper on the future immigration system suggests that occupations in shortage should have lower salary thresholds – "the Government believes that in some circumstances – for example where skills are in shortage – there should be some flexibility to allow migration at lower salary levels"[177]

7.18 While we agree that salary thresholds need to be appropriate, linking them to whether a job is in shortage is just one approach and if commissioned, we will review whether that is sensible. Discussions about the future existence and role of the SOL should be kept distinct from discussions about the appropriate salary

[177]https://assets.publishing.service.gov.uk/Government/uploads/system/uploads/attachment_data/file/766465/The-UKs-future-skills-based-immigration-system-print-ready.pdf

thresholds. If there are occupations with different or lower salary thresholds, these jobs might not necessarily be those that are in shortage.

7.19 It is sometimes believed that being on the SOL is linked to lower salary thresholds. That is not the case, nor should it be. If there is a shortage of workers in a particular occupation, there should be upward pressure on wages to encourage workers to enter this job. Lowering salary thresholds in response to a perceived shortage would be a move in the wrong direction, exacerbating rather than resolving shortages. However, it is possible that for some occupations the salary thresholds are too high to provide any effective upward pressure on wages, because they are essentially out of reach. We do not think that this situation is likely to arise for the high-skilled jobs currently eligible for Tier 2 but could do so if medium-skilled jobs are brought within Tier 2. Our intention is to discuss salary thresholds in more detail our next report.

7.20 If the Government decides to retain the SOL in the new immigration system in which medium-skilled jobs also become eligible, **we recommend a full review of high and medium-skilled jobs when the new immigration system is implemented.**

Annex A: Commissioning Letter

Home Secretary
2 Marsham Street
London SW1P 4DF

Professor Alan Manning
Chair, Migration Advisory Committee
2nd Floor Peel Building
2 Marsham Street
London SW1P 4DF

14 June 2018

Dear Alan,

COMMISSION TO REVIEW THE COMPOSITION OF THE SHORTAGE OCCUPATION LIST

I am writing to commission the Migration Advisory Committee to examine the full composition of the Shortage Occupation List (SOL) at Appendix K of the Immigration Rules, to determine which high skilled roles it would be sensible to fill through non-EEA migration under Tier 2 of the Points Based System.

I am conscious that a full review of the SOL has not been completed since 2013 and I am committed to ensuring that the immigration system reflects, so far as is possible, the latest evidence and trends impacting on the domestic labour market. Under the existing system, the SOL confers advantages for UK employers by exempting them from the need to advertise the job to the resident labour market and ensures that when the Tier 2 (General) cap of 20,700 has been hit, priority is given to these applications above other occupations.

As the Committee will be aware, the Tier 2 (General) cap has recently been hit and has continued to be under pressure in every month since December 2017, resulting in a number of occupations being refused places. This has also impacted on doctors working in critical roles in the NHS – and other highly skilled professionals across other parts of the economy. The recent demand for Tier 2 places appears to have been driven, in part, by increased recruitment for overseas health professionals.

In view of the risks associated with doctors not being able to fill necessary posts within the NHS and in view of the current pressures, I have exceptionally agreed – on a temporary basis – to exempt all doctors and all nurses from the Tier 2 cap, but a review of the full SOL will enable the Committee to assess which occupations should be given priority within the cap. I intend to keep this change under review.

I appreciate that the Committee has been operating at full capacity with two significant commissions on EU migration and on international students and ask that the Committee commence this review of the SOL after the completion of those commissions, both of which are due to report September. I am grateful to the Committee, in advance, for looking at this important issue.

Given the MAC's existing workload, I should be grateful if the Committee could report on this new commission by spring 2019.

Rt Hon Sajid Javid MP

Annex B: The SOL Methodology

Description of top-down shortage indicators

B.1 How the skilled indicators work:

The ONS skill level definition assigns a level between 1 and 4 to each SOC code. We take a SOC assigned to level 4 to be sufficiently skilled at RQF6+. The ONS indicator remains the same with level 4 SOC codes passing under this indicator.
The formal qualifications indicator is based on the proportion of workers in the labour market educated to RQF6+. An overall threshold is calculated as the proportion of workers who are qualified to RQF6+ in the labour market as a whole. In 2017 this was 37.55 per cent, an increase from the 30.3% used in 2012 reflecting the rising share of graduates in UK employment.

The occupations are then ranked in order according to the share of workers who are skilled to RQF6+ level. We also calculate the share of total employment in each SOC. A cumulative total of employment is then added up within the ranked SOC codes until the overall threshold is met. All those that are included pass this indicator.
For the earnings indicator, SOC codes are ranked by their average earnings, data given by ASHE, and then the cumulative share of employment is added until the overall threshold of 37.55% of workers is met. In 2017 the earnings threshold is £15.82 per hour.

B.2 P1 & P2: Using ASHE table 14.5a[178] and CPIH[179]. ASHE table numbers on median wages in each SOC is inflated to real pay and percentage change is then calculated on one year and three years.

B.3 P3: Using the 2017 APS we regress ln(hourly pay) on a set of dummy variables for every SOC (made possible by not estimating a constant as well as a number of control variables (age, sex, region, highest qualification, marriage status, part/full time). The control variables are entered into the regression such that when they are equal to zero the model refers to a “sensible” reference person and thus the coefficients on the SOC dummies represent the predicted hourly wage for said reference person. The reference person is a 35-year-old married male who lives in the south east, has a degree and works full-time (largely based on the modal categories of the control variables).

B.4 We then calculate the weighted average of the SOC coefficients, where the weight is given by SOC employment, to give the average predicted wage for our reference individual. This average is then subtracted from the predicted wage for each SOC. This results in an indicator that is positive for those occupations which offer above average wages for someone with the characteristics of the reference person and that is negative for those occupation that offer below average wages.

[178] https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/datasets/occupation4digitsoc2010ashetable14

[179] https://www.ons.gov.uk/economy/inflationandpriceindices/timeseries/l55o/mm23

The formula below summarises the calculation of P3 for SOC i.

$$P3_i = \hat{\beta}_i - \left[\frac{1}{total\_emp} \sum_{i=1}^{\#SOCs} (employment_i \, x \, \hat{\beta}_i) \right]$$

where $\hat{\beta}_i$ is the predicted wage for our reference person employed in SOC i

B.5 This set of calculations is carried out separately for three groups of SOCs, those skilled to RQF 6 and above, those skilled between RQF3 and 5 and those skilled below RQF 3.

B.6 E1: Vacancy numbers come from the Employer Skills Survey conducted by DfE and are released every two years. Employment numbers come from the APS using ILODEFR variable.

B.7 E2: Job postings data comes from an external web-scraping company called Burning Glass. Total number of job posting scraped in a year for all SOCs are recorded. Employment numbers come from the APS using ILODEFR variable.

B.8 V2: Employment numbers come from the APS using ILODEFR variable. Percentage change is then calculated over one year.

B.9 V3: Using ASHE table 14.9a. ASHE table numbers of median paid hours worked by SOC. Percentage change calculated over three years.

B.10 V4: Using APS variable EMPLEN and grouping so that length of employment of under one year is considered a new hire. Employment numbers come from the APS using ILODEFR variable. Change of ratio formula calculated:

$$\frac{New\ Hires\ 2017}{Employment\ 2017} - \frac{New\ Hires\ 2016}{Employment 2016}$$

A V1

B.11 This indicator is calculated using the INECAC05 variable from the APS and getting counts from this against 4-digit SOC code. We calculated transition weights to be applied to these counts by calculating the probability of moving from one of the inactive/unemployed categories in INECAC05 to employment over a year.

B.12 We did this using the 5Q Longitudinal Labour Force Survey (LLFS) and averaging over 3 years values for sample size issues. Keeping the ILO unemployment to employment transition rate at 1 and calculating the others relative to this give us the transition rates. We then group these weights into three different inactive categories to account for small sample sizes. The transition weights can be seen in the following table.

Table B.1: Transition weights for A V1 indicator				
Category	**Category codes**	**Overall count**	**Average over 3 years of % move into employment**	**Weighting relative to unemployment to employment ratio**
ILO unemployed	5	394	44.08%	1.00
Inactive- seeking, unavailable	6,7,8,9,10,11	58	44.20%	1.00
Inactive- not seeking, would like work	12,13,14,15,16,17,18,19,20,21,22	558	11.27%	0.26
Inactive- not seeking, not like work	23,24,25,26,27,28,29,30,31,32,33	3962	10.32%	0.23

B.13 These weights are then applied to the stock count of the unemployed and inactive categories to give a weighted stock for each SOC.

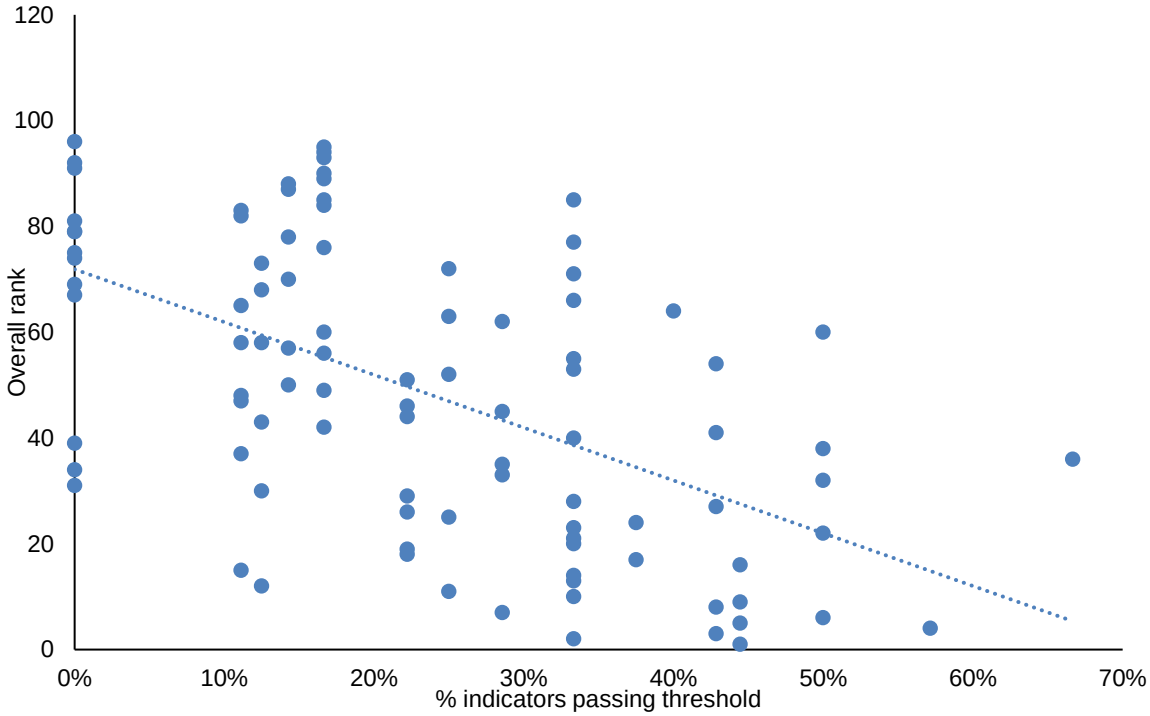
B.14 A V1 is calculated as a ratio of this stock over the total number of employed and weighted stock.

Sample sizes

Table B.2: Number of available SOCs for each indicator taking sample size criteria into effect			
	High-skilled SOCs ***/98***	**Medium-skilled SOCs** ***/142***	**Low-skilled SOCs** ***/129***
P1	96	136	124
P2	96	137	125
P3	98	142	129
E1	55	80	76
E2	98	137	125
V2	98	142	129
V3	95	137	123
V4	41	53	62
A V1	43	54	64

B.15 This method now accounts for all the indicators for each SOC to give an overall value. It uses all available data to give a rounded approach rather than a handful of indicators influencing the decision as under the previous methodology. It was not always clear and obvious using the old methodology what an appropriate threshold would be and whether an indicator should be benchmarked or not, hence this ranking system adds simplicity and interpretability into the methodology of the top-down indicators. Figure B.1 shows a correlation plot between the overall rank of each high-skilled SOC and the percentage of indicators passing the threshold under the 2017 methodology. We can see there is some correspondence between the old thresholds and the new ranking averages as we would expect.

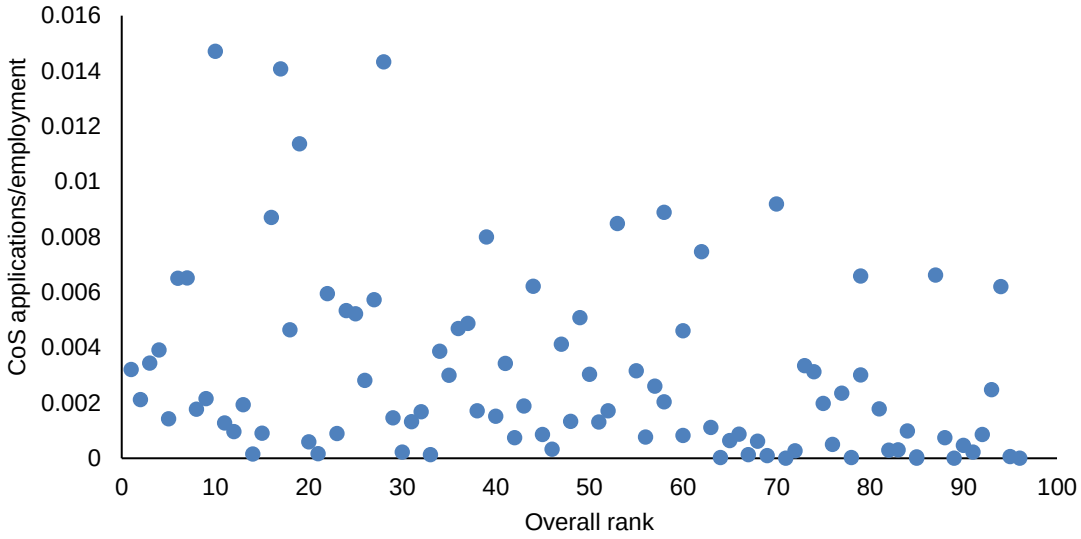
Figure B.1: Correlation between ranking and thresholds methodologies.



B.16 No absolute limit is set on the maximum rank for SOC codes to be considered in shortage. Our top-down analysis is meant to be indicative and used as a guide and aide to our bottom-up evidence. This is because our top-down analysis is provided at 4-digit SOC level as is available to us in national datasets. However, job titles go onto the SOL and not entire SOC codes and therefore the top-down can only be used to direct, indicate and question findings and not in itself set absolute criteria to be considered to go onto the SOL.

B.17 Figure B.2 shows the correlation between the overall rank of high-skilled SOC codes and number of CoS applications granted for those SOC codes over the size of employment in that SOC in 2017. There is a small correlation between overall ranking and proportional CoS applications, which is positive as expected.

Figure B.2: Correlation between overall rank and CoS applications/Employment.*



*SOC code 2119 removed from figure due to large CoS application/Employment ratio skewing graph

B.18 The following two figures look at how a random selection of high-skilled SOC codes vary in their overall rank and the percentage of indicators passing the thresholds from 2012 to 2017. Both methods show there is a high amount of volatility in the two methods, but the overall rank does arguably move more smoothly over time.

Figure B.3: Percentage of indicators passing threshold for certain SOC codes 2012-2017.

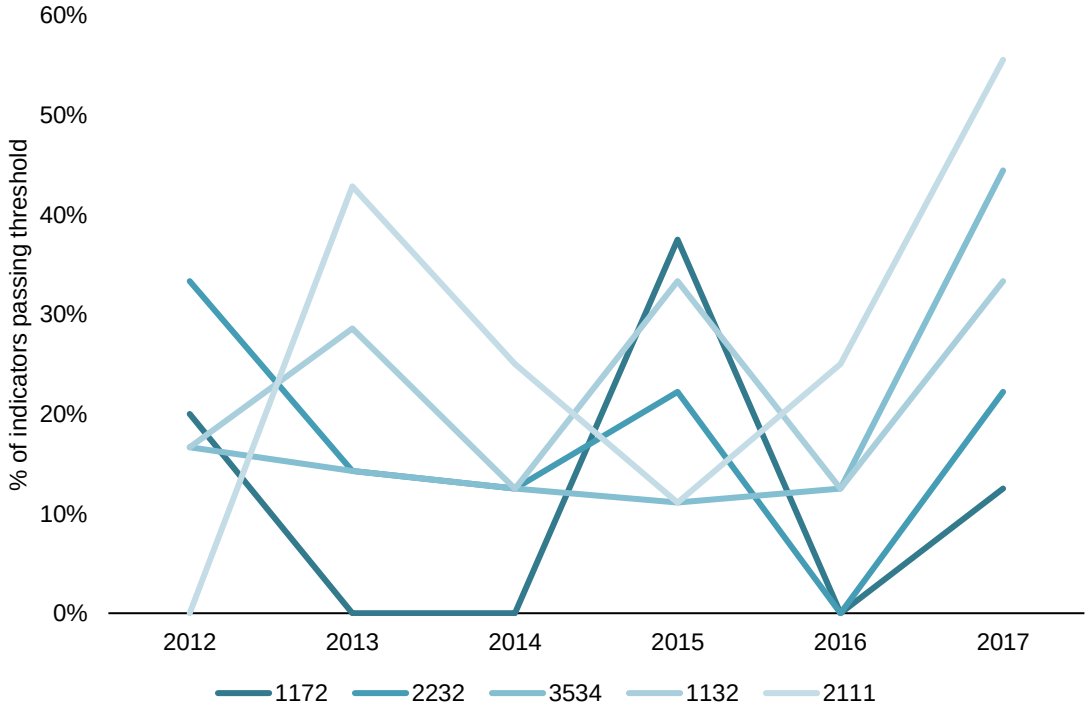
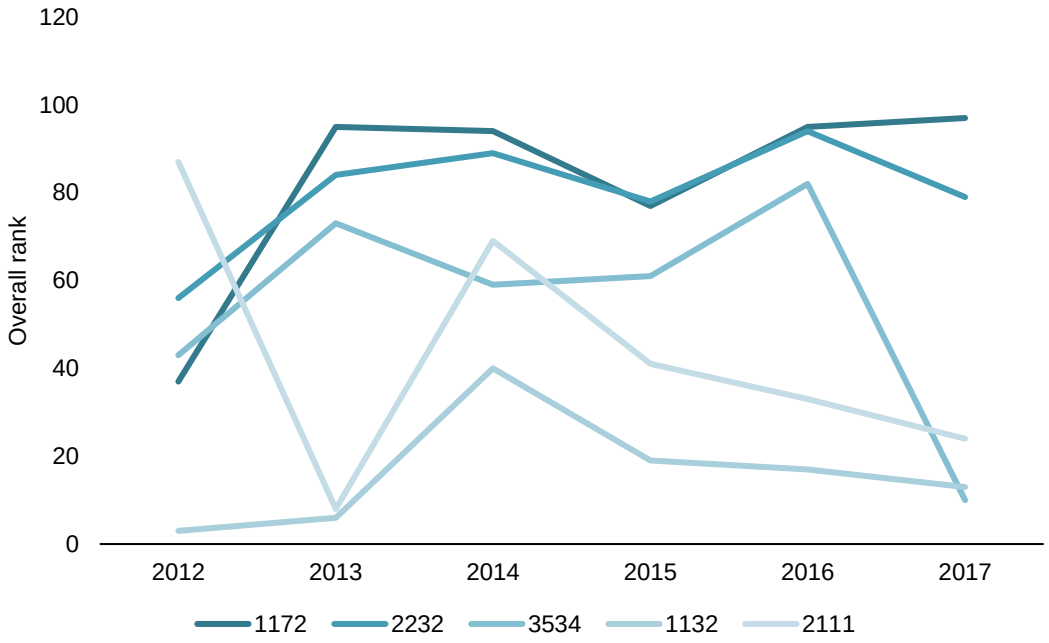
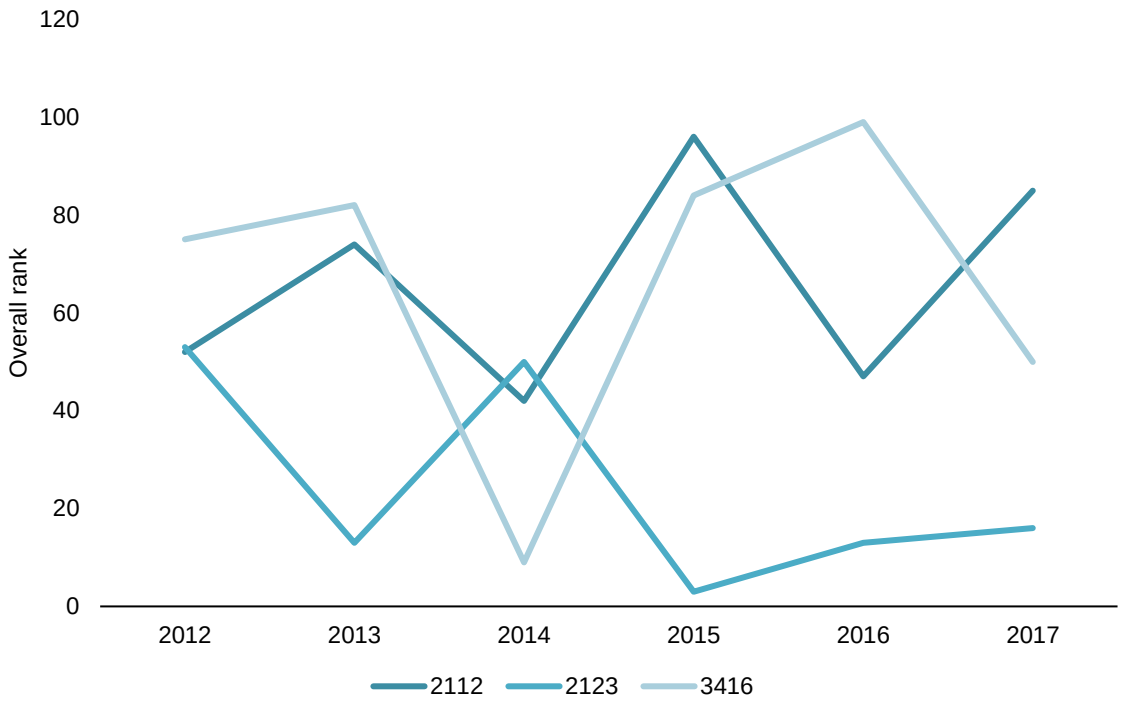


Figure B.4: Overall rank of certain SOC codes 2012-2017.



B.19 Figure C.5 investigates the effect on overall rank of certain SOC codes going onto and coming off the SOL. SOC codes 2112, 2123 and 3416 were added onto the SOL in 2013 with 2112 being removed in 2015 and the other two remaining. Of course, this means only certain jobs within these SOC codes went onto the SOL and not the whole SOC code. We would expect that as a SOC goes onto the SOL in the attempt to reduce labour shortages this would be reflected in overall rankings i.e. the overall ranking would increase as inclusion on the SOL should be alleviating some shortage pressures. However, it is not clear that is happening from Figure 3.8.

Figure B.5: Overall rank of certain SOC codes that have gone on and off the SOL 2012-2017.



Top-down SOC rankings

Table B.3: Top-down average and overall rankings for SOC eligible (in whole or in part) for Tier 2 (G)

SOC title	Average rank	Overall rank
Programmers and software development professionals	24.2	1
IT business analysts, architects and systems designers	25.7	2
Electrical engineers	26.0	3
Advertising and public relations directors	28.8	4
Health services and public health managers and directors	29.9	5
Finance and investment analysts and advisers	29.9	6
Architects	30.1	7
Electronics engineers	30.9	8
Solicitors	31.7	9
Quantity surveyors	32.7	10
Information technology and telecommunications professionals n.e.c.	32.8	11
Construction project managers and related professionals	33.1	12
Quality assurance and regulatory professionals	33.3	13
Speech and language therapists	34.9	14
Business, research and administrative professionals n.e.c.	35.4	15
Chief executives and senior officials	37.4	16
Brokers	38.0	17
Business and financial project management professionals	38.2	18
Occupational therapists	38.9	19

Journalists, newspaper and periodical editors	39.1	20
Taxation experts	39.6	21
IT project and programme managers	40.0	22
Chartered and certified accountants	40.1	23
Mechanical engineers	40.2	24
Information technology and telecommunications directors	40.5	25
Medical practitioners	40.6	26
Engineering technicians	40.6	26
Public relations professionals	40.9	28
Artists	41.0	29
Physical scientists	41.1	30
Quality control and planning engineers	41.4	31
Financial accounts managers	41.6	32
Buyers and procurement officers	41.8	33
Psychologists	42.0	34
Web design and development professionals	42.4	35
Business and related research professionals	42.9	36
Marketing and sales directors	43.6	37
Production and process engineers	43.8	38
Design and development engineers	44.1	39
Authors, writers and translators	44.3	40
Medical radiographers	44.5	41
Electrical and electronic trades n.e.c.	44.7	42
Natural and social science professionals n.e.c.	45.1	43
Veterinarians	45.4	44
Health professionals n.e.c.	45.4	44
Product, clothing and related designers	45.6	46
Nurses	45.8	47
Chefs	45.8	47
Probation officers	45.9	49
Dental practitioners	45.9	50
Engineering professionals n.e.c.	46.0	51
Research and development managers	46.9	52
Welding trades	46.9	53
Legal professionals n.e.c.	47.6	54
Sales accounts and business development managers	47.8	55
Human resource managers and directors	48.0	56
Environment professionals	48.4	57
Management consultants and business analysts	48.8	58
Biological scientists and biochemists	49.5	59
Social services managers and directors	49.8	60
Graphic designers	49.9	61
Physiotherapists	50.0	62
Production managers and directors in manufacturing	50.1	63
Financial managers and directors	50.3	64
Conservation professionals	50.4	65
Arts officers, producers and directors	50.6	66
Pharmacists	51.7	67
Ophthalmic opticians	52.9	68
Civil engineers	53.0	69
Senior professionals of educational establishments	53.6	70
Production managers and directors in construction	53.8	71
Aircraft maintenance and related trades	53.9	72
IT specialist managers	54.1	73
Actuaries, economists and statisticians	54.3	74

Aircraft pilots and flight engineers	54.6	75
Higher education teaching professionals	54.8	76
Education advisers and school inspectors	55.5	77
Chartered surveyors	55.7	78
Purchasing managers and directors	55.9	79
Managers and directors in transport and distribution	55.9	80
Advertising accounts managers and creative directors	56.3	81
Therapy professionals n.e.c.	58.6	82
Social and humanities scientists	58.9	83
Teaching and other educational professionals n.e.c.	59.9	84
Environmental health professionals	60.1	85
Primary and nursery education teaching professionals	60.6	86
Social workers	60.8	87
Production managers and directors in mining and energy	61.5	88
Podiatrists	61.5	88
Further education teaching professionals	61.8	90
Financial institution managers and directors	62.2	91
Functional managers and directors n.e.c.	62.8	92
Secondary education teaching professionals	64.4	93
Musicians	66.0	94
Chemical scientists	67.3	95
Archivists and curators	67.4	96
Special needs education teaching professionals	67.8	97
Barristers and judges	70.7	98
Senior police officers	71.7	99
Senior officers in fire, ambulance, prison and related services	72.1	100
Midwives	72.5	101
Town planning officers	75.6	102
Welfare professionals n.e.c.	76.9	103
Paramedics	81.0	104
Librarians	82.3	105
Chartered architectural technologists	Insufficient data	Na
Actors, entertainers and presenters	Insufficient data	Na
Dancers and choreographers	Insufficient data	Na

Annex C: Relationship between ESS measured vacancy/employment indicator and other shortage indicators

Introduction

We have recently constructed a panel dataset which contains information on the shortage indicator values for each SOC running from 2009-17. These shortage indicators are used to conclude whether there are shortages at the SOC code level. As a way of assessing the suitability of these shortage indicators we can examine the relationship between them and a true measure of shortage at the 4-digit SOC code level. A strong relationship between the indicators and the true measure of shortage would suggest that the indicators are relevant and suitable in highlighting shortages.

Unfortunately, the consensus of the literature is that no all-encompassing measure of skill-based occupational shortage exists. For the MAC, this has been an issue since the first SOL report was published (2008)[180]. As no true measure of occupational shortage exists, this analysis shall use two substitute measures of occupational shortage; hard-to-fill and skill-shortage vacancies (htfv and ssv, respectively). These two measures are sourced from the Employer Skills Survey (ESS) and are recorded whenever an employer mentions that they are finding it difficult to fill a vacancy (htfv). If an employer mentions that this vacancy is difficult to fill because of a lack of "skilled or qualified" candidates, then the vacancy is also recorded as being a skill-shortage vacancy (ssv). The way by which these variables are recorded means that skill-shortage vacancies are a subset of hard-to-fill vacancies.

This analysis uses the hard-to-fill and skill-shortage vacancy rates (htfvr and ssvr, respectively), these are simply calculated by dividing the number of hard-to-fill and skill-shortage vacancies by total employment. While by no means perfect representations of the true level of shortage within an occupation, these substitute variables are convenient for use in this analysis as they are available at SOC level and for the necessary years this analysis takes place. UKCES[181] also states that these measures highlight a mismatch for the demand and supply of skills which is what the shortage indicators ought to be highlighting.

Description of the dataset

The panel used for this analysis runs from 2005-17 and is at the SOC code level. As there are 369 SOC codes, this panel contains 4,797 observations. Combining this with 53 variables contained within the dataset gives 254,241 individual points of data.

[180]https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/343325/Migration-shortage.pdf

[181] https://ukces.blog.gov.uk/2016/01/29/ukces-explains-skills-shortage-vacancies/

The panel contains information on 8 indicators of shortage[182], these indicators are derived from variables which stem from the ASHE, APS, Burning Glass and ESS datasets, which are also present in the panel. Additional variables included in the panel give information on a SOC's skill level, whether it's considered to be in shortage according to the indicators and whether it was recommended for inclusion on the SOL in that year.

Not all indicators stretch back as far as 2005 therefore regression analysis is conducted from 2009-17. Unfortunately, this means dropping one of the indicators, E2, from the regressions as it only begins in 2012 and its inclusion would have constrained the number of observations used.

Summary statistics of the main variables of interest

To provide further context around the nature of the panel used for this analysis, a set of summary statistics are presented below. This table describes the indicators of shortage along with the measures of shortage; hard-to-fill and skill-shortage vacancy rates.

Table C1: Summary statistics of the shortage indicator variables

Variable	Description	Obs[183]	Mean	Std. Dev.	Min	Max
htfvr	Hard-to-fill vacancy rate	1823	0.006707	0.009611	0	0.133863
ssvr	Skill-shortage vacancy rate	1808	0.005161	0.007683	0	0.093123
E1	Vacancies/Employment (ESS)	1843	0.020435	0.023962	0	0.510756
E2	Vacancies/employment (Burning glass)	2214	0.23059	0.405764	0.000344	6.340854
P1	Percentage change in real wage growth (1 year)	3935	-0.00423	0.071231	-1	0.9582
P2	Percentage change in real wage growth (3 year)	3211	-0.01378	0.097088	-1	1.062232
P3	The relative wage premium for a SOC	3321	-0.01933	4.316288	-13.3425	24.47879
V2	Percentage change of employment (1 year)	4059	0.022954	0.209921	-0.72137	4.847323
V3	Percentage change of median hours worked (3 years)	3202	.0002306	.0711121	-.6571344	1.2609
V4	Absolute change of new hires (1 year)	3974	0.007245	0.05246	-0.33347	0.355053

Perhaps the most immediately obvious discrepancy across the variables are the differences in the number of observations. This discrepancy arises as different indicators are available for different years. The comparatively low number of

[182] 9 indicators are included in the panel, however one of these is the now superseded V1 variable. Its replacement, AV1, is currently not included in the panel.
[183] Observations.

observations for E1, ssvr and htfvr can be explained by the fact that they are sourced from the ESS, as statistics from this survey are published every other year.

The maximum values of E2 highlights some irregularities: In 2013, E2 appears to show that for SOC 7129 (Sales related occupations n.e.c) the ratio for vacancies/employment is 6.3. This is not an extreme outlier either; 64 other SOC-Year combinations from 2012-17 had a vacancy/employment ratio of over 1. In comparison, the highest vacancy-employment ratio for E1, which measures the same metric using a different data source, was only 0.51.

This extreme difference is due to the nature of the Burning Glass data; Burning Glass measures the number of vacancies in real time therefore across the year it will sum all vacancies posted, which would give a higher number for high-churn occupancies. Whereas the vacancy count for E1 and the employment variable is a simple snapshot count for the number of vacancies/employed at the point in time that the survey was conducted.

Pairwise correlation matrix

Performing simple pairwise correlations provides an initial overview of the relationship between the different indicators of shortage. The results of the pairwise correlations are presented below, with moderate to strong correlation coefficients (absolute values greater than 0.3) underlined:

Table C2: Pairwise correlation matrix of shortage indicators and measures of shortage, 2009-17

	E1	htfvr	ssvr	V2	V3	V4	E2	P1	P2	P3
E1	1									
htfvr	0.67	1								
ssvr	0.61	0.88	1							
V2	-0.03	-0.01	-0.02	1						
V3	-0.01	-0.01	0.00	0.01	1					
V4	0.08	0.07	0.06	0.05	0.00	1				
E2	0.21	0.24	0.27	-0.03	0.01	0.01	1			
P1	0.02	0.03	0.02	-0.01	-0.06	-0.02	0.01	1		
P2	0.06	0.07	0.07	0.01	-0.06	-0.04	0.02	0.61	1	
P3	-0.19	-0.16	-0.13	0.04	0.00	-0.02	0.15	0.00	0.01	1

There is a strong correlation between the hard-to-fill and skill-shortage vacancy rates, with a coefficient of 0.88. This is to be expected as skill-shortage vacancies are a subset of hard-to-fill vacancies.

E1 does appear to have a moderate, positive correlation with the measures of shortage, with a coefficient of 0.67 and 0.61 with hard-to-fill and skill-shortage vacancy rates respectively. With regards to the remaining indicators of shortage, E2 (and to a lesser extent, P3) shows a weak relationship between itself and measures of shortage, with a coefficient of around 0.24 - 0.27.

Finally, P1 and P2 display a moderately strong correlation between each other, this is to be expected as P1 and P2 are similar in what they measure, differing only in their time scales.

In summary, there appears to be little evidence of a strong relationship between the shortage indicators and the measures of shortage.

Methodology

Expanding upon the correlation matrix, this paper utilises 2 methodologies to determine the relationship between the shortage indicators and the measures of shortage. The general regression takes the form:

$$True\ shortage = \beta_0 + \beta \boldsymbol{X}$$

Where $True\ shortage$ is either skill-shortage or hard-to-fill vacancy rates, β_0 is a constant and $\beta \boldsymbol{X}$ is a vector of the indicator variables. The first model used is a simple SOC code fixed effects regression[184]. The ESS-based variables; E1, hard-to-fill and skill-shortage vacancy rates are transformed into percentages for convenience. Results are as follows:

[184] Following a Hausman (1978) test, a fixed effects model was determined to be more appropriate than a random effects model.

Do the shortage indicators accurately predict actual shortages?

Model 1: Fixed effects panel regression

	Hard-to-fill vacancy rate (%)		Skill-shortage vacancy rate (%)	
	(1)	(2)	(3)	(4)
Constant	-0.0208 (0.0575)	-0.0892 (0.0979)	0.0171 (0.0423)	-0.0034 (0.071)
P1	-0.0737 (0.3311)	-0.0645 (0.3581)	-0.2063 (0.2767)	-0.2452 (0.2878)
P2	0.3464 (0.2978)	0.5009* (0.2845)	0.397 (0.2704)	0.5023** (0.25)
P3	-0.0001 (0.0051)	-0.027** (0.0104)	0.006 (0.0047)	-0.0225* (0.0081)
V2	0.0371 (0.0616)	0.0296 (0.06)	-0.0403 (0.0501)	-0.0055 (0.0472)
V3	-0.1693 (0.1375)	-0.1108 (0.1474)	-0.0629 (0.1232)	0.2858* (0.1141)
V4	-0.2278 (0.3275)	-0.1014 (0.3667)	-0.1532 (0.284)	0.0134 (0.285)
E1 (%)	0.3409*** (0.033)	0.3729*** (0.0463)	0.2456*** (0.0258)	0.2532*** (0.0336)
SOC Fixed Effects	No	Yes	No	Yes
Observations	1687	1687	1674	1674
Prob > F	0	0	0	0

Note: *p<0.1; **p<0.05; ***p<0.01. Standard errors are clustered at the SOC code level and are in parentheses.

The above table sets out the regression results with the hard-to-fill vacancy rate as the dependent variable for (1) and (2) and skill-shortage vacancy rate as the dependent variable for (3) and (4). Results appear to show that only a few of the indicators have any statistical relationship with the measures of shortage. This backs up the initial findings of the correlation matrix. Of the indicators, E1 has the most consistent statistically significant relationship with both measures of shortage. A 1 percentage point increase in E1 is associated with a 0.34-0.37% increase in the hard-to-fill vacancy rate and a 0.25% increase in the skill-shortage vacancy rate. These results are unsurprising as hard-to-fill and skill-shortage vacancy rates are a subset of total vacancies, which makes up the numerator of E1.

Of the remaining indicators, only P2 and P3 show any relationship with both the measures of shortage, becoming significant only with the introduction of SOC fixed effects. Results imply that a 10 percentage point increase in the change in real wage growth over 3 years (P2) is associated with a 5% increase the measures of shortage. This shows that employers are trying to combat shortages with wage increases.

The P3 estimators show that an increase in the relative wage premium for a SOC is associated with a decrease in the measures of shortage. This implies that offering a wage premium does help mitigate SOC-level shortages. Finally, V3 is statistically significant in (4); an increase in the median hours worked in a SOC over 3 years sees an increase in the skill-shortage vacancy rate. This result implies that existing workers are having to work longer hours to cover for shortages.

One weakness of these two models is that they do not account for a potential spurious relationship between the ESS-based variables; E1, skill-shortage and hard-to-fill vacancy rates. This may arise as all three of the contain the same denominator; Employment. Variation in this variable would led to variation in E1, and the skill-shortage and hard-to-fill vacancy rates which would lead to a simple fixed effects regression perhaps erroneously concluding that these variables have a statistically significant relationship[185].

Using a negative binomial regression

By using a Poisson-based model and an offset variable it is possible to solve the denominator problem whilst keeping E1, hard-to-fill and skill-shortage vacancy rates as rates. Rates are given by events per unit, such as tree species per hectare or in this case, vacancies per employment. This unit is also known as the exposure variable. To perform a Poisson-based regression on a rate one must move the exposure variable to the right-hand side of the equation. This log-transformed exposure variable then becomes an offset variable, with its estimate constrained to 1. Below is a brief example of this in practice:

$$log(\frac{E(y|x)}{a}) = \beta \frac{x}{a} + \theta'$$

The above is a general Poisson regression where $\frac{E(y|x)}{a}$ is the expected log of the measure of shortage, $\frac{x}{a}$ is E1 and θ' represents all other explanatory variables. In this example, a is the exposure variable, employment. To enable us to regress this in the correct form we need the left-hand side to be a count variable, this simply involves separating the logs as:

$$\log\left(\frac{E(y|x)}{a}\right) => \log(E(y|x) - \log(a)$$

Once the logs are separated, we move $\log(a)$ to the right-hand side which enables us to treat $\log(a)$ as an offset variable:

[185] A famous example of this issue was presented by Neyman (1952) 'proving' that storks bring babies as storks per capita and babies per capita are highly correlated. This of course is because the denominator is the same for both variables, a variation in the population would lead to variation in both storks and babies per capita.

$$log(E(y|x) = \beta \frac{x}{a} + \theta' + log(a)$$

The above can now be modelled using a Poisson regression. In practice this does mean using the number of hard-to-fill/skill-shortage vacancies instead of their rate, however inferences do not change. A negative binomial regression shall be used to model this data as both the number of skill-shortage and hard-to-fill vacancies have variances that exceed their mean (see Table C4 in the Additional tables and charts section). Because of this, their distribution closely resembles a negative binomial distribution (see Figure C1 and C2 in the Additional tables and charts section).

Model 2: Negative binomial regression

	Number of Hard-to-fill vacancies	Number of Skill-shortage vacancies
	(5)	(6)
Constant	-6.3017*** (0.0617)	-6.5313*** (0.0668)
P1	-0.0705 (0.3363)	-0.0817 (0.3806)
P2	0.0494 (0.2687)	0.0873 (0.2916)
P3	-0.0242*** (0.0074)	-0.0111 (0.0081)
V2	-0.0139 (0.0636)	-0.0774 (0.0678)
V3	-0.3323 (0.2622)	-0.1358 (0.2693)
V4	0.0913 (0.3104)	0.1172 (0.3843)
E1	0.4504*** (0.0276)	0.4463*** (0.0292)
Observations	1687	1674
Prob > chi2	0	0

Note: *p<0.1; **p<0.05; ***p<0.01. Standard errors are clustered at the SOC code level and are in parentheses. Ln(employment) is used as an offset.

Unfortunately, accounting for the potential spurious relationship has led to a loss of statistical significance amongst the indicators. P3 exhibits a statistically significant negative association with the hard-to-fill vacancy rate, mirroring the findings of (2). It is reassuring that the relationship between E1 and the measures of shortage persist when the model changes. This indicates that the relationship between E1 and the measures of shortage are not driven by their denominators.

Both Model 1 and 2 reinforce the findings of the correlation matrix that there appears to be little relationship between the indicators of shortage and the measures of shortage.

Do the Indicators influence inclusion on the SOL?

Another method for evaluating the effectiveness of the shortage indicators is to observe whether they have any influence on the decision to place job titles (and their associated SOCs) on the SOL. Again, this is not a perfect way to evaluate the effectiveness of these indicators however this analysis may, when used in conjunction with the analysis above, highlight indicators that are effective in highlighting shortage. For this analysis, the following model is used:

$$On\ SOL = \beta_0 + \beta \boldsymbol{X}$$

Where $On\ SOL$ is the dummy variable taking the value 1 if a job title from a SOC code was recommended for inclusion for the SOL for that year. The dummy takes the value of 0 otherwise or if all job titles for a SOC were recommended for removal in that year's SOL report[186]. β_0 represents the constant and $\beta \boldsymbol{X}$ a vector of the shortage indicators. As $On\ SOL$ is a binary variable this shall be modelled using a Logit regression. As Tier 2 is restricted for job titles skilled to NQF6+ and SOL reports are not published every year, the sample is restricted to SOCs skilled to NQF6+ and to the years that the MAC published a recommended SOL[187]. Results are as follows:

[186] As the SOL reports were not published every year the dummy retains its values in the years that fall in between the reports. Finally, in the 2013 report when SOC codes used changed from SOC2000 to SOC2010 all SOCs were treated as removed unless they were recommended for inclusion on the SOL during that report.

[187] These years are: 2008, 2009, 2010, 2011, 2013 and 2015. This list does not count the Nurses and Teachers partial reports as these were highly focused and led to no SOC level changes in the recommended SOL.

Model 3: Logit regression with On SOL dummy as dependent variable

	On SOL (7)	Average marginal effects (8)
Constant	-2.0457*** (0.4378)	-
P1	0.3941 (1.9301)	0.0501 (0.246)
P2	0.3461 (1.4095)	0.044 (0.1786)
P3	-0.0236 (0.0484)	-0.003 (0.0062)
V2	-0.0444 (0.2037)	-0.0056 (0.0259)
V3	2.2185 (3.7278)	0.2819 (0.4734)
V4	-7.9896*** (2.6085)	-1.0153*** (0.3773)
E1 (%)	0.3508** (0.1424)	0.0446** (0.0182)
Observations	278	278
Prob > chi2	0	-

Note: Standard errors are clustered at the SOC code level. *p<0.1; **p<0.05; ***p<0.01.
Cluster robust (7) and Delta method (8) standard errors in parentheses.

Of the indicators, only V4 and E1 are statistically significant. V4 appears to exhibit a negative and statistically significant relationship with the decision to recommend a SOC to be included on the SOL. An increase in V4, the absolute number of new hires, sees the log odds of being recommended for inclusion on the SOL decrease. This is concerning, as an increase in V4 is meant to signal shortage, which should increase the odds of being recommended for the SOL.

E1 is similar, exhibiting a positive association instead, indicating that a SOC with an increasing total vacancy rate is more likely to have a job title that is recommended for the SOL.

Column (8) presents the Average Marginal Effects of each variable at the mean. These effects are calculated from regression (7) hence why the statistical significance across variables remains the same. A change in E1 of 1 percentage point increases the predicted probability of being recommended for the SOL by 4.5%. Finally, a 10% increase in the absolute change in new hires over a year (an increase of 0.1 in V4) will lead to a decrease in the predicted probability of recommendation by 10.2%.

Only 2 of the indicators appear to have any bearing on whether a job title from a SOC is included on the SOL. These results suggest that the quantitative evidence has little

influence on whether a job title is recommended for inclusion on the SOL. Results should be taken with a pinch of salt as the SOL recommendations are done on a job title level, and not a SOC code level which is what the above regression assumes.

Conclusion

Overall, results do not shine a favourable light upon the effectiveness of the indicators in either highlighting shortage nor informing SOL recommendations. Of the indicators, only E1 and, to some extent, P2 and P3 highlight SOC level shortages. Despite this, P2 and P3 have no bearing on SOL recommendations. V4 meanwhile, appears to have an incorrect influence on SOL recommendations.

The results should be treated with caution; one of the principal assumptions of this analysis is that hard-to-fill and skill-shortage vacancy rates are an adequate proxy for the level of shortage. This is a strong assumption to make.

Additional tables & charts

Table C3: Summary statistics of other variables of interest contained within the panel

Variable	Obs	Mean	Std. Dev.	Min	Max
Median hourly pay	4362	13.12409	5.703649	0	49.71
Median hours worked	4306	36.59382	5.32334	0.605657	50.1
Employment	4428	80568.32	111307.7	904	1164871
Number of new hires	4375	9973.744	21039.82	17.34961	340311
Claimant count	4797	2753.405	13670.21	0	322786.9
Number of vacancies	1843	1876.381	4832.187	0	74144.9
Number of job postings	2214	19604.69	40990.16	7	493252
Hard-to-fill vacancies	1823	565.5889	1565.033	0	30430.51
Skill-shortage vacancies	1808	403.8402	960.6613	0	13965.9
Is the SOC in shortage	4797	0.062748	0.242534	0	1
Is the SOC recommended for inclusion on the SOL	4797	0.035856	0.18595	0	1
NQF1	4797	0.035022	0.183854	0	1
NQF2	4797	0.120075	0.325083	0	1
NQF3	4797	0.186783	0.389778	0	1
NQF4-5	4797	0.108401	0.310919	0	1
NQF6+	4797	0.165103	0.371312	0	1

Table C4: Descriptive statistics of the number of skill-shortage, hard-to-fill and total vacancies

Variable	Obs	Mean	Std. Dev.	Min	Max
Skill-shortage vacancies	1808	403.8402	960.6613	0	13965.9
Hard-to-fill vacancies	1823	565.5889	1565.033	0	30430.51
Total Vacancies	1843	1876.381	4832.187	0	74144.9

Figure C1: Hard-to-fill vacancy (HTFV) frequency distribution vs Negative binomial distribution

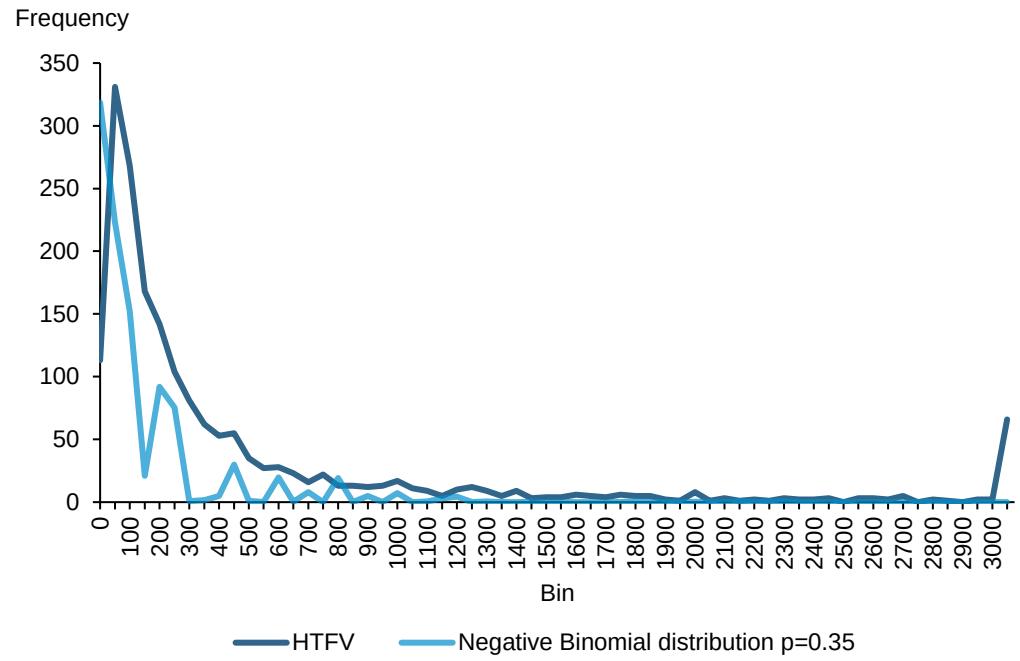
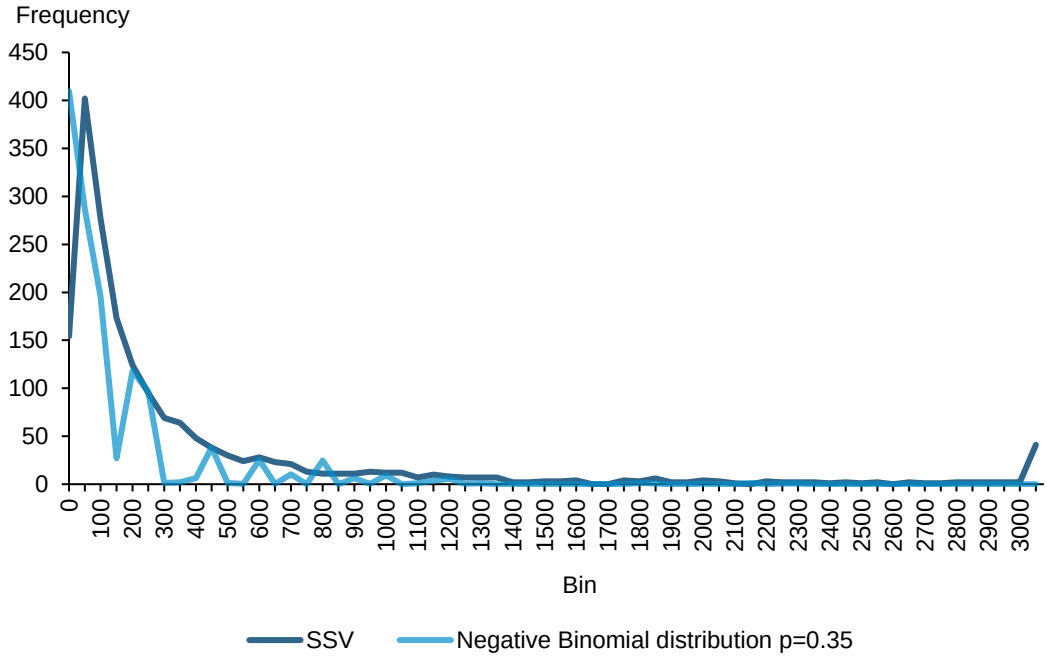


Figure C2: Skill-shortage vacancy (SSV) frequency distribution vs Negative binomial distribution



Annex D: MAC Call for Evidence Online Form

Individual organisations

1. What is the name of your organisation? *

2. What is your email address? *

3. Please indicate if you would like to be added to our database for future research purposes and updates on MAC work. *

Yes
No

4. What is your type of organisation? *

Academic/higher education establishment
Business including voluntary organisations
Business sector representative/bodies including recruitment agencies
Government department/devolved administration/local authority
Other public-sector employer (e.g. NHS trusts).
Think tank/research institution
Other- please specify.

5. Please tell us the location of your organisation? (Please select all that apply.) *

North East
North West
Yorkshire and The Humber
East Midlands
West Midlands
East of England
Greater London
South East
South West
Scotland
Wales
Northern Ireland
UK wide

6. Please indicate which of the options below best explain your reason for completing this online form. *

(a) I would like to provide evidence on recruitment shortages within my organisation/business.

(b) I would like to provide evidence on sector/wider shortages on behalf of members or as a recruitment business.
(c) I would like to provide academic/research evidence on occupational shortages.

More about your organisation/business

As you have indicated that you wish to provide information about specific shortages you have faced, it would be useful for us to know a little more about the context in which you operate.

7. We are interested in hearing from organisations/businesses of all sizes, please tell us the number of individuals your organisation/business currently employ?

1-9 employees
10-49 employees
50-249 employees
250+ employees

8. Please tell us the name and Standard Industrial Classification (SIC) code that most closely describes the industry of your organisation/business. If multiple SIC codes apply, please select the one that best describes the largest component of business/organisation (by employment/turnover). An interactive list of all SIC codes can be found below: http://resources.companieshouse.gov.uk/sic/

Job shortages

9. Please list the job titles that your organisation has currently experienced difficulties in recruiting suitable workers for. (Maximum of 10 job titles).

If there are more than 10 jobs, please use the space below to state what these job titles are.

Help us to standardise job titles

10. Using the Office for National Statistics (ONS) Occupation Tool linked below, please help us by matching the job titles you have provided with the closest standardised ONS job title and associated 4-digit occupation (SOC) code. https://onsdigital.github.io/dp-classification-tools/standard-occupational-classification/ONS_SOC_occupation_coding_tool.html

If there are more than 10 jobs in shortage, please use this space to provide the closest ONS job title and the 4-digit SOC code as above.

More information about those jobs in shortage

11. For each job title provided please state the pay per period (annual, monthly, fortnightly, weekly or hourly). If you, for any job title, provide a pay

per hour figure please also provide the hours per week you would expect to advertise for a vacancy with this job title.

If there are more than 10 jobs in shortage, please state what the job titles are as per question 10 and what the advertised pay would be.

12. What prior relevant work experience is required for each job in shortage?

Entry level-no prior experience
0-6 months experience
6-12 months experience
1-3 years
3 years and over.

If there are more than 10 jobs in shortage, please use the space below to state what these jobs are, and the experience required for each job.

13. What is the minimum qualification requirement for someone applying for the job title(s) you have identified as in shortage?

Degree level qualification
Higher qualification below degree level
A-level/vocational A-level or equivalent
AS- level/vocational AS-level or equivalent
GCSE/vocational GCSE or equivalent
Other work-related or professional qualification
None

If there are more than 10 jobs in shortage, please use this space to state what the job titles are and what minimum qualifications are required. If another work-related qualification is required, please state what this is along with the job title.

14. What do you think are the main reasons for recruitment difficulties?

Too much competition from other employers
Low number of applicants with the required skills.
Low number of applicants generally.
Low number of applicants with the required motivation, personality and or attitude.
Low number of applicants with qualifications that are required for the job.
Job entails shift work and or unsociable hours.
Seasonal work.
Remote location/transport issues.
Don't know.

If there are more than 10 jobs in shortage, please state what these jobs are and what the reasons are for recruitment difficulties. If there are other reasons, please use this space to explain.

15. If known, for a previously advertised job (in shortage), how long did it take to fill that job? (Not to exceed 500 words).

16. Thinking about question 15 in the last 12 months has the length of time to fill that job changed? (Please select one option).

Increased a lot
Increased a little
Stayed the same
Decreased a little
Decreased a lot
Don't know

17. What is being done to reduce recruitment difficulties?

Increase wages to attract candidates.
Increase spending/investment on recruitment.
Increase spending/investment on training of existing staff.
Using different methods/channels for advertising vacancies.
Improve conditions such as the inclusion of holiday allowances and bonuses.
The use of different labour pools such as temporary/contract workers, job sharing.
Other please specify.

18. Thinking about the measures you have taken to reduce recruitment difficulties, can you provide any further information about how these measures have been used? (Not to exceed 500 words).

19. Please use this space to explain the length of time the above measures have been applied? (Not to exceed 500 words).

20. Have the above measures worked in reducing some of the difficulties in recruiting, if not why? (Not to exceed 500 words).

21. What impacts are these job shortages having on your business/organisation? (Not to exceed 500 words).

22. Are the jobs that you said are in shortage, open to eligible workers from the Tier 2 points-based visa system?

Yes
No

23. If you have answered yes to question 22, has your business/organisation used the Tier 2 points-based visa system to recruit workers from outside of the UK? If so, please state how many employees have been recruited in the past 12 months along with the job titles. (Not to exceed 500 words).

24. If you have evidence for other occupations in shortage but have not had enough space to provide in this form, please use this space to explain (not to exceed 1,000 words).

Representatve Organisations

1. What is the name of your organisation? *

2. What is your email address? *

3. Please indicate if you would like to be added to our database for future research purposes and updates on MAC work. *

Yes
No

4. What is your type of organisation? *

Academic/higher education establishment
Business including voluntary organisations
Business sector representative/bodies including recruitment agencies
Government department/devolved administration/local authority
Other public-sector employer (e.g. NHS trusts)
Think tank/research institution
Other- please specify

5. Please tell us the location of your organisation? (Please select all that apply.) *

North East
North West
Yorkshire and The Humber
East Midlands
West Midlands
East of England
Greater London
South East
South West
Scotland
Wales
Northern Ireland
UK wide

6. Please indicate which of the options below best explain your reason for completing this online form. *

I would like to provide evidence on recruitment shortages within my organisation/business.
I would like to provide evidence on sector/wider shortages on behalf of members or as a recruitment business.
I would like to provide academic/research evidence on occupational shortages.

Your evidence

25. Please indicate from which of these industries are you providing evidence?(Please select all that apply).

All sectors
Agriculture, Forestry and Fishing
Mining and Quarrying Activities
Manufacturing
Energy
Water supply, Sewerage, Waste Management
Construction
Wholesale and Retail Trade
Transport
Warehousing
Accommodation and Hospitality
Media and Communications
IT
Financial and Insurance
Professional Services
Administrative and Support Service Activities
Public Administration
Education
Health
Residential and Social Care
Creative Arts and Entertainment
Other- please specify.

26. If you wish, you can provide details of individual jobs titles you/your members have found hard to fill in the boxes below (maximum of 10). Please help us by matching the job titles you have provided with the closest standardised ONS job title and associated 4-digit occupation (SOC) code using the Office for National Statistics (ONS) Occupation Tool. There is also space to list the sector(s) where shortages of candidates to fill these job titles has been most acute. If providing this information, please refer to the list in question 25.

If there are more than 10 jobs in shortage, please use this space to provide the job titles, closest ONS job title, ONS occupation code and sector most affected as above.

27. What do you think are the main reasons for job shortages (answered in the question above), and or wider shortages in the sector(s)? (Not to exceed 500 words).

28. Please explain what measures have been taken to reduce shortages in the sector as informed by your members and or research. (Not to exceed 500 words).

29. Have these measures worked, if not why? (Not to exceed 500 words).

30. Are the jobs that you have said are in shortage, open to eligible workers from the Tier 2 points-based visa system?

Yes
No

31. If known, how many workers from outside of the UK have been recruited using the Tier 2 points-based visa system in the past 12 months, stating the job titles. (Not to exceed 500 words).

32. If you have supporting evidence such as survey results from members please attach here. Please remember to omit sensitive details before attaching.

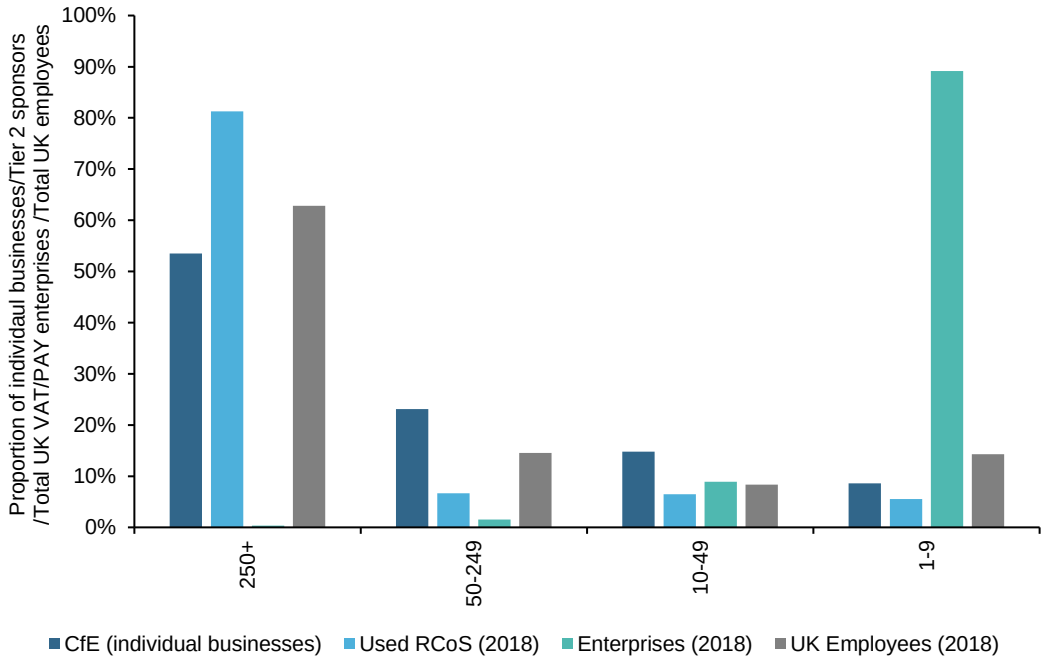
If you have any other information that might be useful for our call for evidence please use the space below to explain (Not to exceed 500 words).

Annex E: Assessing the representativeness of the responses to the CfE

Size

E.1 Individual businesses reported their employment size. Over half (54 per cent) of respondents were large firms with more than 250 employees and only 9 per cent had less than 10 employees. The sample is significantly skewed towards larger organisations (by employment) compared to the UK business population. However, the sample is much more representative when compared to the proportion of Tier 2 (General) sponsors by employment size (weighted by the number of used RCoS in 2018), see figure E.1.

Figure: E.1: Proportion of individual businesses from CfE responses, Tier 2 (G) sponsors (weighted by RCoS used) and UK business population by employment size



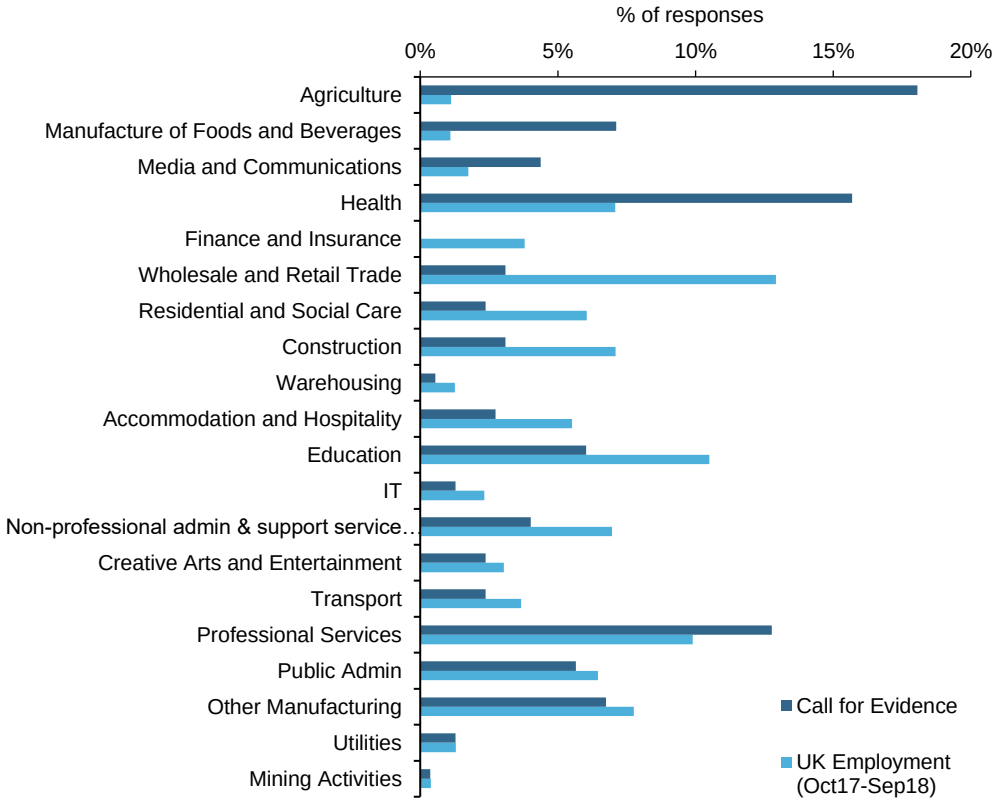
Source: MAC Call for Evidence, Home Office Management Information, IDBR 2018 (ONS), ASHE 2018 (ONS)

Industry

E.2 Figure E.2 shows the proportion of respondents by industry and compares this to the industry share of UK total employment (2017)[188]. On this measure it appears that our call for evidence elicited a higher number of responses from organisations in the Agriculture; Food and Beverage manufacturing; Media and Communications; Health; and Professional Services sectors.

[188] It is not possible to directly compare this measure with the industries of Tier 2 sponsors nor business demography data as the taxonomies do not align.

Figure E.2: Proportion of call for evidence responses and total UK employment (2017) by industrial sector (ranked largest to smallest difference)



Source: MAC Call for Evidence, Annual Population Survey 2017 (ONS)

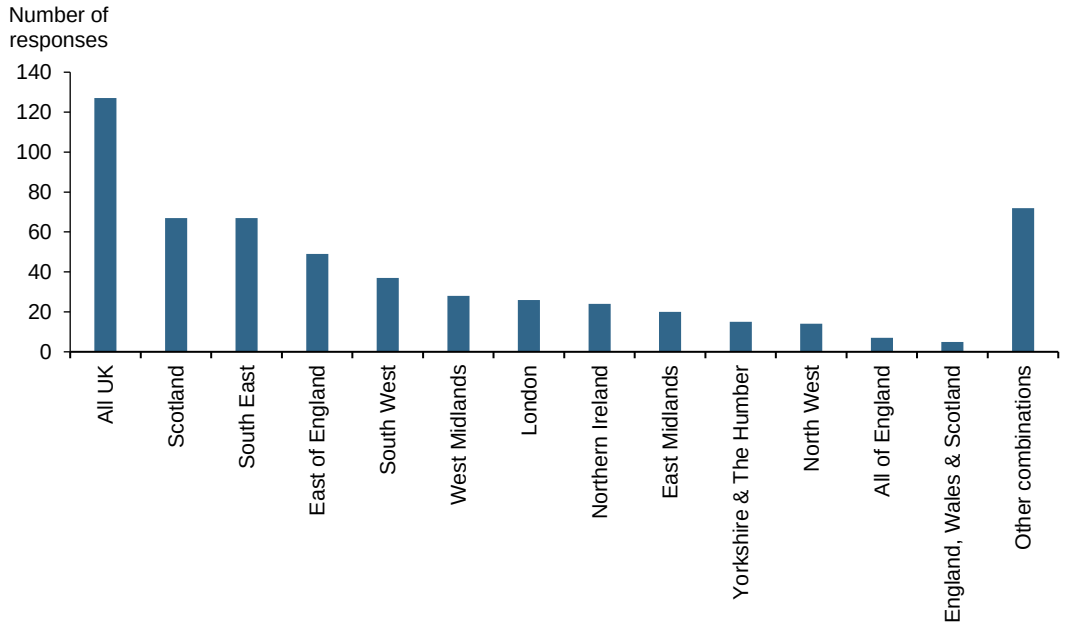
E.3 Figure E.3 compares more detailed information for individual organisations with the sector information of Tier 2 sponsors (again weighted by RCoS used in 2018) and UK employment by sector. The more detailed data also shows that the call for evidence receiving a disproportionate number of responses from the Agricultural sector. However, we can now also see that despite receiving a higher proportion of response from the Health sector than would be expected given its share of total employment, compared to Tier 2 (General) usage the call for evidence somewhat underrepresents this sector.

Figure E.3: Proportion of individual businesses from CfE responses, Tier 2 (General) sponsors (weighted by used RCoS) and total UK employment by industrial sector

Region

E.4 Respondents were given the ability to select multiple options from the nine English regions, Wales, Scotland and Northern Ireland as well as well as a "UK wide" option. Figure E.4 displays the combination of regions selected that had five or more responses. The modal answer from respondents was "UK wide", followed by the South East and Scotland. There is a long tail of responses which selected a unique combination of regions/countries (41 out of the 72 "Other combinations" only have one observation).

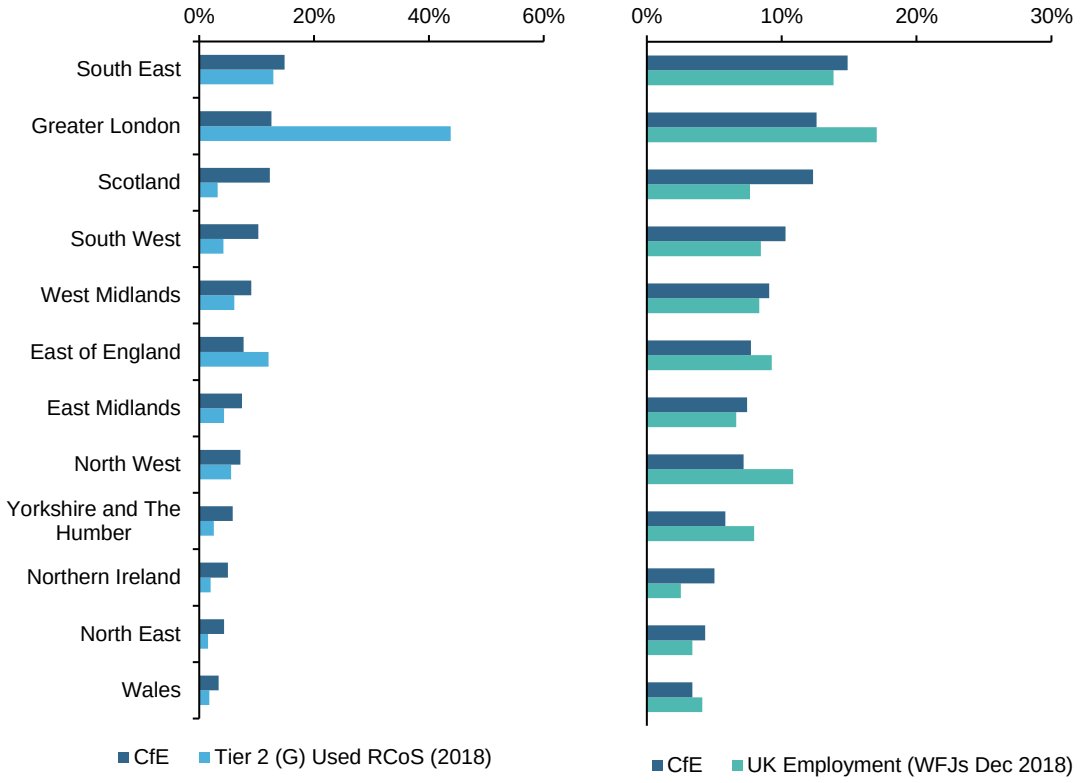
Figure E.4: Number of Call for Evidence responses by region/country or region/country combination (for those options with five or more responses)



Source: MAC Call for Evidence

E.5 To assess how representative our data is, we removed the "UK-wide" responses and treated each selection of a region/country as a unique observation. This results in an underlying count greater than the total number of respondents but when expressed as a proportion can be compared to data on the location of UK employment and active businesses. Figure E.5 shows that, compared to both where business and jobs are in the UK our call for evidence received a disproportionate number of responses from Scotland, Northern Ireland and the North East. On-the-other-hand, we received a smaller number of responses from London, the East of England, the North West, and Yorkshire and The Humber than would be expected if it were a random sample of employers.

Figure E.5: Proportion of Call for Evidence responses (minus those choosing "UK wide"), UK businesses (2017) and UK jobs (Sep 2018) by region/country of the UK



Source: MAC Call for Evidence, Business demography UK 2017 (ONS), Regional labour market summary (ONS)

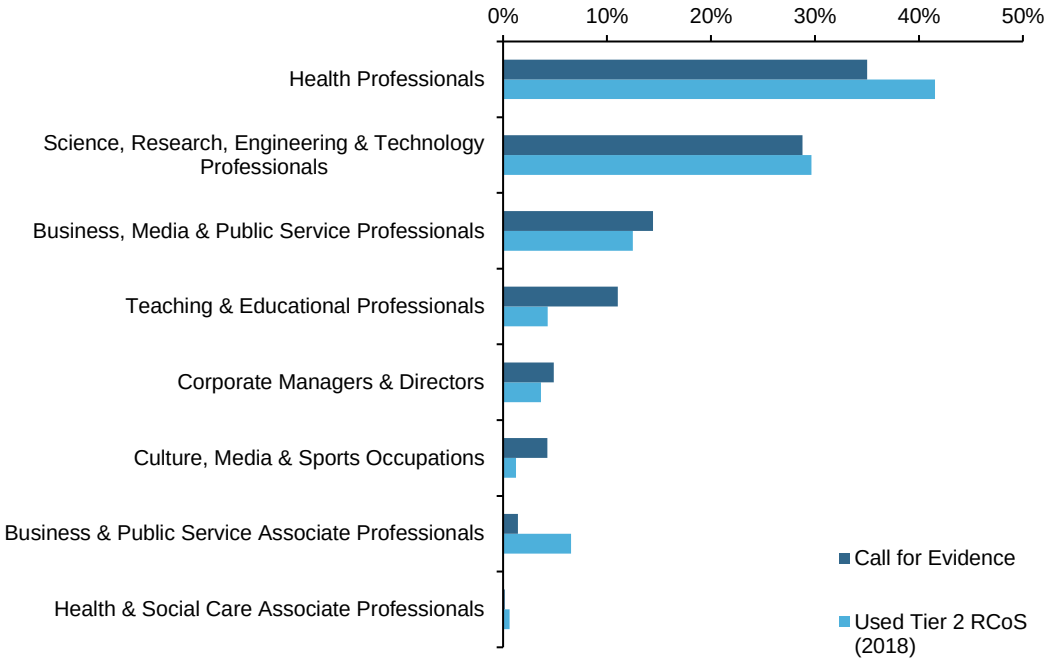
Characteristics of occupations/jobs

Occupation

E.6 All respondents were given the ability to provide up to 10 job titles that they believed were suffering from shortages of labour. In total we received 2,692 job titles[189], of which we also received or were subsequently able to match 2,569 4-digit SOC codes and there was a further 36 responses where we were not provided a job title but did receive a SOC code. The accuracy or consistency of these matches between job titles and occupation codes cannot be verified without a resource intensive manual process and we do not feel it would be a proportionate undertaking. Figure E.6 shows the proportion of 2-digit SOC codes mentioned in the Call for Evidence as well as the same proportion taken from the numbers of Tier 2 CoS used in 2018. As the types of job able to use the Tier 2 route are currently restricted to those 4-digit SOCs deemed to be skilled to RQF6+ we only present the same subset of SOCs from the Call for Evidence (aggregated to the 2 digit level).

[189] More accurately instances where the job title text box was not empty

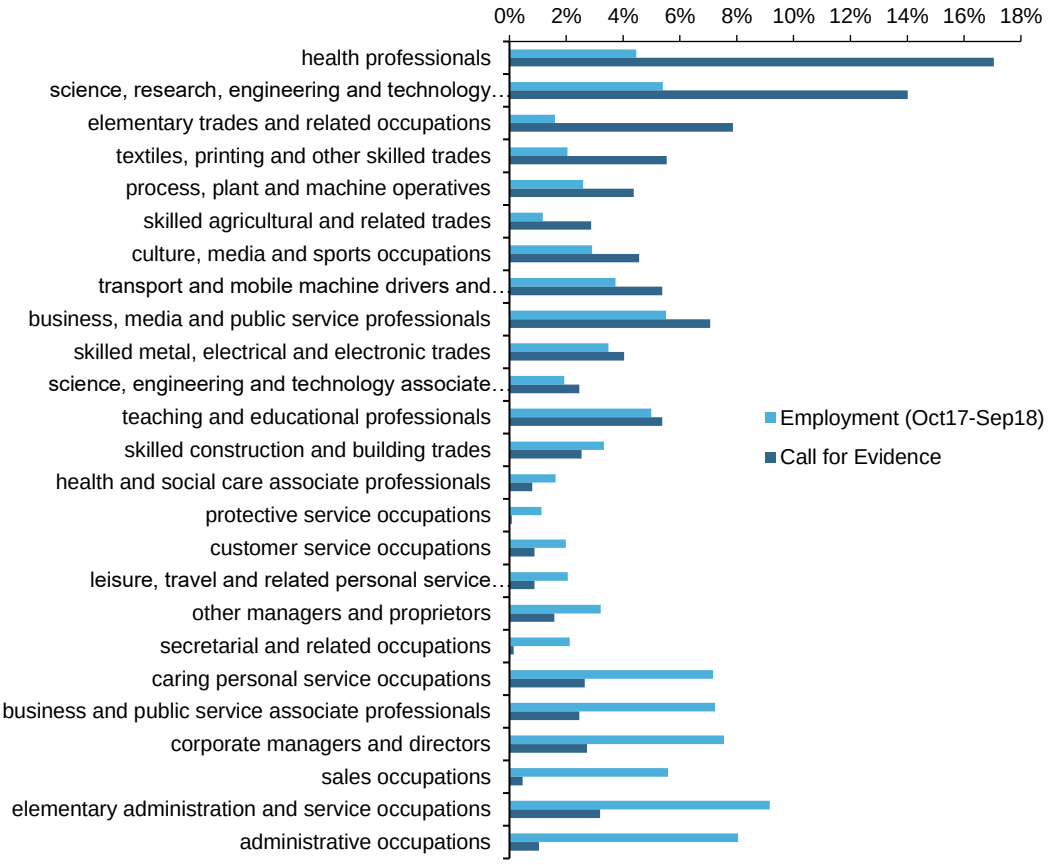
Figure E.6: Proportion of Call for Evidence responses and used Tier 2 (General) RCoS by 2-digit occupation group (RQF6+ occupations only)



Source: MAC Call for Evidence, Home Office Management Information (2018)

E.7 When restricting to the same set of occupations, the call for evidence submissions had a higher focus on *Teaching & Education Professionals* and *Culture, Media & Sports Occupations* than the mix of jobs sponsored under Tier 2 (General) in 2018. Equally the call for evidence responses have a lower representation of *Science, Research, Engineering & Technology Professionals*; *Business, Media & Public Service Professionals;* and *Business & Public Service Associate Professionals.*

Figure E.7: Proportion of Call for Evidence responses and UK employment by occupation



Source: MAC Call for Evidence, Annual Population Survey (2017)

E.8 In Figure E.7 we repeat the above exercise but for all 2-digit SOCs (not just high-skilled) and compared the call for evidence responses against UK wide employment. Amongst the occupations disproportionally represented in our call for evidence (when compared against their share of total UK employment) are *Health Professionals; Science, Research and Technology Professionals* and *Elementary Trades and Related Occupations*. *Administrative Occupations* and *Sales Occupations* are examples of occupations with a lower share of call for evidence responses than employment.

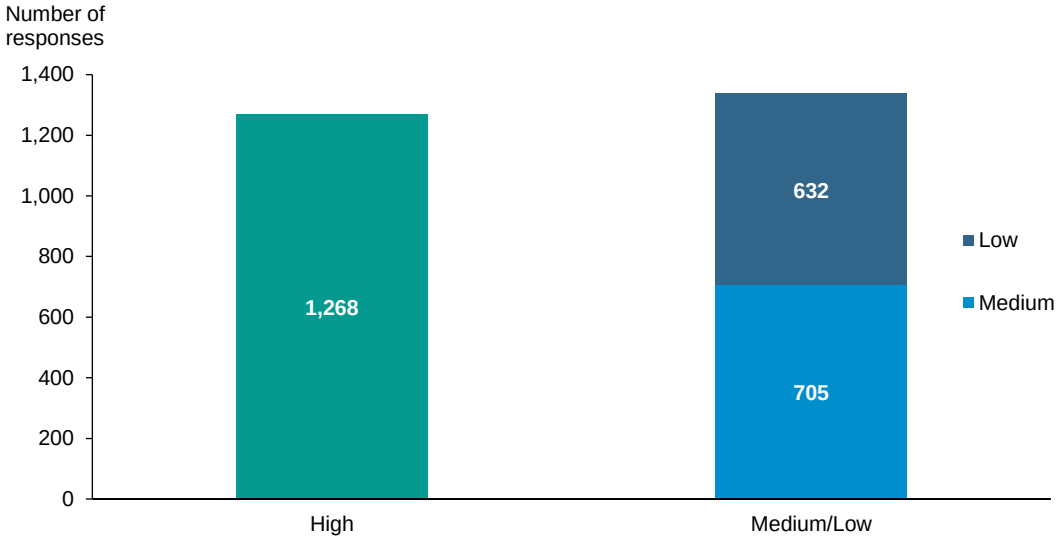
E.9 We also extracted insights from the unstructured information provided in the text boxes where respondents provided their own descriptions of the jobs facing shortage. We cover these in chapter 4.

Skill level

E.10 We have three potential measures of the skill level of the jobs mentioned in the Call for Evidence: the RQF level associated with the occupation code; the answers given to questions regarding both the minimum qualification requirement of the job; and amount of relevant work experience expected of applicants (available for organisations only). Figure E.8, looks at each of these

in isolation. These figures show that we received a reasonably high proportion of information regarding jobs that would likely not meet the current Tier 2 skill requirements.

Figure E.8: Proportion of jobs mentioned in online form by RQF level of SOC



Source: MAC Call for Evidence online form(does not sum to 2,692 as not all job titles were matched to 4 digit occupation codes and therefore could not be assigned a skill level)

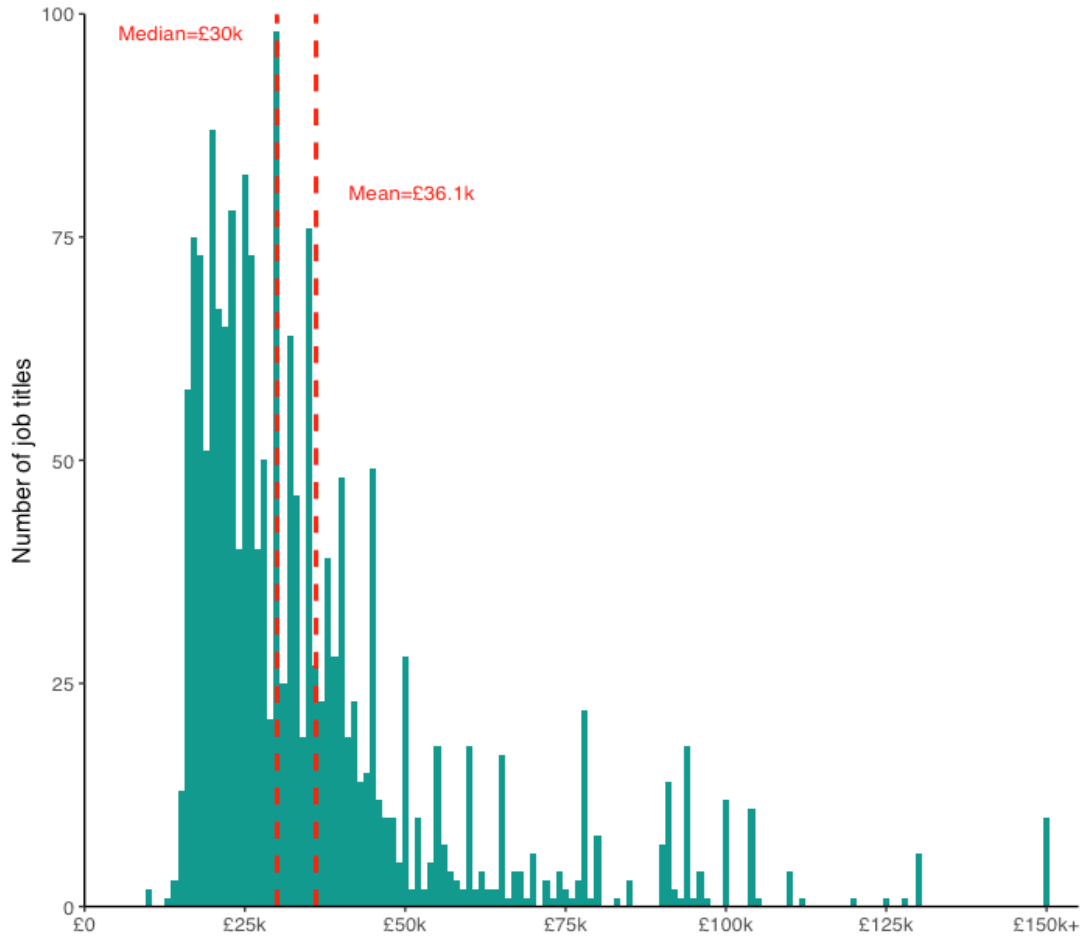
E.11 The variability of these three measures when interacted with one another generates a predictable pattern, with jobs matched to high-skilled SOCs more likely to require a degree level qualification and more likely to require greater work experience – and the opposite relationship for jobs matching to lower-skilled SOCs.

Salary

E.12 For each of the 10 job titles that respondents could provide, individual businesses were additionally asked about the salary of those jobs. In total we have been able to compute 1,816 annual salaries[190] from the 1,924 individual jobs mentioned by individual organisations. This translates to 1,775 annual salary/4-digit SOC combinations. Figure E.9 plots the frequency distribution of these salaries. The distribution shows that the median and mean salaries are £30,000 and £36,090 respectively. Meaning that 50 per cent of jobs highlighted to us by individual businesses (for which we have salary figures) have annual salaries below the floor applied to most Tier 2 (General) applications.

[190] If an annual salary was provide this was used otherwise, if monthly then x12, if fortnightly then x26, if weekly then x52, if hourly & hours/week provided & hours/week>37.5 then hourly pay x hours/week x 52, if hourly & hours/week provided & hours/week<37.5 then hourly pay x 37.5 x 52, if hourly & hours/week not provided then hourly pay x 37.5 x 52.

Figure E.9: Frequency distribution of annual salaries provided by individual businesses



Source: MAC Call for Evidence

E.13 To carry out similar comparisons as those done above and ascertain the representative of the salary data we compare it to the salaries of current users of Tier 2 (General) and the stock of jobs in the UK's labour market (using the Annual Survey of Hours and Earning, ASHE data). In Table E.1, we report the percentage difference between the Call for Evidence salaries and those from the used RCoS and ASHE datasets controlling for the common available information across the datasets, the 4-digit SOC, industry (at the section level) and the size of the employer (measured by four employee size bands).

Table E1: Percentage difference in mean salaries between Call for Evidence, Tier 2 (General) and ASHE datasets controlling for individual characteristics				
Characteristics controlled for:	**% difference between CfE and Tier 2 (G) used RCoS (2018)**		**% difference between CfE and ASHE (2018)**	
	All observations	Only RQF6+ occupations	All observations	Only RQF6+ occupations
Occupation	-5.8%	-5.1%	None	-3.4%
Occupation & Industry	-5.7%	-5.7%	None	-4.2%
Occupation, Industry & Employer size	-6.5%	-5.4%	None	-4.9%

Source: Negative differential indicates salaries collected from the Call for Evidence lower than comparator data source on average, negative differentials the opposite. Differences significant at the 5 per cent level unless stated otherwise. "None" indicates no statistically significant difference. Linear regression with outcome variable ln(salary), separate regressions estimated using CfE/CoS and CfE/ASHE combined datasets, ASHE sampling weights not applied, ASHE sample restricted to full-time workers with positive salaries, over the age of 15, on adult rates and in the same job for one year or more.

E.14 These results show that the salary data collected by the Call for Evidence online form are slightly lower (around 5%) than the salaries associated with Tier 2 (G) RCoS used in 2018 after controlling for occupation, industry and employer size. Compared to employees more generally (measured using ASHE 2018) there is no significant difference after controlling for occupation. If we restrict the sample of observations to just those associated with RQF6+ occupations, then the comparison with used RCoS remains similar while compared to employees more generally the Call for Evidence salaries now appear slightly lower. Overall the salaries we collect appear to be broadly in line with our other data sources.

E.15 These results show that once controlling for occupation (at the 4-digit level) there is no significant difference between the salaries reported to us through the call for evidence and those contained in the CoS data (when comparing the subset of occupations that exist in both datasets – namely high-skilled occupations). However, call for evidence salaries are somewhat higher than the UK labour market as a whole, even after controlling for occupation and industry.

Annex F: List of events held

Roundtables	Date
Birmingham	29th January 2019
Bristol	28th February 2019
Derbyshire	18th January 2019
Liverpool	11th March 2019
London	21st February 2019
Newcastle	14th February 2019
Northern Ireland	26th February 2019
Scotland	28th February 2019
Sheffield	15th March 2019
Stevenage	20th February 2019
Wales - Cardiff	5th March 2019
Wales - Llandudno	20th February 2019

Annex G: List of organisations met

ABP Food Group

ABurnet Limited

Academy of Medical Sciences

Acas East Midlands

Advantage NRG

AG Recruitment and Management Ltd.

Airbus Defence and Space Limited

AKPR

Allstate

Almac

Aloft Liverpool

AM

AND Automation Ltd

Apex Hotels

Arup

Associated British Foods

Association of Circus Proprietors

Association of Labour Providers

Association of Medical Research Charities

Astute Electronics Limited

AVSPNI

AWD Development Solutions Ltd

Barber Brown

BASW

BCC Strategic Policy Group

Bradgate Bakery

Bristol City Council

Bristol University

British Academy

British Association of Community Child Health

British Heart Foundation

British Medical Association

Broudie Jackson Canter

Building Alliance

Business in the Community

Cancer Research UK

Cardiff University

Care Forum Wales (N. Wales)

Care Forum Wales (S. Wales)

Carson-McDowell

Catalyst (Director of Finance)

CBI

Centre for Ecology and Hydrology

CGHG & Place Hotels

Chilair (uk) training academy

CITB

Coleg y Cymoedd

Concentrix

Concordia UK

Confederation for Forest Industries (UK)

Constantine Law

Continental Nurse Ltd

Cranswick Foods

Cranswick Foods

Dacorum Borough Council

DAERA

DCMS

DEFRA

Department for Business, Energy & Industrial Strategy

Department for the Economy (DfE)

Department of Health

Department of Health and Social Care

DfE

DH

DWP

East Midlands Chamber

Edwardian Hotels London

EU Exit, Trade and Migration Division Department for the Economy

Eversheds Sutherland (International) LLP

F H Harvey & Sons (Decorators) Ltd

Federation of Scottish Theatre

Federation of Small Business (Policy Advisor)

Four Seasons Healthcare

Fragomen

Freight Transport Association

Gateshead Council

Geldards

General Electric (GE)

Go-Science

Greenyard Flowers

Grŵp Llandrillo Menai

Health & Social Care Trusts

Healthcare Ireland (Belfast) Ltd

Hertfordshire Building Control Limited

Hertfordshire Chamber of Commerce

Hilton Liverpool

Hospitality Ulster

Hurlingham Polo Association

IFS

Imperial College London

Innovate UK

Institute of Directors

Institute of Physics

Institute of Physics and Engineering in Medicine

Integrated Environmental Solutions Limited

International House Bristol

Invest NI

IPPR

Jackson Lees

KPMG

Laurence J Betts

Liverpool Chamber of Commerce CIC

Liverpool City Region Combined Authority

Liverpool School of Tropical Medicine (LSTM)

Loates HR

Loch Melfort Hotel

London First

Lough Neagh Fishermen’s Co-operative

Lush Retail Ltd

Mace

Maelor Forest Nurseries Ltd (Clwyd

Magrath Sheldrick LLP

Manufacturing NI

Matchworkers International

Matrix

McAvoy Group

MCS Group

Medical Research Council

MJM Group

Monaghan Mushrooms Group

Mondelez International

Moor Beer

Mott Macdonald

National Farmers Union

National Pharmacy Association

Natural History Museum

NBI Partnership

Nesta

Network Integrity Services (NIS)

New College Durham

Newland Chase

Newman University

NFU Scotland

NHS Employers

NI Screen

NI Tourism Alliance

NIESR

NIFPO

NIMEA

Nissan Motor Manufacturing UK Ltd

NIVA

Norbrook Laboratories

North East England Chamber of Commerce

Northern Ireland Social Care Council

Nottingham Trent University

Oil & Gas UK

Openreach

Optimus Law

Origin Care (MD)

Paragon Law

PDSA

Pennine Healthcare

People Plus

Pets at Home Group

Prestige Communications

Proftech Talent Ltd

PwC

RCN

RCN Marketing Consultants Network GmbH

Retail NI

RLP Manager, South West & Mid Wales RSP

Robert Bosch Ltd

Rolls Royce PLC

Rooney Fish

Royal Brompton & Harefield NHS Foundation Trust

Royal Society of Chemistry

Royal Surrey County Hospital NHS Foundation Trust

Russell Group

Samworth Brothers Limited

Sanger Institute

Science and Technology Facilities Council

Science Council

Scottish Ballet

Scottish Government

Scottish Opera

Scottish Tourism Alliance

Seetru

Shepherd and Wedderburn LLP

Sheraton Grand Hotel & Spa

Siemens plc

Skills Development Scotland

Skills for Health

South Eastern Health and Social Care Trust

South West College

South West Law

Stagecoach UK Bus

Stevenage Borough Council

Stevenage Circuits Limited

Sunrise Eggs

Talent Scotland

Talk Staff Group Ltd

Tate Recruitment (Hitchin)

Tech UK

TechSpark Limited

Telecoms, DfE

The Alan Turing Institute

The Association of the British Pharmaceutical Industry (ABPI)

The Institution of Engineering and Technology (IET)

The Know Group

The Royal Academy of Engineering

The Royal Society

The Sainsbury Laboratory

Tourism NI

Tourism, DfE

Trade, DfE

TUC

TWI Ltd

Ubisoft

UK Chamber of Shipping

UK Hospitality

UK Partnerships Ltd- UK

UK Research and Innovation (UKRI)

UK Screen Alliance

UK Shared Business Services (UK SBS)

Universities and Colleges Employers Association

Universities Scotland

Universities UK

Universities Wales

University of Birmingham

University of Cambridge

Walgreens Boots Alliance

Wellcome Trust

WG - SHELL

Wildseed Studios

Withers LLP

WM Morrisons Produce Ltd-Flowerworld

Workforce People Solutions

Glossary of Terms and Abbreviations

ABPI	Association of the British Pharmaceutical Industry
AI	Artificial intelligence
APS	Annual Population Survey
ASHE	Annual Survey or Hours and Earnings
BAME	Black, Asian, and minority ethnic
BAPO	British Association of Prosthetists & Orthotists
BCF	Better Care Fund
BEIS	Department for Business, Energy and Industrial Strategy
BMA	British Medical Association
BME	Black and minority ethnic
BMJ	British Medical Journal
CABGA	Cornwall Area Bulb Growers Association
CCG	Clinical Commissioning Group
Cebr	Centre for Economics and Business Research
CfE	Call for Evidence
CITB	Construction Industry Training Board
COP	College of Podiatry
CoS	Certificate of sponsorship
COSLA	Convention of Scottish Local Authorities
CPIH	Consumer Prices Index including owner occupiers' housing costs
CPT	Core Psychiatry Training
CT	Core Training
DA	Devolved Administration
DCMS	Department for Culture Media and Sports
DfE	Department for Education
DfT	Department for Education
DHSC	Department of Health and Social Care

EBacc	English Baccalaureate
ECITB	Engineering Construction Industry Training Board
EEA	European Economic Area
ESS	Employer Skills Survey
EU	European Union
EU27	Twenty-seven member states of the EU not including United Kingdom
FDF	Food and Drink Federation
FE	Further Education
FoM	Freedom of Movement
FTE	Full Time Equivalent
GCSE	General Certificate of Secondary Education
GDP	Gross Domestic Product
GVA	Gross Value Added
HE	Higher Education
HEE	Higher Education England
HESA	Higher Education Statistics Agency
HO	Home Office
HPC	Health Professionals Council
HTS	Harvesting Tomorrow's Skills
ICT	Intra Company Transfer
ICT	Information and communications technology
IT	Information Technology
ITT	Initial Teacher Training
LEO	Longitudinal Education Outcomes
LFS	Labour Force Survey
LLFS	Longitudinal Labour Force Survey
LPC	Low Pay Commission
MAC	Migration Advisory Committee

MFL	Modern Foreign Languages
n.e.c	not elsewhere classified
NAHT	National Association of Headteachers
NAO	National Audit Office
NASUWT	National Association of Schoolmasters Union of Women Teachers
NCSS	National Cyber Security Strategy
NMDS-SC	National Minimum Dataset for Social Care
NFU	National Farmers Union
NHS	National Health Service
NLW	National Living Wage
NMW	National Minimum Wage
NOMIS	Web-based database of labour market statistics
Non-EEA	Not from European Economic Area
Non-EU	Not from European Union
NQF	National qualifications framework
NRS	National Records of Scotland
OBR	Office for Budget Responsibility
OECD	Organisation for Economic Co-operation and Development
ONS	Office National Statistics
P.E	Physical Education
PhD	Doctor of Philosophy
POLAR	Participation of local areas
PTR	Pupil Teacher Ratio
RCoS	Restricted Certificate of Sponsorship
RCVS	Royal College of Veterinary Surgeons
Red	Recruitment for Education
RLMT	Resident Labour Market Test
RoI	Republic of Ireland

RQF	Regulated Qualifications Framework
SIC	Standard Industry Classification
SME	Small and Medium-sized Enterprises
SOC	Standard Occupational Classification
SOL	Shortage Occupation List
ST	Specialty Training
STEM	Science, Technology, Engineering and Mathematics
STEMM	Science, Technology, Engineering, Mathematics and Medicine
STP	Scientist Training Programme
STRB	School Teachers Review Body
SWAN	Scientific Women's Academic Network
Tier 2 (G)	Tier 2 (General) Visa
TIGA	The Independent Game Developers Association
TSM	Teacher Supply Model
UCAS	Universities and Colleges Admissions Service
UKIE	Association for UK Interactive Entertainment
UKLA	United Kingdom Lubricants association
UKVI	UK Visas and Immigration
UX	User Experience
VFX	Visual Effects
YMS	Youth Mobility Scheme
ZHC	Zero Hours Contract

Migration Advisory Committee report
https://www.gov.uk/government/organisations/migration-advisory-committee

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