EUROPEAN LABOUR AUTHORITY

Report on Labour Shortages and Surpluses

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Statistics FMSSFE

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Contents

Country codes

Code	Country	Code	Country	Code	Country	Code	Country
AT	Austria	EE	Estonia	LT	Lithuania	RO	Romania
BE	Belgium	EL	Greece	LU	Luxemburg	SE	Sweden
BG	Bulgaria	ES	Spain	LV	Latvia	SI	Slovenia
CH	Switzerland	FI	Finland	MT	Malta	SK	Slovakia
CY	Cyprus	HR	Croatia	NL	The Netherlands		
CZ	Czechia	HU	Hungary	NO	Norway		
DE	Germany	IE	Ireland	PL	Poland		
DK	Denmark	IT	Italy	PT	Portugal		

Abbreviations and acronyms

Acronym	Full title
ISCED 11	International Standard Classification of Education; 2011
ISCO 08	International Standard Classification of Occupations; 2008
LFS	Labour Force Survey
NCOs	National Coordination Offices
PES	Public Employment Services
PP	Percentage points
STEM	Science, Technology, Engineering, Mathematics

Definitions

Variable	Definition
Inflows	Persons who establish their usual residence in a country for at least 12 months having resided previously in a different country
Skills shortage	A skills shortage occurs where there is an insufficient supply of persons with the appropriate skills.
Skills surplus	A skills surplus occurs where the supply of persons with the appropriate skills is greater than the market requires.
Labour shortage	A labour shortage occurs where there is a sufficient number of skilled persons but an insufficient number of them are able take up employment in the occupation and location in question.
ISCED 0-2	Persons who are unqualified or who have only participated in lower secondary education or second stage of basic education.
ISCED 3-5	Persons who have completed the secondary school cycle but who have not progressed to further education or training programmes.
ISCED 5+	Persons who have participated in programmes that are classified as being on a level above the basic secondary school cycle.

Executive summary

The geographic area covered by this study includes 30 countries and regions including 25 EU Member States, three autonomous Belgian regions[1] and Norway and Switzerland. The data on shortage occupations was provided by the EURES National Coordinating Offices (NCOs) in all 27 countries and the three Belgian regions and the data on surplus occupations by the NCOs in 24 countries and one Belgian region. In general, the data refers to the latter half of 2020 and the first quarter of 2021[2].

Many of the findings of this report are consistent with the impact of major economic and social trends such as the green agenda, the rapid and widespread diffusion of digital technologies, and the ageing of the European population. A discussion on labour shortages and surpluses in times of the COVID-19 pandemic is also included.

The report provides detail on the nature of labour shortages and surpluses including their extent and severity, and the profile of those who were working in these shortage and surplus occupations in the EU in 2020. That profile includes their education attainment and gender.

An illustrative exploration is also undertaken of the relationship between labour mobility and imbalances of shortages and surpluses across countries. While the initial results suggest that migrants may make a positive contribution to alleviating labour shortages, more data is required to test whether the results are statistically significant.

Key findings: shortage occupations

- A total of 28 occupations, employing 14% in the EU workforce in 2020 (27 million), were classified as shortages – and 19 occupations were classified as shortages of high magnitude.
- Healthcare occupations were prominent, as were STEM occupations at all levels.
- Shortage occupations are characterised by a share of female employment which was significantly below the overall female employment share.
- Most employees in shortages occupations had a medium level of education; the share of those with higher levels of education was a little below the average for all occupations, as was the share of those with a lower level of education.
- Many of these shortages were ubiquitous; consequently, the potential for matching shortages with surpluses across frontiers was limited. Nevertheless, the data indicates that a potential for matching does exist in certain local, niche markets.
- The findings provide some evidence that migrant workers contribute to alleviating shortages, but more research on this topic is required.
- The findings provide evidence that the pandemic has accentuated shortages among healthcare professionals and in some other skills, most notably toolmakers and software related skills.

[1] The feasibility of combining the three Belgian regions into a national profile will be discussed for the 2022 report.
[2] Two countries/regions provided 2019 data, while one country provided data prior to 2019.

Key findings: surplus occupations

- A total of 24 occupations, employing 17% in the EU workforce in 2020 (32 million), were showing labour surpluses – and 10 occupations were classified as surpluses of high magnitude.
- Clerical occupations were prominent, as were hospitality and personal services, but there were some graduate occupations also. The female share in these surplus occupations was significantly higher than their share among all occupations.
- Most employees in surplus occupations had a medium level of education; the share with higher levels of education was significantly below the average for all occupations, but the share with a lower level of education was higher.
- The share of migrant workers was not significantly different compared to labour shortages. Migrant workers appear to be attracted to certain countries. Their representation in some countries was very low, but in others, their share in both shortage and surplus occupations was relatively high.

Recommendations

- EU and national campaigns could promote the usefulness of acquiring medium level vocational qualifications – particularly vocational qualifications associated with construction and engineering.
- Female and male jobseekers should be further encouraged to pursue non-traditional career paths. The findings suggest that the diffusion of technology is fuelling a demand from employers for STEM qualifications, and female workers are significantly disadvantaged by the current levels of occupational gender segregation. However, males are also significantly under-represented in some occupations such as nursing, and the recommendation applies equally to them.
- Member States should be encouraged to submit all their vacancies to the EURES portal and to do so in a timely manner. While the portal alone may not provide a comprehensive overview of vacancies, it has the potential to be a useful source of intelligence on labour demand.
- Discussions should take place with EURES on how best to utilise the data from the report for developing a greater understanding of the potential for cross-border matching, particularly in local areas or niche markets.
- The link between labour shortages and surpluses and major social and economic trends, for example, digitalisation and climate change, should be explored in future reports, perhaps through a more qualitative analysis.
- Employers should be encouraged to adopt a ‘human capital management’ approach to recruitment and retention of staff. This approach includes the possibility of recruiting persons who may be under-qualified for the job and upskilling them. It might also involve reskilling clerical workers whose job is being replaced by digital technologies.
- The findings of this study suggest that it is difficult to fill vacancies for some elementary occupations. Policymakers and employers should consider how such occupations could be made more attractive to jobseekers, through for example introducing more flexible hours or indeed remote working where that is feasible.
- Changes in shortage or surplus occupations over the next couple of years should be monitored as they will provide an insight into the extent to which the pandemic has created structural change in the demand and supply of skills or whether such changes are temporary.

1.0 Background, scope, and methodology

1.1. Background

The annual EU report on labour shortages and surpluses has been produced by DG Employment, Social Affairs, and Inclusion since 2016. In 2021, the responsibility for producing the report has been transferred to the European Labour Authority (ELA).

The purpose of the annual report is to implement Article 30 of EURES Regulation (EU) 2016/589, which states the following:

'Each Member State shall, in particular, collect and analyse gender-disaggregated information on: (a) labour shortages and labour surpluses on national and sectoral labour markets, paying particular attention to the most vulnerable groups in the labour market and the regions most affected by unemployment; (b) EURES activities at national and, where appropriate, cross-border level. The EURES National Coordinating Officers (NCO's) shall be responsible for sharing the available information within the EURES network and contributing to the joint analysis.'

1.2. Scope and methodology

The ELA circulated a template (see Annex 1) to the NCOs of 29 countries and 3 regions seeking detailed information on shortage and surplus occupations. These countries and regions include the 27 Member States of the European Union (EU) plus Iceland, Norway, and Switzerland. In the case of Belgium, the NCOs of the three autonomous regions, namely the Flemish Region, the Brussels-capital region, and the Walloon Region, provided their own regional data[3].

Table 1.1 Participating countries and regions

Countries and regions which submitted data on shortage occupations
AT, BE Actiris, BE Le Forem, BE VDAB, BG, CH, CY, CZ, DE, DK, EE, EL, ES, FI, HR, HU, IE, IT, LT, LU, LV, MT, NL, NO, PL, PT, RO, SE, SI, SK
Countries and regions which submitted data on surplus occupations
AT, BE Le Forem, BG, CH, CY, CZ, DE, DK, EE, EL, ES, FI, HR, HU, IT, LT, LU, LV, NL, PL, PT, RO, SE, SI, SK

Source: Analyses of data submitted by EURES National Coordination Offices

Templates from 30 of the 32 countries/regions were completed in respect of shortage occupations, while 25 templates were completed in respect of surplus occupations[4] (see Table 1.1). This is the highest response rate of any of the annual reports to date.

In half of the countries/regions, the reference period covered the first quarter of 2021, while 12 countries provided data for the latter half of 2020. In two cases, however, the data referred to 2019, while one country has not had the opportunity to analyse shortage or surplus occupations for some time. Thus, in the case of 27 of the 30 countries/regions who provided completed templates, the lists of shortage and surplus occupations were

[3] Due to the chosen methodological approach, the three Belgian regions will be presented separately in this report. An alternative approach, joining the regional information to give a national perspective, will be explored for the 2022 edition of this report.
[4] France and Iceland are missing from the analyses of shortage occupations. Malta, Ireland, VDAB (Belgium), Actiris (Belgium), and Norway did not provide data on surplus occupations.

constructed during the pandemic. While it is acknowledged that in the current labour market situation, characterised by the impact of the COVID-19 crisis, supply and demand on the labour market are dynamically changing and a continuous monitoring and analysis of shortages and surpluses would be beneficial for labour market actors, this report is limited to a 'snapshot analyses of the most recent information available at the time of data collection.

A wide range of sources was used to identify shortage and surplus occupations (see Table 1.2). The source most frequently used was the administrative data of the public employment services (PES). The indicators used included the ratio of jobseekers to vacancies and the length of time required to fill vacancies. Although occupations normally associated with high level qualifications (i.e., occupations classified as professional occupations in ISCO '08) are not traditionally associated with vacancies notified by employers to the PES, all 13 NCOs who based their analyses solely on PES administrative data identified at least one – and generally much more than one - professional occupation among their shortage or surplus occupations.

Table 1.2 Main sources used to identify shortages and surpluses

Sources	Number of NCOs
PES administrative data only	13
Combination of different sources	8
National occupation forecasts	5
Occupation barometer[5]	3
PES survey only	1

Source: Analyses of data submitted by EURES National Coordination Offices

Each country/region was requested to provide a range of information in respect of each identified shortage and surplus occupation. This information included the extent of the shortage or surplus (i.e., was it of low, medium, or high magnitude), and the anticipated duration of the shortage or surplus (i.e., current, medium term or future). Both the concepts of 'magnitude' and 'duration' were defined in quantitative terms[6] to give an indication of how 'severe' the shortages or surpluses were. There was some difficulty experienced estimating the severity of shortages and surpluses and only 17 of the 30 countries/regions were able to provide this data.

The sources used in some countries/regions to identify shortage occupations may be the reason why some countries/regions did not provide data on surplus occupations.[7]

A total of 10 countries/regions indicated that their data referred to current shortages and surpluses, while 16 stated that their shortages and surpluses refer to the medium-term future also. Four countries/regions did not have information on the duration. Not surprisingly, those who based their identification of shortage and surplus occupations solely on PES administrative data tended to classify them as *current* shortages or surpluses.

Article 30 of EURES Regulation (EU) 2016/589 also requires information on the gender composition of shortage and surplus occupations and the extent to which vulnerable groups are represented in these occupations. This information was extracted from the EU Labour Force Survey, as it is more readily available from that source

The geographic distribution of shortage and surplus occupations is explored as is the extent to which the occupations on the list of widespread shortages are also identified as surpluses by other NCOs - thus facilitating

[5] An occupation barometer is often based on qualitative data and has a shorter time horizon than a typical forecast.
[6] See annex 1. The extent to which respondents adhered to the quantitative definitions is not known.
[7] For example, it may require more work to identify a surplus if the PES administration data is not used, as surpluses would not be generally identified in employer surveys or forecasting models or occupation barometers.

a cross-border match. The current most widely reported shortage occupation is 'plumbers and pipefitters' and it was identified by 19 NCOs; but it was not identified as a surplus by any of the 27 countries or the three regions.

There is also an analysis of the share of migrants in the most important shortage and surplus occupations. The purpose of this analysis is to establish whether inward migration contributes to alleviating labour shortages or contributes to accentuating labour surpluses[8].

The report also includes a section on the impact of the pandemic on the balance between skills demand and supply. Three different sources are used; data on employment in the shortage and surplus occupations in the pre-pandemic year (2019) and 2020; the results of the four previous reports, and the volume of vacancies notified to the EURES portal between the second quarters of 2019, 2020 and 2021.

The basic unit of analysis on shortages and surpluses in the report – unless otherwise stated - is the 4-digit occupation description of the International Labour Organisation (ILO) International Standard Classification of Occupations (ISCO '08). This is the highest level of granularity in the ISCO classification system, and it includes 436 specific occupations. It is chosen because that level of detail is required by those who are responsible for the provision of education and training programmes to identify the specific qualifications which are required by the labour market. A lower level of granularity (e.g., 3 digits) would entail combining 2 or more specific occupations and it would not be clear which specific occupation was associated with the identified shortage or surplus.[9]

Finally, the application of a range of different methodologies in the annual reports on labour shortages and surpluses means that there may be an element of 'subjectivity' in the results. For this reason, the findings from contemporary studies on this topic are consulted to determine whether the results from each report are consistent with those findings. To date, there has been a high level of consistency between the findings of contemporary studies on this topic and the results of the relevant editions of this report. [10] These studies strongly endorse the findings of this report.

The October 2016 CEDEFOP study 'Skills shortages in Europe, which occupations are in demand and why' illustrates the degree of overlap between the results of quite recent academic studies and this report. The study identified the top five shortage occupations as ICT, medical doctors, STEM occupations at both upper secondary and graduate levels, nurses and midwives, and teachers. The top four are on the list of most reported shortages in this report.

[8] There are other issues regarding the link between mobility and labour shortages and surpluses and it is recommended that they should be explored in the next edition of this report.
[9] Nevertheless, a lower level of granularity (i.e., 2 digits) is used in a small number of situations, mainly when the analysis is based on samples rather than administrative data, and when the use of the 4-digit codes would result in significant sample errors.
[10] For example, the July 2021 Eurofound study 'Tackling Labour Shortages in EU Member States' and the 2021 report on 'Tackling EU shortages in Member States'.

2.0 Prevalence, extent and severity of shortages and surpluses

2.1. Introduction

This chapter contains a detailed profile of the shortage and surplus occupations identified in 30 European countries/regions mainly in the latter half of 2020 and the first quarter of 2021. The focus of the chapter is on two aspects of the shortage and surplus. Firstly, how extensive they were both in terms of their geographic spread and the numbers of workers involved, and secondly, the severity of the shortage or surplus.

Each country/region was asked to limit the list of both shortage and surplus occupations to 30[11]. However, this was not always possible, and some countries/regions provided substantially more than 30 shortage or 30 surplus occupations, and some provided less.

2.2. Most widespread shortage occupations

The extent to which a shortage or surplus was 'widespread' is indicated by the number of countries/regions who classified the occupation as a shortage or surplus. Table 2.1 shows the 28 occupations which were identified as shortage occupations in at least nine different countries/regions[12]. The list of shortages is dominated by just four groups of occupations; healthcare related occupations; software professionals; construction, and engineering craft workers. These four occupation groups account for 21 of the 28 identified shortage occupations and for 64% of the total employment in the 28 occupations.

Table 2.1 Most often reported shortage occupations

Occupation	Number of reporting countries/regions	Occupation	Number of reporting countries/regions
Plumbers and Pipe Fitters	19	Applications Programmers	11
Nursing Professionals	18	Health Care Assistants	11
Systems Analysts	17	Motor Vehicle Mechanics, Repairers	11
Welders and Flame Cutters	17	Nursing Associate Professionals	11
Heavy Truck and Lorry Drivers	16	Specialist Medical Practitioners	11
Civil Engineers	14	Civil Engineering Technicians	10
Software Developers	14	Metal Working Machine Tool Setters	10
Carpenters and Joiners	13	Toolmakers and Related Workers	10
Concrete Placers and Finishers etc.	13	Accountants	9
Generalist Medical Practitioners	13	Air Conditioning/Refrigeration Mech.	9
Agricultural & Ind. Machinery Mechanics	12	Cooks	9
Bricklayers and Related Workers	12	Roofers	9
Building and Related Electricians	12	Software Developers nec.	9
Electrical Mechanics and Fitters	**12**	Web and Multimedia Developers	9

Source: Analysis of data submitted by EURES National Coordination Offices

[11] The figure 30 was considered suitable because it generates almost 2,000 occupations in the responses (Table 3.1)
[12] If shortage occupations identified by eight countries/regions were included in the list, the number of occupations would have significantly exceeded 30.

There were just over 27 million working in the 28 most prevalent shortage occupations in the EU27 in 2020. While the 28 occupations represent only 6% of the 436 occupations in the ISCO'08 classification, the numbers employed in those occupations represent 14% of the 189 million employed in all occupations in 2020.

Table 2.2 The numbers employed in the identified shortage occupations in 2020

Occupation	Number employed in the EU27 (000's)	Occupation	Number employed in the EU27 (000's)
Plumbers and Pipe Fitters	924	Applications Programmers	743
Nursing Professionals	1087	Health Care Assistants	1578
Systems Analysts	684	Motor Vehicle Mechanics and Repairers	1398
Welders and Flame Cutters	678	Nursing Associate Professionals	2655
Heavy Truck and Lorry Drivers	2548	Specialist Medical Practitioners	857
Civil Engineers	545	Civil Engineering Technicians	712
Software Developers	1006	Metal Working Machine Tool Setters	1146
Carpenters and Joiners	626	Toolmakers and Related Workers	622
Concrete Placers and Finishers etc.	283	Accountants	1320
Generalist Medical Practitioners	561	Air Conditioning/Refrigeration Mechanics	158
Agricultural & Ind. Mach. Mechanics	1509	Cooks	1875
Bricklayers and Related Workers	1224	Roofers	215
Building and Related Electricians	1023	Software and Applications Developers nec	270
Electrical Mechanics and Fitters	**715**	Web and Multimedia Developers	99

Source: Analysis of data from Eurostat

The reason why the share of employment is much greater than the share of occupations is because some of the identified shortage occupations are associated with very high employment. For example, while the average employment in an ISCO 4-digit occupation in 2020 was 440,000, there were almost 7 million workers employed in the five healthcare shortage occupations, and 3.3 million employed in the five construction related crafts (see Table 2.2).

2.3. Shortages of high magnitude

Information on the relative severity of the shortages was also requested and 18 countries/regions provided the relevant data. The severity of the shortage is indicated by the number of countries/regions who rated the shortage as being of high magnitude, understood as a lack of employees amounting to more than 3% of the current employment in that occupation.

The 19 occupations which were most often rated as the most severe shortage occupations are shown in Table 2.3. These occupations include four of the five healthcare occupations from the list of most widespread shortages and four of the five software occupations (see Table 2.1).

However, it also includes two occupations, home-based personal care workers and contact centre information clerks, which are not included in the list of the most widespread shortages because they were identified by fewer than nine countries/regions.

The list of severe shortages includes two occupations, nurses and civil engineers, which are included at both professional and technician levels. In the case of nursing, this reflects the fact that nursing is not a degree occupation in some Member States (e.g., Germany), while the inclusion of civil engineers at technician level may be because technicians can do at least some of the jobs performed by professional civil engineers, and as a severe shortage of the latter has been reported, employers might turn to recruit civil engineering technicians instead.

There was 17,671 million working in the 19 most often mentioned as severe shortage occupations in 2020. This is equivalent to an average of 930,000 workers per occupation which is roughly similar to the average employment in the 28 most widespread shortage occupations in Table 2.1.

Table 2.3 High magnitude shortages reported by the highest number of countries/regions

Occupation	Number stating high magnitude of shortage	Occupation	Number stating high magnitude of shortage
Nursing Professionals	9	Health Care Assistants	5
Plumbers and Pipe Fitters	7	Civil Engineering Technicians	4
Software Developers	7	Civil Engineers	4
Systems Analysts	7	Concrete Placers and Finishers etc.	4
Welders and Flame Cutters	7	Contact Centre Information Clerks	4
Bricklayers and Related Workers	6	Home-based Personal Care Workers	4
Heavy Truck and Lorry Drivers	6	Nursing Associate Professionals	4
Applications Programmers	5	Sheet Metal Workers	4
Carpenters and Joiners	5	Web and Multimedia Developers	4
Generalist Medical Practitioners	5		

Source: Analysis of data submitted by EURES National Coordination Offices

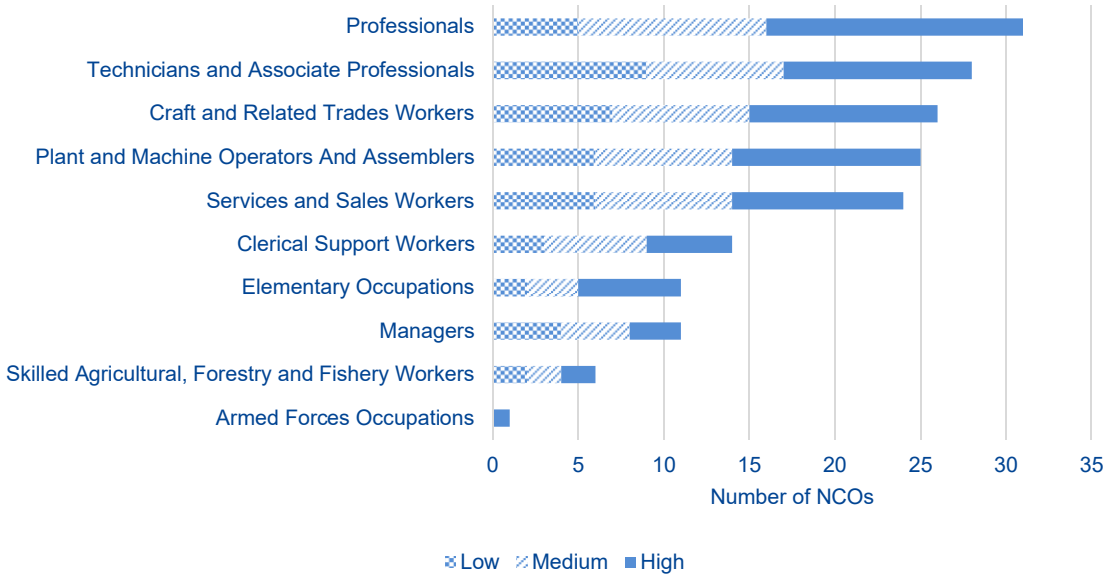
To explore whether there are specific qualification levels associated with different magnitudes of shortages, the number of occupations which attracted a shortage rating of 'high', 'medium' or 'low' were distributed across the nine broad ISCO occupation groups – each of which is associated with a predominant level of qualification[13].

The result of this analysis is shown in figure 2.1 below. Of the 18 NCOs who rated the shortage occupations by the degree of the severity of the shortage, 15 NCOs rated professional occupations as being of high magnitude, 11 NCOs as being of medium magnitude and five NCOs as being of low magnitude.[14] Indeed, in six of the nine broad occupation groups, more NCOs gave a high rating to the professional occupations than either a medium or a low rating. The exceptions were the clerical occupations, management occupations and skilled agricultural workers. However, only a few NCOs identified these occupations as shortages – hence their absence from both the list of the most widespread shortage occupations and the list of the most severe shortages.

While it may be surprising that the number of elementary occupations which attracted a 'high shortage' rating is greater than the number which attracted either a low or medium rating, the number of occupations is very small. Furthermore, the fact that in many European countries, several elementary occupations such as cleaners, boners, building labourers and farm workers have relatively high shares of migrant workers suggests that some jobseekers in the domestic labour force may consider such jobs to be unattractive, and this may give rise to shortages[15].

[13] For example, occupations in the professional groups have predominantly degree level qualifications; in the technical group sub-degree third level qualifications; in the crafts group a completed apprenticeship, the clerical group a completed second level qualification and so on.
[14] The total of 31 NCOs is much greater than the 18 NCOs who provided a rating. This is because many NCOs made ratings in each of the three rating categories.
[15] Elementary occupations which attracted a high rating included cleaners and labourers.

Figure 2.1 Shortages by estimated shortage magnitude (1-digit level)



Source: Analysis of data submitted by EURES National Coordination Offices

2.4. Most widespread surplus occupations

A total of 25 countries/regions submitted lists of surplus occupations to the EURES National Coordination Office. As the number of countries/regions submitting data on surpluses was lower than the number submitting data on shortages, the threshold for inclusion on the list of most widely reported surpluses (six) is lower than the threshold for the most widespread shortages (nine).

Table 2.4 Most often reported surplus occupations

Occupation	Number countries/regions reporting this occupation as surplus	Occupation	Number of countries/regions reporting this occupation as surplus
Shop Sales Assistants	11	Photographers	8
Car, Taxi and Van Drivers	10	Cooks	7
Receptionists (general)	9	Gardeners; Horticultural Growers	7
Waiters	9	Secretaries (general)	7
Administrative, Exec. Secretaries	8	Security Guards	7
Beauticians and Related Workers	8	Travel Consultants and Clerks	7
Building Construction Labourers	8	Cashiers and Ticket Clerks	6
Cleaners & Helpers in Offices etc.	8	Interior Designers and Decorators	6
Elementary Workers nec	8	Journalists	6
General Office Clerks	8	Kitchen Helpers	6
Graphic and Multimedia Designers	8	Sociologists, Anthropologists etc.	6
Hairdressers	8	Translators, Interpreters and Linguists	6

Source: Analysis of data submitted by EURES National Coordination Offices

At least six countries/regions identified 24 surplus occupations and these occupations are displayed in table 2.4 above. The 24 occupations are dominated by clerical occupations, personal services, sales, and graduate occupations. Some of the graduate occupations also appeared on the list of surplus occupations in last year's report, including journalists and sociologists and anthropologists.

Table 2.5 The numbers employed in the identified surplus occupations in 2020

Occupation	Number employed in the EU27 (000's)	Occupation	Number employed in the EU27 (000's)
Shop Sales Assistants	6470	Photographers	158
Car, Taxi and Van Drivers	1612	Cooks	1875
Receptionists (general)	423	Gardeners; Horticultural Growers	932
Waiters	1446	Secretaries (general)	2600
Administrative and Exec. Secretaries	1121	Security Guards	1222
Beauticians and Related Workers	513	Travel Consultants and Clerks	228
Building Construction Labourers	558	Cashiers and Ticket Clerks	1182
Cleaners & Helpers in Offices etc.	3682	Interior Designers and Decorators	118
Elementary Workers nec	228	Journalists	384
General Office Clerks	4518	Kitchen Helpers	836
Graphic and Multimedia Designers	478	Sociologists, Anthropologists etc.	66
Hairdressers	934	Translators, Interpreters and Linguists	207

Source: Analysis of data extractions from Eurostat

In general, the list of occupations which were identified as the most widespread surpluses were more diverse than the corresponding list of shortage occupations. Nevertheless, it is notable that not enough countries/regions cited an occupation from either the 'crafts and related trades' group or the 'plant, machine operators and assemblers' group to warrant their inclusion in the list of the most widespread surpluses.

Although they include only 24 different occupations, these occupations provided employment for over 31 million workers in the EU in 2020, significantly more than the numbers employed in the most widespread shortage occupations. Some of these occupations are associated with exceptionally high levels of employment such as shop sales assistants (6.5 million), general office clerks (4.5 million), cleaners (3.7 million) and secretaries (2.6 million).

2.5. Surpluses of high magnitude

A total of 13 countries/regions rated the extent of the surplus in terms of a high, medium, or low magnitude. There were only 10 occupations which were classified by at least three countries/regions as being surplus occupations of high magnitude (see Table 2.6). However, these 10 occupations provided employment for 21 million workers in the EU in 2020. The relatively high employment is because the occupations associated with exceptionally high levels of employment in the list of widespread surpluses are also included in the list of occupations with surpluses of high magnitude.

Table 2.6 High magnitude surpluses reported by the highest number of countries/regions

Occupation (note: 4-digit codes)	Number of countries/regions stating surplus is of high magnitude
Building Construction Labourers	**4**
Cleaners and Helpers in Offices, Hotels and Other Establishments	4
Cooks	**4**
Elementary Workers Not Elsewhere Classified	3
Gardeners; Horticultural and Nursery Growers	**3**
General Office Clerks	3
Manufacturing Labourers Not Elsewhere Classified	**3**
Mixed Crop and Livestock Farm Labourers	3
Shop Sales Assistants	**3**
Waiters	3

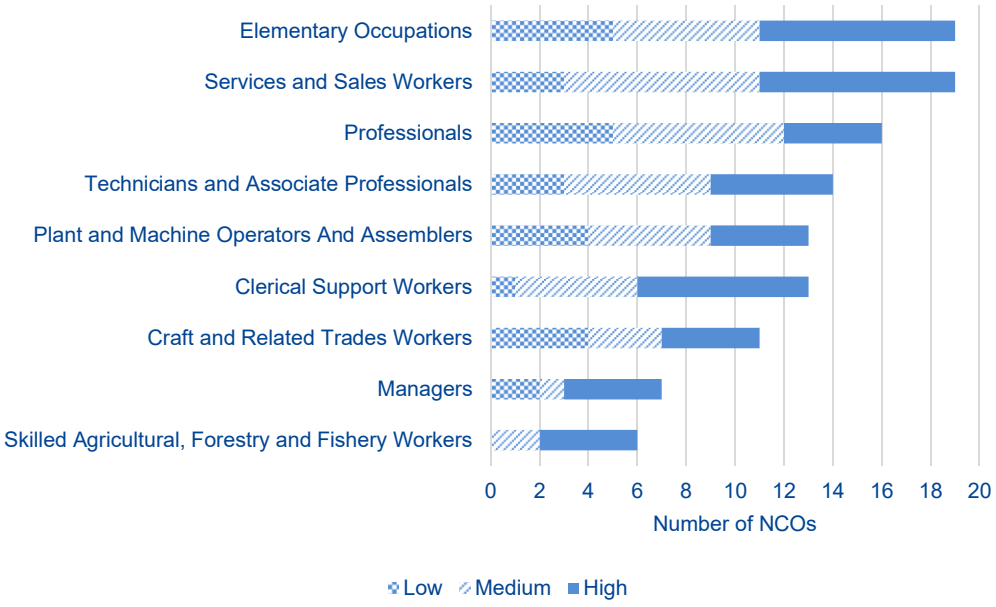
Source: Analysis of data submitted by EURES National Coordination Offices

Half of the occupations belong to the elementary group, and three of these occupations involve labouring.[16] A further three occupations are from the services and sales broad occupation category and involve cooking, waiting on tables, and retailing.

Figure 2.2 below shows the distribution of labour surpluses across the broad occupation groups and the number of NCOs who rated the magnitude of the surplus. Considering occupational groups, only four NCOs rated professional occupations as being of high magnitude compared to eight countries/regions who rated them as being of either medium or low magnitude.

However, the number of countries (seven) who rated clerical occupations as surpluses of high magnitude was greater than the total number of countries/regions who gave them a medium (5) or a low rating (1). This finding suggests that those who work in clerical occupations are vulnerable to unemployment.

Figure 2.2 Surpluses by estimated surplus magnitude



Source: Analysis of data submitted by EURES National Coordination Offices

2.6. Comparison of shortages and surpluses by broad occupation

Table 2.8 below provides information on the number of different occupations which were identified in the study and the number of times the occupation was mentioned as either shortage or surplus.

In terms of shortage occupations, the Table shows that a total of 333 different occupations were identified as a shortage at least once by a country/region out of a possible total of 436 occupations in the ISCO classification system. This represents a share of 76% of total occupations and indicates that shortages occur in many different occupations.

However, these shortages are not widespread; on the contrary, many of them are confined to a couple of countries/regions (see Table 3.1). As already shown, only 28 shortage occupations were identified by at least nine of the 30 reporting countries/regions.

[16] The inclusion of cooks should be treated with caution. Cooks appear on the list of both shortages and surpluses.

The highest number of shortages were identified in the broad group of professional occupations (77), followed by the group of associated professional occupations (59) and the craft group (51). However, when expressed in terms of the number of occupations which are in each group in the ISCO classification, the professional group contains the highest share (84%), but the share for the craft group (77%) is higher than the share for associate professionals (70%).

Only one country/region did not identify a professional occupation or an associate professional occupation as a shortage, while only two countries/regions did not identify a craft occupation as a shortage occupation.

The lowest number of shortage occupations occurred among the skilled agricultural workers, clerical workers, managers, and elementary workers. The position of managers however is worth noting because the 24 identified management occupation represent 83% of the occupations available in the ISCO system. This reflects the fact that a wide range of different management occupations were classified as shortages, but in each case, by fewer than nine countries/regions.

Table 2.7 Shortages and surpluses by broad occupation group

Main occupation groups	Shortages			Surpluses		
	Number of occupations ISCO08	Number of mentions	Number of countries/regions	Number of occupations ISCO08	Number of mentions	Number of countries/regions
Armed Forces Occupations	1	1	1			
Managers	24	63	15	11	18	10
Professionals	77	367	29	51	120	21
Technicians and Associate Prof.	59	185	29	41	97	20
Clerical Support Workers	18	43	19	22	81	19
Services and Sales Workers	29	91	25	28	120	23
Skilled Agriculture, Forestry, Fishery	9	20	11	6	13	9
Craft and Related Trades Workers	51	299	28	27	49	15
Plant/Machine Operators. Assemblers	40	142	25	22	43	17
Elementary Occupations	25	68	18	23	86	18
Total	333	1279	30	231	627	25

Source: Analysis of data submitted by EURES National Coordination Offices

In contrast, both the number and share of clerical and skilled agricultural occupations was relatively low. The 25 shortage occupations in the elementary group represent 76% of the elementary occupations in the ISCO classification, indicating that elementary occupations are considered unattractive by some jobseekers.

A total of 231 different occupations were classified as surplus occupations by 25 countries/regions. Perhaps surprisingly, the most surpluses were among the professional group of occupations (51). Furthermore, more than half (55%) of all the professional occupations in the ISCO classification were classified as a surplus occupation by at least one country/region.

However, in the case of surplus occupations, the share is highly relevant. This is especially true of the clerical occupations where more than three quarters of the occupations were classified as a surplus occupation by at least one country/region, while 70% of the occupations in the services and sales and elementary occupations were classified as a surplus.

Local shortages or surpluses are important from the perspective of the individual country or region, and they may contribute to matching a shortage in an occupation in one country or region with a surplus in that occupation in another country or region. Such matching possibilities might be particularly attractive between countries which were adjacent to one another, share the same language or are culturally compatible.

This issue is explored in the next chapter which contains an analysis on the potential for cross-border matching.

Main findings from chapter 2:

- Almost one in three workers were employed in a labour surplus or shortage occupation in the EU in 2020
- Healthcare and STEM related occupations featured strongly among labour shortages
- Clerical, retail, and personal services featured strongly among labour surpluses
- Many of the labour shortages and surpluses were rated as being of 'high magnitude'
- Professional, technical and craft occupations were most often reported as labour shortages
- Professional, sales and service occupations were most often reported as labour surpluses
- A few countries (three) reported very large numbers of labour shortages (90+)
- Only one county reported a large number of labour surpluses (50+)

3.0 Specific considerations on shortages and surpluses, vulnerable groups, and labour mobility

3.1. Introduction

Article 30 of EURES Regulation (EU) 2016/589 requests that labour shortages and surpluses should be disaggregated by gender, and that particular attention should be paid to vulnerable groups. It also seeks information on the geographic distribution of shortages and surpluses and on the relationship between labour mobility and labour shortages and surpluses.

The objective of this chapter is to give effect to Article 30 by exploring the gender composition of the most widely reported shortage and surplus occupations and by exploring the education qualifications of those who are working in these occupations, focusing on the relative position of the least educated.

Furthermore, the geographic distribution of shortages and surpluses is outlined, and an analysis is undertaken to identify those occupations which are on the list of most widely reported shortages, but which also have been reported in at least one other country/region as a surplus. The analyses also explore the relationship between labour mobility and the identified shortage and surplus occupations.

3.2. Gender composition of shortage occupations

Of the 27 million employed in the 28 most widespread shortage occupations in 2020, 8 million (29%) were female. This compares to a female share in all occupations of 46%.

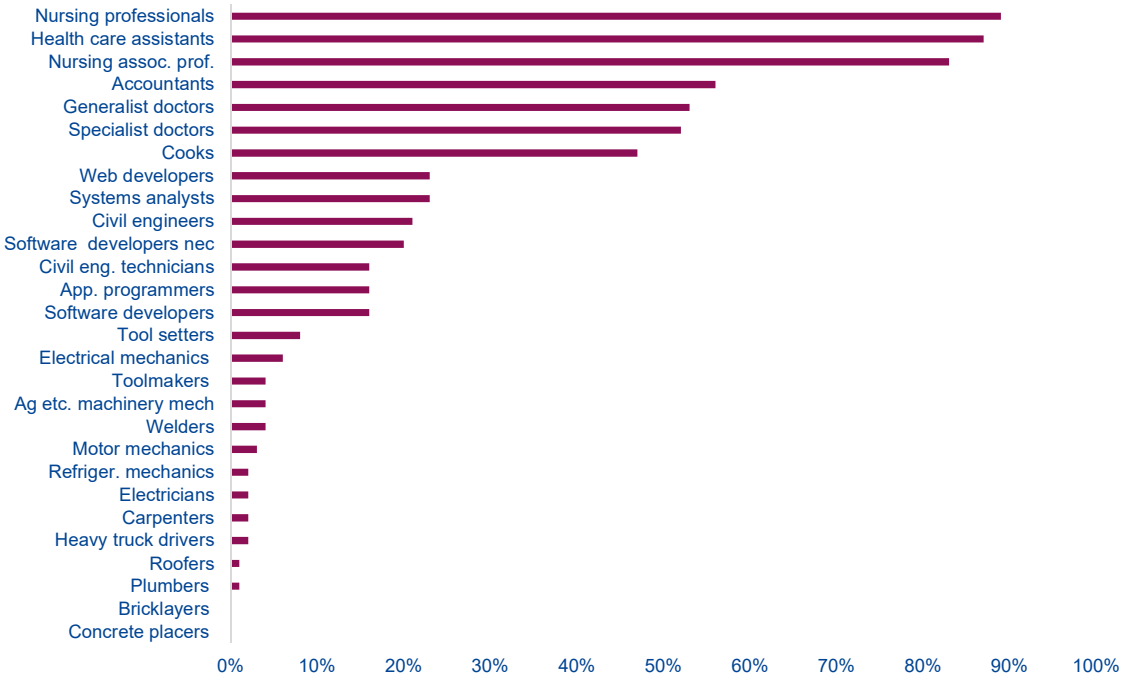
The female share would be significantly lower were it not for the presence of five healthcare occupations which together provide employment for almost 7 million females or 25% of the total employment in the 28 shortage occupations. The share of females among the healthcare occupations in 2020 was 78%.

The share of females in each of the most widespread shortage occupations is shown in Figure 3.1. Females are very poorly represented in most of the 23 non-healthcare occupations. The exceptions are accountants (56%) and cooks (47%). In the other 21 occupations, female representation is at best in the low 20s and in many cases is virtually absent.

Among those occupations which have been identified as severe shortages, the female representation rises to 38%. This is due to two reasons. Firstly, four of the five healthcare occupations from the list of widespread shortages are also on the list of the 19 shortage occupations of high magnitude, while two additional occupations – which did not qualify for inclusion in the list of more widespread shortages – home-based personal care workers and contact centre information clerks – have a high share of female workers.

Also, the total number of females in the 19 severe shortage occupations is considerably lower than the number in the 28 widespread shortage occupations and this drives the share higher.

Figure 3.1 Share of females in the most widespread shortage occupation, 2020



Source: Analysis of Eurostat data

3.3. Gender composition of surplus occupations

While females are significantly under-represented in shortage occupations, they are significantly over-represented in the 24 surplus occupations. Thus, of the 32 million who are employed in these occupations, 21 million are females representing a share of 65% or almost two out of three working in widespread surplus occupations in 2020.

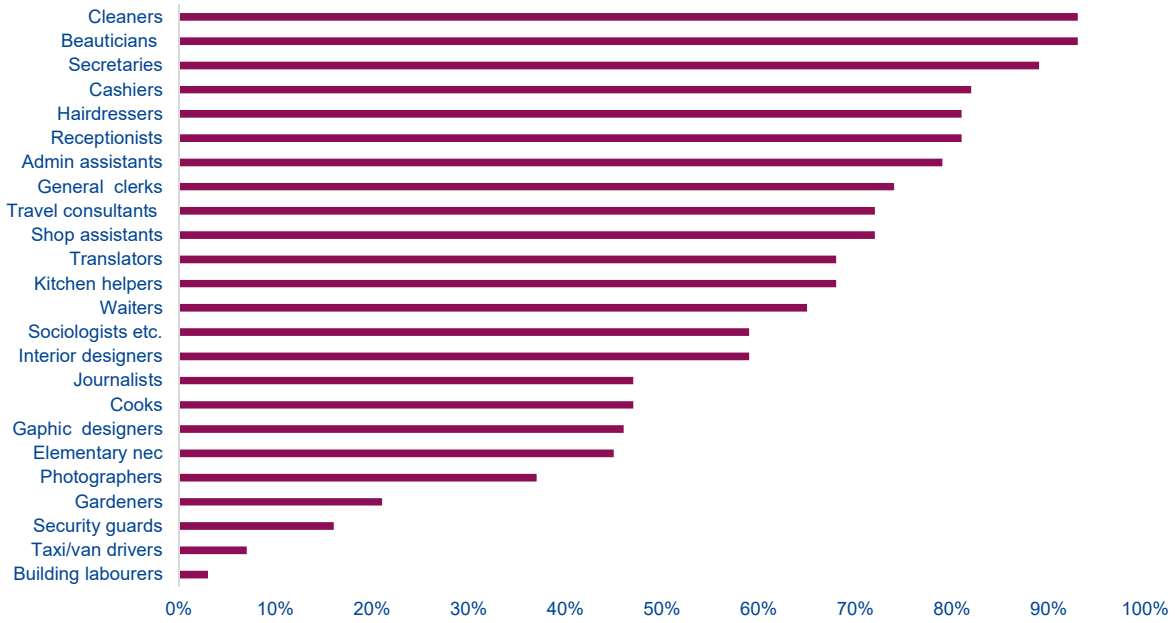
The relatively high share of female workers is evident in most of the occupations; indeed, only six occupations - a quarter of the 24 surplus occupations – have a female share below the EU average of 46% (see Figure 3.2). Furthermore, many of the occupations have very high female shares – the first six occupations each have shares of over 80%.

The same share of female workers is evident in the 10 occupations which were identified as having surpluses of high magnitude.

The employment prospects of a jobseeker are enhanced if he or she is qualified to work in an occupation which is identified as a shortage. Conversely, their prospects are diminished if they are only qualified to work in occupations which have been identified as labour surpluses.

The fact that females are strongly over-represented in the most widespread surplus occupations and do not feature to any meaningful extent in many of the widespread shortage occupations is a cause for concern, and a recommendation to encourage females to pursue non-traditional careers is included in chapter 5.

Figure 3.2 Share of females in the most widespread surplus occupations, 2020

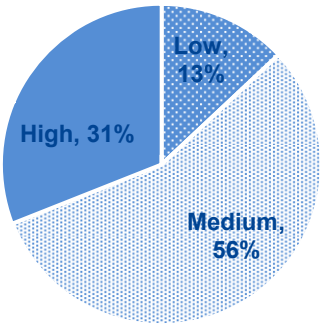


Source: Analysis of Eurostat data

3.4. Education levels of workers in the most widespread shortage occupations

In the European Union in 2020, the share of workers with a high, medium, or low education attainment was 36%, 48% and 16% respectively. In the 28 occupations on the list of widespread shortages, the share in 2020 was 31%, 56% and 13% respectively. Thus, the share of highly qualified workers and the share of lowly qualified workers among the shortage occupations was a little below the average for all occupations in the EU27, while the share of medium level qualified workers was higher than the average.

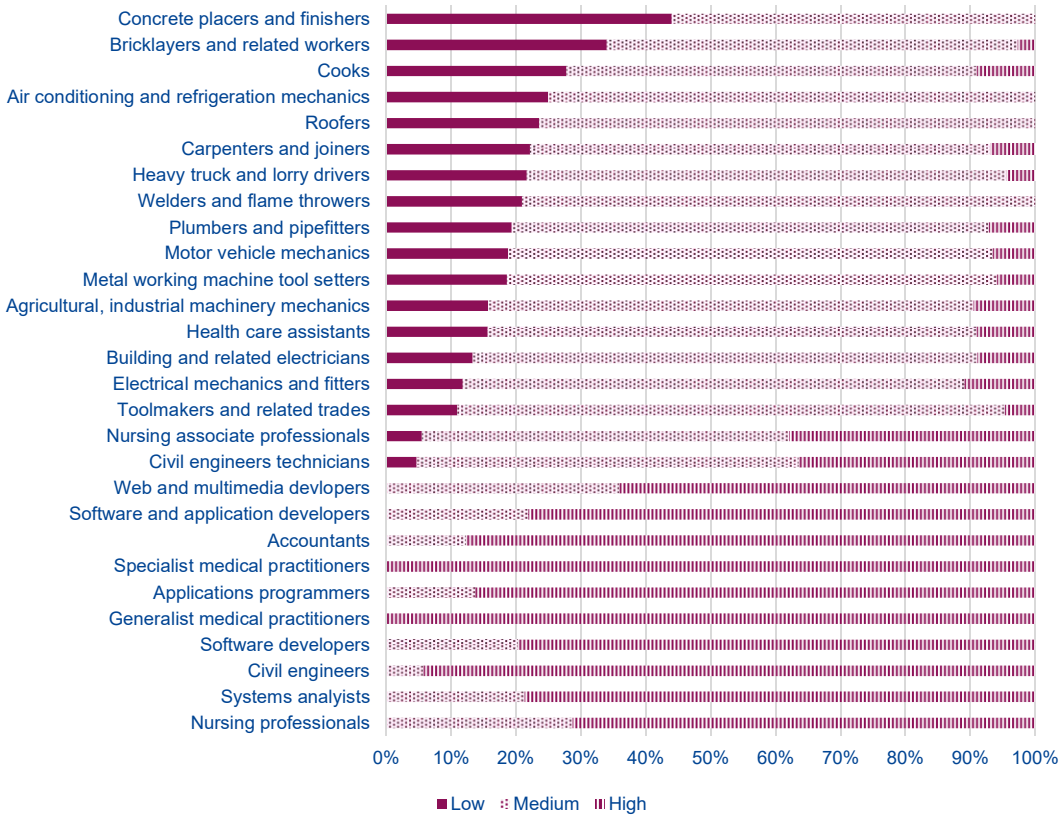
Figure 3.3 Overall education level of workers in shortage occupations, 2020



Source: Analysis of Eurostat data

The finding that the share of highly qualified workers in the 28 widespread shortage occupations is lower than the EU average is significant. It is due to the dominance of craft level occupations within the list of shortages. Only 10 of the 28 shortage occupations are classified by ISCO as professional (generally requiring a degree qualification) while at least 14 of the occupations require craft level skills – equivalent to a completed apprenticeship.

Figure 3.4 Education levels of workers in most widespread shortage occupations, 2020



Source: Analysis of Eurostat data

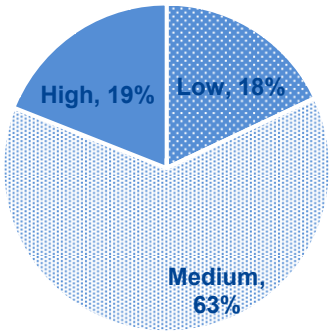
The finding provides evidence that it is not always the case that a jobseeker with a higher level of education is more employable than a jobseeker with a medium level of education. It very much depends on the type of occupation which the jobseeker is qualified to work in. The list of the most widespread surplus occupations contains four occupations in the professional category (see Table 2.1), while in contrast, the list of widespread shortage occupations contains at least 14 craft occupations (see Table 2.4).

This finding is an endorsement of the potential usefulness of training in a vocational skill – especially a skill delivered by the traditional apprenticeship system. Based on the results of this study, a person qualified in an engineering or construction related craft would appear to possess a technical skill set which is in demand throughout Europe.

3.5. Education levels of workers in the most widespread surplus occupations

Despite the inclusion of four graduate occupations in the list of 24 widespread surplus occupations, the share of workers with a third level qualification (19%) is significantly lower than the EU average (36%), while the share of workers with both medium (63%) and low qualifications (18%) are higher than the EU average.

Figure 3.5 Overall education level of workers in surplus occupations, 2020



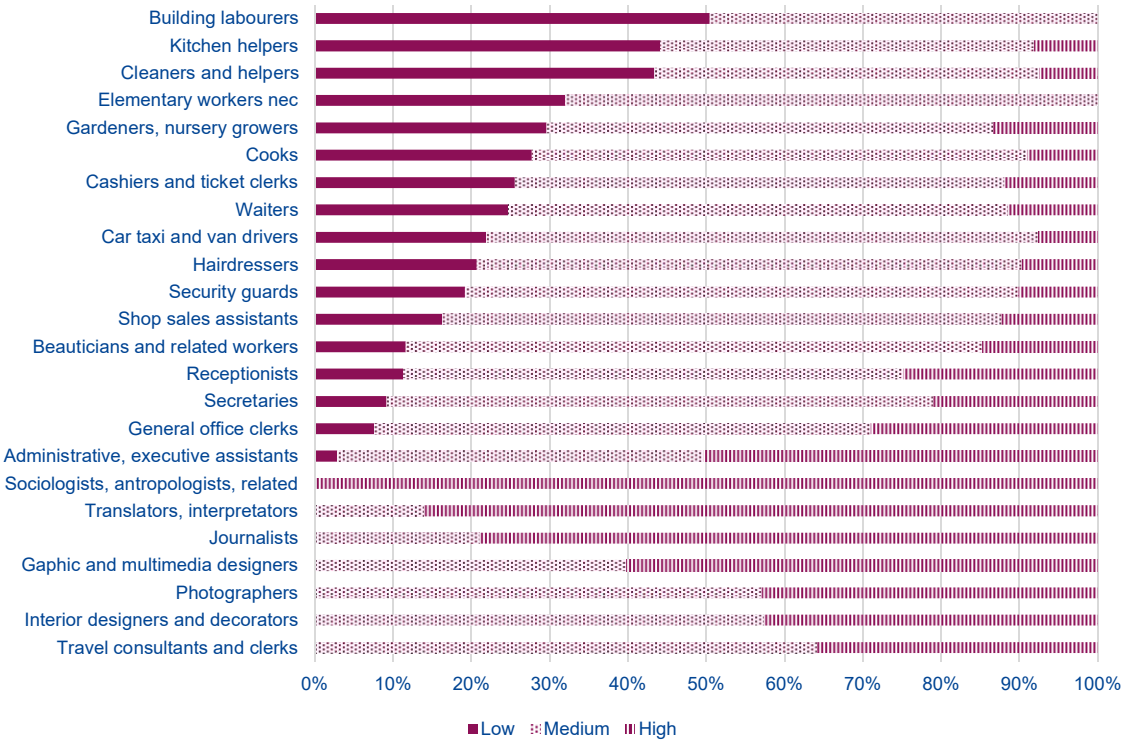
Source: Analysis of Eurostat data

While the share of workers with medium level qualifications in the most widespread surplus occupations is significantly higher than the EU average in 2020, these workers for the most part were not employed in craft occupations. Rather, they were employed in either retail or clerical occupations and the medium level qualification refers to the fact that they have completed the second level school cycle.

The share of those employed in all four elementary occupations in the widespread surplus occupations is very low (see Table 3.6). Half of all building labourers possess only the lowest qualification possible (i.e., 0-2 ISCED'11). Kitchen helpers and cleaners each have shares of over 40%, while other elementary workers (32%) have twice the EU average (16%).

There were over 5.3 million employed in these occupations in the EU in 2020, and their low education profile combined with their classification as working in occupations which are surplus to market requirements makes them vulnerable to becoming unemployed, and without further education and training, remaining unemployed.

Figure 3.6 Education levels of workers in most widespread surplus occupations, 2020



Source: Analysis of Eurostat data

3.6. Geographic distribution of shortages and surpluses

The geographic distribution of shortage occupations is shown in Table 3.1 below. The figures reveal a considerable variation in the number of shortage occupations which each country/region reported. Both Norway and Actiris (Belgium) identified more than 100 occupations, while Slovenia identified 93. In contrast, Greece only reported 11 shortage occupations. There are of courses differences in wealth which may explain to some extent the large disparity between the number of shortage occupations reported by, for example, Greece and Norway.[17]

The most frequently cited occupations were in the professional group, and they were particularly prominent in the submissions of Norway, Actiris (Belgium), Slovenia, Ireland, Sweden, and Estonia. Greece did not cite any shortages among professional occupations, Czechia and Hungary identified one, Croatia and Malta identified three, while Poland and Slovakia identified four.

The figures in Table 3.1 confirm that the sources used in this report for identifying shortage occupations - including the administrative data of the PES – could identify a wide range of professional occupations. A total of 29 countries/regions identified at least one graduate occupation as a shortage, which is one more than the number who identified a craft occupation as a shortage, although the latter traditionally has been more associated with vacancies notified to public employment services.

[17] GDP per capita in 2020 was 15,177 Euros in Greece compared to 57,779 in Norway.

Table 3.1 Number of shortage occupations mentioned by broad occupation groups[18]

Country	Managers	Professionals	Technicians	Clerks Support workers	Services Sales workers	Farmers Foresters Fishing	Craft Trades workers	Operatives	Elementary workers	Total
Austria		5	9	1			15			30
BE Actiris	14	46	20	5	8		13	5	1	112
BE Le Forem	7	9	7				7			30
BE VDAB	2	6	12		1		5	2	1	29
Bulgaria	2	9	4	3	6		4	3		31
Croatia		3	1		4	1	22	4	5	40
Cyprus		8			3		5	4	2	22
Czechia		1	1	1	2	1	8	11	5	30
Denmark	1	6	4		4	1	7	4	2	30
Estonia	1	18	8	1	5	2	16	9	3	63
Finland		10	4		1		9		2	26
Germany	1	6	8		2	1	9	3		30
Greece			2	1	1		3	4		11
Hungary		1	2	2	3		7	4	11	30
Ireland	1	24	4	2	1		3			35
Italy	2	16	4	1				3		26
Latvia		5	4		2		14	3	2	30
Lithuania		5	1				16	6	2	30
Luxembourg	8	14	5	1	1		1			30
Malta	1	3	3	4	7		5	4	3	30
The Netherlands	1	9	5	4	1	1	8	1		30
Norway	20	67	43	10	19	8	44	29	10	250
Poland		4	2	1	2		14	3		26
Portugal		7	1	1	2		11	8	1	31
Romania	1	7	4	2	1	1	4	7	3	30
Slovakia		4	3	1	3	1	11	5	2	30
Slovenia		25	10	1	8	1	30	11	7	93
Spain		9	3	1	2	2	2	5	6	30
Sweden		25	7				6	3		41
Switzerland	1	15	4		2			1		23
Grand Total	63	367	185	43	91	20	299	142	68	1278

Source: Analysis of data submitted by EURES National Coordination Offices

Table 3.1 also shows that there are very few clerical occupations which are considered shortage occupations. Indeed, 11 countries/regions did not identify any clerical occupations, while a further 11 identified only one such occupation.

Professional occupations also feature strongly in the number of countries who identified surplus occupations. The total number of professional occupations mentioned was 120 – the same as the number of occupations mentioned in the service and sales broad occupation group (see Table 3.2). Almost all countries/regions identified at least one labour surplus among these two broad occupation groups; only four countries/regions did not identify a

[18] The army is excluded, but only one occupation was mentioned by one country as a shortage.

professional occupation, while only two did not identify an occupation in the service and sales broad occupation group.

Table 3.2 Number of surplus occupations mentioned by broad occupation group

Country or Region	Managers	Professionals	Technicians	Clerks Support workers	Service Sales workers	Farmers Foresters Fishing	Craft Trade workers	Operatives	Elementary workers	Total
Austria		4	9	1	1		13	2		30
BE Le Forem		3	4		14		1	2	6	30
Bulgaria		3		2	9	2	2	4	8	30
Croatia		2								2
Cyprus		2		3	1				1	7
Czechia	1	2	7	6	8			1	6	31
Denmark	1	4	1	3	9	1		3	8	30
Estonia	3		4	3	1					11
Finland		8	5	5	6		5	1		30
Germany		7	1	3	4		1	3	9	28
Greece	2	8	3		5	2	2		8	30
Hungary			1	2	8	1	6	4	8	30
Italy	3	11			3			1	2	20
Latvia	1	1	8	6	8		1	4	1	30
Lithuania	2	10	8	3	5				2	30
Luxembourg			1	4	2	1		1	1	10
The Netherlands		7	6	4	11		1	1		30
Poland		1								1
Portugal	2	9	3	6	2	2	1	1	4	30
Romania	2	8	7	3	2	1	3	2	2	30
Slovakia			2	3	8		4	5	8	30
Slovenia		9	4	4	2				1	20
Spain	1	9	10	2	2	1	1	2	2	30
Sweden		8	9	18	7		4		9	55
Switzerland		4	4		2	2	4	6		22
Grand Total	18	120	97	81	120	13	49	43	86	627

Source: Analysis of data submitted by EURES National Coordination Offices

Both clerical occupations and – perhaps surprisingly – technical occupations had a high incidence of identification as surplus occupations. A total of 20 out of 25 countries/regions identified at least one technical occupation as a labour surplus while the corresponding figure for clerical occupations was 19.

In contrast, only 15 countries/regions identified at least one craft occupation as a labour surplus.

These findings are consistent with the findings of previous editions of this study, and they suggest that in some situations, employability may be more related to the type of work rather than the level of education. For example, the findings suggest that a person qualified in sociology may be less employable in their chosen profession than a person qualified as a plumber.

With the notable exception of healthcare, it appears to be the case that technical work is associated with higher employment prospects than non-technical work. Furthermore, this finding appears to apply between occupations which require different levels of education. Thus, some graduate and clerical occupations are widely classified as labour surpluses, while most crafts are classified as shortage occupations.

3.7. Labour shortages/surpluses and labour mobility

Article 30 of EURES Regulation (EU) 2016/589 requests that attention should be given to the cross-border dimension of labour shortages and surpluses and to labour mobility. This is addressed in the first instance by identifying which, if any, of the 28 labour shortages were also classified as a labour surplus. The results are displayed in Table 3.3 below.

Table 3.3 Number of cross border matches for the most reported labour shortages

Occupation	Number of NCOs reporting shortages	Number of NCOs reporting surpluses
Welders	17	1
Truck drivers	16	2
Civil engineers	14	1
Ag. Industrial mechanics	12	2
Bricklayers	12	3
Electricians	12	1
Electrical mechanics	12	1
Motor mechanics	11	4
Civil engineering technicians	10	1
Toolmakers	10	2
Accountants	9	1
Cooks	9	7
Bakers	8	1
Butchers	8	2
Construction supervisors	8	1
Contact centre clerks	8	1
Plasterers	8	1
Machine operators (plastics)	8	2
Stationary plant operators	8	2

Source: Analysis of data submitted by EURES National Coordination Offices

Several features of this Table are worthy of note. Firstly, only 12 of the 28 occupations in Table 2.1 are included; the other 16 occupations are excluded because they are not identified as a surplus occupation by even one country or region. Among these 16 occupations are all five software professionals and all five healthcare occupations. This finding confirms that many of the most widespread *and* the most severe shortage occupations are not considered to be in surplus *anywhere* in the EU.

Secondly, as only 12 of the 28 most widespread shortage occupations could be included in Table 3.3, it was decided to extend the list of widespread shortage occupations in the table to 19 by including seven occupations which were identified by at least eight different countries/regions.

As shown in Table 3.3, the number of NCOs who reported a labour surplus for any of the 19 shortage occupations is limited. Only one NCO reported a surplus for 10 of the 19 occupations, while only two NCOs reported a surplus for a further six occupations.

The occupation with the highest incidence of potential cross-border matching was cooks[19], followed by motor mechanics and bricklayers. The results indicate that the extent to which labour shortages and surpluses can be alleviated through cross-border matching is limited.

[19] Hungary identified this occupation as both a shortage and a surplus based on regional differences.

However, as shown in Table 2.7, there were 333 different shortage occupations and 231 different surplus occupations identified by the NCOs. This implies that there were at least 128 matching occupations[20] – albeit most of these matches would have consisted of only one country or region in the identification of the shortage or surplus.

Nevertheless, information on such matches might be useful to EURES especially if the potential matches occur between countries which have strong historic and cultural ties and whose labour markets are broadly similar, and who are in close proximity to one another. This is illustrated in the following.

Table 3.4 displays the results of an analysis of the labour shortages and surpluses in the Baltic States. The definition of a match in the table is that the occupation has been identified as a labour shortage in one of the three countries in the group, and as a labour surplus in at least one of the other two countries in the group.

Table 3.4 Matching labour shortages and surpluses across the Baltic Sates

Labour surpluses	Labour shortages		
Countries	Estonia	Latvia	Lithuania
Estonia	X	No match	No match
Latvia	No match	X	Farm, livestock labourers
Lithuania	Physiotherapist technicians, assistants	No match	X

Source: Analysis of data submitted by EURES National Coordination Offices

The results show that there were only two occupations which were classified as a shortage in one of the countries and a surplus in one of the other countries. The occupation of physiotherapist technicians and assistants was identified by Estonia as a labour shortage and by Lithuania as a labour surplus. Latvia identified farm labourers as a surplus, while Lithuania identified them as a labour shortage.

A similar analysis (see Annex 2) shows that bricklayers, toolmakers, cooks and truck drivers are shortage occupations in Czechia while there is a surplus in Slovakia; a labour market situation that might be balanced through cross-border awareness raising, information provision and active matching activities. Such potential seems even higher in the German-speaking cluster of Germany, Austria and Switzerland. Germany reports a shortage in civil engineers and civil engineer technicians, construction supervisors, agricultural and electrical as well as motor mechanics, and Austria shows a surplus for some of these occupations. For the latter, as well as for electricians (another shortage occupations identified by Germany), also Switzerland reports a surplus.

That said, the overall low number of matches appears inconsistent with the finding from Table 2.7 that 333 labour shortages and 231 labour surpluses were identified. However, a small number of countries identified large numbers of surpluses and shortages. Norway for example identified 250 shortage occupations, while Sweden identified 55 surplus occupations (Tables 3.1 and 3.2) Such relatively large numbers of labour shortages and surpluses generate a considerable volume of ‘matches’ between the countries concerned, but the findings of this report indicate that these situations are the exception.

Nevertheless, one of the recommendations of this report is that discussions should take place with EURES on how to best utilise the data on labour shortages and surpluses for a greater understanding of the potential for cross-border matching – including matching in neighbouring countries..

The report also includes a preliminary exploration of the possibility that there might be a statistical relationship between the incidence of inward migration and labour shortages and surpluses. In the case of shortages, this is done through exploring the employment patterns in the four skill groupings that account for most of the employment

[20] Even if the 231 surplus occupations included all the 103 occupations not identified as shortages, 128 occupations must have a match.

in the 28 widespread shortage occupations. The focus of the analyses is the share of immigrant workers[21] in these four skill groups and the extent to which this share impacts on the incidence of shortage.

Table 3.4 shows that the share of immigrants in the main skill groups associated with widespread shortages varied from 17% in the case of construction craft workers to 11% in respect of healthcare professionals. A comparison between the shares of total employment and the shares of immigrants within each skills group showed that there was no statistical difference between these shares for any of the four skill groups.

Table 3.5 Share of employment[22] of immigrants in the main skill groups[23] associated with widespread shortages, 2020

Skills groups	Total employed	Residents born elsewhere	Share of employment
Software professions	3,441,000	548,000	16%
Healthcare professions	5,161,000	541,000	11%
Construction craft workers	6,443,000	1,090,000	17%
Engineering craft workers	6,889,000	837,000	12%
Total employed	21,934,000	3,016,000	14%

Source: Eurostat combined with analysis of data from NCOs

However, as shown in Table 3.5, when the employed populations of native-born and immigrants in each of the four skill groups is distributed between the countries/regions which reported no shortage, shortages, and severe shortages, significant differences emerge. The analyses reveal that just over one in four (26%) were employed in these four skill groups in countries which did not report any labour shortages. However, within the immigrant sub-population, more than one in three were employed in these skill groups in these countries.

Table 3.6 Share of employment of immigrants by level of reported shortages, 2020

Countries	Total employed	Share of employed	Employed immigrants	Share of immigrants
Not reporting shortages	5,608,000	26%	974,000	36%
Reporting shortages	12,644,000	58%	1,312,000	49%
Reporting severe shortages	6,889,000	17%	385,000	14%
Totals	21,933,000	100%	2,671,000	100%

Sources: EUROSTAT combined with analysis of data from NCOs

The significant higher share of immigrants working in countries which did not report shortages in these skill groups suggests that immigrants may make a significant contribution to alleviating shortages. While further analyses are required, this tentative conclusion is supported by the fact that many of the countries who reported shortages have a very low share of immigrants working in the skill group where the shortages were identified. For example, countries such as Poland, Hungary, Romania Slovakia, and Bulgaria have very low shares of immigrants working in *any* of the skill groups where shortages have been identified in their countries. This issue should be further explored.

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[21] Immigrants in this context are defined as residents of the reporting country who were not born in the reporting country. Resident is defined as living in the reporting country for at least a year. There is no distinction between those who were born in an EU country or a third country because of the possibility that such a distinction would produce statistically unreliable data.

[22] Both Tables 3.4 and 3.5 include all the countries included in the study except for the three Belgian regions, as detailed data on the employment of immigrants is not available at regional level.

[23] Skill groups are represented by the 2-digit ISCO 08 code and there is a total of 43 such groups in the ISCO '08 classification.

Table 3.7 Share of employment of immigrants in the main skill groups associated with widespread surpluses, 2020

Skills groups	Total employed	Residents born elsewhere	Share of employment
Clerical workers	7,016,000	472,000	7%
Personal services	8,030,000	1,654,000	21%
Sales, services workers	11,800,000	1,295,000	11%
Total employed	26,846,000	3,421,000	13%

Sources: EUROSTAT combined with analysis of data from NCOs

While inward migration into an occupation which is identified as a shortage may contribute to alleviating that shortage, inward migration into an occupation which is identified as a surplus may accentuate that surplus and hence makes the mobile workforce in those occupations more vulnerable to unemployment.

It is *not possible* to explore if there is a causal relationship between the share of migrants and labour surpluses because there is not sufficient data to generate results which are statistically reliable. The number of countries reporting labour surpluses is lower – significantly so when the severity of the surplus is analysed. Furthermore, the list of widespread surpluses is more varied than the list of widespread shortages.

Nevertheless, it is *of interest* to quantify the share of migrants working in the surplus occupations which account for the most significant employment; these are clerical occupations, personal services occupations and sales and service occupations.

The results are shown in Table 3.7 above. The overall share of migrants working in these occupation groups is virtually the same as the overall share working in the four shortage occupation groups.

At least part of the explanation may lie in the fact that many of these occupations are relatively low skilled and in many cases there would be few if any barriers to entry, and this may appeal to some migrants. The sales and services group, for example, includes most of those who work in the retail sector. They include the occupation which is associated with the most widespread labour surpluses, ‘shop sales assistant’. Within the Member States, this occupation alone provided employment for 6.5 million people in 2020.

From a policy perspective, this raises the issue of the extent to which migrants working in labour surpluses may be over-qualified or indeed under-employed, with the risk of crowding-out the lower qualified workers.

The phenomenon of a relatively high share of migrant workers employed in occupations which have been identified as labour surpluses is not widespread. Indeed, several countries have virtually no migrants employed in either clerical occupations, personal services or the sales and general services occupation group. These countries include many of those who do not have migrant workers employed in the shortage occupations either and include Bulgaria, Hungary, Poland, Romania, and Slovakia.

The fact that in many countries there is a low share of residents who were not born in the country working in *both* the occupations identified as labour shortages and the occupations identified as labour surpluses raises broader issues, including the relative attractiveness of different countries to the migrant population. This issue warrants further research, and a recommendation to this effect is included in chapter 5.

Main findings from chapter 3:

- Gender segregation is very significant among labour shortages and surpluses
  - Fewer than one in three workers in labour shortages are female
  - But two in three workers in labour surpluses are female
- Most workers in labour shortages and surpluses have a medium level of education
- But cadre of 5 million low educated workers in surplus elementary occupations
- Strong concentration of vocational qualifications (construction, engineering) in labour shortages
- Matching of labour shortages with surpluses is limited from an overall EU perspective
- But potential may exist for matching in local and niche markets
- Some evidence that migrants contribute to the alleviation of shortages

4.0 Impact of the pandemic on labour shortages and surpluses

4.1. Introduction

This chapter contains an assessment of the impact of the pandemic on the demand for, and supply of skills in the European labour market.

The analyses use a combination of three data sources to make this assessment, the European Labour Force Survey, the findings of the current and previous studies on labour shortages and surpluses, and the EURES Portal on vacancies.

Using data from Eurostat, the analysis seeks to quantify the net change in total employment between 2019 and 2020 and to compare it to the net change in employment in each of the 28 widespread shortage and surplus occupations. Secondly, it explores the occupational composition of widespread shortages identified in previous issues of this report to establish whether there are any significant differences in the current period.

Finally, it explores the occupational composition of the vacancies notified to the EURES portal by the European public employment services during the pandemic and compares their composition to the occupational composition of vacancies in the same period in the pre-pandemic year of 2019.

4.2. Recent trends in net employment

Total employment in the EU27 Member States in 2020 was 192.190 million[24] - a reduction of 2.7 million or -1.4% on the 2019 figure. Over the same period, employment in the 28 widespread shortage occupations declined from 27.8 million to 27.1 million – equivalent to a reduction of -2.5% (see Table 4.1).

[24] We use a lower figure of roughly 189 million when comparing employment totals by specific variables (e.g., occupation) because we adjust for the number of 'no answers.

Table 4.1 Employment change in the EU27 in occupations which recorded widespread shortages in 2020

Occupation	Change in employment 2019-2020	Occupation	Change in employment 2019-2020
Plumbers and Pipe Fitters	-2%	Applications Programmers	0
Nursing Professionals	0	Health Care Assistants	-11%
Systems Analysts	-1%	Motor Vehicle Mechanics and Repairers	0
Welders and Flame Cutters	-2%	Nursing Associate Professionals	-3%
Heavy Truck and Lorry Drivers	-4%	Specialist Medical Practitioners	+2%
Civil Engineers	-7%	Civil Engineering Technicians	-6%
Software Developers	+18%	Metal Working Machine Tool Setters	-15%
Carpenters and Joiners	-4%	Toolmakers and Related Workers	+6%
Concrete Placers, Concrete Finishers etc.	-5%	Accountants	+6%
Generalist Medical Practitioners	-15%	Air Conditioning/Refrigeration Mechanics	-1%
Agricultural & Ind. Machinery Mechanics	+22%	Cooks	-9%
Bricklayers and Related Workers	--5%	Roofers	-2%
Building and Related Electricians	+3%	Software and Applications Developers nec	+21%
Electrical Mechanics and Fitters	**-24%**	Web and Multimedia Developers	+13%

Source: combination of Eurostat LFS extracts and responses from NCOs

Reductions in employment were recorded for 17 of the shortage occupations, while growth was recorded for eight occupations and there was no change in employment in the case of three occupations. Software provided the highest growth with employment increasing strongly in three of the five shortage occupations.

While growth was recorded for specialist doctors and nursing professionals, there were reductions in the employment of associate professional nurses, healthcare assistants and general practitioners.

Most of the construction craft occupations suffered reductions of between 2% and 5%, perhaps reflecting the temporary closure of building sites in many Member States during 2020. Employment in the engineering crafts displayed a more mixed pattern. Not surprisingly, employment in the only occupation on the list associated with the hospitality industry, 'cooks', contracted by 9%.

The reduction in employment in occupations related to the hospitality industry is more evident in the list of 24 widespread surplus occupations. The employment of kitchen helpers declined by 16%, while waiters contracted by 17% (see Table 4.2).

Table 4.2 Employment change in the EU27 in occupations which recorded widespread surpluses in 2020

Occupation	Change in employment 2019-2020	Occupation	Change in employment 2019-2020
Shop Sales Assistants	-9%	Photographers	0
Car, Taxi and Van Drivers	-6%	Cooks	-9%
Receptionists (general)	-1%	Gardeners; Horticultural Growers	+4%
Waiters	-17%	Secretaries (general)	+1%
Administrative, Executive Secretaries	-40%	Security Guards	-2%
Beauticians and Related Workers	-8%	Travel Consultants and Clerks	-8%
Building Construction Labourers	-2%	Cashiers and Ticket Clerks	-5%
Cleaners & Helpers in Offices, etc.	-6%	Interior Designers and Decorators	-12%
Elementary Workers nec	-3%	Journalists	+1%
General Office Clerks	+45%	Kitchen Helpers	-16%
Graphic and Multimedia Designers	+5%	Sociologists, Anthropologists and Related	+9%
Hairdressers	+6%	Translators, Interpreters and Linguists	-3%

Source: combination of Eurostat LFS extracts and responses from NCOs

The reduction in travel and non-essential shopping - which was a feature of the pandemic - is reflected in a reduction in the employment of shop sales assistants and 'travel consultants and clerks. There were also significant reductions in many clerical occupations[25] and in the employment of cleaners.

Total employment in the 24 widespread surplus occupations in 2020 was 31.8 million – a reduction of 1.020 million or -3.1% on the 2019 employment figure. Thus, the reduction in total employment in the EU between 2019 and 2020 of -1.4% was somewhat lower than the reduction in employment in either the 28 most widespread shortage occupations (-2.5%) or the 24 most widespread surplus occupations (-3.1%).

4.3. Comparing the findings from previous reports

An alternative method of exploring the impact of the pandemic on labour shortages[26] is to compare the list of shortages from the current report with the lists from previous reports. This comparison is shown in Table 4.3 below.

Table 4.3 Comparison of top shortage occupations over time

Occupation	Current report ranking[27]	2020 Report ranking	2019 report ranking	2018 report ranking
Plumbers and Pipe Fitters	1	2	4	2
Nursing Professionals	2	1	6	4
Systems Analysts	3	6	2	5
Welders and Flame Cutters	3	3	2	3
Heavy Truck and Lorry Drivers	4	3	1	4
Civil Engineers	5	6	8	0
Software Developers	5	4	8	4
Carpenters and Joiners	6	6	4	0
Concrete Placers, Concrete Finishers etc.	6	6	6	0
Generalist Medical Practitioners	6	4	7	2
Agricultural & Industrial Machinery Mechanics	7	6	3	5
Bricklayers and Related Workers	7	5	7	6
Building and Related Electricians	7	5	4	6
Electrical Mechanics and Fitters	7	0	0	0
Applications Programmers	8	4	0	0
Health Care Assistants	8	7	0	0
Motor Vehicle Mechanics and Repairers	8	7	6	6
Nursing Associate Professionals	8	7	0	6
Specialist Medical Practitioners	8	0	0	0
Civil Engineering Technicians	9	0	0	0
Metal Working Machine Tool Setters	9	0	0	0
Toolmakers and Related Workers	9	0	0	0
Accountants	10	7	9	0
Air Conditioning and Refrigeration Mechanics	10	7	9	0
Cooks	10	3	5	1
Roofers	10	0	0	0
Software and Applications Developers nec.	10	6	8	0
Web and Multimedia Developers	10	5	9	0

Source: Analysis of data submitted by EURES National Coordination Offices

[25] However, the significant increase in employment of general office clerks is surprising. It may reflect the significant number of people who were recruited in the Member States in 2020 to monitor the spread of the virus and to administer the vaccine roll-out. It is notable that contact information clerks, who are identified as a severe shortage by several countries and who may have been involved in some administrative duties related to the pandemic, actually declined during 2020 according to the LFS. This may be an issue related to the coding of the administrative staff recruited to administer aspects of the management of the virus.

[26] Unfortunately, a similar history of labour surpluses is not available.

[27] Ranking of 1 means that the highest number of countries/regions identified the occupation as a shortage; ranking of 2 means that the second highest number identified the occupation etc. Ranking of 0 means that the occupation was not on the list of top shortages that year.

In general, there is very little change in either the type of occupations or their ranking. Indeed, the same nine occupations occupy the top six rankings in every year.

Nevertheless, the ranking of some occupations has changed significantly since the emergence of the pandemic in early 2020. This is particularly true for healthcare related occupations. Specialist medical practitioners appear for the first time in the current report, and healthcare assistants is again represented having appeared for the first time in last year's report. While nursing professionals are represented in each report, they achieved a very high-ranking last year, and this has continued in the current report. Nursing associate professionals are represented in both the current and last year's report, having failed to qualify for inclusion in the 2019 report.

Three engineering occupations appear for the first time and occupy a joint ninth ranking. Contract toolmaking companies supply precision tools for the pharmaceutical and medical devices sectors[28] and the significant increase in activity in both these sectors during the pandemic may have created a shortage among toolmakers and, to a lesser extent, machine setters. However, there is not an obvious relationship between the pandemic and a shortage of the third occupation 'civil engineering technicians.'

Table 4.4 Comparison of most severe shortage occupations over time

Occupations	Current report ranking	Ranking in 2020 report	Ranking in 2019 report	Ranking in 2017 report
Nursing Professionals	1	1	0	3
Plumbers and Pipe Fitters	2	2	2	2
Software Developers	2	3	3	4
Systems Analysts	2	0	0	0
Welders and Flame Cutters	2	2	2	2
Bricklayers and Related Workers	3	2	2	0
Heavy Truck and Lorry Drivers	3	2	1	4
Applications Programmers	4	1	3	3
Carpenters and Joiners	4	4	2	3
Generalist Medical Practitioners	4	2	3	0
Health Care Assistants	4	4	0	0
Civil Engineering Technicians	5	0	0	0
Civil Engineers	5	0	0	0
Concrete Placers, Concrete Finishers etc.	5	2	1	2
Contact Centre Information Clerks	5	0	0	0
Home-based Personal Care Workers	5	0	0	0
Nursing Associate Professionals	5	4	0	0
Sheet Metal Workers	5	0	0	0
Web and Multimedia Developers	5	3	0	0

Source: Analysis of data submitted by EURES National Coordination Offices

An analysis of the most severe shortages identified in previous reports (see Table 4.4) provides further evidence of the relationship between the pandemic and labour shortages. Nursing professionals is classified as the most severe shortage in the current report – the same ranking as in last year's report. However, it was not considered to be a severe shortage in the 2019 report.

[28] This activity should not be confused with the manufacture of press tools for the automobile and other industries. The tools created for the medical devices and pharma industries must confirm to extreme tolerances and require the use of highly sophisticated technologies and skills.

Associate nursing professionals and 'healthcare assistants' are both classified as severe shortages in the current report and in the previous report, but neither were classified as a severe shortage in the 2019 and 2017 reports.

A healthcare occupation 'home-based personal care workers' which has never appeared on the list of widespread shortages is classified as a severe shortage for the first time in the current report.

Similarly, the occupation of 'contact centre information clerk' is classified as a severe shortage having never been classified as a shortage before. This may reflect the fact that the governments in many Member States contracted professional companies to monitor the spread of the virus and to identify and inform persons who were in close contact with positive cases.

The current list confirms that serious shortages have emerged in civil engineering. Both civil engineering professionals and civil engineering technicians appear on the list of severe shortages for the first time. However, these shortages are probably due to factors other than the pandemic.

Neither toolmakers nor machine setters appear on the list suggesting that shortages in these areas may be emerging, rather than widely established. However, as both the pharma and medical devices sectors continue to engage in high levels of production, it is likely that toolmakers may feature in next year's report.

4.4. Vacancy notifications during the pandemic

Another method of identifying whether the pandemic had any impact on the demand for skills is to explore vacancies. CEDEFOP has recently entered into a formal agreement with Eurostat to conduct a comprehensive data-mining exercise on all significant on-line European vacancy data bases. However, the results will not be available for a few years. In the meantime, the EURES Portal offers the opportunity to monitor vacancy trends in a large database over the duration of the pandemic[29]. . The most recent data is shown in Table 4.5 and compares the number of vacancies submitted to the EURES Portal by the European PES and Members and Partners in the different skill groups[30] using the second quarter of 2019 as the base quarter. Not all countries/regions are included in the comparison[31] because the trends in notified vacancies in some cases contained some inconsistencies.[32]

The initial impact of the pandemic was severe. Within the 12-month period between the second quarter of 2019 and the same period in 2020, the overall volume of vacancies had declined by 56%. However, the most recent figures – which refer to the second quarter of 2021 – show that the level of vacancies is increasing, and the overall decline compared to the base of the second quarter of 2019 has been reduced to just below **40%**.

There are two striking exceptions to the general decline in the number of vacancies notified to the EURES Portal in this period. Firstly, after an initial decline in the number of vacancies notified for health professionals of roughly a third **(-32%**), the number of vacancies notified has increased very significantly.

Secondly, the decline in the number of vacancies for personal care workers – many of whom are healthcare assistants[33] - was lower throughout the period than any other skills group.

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[29] An ex-post evaluation showed that the Portal in 2019 contained 61% of national vacancies available at national level.
[30] Three skill groups are excluded; managers, skilled agricultural workers and the military because they do not feature prominently in vacancies notified to the PES.
[31] There are 23 countries/regions included AT; BE-Actiris; BE-VDAB; CH; CY; CZ; DE; DK; EE; EL; ES; FI; FR; IS; LU; MT; NO; PL; PT; RO; SE; SI; SK.
[32] Countries/regions were removed if they had not provided data for each quarter; not provided the correct data, or if there were unusual and sudden increases in vacancy numbers.
[33] In 2020, 66% of those employed in this skill group were working in healthcare occupations

ICT professions are making a significant recovery judging by the volume of vacancies notified in the second quarter of 2021 which supports the widely discussed hypothesis that the COVID-19 pandemic has accelerated the structural digitalisation trend.

To summarise, the reduction in overall net employment during the pandemic in 2020 was modest. The reduction in the numbers working in the most widespread shortage and surplus occupations was greater than the overall contraction in EU employment, but not to a significant extent. The introduction of various work-related grants and subsidies by many governments in Europe, notably short-time working and temporary lay-off schemes, appears to have contributed to the maintenance of employment.

The pandemic is having a significant impact on the demand for several specific shortage occupations. The biggest impact is on healthcare skills. They have established a stronger profile among skill shortages in the current report than in previous reports, and there is evidence from last year's report that a stronger demand was developing for healthcare skills.

The demand for the skills of software professionals has continued to increase throughout the pandemic. All five specific professional software occupations are included among the 28 widespread shortage occupations. While the demand for software skills was already on an upward trajectory, the pandemic appears to have resulted in an acceleration of these trends. After an initial significant decline in the volume of vacancies notified to the EURES Portal, the volume of vacancies for ICT professionals appears to be quickly returning to the 2019 levels.

Several occupations have appeared for the first time on the lists of widespread and severe shortages, and these may be related to the pandemic. For example, toolmakers appear as a shortage for the first time and many toolmaking companies supply specialised tools to the medical devices and pharma sectors and many companies in these sectors are engaged in high levels of production because of the pandemic.

Finally, the occupation of contact centre information clerks appears for the first time and is classified as a severe shortage. This may be related to the pandemic as persons employed in such companies were recruited in many countries to monitor 'close contacts' and to assist in the roll-out of the vaccination programme.

Table 4.5 Trends in vacancy notifications to EURES Portal during the pandemic 2019-2021

Skill Groups	Vacancy notifications Q2, 2019 (Base quarter)	Vacancy notifications Q2, 2019 to Q2, 2020 *percentage*	Vacancy notifications Q2, 2019 to Q2, 2021 *percentage*
Science, engineering professionals	123,659	-49%	-37%
Healthcare professionals	77,386	-32%	+36%
Teaching professionals	100,913	-54%	-39%
Business administration professionals	121,652	-54%	-25%
ICT professionals	113,124	-47%	-26%
Legal, social cultural professionals	58,058	-47%	-29%
Science, engineering technicians	190,525	-52%	-34%
Health associate professionals	174,776	-43%	-64%
Business associate professionals	352,568	-50%	-30%
Legal, social, cultural associate professions	70,319	-48%	-3%
ICT Technicians	57,701	-56%	-49%
General and keyboard clerks	133,211	-69%	-64%
Customer service clerks	94,356	-65%	-52%
Numerical and material recording clerks	200,462	-60%	-49%
Other clerical support workers	35,169	-67%	-35%
Personal services workers	204,738	-75%	-43%
Sales workers	226,783	-69%	-46%
Personal care workers	100,432	-9%	-18%
Protective service workers	26,774	-51%	-50%
Building and related trade workers	191,004	-49%	-26%
Metal machinery and related trades	341,278	-61%	-57%
Handcraft and printing workers	21,424	-66%	-70%
Electrical and electronic trade workers	136,658	-57%	-61%
Food processing, wood working, garments	81,858	-59%	-32%
Stationary plant, machine operators	87,540	-54%	-30%
Assemblers	40,266	-62%	-12%
Drivers and mobile plant operators	186,504	-60%	-41%
Cleaners and helpers	98,565	-62%	-35%
Agricultural, forestry, fisheries labourers	10,977	-52%	-48%
Labourers nec.	255,209	-59%	-43%
Food preparation assistants	41,025	-81%	-51%
Street and related sales, service workers	1,198	-78%	-24%
Refuse workers	17,771	-65%	-49%
Total	3,973,883	-56%	-39%

Source: EURES database

Main findings from chapter 4:

- There was a modest decline in employment in the EU between 2019 and 2020
- Employment supports introduced by EU governments appear to have been successful to cushion short-term negative labour market effects
- Demand for healthcare skills much stronger in 2020 and early 2021
- Also increasing demand for ICT skills, toolmaking, and contact information clerks
- Volume of vacancies submitted to EURES Portal declined significantly in 2020
- But results from Q2 2021 show that a recovery is underway

5.0 Conclusions and recommendations

5.1. Conclusions

From a policy perspective, the findings of this report add to the evidence from other reports that skill shortages are widespread in several occupations, particularly those related to STEM qualifications and to healthcare. While these shortages reflect the continuation of a trend which has been evident for several years, the findings suggest that shortages in some occupations such as healthcare and IT may have been accentuated by the pandemic.

Undoubtedly, the labour shortages and surpluses identified in this report reflect significant underlying structural developments in the European economy and society. The shortages in software related skills reflect the rapid diffusion of information technology across many different sectors, while the shortage in healthcare related skills is to be expected in view of the ageing of the European population and the significant advances made in the efficacy of medical procedures.

The green agenda is and will continue to have an impact on the demand for skills. It is interesting in this context that the findings reveal a strong demand for medium level vocational qualifications especially in construction and engineering related skills. The demand for a more sustainable lifestyle has implications for the construction of buildings and many of the skills which were appropriate for the traditional house or factory are not suitable for the creation of buildings with a low or zero carbon output.

The development of advanced technologies is expected to result in the displacement of some skills. In this regard, it may be significant that clerical, retail and selling skills featured prominently in the list of occupations which were classified as labour surpluses. The IKEA concept, where the customer is responsible for selecting, delivering, and paying for their purchases without the assistance of retail staff has become the business model in many large retail stores and that trend is expected to continue. The typing pool has become an anachronism, as the personal computer has enabled every worker to attend to his/her own paperwork.

One of the major developments in the European labour market is the automation of routine tasks and these developments may be impacting on the composition of surplus occupations.

Sales assistants, cashiers, and secretaries feature prominently in the list of surplus occupations and these occupations are susceptible to automation. The employment of those working in these occupations might be more secure if they were retrained for positions which require increased cognitive complexity or significant social interaction. In contrast, the presence of a few occupations on the list associated with the hospitality sector (waiters, cooks, kitchen helpers etc.) have been influenced to some extent by the pandemic.

Overall, the findings confirm that the imbalance between demand and supply in the European labour market is significant; it is estimated that almost one in three workers were employed in a labour shortage or surplus occupation in the European Union in 2020, and many of these shortages and surpluses were rated as being of high magnitude by those supplying the data for this report.

An issue which will be of concern to policy analysts is the finding that occupational gender segregation is still a major issue in the European labour market. Furthermore, with the notable exception of healthcare related occupations, female workers continue to be significantly disadvantaged on the labour market because of occupational gender segregation. More than two out of every three workers in surplus occupations were female, and many of them had low education qualifications which makes them particularly vulnerable to (long-term) unemployment, unfavourable employment and working conditions and labour market segmentation.

The report provides evidence that a medium level qualification – particularly if it is a vocational qualification in construction or engineering – may be associated with greater employment prospects than some degree level

qualifications in the humanities. While both professional occupations and craft qualifications feature prominently in the lists of labour shortages, professional occupations also feature strongly in the list of labour surpluses, but craft qualifications do not feature.

This report is an intrinsic component of the work programme of EURES, and the report includes a focus on labour mobility and the extent to which it might contribute to improving the balance between labour shortages and surpluses within and across countries. As shown in the report, the attempt to find instances where the most widespread labour shortages were identified as surpluses in another country or region had limited success. The most prominent labour shortages - such as those involving healthcare or software skills – were not identified as a labour surplus anywhere in the EU or in Norway or Switzerland.

In this sense, we may conclude that many of the most significant labour shortages are ubiquitous. However, this finding does not preclude the possibility that matches between some labour shortages and surpluses may be possible in local, neighbouring countries or regions.

5.2 Recommendations

- EU and national campaigns should promote the usefulness of acquiring medium level vocational qualifications – particularly vocational qualifications associated with construction and engineering.
- Female and male jobseekers should be encouraged to pursue non-traditional career paths. The findings suggest that the diffusion of technology is fuelling a demand from employers for STEM qualifications, and female workers are significantly disadvantaged by current levels of occupational gender segregation. However, males are also under-represented in some occupations, for example nursing, and the recommendation applies equally to them.
- Member States should be encouraged to submit all their vacancies to the EURES Portal and to do so in a timely manner. While the Portal alone may not provide a comprehensive overview of vacancies, it has the potential to be a most useful source of intelligence on labour demand.
- Discussions should take place with EURES on how best to utilise the data from the report for developing a greater understanding of the potential for cross-border matching - particularly in local areas or niche markets.
- The link between labour shortages and surpluses and developments in, for example, digitalisation and climate change, should be explored in future reports, perhaps through a more qualitative analysis.
- Employers should be encouraged to adopt a ‘human capital management’ approach to recruitment and retention of staff. This approach includes the possibility of recruiting persons who may be under-qualified for the job and upskilling them. It might also involve reskilling clerical workers whose job is being replaced by digital technologies.
- The findings of this study suggest that it is difficult to fill vacancies for some elementary occupations. Policymakers and employers should consider how such occupations could be made more attractive to jobseekers, through for example introducing more flexible hours or indeed remote working where that is feasible.
- Changes in shortage or surplus occupations over the next couple of years will provide an insight into the extent to which the pandemic has created structural change in the demand and supply of skills or whether such changes are temporary, and these trends should be monitored.

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Annex 1: Data collection template

Information sought	Explanation
Occupation title (text)	Type in free text a list of occupations (one row one occupation) for which shortages and surpluses exist; first list occupations for which there is a shortage; the list should contain a maximum of 30 occupations; if your list contains less than 30 occupations, please provide a brief explanation in your email response for why the number is lower than 30; second, list occupations for which there is a surplus; the list should contain a maximum of 30 occupations ; if your list contains less than 30 occupations, please provide a brief explanation in your email response for why the number is lower than 30;
Shortage/surplus indicator	For each occupation indicate if it refers to a shortage by typing in 'shortage' or surplus by typing in 'surplus'; to identify surplus occupations you can examine for each occupation the ratio of the number of job seekers to the number of vacancies at the end of each year; for example if there are 5,000 shop assistants seeking employment and there are 300 vacancies at the end of the reference period, the ratio is 25:1; you can rank the calculated ratios and report the occupations associated with the 30 highest ratios
Occupational classification used in your country	For each occupation indicate what occupational classification (if any) was used to identify this occupation; for instance, you can report a country specific classification, ISCO, ROME, SOC, etc. If you don't use occupational classifications, type 'None'
Occupation code to the lowest level of disaggregation (e.g. ROME, SOC, ISCO at 4 digits)	If you have indicated a classification used, type the code for each occupation; use the lowest level of disaggregation (e.g. 4-digit ISCO code); if you don't use occupational classification leave black
ISCO-08 code at 4-digit level (or lower if 4-digit not available)	If you use occupational classification which is not ISCO-08 and if it is possible, provide a translation of the national code to ISCO-08 code; ISCO is the International Standard Classification of Occupations which is used to report to Eurostat; code should be at 4 digits; if this is not available than the lowest level of disaggregation that is available should be reported (3 digits if 4-digit code is not available; 2 digits if neither 4-digit nor 3-digit code is available; 1 digit if neither 4-digit, 3-digit nor 2-digit code is available); if it is not possible to provide translation to ISCO-08, leave black; if you have already reported ISCO-08 code in column 4 leave column 5 blank
Estimate of shortage/surplus magnitude (high (>3% of employment), medium (1%-3% of employment), low (<1% of employment))	For each occupation, indicate a broad estimate of the magnitude of the shortage/surplus; if you estimate that the shortage/surplus is less than 1% of the total employment in the occupation in question, type 'low', if between 1%-3% type 'medium', if greater than 3%, type 'high'; if you cannot provide a rough estimate of magnitude, type 'don't know'

Information sought	Explanation
Current shortage/surplus (C), future short term (FST), future medium term (FMT), future long term (FLT), don't know (indicate all that apply)	Against each occupation, indicate if the identified shortage/surplus refers to present situation, by typing 'C', if the shortage is expected to occur in the short term future i.e. within 12 months, by typing 'FST', if it is expected to occur over the medium term (within 1-5 years) by typing 'FMT', if it is expected to occur in the long term (in 5 or more years) by typing 'FLT'; if more than one time period applies, indicate all relevant ones (e.g. for current shortages/surpluses that are expected to persist over the short term type 'C', 'FST'); if you don't know type 'don't know'
Year for which the shortage/surplus refers to (YYYY)	Indicate the year that the information on shortages/surpluses (column 7) refers to e.g. type '2018' for a survey of difficult to fill vacancies conducted in 2018, even if the report was published in 2019
What indicator(s) suggested that there is a shortage/surplus?	Indicate what criteria was used to conclude that this occupation is associated with a shortage/surplus; for instance, ratio of registered job seekers to vacancies, employers views, sourcing from abroad to fill vacancies, growth in employment faster than growth in education/training output, time required to fill vacancies higher than average, etc.
Skill or labour shortage	Indicate if a shortage refers to a skill or labour shortage; a skill shortage occurs where there is an insufficient supply of persons with the appropriate skills; labour shortages occur where there is a sufficient number of skilled persons, however, an insufficient number of them is willing to take up employment in the occupation in question
Source of information on shortages/surplus (e.g. PES administrative data (vacancies, job seekers), PES survey, third party survey, National occupational forecasts, other (specify) etc.)	Indicate the source of information used to assess the imbalance in the labour market - shortages and surpluses (e.g. PES administrative data on vacancies and job seekers, PES survey, third party survey, National occupational forecasts, etc.); if there is more than one source used, indicate all sources used

Annex 2: Cross-border matching of most widespread shortages with surplus occupations

	Reporting shortages	Reporting surplus
Welders	AT, BG, CY, CZ, EE, EL, FI, HR, HU, IE, LT, LV, MT, NO, PL, SI, SK	HU
Truck Drivers	BE A, BE V, CZ, DK, EE, HR, HU, LV, MT, NL, NO, PL, PT, SE, SI, SK	HU, SK
Civil Engineers	BE A, BE V, CH, DE, DK, EE, FI, IE, LU, NL, NO, PT, SE, SI	
Ag. Mech.	BE A, BE LF, BE V, DE, EE, ES, HU, LT, NL, NO, SE, SI	AT, HU
Bricklayers	AT, CZ, DK, FI, HR, HU, LT, LV, NO, PL, SI, SK	EL, HU, SK
Electricians	BE A, BE V, BG, DE, EE, HR, LT, NL, NO, PT, SI, SK	CH
Electr. Mech.	AT, BE A, BE LF, DE, EE, HR, IE, LT, NO, PL, PT, SI	AT
Motor Mech.	BE LF, BE V, DE, DK, EE, FI, HR, NO, PL, SE, SI	AT, BG, CH, SK
Civil Eng Tech	AT, BE A, BE LF, BE V, DE, EE, IT, NO, SE, SI	
Toolmakers	AT, BE LF, CZ, EE, LV, NO, PL, PT, SI, SK	AT, SK
Accountants	BE A, BE LF, DK, IE, LU, MT, NO, PT, SI	AT
Cooks	BE A, CY, CZ, HR, HU, NO, PL, SI, SK	DK, EL, FI, HU, NL, SE, SK
Bakers etc.	BE A, HR, HU, LT, NO, PL, SI, SK	FI
Butchers	BE A, CZ, EE, HR, LT, NO, PT, SI	AT, CH
Constr. Superv.	BE A, BE LF, BE V, DE, EE, NL, NO, SI	AT
Contact Centre	BE A, BG, CZ, EL, IE, MT, NO, PT	DK
Plasterers	HR, LT, LV, NO, PL, RO, SI, SK	AT
Plastic Machine Op.	CZ, EL, HU, LT, NO, RO, SI, SK	AT, CH
Stationary Plant Op.	CY, CZ, DK, EE, ES, MT, NO, RO	DK, SK

Source: Analysis of data submitted by EURES National Coordination Offices