EURES

Report on labour shortages and surpluses

2024

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Abbreviations

ABBREVIATION	FULL VERSION
AI	artificial intelligence
CCAM	cooperative, connected and automated mobility
Cedefop	European Centre for the Development of Vocational Training
EU-27	the 27 Member States comprising the European Union
EURES	European Employment Services
EQF	European Qualifications Framework
GDP	gross domestic product
ISCED	International Standard Classification of Education
ISCO	International Standard Classification of Occupations
JVR	job vacancy rate
EU-LFS	European Labour Force Survey
NACE	general industrial classification of economic activities within the European Union
NCO	EURES National Coordination Office
NUTS	nomenclature of territorial units for statistics
OECD	Organisation for Economic Co-operation and Development
PES	public employment service
STEM	science, technology, engineering and mathematics
VET	vocational education and training

Country codes

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

Definitions

TERM	DEFINITION
ageing population	Refers to a demographic shift characterised by a rising proportion of elderly individuals relative to the total population. This phenomenon results from longer life expectancy and declining birth rates (European Labour Authority, 2024a).
artificial intelligence systems	Software (and possibly also hardware) systems designed by humans that, given a complex goal, act in the physical or digital dimension by perceiving their environment through data acquisition, interpreting the structured or unstructured data collected, processing the information derived from these data and selecting the best action(s) to take to achieve the given goal. Artificial intelligence includes several approaches and techniques, such as machine learning (High-level Expert Group on Artificial Intelligence, 2019).
automation	The use of technology, typically in the form of machines or computer systems, to perform tasks with minimal human intervention (European Labour Authority, 2024a).
bogus self-employment	Often referred to as false self-employment or dependent self-employment. This is commonly understood as involving workers registered as self-employed whose conditions of employment are de facto those of dependent employment. National legislation and/or court decisions determine this status. This employment status is used to circumvent tax and/or social insurance liabilities and/or employers' responsibilities.
cooperative, connected and automated mobility	Refers to the way in which today's vehicles are connected, and in many cases also interact directly with each other, with road infrastructure and with other road users, through cooperative intelligent transport systems.
digitalisation	The process of converting analogue information into a digital form, enabling the storage, processing and transmission of data using digital technology (Eurofound, n.d.-d).
employment level	Defined as the number of people engaged in productive activities in an economy. The concept includes both employees and the self-employed. The two main indicators used to calculate the employment level are the number of persons employed or the number of employees. (Eurostat)
European Employment Services (EURES) countries	The EU Member States plus Iceland, Liechtenstein, Norway and Switzerland.
green transition	The comprehensive process of shifting from traditional, resource-intensive and environmentally harmful practices to more sustainable, eco-friendly alternatives. It involves adopting cleaner technologies, reducing carbon emissions, promoting renewable energy sources and implementing environmentally conscious policies across various sectors.
ICT professionals	Individuals skilled in ICT fields, including computer science, software engineering, cybersecurity and data analysis (European Labour Authority, 2024a).
International Standard Classification of Education	The reference international classification for organising education programmes and related qualifications by levels and fields. The 2011 version has nine education levels, from level 0 to level 8.
International Standard Classification of Occupations	An international classification developed by the International Labour Organization to organise jobs into a clearly defined set of groups according to the tasks and duties undertaken.
jobseekers	Individuals actively looking for employment opportunities, seeking suitable jobs based on their skills, qualifications and career goals (European Labour Authority, 2024a).
labour demand	The amount of labour that employers seek to hire during a given time period (e.g. expressed in working hours) at a particular wage rate and under specific working conditions, requiring a specific set of skills, in order to meet the needs of the production of goods and services.
labour market imbalance	An imbalance between supply and demand in a given labour market. It can be driven by underlying skills mismatches, but can also be caused by other conditions such as overall labour supply and demand.
labour migration	Movement of non-EU nationals to EURES countries for the purpose of employment.

TERM	DEFINITION
intra-EU labour mobility	Movement of EU citizens or legally resident non-EU nationals benefiting from free movement from one Member State or European Economic Area / European Free Trade Association country to another for the purpose of employment; includes the posting of workers in accordance with Directive 2018/957/EU.
labour shortage	A situation where there are a sufficient number of people with the required skills, but for various reasons an insufficient number of them take up employment in the occupation and location in question.
labour surplus	A situation where there are more people looking to take up employment in the occupation and location in question than there are jobs available.
labour supply	For the purposes of this study, the total number of hours worked in the economy. This is based on the number of people participating in the labour force, structural causes of unemployment and the average hours worked per worker.
labour market tightness	A situation where labour demand is high compared with the supply (European Labour Authority, 2024a).
NACE (general industrial classification of economic activities within the European Union)	A four-digit classification serving as a framework for collecting and presenting statistical data according to economic activity, applicable in a wide variety of European statistics in the economic, social, environmental and agricultural domains.
platform work	A form of employment and a business model that uses an online platform or application (with strong reliance on an algorithm) to enable organisations or individuals to engage other organisations or individuals to solve problems or provide services in exchange for payment.
public employment service	A government-run agency or organisation that provides employment-related services, including job matching, career counselling and support, to jobseekers and employers (European Labour Authority, 2024a).
replacement demand	The number of openings created by people leaving the labour market, either on a temporary basis (e.g. for parental leave or due to sickness) or through retirement or death.
robotics	The interdisciplinary field involving the design, construction, operation and use of robots to perform tasks autonomously or with human assistance (European Labour Authority, 2024a).
self-employment	A form of work where individuals operate their businesses or pursue gainful activity on their own account rather than being employed by others, assuming both the risks and rewards of their endeavours (European Labour Authority, 2024a).
severe shortage	Shortage of a high magnitude, as defined by EURES National Coordination Offices for their national context.
skills gap	A situation where the level of skills of the existing workforce is lower than required to perform a job adequately or to match the requirements of a job (European Labour Authority, 2024a).
skills mismatch	The discrepancy between the qualifications and skills that individuals possess and those needed by the labour market (European Labour Authority, 2024a).
skills shortage	A situation where the demand for a particular type of skill exceeds the available supply of that skill at the market-clearing rate of pay; also called a talent shortage (European Labour Authority, 2024a).
skills surplus	A situation where there is insufficient demand for the skills available.
vulnerability	The conditions determined by physical, social, economic and environmental factors or processes that increase the susceptibility of an individual, a community, assets or systems to the impacts of hazards (UNDRR, n.d.). Alternatively, '[a] person (or household) is vulnerable to future loss of well-being below some socially accepted norms if he or she lacks (or is strongly disadvantaged in the distribution of) assets which are crucial for resilience to risks' (Morrone et al., 2011).
widespread shortage / shortage occupation	A labour shortage occupation that has been identified by EURES National Coordination Offices in at least 15 countries.
widespread surplus / surplus occupation	A labour surplus occupation that has been identified by EURES National Coordination Offices in at least 14 countries.
working conditions	The working environment and aspects of an employee's terms and conditions of employment. This covers aspects such as the organisation of work and work activities; training, skills and employability; health, safety and well-being; and working time and work–life balance. Pay is also an important aspect. Working conditions overlap with job quality, but it is a broader concept (Eurofound, 2011).

Executive summary

This seventh edition of the European Employment Services (EURES) report on labour market imbalances explores the current status of labour shortages and surpluses and how they have developed over time. Since the first report, published in 2016, the methodology for identifying labour shortages and surpluses has relied on the EURES National Coordination Offices as its primary data source, complemented by additional quantitative and qualitative sources.

While continuity in the methodology has largely been maintained between different editions of the report, there have been changes to the data collection process for this edition. These changes enable a more comprehensive collection of information on labour market imbalances, but limit comparisons with previous reports.

This edition introduces new features to the analysis, including the quantification of labour market imbalances, a refined methodology for analysing the characteristics of workers in shortage and surplus occupations and an in-depth focus on the transportation and storage sector.

Labour market imbalances

Despite the overall strong performance of the EU labour market, with low unemployment rates and high employment rates, there are significant challenges related to labour market tightness and skills mismatches. One of the main issues is persistent labour shortages in various sectors and occupations, driven by structural factors such as demographic changes (e.g. ageing populations), technological advancements altering workforce requirements, the green transition shifting sectoral and occupational compositions, geographical dispersion causing spatial mismatches and working conditions affecting job attractiveness, especially in certain sectors and occupations.

All EURES countries reported shortage occupations, with Malta, Slovakia, Bulgaria, Italy and Romania (in descending order) identifying the most. Around 98 % of all distinct four-digit International Standard Classification of Occupations 2008 occupations are identified as having labour shortages in at least one country.

Occupations frequently facing shortages include welders, nursing professionals, cooks and electricians. Generally, the healthcare and construction sectors face severe and widespread labour shortages. The severity of these shortages is highest among plant and machine operators and assemblers.

Nearly all existing occupations have been identified as surplus by at least one country. Spain, Austria, Latvia, Portugal and Finland (in descending order) report the highest numbers of surplus occupations. Occupations in the broad group of clerical support workers often have surpluses, as do elementary occupations and professionals, specifically in design-related occupations. The impact of automation and digitalisation may partially explain some of these widespread surplus occupations, since clerical support workers and professional design-related occupations are likely to be affected by automation using generative artificial intelligence.

Characteristics of workers employed in shortage and surplus occupations

Approximately 70.5 million workers were employed in widespread shortage or surplus occupations in the EU in 2023, amounting to about 35 % of the total employment. The analysis highlights substantial gender disparities, with women representing only 29 % of workers in shortage occupations, while making up 62 % of those in surplus occupations. This gender disparity is particularly evident in male-dominated fields such as construction and engineering. Conversely, women are highly represented in clerical positions, which are categorised as surplus occupations. This heightens the labour market vulnerability of women, as their risk of unemployment is higher.

Younger workers are under-represented in shortage occupations, while older workers are predominant in both shortage and surplus occupations. This raises concerns about future labour shortages as older workers retire. Improving working conditions and providing upskilling opportunities could help attract younger workers to shortage occupations.

Shortage occupations often require higher education levels, particularly those in in healthcare and engineering. Nearly one third of workers in shortage occupations have tertiary education, compared with 20 % in surplus occupations. Medium-level education is more common in both shortage and surplus occupations, but the nature of the education differs. For example, medium-level education in shortage occupations is often linked to vocational training, while in surplus occupations, it corresponds to general secondary education. High-level education is prevalent in healthcare and engineering professions in shortage occupations, while in surplus occupations, it is mainly found in arts and design professions.

Labour shortages in the transportation and storage sector

The transportation and storage sector in the EU is facing substantial labour shortages, particularly in occupations such as drivers and mobile plant operators. These shortages have been exacerbated by several factors, including unattractive working conditions, demographic changes and mismatches between available skills and job requirements. The sector also struggles with issues like undeclared work and bogus self-employment. The COVID-19 pandemic has further heightened these shortages by disrupting training and certification processes.

Accordingly, efforts to address these imbalances include improving working conditions, tackling undeclared work, enhancing training and certification processes and promoting regional and transnational mobility so that labour supply better matches demand.

Taking action to alleviate labour market imbalances

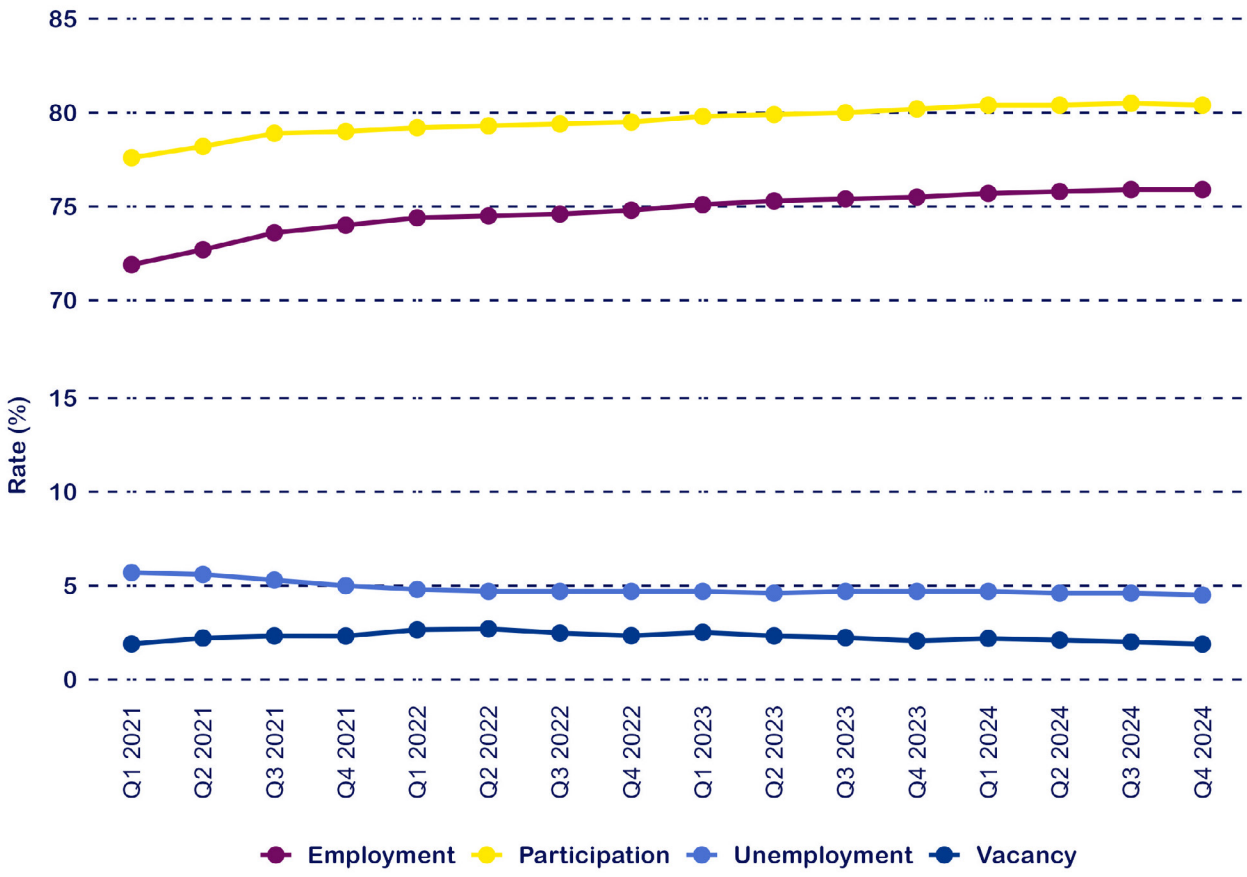
The analysis highlights the need for diverse policy responses to address labour shortages and surpluses. National and transnational collaboration remains crucial, as does the exchange of data and good practices. Key areas for action include strengthening labour mobility through fast sharing of information, improving education and training for digital skills, increasing participation in science, technology, engineering and mathematics education and addressing gender gaps in the labour market. In addition, initiatives to attract young people to shortage occupations will be needed.

1. Introduction

1.1. Background

EU gross domestic product (GDP) experienced modest growth in the first quarter (Q1) and second quarter (Q2) of 2024, by 0.3 % and 0.2 % respectively (Eurostat, 2024b). The labour market showed a strong performance as the unemployment rate among people aged 20–64 years in the fourth quarter (Q4) of 2024 stood at 4.5 %, down by almost half from 8.1 % in Q4 2014 (Eurostat, n.d.-f). Similarly, the employment rate among people aged 20–64 years in the EU-27 hit 75.9 % in Q4 2024, the highest in the past three years. This strong labour market performance is influenced by favourable developments in both labour demand and labour supply, and is also due to migration (European Commission: Directorate-General for Economic and Financial Affairs, 2024b). Since 2021, unemployment rates have been consistently diminishing across the EU-27, while employment and labour participation rates have risen. In particular, employment rates among women have been steadily increasing in the aftermath of the pandemic, by 1.8 percentage points between Q4 2019 and Q4 2023 (European Commission: Directorate-General for Economic and Financial Affairs, 2024b). This positive trend shows the recovery of the EU labour market from both the COVID-19 pandemic and the financial crisis. On the other hand, vacancy rates have remained stable at around 2 % on average in the EU-27.

Figure 1: Employment, labour market participation, unemployment and vacancy rates in the EU-27, 2021–2024 (people aged 20–64 years)



NB: Q3, third quarter.

Sources: Eurostat datasets lfsi_emp_q (13 March 2025), jvs_q_nace2 (18 March 2025) and une_rt_q (13 March 2025).

Overall, the strength of the EU-27 labour market reflects its resilience to economic shocks. Notably, it has overcome the economic disruptions resulting from Russia's invasion of Ukraine, while integrating 4.2 million people displaced from Ukraine whose employment rate ranges from more than 10 % to well above 40 % in some Member States (Eurofound, 2024b). However, the strong labour demand, combined with the accelerating trend of ageing populations, results in labour market tightness (European Commission: Directorate-General for Economic and Financial Affairs, 2024b). Consumption is expected to remain a key driver of GDP growth in 2025, supported by increasing real disposable income as inflation decreases and wage growth is driven by labour market tightness (European Commission: Directorate-General for Economic and Financial Affairs, 2024b). This could further increase labour demand in the retail and service sectors.

Job vacancy rates (JVR) in the EU-27 have been following an upward trend over the past 10 years and stood at 2.4 % in the EU-27 in Q2 2024 (Eurostat, 2024a). The European economy displays persistent labour shortages in several sectors and occupations, for both low-skilled and highly skilled workers. Around one quarter of European companies have faced difficulties in finding employees with the right skills, while 77 % report that even newly recruited employees do not have the required skills (European Commission, 2024b). The EU has successfully brought down the rate of those aged 18–24 years leaving school without attaining upper secondary education from 16.9 % in 2002 to 9.6 % in 2022 (European Commission, 2024b). However, the EU lags behind its Organisation for Economic Co-operation and Development (OECD) peers in terms of tertiary education graduates, with 42 % of those aged 25–34 years in the EU-27 holding a university degree, while in the United States, Canada and South Korea, this share is 51 %, 67 % and 70 %, respectively (Eurostat, n.d.-e; OECD, n.d.).

Left unaddressed, labour market imbalances bring negative consequences for workers and employers alike. While tight labour markets may improve the bargaining position of workers and jobseekers, it is also possible that working conditions, specifically concerning working hours and work intensity, may deteriorate in occupations/sectors where there is insufficient labour supply. For employers, labour shortages may result in higher job turnover costs and reduced production capacity and growth potential (Eurofound, 2021). Moreover, 81 % of companies consider the

inability to recruit an appropriately skilled workforce one of the most important obstacles to long-term investment (European Investment Bank, 2024).

Given trends of increasing shortages across all Member States, in March 2024, the European Commission unveiled its action plan to address labour and skills shortages across the EU (European Commission, 2024a) by:

- activating under-represented groups in the labour market;
- supporting skills development, in particular green and digital skills;
- improving working conditions;
- facilitating intra-EU mobility;
- attracting talent from outside the EU.

Addressing the structural drivers behind shortages is necessary in order to overcome this challenge. The literature identifies a number of such drivers (Eurofound, 2021, 2023; Blanchard et al., 2022; Groiss and Sondermann, 2023; European Commission, 2023a; European Labour Authority, 2024b; Gil-Alana et al., 2025; Handel, 2024), including the following.

- Demographic changes, such as ageing populations, leading to a decline in the workforce and an increase in demand for certain services and products (and, hence, higher labour demand in those sectors).
- Technological changes altering the skills required from the workforce.
- The green transition substantially shifting sectoral and occupational compositions, as the EU's competitiveness increasingly depends on digitalisation and building strengths in advanced technologies, especially those required for the green transition. Relatedly, the clean technologies sector is projected to continue expanding in size, investment and contribution to employment (European Commission, 2024b).
- Geographical dispersion resulting in spatial mismatches.
- Working conditions affecting the attractiveness of occupations.

1.2. Scope and methodology

This report aims to comply with Article 30 of Regulation (EU) 2016/589. This regulation requires each EURES country to gather and analyse gender-specific data on labour shortages and surpluses in national and sectoral labour markets, with special emphasis on the most vulnerable groups.

The 2024 edition is the seventh in this series. The methodology employed in these reports is both consistent and adaptable, enabling the comparison of key findings over time while taking into account related caveats. This approach helps to determine whether certain labour shortages are structural or temporary. This edition highlights the importance of intra-EU labour mobility and the transportation and storage sector, and investigates whether certain labour market imbalances are associated with multiple vulnerabilities.

The purpose of this report is to pinpoint occupations experiencing labour shortages and surpluses within the EURES countries, encompassing the EU Member States, Iceland, Liechtenstein, Norway and Switzerland. It also provides an indication of the magnitude of labour market imbalances.

The main input for this report stems from the EURES National Coordination Offices (NCOs), which were asked in the third quarter (Q3) of 2024 to indicate for their countries or regions which occupations were experiencing labour shortages and surpluses. While in previous editions of the report, NCOs reported an open list of shortage and surplus occupations, for the current report, they were asked to indicate whether a shortage or surplus existed for each of the 436 four-digit International Standard Classification of Occupations (ISCO) 2008 occupations in their countries. Alternatively, NCOs could indicate that an occupation was in balance, meaning neither in shortage nor in surplus, or that it exhibited both a shortage and a surplus, indicating regional differences. Where no information was available for a specific occupation, NCOs could also indicate this. This revision to the data collection method partially explains the differences in the numbers of shortage and surplus occupations in this edition compared with the previous year's report. For countries with substantial differences, clarifications were sought from the NCOs. NCOs indicated that either changes in their national methodologies for identifying mismatch occupations and/or the above-described change in the methodology for collecting data from the NCOs contributed to the differences in the compositions and numbers of reported mismatch occupations. Changes to national methodologies often relate to different and/or additional indicators used to identify occupations. Table 1 provides an overview of the countries where methodological changes influenced the data reported in 2024. In these cases, a direct comparison with previous editions of the report in terms of the number of identified mismatch occupations is not feasible.

Table 1: Methodological changes affecting the identification of shortage or surplus occupations in 2024 compared with 2023

CHANGE IN METHOD	COUNTRIES
Changes to national methodologies	Denmark, Germany, Greece, Italy, Lithuania, Norway, Sweden
Changes to the EURES report methodology	Hungary, Lithuania, Poland, Portugal, Spain, Switzerland

Source: Data submitted by EURES NCOs.

Among the EURES countries, only Iceland and Liechtenstein did not complete the data collection questionnaire. Three of the four Belgian NCOs (for the Brussels, Flemish and Walloon Regions) reported their respective regional labour market imbalances. All of the shortage and surplus occupations identified by at least one Belgian region were included in the overall contribution for Belgium. While all countries identified shortage occupations, four EURES countries did not provide information on surplus occupations (i.e. Ireland, Italy, Poland and Switzerland). In these cases, data enabling the identification of surpluses were not available at the national level.

The data underwent a thorough quality check to ensure both comprehensiveness and consistency. NCOs were contacted for any necessary clarifications. Detailed information on the methodology and data cleaning process can be found in Annex 1. Various sources and indicators were utilised by NCOs to identify occupations with labour shortages and surpluses. The primary source of data was administrative records from public employment services (PES), which included information on vacancies reported by employers and the characteristics of jobseekers. It is important to note that PES data often focus on specific characteristics of vacancies and jobseekers, rather than providing a complete picture of the entire economy and labour market. In addition, there are national differences in requirements, such as the obligation for companies to submit vacancy information to PES and the obligation for jobseekers to register with PES.

To identify labour market imbalances, most NCOs use specific indicators. They often rely on the ratio of vacancies to jobseekers in an occupation, or the total number of jobseekers or vacancies. The data for this report primarily cover the years 2023 and 2024, and Table 2 illustrates that in this instance the data sources extend beyond quantitative data. Discussions with employers and labour market experts were also held.

Table 2: Main data sources and indicators used to identify labour shortages and surpluses, 2024

Data source	Number of reporting NCOs	Indicator used	Number of reporting NCOs	Reference year	Number of reporting NCOs (1)
PES administrative data	23	Ratio of jobseekers to vacancies	17	2024	15
Views of employers (qualitative)	2	Total number of vacancies (2)	11	2023	14
Occupational barometer (3)	3	Total number of jobseekers (2)	8	2022	1
National data (e.g. a national labour force survey)	5	Ratio of jobseekers to total employed people	7	2021	1
Third-party employment survey (i.e. a survey not conducted by a PES)	4	Views of PES (qualitative)	9		
PES employment survey	2	Employer skills shortage surveys	6		
Views of PES (qualitative)	9	Ratio of vacancies to total employed people	4		
Views of experts (qualitative)	4	Views of experts (qualitative)	4		

Data source	Number of reporting NCOs	Indicator used	Number of reporting NCOs	Reference year	Number of reporting NCOs (1)
Immigration data	1	Employers' views (no survey) (qualitative)	3		
Cedefop's Skills Online Vacancy Analysis Tool for Europe	1	Number of work permits issued	3		
Views of trade unions (qualitative)	1	Frequency of sourcing the skill from abroad	2		
		Time required to fill vacancies	1		
		Vacancy rate (i.e. the estimated number of vacancies divided by total employment plus the estimated number of vacancies)	1		

(1) This number includes the separate submissions from the three Belgian regions. Therefore, the total sum is 31 (i.e. the number of NCOs) and is higher than the number of countries (29).

(2) While NCOs generally rely on more than one indicator to determine occupations in shortage or surplus, an indicator that exclusively considers either the demand or the supply side is not sufficient to establish whether a shortage or surplus is present in an occupation.

(3) An occupation barometer is often based on qualitative data and has a shorter time horizon than a typical forecast.

NB: Countries could select up to three data sources and up to three indicators from a list, and could add any other alternative ones.

Source: Data submitted by EURES NCOs.

To delve deeper into and provide context for the identified labour market imbalances, a range of secondary data sources (public data from Eurostat, the European Centre for the Development of Vocational Training (Cedefop) Skills Forecast (Cedefop, n.d.-c), etc.) and publicly available reports or studies were employed.

Moreover, data from the European Labour Force Survey (EU-LFS) were examined in light of the labour market imbalances identified to assess the imbalances' effects on vulnerable groups. The report offers an in-depth analysis of four key characteristics – gender, education level, age and country of origin ([1]) – to foster a detailed understanding of the demographic groups facing increased vulnerability.

Finally, the analysis made use of information gathered through various qualitative methods. The qualitative analysis aimed to explore the underlying causes behind the persistent shortages in the transportation and storage sector. The analysis was disaggregated by subsector according to the relevant NACE (general industrial classification of economic activities within the European Union) classifications, resulting in the subsectors of land transport, air transport, postal and courier activities, warehousing, storage and support activities for transportation, and water transport. The analysis was based on three key sources of information: a literature review, data gathered from focus group discussions and interviews (see Annex 3 on the discussion guides used) and the insights provided by the EURES NCOs through an open questionnaire (see Annex 4). Focus groups were organised by subsector (the land transport subsector was split into two discussions: one for roads and one for railways); they took place in Q4 2024 and involved different types of stakeholders, including trade unions, key industry operators, PES and employer organisations.

1. Country of origin was used rather than citizenship because the process of acquiring citizenship varies between countries, and consequently it is more difficult to measure and compare the migrant workforce on the basis of citizenship.

2. Labour market imbalances identified

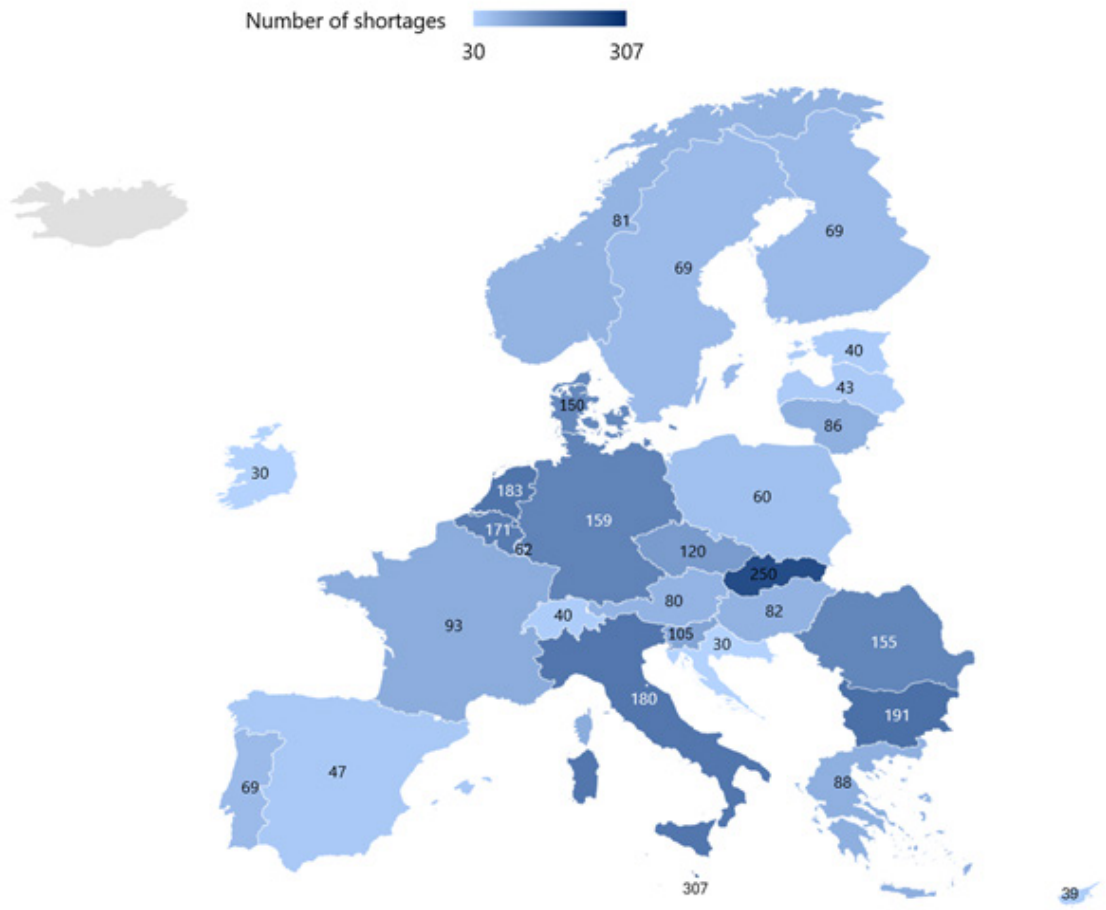
2.1. Geographical distribution of labour market imbalances

2.1.1. Countries reporting shortages

Shortage occupations were reported by 29 EURES countries ([2]). Around 98 % of all four-digit ISCO 2008 occupations are identified as having either labour or skills shortages in at least one country. This amounts to 3 079 instances of shortage occupations among all reporting countries ([3]). There is substantial variation in the number of shortage occupations identified by countries (Figure 2). The countries facing the largest number of shortages are Malta (307), Slovakia (250), Bulgaria (191), the Netherlands (183) and Italy (180). Malta alone accounts for 10 % of all shortage instances in the 29 countries, with the top 10 countries accounting for 61 %. Countries with the lowest number of shortages include Croatia (30), Ireland (30), Cyprus (39), Switzerland (39) and Estonia (40), which combined make up just 6 % of shortage instances. From a regional perspective, countries in southern and eastern Europe, such as Malta, Slovakia, Bulgaria, Italy and Romania (155), frequently identified a large number of shortage occupations. In western and northern Europe, Belgium (171), the Netherlands, Germany (159) and Denmark (150) also report many shortage occupations.

2. NCOs from Liechtenstein and Iceland have not provided data.
3. This is not a count of unique occupations, as all countries could mention the same occupation. Overall, 430 of the 436 distinct four-digit ISCO 2008 occupations were identified as shortage occupations by at least one country. Shortage occupations include those that were categorised as either 'Shortage' or 'Both shortage and surplus (e.g. regional differences)'.

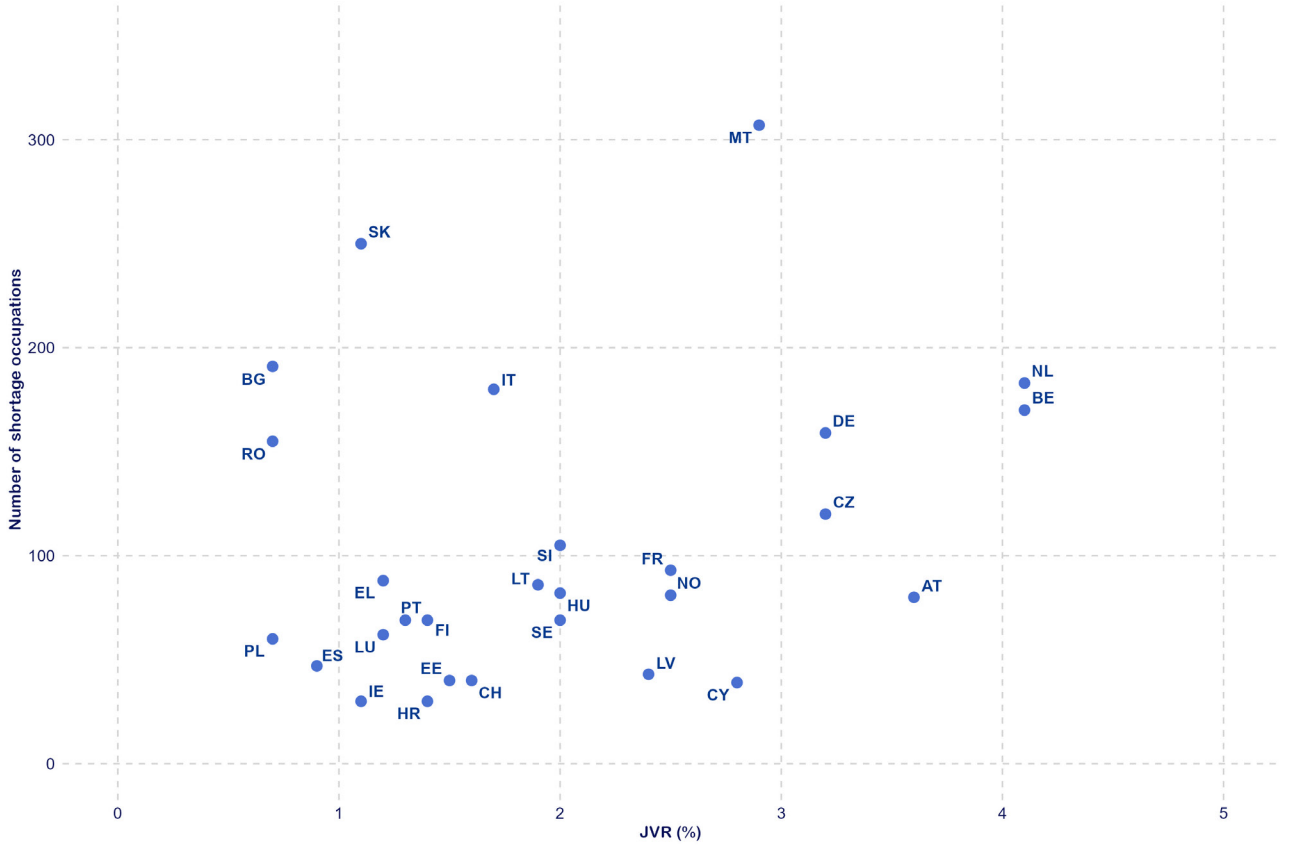
Figure 2: Number of shortage occupations identified, by EURES country, 2024



NB: Includes occupations categorised as 'Shortage' and 'Both shortage and surplus (e.g. regional differences)'.
Source: Data submitted by EURES NCOs.

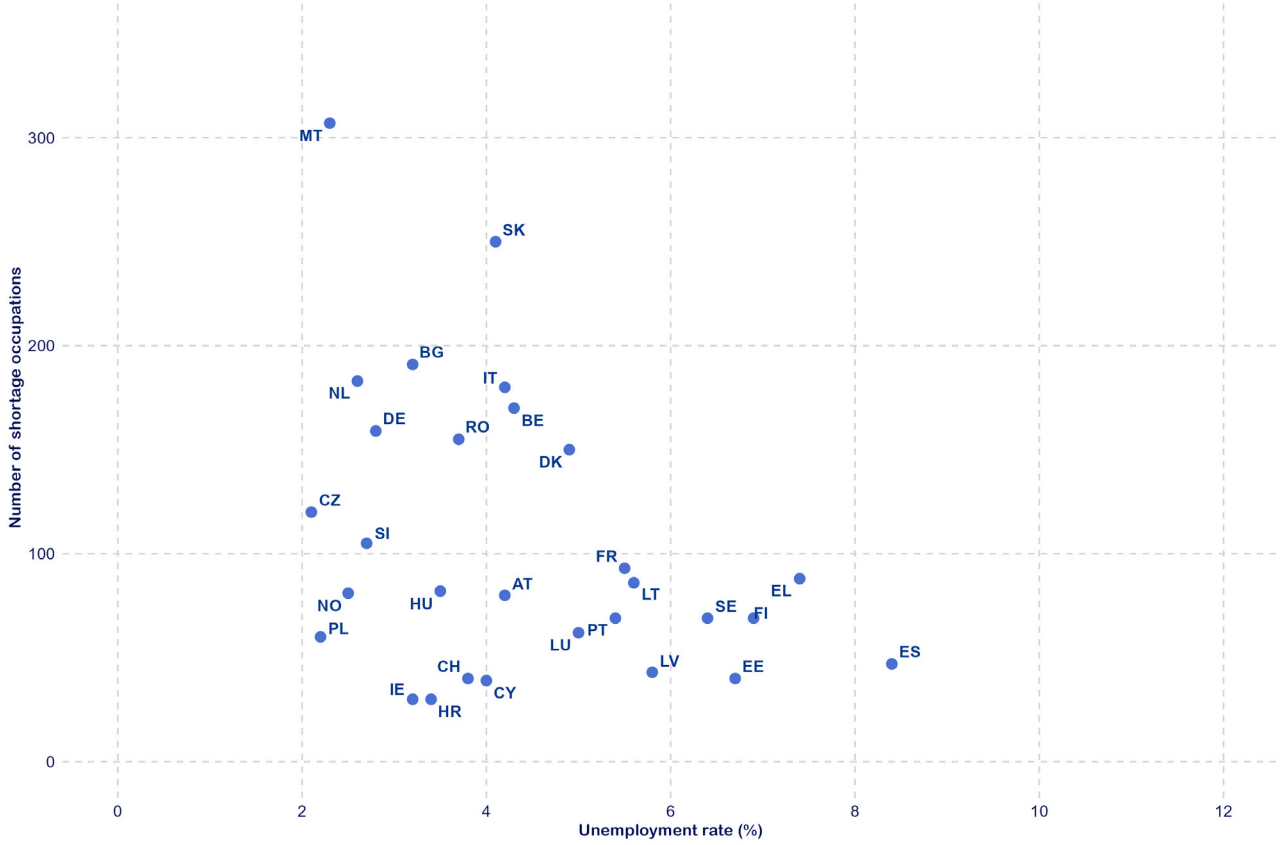
In most countries, the relationship between the number of shortage occupations identified and the JVR is positive, while the relationship between shortages and the unemployment rate is negative. A high JVR can be an indicator of economic growth or high replacement needs, and in the presence of lower unemployment can lead to a higher number of shortages. However, in some instances this expectation is not realised, since the composition and share of total employment of shortage occupations and the recruitment practices used (e.g. if recruitment is conducted through word of mouth rather than public vacancy notices) are important. Some countries may have fewer shortage occupations, but these occupations could constitute a larger share of employment than they do in other countries, which would lead to a higher JVR, despite fewer shortage occupations. It is possible that the strength of the relationship between the JVR and the number of shortage occupations is influenced by the different methods used by the NCOs to identify if an occupation is in shortage. For example, in Bulgaria (with a low JVR), an occupation is considered in shortage if the ratio of jobseekers to vacancies is less than 20, while in Austria (with a high JVR), an occupation is in shortage if the ratio of jobseekers to vacancies is less than 1.4.

Figure 3: Number of shortage occupations and JVR, by EURES country, Q4 2024



NB: Includes occupations categorised as 'Shortage' and 'Both shortage and surplus (e.g. regional differences)'.
Sources: Data submitted by EURES NCOs; Eurostat dataset jvs_q_nace2 (18 March 2025).

Figure 4: Number of shortage occupations and unemployment rate, by EURES country, Q4 2024 (people aged 20–64 years)



NB: Includes occupations categorised as 'Shortage' and 'Both shortage and surplus (e.g. regional differences)'.
Sources: Data submitted by EURES NCOs; Eurostat dataset une_rt_q (13 March 2025).

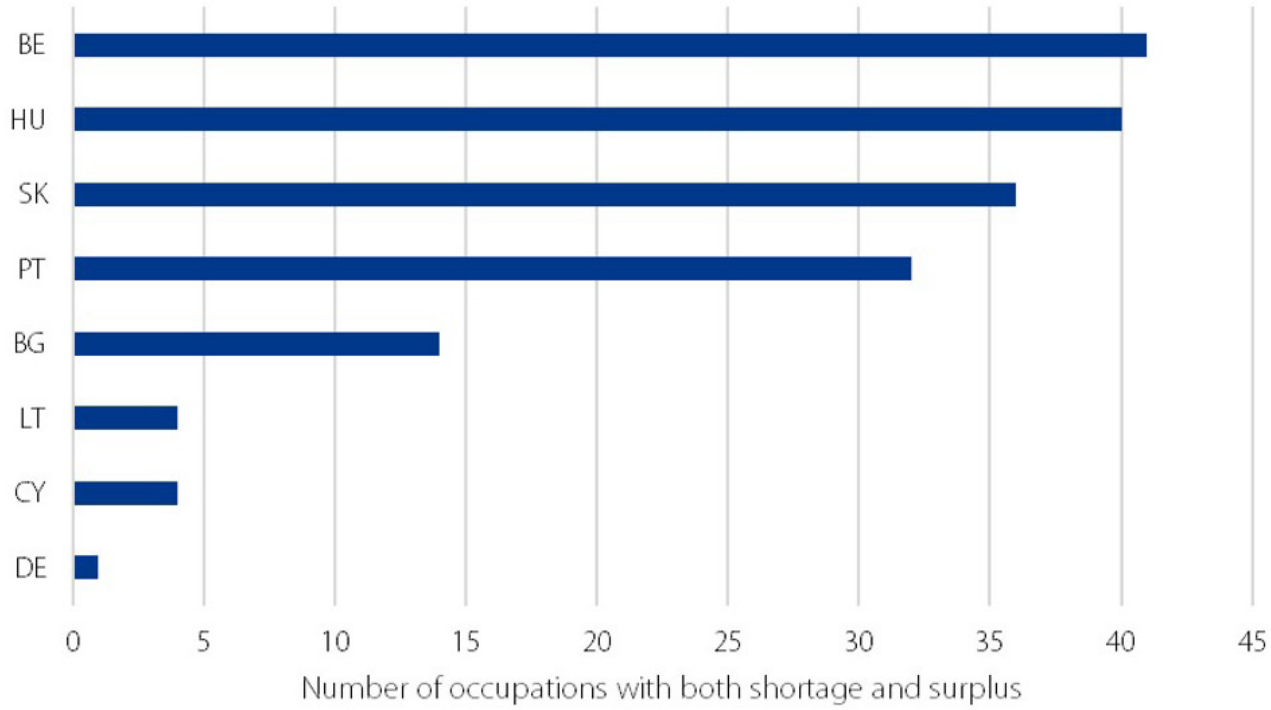
While shortages in a specific occupation may emerge across the entire country, there may also be shortages and surpluses in the same occupation at the same time, indicating regional differences in terms of the demand and supply. In eight countries, NCOs identified occupations that have both shortages and surpluses (Figure 5). Belgium reported the most occupations in both shortage and surplus ([4]). Hungary, Slovakia and Portugal (in descending order) also reported relatively large numbers of occupations characterised by such regional divergences ([5]). The specific occupations that are more frequently reported by NCOs to be in shortage and surplus at the same time are in the broad groups of:

- service and sales workers, specifically cooks, waiters, bartenders and hairdressers;
- craft and related trades workers, specifically painters and related workers, butchers, fishmongers and related food preparers, and bakers, pastry cooks and confectionary makers;
- elementary occupations, specifically cleaners and helpers in offices, hotels and other establishments, and kitchen helpers.

Instances of simultaneous shortages and surpluses for the same occupation within a country suggest there may be scope for reducing imbalances by transferring workers from surplus regions to shortage regions. The extent to which imbalances could be reduced would depend on the exact scope of the shortages and surpluses, alongside other factors such as awareness of job vacancies among workers and the willingness and ability of workers to move.

4. The large number of occupations reported as 'Both shortage and surplus (e.g. regional differences)' is probably due to the methodology used to collect Belgian data. Each region submits its own data, which are aggregated at a later stage.
5. It is possible that more occupations exhibit shortages and surpluses simultaneously, but that the information necessary for identifying them is lacking. For example, a few NCOs only report information on shortage occupations, suggesting that indicators on surplus occupations are not available at the same level.

Figure 5: Countries reporting occupations in both shortage and surplus, 2024

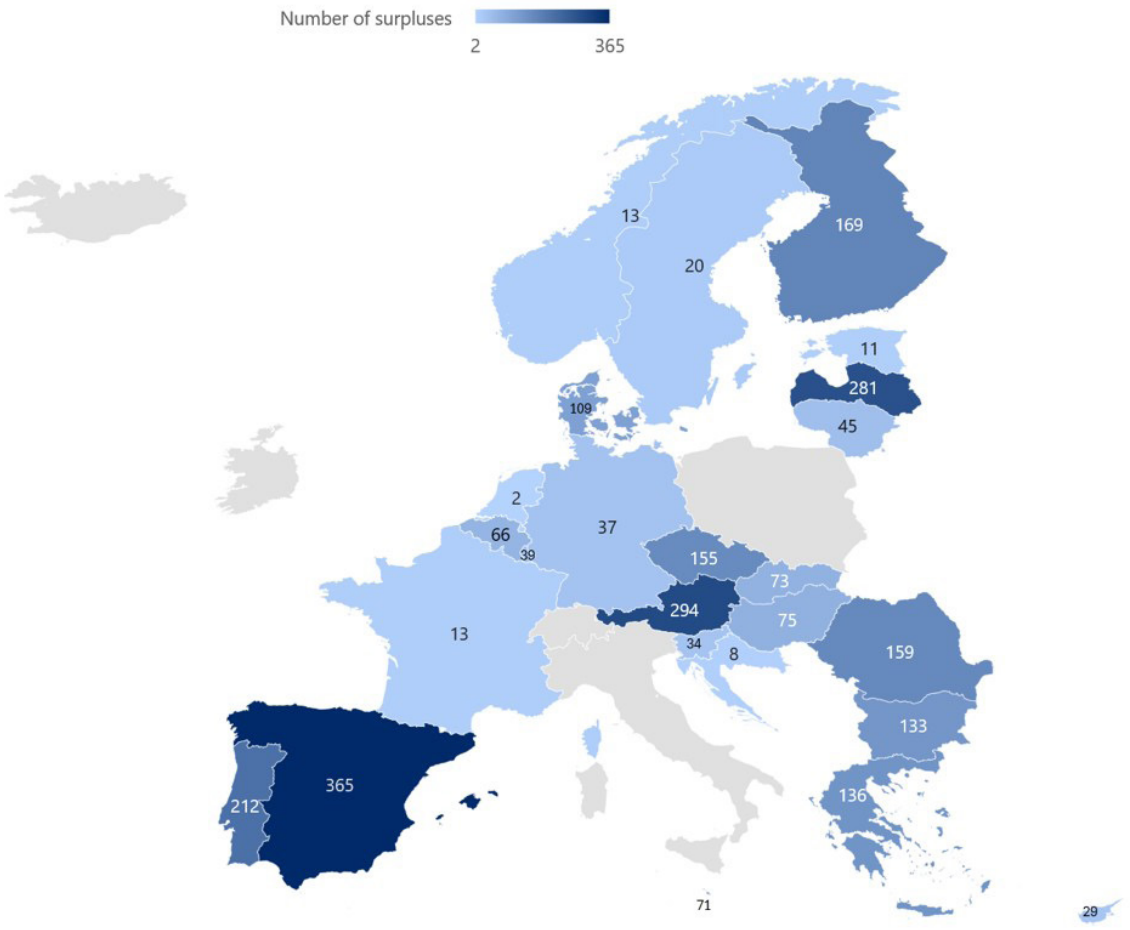


Source: Data submitted by EURES NCOs.

2.1.2. Countries reporting surpluses

A total of 2 549 occupations were identified as having surpluses by the 25 countries (Figure 6) that have this information available. Spain (365), Austria (294), Latvia (281), Portugal (212) and Finland (169) reported the largest number of surplus occupations. These five countries account for 52 % of all surplus instances, while the first two alone make up more than one quarter of all surplus occupations among the 25 countries. The lowest number of surplus occupations are in the Netherlands, Croatia, Estonia, France and Norway (in ascending order). These countries make up just 2 % of surplus occupations.

Figure 6: Number of surplus occupations identified, by EURES country, 2024



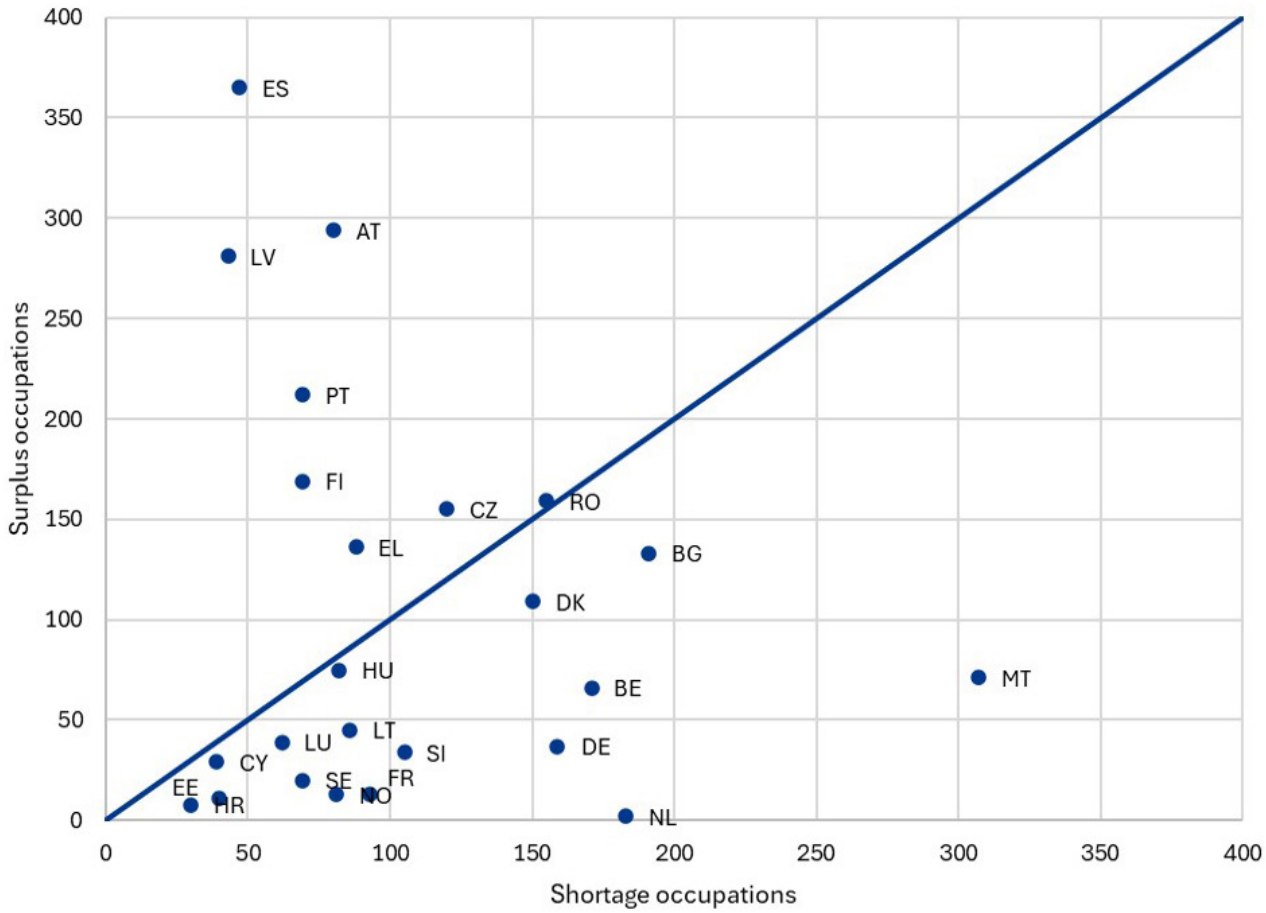
NB: Includes occupations categorised as 'Surplus' and 'Both shortage and surplus (e.g. regional differences)'.
Source: Data submitted by EURES NCOs.

Figure 7 shows that there exists no clear relationship between the number of shortage and surplus occupations within countries. Countries above the diagonal line exhibit more occupations in surplus than in shortage, while countries below the line have more shortage than surplus occupations. Countries near the diagonal line have similar numbers of occupations in shortage and in surplus. In an ideal situation, where demand and supply in the labour markets are well balanced, countries would be in the lower left corner of the plot. Notably, Croatia, Estonia and Cyprus have a relatively more balanced labour market than other countries.

Specifically, cases where the number of shortage occupations is relatively large and the number of surplus occupations relatively small (e.g. in Belgium, Germany, Malta and the Netherlands) indicate an overall lack of supply of workers and/or a lack of adequately skilled workers in the national labour market. In this case, the country might experience a labour demand exceeding the supply in rapidly growing occupations, or difficulties in replacing workers who retire or switch careers, alongside skills imbalances resulting from discrepancies between worker qualifications and job requirements (Cedefop, n.d.-a). In the opposite situation, when surplus occupations significantly outnumber shortage occupations (e.g. in Spain, Latvia and Austria), the challenge lies in a lack of demand for workers.

A number of countries have similar numbers of shortage and surplus occupations (e.g. Hungary and Romania). In these situations, there may be scope for reducing imbalances by transitioning workers from surplus to shortage occupations. The feasibility and scope for doing so will depend on a variety of factors. These include the composition of occupations that are imbalanced, that is, the complementarity of skills and qualification levels required in shortage and surplus occupations and the size of the demand and supply in those occupations. Other crucial factors are the degree of awareness of job opportunities among workers and of available workers among employers, and the willingness of workers to relocate and to change occupation. The readiness of employers to consider workers from different occupational backgrounds, but with similar skill sets, can also be a factor.

Figure 7: Number of shortage occupations versus surplus occupations reported, by EURES country, 2024



NB: Includes occupations categorised as 'Shortage', 'Surplus' and 'Both shortage and surplus (e.g. regional differences)'.
Source: Data submitted by EURES NCOs.

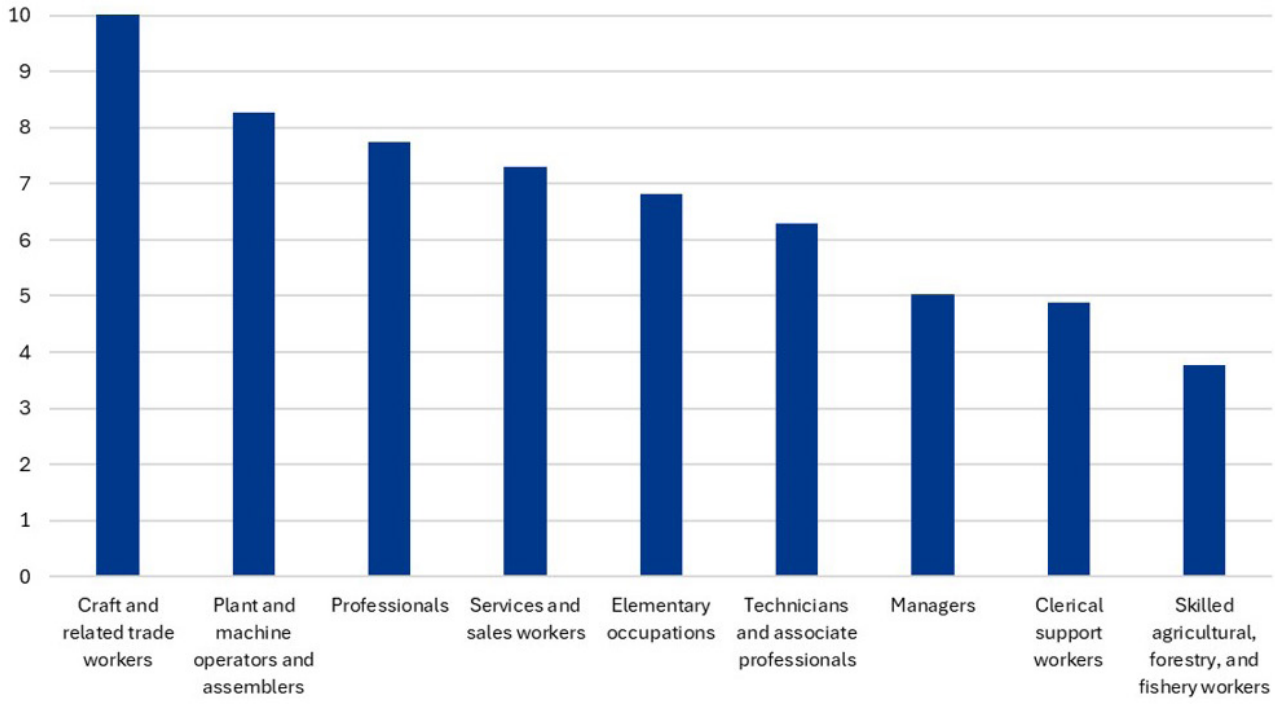
2.2. Identification of shortage occupations

2.2.1. Broad occupation groups

Occupations within the groups of professionals, craft and related trades workers, and technicians and associate professionals are most commonly facing shortages. However, within all broad groups, most existing occupations have shortages in at least one country, illustrating the diversity and spread of labour market imbalances in EURES countries.

Findings from a company survey indicate that businesses face acute shortages particularly in technical and engineering-related professions (BusinessEurope, 2023). This broadly aligns with the analysis of shortage occupations presented here.

Figure 8: Most common shortage occupations, by broad occupation group, 2024

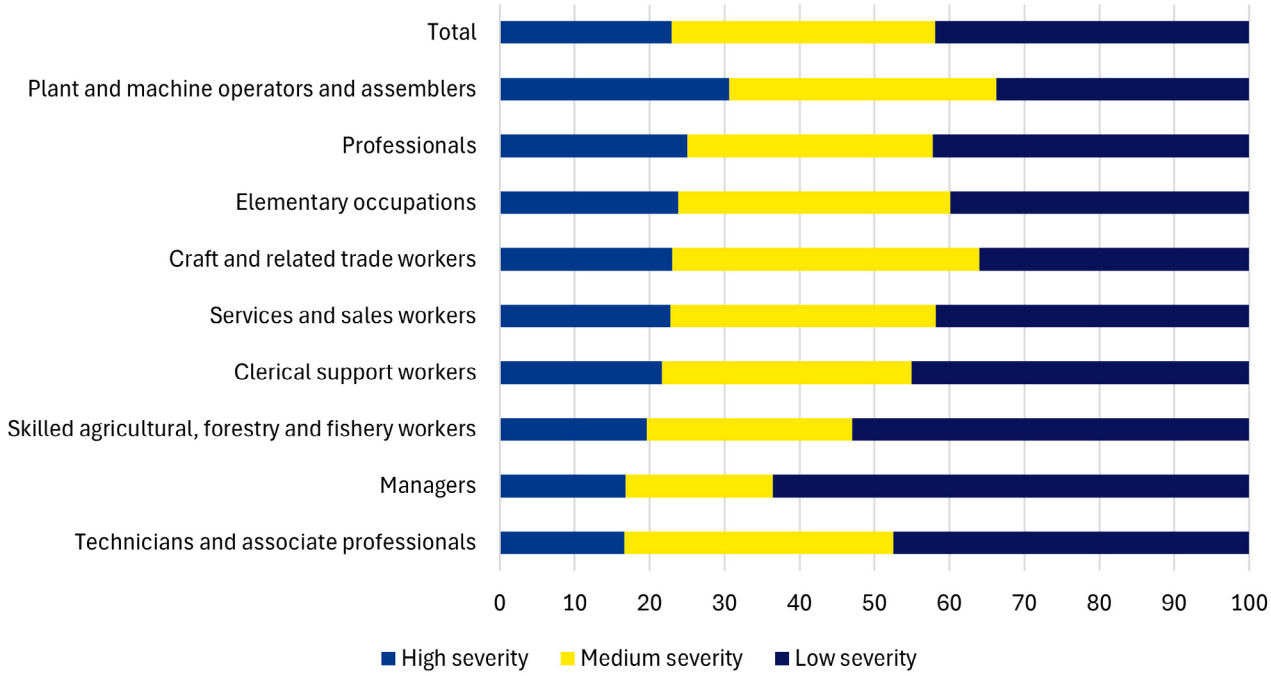


NB: Calculated as the ratio of the number of shortage occupations identified to unique occupations within each group.
Sources: Data submitted by EURES NCOs; ISCO classification list.

Among all shortage occupations, 23 % are indicated as being high severity, 35 % medium severity and 42 % low severity.

The occupation group of plant and machine operators and assemblers has the highest share of severe shortages among all broad occupation groups, followed by professionals (as shown in Figure 9). Shortage occupations within the broad group of elementary occupations are also frequently high severity. This clearly indicates that shortages are not exclusive to occupations that typically require high skill levels. In fact, shortages are less severe among managers, technicians and associate professionals and skilled agricultural, forestry and fishery workers.

Figure 9: Severity of shortage occupations by broad occupation group, 2024 (%)



NB: Shortage occupations without an indication of severity are excluded from the analysis (782).
Source: Data submitted by EURES NCOs.

2.2.2. Individual occupations

To assess the importance of a shortage in a specific occupation, the number of countries reporting the occupation as a shortage and the severity of the shortage are examined. In this analysis, widespread shortage occupations are those identified as being in shortage in more than half of the countries that provided information on the occupations.

The most widespread shortage occupations are welders and flame cutters, nursing professionals, cooks and building and related electricians. These occupations are identified as being in shortage in at least 75 % of reporting countries. The full list includes several health professional occupations and craft and related trades occupations. As in previous editions of the report, widespread shortage occupations include many jobs in engineering and construction. In general, a large number of the shortage occupations identified fall within the same subgroups at the two-digit ISCO 2008 level. These include:

- health professionals: generalist medical practitioners, specialist medical practitioners, nursing professionals, pharmacists and physiotherapists;
- building and related trades workers (excluding electricians): concrete placers, concrete finishers and related workers, carpenters and joiners, insulation workers, plumbers and pipe fitters, air conditioning and refrigeration mechanics, painters and related workers, and spray painters and varnishers;
- metal, machinery and related trades workers: welders and flame cutters, sheet metalworkers, structural metal preparers and erectors, metalworking machine tool setters and operators, motor vehicle mechanics and repairers and agricultural and industrial machinery mechanics and repairers;
- electrical and electronic trades workers: building and related electricians, electrical mechanics and fitters, electrical line installers and repairers and electronics mechanics and servicers.

Among these widespread shortage occupations, the share of high-severity instances tends to be relatively large. For these occupations, on average, one quarter of shortages are highly severe. In comparison, one seventh of non-widespread shortage occupations are highly severe. Moreover, by analysing the degree of severity among occupations often identified as being in shortage, a further distinction in terms of acuteness can be made. For example, nursing professionals and cooks are both identified by 22 countries

out of 29 as being in shortage. However, the share of the countries reporting a shortage that classed the shortage as high severity is substantially larger for nursing professionals. Overall, the most acute shortages, in terms of both the number of countries reporting a shortage and the degree of severity of those reports, are heavy truck and lorry drivers, specialist medical practitioners and nursing professionals.

Table 3: Widespread shortage occupations by number of countries and prevalence of high severity, 2024

Occupation	Number of countries reporting occupation in shortage	Percentage of shortage reports classed as high severity
Welders and flame cutters	23	32 %
Nursing professionals	22	36 %
Cooks	22	18 %
Building and related electricians	22	27 %
Plumbers and pipe fitters	21	29 %
Heavy truck and lorry drivers	21	48 %
Sheet metalworkers	21	14 %
Specialist medical practitioners	21	43 %
Metalworking machine tool setters and operators	20	20 %
Butchers, fishmongers and related food preparers	20	15 %
Bakers, pastry cooks and confectionery makers	19	5 %
Physiotherapists	19	11 %
Healthcare assistants	19	26 %
Waiters	18	39 %
Bus and tram drivers	18	28 %
Generalist medical practitioners	18	28 %
Electrical mechanics and fitters	18	17 %
Structural metal preparers and erectors	18	28 %
Electrical engineering technicians	17	18 %
Spray painters and varnishers	17	18 %
Chefs	17	18 %
Concrete placers, concrete finishers and related workers	17	24 %
Carpenters and joiners	17	24 %
Motor vehicle mechanics and repairers	17	29 %
Air conditioning and refrigeration mechanics	16	31 %
Insulation workers	16	19 %
Agricultural and industrial machinery mechanics and repairers	16	25 %
Electrical line installers and repairers	16	25 %
Electrical engineers	16	31 %
Industrial and production engineers	16	13 %

Occupation	Number of countries reporting occupation in shortage	Percentage of shortage reports classed as high severity
Electronics mechanics and servicers	16	19 %
Building construction labourers	16	19 %
Pharmacists	16	19 %
Bricklayers and related workers	15	20 %
Earth moving and related plant operators	15	13 %
Systems administrators	15	13 %
Painters and related workers	15	13 %
Building frame and related trades workers not elsewhere classified	15	20 %
Software developers	15	27 %
Nursing associate professionals	15	40 %
Food and related products machine operators	15	13 %
Dentists	15	20 %
Civil engineers	15	33 %
Mechanical engineering technicians	15	13 %
Fast food preparers	15	20 %

NB: Widespread shortage occupations are defined as occupations indicated as being in shortage by more than half of the countries that reported on shortage occupations.

Source: Data submitted by EURES NCOs.

Taking into account different national sources of information on shortages, most countries classify ICT occupations, healthcare occupations and transport occupations such as professional drivers as those facing critical shortages.

For example, Germany published a list of occupations facing shortages in 2024, including manufacturing managers, ICT service managers, physicists and astronomers, generalist medical practitioners and software developers (Federal Government of Germany, n.d.). Ireland's critical skills occupations list classifies occupations based on the qualifications, experience or skills that are in shortage. The list includes ICT professionals, health and social services managers and directors, engineering professionals and other health professionals.

Some Member States produce lists of perceived shortages in different sectors. For example, the Ibw Austria - Research & Development in VET found that 82.4 % of companies reported being affected by a shortage of labour and skilled workers, with the most severe shortages felt in the tourism and leisure (66.3 %), trades and crafts (63.3 %) and transport and traffic (61.7 %) sectors (Ibw, 2024). Finland's Labour Force Barometer cites the following occupations as facing the greatest shortages: nurses, healthcare assistants, generalist medical practitioners, early childhood educators, software developers, welders and flame cutters, security guards, psychologists, earth moving and related plant operators and social work and counselling professionals (Ministry of Economic Affairs and Employment of Finland, 2023).

Box 1: Quantification of labour shortages and surpluses in selected EURES countries

A limited number of EURES countries describe the extent of the labour imbalances they face in terms of the number of vacancies. Examples are presented below.

In 2024, France was projected to face significant labour shortages in various occupations. For instance, among the top 10 occupation groups facing hiring difficulties, there were 58 870 vacancies (2 % of all national vacancies) for stockers in shops, 121 950 (4 %) for waiters and 111 240 (4 %) for kitchen helpers and versatile restaurant employees. In addition, there were 70 000 (2.5 %) vacancies for winegrowers and arboriculturists, and 80 000 (3 %) for cleaners (France Travail, n.d.).

According to the Government of Luxembourg (2024), Luxembourg's shortage occupations include credit and risk banking analysts, installers, industrial maintenance technicians, engineers in renewable energy research and development, production managers, roofing installation and restoration assistants, industrial maintenance technicians, nurses and psychologists. Each of these occupations has at least 84 vacancies annually, with more than 25 % (or 10 % depending on the occupation) of job offers going without a candidate.

In Norway, health-related professions dominated the list of shortage occupations in 2024, with nurses (3 750 vacancies or 6 % of the desired employment in that occupation (1)), healthcare workers (3 100 or 3 %) and other health roles (1 950 or 53 %) facing significant deficits (NAV, 2024). Skilled trades linked to the construction industry, such as electricians (1 000 or 3 %), carpenters (900 or 2 %) and plumbers and heating, ventilation and air conditioning installers (550 or 3 %), and service roles, including shop assistants (1 600 or 1 %) and cooks (1 250 or 5 %), also exhibit notable shortages. This shortage is substantial, considering the total number of completely unemployed individuals and jobseekers on benefits in the health sector is only 3 450. The shortage of workers in occupations in the construction sector represents a substantial decrease from previous years, yet the demand remains high. In addition, the industrial sector requires 6 100 workers, with specific shortages in roles such as industrial mechanics (950 or 4 %), welders (850 or 14 %) and sheet metalworkers (550 or 13 %).

Table 4: Overview of quantifications of occupations facing shortages

COUNTRY	QUANTIFICATION
France	58 870 vacancies (2 % of all national vacancies) for stockers in shops, 121 950 (4 %) for waiters, 111 240 (4 %) for kitchen helpers, 98 430 (3.5 %) for winegrowers, 80 000 (3 %) for cleaners
Luxembourg	Each listed occupation has at least 84 vacancies annually, with > 25 % of job openings unfilled
Norway	Shortages: nurses (3 750 vacancies or 6 % of desired employment), healthcare workers (3 100 or 3 %), shop assistants (1 600 or 1 %), cooks (1 = 250 or 5 %), electricians (1 000 or 3 %), carpenters (900 or 2 %)

In addition, the International Road Transport Union report (2023a) on driver shortages indicates that 105 000 bus and coach driver positions were unfilled in 2023, representing 10 % of the total positions in the sector. This shortage had increased by 54 % between 2022 and 2023.

(1) Desired employment is the employment level required to meet the production of the desired output or actual demand.

2.2.3. Nature of shortages: transient or structural

Table 5 shows the recent trends in the most prominent shortage occupations, comparing their ranking in 2024 with previous years ([6]). For several occupations, shortages seem to be structural, given that they have ranked within the top 10 over the past five years. For instance, welders and flame cutters are consistently reported among the top five shortage occupations, and have taken the top place for the past two years. Other structural shortage occupations include nursing professionals, specialist medical practitioners, plumbers and pipe fitters, heavy truck and lorry drivers and healthcare assistants.

Among healthcare professionals, EU-wide shortages became relatively more pronounced in 2024, as did shortages among the broader group of craft and related trades occupations. This may reflect the increasingly pressing challenges related to ageing populations, but also, to an extent, the lasting impacts of the COVID-19 pandemic (Eurofound, 2023). The pandemic laid bare the vulnerabilities of the healthcare sector, especially in terms of labour shortages, and even several years down the road, a vicious cycle is compounding the situation in several EU countries, as working conditions deteriorate due to a lack of staff, leading to increased resignations (OECD, 2024b).

In addition, actions and commitments to mitigate climate change lead to higher demand, particularly in occupations typically related to the construction sector or linked through the supply chain (e.g. heavy truck and lorry drivers). Welders and flame cutters, building and related electricians, and plumbers and pipe fitters are occupations in high demand for construction. Labour shortages in the construction sector have become increasingly acute since the COVID-19 pandemic, with the European Commission estimating that labour shortages in the sector have reached levels three times as high as a decade ago (European Commission, 2023a). The European Construction Industry Federation (2023) stressed how national and European policies, such as the EU Green Deal and national recovery and resilience plans, and their environmental targets require vast investments in construction, leading to strong demand growth for workers with the right skills. Specific challenges for the sector that are driving the labour shortages include the ageing of the workforce, a lack of attractiveness and issues around working conditions.

Moreover, various occupations linked with the hospitality sector are facing increasingly widespread shortages (e.g. cooks, chefs and waiters). Following the COVID-19 pandemic, when containment measures were discontinued, this sector, which was among the most negatively affected ones, faced severe labour shortages when demand for workers recovered more quickly than supply (OECD, 2022). As the tourism sector continues to grow post-pandemic, there is increasing demand for hospitality workers ([7]).

The widespread shortage ranking of several occupations has increased substantially. These include sheet metal workers, bakers, pastry cooks and confectionery makers, physiotherapists, electronics mechanics and servicers, and pharmacists. Compared with the previous edition of the report, at least nine additional countries indicated a shortage in these occupations.

ICT-related occupations are also frequently listed as being in shortage. Given Europe's Digital Decade targets regarding the digital transition, which aim for 20 million ICT specialists by 2030, it is unsurprising that the demand for such occupations outpaces the supply in a number of countries in Europe. In relation to software developers, application programmers and systems administrators, 14 countries report shortages. Given the definition of widespread shortages applied in this report (i.e. more than half of the 29 countries identifying the occupation as being in shortage), ICT professionals do not qualify as widespread shortage occupations, but are nonetheless frequently mentioned. It may be reasonable to expect shortages in these occupations to become more widespread, given the ambitious targets for 2030.

More generally, ICT skills are increasingly in demand in a wide range of occupations and sectors, not exclusively among ICT professionals or the ICT sector. The supply of required skills not necessarily keeping up with the demand contributes to increased shortages in general, as digitalisation affects the task composition in many types of occupations (European Commission, 2023a).

6. It needs to be noted that the changes in the methodology for collecting information on occupations from the NCOs partly limits direct comparison with previous reports (see Section 1.2).
7. See Eurostat, 'Tourism statistics – Nights spent at tourist accommodation establishments' (https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Tourism_statistics_-_nights_spent_at_tourist_accommodation_establishments&stable=1).

Table 5: Ranking of widespread shortage occupations identified in 2024 compared with previous reports

Occupation	Change in ranking from 2023 to 2024	Ranking in current report (2024)	Ranking in previous editions of this report					
			2023	2022	2021	2020	2019	2017
Welders and flame cutters	=	1	1	5	3	3	2	3
Nursing professionals	+	2	5	2	2	1	6	4
Cooks	+	2	6	6	10	3	5	1
Building and related electricians	+	2	6	4	7	5	4	6
Plumbers and pipe fitters	–	3	2	3	1	2	4	2
Heavy truck and lorry drivers	=	3	3	3	4	3	1	4
Sheet metalworkers	+	3	10	6				
Specialist medical practitioners	+	3	4	8	8			
Metalworking machine tool setters and operators	+	4	5	3	9			
Butchers, fishmongers and related food preparers	+	4	9	9				
Bakers, pastry cooks and confectionery makers	+	5	12	9				
Physiotherapists	+	5	12	10				
Healthcare assistants	+	5	7	10	5	6	8	
Waiters	–	6	5	8				
Bus and tram drivers	+	6	9	7				
Generalist medical practitioners	=	6	6	7				
Electrical mechanics and fitters	+	6	9	7	7			
Structural metal preparers and erectors	+	6	11	9				
Electrical engineering technicians	+	7	13	10				
Spray painters and varnishers	+	7	11	11				
Chefs	+	7	9	11				
Concrete placers, concrete finishers and related workers	+	7	10	5	6	6	6	
Carpenters and joiners	+	7	8	3	6	6	4	
Motor vehicle mechanics and repairers	–	7	5	7	8	7	6	6
Air conditioning and refrigeration mechanics	+	8	11	13				
Insulation workers	+	8	12	12				
Agricultural and industrial machinery mechanics and repairers	+	8	10	9	7	6	3	5
Electrical line installers and repairers	+	8	13	13				

Occupation	Change in ranking from 2023 to 2024	Ranking in current report (2024)	Ranking in previous editions of this report					
			2023	2022	2021	2020	2019	2017
Electrical engineers	+	8	12	15				
Industrial and production engineers	+	8	12	13				
Electronics mechanics and servicers	+	8	17	15				
Building construction labourers	+	8	10	6				
Pharmacists	+	8	15	15				
Bricklayers and related workers	=	9	9	1	7	5	7	6
Earth moving and related plant operators	+	9	11	8				
Systems administrators	+	9	16	15				
Painters and related workers	+	9	11	9				
Building frame and related trades workers not elsewhere classified	+	9	16	12				
Software developers	=	9	9	6	10	6	8	
Nursing associate professionals	+	9	13	12				
Food and related products machine operators	+	9	14	12				
Dentists	+	9	14	14				
Civil engineers	–	9	7	10	5	6	8	
Mechanical engineering technicians	+	9	13	12				
Fast food preparers	+	9	15	16				

NB: Due to methodological changes, there may be slight deviations from the previously published reports. For some widespread shortage occupations identified in 2024, the rankings for the years 2017–2021 could not be retrieved, as the data from those years could no longer be obtained. For the years 2017–2021, any rankings displayed are taken directly from previous reports.

Source: Data submitted by EURES NCOs.

The structural nature of shortages is even more visible in the ranking of high-severity shortages than in that of shortage occupations in general. In particular, heavy truck and lorry drivers are facing consistent and significant shortages, with 10 countries reporting severe shortages. Nine and eight countries respectively indicate that labour shortages for specialist medical practitioners and welders and flame cutters are highly severe.

Overall, there has not been much change in the number of countries reporting severe shortages among the different occupations or in the ranking of these occupations in the list. On the other hand, out of the 20 occupations listed, only 7 exhibit a lower ranking than in the previous report, and for all other occupations the ranking remained stable or increased. This indicates a fundamental challenge, where shortages in specific occupations are critical and remain at high levels over time.

Table 6: Ranking of high-severity shortage occupations identified in 2024 compared with previous reports

Occupation	Change in ranking from 2023 to 2024	Ranking in current report (2024)	Ranking in previous editions of this report					
			2023	2022	2021	2020	2019	2017
Heavy truck and lorry drivers	=	1	1	3	3	2	1	4
Specialist medical practitioners	+	2	3	6				
Welders and flame cutters	=	3	3	4	2	2	2	2
Nursing professionals	–	3	2	2	1	1		3
Waiters	–	4	3	7				
Plumbers and pipe fitters	–	5	3	5	2	2	2	2
Building and related electricians	–	5	4	6				
Nursing associate professionals	+	5	7	9				
Bus and tram drivers	+	6	8	7				
Audiologists and speech therapists	=	6	6	8				
Air conditioning and refrigeration mechanics	–	6	5	8				
Civil engineers	=	6	6	8				
Generalist medical practitioners	–	6	3	4				
Electrical engineers	+	6	7					
Kitchen helpers	+	6	9	8				
Structural metal preparers and erectors	+	6	7	8				
Roofers	–	6	4	5				
Motor vehicle mechanics and repairers	=	6	6	8				
Healthcare assistants	=	6	6	8				
Rubber products machine operators	+	6	9	10				

NB: Due to methodological changes, there may be slight deviations from the previously published reports. For some high-severity shortage occupations identified in 2024, the rankings for the years 2017–2021 could not be retrieved, as the data from those years could no longer be obtained. For the years 2017–2021, any rankings displayed are taken directly from the previous reports.

Source: Data submitted by EURES NCOs.

2.3. Identification of surplus occupations

Table 7 presents the occupations that more than half of the countries identified as being in surplus, along with the percentage of these widespread surpluses that were identified as high severity. Occupations in the broad group of clerical support workers often have surpluses, as do elementary occupations and professionals, specifically in design-related occupations.

The impact of automation and digitalisation may partially explain some of these widespread surpluses. Generally, automation tends to affect manual, high-routine occupations relatively more than other groups ([8]). Occupations with a high degree of routine tasks, including freight han-

8. See Cedefop Skills Intelligence dashboard, 'Automation risk' (https://www.cedefop.europa.eu/en/tools/skills-intelligence/automation-risk?year=2021#1).

dlers and car, taxi and van drivers, tend to be more easily replaced by automated systems. In addition, as technological advancements like generative AI increasingly enable the automation of tasks traditionally thought to be difficult to automate, other occupations may be characterised by a decreasing demand for labour. Professional design-related occupations and those in the broad group of clerical support workers and can reasonably fall within this category (International Labour Organization et al., 2023), potentially explaining the surpluses in graphic and multimedia design and product and garment design occupations.

Table 7: Widespread surplus occupations by number of countries and prevalence of high severity, 2024

Occupation	Number of countries reporting occupation in surplus	Percentage of surplus reports classed as high severity
Graphic and multimedia designers	19	16 %
Cleaners and helpers in offices, hotels and other establishments	16	25 %
Freight handlers	15	33 %
Secretaries (general)	15	27 %
General office clerks	15	27 %
Car, taxi and van drivers	14	21 %
Shop sales assistants	14	29 %
Product and garment designers	14	14 %
Tailors, dressmakers, furriers and hatters	14	29 %
Photographers	14	36 %
Journalists	13	31 %
Stock clerks	13	31 %

Source: Data submitted by EURES NCOs.

2.4. Relationship between intra-EU labour mobility, labour migration and labour market imbalances

In the understanding of the EURES network, the term 'transnational workers' refers to those who work in a EURES country other than their country of origin, whether taking advantage of the free movement of labour (either for a long duration or temporarily, such as for seasonal work), being posted by their current employer or teleworking from another country. Cross-border workers, meanwhile, live in one EURES country and work in a neighbouring country, either as employees or self-employed people (European Commission: Directorate-General for Employment, Social Affairs and Inclusion, 2024a), and return to their country of residence regularly, for example daily or weekly (European Commission: Directorate-General for Employment, Social Affairs and Inclusion, 2024a).

In 2023, there were about 10.1 million working-age (20–64 years) EU movers ([9]) (European Commission: Directorate-General for Employment, Social Affairs and Inclusion, 2025). This constitutes an increase of 2.2 % compared with 2022 and a return to pre-pandemic levels. In 2023, the main destination country of EU movers was Germany (34 % of working-age EU movers), and the main countries of origin were Romania (25 % of all EU movers), Poland (12 %) and Italy (9 %). About 738 000 movers returned to their countries of origin in 2022 (+ 6 % compared with 2021).

There were approximately 1.8 million cross-border workers in the EU-27 in 2023 (European Commission: Directorate-General for Employment, Social Affairs and Inclusion,

9. EU citizens who reside in an EU country other than their country of citizenship.

2025). Posted work represents a substantial share of EU transnational labour mobility. In 2023, 5.5 million postings of employed and self-employed workers were issued, representing an increase of 19.5 % compared with 2022. Germany is the top sender country, followed by Poland (European Commission: Directorate-General for Employment, Social Affairs and Inclusion, 2025). Between 2021 and 2022, the number of non-EU nationals increased substantially in the EU workforce, reaching about 3.3 million in 2022.

Against this background, some opportunities for transnational matching of shortage and surplus occupations can be identified – see Table 8 and Annex 5. For 422 of the 430 (98 %) occupations that have been classified as in shortage in at least one country, there exists at least one country that has identified the same occupation as being in surplus. The occupation most often reported to be in shortage, welders and flame cutters, has been reported as in shortage in 23 countries and in surplus in 5 countries. Some occupations, such as painters and related workers, security guards and carpenters and joiners, have a relatively high number of potential matches. In particular, carpenters and joiners are classified as a shortage occupation in 17 countries, while being considered a surplus occupation in 10 others. For occupations in the hospitality sector (e.g. cooks and waiters), a number of matching possibilities exist. Transnational matching potential is limited, on the other hand, for healthcare professions, such as nursing professionals and medical practitioners. For example, 22 countries identified nursing professionals as a shortage occupation, whereas only Romania identified it as being in surplus.

Table 8: Transnational matching possibilities to alleviate labour market imbalances – number of countries identifying a certain occupation as in shortage or surplus, 2024

Occupation	Number of countries identifying a shortage	Number of countries identifying a surplus
Welders and flame cutters	23	5
Nursing professionals	22	1
Sheet metalworkers	21	4
Butchers, fishmongers	20	6
Waiters	18	9
Electrical mechanics, fitters	18	4
Carpenters and joiners	17	10
Construction labourers	16	9
Bricklayers and related	15	7
Software developers	15	4
Plasterers	14	6
Cooks	22	6
Specialist medical practitioners	21	1
Generalist medical practitioners	18	2
Healthcare assistants	19	5
Motor mechanics	17	5
Structural metal preparers	18	3
Painters and related	15	11
Agricultural mechanics	16	5
Early childhood educators	14	7
Security guards	13	12
Special needs teachers	12	7

Source: Data submitted by EURES NCOs.

However, the existence of job opportunities within EURES countries is not sufficient to enable or encourage workers to look for a job abroad. The literature has identified key determinants influencing cross-border work dynamics. First, several studies show the importance of wage differentials between the living and working countries of cross-border workers in explaining their decision to look for a job abroad (Broersma et al., 2022; Edzes et al., 2022). Higher wages in the home country make locals more reluctant to look for work abroad, while higher wages in the destination country can attract more workers to go there, assuming sufficient awareness of the jobs available abroad and no language or other barriers. In addition, the higher the unemployment rate in their region of origin, the more likely a worker is to look for a position in a neighbouring country (Broersma et al., 2022; Edzes et al., 2022). Other barriers to cross-border work can include language barriers, a lack of information, restrictive labour market regulations and a lack of transferability of qualifications (European Parliament, 2019). When it comes to individual workers' characteristics, several studies show that women are less likely than men to commute across a border (Gottholmseder and Theurl, 2007; Broersma et al., 2022; Edzes et al., 2022; Tsiopa et al., 2024). Age and education are also influencing factors in commuting decisions, as younger and more highly educated workers are more likely to commute. The flow of frontier workers is also easier between regions speaking a common language (Broersma et al., 2022; Edzes et al., 2022; Tsiopa et al., 2024). Finally, the accessibility of the job location, as measured, for example, by commuting time, is an important criterion. Workers are incentivised to search for positions in neighbouring countries if work sites abroad are easily reachable from their region of residence (Broersma et al., 2022; Edzes et al., 2022) (see Box 2). When it comes to temporary transnational migration, the fear of losing one's social network may also fuel reluctance to look for jobs abroad (Harsløf and Zuev, 2023).

Box 2: Characteristics of the flow of cross-border workers in the Meuse macro-region

In 2022, 8 % of the flow of all EU frontier workers occurred within the Meuse macro-region, which encompasses the border areas between Belgium, Germany and the Netherlands. An analysis of cross-border commuting flows from 2006 to 2013 (1) in this region reveals several important characteristics of cross-border mobility. First, during this period, cross-border commuting was a relatively small-scale phenomenon that generally involved less than 1 % of the employed labour force living in the NUTS (nomenclature of territorial units for statistics)-2 border regions of Belgium, Germany and the Netherlands.

Second, the majority of frontier workers lived in directly bordering regions. Between 2006 and 2013, 75 % of the 44 000 commuters to the Netherlands from Germany lived in Germany's NUTS-2 border regions with the Netherlands. Similarly, cross-border commuters living in Belgium and working in the Netherlands in that period amounted to 37 000, of whom 86 % lived in Belgian NUTS-2 border regions with the Netherlands.

Third, the number of commuters living in the border regions of Belgium and Germany and working in the Netherlands was two to three times larger than the number of commuters living in Dutch border regions and working in Germany or Belgium. This can be explained by the more favourable situation of the Dutch labour market at the time compared with its neighbouring countries. The analysis found that an increase of 1 percentage point in real wage differentials between two regions will lead to an increase of 13 percentage points in the flow of cross-border commuters moving from the low-wage to the high-wage border region. Similarly, a rise of 1 percentage point in the regional unemployment rate will raise cross-border commuting by 0.6 percentage points.

(1) The latest data available when the study cited was drafted.

Sources: Broersma et al. (2022); European Comission: Directorate-General for Employment, Social Affairs and Inclusion (2023c).

2.5. Chapter summary

Approximately 98 % of all four-digit ISCO 2008 occupations are reported to be in shortage in at least one country. Countries in southern and eastern Europe, particularly Malta and Slovakia, report the highest number of shortage occupations.

Table 9: Top 10 shortage and surplus occupations in EURES countries, 2024

Rank	Shortage occupations	Surplus occupations
1	Welders and flame cutters	Graphic and multimedia designers
2	Nursing professionals	Cleaners and helpers in offices, hotels and other establishments
3	Cooks	Freight handlers
4	Building and related electricians	Secretaries (general)
5	Plumbers and pipe fitters	General office clerks
6	Heavy truck and lorry drivers	Car, taxi and van drivers
7	Sheet metalworkers	Shop sales assistants
8	Specialist medical practitioners	Product and garment designers
9	Metalworking machine tool setters and operators	Tailors, dressmakers, furriers and hatters
10	Butchers, fishmongers and related food preparers	Photographers

Source: Data submitted by EURES NCOs.

Various occupations exhibit widespread shortages that persist over time and are frequently highly severe. Specifically, occupations related to healthcare services, the construction sector and hospitality have been present on the shortage list for many years. Megatrends, such as demographic change and the green transition, are expected to exacerbate shortages in some of these occupations.

Moreover, the chapter reveals a notable coexistence of shortages and surpluses in certain occupations within the same country. For instance, Belgium and Hungary report a considerable number of occupations experiencing both conditions, indicating regional differences in the labour demand and supply.

Nearly all (99 %) of the four-digit ISCO 2008 occupations are reported to be in surplus in at least one country, with Spain and Austria leading in the number of reported surplus occupations. There is no clear correlation between the numbers of surplus occupations and shortage occupations within individual countries, indicating structural differences in labour market dynamics.

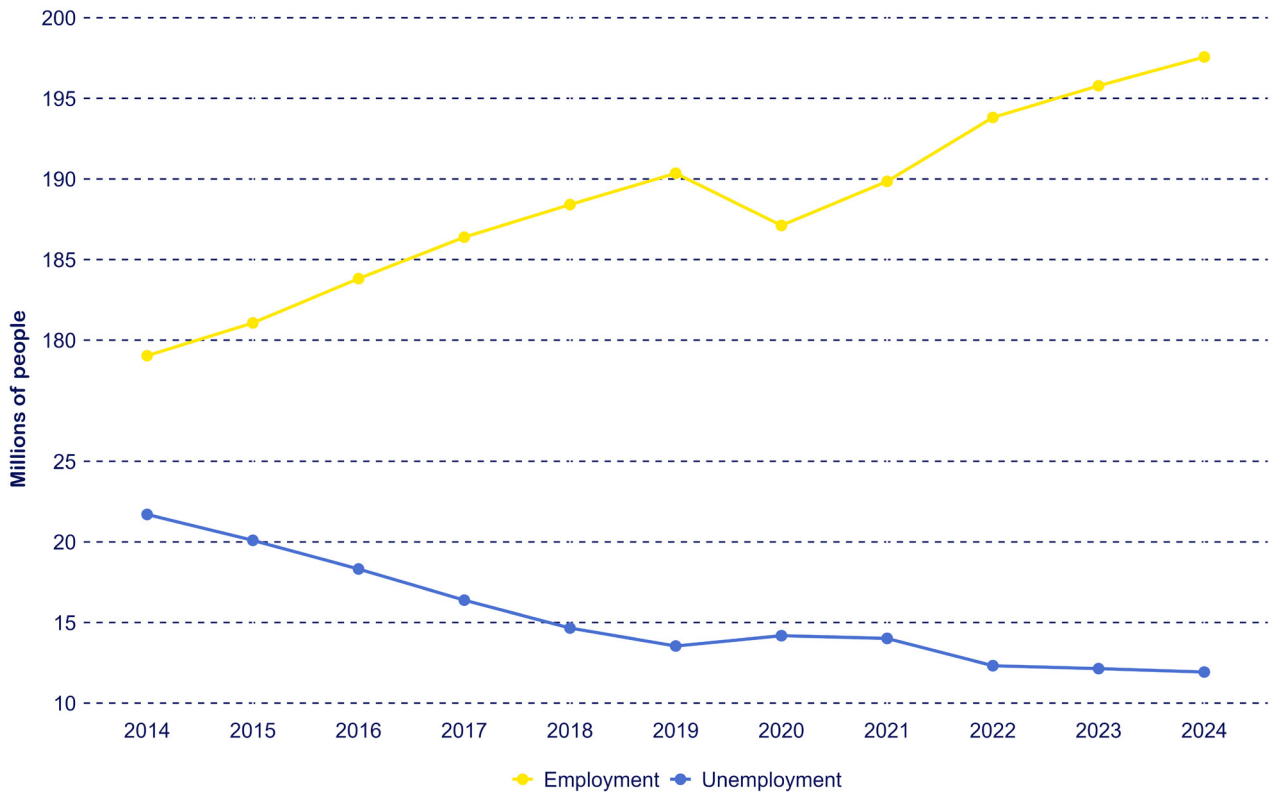
For 422 of the 430 occupations (98 %) that have been classified as in shortage in at least one country, there exists at least one other country that has identified the same occupation as being in surplus. Several challenges may, however, hinder transnational labour matching, such as obstacles to recognising qualifications across countries and language barriers. Quantified labour shortages in France, Luxembourg and Norway highlight significant deficits in health-related professions, skilled trades and various service roles, emphasising the need for targeted recruitment and training initiatives.

3. Developments in labour shortages and surpluses over time

3.1. Overall trends in the workforce

From 2014 to 2023, employment levels in the EU-27 showed a steady increase, rising from approximately 182 million people to over 199 million (see Figure 10). Employment saw a drop of roughly 3.5 million people in 2020 due to the COVID-19 pandemic. This decrease was not accompanied by a comparable increase in unemployment, reflecting both the implementation of job retention measures and a reduction in the economically active population due to care responsibilities. Nevertheless, employment recovered to pre-pandemic levels by 2022.

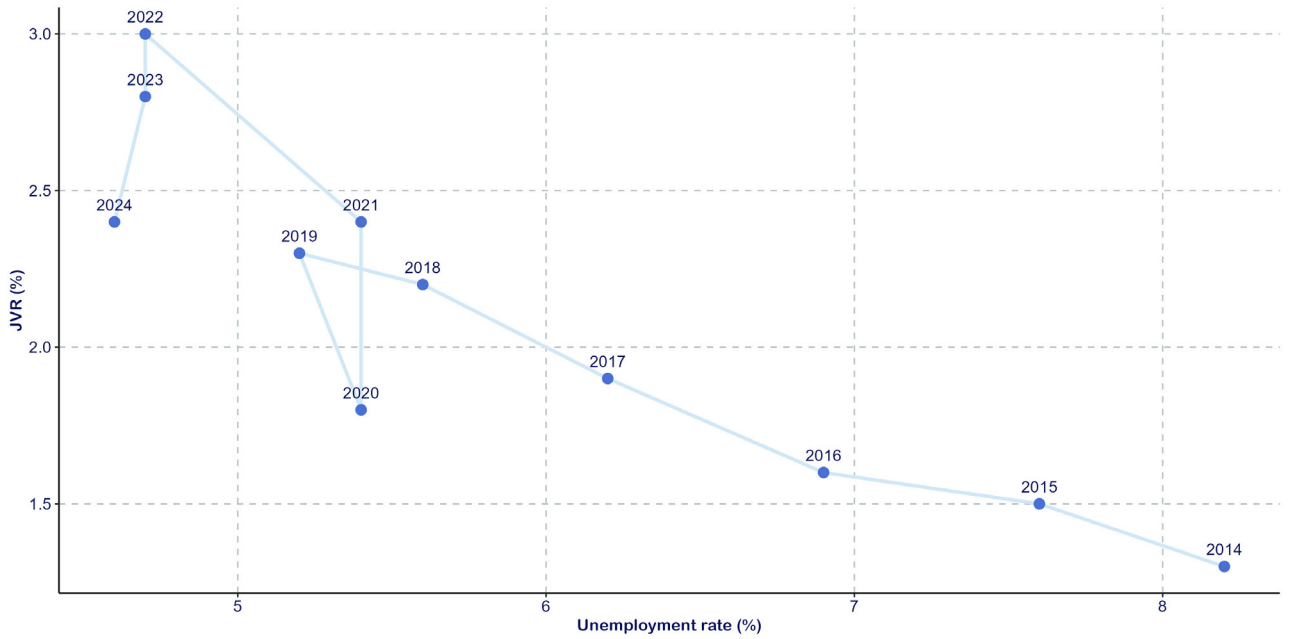
Figure 10: Trends in employment and unemployment levels in the EU-27, 2014–2024 (people aged 20–64 years)



Sources: Eurostat datasets une_rt_a and lfsi_emp_a (13 March 2025).

The labour market has experienced a period of tightening over the past decade (see Figure 11). The overall unemployment rate decreased from approximately 11 % in 2014 to just over 4.5 % in 2024, while the JVR increased from about 1.5 % to 2.8 % in the same period. This trend broadly reflects the recovery following the euro-area crisis. However, it is important to note that the COVID-19 pandemic caused an abrupt drop in job vacancies in 2020 and a slight increase in the unemployment rate, before both indicators returned to roughly pre-pandemic levels in 2021. Since 2022, the JVR has fallen for the first time since 2014, with the exception of the drop during the COVID-19 pandemic in 2020. The unemployment rate has continued declining nonetheless.

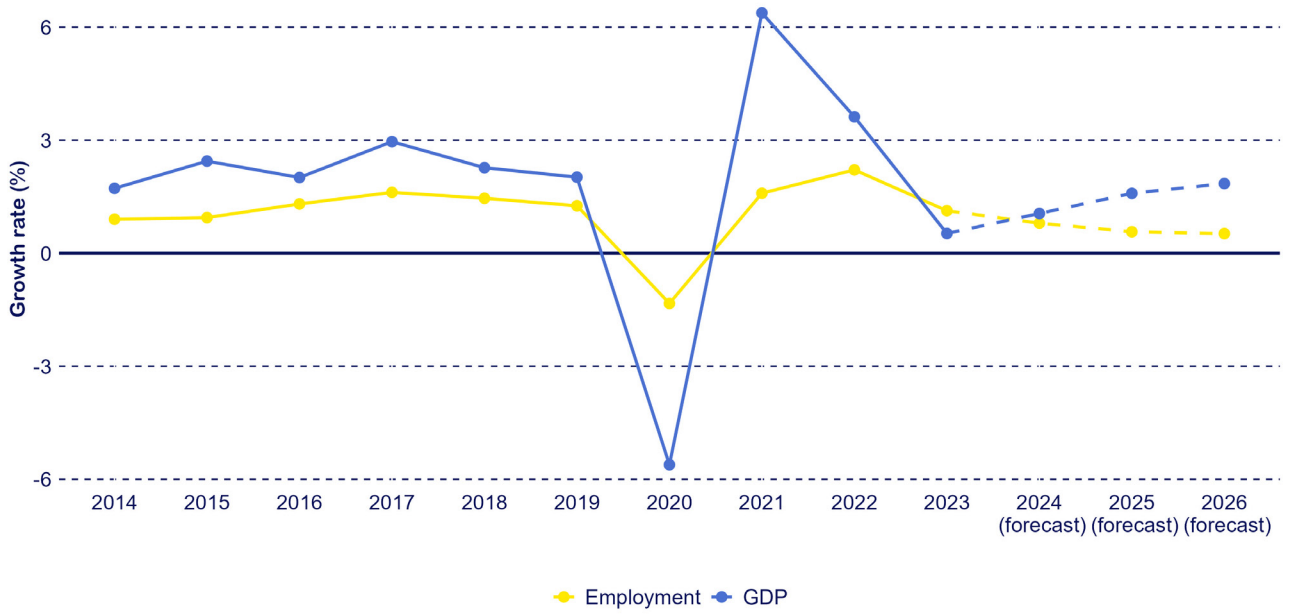
Figure 11: Beveridge curve for JVR and unemployment rate in the EU-27, 2014–2024 (people aged 20–64 years)



Sources: Eurostat datasets une_rt_a (13 March 2025) and jvs_a_rate_r2 (18 March 2025).

The increase in employment levels and JVR is linked with the economic growth of roughly 1.5–2 % observed over this period (see Figure 12). The COVID-19 pandemic led to a contraction in both real GDP and employment, with the former notably contracting more than the latter in 2020. The smaller decline in employment shows the benefits of job protection measures implemented throughout the EU. Based on the European Economic Forecast – Autumn 2024 (European Commission: Directorate-General for Economic and Financial Affairs, 2024a), employment growth is projected to decline to 0.5 % by 2026. This trend is anticipated as the EU labour market is expected to continue loosening, with a decline in labour shortages and job vacancies in the future. Conversely, the forecast suggests a rise in real GDP growth, reaching 1.8 % by 2026. This growth is expected to be driven by an expansion in demand, underpinned by the continuation of the disinflationary trend that began in 2022, leading to price stabilisation for non-energy goods.

Figure 12: Employment and real GDP growth rates for the EU-27, 2014–2023



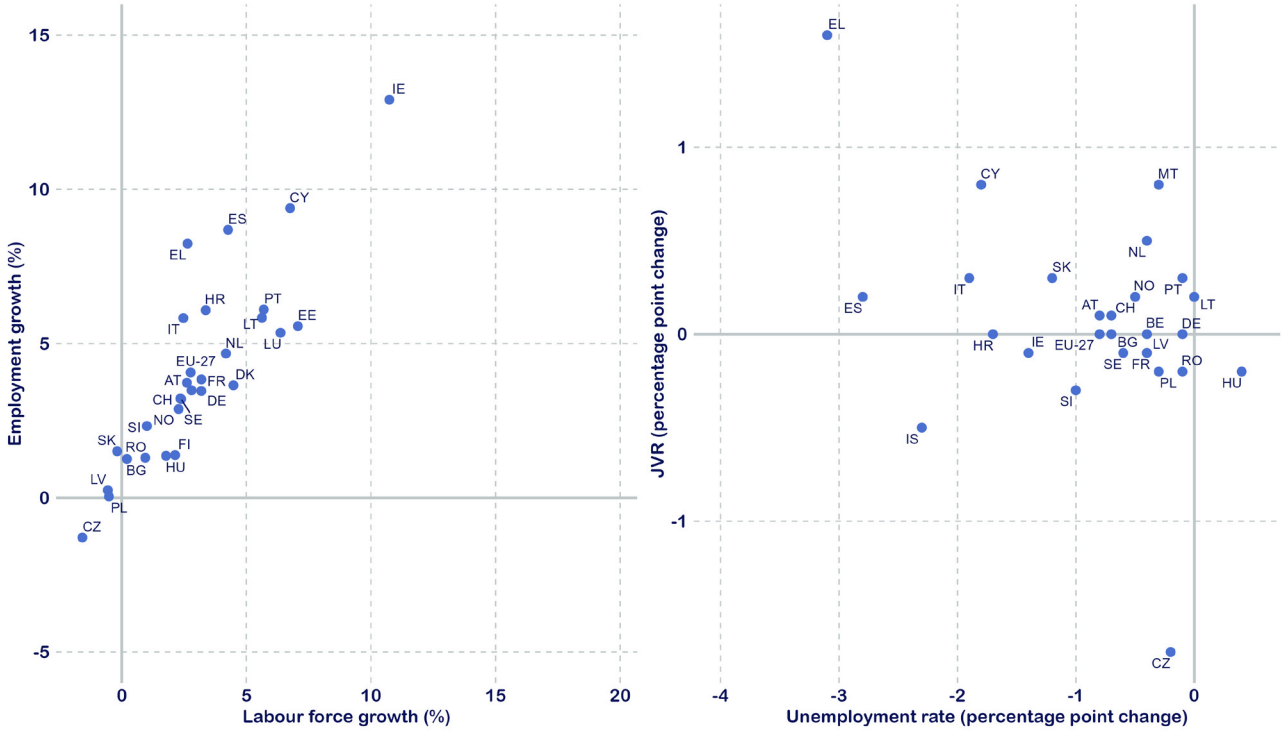
NB: The definition of employment is based on national accounts. For differences in the definition of employment between national accounts and the EU-LFS, see https://ec.europa.eu/eurostat/documents/24987/4253479/LFS-ESA2010.pdf/47eb1f62-b546-4848-a0e5-930ab84a26f8.

Source: Authors' elaboration based on the AMECO database (https://economy-finance.ec.europa.eu/economic-research-and-databases/economic-databases/ameco-database_en#database), accessed 15 November 2024.

Employment levels increased in most countries between 2021 and 2023, with the exception of Czechia and Romania (see the left-hand panel of Figure 13). The increase in employment was supported by the growth of the labour force. Although this is a positive development, most Member States experienced modest growth in both variables (i.e. below 5 %). It is worth highlighting that Malta, the Member State with the highest number of reported shortages in 2023 (see Figure 13), experienced by far the highest relative employment and labour force growth.

Between 2021 and 2023, the unemployment rate decreased in most Member States, with the exceptions of Estonia and Hungary (see the right-hand panel of Figure 13). This decrease was accompanied by an increase in the JVR in most, but not all, Member States. It should be noted that the Member States experiencing growth in the JVR are broadly the same Member States experiencing positive employment and labour force growth (as seen in the left-hand panel of Figure 13), with the exception of Ireland. Czechia experienced a contraction in the labour force and employment level, which led to a decline in unemployment and a decline in the JVR. While Malta experienced little change in its unemployment rate between 2021 and 2023, the small increase in the JVR over the same period suggests that much of the increase in the labour force has been quickly absorbed by the economy.

Figure 13: Labour market trends in EURES countries, 2021–2024 (people aged 20–64 years)



Sources: Eurostat datasets une_rt_a and lfsi_emp_a (13 March 2025) and jvs_a_rate_r2 (18 March 2025).

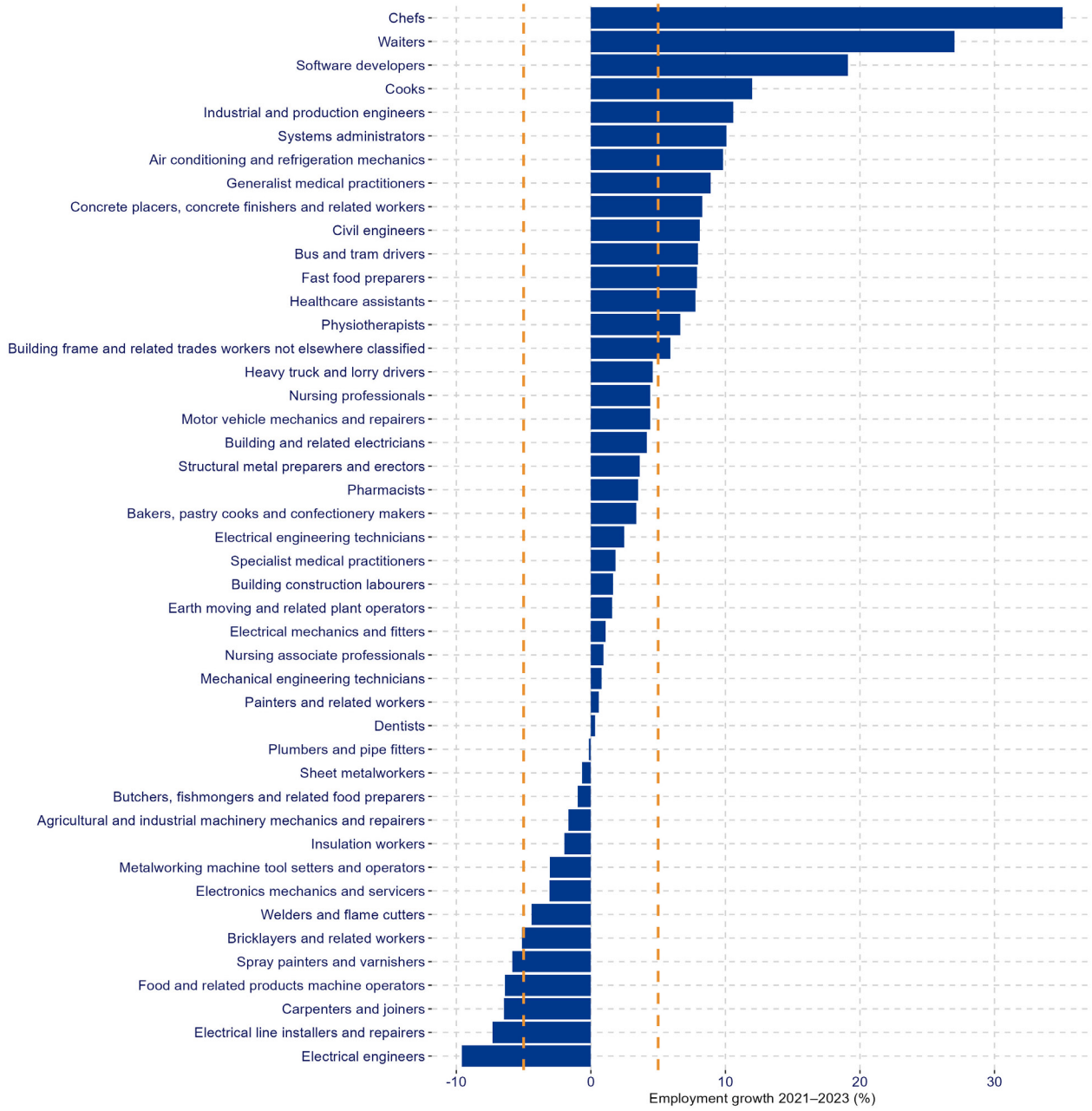
In conclusion, the EURES countries overall seem to have experienced tightening labour markets between 2021 and 2023, characterised by an increased JVR and falling unemployment rates.

3.2. Employment trends in widespread shortage occupations

Between 2021 and 2023 ([10]), employment in widespread shortage occupations increased from 39.8 million to 41.5 million people. Figure 14 shows that among these 45 occupations, 14 saw a decline in employment, while 31 experienced an increase. The substantial decline (more than – 5 %) in the final six occupations listed in Figure 14 may be attributed to an ageing workforce and unattractive working conditions, including aspects such as gender imbalances and an overall limited attractiveness to young talent, as this is broadly the case in the construction sector (European Construction Industry Federation, 2023).

10. Due to a methodological change in the definitions of employment and the labour force in the EU-LFS in 2021, the trend analysis was restricted to 2021–2023 to avoid the impact of a break in the series on the interpretation.

Figure 14: Changes in employment in widespread shortage occupations in the EU-27, 2021–2023 (people aged 15–64 years)



Source: EU-LFS special data extractions.

Among those 31 widespread shortage occupations which saw an increase in employment, several are related to the health sector. Occupations such as general medical practitioners (9 %) and physiotherapists (7 %) experienced substantial growth rates. This increase in demand for occupations in the healthcare sector has been accentuated by the COVID-19 pandemic (Blanco Moreno, 2024). However, these occupations also have a high reliance on intra-EU mobility, which could exacerbate shortages in this occupation group in mobile workers' countries of origin in the long term.

The hospitality sector has seen notable increases in employment in occupations such as cooks, chefs and waiters. After the COVID-19 pandemic, as containment measures were lifted, the hospitality sector – one of the most affected sectors – faced significant labour shortages due to a rapid recovery of the labour demand that outpaced the supply (OECD, 2022). As shown in Figure 14, employment in these roles has since surged, with chefs (35 %), waiters (27 %) and cooks (12 %) experiencing some of the highest employment growth rates in widespread shortage occupations between 2021 and 2023. This trend suggests that the labour market impacts of the COVID-19 pandemic had diminished by 2023 (Duval et al., 2022).

Box 3: Nursing professionals

- **Sectors with the highest employment shares:**
  - Human health activities
  - Residential care
  - Retail excluding motor vehicles
- **19.5 % of health professionals in EURES countries reported working over 40 hours per week in 2023 ([1]):**
  - 2021: 6.4 million workers working 40 + hours/week (average among sectors: ~ 740 000)
  - 2023: 6.7 million workers working 40 + hours/week (average among sectors: ~ 708 000)
- **Increasing demand due to ageing ([2]):**
  - Share of people aged 65 years and over in the EU-27, 2014: 18.7 %
  - Share of people aged 65 years and over in the EU-27, 2024: 21.6 %

(1) Based on EU-LFS special data extractions.

(2) Based on Eurostat dataset demo_pjanind (20 March 2025).

Sources: EU-LFS special data extractions; Eurostat dataset demo_pjanind (20 March 2025).

Box 4: Cooks

- **Sectors with the highest employment shares:**
  - Accommodation and food services
  - Other personal services
  - Households as employers
- **15 % of personal service workers in EURES countries reported working over 40 hours per week in 2023:**
  - 2021: 8.3 million workers working 40 + hours/week (average among sectors: ~ 740 000)
  - 2023: 9.5 million workers working 40 + hours/week (average among sectors: ~ 708 000)
- **Increasing demand after the COVID-19 pandemic ([1]):**
  - 1.84 million enterprises in accommodation and food services in the EU-27, 2020
  - 1.9 million enterprises in accommodation and food services in the EU-27, 2023

(1) See https://ec.europa.eu/eurostat/statistics-explained/index.php?oldid=664652.

Sources: EU-LFS special data extractions; Eurostat, 'Businesses in the accommodation and food services sector' (https://ec.europa.eu/eurostat/statistics-explained/index.php?oldid=664652).

Box 5: Welders and flame cutters

- **Sectors with the highest employment shares:**
  - Fabricated metal products
  - Other machinery and equipment
  - Retail excluding motor vehicles
- **The number of people aged 15–29 years in employment as welders and flame cutters fell between 2021 and 2023 from 121 000 to about 118 000.**
  - The number of people aged 50 years and over working as welders and flame cutters increased from roughly 230 000 to about 232 000 over the same period.
- **12.2 % of metal, machinery and related trades workers in EURES countries reported working over 40 hours per week in 2023 (1):**
  - 2021: ~ 999 000 workers working 40 + hours/week (average among sectors: ~ 740 000)
  - 2023: ~ 934 000 workers working 40 + hours/week (average among sectors: ~ 708 000)

(1) Based on EU-LFS special data extractions.

Source: EU-LFS special data extractions.

In Boxes 3, 4 and 5, the trends and possible drivers of the widespread shortages of nursing professionals, cooks and welders and flame cutters are considered in more detail. The occupation of welders and flame cutters is important in sectors such as the manufacture of fabricated metal products excluding machinery and equipment, the manufacture of machinery and equipment not elsewhere classified, and retail trade excluding motor vehicles and motorcycles. The ageing workforce has led to an increased number of retirements without sufficient replacements (Banks, 2022), and technological advancements have also created a demand for new skills that incumbent workers may lack. These factors, combined with the growth experienced in the sector (by around 200 000 workers between 2014 and 2022) could have resulted in the demand outpacing the supply of skilled workers and thereby accentuating already existing labour shortages.

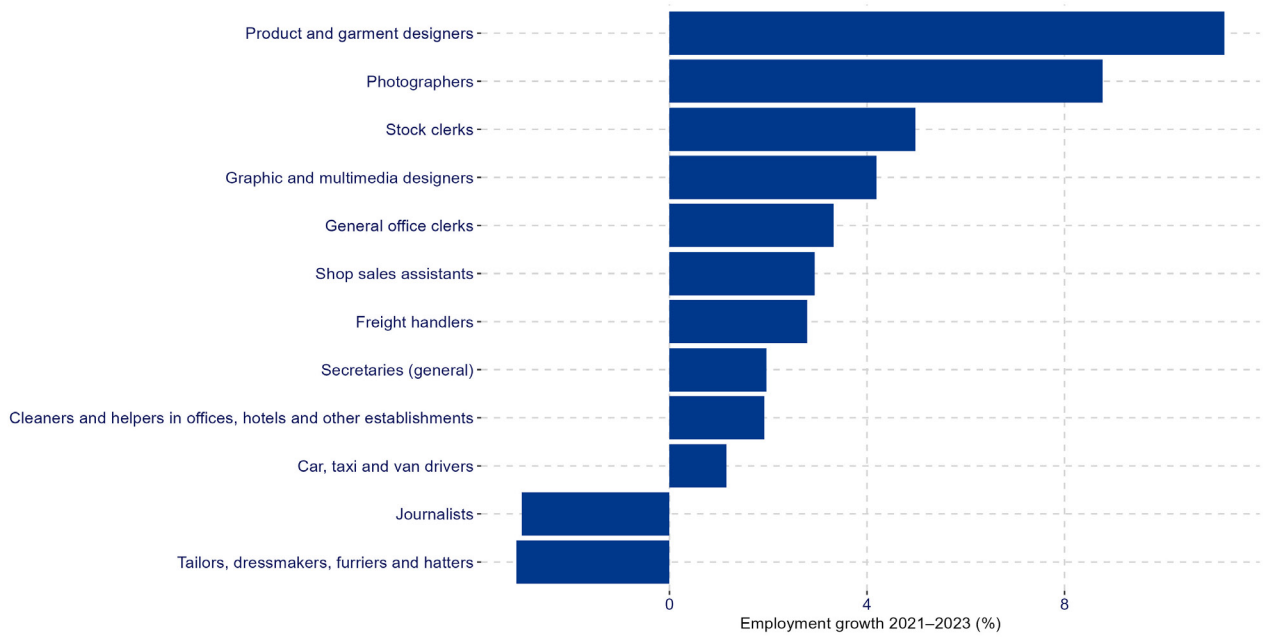
With regard to nursing professionals, their widespread shortage can be attributed to several factors. According to Alshahrani (2022), the ageing workforce has led to many retirements without sufficient replacements. Burnout and high workloads, especially post-COVID-19, have played a major role in driving many nurses to leave the profession. In addition, poor working conditions and inadequate pay are further deterrents to individuals entering or remaining in the profession. These factors, combined with the increase in demand for healthcare services between 2014 and 2022 (as demonstrated by an employment growth of roughly 3.2 million people across the human health activities and residential care and social work sectors), may have exacerbated labour shortages.

Finally, multiple drivers can help explain the current widespread shortage of cooks. Long hours and low pay have made these positions less attractive, leading to high turnover rates (Hospitality Business Review, 2024). The COVID-19 pandemic exacerbated the situation by causing many cooks to leave the industry and seek employment elsewhere. In addition, the high-pressure environment in kitchens has led to burnout and mental health issues, further driving individuals away from the profession. These challenges may have contributed to the increase in demand for skilled cooks, thereby intensifying widespread labour shortages.

3.3. Employment trends in widespread surplus occupations

Figure 15 shows that almost all identified widespread surplus occupations experienced positive employment growth during 2021–2023. Most of these occupations involve a high degree of routine tasks and are generally considered more vulnerable to automation and digitalisation (Pouliakas, 2018). Moreover, general office clerks and shop sales assistants, generally seen as vulnerable to digitalisation, saw the largest inflows of new workers between 2021 and 2023 (180 000 and 227 000 people respectively).

Figure 15: Changes in employment in widespread surplus occupations in the EU-27, 2021–2023 (people aged 15–64 years)



Source: EU-LFS special data extractions.

Employment in creative roles, assumed to be at a relatively high risk of automation by AI, has not been negatively affected, indicating slow adoption of AI in the EU, which is consistent with the current academic literature (Anantrasirichai and Bull, 2022). Figure 15 shows that creative professions such as product and garment designers (11 %) and graphic and multimedia designers (4 %) have continued to grow.

Looking more closely at the most widely reported surplus occupations, the labour surplus of graphic and multimedia designers can be attributed to several factors. The rapid technological advancements over the past few years in design software and tools, including the development of generative AI software, have increased productivity, reducing the need for as many designers, which may in turn have been a contributing factor to a decline in the labour demand for this occupation. Furthermore, the growth in the ICT sector (480 000 additional jobs) between 2014 and 2022 may have also attracted more individuals to pursue careers in graphic and multimedia design, leading to an oversupply of qualified candidates.

3.4. Future trends expected

Several factors, such as technological advancements, jobseekers' preferences and climate change policies, will exacerbate labour market imbalances by 2030 (European Labour Authority, 2024c). These factors may lead to significant labour shortages in certain sectors while creating surpluses in others. For example, the automation of otherwise labour-intensive work through robotics, AI and machine-learning technologies is expected to reshape employment, potentially displacing workers with lower technical skills (Cedefop, 2024). Workers in sectors such as mining and quarrying, manufacturing, construction and agriculture will probably face dismissal, while productivity in other occupations, such as ICT, will be enhanced (Cedefop, 2024). In the healthcare sector, especially for general practitioners and specialist medical practitioners, automation technologies like telemedicine platforms for preventive care and robotic surgery systems enhance care delivery, streamline workflows and reduce the workload and stress of medical staff, thereby addressing some shortages (European Labour Authority, 2024c). Climate change is also likely to deepen economic divides, with southern regions facing recurrent heatwaves that affect agriculture and tourism, and northern regions experiencing increased flooding that damages infrastructure (European Labour Authority, 2024c). These are likely to drive up the demand for workers in certain occupations, such as building and related electricians, plumbers and pipe fitters, and sheet metalworkers, which in turn could worsen the existing

widespread shortages in these fields.

Demographic changes and the shrinking working-age population will heighten pressure on social security systems and increase the need for younger workers to fill gaps. This demographic shift is likely to exacerbate labour shortages in sectors such as healthcare, particularly in shortage occupations such as nursing professionals, specialist medical practitioners, physiotherapists and healthcare assistants, where demand for services is rising due to an ageing population; meanwhile, the demand in the children's education sector is likely to be reduced.

A number of countries provide a forecast of future developments with regard to shortage occupations.

- Cyprus forecasts an increase in the demand for certain occupations such as ICT professionals (417 people annually, 5 %), sales workers (1 068 people annually, 2.7 %) and health professionals (459 people annually, 3.3 %), reflecting sector-specific growth and skills demand (Human Resource Development Authority of Cyprus, 2022).
- The Polish Occupational Barometer (Ministry of Family, Labour and Social Policy Republic of Poland, 2024) forecasts shortages for 2025 in line with the NCOs' list of occupations facing shortages for 2023. Occupations such as stock clerks, construction installation assemblers, bus and tram drivers, roofers and sheet metalworkers are all expected to face shortages in 2025.
- The German labour market forecast (Burstedde and Tiedemann, 2024) indicates there will be skilled labour shortages by 2027 ([11]) in the top five shortage occupations. Shortages of 36 989 sales specialists (e.g. cashiers); 27 621 childcare and education specialists; 22 207 social work and social pedagogy experts; 20 327 health and nursing care specialists and 19 022 computer science experts are expected.

At the EU level, the 2025 Cedefop Labour and Skills Shortage Index ([12]) provides an estimation of future labour shortages in 41 occupations, at the two-digit ISCO 2008 level (Cedefop, n.d.-a). The index examines three key factors contributing to labour shortages:

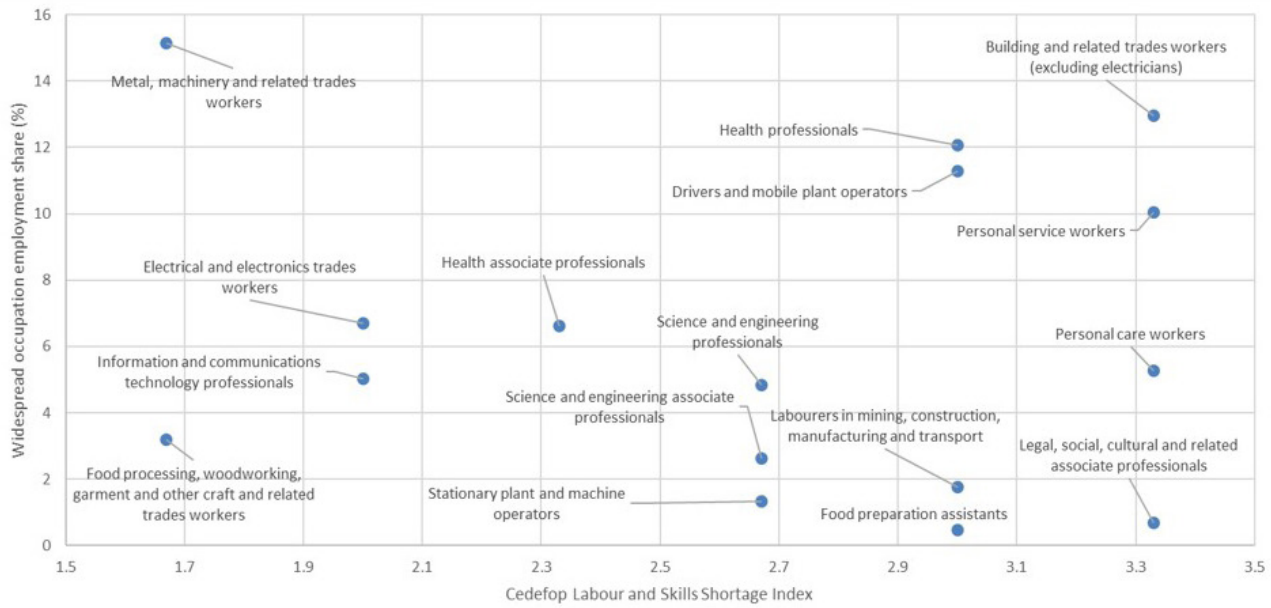
- demand, where rapidly growing occupations may exceed the available skill supply;
- supply, emphasising the need to replace workers who retire or switch careers;
- imbalances, pinpointing discrepancies between job qualifications and the requirements of available positions.

The index ranges from 1 to 4, where 1 indicates no expected shortage or surplus in the occupation group by 2035, and 4 indicates widespread labour and skills shortages by that year. Health professionals and legal, social and cultural professionals are expected to face intense demand and supply shortages by 2035, and ICT professionals are expected to face intense demand which would likely lead to labour shortages. General and keyboard clerks and other clerical support workers are indicated to face no shortage or surplus.

Figure 16 shows the 2025 Cedefop Labour and Skills Shortage Index estimations in comparison with the 2024 employment shares of the two-digit ISCO 2008 groups of widespread shortage occupations. Metal, machinery and related trades workers, health professionals, drivers and mobile plant operators, personal service workers and building and related trades workers were the widespread shortage occupational groups with the top five largest shares of employment in 2024. Among these, only the first group is expected to experience low/no labour shortage by 2035. Conversely, the other occupation groups in the top five have index values at or above 3, indicating the future persistence of the severe labour shortages observed in 2024.

11. Occupation names are translated from German to English and do not directly match the four-digit ISCO 2008 occupation labels.
12. See https://www.cedefop.europa.eu/en/tools/european-skills-index/labour-skills-shortage-index?country=BE&countryb=EU27#1.

Figure 16: Estimated future labour shortage intensity (by 2035) of the most widespread shortage occupations in the EU-27 in 2024



Sources: Cedefop Labour and Skills Shortage Index (2025a) EU-LFS special data extractions.

A closer examination based on Cedefop (2025a) of the estimated future labour shortages for occupations currently experiencing both widespread shortages and surpluses reveals that cleaners and helpers are expected to experience shortages by 2035. This occupation is currently in surplus, with a high share of employment. This predicted shift could be caused by the ageing out of the current workforce and the low attractiveness of this occupation for young workers. At the same time, the employment demand for cleaners and helpers is projected to decrease by around 458 000 jobs.

Table 10: Expected widespread shortages and surpluses in the EU-27 by 2035

Widespread in 2024	ISCO group	Share of total widespread shortage/surplus employment in 2024 (%)	Cedefop Labour and Skills Shortage Index score	Forecasted increase in employment from 2022 to 2035 (thousands of jobs)
Shortage	Building and related trades workers (excluding electricians)	12.95	3.33	332
Shortage	Personal service workers	10	3.33	772
Shortage	Personal care workers	5.26	3.33	610
Shortage	Legal, social, cultural and related associate professionals	0.69	3.33	1 160
Surplus	Legal, social, cultural and related associate professionals	0.7	3.33	1 160
Surplus	Cleaners and helpers	15.7	3.33	– 458
Surplus	General and keyboard clerks	28.68	1.33	– 513
Surplus	Numerical and material recording clerks	8.35	1.33	– 687

Sources: Cedefop Labour and Skills Shortage Index (2025a); Cedefop Skills Forecast (2025b); EU-LFS special data extractions.

Geospatial factors like urban concentration and industrial clustering are also likely to influence labour market dynamics in the coming years by affecting skill availability, wage dynamics and regional disparities in employment (König and Brenner, 2022; Groiss and Sondermann, 2023).

All these factors combined are likely to continue introducing disruptions to the labour market, which, if left unaddressed, could bring negative consequences for workers and employers alike. While tight labour markets may improve the bargaining position of workers and jobseekers, it is also possible that working conditions, specifically in relation to working hours, may deteriorate in occupations and sectors with an insufficient labour supply. In those industries, if labour shortages persist, automation and other technological solutions may become more economically attractive despite their initial cost (Autor and Salomons, 2018). For employers, labour shortages may result in higher job turnover costs and reduced production capacity and growth potential (Eurofound, 2021). In addition to working hours, other factors such as unionisation are also likely to shape labour market trends going forward (Kölling, 2022).

3.5. Chapter summary

The EU-27 experienced a steady rise in employment levels from 2014 to 2023, despite a temporary decline during the COVID-19 pandemic. Between 2021 and 2023, most Member States saw growth in employment and labour force participation. The unemployment rate has broadly decreased, accompanied by rising numbers of job vacancies, signalling tightening labour markets.

Widespread shortage occupations, particularly in healthcare and hospitality, experienced significant employment growth. Health professionals, such as general practitioners and physiotherapists, saw increases due to pandemic-driven demand, while the hospitality sector recovered rapidly post-pandemic, with jobs such as cooks, chefs and waiters experiencing substantial growth.

Widespread surplus occupations, often vulnerable to automation, continued to see positive employment growth. Despite concerns about digitalisation, creative roles such as designers saw growth, indicating the slow adoption of automation technologies in the EU.

With regard to future trends, demographic change, digitalisation and the green transition are expected to remain key drivers of labour market imbalances. Regional disparities and geospatial factors such as urban concentration and industrial clustering are likely to influence future trends. If labour shortages persist, automation may become more economically viable for employers, though it could lead to increased job turnover and reduced production capacity.

4. Characteristics of workers

In 2024, 57 occupations ([13]) were identified as experiencing either widespread shortages or widespread surpluses. These occupations collectively employed approximately 70.5 million workers in the EU-27 in 2023. Of these, 41.5 million were employed in the 45 widespread shortage occupations, while 29 million were employed in the 12 widespread surplus occupations.

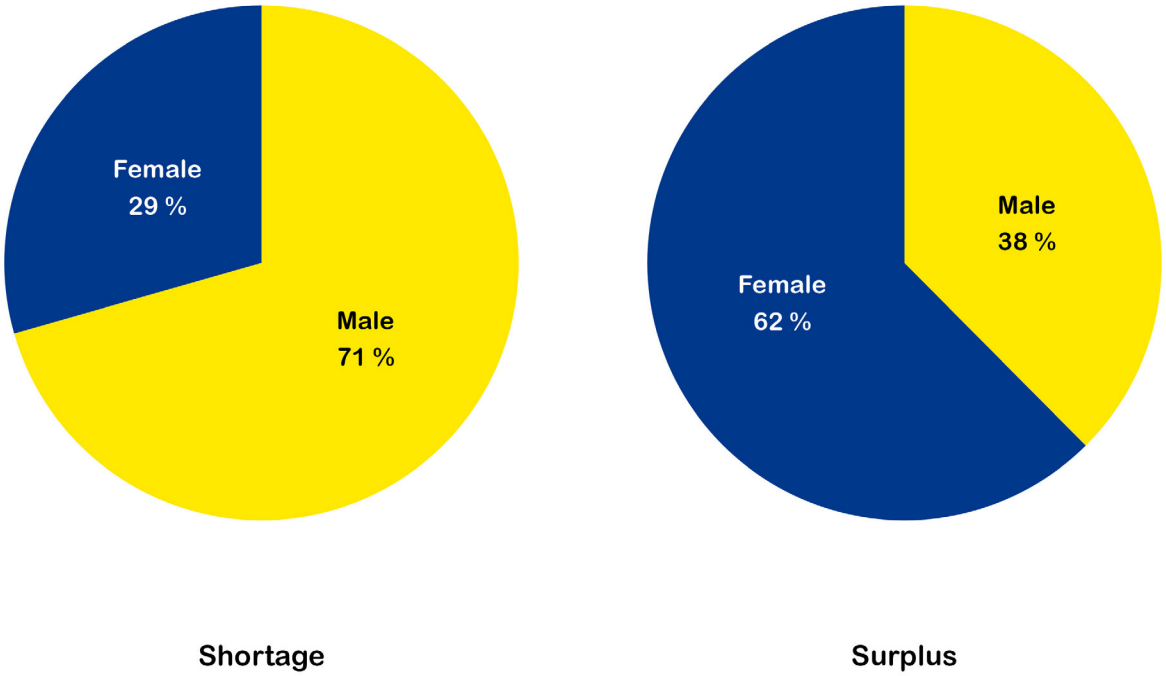
The 70.5 million workers in widespread shortage or surplus occupations represent around 35 % of the total 199.6 million individuals employed in the EU-27 in 2023. These widespread shortage and surplus occupations constitute around 13 % of the 436 occupations classified under the ISCO 2008 system, with some of the occupations, such as secretaries and shop sales assistants, having some of the highest shares in overall employment out of all ISCO occupations.

4.1. Gender profile

In 2023, the widespread shortage and surplus occupations identified employed 30.3 million women and 40.2 million men. The gender distribution in these occupations taken together mirrors the gender split in the overall EU workforce, with women and men comprising 43 % and 57 %, respectively. However, women represent only 29 % of workers employed in widespread shortage occupations, while their share in widespread surplus occupations is greater, remaining stable at 62 % in 2023 compared with 63 % in 2022.

13. See Sections 2.2 and 2.3; this includes shortages and surpluses from Norway and Switzerland.

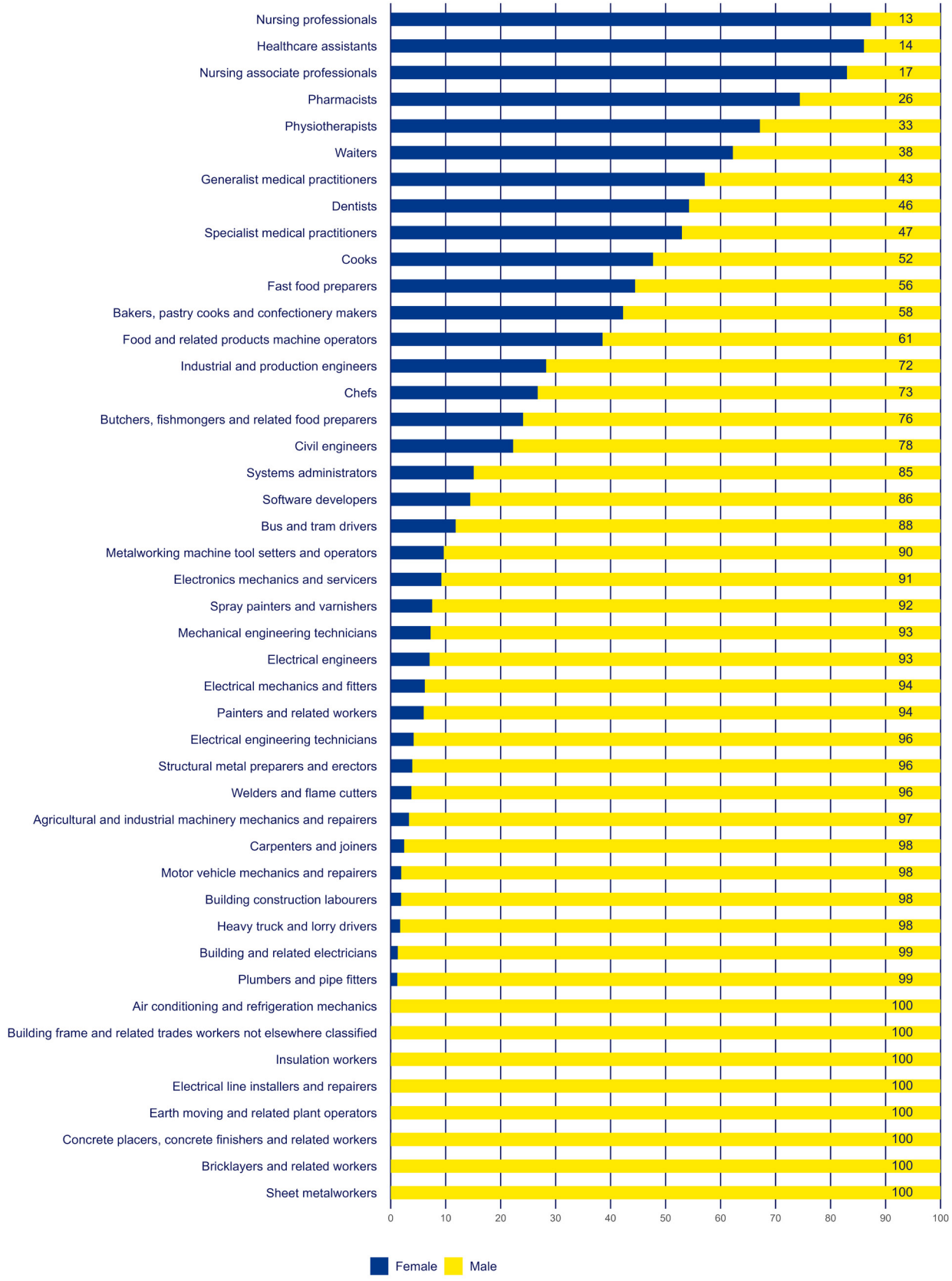
Figure 17: Shares of employment in widespread shortage and surplus occupations in the EU-27 by gender, 2023 (people aged 15–64 years)



Source: EU-LFS special data extractions.

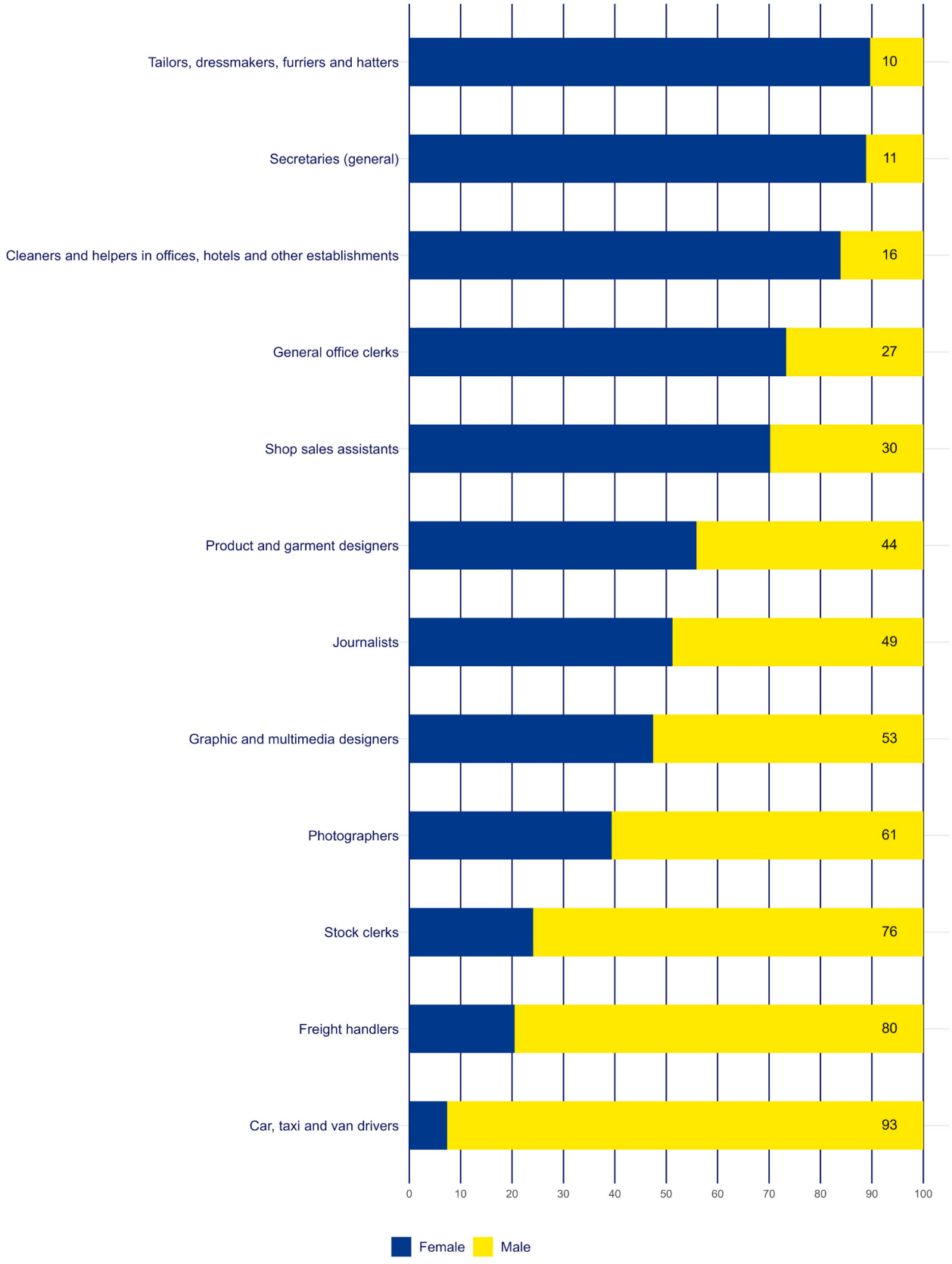
As shown in Figure 18, women are substantially under-represented in some of the largest groups of occupations experiencing widespread shortages, particularly skilled occupations related to construction. The two main groups dominating the widespread shortages – building and related trades workers and metal, machinery and related trades workers – have traditionally been male-dominated occupations. Representation of women is also low in engineering and electrical trades and software-related professions. Notably, aside from waiters, high representation of women in shortage occupations is found only in healthcare roles. Employment of health professionals grew from 2021 to 2023, with general practitioners seeing a 15 % increase in the number of women, from 369 000 in 2021 to 426 000 in 2023. This growth outpaced the total employment growth in that occupation (9 %). Occupations tied to the food industry (e.g. waiters, bakers) also saw above-average growth in the number of women employed from 2021 to 2023. In 24 out of the 45 widespread shortage occupations, the growth in the number of women employed outperformed the growth of total employment in the respective occupations from 2021 to 2023.

Figure 18: Share of employment in widespread shortage occupations in the EU-27 by gender, 2023 (people aged 15–64 years) (%)



Source: EU-LFS special data extractions.

Figure 19: Share of employment in widespread surplus occupations in the EU-27 by gender, 2023 (people aged 15–64 years) (%)

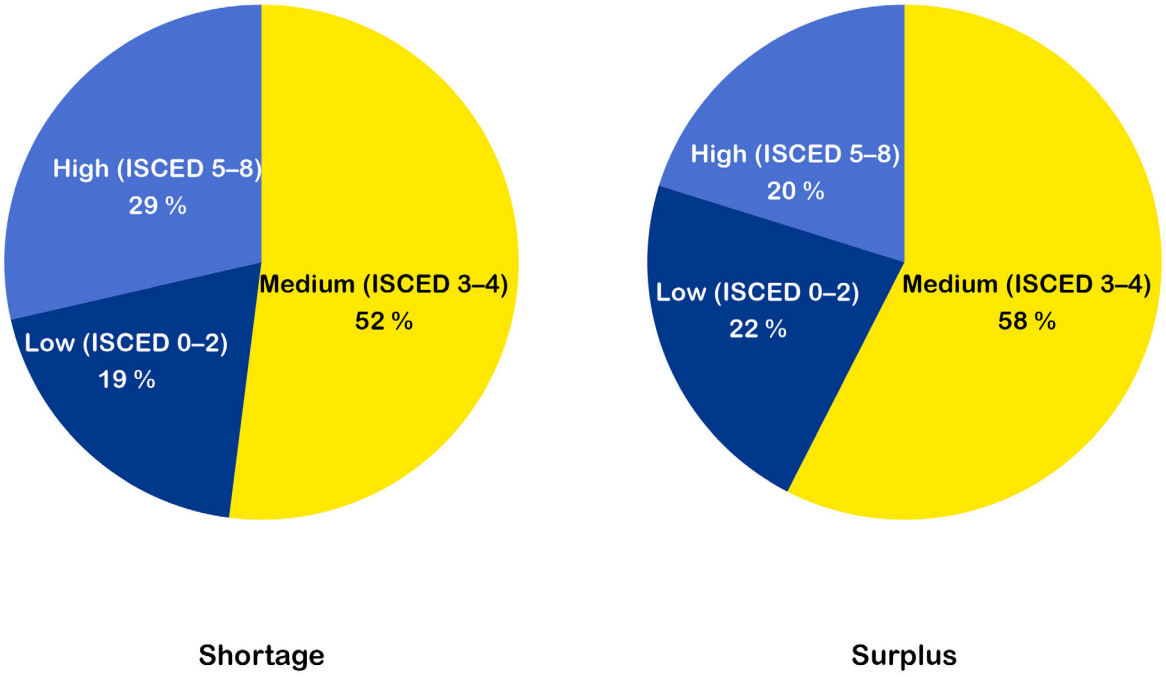


Source: EU-LFS special data extractions.

4.2. Education profile

Figure 20 shows that the proportion of workers with a tertiary or higher education level (ISCED 5 or above) in shortage occupations was 29 %, compared with 20 % in surplus occupations. In contrast, the share of workers with a medium level of education (ISCED 3–4) was 52 % in shortage occupations and 58 % in surplus occupations. The proportion of workers with a low level of education (ISCED 0–2) was 19 % in shortage occupations and 22 % in surplus occupations. Across the EU-27 workforce, educational attainment levels remained stable over 2022–2023. Workers with low levels of education comprised 16.2 % of the workforce in 2023 (16.4 % in 2022), those with medium levels of education 45.8 % in 2023 (46.4 % in 2022) and those with tertiary or higher qualifications 37.9 % in 2023 (37.2 % in 2022).

Figure 20: Share of employment in widespread shortage and surplus occupations in the EU-27 by education level, 2023 (people aged 15–64 years)



Source: EU-LFS special data extractions.

In shortage occupations, medium-level education is generally linked to trade professions (e.g. painters, carpenters), which typically involve apprenticeships or vocational education and training pathways. Conversely, in surplus occupations, medium-level education usually corresponds to roles requiring general secondary education (e.g. shop sales assistants). Figure 21 and Figure 22 present the shares of education levels in each widespread shortage and surplus occupation in more detail.

Other occupations that require medium-level education include transport-related roles, and they are represented in both shortage and surplus occupations. For example, surplus occupations include freight handlers and car, taxi and van drivers, while shortage occupations include truck drivers and bus and tram drivers.

While overall trends with regard to education levels have remained stable over the past year, changes in the employment levels of individual occupations can be broadly linked to changes in the education-level subsegments of the occupation's workforce. For example, the growth in employment among personal service workers, including waiters, chefs and cooks, can be attributed to the medium-educated and low-educated segments of their respective workforces. Specifically, according to the EU-LFS special data extractions, waiters saw a 26 % increase in medium-educated workers (255 000 people) and a 33 % increase in low-educated workers (161 000 people) between 2021 and 2023.

The dynamics of employment growth by education segment are also noteworthy for occupations with large shares of highly educated people. For example, the growth in

employment among software developers is primarily driven by growth in the number of highly educated workers, which rose by 18.6 % between 2021 and 2023 (204 000 people), compared with medium-educated workers (up by 23.2 % or 53 200 people) and low-educated workers (up by 10 % or 2 500 people).

There are also notable differences in the share of highly educated workers between shortage and surplus occupations (Figure 21 and Figure 22). In shortage occupations, high-level education is most prevalent in healthcare and engineering professions, which require occupation-specific high qualifications. In contrast, high-level education in surplus occupations is mainly found in the arts and design fields. This indicates that labour shortages are driven by specific skill requirements, as employers favour candidates with occupation- or job-specific technical qualifications over general qualifications.

The data also seem to indicate that trends in education levels mirror trends in gender division. In shortage occupations, health professions are characterised by the predominance of women and of those highly educated. This apparent parallel in the division of gender and education levels could explain some of the skills shortages currently experienced in the labour market. Member States have already introduced policies that aim to reduce gender imbalances in education. For example, the national recovery and resilience plan recently implemented in Italy is attempting to, among other things, address gender gaps in employment in highly skilled professions. The science, technology, engineering and mathematics (STEM) field currently exhibits a gender gap favouring men (European Commission, 2024b). The national recovery and resilience plan seeks to reduce this gap by providing scholarships/grants to women in STEM fields and offering incentives for employers to hire and promote women in STEM roles, including tax benefits and subsidies that encourage businesses to support gender diversity in highly skilled professions (D'Alfonso, 2024).

Ireland stands out for having one of the highest proportions of highly educated workers in widespread shortage occupations, at 50 %. Specifically, 6 out of the 15 shortage occupations identified classify more than 50 % of their workforce as highly educated. This distribution is predominantly driven by the high-level education requirements of occupations in the healthcare sector, including roles such as physiotherapists, pharmacists and nursing professionals.

Box 6: The Future of European Competitiveness on skills gaps

The Future of European Competitiveness emphasised the importance of considering the future development of skills gaps (European Commission, 2024b). The report calls for a European strategy to address skills shortages at all levels of education. Projections indicate that shortages will affect roles requiring high education levels and non-manual skills (e.g. professional, scientific and technical activities and ICT) due to the changing labour needs resulting from the digital and green transitions and the phasing out of a large cohort of skilled labour from the workforce.

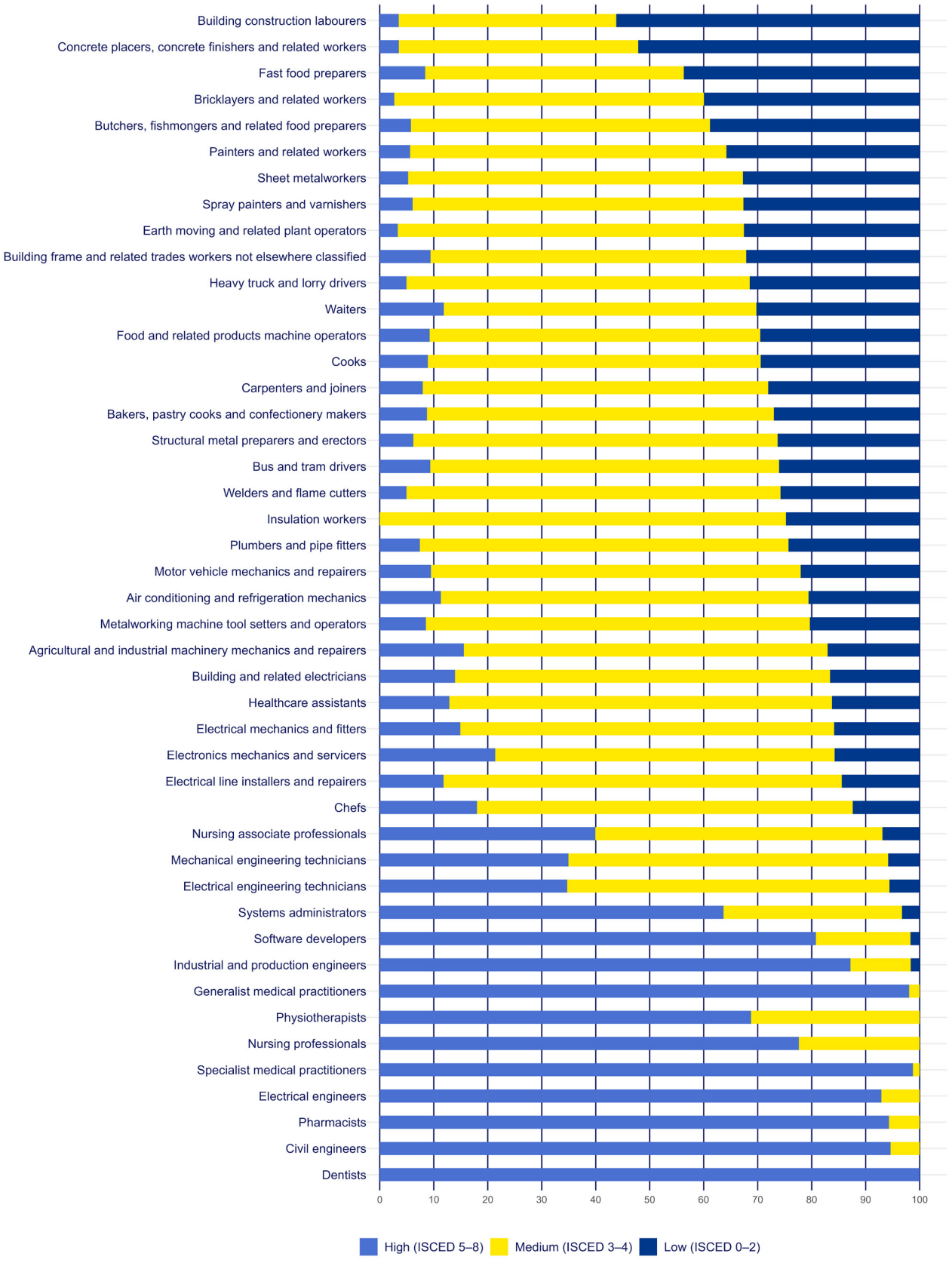
The Future of European Competitiveness draws attention to a significant transformation in skill requirements, driven by digitalisation and decarbonisation within the transportation and storage sector. Specifically, the report anticipates a decline in demand for low-skilled workers as human–machine interactions become more prevalent. Notably, approximately 250 000 seafarers will require reskilling in how to manage alternative fuels and automated operations. The report advises prioritising the development of new competencies in the transport workforce, such as safely handling and bunkering alternative fuels, maintaining optimal operating speeds and overseeing automated vessel operations.

Source: European Commission (2024b).

The findings on the severity and frequency of labour shortages in this report are consistent with those in previous editions, suggesting that an increase in the supply of highly educated jobseekers would not fully resolve all the shortages identified. However, it would be particularly beneficial for addressing shortages in certain professions such as healthcare. Conversely, increasing the labour supply of workers with intermediate education could help mitigate shortages across a wide range of occupations, especially in the construction and transportation and storage sectors.

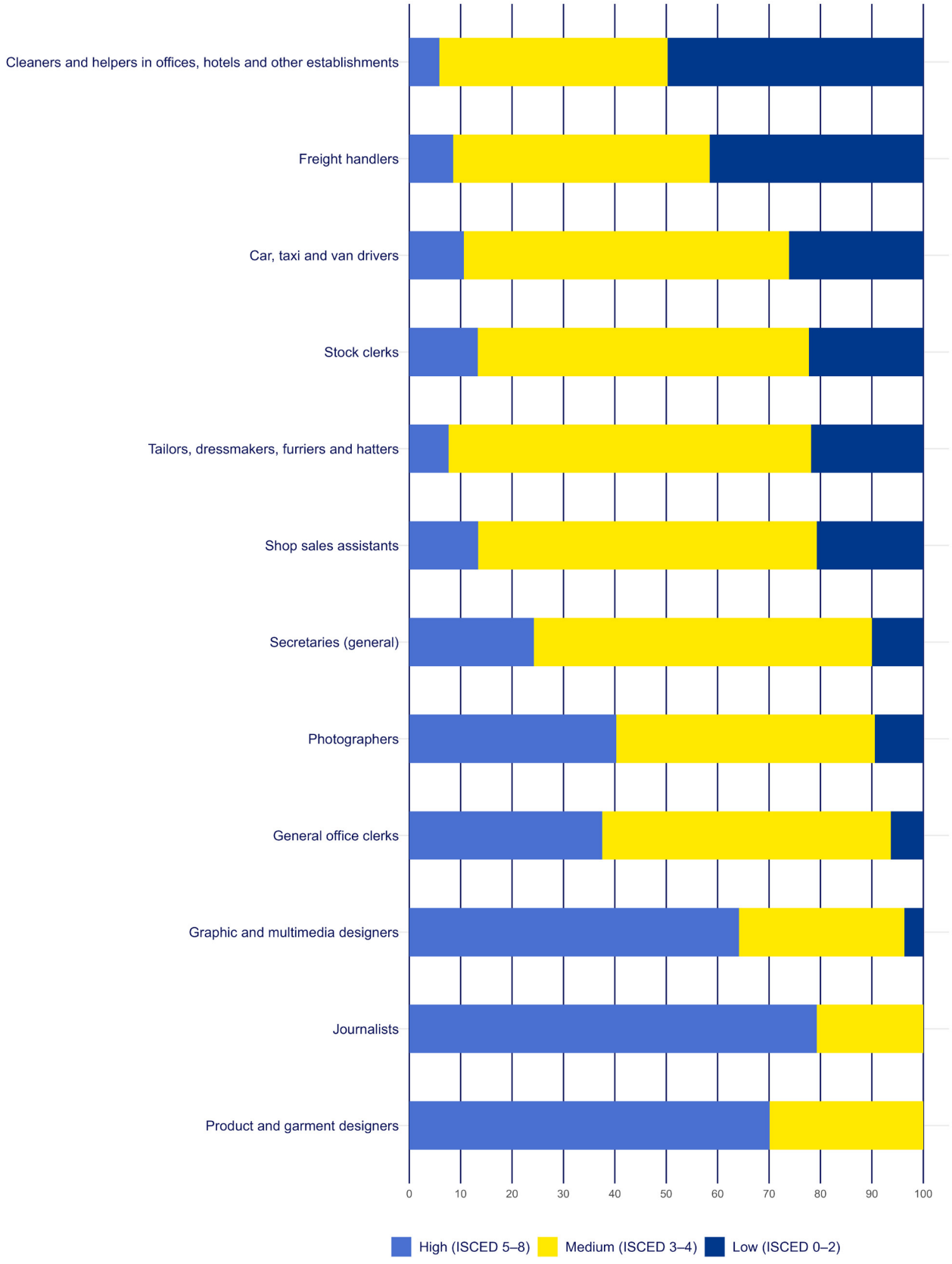
Finally, workers with low education levels are more likely to be present in widespread surplus occupations than workers with high skill levels, as are other vulnerable groups (women, migrants, young and older workers).

Figure 21: Share of employment in widespread shortage occupations in the EU-27 by education level, 2023 (people aged 15–64 years) (%)



Source: EU-LFS special data extractions.

Figure 22: Share of employment in widespread surplus occupations in the EU-27 by education level, 2023 (people aged 15–64 years) (%)



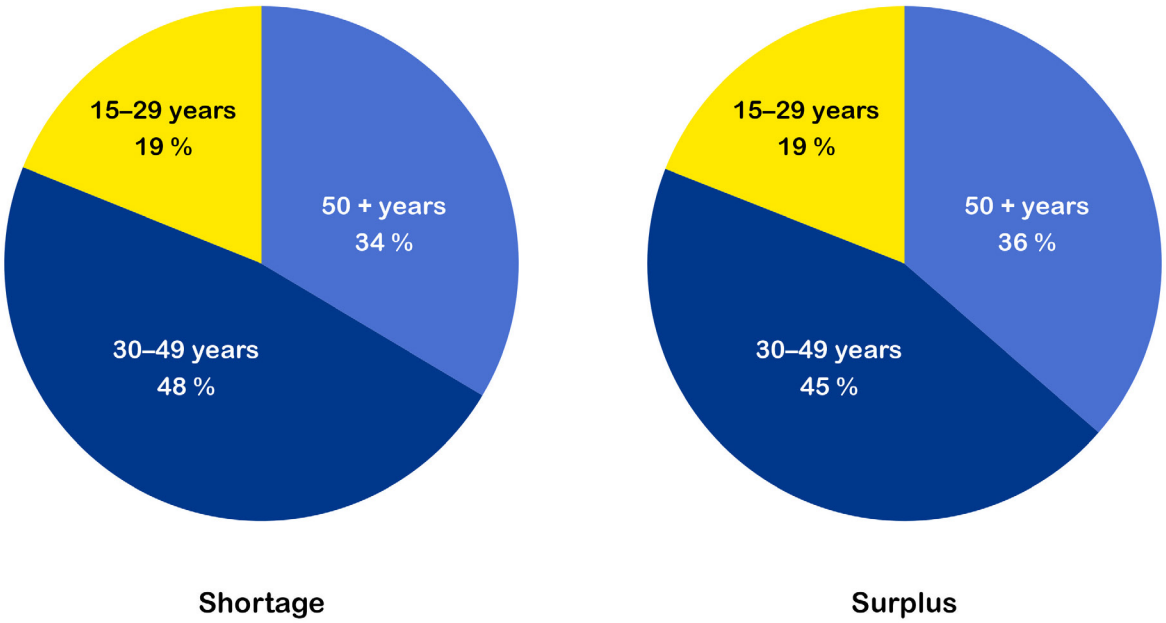
Source: EU-LFS special data extractions.

4.3. Age profile

Based on EU-LFS special data extractions, in 2023, there were 34.9 million workers under the age of 30 years in the EU-27, representing 17.3 % of the total workforce across the Member States. Within the most widespread shortage occupations, 41.5 million people were employed, of which 7.8 million were under the age of 30 years, comprising 22.5 % of the total employed in these occupations. In contrast, the most widespread surplus occupations employed 29 million people, with 5.5 million under the age of 30, representing 15.8 % of the EU-27 workforce in these roles.

In 2023, 69.4 million workers in the EU-27 were over the age of 50 years, making up 34.4 % of the total workforce. Among the most widespread shortage occupations, 13.9 million workers were over the age of 50 years, constituting 34.2 % of people employed in these roles. In the most widespread surplus occupations, 10.5 million workers were over 50 years old, representing 36 % of the EU-27 workforce in these roles.

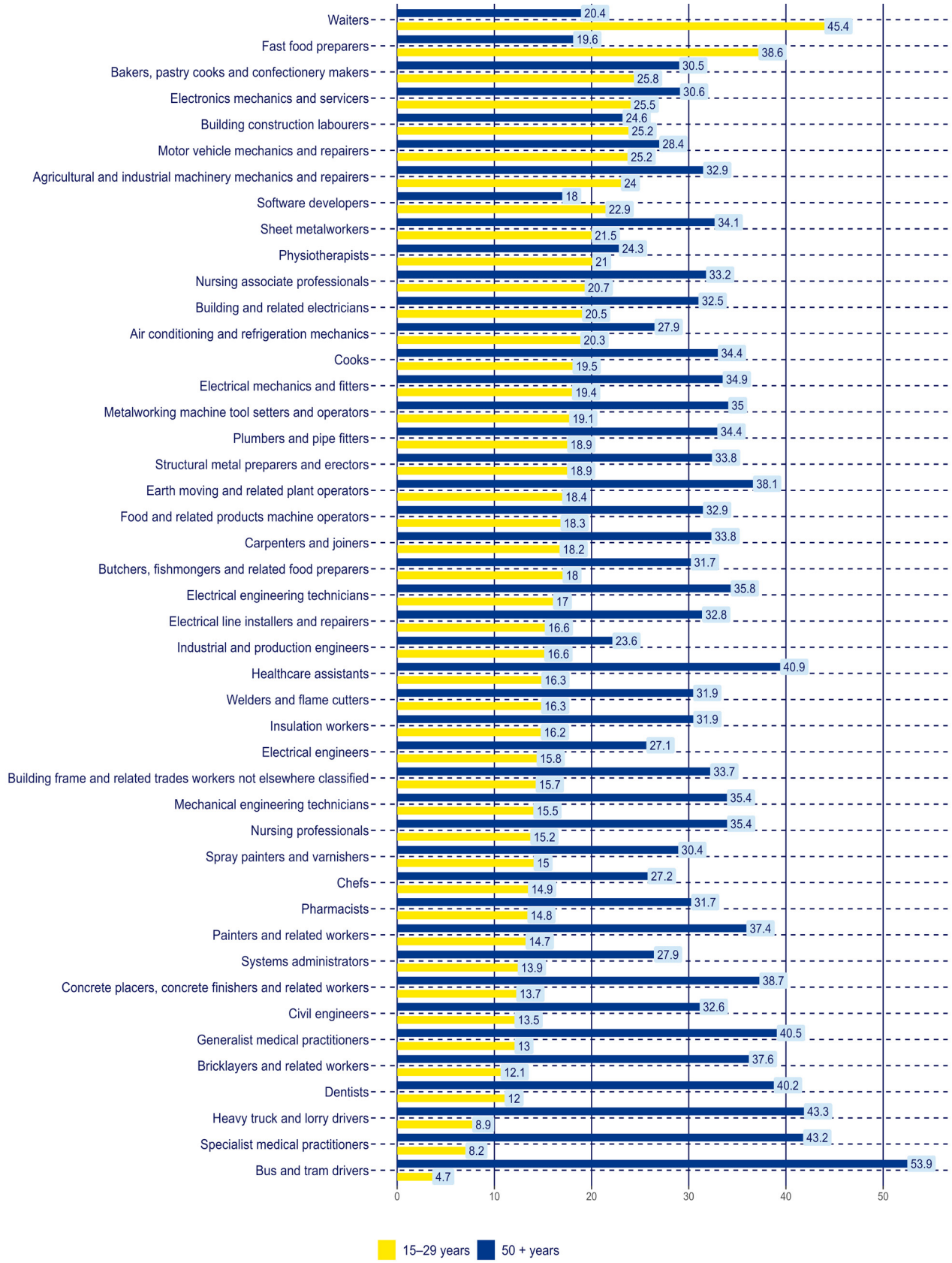
Figure 23: Share of employment in widespread shortage and surplus occupations in the EU-27 by age group, 2023



Source: EU-LFS special data extractions.

Workers under 30 years old comprised over 20 % of the workforce in half of the widespread surplus occupations. This suggests a relatively high number of young people are employed in roles where supply exceeds demand. For example, transportation and storage occupations such as car, taxi and van drivers show large shares of workers under the age of 30 years. The relative over-representation of young workers in surplus occupations could be indicative of low barriers to entry in these occupations enabling easier entrance to the labour market. For example, as illustrated in Figure 24, surplus occupations with lower entry requirements, such as shop sales assistants and construction labourers, have the highest shares of young workers.

Figure 24: Share of workers aged under 30 years and aged 50 years and over in widespread shortage occupations in the EU-27, 2023 (%)



Source: EU-LFS special data extractions.

Age distribution varies substantially between specific shortage occupations. For example, where waiters are classed as a shortage occupation, over 40 % of them are young workers. However, only 13 other shortage occupations (out of the total of 45) employed more than 20 % young people in 2023.

The lack of young workers in occupations that require higher levels of education, such as specialist medical practitioners, healthcare assistants and pharmacists, is natural. Here, the length and cost of education could be a barrier to entry, leading to fewer young workers being hired (until their education is completed) despite existing shortages.

The under-representation of young workers in shortage occupations raises concern, suggesting that shortages will persist unless measures, such as upskilling and reskilling and incentivising improved working conditions, are taken to increase the attractiveness of these specific roles. The occupations in question are those with a share of employees under the age of 30 years of close to or below 10 %, including heavy vehicle truck drivers, bus and tram drivers and other healthcare professionals.

This highlights the increased need for EU initiatives such as 'Aim, Learn, Master, Achieve' ([14]), which provides tailored training, a supervised work-related experience in another Member State, and continued support to young people who are not in any kind of employment, education or training in their home country. This could reduce barriers to entry in occupations that face severe and widespread shortages, although time must be spent in training.

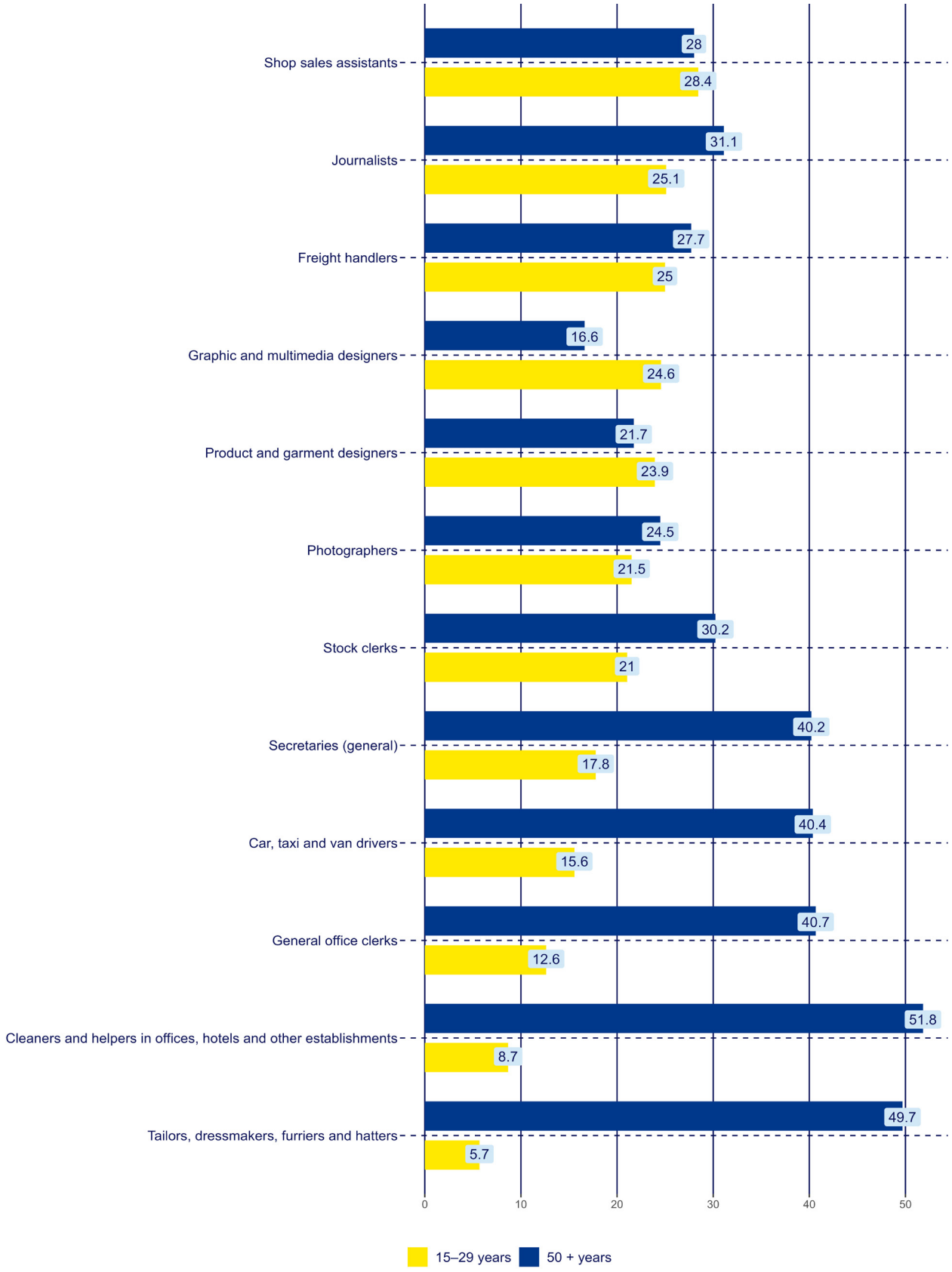
Conversely, all widespread shortage occupations have a share of workers aged 50 years and over higher than 20 %, with five occupations showing a share higher than 40 %. The substantial share of older workers in shortage occupations is a pressing issue, as the labour replacement needs will lead to a higher severity of shortages in those occupations. This is particularly relevant for the transportation and storage sector, where many shortage occupations (e.g. bus and tram drivers, truck drivers) exhibit very large age disparities and high shares of workers aged 50 years and over. Occupations such as bus and tram drivers and heavy truck and lorry drivers employ 290 000 and 1.3 million workers over the age of 50 years, respectively. For example, 41 % of healthcare assistants and 53 % of bus and tram drivers are expected to leave the workforce within the next 15 years. This suggests that by 2040, there could be a shortage of approximately 843 000 healthcare assistants and 396 000 bus and tram drivers. An equivalent number of employees will need to be trained and hired to fill these positions. Alternatively, developments in automation could help address at least part of these anticipated occupational shortages ([15]).

Younger workers must be attracted through better information and awareness raising, job security, better working conditions and contracts, flexible hours and competitive pay. Reducing working hours, offering more training opportunities and providing clear career progression pathways could make these vital transportation and storage sectors more appealing to younger individuals. In addition, while technology and automation should be integrated into the transportation and storage sector, such advancements should complement efforts to ensure these jobs remain attractive and sustainable for future working cohorts.

Similarly, the over-representation of older workers in surplus occupations (see Figure 25) is concerning, as it suggests that this vulnerable segment of the labour force will struggle with stable employment unless measures are taken to facilitate their transition to less exposed occupations. In some surplus occupations, including van drivers and cleaners, the share of employees aged 50 years and over is close to or above 40 %. This could potentially lead to future labour shortages in these occupations unless younger cohorts of workers are employed to fill the replacement need. For example, occupations like general office clerks, with 2.2 million workers over the age of 50 years, and shop sales assistants, with over 2 million in the same age group, will face substantial retirement numbers by 2039. This implies that while these occupations are in surplus presently, they may face future shortages (Cedefop, 2024a). The largest discrepancies in age are found in occupations such as taxi and van drivers, cleaners and general office clerks, where those aged 50 years and over vastly outnumber those aged under 30 years.

14. https://ec.europa.eu/social/main.jsp?catId=1549&langId=en.
15. However, there is no evidence to suggest that sufficient automation to address sectoral labour shortages will be achieved in the transportation and storage sector, particularly within the passenger fleet, in the next 15 years. Consequently, it is anticipated that the demand for transport employees will remain consistent throughout this period.

Figure 25: Share of workers aged under 30 years and aged 50 years and over in widespread surplus occupations in the EU-27, 2023 (%)



Source: EU-LFS special data extractions.

In addition, due to demographic change, the EU's working-age population is projected to decline (by 48 million by 2035) and the old-age dependency ratio is expected to increase (from 33 % to 56.7 % by 2050). This would require Member States to incentivise upskilling and vocational education and training (VET) for the younger worker cohorts or upscale automation. For example, labour shortages in public transport could be alleviated through connected, cooperative automated mobility (CCAM). This initiative is being piloted in many Member States such as Italy (Turin) and Austria (Salzburg) ([16]) (with 25 % and 20 % of the population of the respective countries over the age of 65 years ([17])), thereby addressing demographic transition (and to some extent digital transition) pressures on the labour market. However, there may remain a continued demand for workers in these occupations given that complete automation in the transportation and storage sector is still far off in the future. Furthermore, pilot programmes in countries like Germany aim to actively tackle labour shortages through migration initiatives. For instance, the Skillution ([18]) programme not only identified a short-term requirement of 400 000 workers per year but also suggested measures to meet this demand. To mitigate shortages in the transportation and storage sector, Germany has successfully recruited and trained 3 000 bus drivers from Kenya as of September 2024. While labour shortages in critical occupations are a cause for concern and further policy debate, data captured by statistical offices could mask local hiring trends. For instance, after the COVID-19 pandemic, the share of workers employed through agencies and staffing services in healthcare ranged from 0.4 % in France to around 1 % in Norway, 2 % in Italy, 12 % in the Netherlands and 18 % in Ireland (World Employment Confederation, 2023).

Finally, looking at recent trend developments, it seems that part of the employment growth in both widespread shortage and surplus occupations is observed in occupations with a high share of older workers. In 13 out of the 45 shortage occupations, workers aged 50 years and above improved their employment outcomes, while the young cohorts (aged 15–29 years) are less attracted by shortage occupations. Medium-skilled occupation groups, such as craft and related trades workers, as well as highly skilled ones, such as health professionals (e.g. pharmacists), are occupations in which more older than younger workers can be found. Furthermore, the ageing of the workforce can be observed in all shortage occupations, including occupations associated with the transportation and storage sector, such as bus and tram drivers or heavy truck drivers. This trend could be the result of social policy changes in Member States observed over the past few years (e.g. in Germany, Spain, France), which have introduced reforms aimed at prolonging working lives to alleviate fiscal strain coming from the pension systems (Hinrichs, 2021).

Box 7: Labour shortages in the retail sector

The retail sector, employing 10 % of the EU workforce, is currently navigating transformative challenges. Firstly, the digital and green transitions are reshaping the sector, driving a high demand for digital literacy, technical and analytical skills for revenue analysis, and soft and green skills. Consequently, there is a pressing need to reskill a portion of the existing workforce.

Secondly, the sector is grappling with an ageing workforce. The declining working-age population in the EU exacerbates the challenge of replacing retiring workers. As a result, the retail sector will need to hire between 800 000 and 1.5 million new employees annually by 2030, while reskilling 40 % to 50 % of its current workforce. However, 40 % of the sector is already struggling to recruit candidates with the necessary skills.

To address these challenges, potential policy measures include:

- implementing targeted training programmes in e-commerce and retail for existing retail staff and junior employees;
- focusing on improving job quality and providing stable, full-time opportunities;
- exploring untapped labour markets, such as retirees, to fill workforce gaps.

Source: OECD (2024a).

16. https://eurocities.eu/latest/automated-vehicles-at-the-service-of-people/.
17. https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Population_structure_and_ageing#The_share_of_elderly_people_continues_to_increase.
18. https://www.skillution.de/en/.

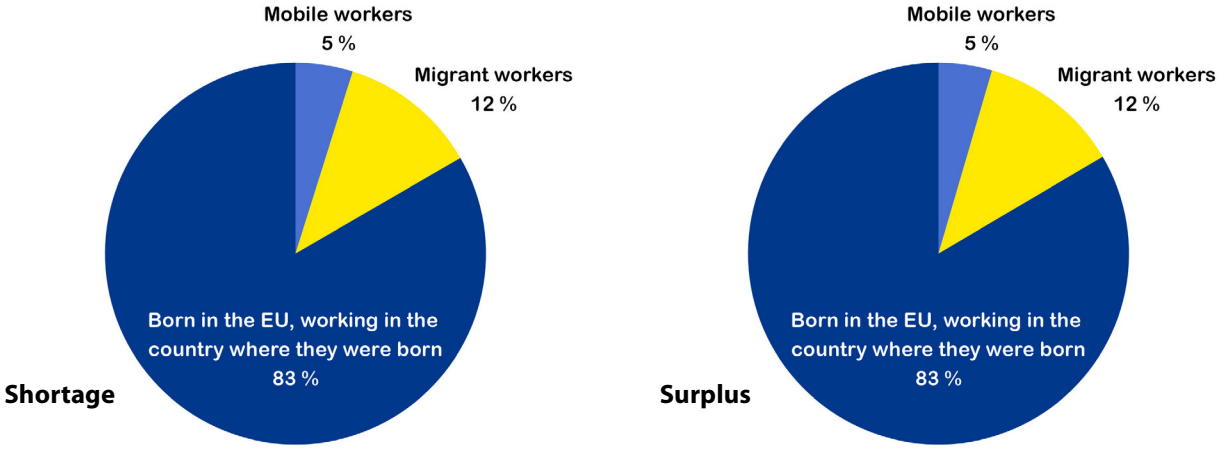
4.4. Country of origin

In 2023, 83 % of workers in the 45 most widespread shortage occupations were native to the Member State where they were employed. Meanwhile, 5 % were mobile workers from other Member States, and 12 % were migrant workers from non-EU countries. The same distribution with regard to country of origin is observed for widespread surplus occupations in the same year (see Figure 26). Overall, EU mobile workers constituted 3.7 % of the total workforce, while migrant workers made up 9.8 %.

It is likely for the share of migrant workers in shortage occupations to be somewhat higher than the average share across all occupations in 2023. This is because many Member States have work permit systems designed to attract foreign workers with qualifications that are in short supply in the EU. A closer look at widespread shortage occupations reveals that those with above-average shares of migrant workers are mostly associated with the construction sector (e.g. building construction labourers, bricklayers) and the hospitality sector (e.g. fast food preparers, cooks). The fact that migrant workers are over-represented in these lower-skilled occupations could reflect lower barriers to entry and the reliance of certain sectors such as construction on migrant labour (Morrison et al., 2014).

The Russian aggression against Ukraine has also influenced European labour market policies. In light of the current labour shortages, integrating the skilled labour of Ukrainian refugees is an important policy element. Member States have achieved some successes, but the policies implemented so far are observed to have some shortfalls. Eurofound (2024b) finds that while the integration rate among migrants from Ukraine is positive, the share of individuals performing work outside and below their qualifications is high. The authors conclude that policymakers should therefore focus on providing suitable language training and facilitate the recognition of qualifications gained in other countries in order to benefit from the skills that displaced people have.

Figure 26: Overall employment in widespread shortage and surplus occupations in the EU-27 by country of origin, 2023 (people aged 15–64 years)



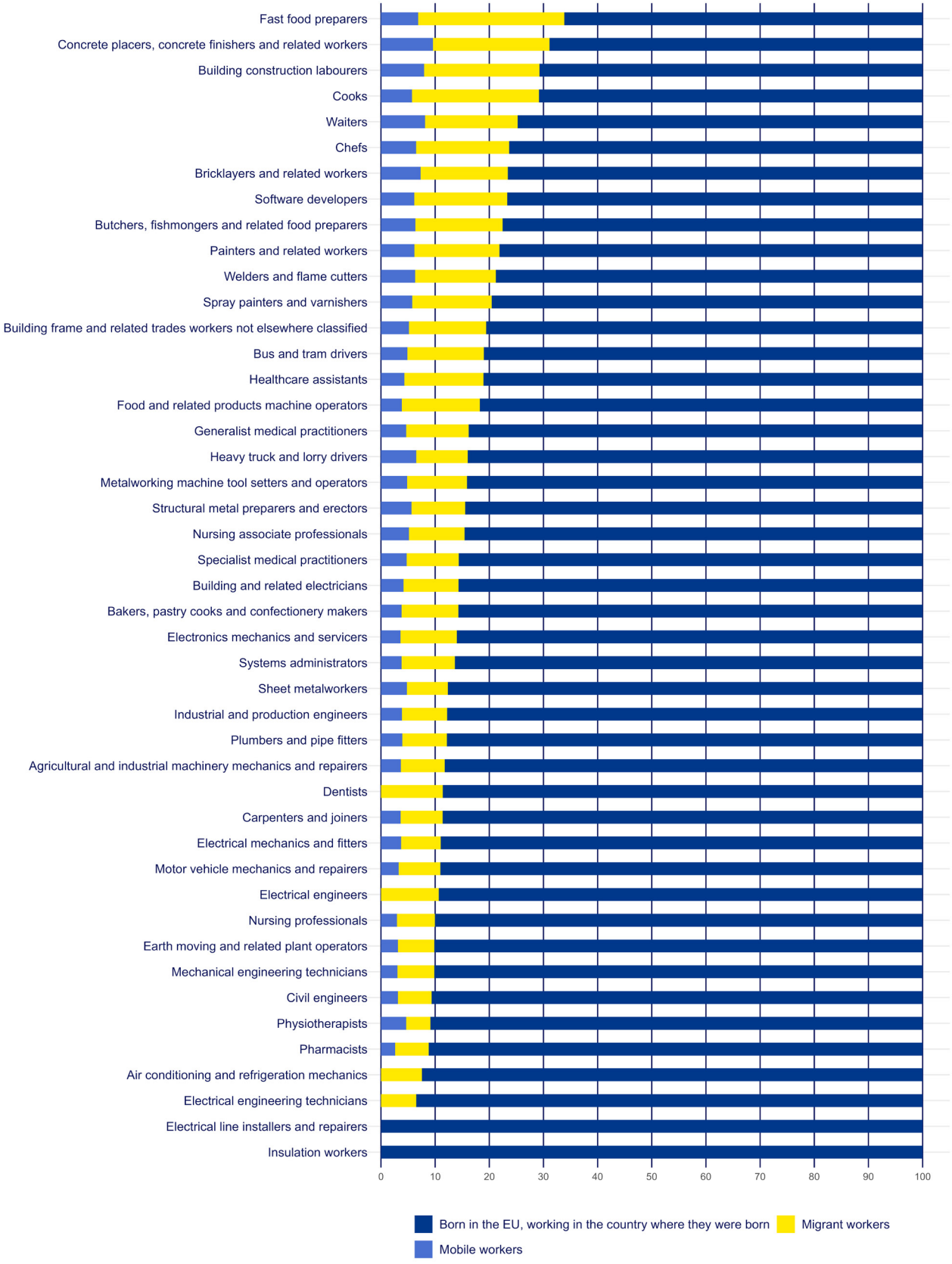
NB: 'Mobile workers' refers to people originating from the EU but working in another Member State. 'Migrant workers' refers to people originating from outside the EU and working in a Member State.

Source: EU-LFS special data extractions.

Figure 27 highlights the widespread shortage occupations with the highest share of migrant workers, including building construction labourers, cooks and waiters. Figure 28 shows the same information for the widespread surplus occupations identified. Most of the shortage and surplus occupations listed do not require specific education levels. In fact, shortage occupations with low barriers to entry, such as roles in the hospitality sector, exhibit some of the highest proportions of mobile and migrant workers. In contrast, shortage occupations with high barriers to entry, such as health professionals (e.g. pharmacists and physiotherapists), have some of the lowest shares of mobile/migrant workers. This is indicative of a need for policies to address the high barriers to entry for skilled migrant and mobile workers. Initiatives such as the Chancenkarte ([19]) in Germany, which provides entry visas to skilled professionals to facilitate their job search and integration into the German labour market, are an example of policies that could help address this issue.

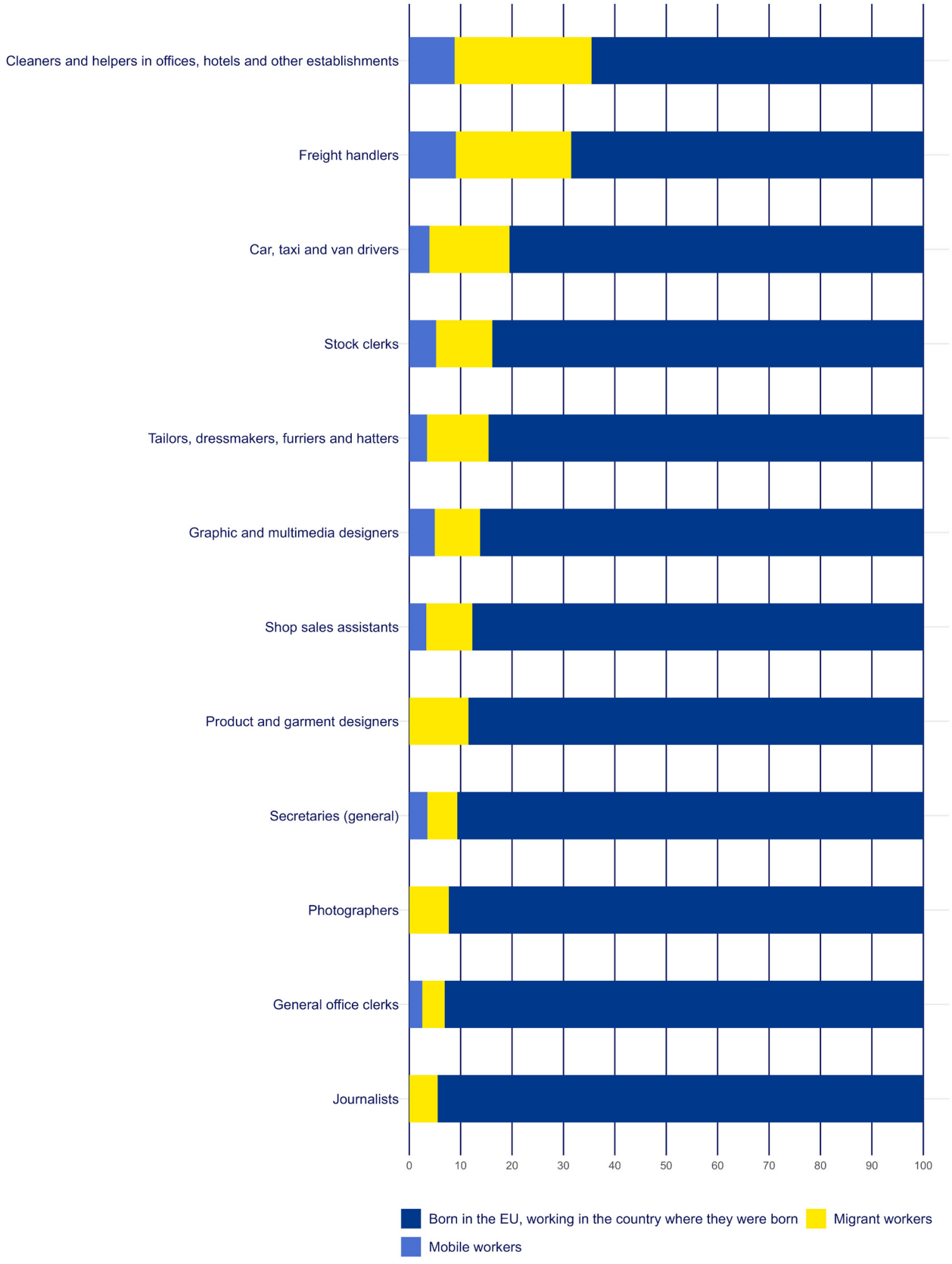
19. https://chancenkarte.com/en/.

Figure 27: Share of employment in widespread shortage occupations in the EU-27 by country of origin, 2023 (people aged 15–64 years) (%)



Source: EU-LFS special data extractions.

Figure 28: Share of employment in widespread surplus occupations in the EU-27 by country of origin, 2023 (people aged 15–64 years) (%)



Source: EU-LFS special data extractions.

Supporting this point, a similar dynamic in the mobile and migrant labour force can be observed in widespread surplus occupations. Widespread surplus occupations requiring elementary education levels (e.g. cleaners) have shares of mobile and migrant workers exceeding 20 %, while those requiring higher education levels (e.g. clerical support workers) have shares of migrant and mobile workers under 10 %.

To assess the impact of changes in migration policies at the Member State level on the labour supply in shortage and surplus occupations, it is instructive to examine Spain's recent legislative developments with regard to its simplification of immigration processes for non-EU nationals (see Box 8).

Box 8: Impact of migration policies on the labour force

In 2022, Spain introduced a new migration law ([1]). This reform of Spain's Regulation on Foreigners simplifies the process for non-EU nationals to obtain work permits, regularise their status if they have resided in Spain for two years and undergo training. In addition, it updates the conditions for employment, social and family permits, and facilitates the integration of foreign students by allowing them to work while studying and easing their transition into the labour market.

According to EU-LFS data, in 2021, prior to the law's introduction, migrant workers constituted 14.7 % of Spain's workforce in occupations with widespread shortages. By 2023, this figure had risen to 17.9 %, reflecting a moderate increase of 3.2 percentage points.

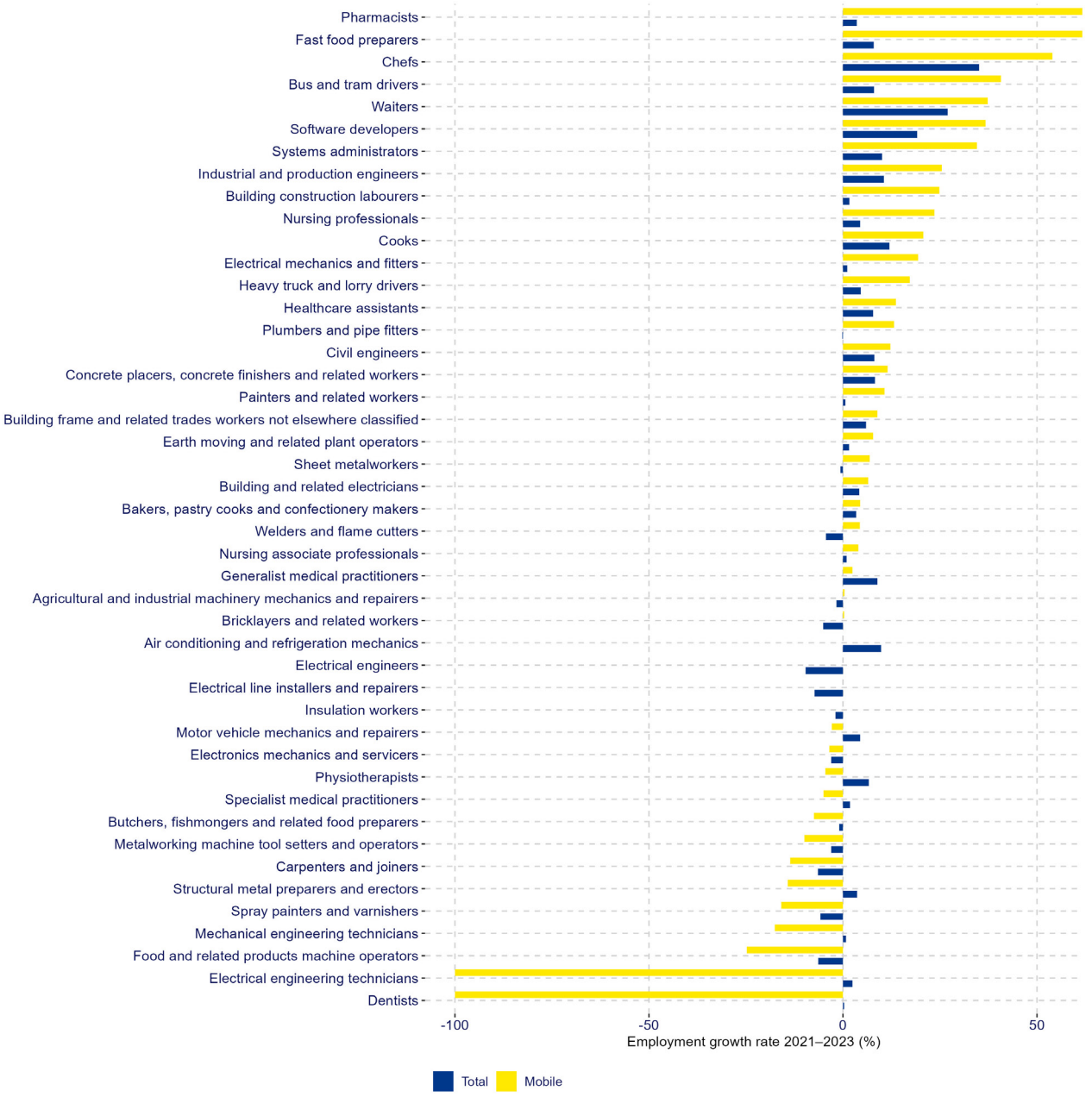
However, a similar trend was observed in occupations characterised by widespread labour surpluses. In 2021, migrant workers made up 16.1 % of Spain's workforce in surplus occupations; this figure rose to 21.5 % in 2023 following the new law's implementation, representing an increase of 5.4 percentage points. This could indicate that the policy needs to be better targeted towards those migrants seeking employment in shortage occupations.

While it is too early to assess the long-term impact of this legislation, these initial indicators suggest that such policies are effective in attracting migrant workers to the domestic workforce. However, there is potential for further refinement to better target workers in occupations experiencing widespread shortages.

(1) See https://migrant-integration.ec.europa.eu/news/spain-government-adapts-immigration-law-include-migrant-workers-labour-market_en.

During 2021–2023, transnational mobility had an important role for widespread shortage occupations. The share of mobile workers in shortage occupations increased by roughly 10 %, from 1.8 million to about 2 million. Figure 29 shows that 14 shortage occupations saw at least a 10 % growth in their employment of intra-EU mobile workers. This growth was mainly identified in lower-skilled occupations tied directly or through supply chains to the construction sector (e.g. plumbers and pipe fitters) or in the hospitality sector (e.g. waiters) The exception was health professionals (e.g. nursing professionals, healthcare assistants). Both the construction (European Commission: Directorate-General for Employment, Social Affairs and Inclusion, 2024a) and healthcare sectors (Williams et al., 2020; Panteli and Maier, 2021) are likely to continue to rely on foreign labour (both mobile and migrant workers) for low- and mid-level roles.

Figure 29: Growth rates of intra-EU mobile workers and total workers in shortage occupations in the EU-27, 2021–2023 (people aged 15–64 years)



Source: EU-LFS special data extractions.

However, 13 widespread shortage occupations experienced a decline in their reliance on intra-EU mobile workers between 2021 and 2023. This decline is visible in some highly skilled occupations in the healthcare and construction sectors. This could be indicative of high barriers to internal migration based on skill requirements (Panteli and Maier, 2021; European Construction Industry Federation, 2023) or less motivation to move to another country if workers can benefit from improved working conditions in their own country due to the persistent shortages.

4.5. Multiple vulnerabilities linked to labour surpluses

The analysis reveals that in several surplus occupations, workers with characteristics generally considered vulnerabilities in the labour market are prevalent. For instance, kitchen helpers stand out with a notably high share of workers in one (or more) of four vulnerable groups: women, those with low educational attainment, youth and mobile/migrant workers. Similarly, cleaners and helpers in institutional settings show high shares of three of the four groups, especially the low educated and mobile/migrant workers. This concentration of vulnerabilities within low-demand, low-skilled occupations implies a reinforced disadvantage, as workers in these occupations are often the least equipped to transition into more sustainable employment pathways.

Similar trends are seen among service and sales workers, where many occupations, such as cashiers and ticket clerks, shop sales assistants and hairdressers, are held predominantly by women (83 %, 70 % and 78 % women, respectively) and also skew towards the younger and less formally educated. For example, cashiers display high levels of vulnerability, with 83 % women, 36 % youth and 26 % low-educated workers. Meanwhile, occupations like receptionists (82 % women, 24 % youth, 12 % low educated) and travel consultants (74 % women, 17 % youth) exhibit similar, albeit slightly less intense, patterns.

In contrast, gardeners and horticultural and nursery growers are primarily affected by low education levels and a high share of mobile/migrant workers. Among technicians and associate professionals, the prevalence of multiple vulnerabilities is generally lower, except for translators, interpreters and other linguists, with above-average representation of both women (69 %) and migrant/mobile workers (35 %). These occupations are also at risk of automation, with the introduction of AI-powered tools in translation increasing the likelihood of future job losses. Most other surplus occupations show tendencies towards a single vulnerability, such as gender among graphic designers or migrant status among visual artists, or fall within the average ranges for all vulnerabilities.

Table 11: Share of workers in vulnerable categories in surplus occupations in the EU-27, 2023

Occupation title		Women	Low educated	Youth	Mobile/migrant workers
EU-27 average across all occupations		47 %	16 %	17 %	14 %
Agricultural, forestry and fishery workers	Gardeners and horticultural and nursery growers	21 %	33 %	17 %	16 %
Clerical support workers	Secretaries (general)	89 %	10 %	18 %	9 %
	Receptionists (general)	82 %	12 %	24 %	10 %
	Accounting and bookkeeping clerks	77 %	5 %	15 %	10 %
	Travel consultants and clerks	74 %	5 %	17 %	19 %
	General office clerks	73 %	6 %	13 %	7 %
	Library clerks	71 %	0 %	27 %	0 %
	Data entry clerks	68 %	6 %	18 %	7 %
Elementary occupations	Tailors, dressmakers, furriers and hatters	90 %	22 %	6 %	15 %
	Cleaners and helpers in offices, hotels and other establishments	84 %	50 %	9 %	36 %
	Kitchen helpers	70 %	46 %	28 %	38 %
	Elementary workers not elsewhere classified	40 %	31 %	21 %	8 %
	Manufacturing labourers not elsewhere classified	40 %	38 %	19 %	29 %
	Messengers, package deliverers and luggage porters	27 %	37 %	29 %	19 %
	Freight handlers	20 %	42 %	25 %	32 %
	Car, taxi and van drivers	7 %	26 %	16 %	20 %
	Building construction labourers	2 %	56 %	25 %	29 %
Professionals	Translators, interpreters and other linguists	69 %	0 %	12 %	35 %
	Product and garment designers	56 %	0 %	24 %	12 %
	Advertising and marketing professionals	54 %	2 %	23 %	13 %
	Visual artists	52 %	7 %	10 %	19 %
	Journalists	51 %	0 %	25 %	6 %
	Graphic and multimedia designers	47 %	4 %	25 %	14 %
	Musicians, singers and composers	30 %	8 %	15 %	20 %
Service and sales workers	Beauticians and related workers	96 %	15 %	25 %	20 %
	Teachers' aides	88 %	13 %	20 %	12 %
	Cashiers and ticket clerks	83 %	26 %	36 %	12 %
	Hairdressers	78 %	23 %	20 %	17 %
	Shop sales assistants	70 %	21 %	28 %	12 %
	Travel guides	62 %	0 %	30 %	15 %
Technicians and associate professionals	Administrative and executive secretaries	79 %	4 %	11 %	9 %
	Interior designers and decorators	63 %	8 %	19 %	0 %
	Photographers	39 %	9 %	22 %	8 %
	Commercial sales representatives	32 %	10 %	15 %	9 %

Source: EU-LFS special data extractions.

4.6. Chapter summary

In this chapter, different characteristics of workers were discussed with the aim of identifying the intersections between vulnerable groups (women, youth, etc.) and labour shortages and surpluses. Among vulnerable groups, women are predominantly found in surplus occupations, heightening their risk of unemployment. This is in line with trends observed, with women experiencing notable employment growth in healthcare and food industry roles and high representation in both shortage and surplus occupations, particularly clerical positions.

The situation for workers under the age of 30 years is more varied. Their representation is similar in both widespread shortage and surplus occupations but differs between specific roles. Young workers are over-represented in only two widespread shortage occupations – waiters and fast-food preparers – and under-represented by wide margins in healthcare roles. Older workers are predominant in surplus occupations, indicating potential employment instability for this group unless upskilling/reskilling is facilitated. Employment trends observed since 2021 indicate an increase in employment of older workers (aged 50 years and above) relative to younger cohorts (aged 15–29 years), particularly in shortage occupations.

Highly educated workers are primarily employed in shortage occupations, as these roles often have specific qualification requirements. Increasing the supply of highly educated jobseekers alone would not resolve all shortages, but it would help address shortages in professions such as healthcare. Supporting this point are the employment trends of different educational groups, where important employment changes in individual occupations are concentrated in educational subsegments, such as the growth in personal service workers driven by medium- and low-educated segments. Conversely, the share of highly educated workers is more spread out in surplus occupations due to their more general and transversal qualifications requirements. Migrant workers have a higher share in both widespread shortage and surplus occupations than in in the overall EU economy. While their presence in shortage occupations is expected due to schemes facilitating the entry of non-EU nationals to fill vacancies, their high share in surplus occupations may be explained by low barriers to entry for some surplus occupations. Although there is no significant difference in the shares of mobile and migrant workers between widespread shortage and surplus occupations, a 10 % increase in the number mobile workers in shortage occupations was observed between 2021 and 2023, especially in lower-skilled roles in sectors such as construction and hospitality. Meanwhile, there was a decline in reliance on mobile workers in some highly skilled occupations in sectors like healthcare.

Multiple vulnerabilities are represented in the workforce in surplus occupations, with high shares of demographics such as women, youth and migrant workers. This is particularly evident in low-skilled occupations such as cleaners and kitchen helpers. However, these vulnerabilities are not reflected in surplus occupations such as gardeners, horticultural and nursery growers and technicians and associate professionals.

5. Labour market imbalances in the transportation and storage sector

5.1. Labour demand in the transportation and storage sector

Transportation and storage (NACE Rev. 2 sector H) is a fundamental sector for the EU economy, delivering essential goods and services to EU citizens and businesses and ensuring access to global supply chains. Through connectivity and mobility across Europe, transport significantly enhances free movement, cohesion and competitiveness within the internal market (European Commission: Directorate-General for Mobility and Transport, 2024). The transportation and storage sector includes five subsectors: water transport, air transport, warehousing, storage and support activities for transportation, postal and courier activities, and land transport. Land transport, which includes road and railway transport, employs the majority of the sector's workers (51 % in Q4 2024). The transportation and storage sector contributed a total of 4.8 % of EU gross value added in 2023 (Eurostat, n.d.-d). Lithuania and Romania have important transportation and storage sectors, contributing 10.9 % and 7.3 % of their total national gross value added in 2023, respectively (Eurostat, n.d.-d). Overall, EU transportation and storage services encompass a complex network of around 1.3 million private and public companies (European Commission: Directorate-General for Mobility and Transport, 2023, 2024).

According to the Directorate-General for Mobility and Transport (2024), passenger transport activity was severely hit by the COVID-19 pandemic, dropping by 27 % between 2019 and 2020. The activity recovered slowly by 2021 with an increase of 9 %, still 20 % below 2019 levels. Freight transport was, however, less affected. Even though its activity dropped by 4 % in 2020, the sector grew by 5 % in 2021.

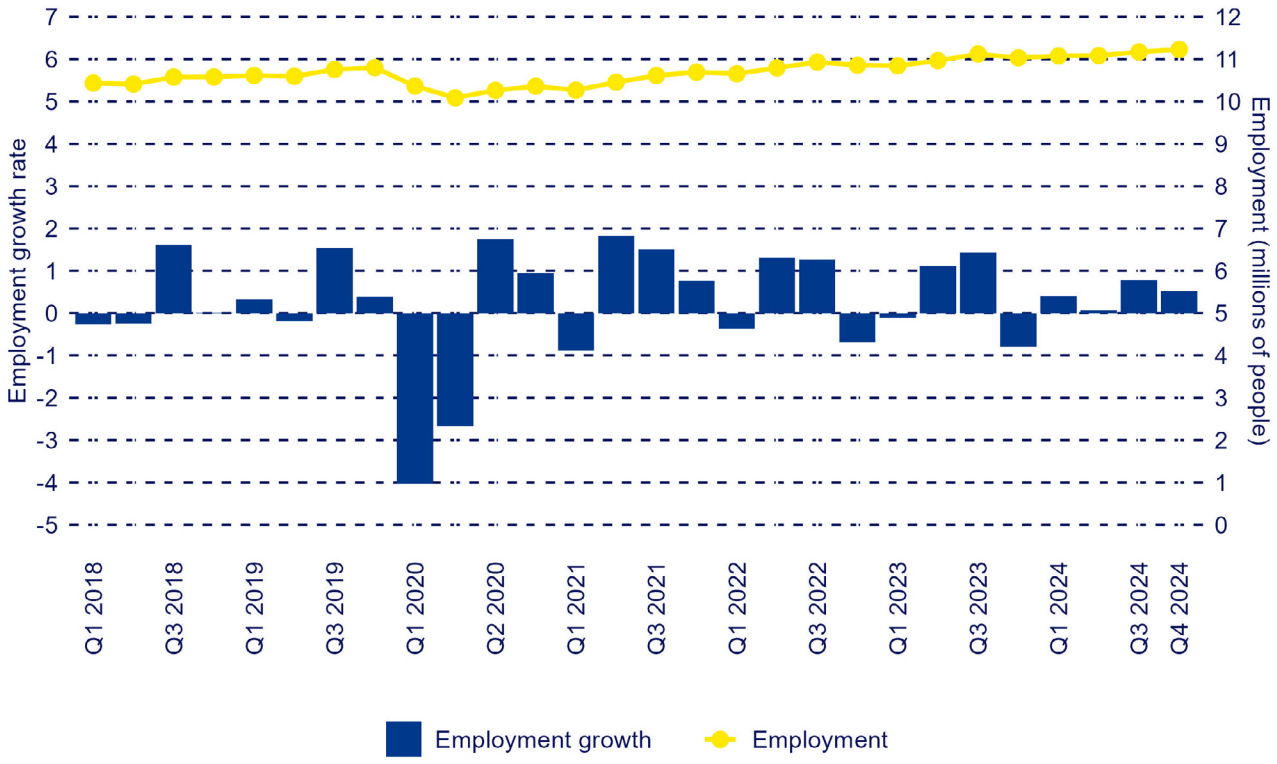
Figure 30 shows the changes in employment in the transportation and storage sector since the start of the COVID-19 pandemic. Over 11 million people were employed in the sector in Q4 2024 (Eurostat, n.d.-b). Moreover, employment in the transportation and storage sector rebounded quickly after the COVID-19 pandemic. Between Q2 2020 and Q2 2024, the number of people employed in the sector increased by around 1 million in the EU-27. In 2021, employment growth was at 2.1 %, higher than for the rest of the economy. As a consequence, by Q2 2022, employment had recovered to pre-pandemic levels (Q4 2019). The transportation and storage sector was also one of the key sectors driving employment growth in the EU-27 in 2023 (European Commission: Directorate-General for Employment, Social Affairs and Inclusion, 2024b). However, the increase in the labour demand generated more labour shortages in some subsectors.

Stakeholders consulted in focus groups for this study agreed that the COVID-19 pandemic exacerbated labour shortages in the transportation and storage industries, deepening pre-existing challenges and leaving lasting effects. On the one hand, the demand for certain occupations in the transportation and storage sector rose during the COVID-19 pandemic. For example, a surge in e-commerce activities required additional freight and last-mile delivery drivers due to higher delivery frequencies and extended transport distances (Rodrigues et al., 2021). The rise of e-commerce also increased the demand for warehousing staff and the workload pressure in this subsector (European Agency for Safety and Health at Work, 2024). Many workers who had been laid off in other sectors took up employment in the warehousing subsector. However, as the COVID-19 pandemic eased, labour shortages for some warehousing roles arose as employees returned to their pre-pandemic employment sectors. Some of these shortages have yet to be resolved, and they continue to affect service levels and operational performance (Descartes, 2024). Further, in the warehousing, land transport and postal services subsectors, the COVID-19 pandemic led to an increased demand for workers with new skills re-

lated to digital innovations. This is reshaping jobs around skills that current workers (oftentimes older ones) may not have (Expert Group for Urban Mobility, 2024).

On the other hand, the COVID-19 pandemic significantly affected employment and working conditions in the transportation and storage sector, prompting many workers to shift to sectors with better job security. Employers introduced new conditions, and in the air transport subsector, there were sharp rises in precarious work for aircrew and in the share of younger, less experienced workers as older aircrew retired or changed sectors. Stakeholders reported that many aircrew members and aircraft engine mechanics and repairers were offered early retirement, leading to a loss of experienced staff. Airports struggled to recruit baggage handling personnel after many were made redundant (European Agency for Safety and Health at Work, 2024). In the water transport subsector, young people largely exited the labour market; for example, in Finland, the workforce shifted towards employees aged over 60 years, while those aged 45–50 years had been prevalent before the pandemic. Across various sectors, COVID-19 paused training programmes and hiring, exacerbating shortages in roles such as locomotive engine drivers, heavy truck and lorry drivers, motor vehicle and aircraft engine mechanics and repairers, and aircraft pilots.

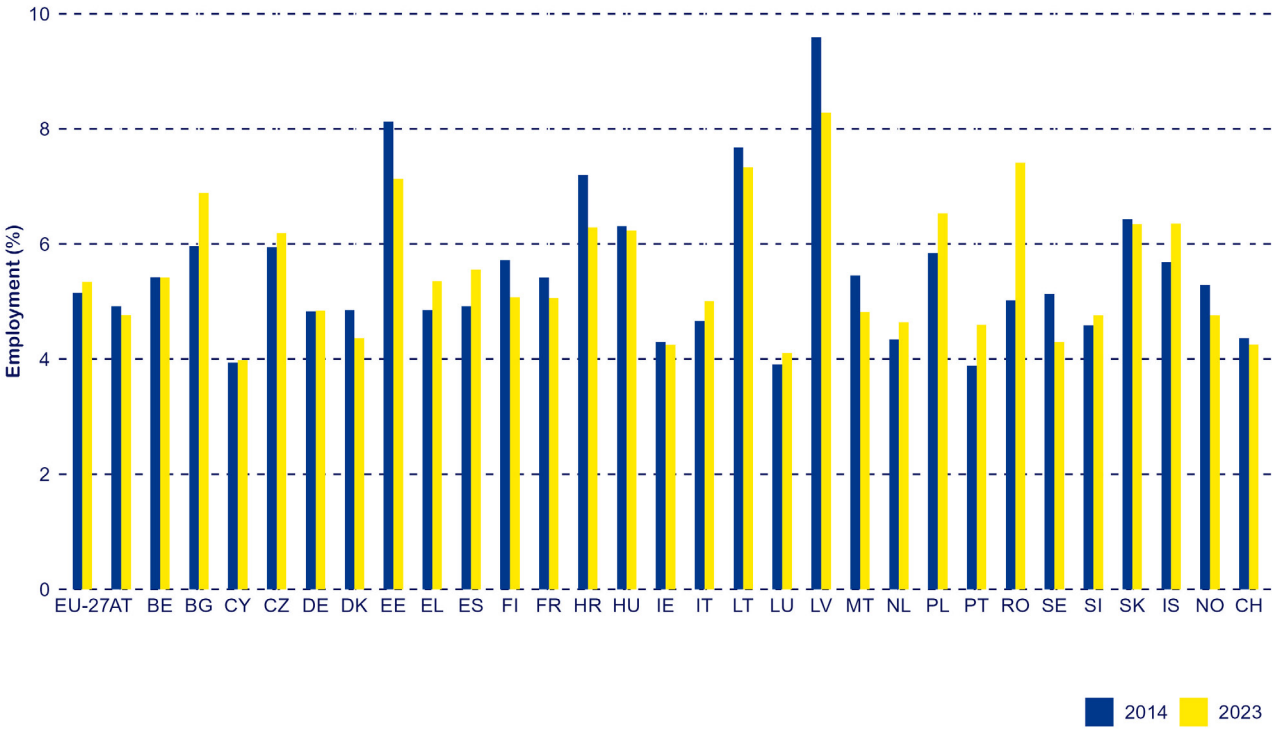
Figure 30: Employment growth (%) and changes in employment levels (millions of workers) in the transportation and storage sector in the EU-27, Q1 2018–Q4 2024 (people aged 15–64 years)



Source: Eurostat dataset lfsq_egdn2 (25 March 2025).

Overall, the transportation and storage sector accounts for a considerable share of EU employment. On average, it employs 5.2 % of EU workers, with a high of 8.3 % in Latvia (see Figure 31). This proportion has increased in 13 of the EURES countries during the last 10 years, with the largest growth occurring in Romania (from 5 % to 7.4 %). It has, however, seen a decline in nine countries, with the largest in Sweden. These decreases were associated with an increase in the JVR over the same period in the Member States affected. For example, between 2013 and 2023, the JVR in the transportation and storage sector went up from 1 % to 3.4 % in Denmark, from 0.4 % to 2.2 % in France, from 0.7 % to 2.3 % in Hungary and from 1.6 % to 3.9 % in Norway (Eurostat, n.d.-c).

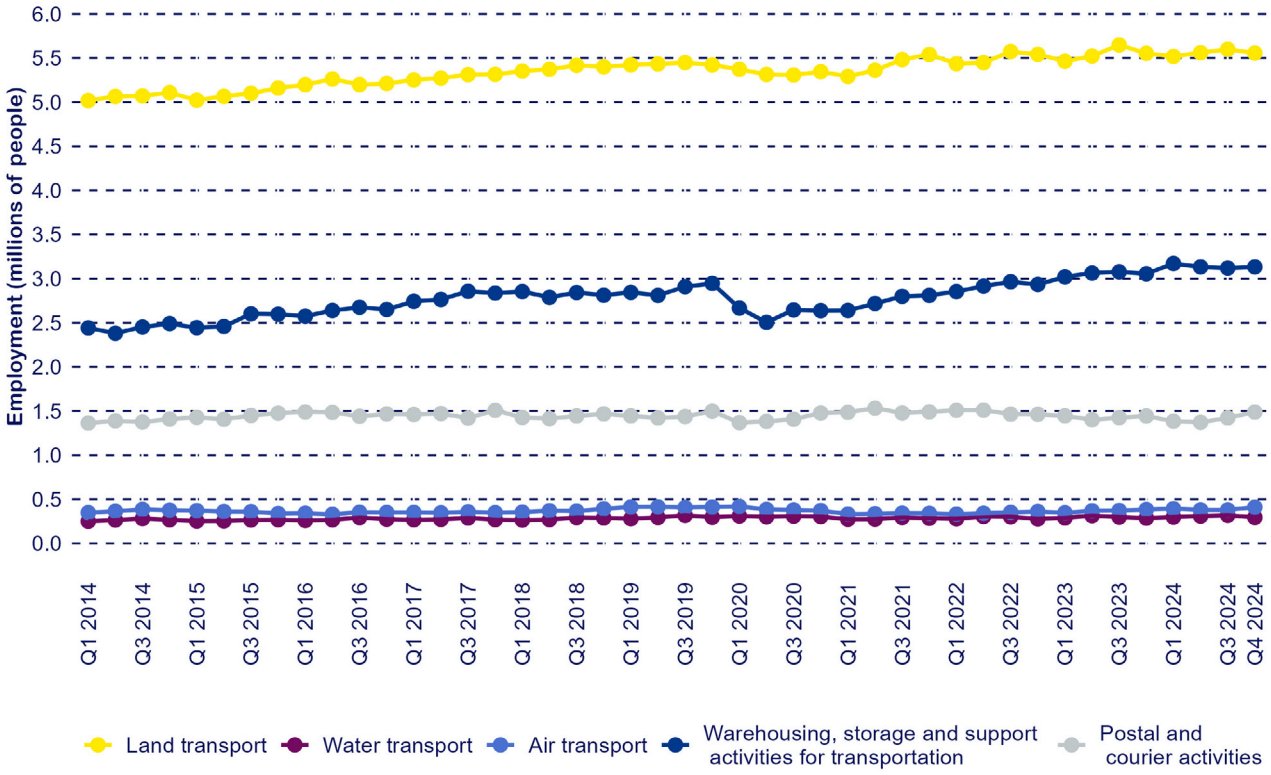
Figure 31: Share of employment in the transportation and storage sector by EURES country, 2014 and 2023 (people aged 15–64 years)



Source: Eurostat dataset lfsa_eisn2 (13 March 2025).

The number of workers involved in water transport, air transport and postal and courier activities has remained relatively stable since 2014, and most of the growth in transportation and storage sector employment has been driven by the expansion of the warehousing and land transport subsectors. Figure 32 shows the number of workers in the land transport subsector in the EU-27, which increased by more than 500 000 between 2014 and 2024. The warehousing, storage and support activities for transportation subsector has also expanded over the past 10 years, from 2.5 million workers in 2014 to 3.1 million in 2024. This trend was driven by changes in consumption patterns, such as the rising importance of online shopping and the subsequent increase in demand for warehousing and accelerated delivery services, especially during and following the COVID-19 pandemic (European Transport Workers' Federation, 2023). E-commerce development also had a positive impact on the postal and courier activities subsector: in the EU-27, domestic parcel volumes increased by 14.6 % annually between 2017 and 2021. However, this increase in logistics activity was compensated for by the decline in letter mail in favour of electronic alternatives; between 2017 and 2021, letter mail volumes declined, on average, by 6.1 % per year (Copenhagen Economics and European Commission: Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs, 2022). As a consequence, the number of workers in this subsector has remained around 1.5 million in the EU-27 for the past 10 years.

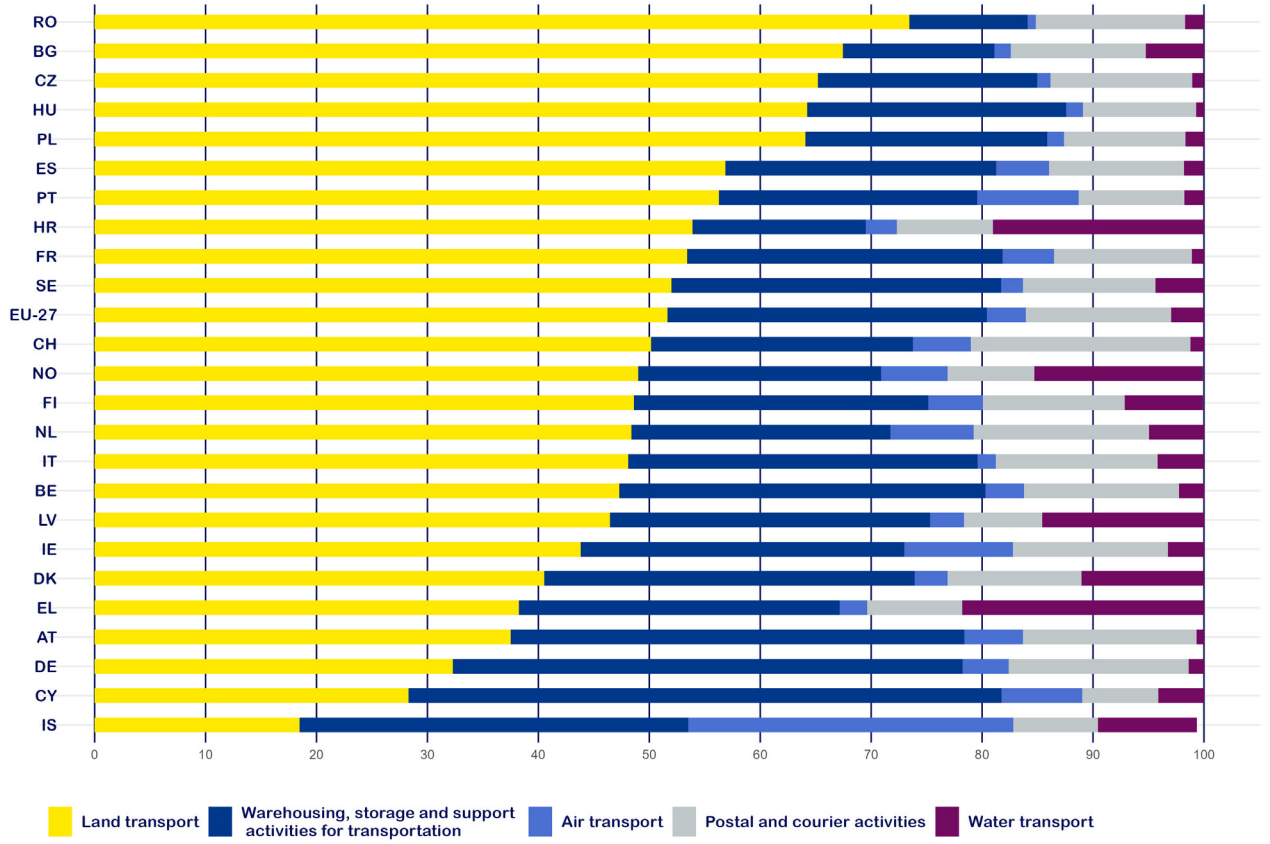
Figure 32: Change in employment levels in transportation and storage subsectors in the EU-27, Q1 2014–Q4 2024 (people aged 15–64 years)



Source: Eurostat dataset lfsq_egan22d (25 March 2025).

Romania is the Member State with the largest share of land transport workers, accounting for 78 % of national transportation and storage sector employment in Q4 2024. Bulgaria, Czechia, Hungary and Poland also have large shares of land transport employment in total national transportation and storage employment (around 65 % each). Greece, Croatia and Norway are the EURES countries where the transportation and storage sector relies the most on water transport (with the subsector accounting for 23 %, 17 % and 16 % of national sectoral employment, respectively). Air transport represents less than 5 % of transportation and storage sector employment for most countries. Notable exceptions are island countries such as Iceland (28 %) and Ireland (10 %). The postal and courier activities subsector employs the largest shares of transport workers in Switzerland (21 %), Germany (18 %) and the Netherlands (16 %). Finally, warehousing, storage and support activities for transportation accounted for the highest shares of transportation and storage employment in Cyprus (55 %), Germany (46 %) and Austria (38 %).

Figure 33: Employment in transportation and storage subsectors by EURES country, Q4 2024 (people aged 15–64 years) (%)

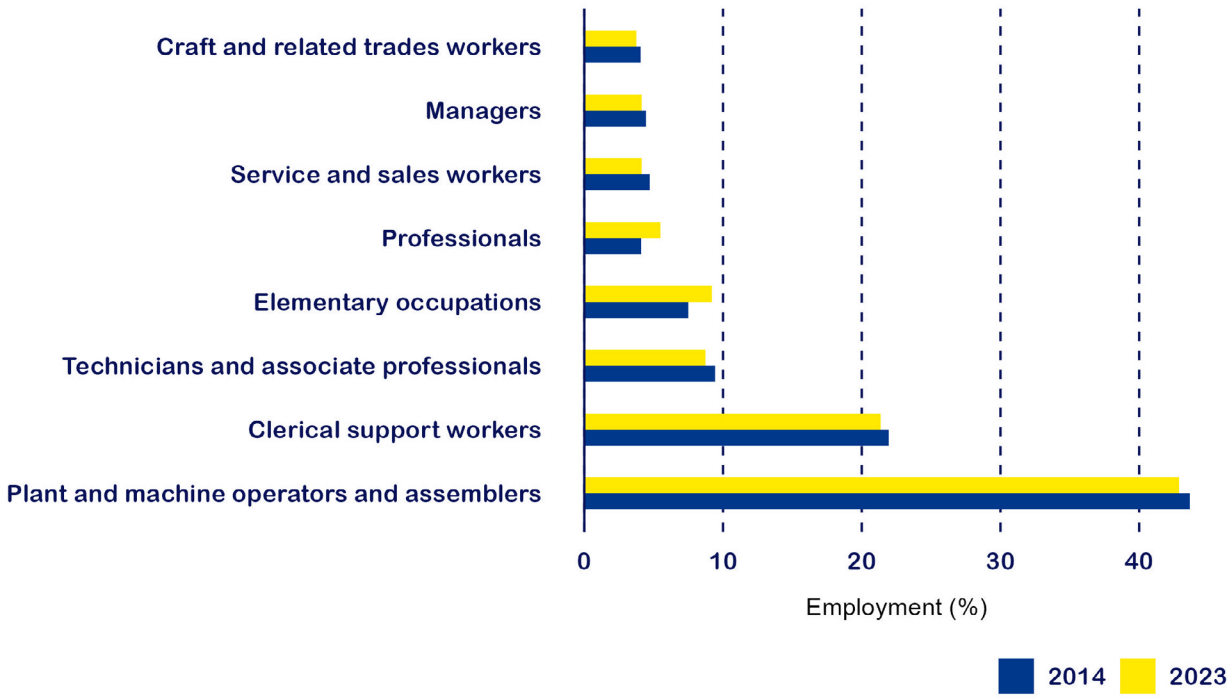


NB: Countries are arranged in descending order by the share of the land transport subsector in total national sectoral employment.
Source: Eurostat dataset lfsq_egan22d (25 March 2025).

When comparing the occupational distribution of employment in the transportation and storage sector with that in the overall economy, the sector is more dependent on plant and machine operators and assemblers than the rest of the economy. These accounted for more than 40 % of all transportation and storage sector employment in 2023, while they represented less than 10 % of workers in the EU-27 in the same year (Eurostat, n.d.-b).

The occupational distribution of transportation and storage sector employment remained relatively stable between 2013 and 2023. Digitalisation seems to have had an impact on the share of service and sales workers, which dropped by 1 percentage point between 2013 and 2023, and on the share of professionals, which increased by 1.5 percentage points. For example, a consequence of digitalisation is an increase in the online purchase of transport services, which reduces the need for customer-facing staff. On the other hand, the adoption of digital technologies increased the demand for web designers, digital service managers and marketing officers, creating new jobs for professionals. The automation of warehousing activities, particularly through robotics and AI-driven inventory management systems, has also influenced employment patterns in this sector. In warehousing and storage occupations, automated picking, sorting and tracking systems have reduced the demand for certain manual roles while increasing the need for technicians and logistics specialists who oversee and maintain these technologies (Eurofound, n.d.-a). For example, the number of workers in the occupation 'supply, distribution and related manager' increased by more than 28 000 in the EU-27 between 2021 and 2023, according to EU-LFS special data extractions. In the water transport subsector, lower-skilled jobs are increasingly at risk of becoming redundant due to technological advancements. Innovation is driving the need for smaller but more specialised ship crews, requiring employees to adapt to new technologies. Stakeholders have also noted a growing need for mechanics, particularly for aircraft and lorries as these vehicles become more technologically advanced.

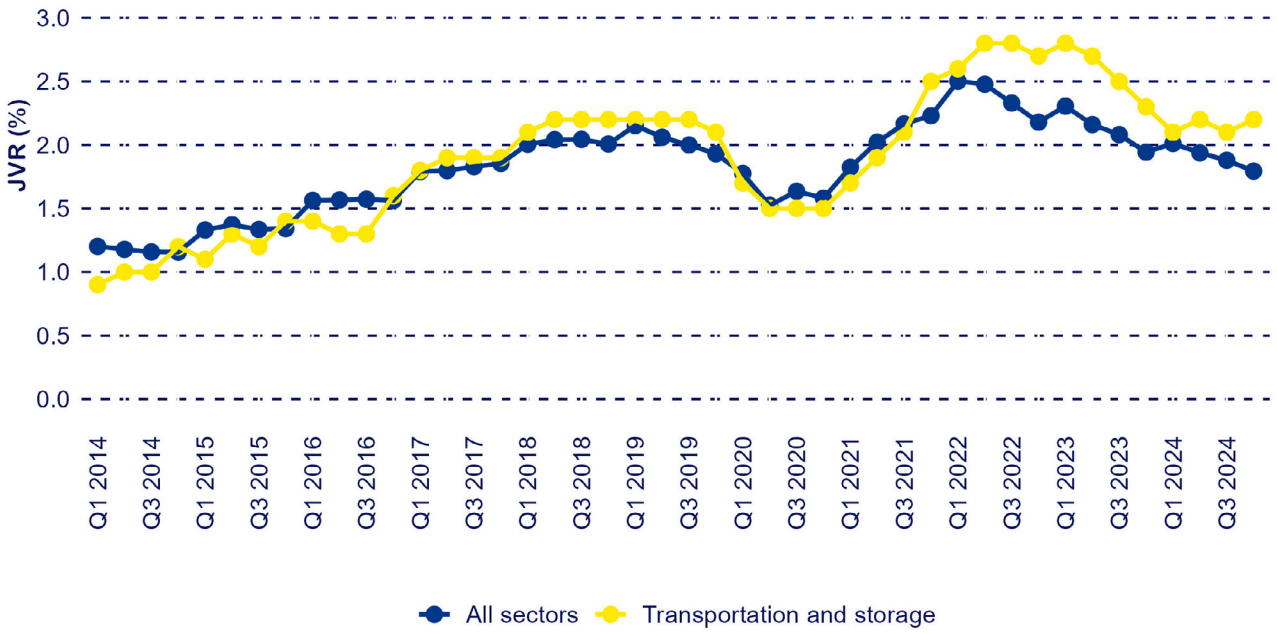
Figure 34: Occupational distribution of employment in transportation and storage in the EU-27, 2014 and 2023 (people aged 15–64 years)



Source: Eurostat dataset lfsa_eisn2 (13 March 2025).

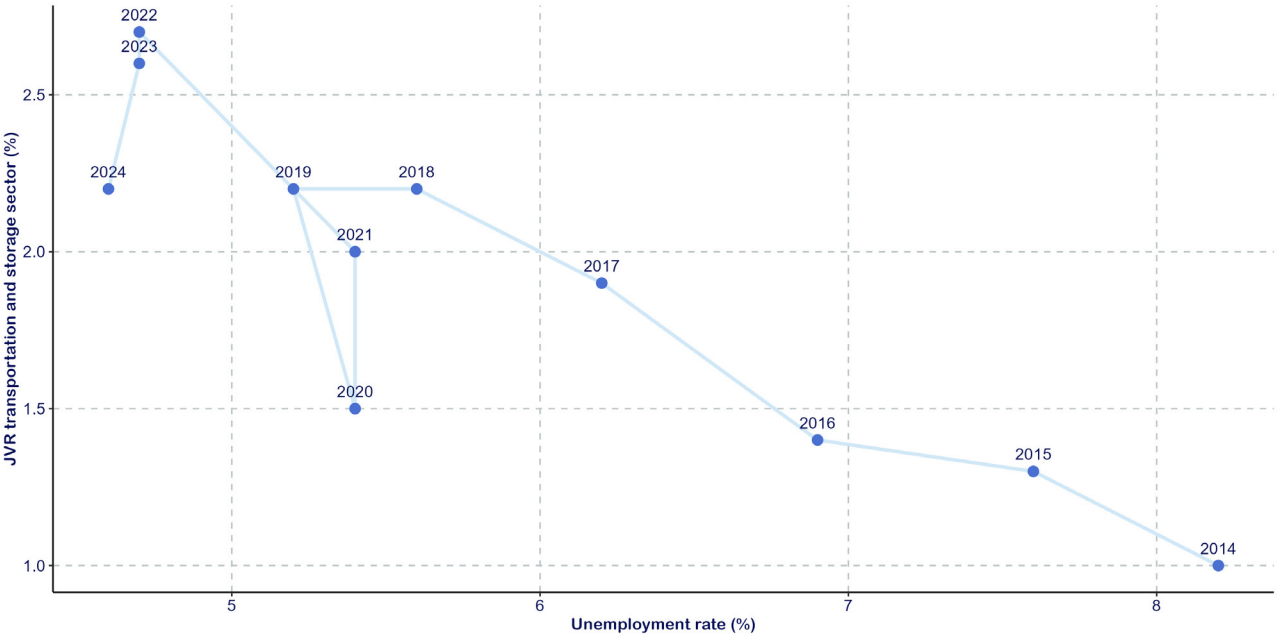
Figure 35 illustrates the dynamic of the JVR in the transportation and storage sector relative to that in the economy overall. Since Q2 2021, JVRs have been slightly higher in the transportation and storage sector than in the economy overall. However, this difference was at a maximum of 0.5 % in Q4 2023. In general, vacancies in the transportation and storage sector have followed a similar trajectory to those in the economy overall, as illustrated by the sector's Beveridge curve. Figure 36 shows that unemployment in the transportation and storage sector fell in 2023 for the first time since 2014 (except during the COVID-19 pandemic), while JVRs remained high, reflecting persistent labour shortages and recruitment challenges. The declining unemployment has not necessarily translated into an easing of hiring difficulties.

Figure 35: JVRs in the transportation and storage sector in the EU-27, Q1 2014–Q4 2024



Source: Eurostat dataset jvs_q_nace2 (18 March 2025).

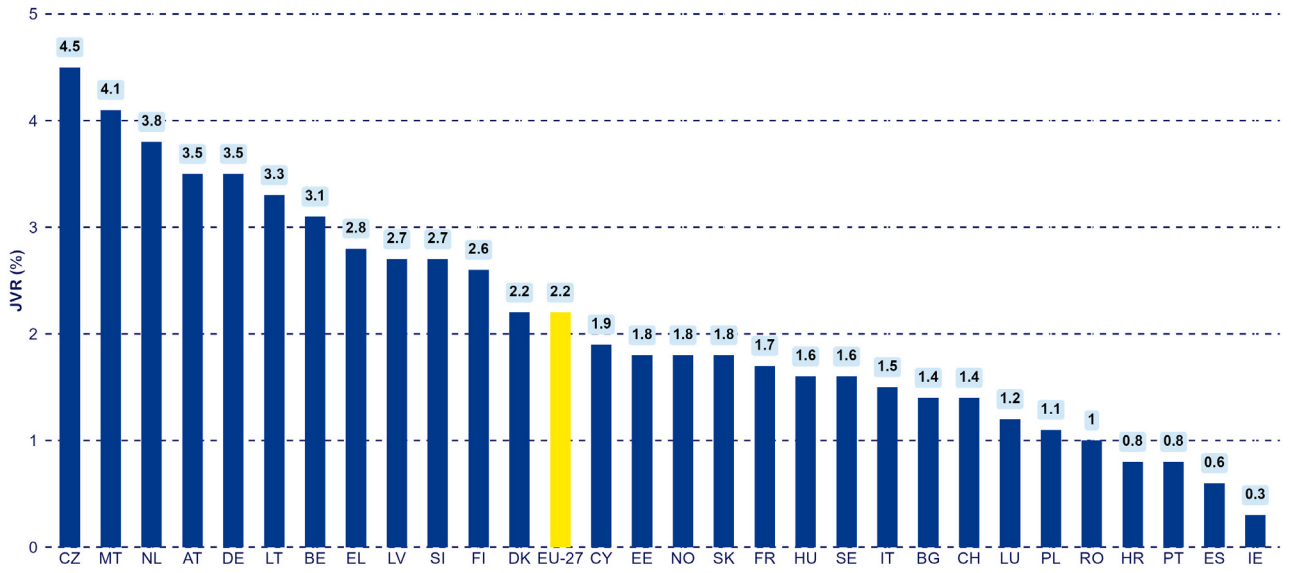
Figure 36: Beveridge curve of the transportation and storage sector in the EU-27, 2014–2024 (people aged 15–64 years)



Source: Eurostat datasets une_rt_a (13 March 2025) and jvs_a_rate_r2 (18 March 2025).

Figure 37 shows the differences among EURES countries in terms of their JVR in December 2024. While Spain and Ireland had low JVRs at 0.6 % and 0.3 %, respectively, two countries' JVRs were above 4 %: Czechia (4.5 %) and Malta (4.1 %).

Figure 37: JVRs in the transportation and storage sector by EURES country, Q4 2024



Source: Eurostat dataset jvs_q_nace2 (18 March 2025).

Transportation and storage occupations frequently face widespread labour shortages of trained professionals (European Commission, 2024b). As seen in Table 12, a great variety of transportation-related occupations are reporting labour shortages. For example, 21 countries report shortages in heavy truck and lorry drivers, and 18 countries suffer from bus and tram driver shortages. Reasons for shortages are similar in passenger and freight transport, and include an ageing workforce, competition from other industries, the perception of low wages and benefits, the lack of perceived safety and work–life balance, and changing skill sets (Expert Group for Urban Mobility, 2024; International Road Transport Union, 2024). This widespread driver shortage results in limited potential transnational matching opportunities. Nevertheless, a few opportunities exist. For example, bus and tram drivers, car, taxi and van drivers, and heavy truck and lorry drivers are in shortage in Germany, while they are surplus occupations in Austria. Since the two countries share a border and a common language, labour mobility might help reduce the pressure of labour shortages in Germany's transportation and storage sector. Establishing an EU framework to standardise the recognition and acceptance of qualifications for these roles would enhance workforce mobility and flexibility across the EU (European Commission: Directorate-General for Mobility and Transport, 2024).

Locomotive engine drivers are another group with severe shortages. This occupation has similar issues to the other driver occupations in shortage, including skills mismatches, the lack of female representation and the low overall attractiveness of the sector for youth (Staffer, 2024). The effects of pausing training and hiring in the sector during the COVID-19 pandemic continue to be felt.

Shortages of both motor vehicle mechanics and repairers and aircraft engine mechanics and repairers have arisen due to an ageing workforce, meaning experienced staff are leaving the labour market to retire, in addition to the many already having left during the COVID-19 pandemic (Wildes, 2022). Furthermore, working conditions associated with these occupations are not attractive to younger workers, who prefer less physically demanding jobs. Indeed, in the air transport subsector, the number of young people pursuing training to become aircraft engine mechanics is declining. In parallel, stakeholders mentioned the increasing need for highly skilled mechanics to stay apace with continuous technological advancements (Helaly, 2023).

Overall, the land transport, warehousing, storage and support activities for transport, and postal and courier activities subsectors are strongly affected by shortages in drivers and mobile plant operators, as these occupations represent, respectively, 69 %, 21 % and 15 % of their workforce ([20]). This broad ISCO 2008 two-digit category includes occupations that a high number of countries reported as being in shortage or severe shortage. These include railway brake, signal and switch operators (six countries reported shortages, with four experiencing high severity); locomotive engine drivers (10 countries reported shortages, with three experiencing high severity); car, taxi and van drivers (nine countries reported shortages, 25 % of which were of high severity); heavy truck and lorry drivers (21 countries reported shortages, 45 % of which were of high severity); and bus

20. EU-LFS special extractions and authors' own calculations.

and tram drivers (18 countries reported shortages, 23.5 % of which were of high severity).

On the other hand, the air transport subsector is relatively less affected by shortages. This subsector's workforce is heavily composed of personal service workers (35 %) and science and engineering associate professionals (30 %) ([21]). The latter group includes occupations that a low number of countries reported as being in shortage: air traffic controllers (five countries reported shortages); aircraft pilots and related associate professionals (five countries reported shortages); and air traffic safety electronics technicians (five countries reported shortages). The former group includes two professions (travel attendants and travel stewards, and transport conductors) that display diverging patterns. For travel attendants and travel stewards, five countries reported shortages but seven surpluses, and of the surpluses, 43 % were high severity. For transport conductors, 40 % of shortages reported were high severity.

Table 12: Frequency and severity of labour shortages or surpluses identified in transport-related occupations, 2024

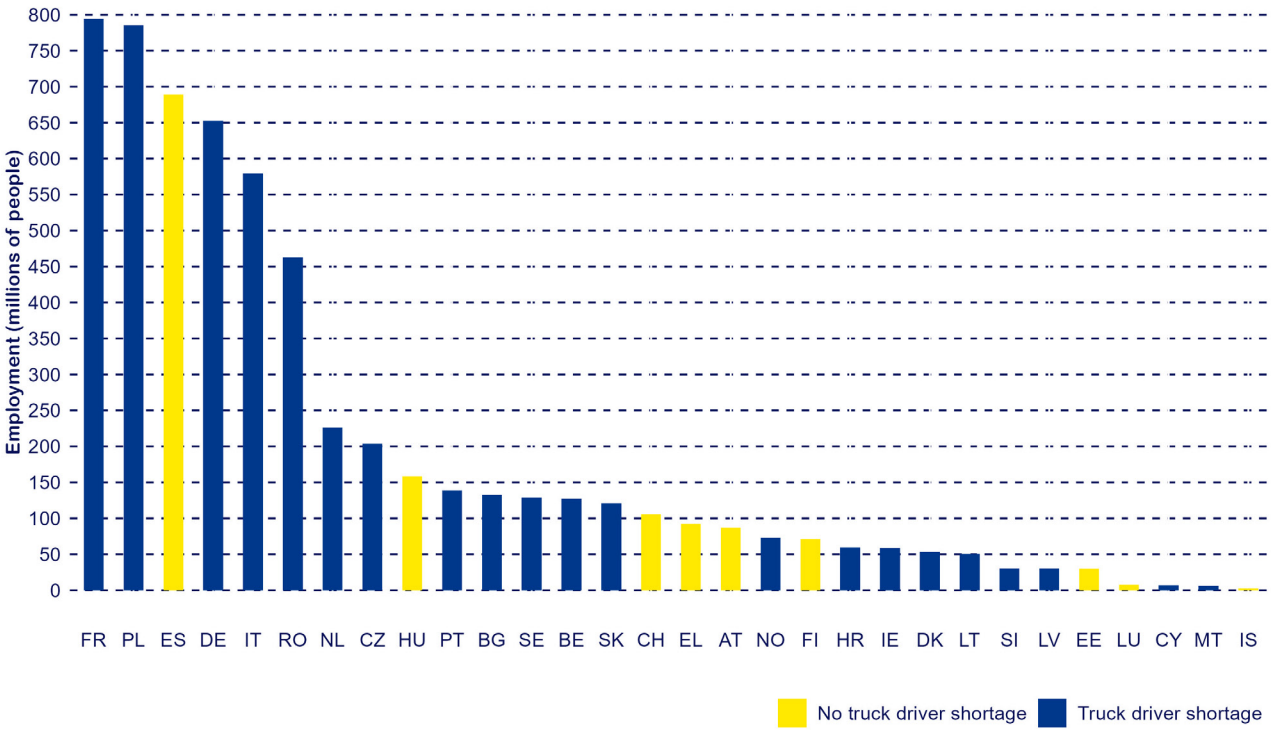
Occupation	Number of countries identifying shortage	Percentage of shortages at high severity	Number of countries identifying surplus	Percentage of surpluses at high severity
Ships' deck officers and pilots	5	0 %	6	33 %
Aircraft pilots and related associate professionals	4	25 %	4	25 %
Air traffic controllers	5	0 %	3	33 %
Air traffic safety electronics technicians	5	0 %	5	20 %
Motor vehicle mechanics and repairers	17	25 %	5	20 %
Aircraft engine mechanics and repairers	10	10 %	3	0 %
Locomotive engine drivers	10	30 %	3	0 %
Transport clerks	12	17 %	6	17 %
Mail carriers and sorting clerks	7	0 %	10	20 %
Messengers, package deliverers and luggage porters	7	29 %	7	57 %
Transport conductors	4	40 %	4	25 %
Railway brake, signal and switch operators	6	67 %	5	20 %
Motorcycle drivers	2	0 %	5	20 %
Car, taxi and van drivers	9	25 %	14	21 %
Bus and tram drivers	18	23 %	4	25 %
Heavy truck and lorry drivers	21	45 %	6	33 %
Ships' deck crews and related workers	8	0 %	8	50 %
Supply, distribution and related managers	6	0 %	7	29 %
Travel attendants and travel stewards	5	0 %	7	43 %
Freight handlers	5	0 %	15	33 %
Bicycle and related repairers	3	0 %	4	25 %
Ships' engineers	5	0 %	6	0 %

Source: Data submitted by EURES NCOs.

21. EU-LFS special extractions and authors' own calculations.

Furthermore, shortages in transport-related occupations are present in all EURES countries, with no apparent correlation between the size of the national transportation and storage sector and the need for workers. For example, Figure 38 shows the employment levels in the land transport subsector and the occurrence of shortages in the heavy truck and lorry driver occupation. It is apparent that shortages impact countries with both large land transport subsectors (e.g. Germany and France) and smaller ones (e.g. Malta, Norway and Portugal). Meanwhile, Spain reports no truck driver shortage despite its land transport subsector being the third largest in Europe.

Figure 38: Truck driver shortages and land transport subsector employment in EURES countries, Q4 2024 (people aged 15–64 years)



Source: Data submitted by EURES NCOs; Eurostat dataset lfsq_egan22d (25 March 2025).

5.2. Structural factors affecting labour market imbalances

Structural factors affecting the labour shortages in the transportation and storage sector include demographic shifts, occupational safety, market competition and changing business models, and digitalisation. These structural factors affect working conditions, contractual arrangements, gender representation, job security and skills gaps, which all, in turn, have implications for labour market imbalances (Table 13).

Table 13: Structural factors affecting labour market imbalances in the transportation and storage sector

Structural factor	Implications for labour market imbalances
Demographic shifts	Older workers retiring may lead to labour shortages when there are not enough young workers to replace them (e.g. due to the low appeal of working conditions or reputational issues). In addition, an ageing workforce can be more difficult to upskill and adapt to new technologies, leading to skills shortages.
Occupational safety	Dangerous and/or highly demanding physical working conditions reduce the sector's attractiveness. They may particularly deter women and people with disabilities. Inadequate safety and sanitary provisions and non-inclusive working environments may lead to gender disparities. Characteristics such as non-standard work schedules and long stretches away from home may make this sector less attractive than others.
Market competition and changing business models	Increased competition has led to cost-cutting measures such as lower wages, reduced benefits and reduced predictability of earnings, decreasing the sector's attractiveness. Transportation subsectors are very fragmented due to increasing specialisation to gain a competitive advantage. Fragmentation, in addition to low unionisation rates, makes it difficult for social partners to achieve collective agreements to protect workers' rights. Unfavourable employment arrangements (e.g. bogus self-employment, multilevel subcontracting, non-declaration of posted workers, under-reported working hours, platform work) can lead to lower salaries, less employment protection and fewer social benefits when used to circumvent legal responsibilities and cut costs. This reduces workforce retention and the attractiveness of the sector . Temporary and part-time contracts to cope with spikes in demand may not be the employees' preferred option. These may lead to job insecurity, lowering the attractiveness of occupations in the sector.
Digitalisation	Digital tools may have negative repercussions on working conditions when used to monitor employees' performance due to increasing pressure on productivity, leading to increased stress, physical strain and privacy concerns. Digitalisation creates skills gaps when there is no supply of adequately trained employees for new positions or responsibilities. In parallel, there may be surpluses of labour for occupations that are disappearing due to digitalisation.

Demographic shifts towards an ageing working population are a major structural factor responsible for labour market imbalances. This is exemplified by a higher share of older workers in the transportation and storage sector than in the rest of the economy. It is especially worsening among bus and tram drivers and heavy truck and lorry drivers, two widespread shortage occupations. As seen in Figure 24, respectively, 54 % and 43 % of the workers in these occupations are older than 50 years. The average age of truck drivers in the EU is also the highest in the world (European Commission, 2024b). An increase in labour shortages is expected, as these workers will retire within the next 15 years and there will not be enough young workers to replace them (International Road Transport Union, 2023a). Indeed, workers aged 15–29 years only represent 5 % of bus and tram drivers and 9 % of heavy truck and lorry drivers. This trend is further reinforced by the fact that the minimum age to become a truck driver is not yet harmonised across the EU, with some countries requiring a minimum age of 21 years for international transport drivers (International Road Transport Union, 2023a).

The ageing workforce was a major concern raised by stakeholders in the focus groups, suggesting there will be significant consequences for labour market matching. In some subsectors, such as postal and courier activities, older employees have a harder time adapting to new technologies and coping with physically demanding jobs, increasing skills mismatches and skills-related shortages. In Bulgaria, these challenges are particularly pronounced in the state-owned Bulgarian Post, where the average employee is aged between 48 and 58 years.

Ageing also creates challenges in addressing skills gaps. Stakeholders shared that older workers are reluctant to update their skills, as they have little incentive to do so with retirement approaching. In the road transport subsector, for example, older drivers are frequently unwilling to drive electric vehicles, as they may not see the value in learning new technologies so close to the end of their careers. In the railway subsector in the Netherlands, stakeholders identified past hiring freezes as a factor that induced demographic shifts by creating a gap in mid-career employees. This gap is creating significant issues, particularly for drivers, engineers and maintenance staff, as the older generation begins to retire. The loss of their expertise, combined with the challenge of attracting younger workers, who often lack the experience and training required, is making it difficult to fill these critical roles.

Demographic shifts are further exacerbated by the transportation and storage sector's low appeal to younger generations, which limits the pool of potential replacements. Stakeholders observed that young people are less attracted to jobs in this sector than in the past because they can find a better work–life balance elsewhere. With regard to the railway sector, stakeholders from Czechia said there has been a shift in the perception of railway jobs from being a 'good' job that ensures social security to being an outdated working-class endeavour. In Spain, reputational issues are highly dependent on context and role, as many young people are applying to become locomotive engine drivers. Reasons for this include good collective agreements and working conditions. For the water transport subsector, the high costs of certification and low wages are a deterrent for young people who may not be able to afford training.

The labour market imbalances in the transportation and storage sector can also be traced back to the underuse of existing talent due to gender segregation. Despite women's participation increasing by 1.8 % in the EU transportation and storage sector between 2019 and 2023 (European Commission: Directorate-General for Economic and Financial Affairs, 2024b), the share of women employees has remained stable over the past 10 years, at less than half the average across all sectors. In Q4 2024, 22.63 % of workers in the transportation and storage sector were women, while women represent 46 % of the workforce in the EU (Eurostat, n.d.-b). Deep gender gaps are observed in some occupations, especially in the land and water transport subsectors. Women accounted for 14.6 % of workers in land transport and 20 % in water transport, compared with 42.5 % in air transport (European Parliament, 2024). Despite national variations, gender imbalances exist in all countries. Among widespread shortage occupations, 98 % of heavy truck and lorry drivers and motor vehicle mechanics and repairers and 88 % of bus and tram drivers are men. Women are under-represented in all parts of the transportation and storage sector, including piloting, planning, design, management and research and innovation (European Parliament, 2024). This gender divide further limits the pool of people engaging in training or available to fill new vacancies in times of rising demand, which reinforces the persistence of labour shortages.

Inadequate occupational safety, contributing to an uninviting and non-inclusive working environment, may be one of the structural factors explaining gender disparities in the sector. Safety is a crucial concern: in 2021, the transportation and storage sector represented 5.2 % of workers in the EU-27 (Eurostat, n.d.-b), but accounted for 9.2 % of accidents at work resulting in at least four days of work incapacity, and 16.3 % of fatal accidents (Eurostat, n.d.-a). Similarly, in 2021, 47.4 % of transportation and storage sector workers in EURES countries reported that they thought their health or safety was at risk because of their work, while this percentage stood at 34 % across all sectors ([22]) (Eurofound, n.d.-c). Lack of safety in the road transport subsector is also due to the inadequacy of parking and resting facilities along highways for female drivers, creating environments where women may feel unsafe or uncomfortable. For example, the absence of decent sanitary facilities for women and workers with disabilities is often reported, alongside bullying and harassment (European Commission: Directorate-General for Mobility and Transport et al., 2021). Stakeholders emphasised the need for investment in safer, more accessible facilities, such as well-lit and secure rest stops.

In addition, occupational characteristics such as shift work, 'life on board' and long days away from home lower the sector's attractiveness. In 2021, 30.4 % of transportation and storage workers reported that their working hours did not fit with their family or social commitments outside work, while this was only the case for 5.2 % of workers in the overall economy ([23]) (Eurofound, n.d.-c). As seen in Figure 39, transportation and storage workers were also more likely to work at night (27.5 % versus 11.6 % in other sectors), in environments with noise (49.3 % versus 46.1 %) or in tiring positions (54.4 % versus 51.1 %) ([24]) (Eurofound, n.d.-c). These job characteristics may be less attractive to women, especially those with families and primary-carer duties. In addition, job strain is above average for occupations in the transportation and storage sector, with 44 %

22. 2021 European Working Conditions Telephone Survey and authors' calculations.
23. 2021 European Working Conditions Telephone Survey and authors' calculations.
24. 2021 European Working Conditions Telephone Survey and authors' calculations.

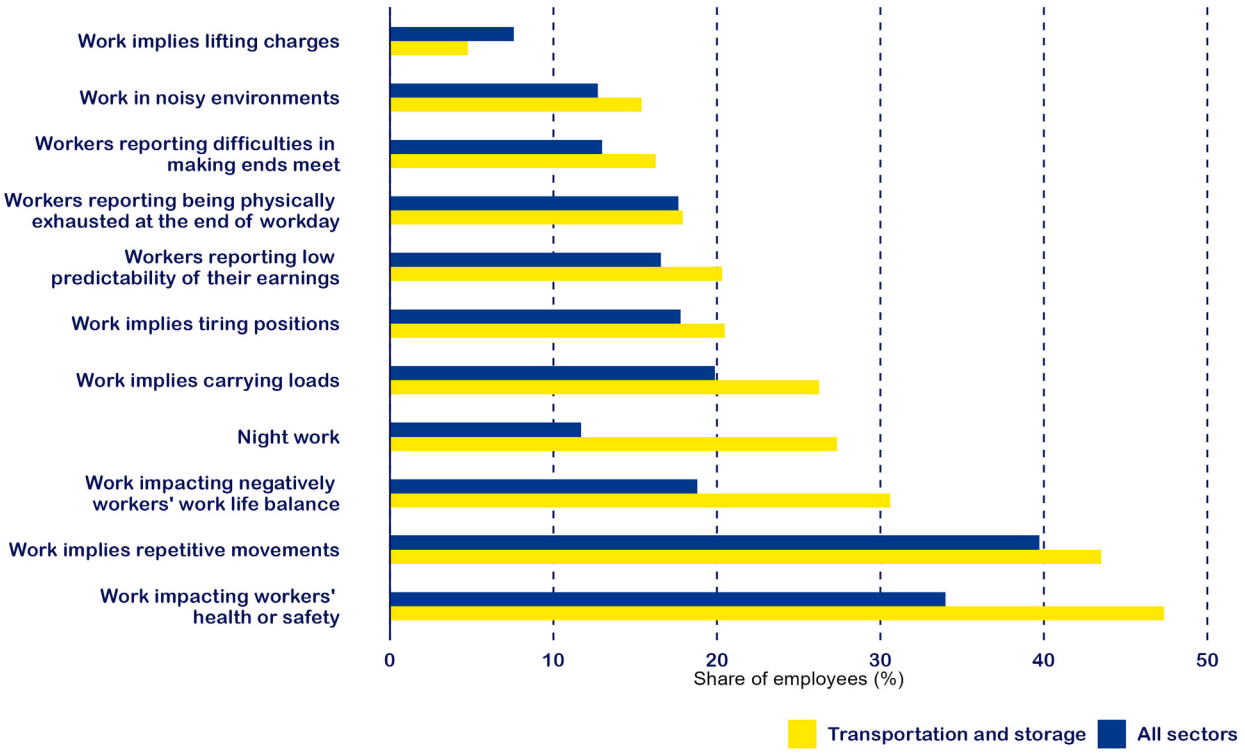
of drivers facing a high level of job strain (European Commission, 2023b). The intensity of manual or physical tasks could be an additional deterrent for women, young people and workers with disabilities (European Commission: Directorate-General for Mobility and Transport et al., 2021).

Transformations driven by changes in business models, competition and regulatory frameworks are also responsible for deteriorating working conditions and the industry's poor image. Indeed, privatisation and competition affect working conditions and job stability through atypical employment practices and cost-cutting measures, such as lower wages, reduced benefits and reduced predictability of earnings (Broughton et al., 2024). For example, in the air transport subsector, working conditions and terms of employment have seen notable deterioration, with cost competition driven by low-cost carriers influencing other airlines to reduce standards to remain competitive (Harvey et al., 2021; Staunton, 2022). In relation to wages, the share of workers reporting difficulty in making ends meet was 3.2 percentage points higher in the transportation and storage sector than in the overall economy (16.2 % and 13 %, respectively). Similarly, the proportions of workers reporting difficulty in predicting their income stood at 20.5 % and 16.3 %, respectively, as seen in Figure 39.

Another consequence of increasingly liberalised business models is the fragmentation of many transportation and storage subsectors, making it more difficult to engage in social dialogue and achieve collective agreements that protect workers' rights, improve the image of sectors and attract workers into roles with labour shortages. In Germany, for instance, Deutsche Bahn consists of over 500 companies, complicating worker representation and negotiations. Solutions to address labour shortages, such as atypical work contracts and hiring non-EU nationals for economic reasons, further exacerbate the problem. These approaches tend to lower wages and worsen working conditions, reinforcing the sector's low attractiveness and making recruitment even more difficult.

Stakeholders also noted that part of the issue lies in communication. Companies and associations representing them are making efforts to improve this aspect. This issue seems particularly relevant for the water transport subsector and for ports, which are often perceived as tough, dirty and challenging environments. Stakeholders pointed out that the messaging about roles in these environments can be misleading. For example, the prospect of working for three weeks and then having three weeks off could be appealing to young seafarers.

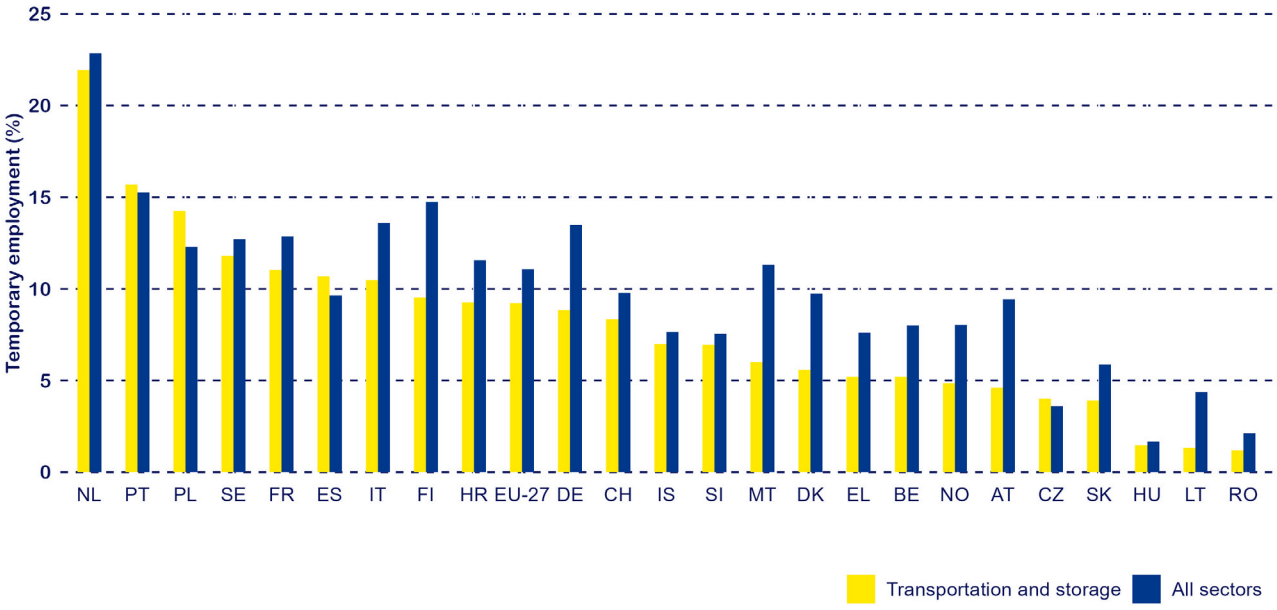
Figure 39: Working conditions reported by workers in the transportation and storage sector and in the overall economy, 2021



Source: 2021 European Working Conditions Survey.

In terms of job security, the transportation and storage sector is characterised by relatively low rates of temporary contracts. As seen in Figure 40, temporary contracts account for a larger share of work contracts in the transportation and storage sector than in the overall economy in four countries: Czechia, Spain, Poland and Portugal. On the other hand, temporary contracts are less common in the transportation and storage sector than in the overall economy in Finland, Germany, Italy, Lithuania, Malta and Norway. Notably, 17.6 % of workers in the water transport subsector reported having temporary contracts, compared with 11.6 % in the overall economy.

Figure 40: Share of temporary contracts in the transportation and storage sector versus average for all sectors, per EURES country, 2023 (people aged 15–64 years)



Source: Eurostat datasets lfsa_egan2 and lfsa_etgan2 (13 March 2025).

In the EU-27 in 2023, 82.3 % of transportation and storage sector employees held permanent contracts, while this share stood at 74.7 % in the wider economy.

Table 14 shows that within the transportation and storage sector, the warehousing and air transport subsectors exhibit higher shares of permanent contracts, at 85 % and 92.3 %, respectively. In other subsectors, the share of permanent contracts is lower than average for the sector, but still relatively high. Specifically, 80.4 % of workers in water transport, 80.4 % in land transport and 84.0 % in postal and courier activities have permanent contracts. The share of self-employment in the transportation and storage sector is substantially lower than in the overall economy (13.3 %), with the exception of land transport (12.7 %).

Similarly, the transportation and storage sector displays a higher rate of full-time employment (90.3 %) than the overall economy (82.2 %) (see Table 14). In particular, the share of part-time employment is substantially higher in the overall economy (17.8 %) than in the land transport (9.7 %), postal and courier services (8.8 %) and water transport (5.2 %) subsectors.

Table 14: Share of employment by type of contract and employment in transportation and storage subsectors in the EU-27, 2023 (people aged 15–64 years)

Sector	Type of contract			Type of employment	
	Permanent contract	Temporary contract	Self-employed	Full-time employment	Part-time employment
All sectors (EU-27 economy overall)	74.7 %	11.6 %	13.3 %	82.2 %	17.8 %
Transportation and storage sector	82.3 %	9.3 %	8.4 %	90.3 %	9.7 %
Land transport subsector	80.4 %	7.0 %	12.7 %	92.3 %	7.7 %
Air transport subsector	92.3 %	7.7 %	0 %	83.5 %	16.5 %
Water transport subsector	80.4 %	17.6 %	5.6 %	94.8 %	5.2 %
Postal and courier activities subsector	84.0 %	11.6 %	4.5 %	91.2 %	8.8 %
Warehousing, storage and support activities for transportation subsector	85.0 %	11.9 %	3.1 %	81.3 %	18.7 %

NB: For better readability, other types of employment contracts have not been included in this table. Coefficients have been rounded up to the superior decimal and may not add up to 100 %.

Source: EU-LFS special data extractions.

Figure 41 examines broader employment effects. For drivers and mobile plant operators, part-time work emerged as a key factor linked to reduced unemployment. A 1 % increase in part-time work prevalence within specific sectors, relative to the national average, corresponds to a 1.21 % decrease in unemployment growth. This indicates that part-time work may be a result of increased platform work in certain professions such as freight and last-mile delivery drivers. Indeed, platform work has rapidly expanded in the past 10 years, along with concerns regarding labour rights (see Box 9). In addition, part-time work could be a preferred choice for workers with care responsibilities or a common option in certain regions.

Box 9: Increasing prevalence of platform work in the EU

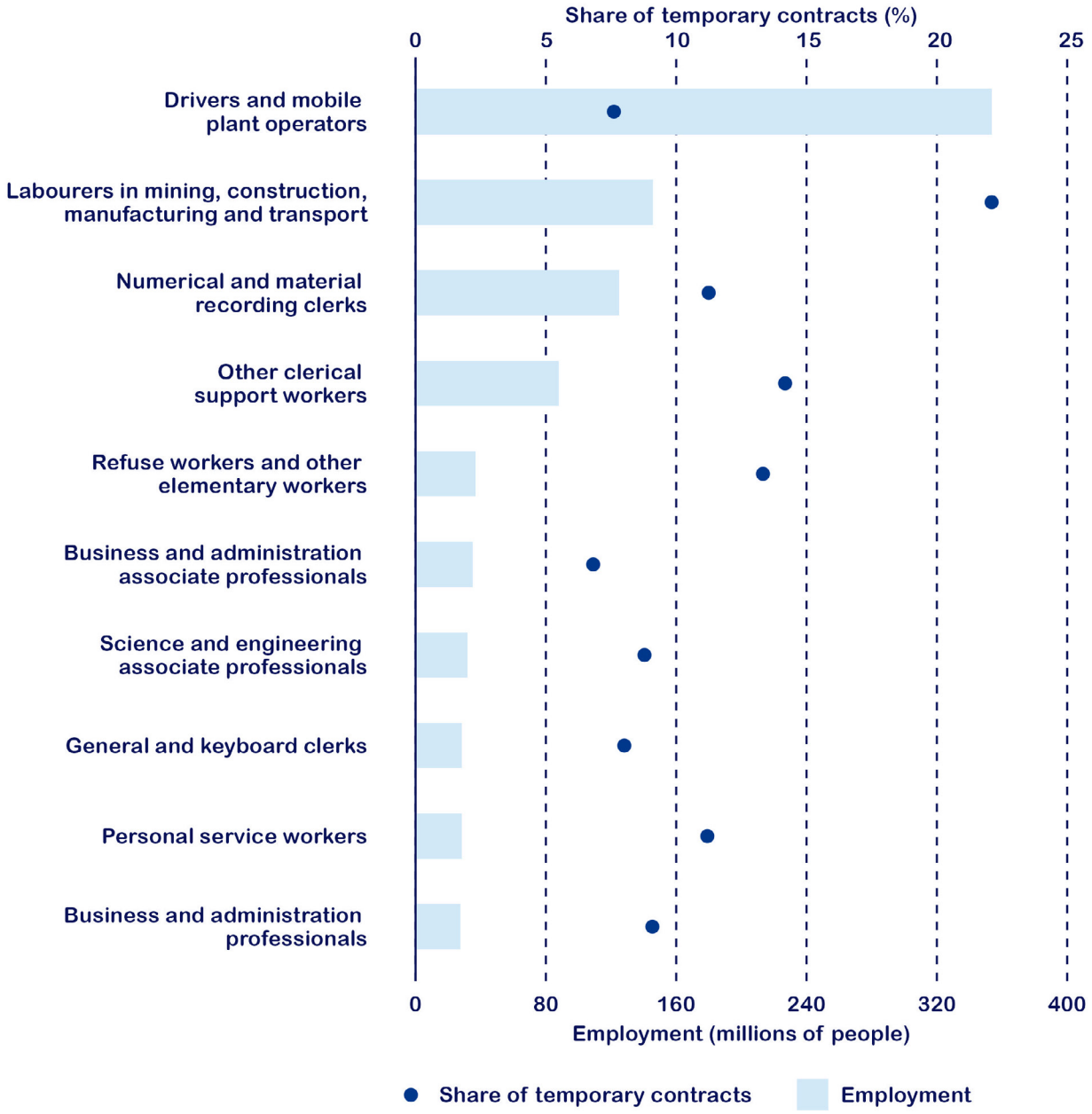
Digital labour platforms have significantly expanded across the EU, with over 500 active platforms contributing to a platform economy valued at EUR 14 billion in 2020, up from EUR 3 billion in 2016 (European Commission, 2021). This rapid growth has reshaped the labour dynamics in the postal and courier services subsector. Platform-based courier services now offer more tailored solutions, such as on-site pick-up and delivery, with prices varying based on speed, contrasting with the standardised services of traditional postal operators. This shift has led to a diversification of delivery options, with postal operators increasingly collaborating with or adopting platform-based models to enhance service flexibility and meet evolving consumer demands. In the land transport subsector, companies like Uber Freight and various on-demand delivery services have introduced flexible working arrangements, attracting a diverse workforce, including those seeking task-based opportunities (Uber Freight, 2019).

Stakeholders consulted through focus groups have highlighted the increased use of platform-based models as a way for companies to meet tight delivery schedules and the demands of e-commerce. They can offer a partial short-term solution to driver shortages by providing low-barrier entry opportunities and adaptable working conditions. These models often involve more flexible, part-time employment arrangements, and workers may not receive the same benefits as traditionally employed staff. Collectively, these changes have led to diminished wages and a less stable and equitable work environment (Syndex and Uni Global, 2018).

The increased involvement of global platforms in last-mile delivery, often relying on self-employed workers, has raised concerns about social equity, fair wages and long-term employment stability. This shift creates significant challenges for trade unions as they navigate the complexities of bargaining on behalf of workers. Trade unions have expressed growing concern over the adoption of low-cost models, including platform work, that put additional strain on wages and working conditions. They are advocating for fair wages, better working conditions and more equitable treatment for postal workers across the subsector. For example, in Belgium, trade unions have called for equal minimum standards for all market stakeholders to ensure fair competition and protect workers' rights (Copenhagen Economics and European Commission: Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs, 2022).

Temporary agency work also played a notable role, with a 1 % increase associated with a 0.13 % decline in unemployment growth. Stakeholders see a direct link between recruitment practices and deteriorating working conditions, which in turn contribute to labour shortages across the EU. In the air transport subsector, for example, temporary work agencies employ pilots and cabin crew. The agencies are responsible for taxes and social security obligations (European Commission: Directorate-General for Mobility and Transport et al., 2019), while the airline oversees worker supervision, health and safety. This system can lead to differences in working conditions between workers employed through intermediaries and those employed through direct contracts with airlines. Air carriers are sometimes accused of 'rule shopping' by choosing agencies in countries with more favourable regulations for temporary agency work. This can enable airlines to avoid upholding trade union agreements (Ydersbond, 2022).

Figure 41: Employment levels and shares of temporary contracts in the 10 most common broad ISCO occupations in the transportation and storage sector, EU-27, 2023 (people aged 15–64 years)



Source: EU-LFS special data extractions.

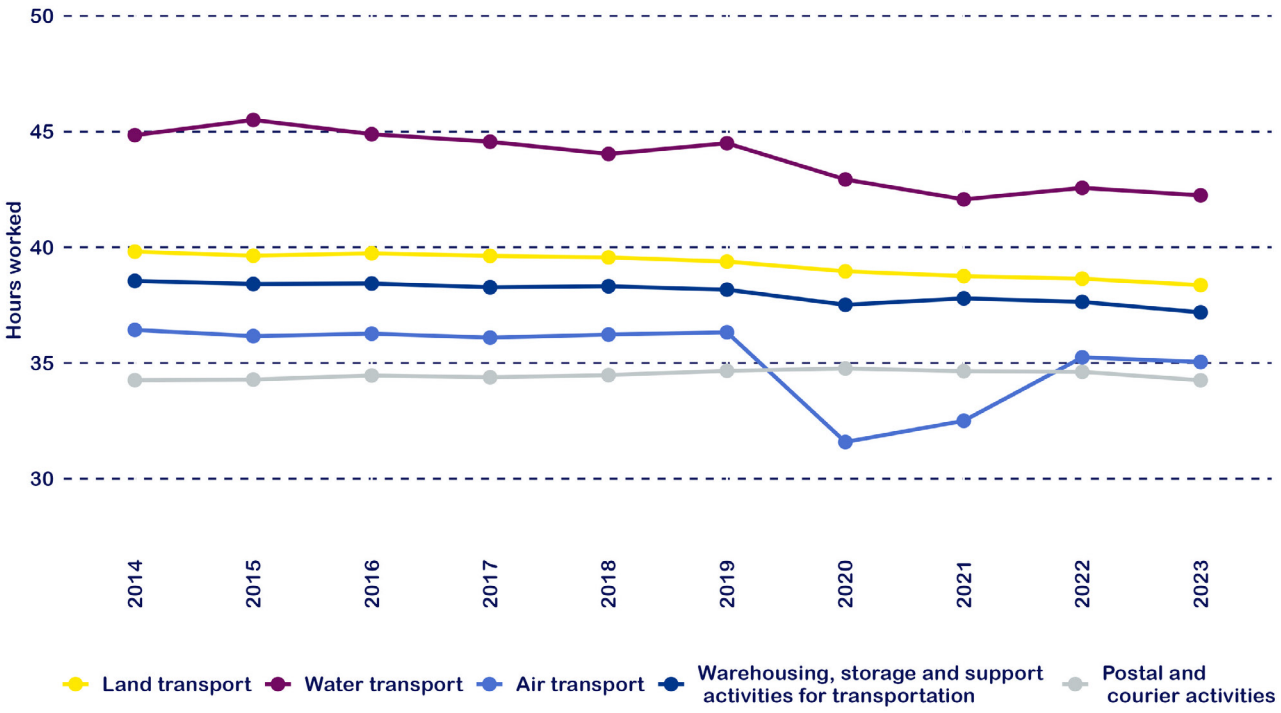
Overall, the average number of weekly hours worked per employee has followed a decreasing trend over the past 10 years, as seen in Figure 42. However, the average number of hours worked is substantially higher in the water transport subsector, with 42.3 hours worked weekly compared with 38.3 in the land transport subsector, for example. Findings from the regression analysis on working hours are more nuanced. Employment growth generally reduced unemployment, while longer average working hours slightly increased it, potentially reflecting structural inefficiencies. Meanwhile, changes in the working-age population had a minimal direct impact on unemployment trends, suggesting that demographic challenges may not explain unemployment effectively. These findings align with persistent labour shortages in transportation and storage occupations, as detailed in Table 15. A combination of poor working conditions, demanding shift schedules and high entry barriers continues to limit new entrants – especially women and young people – into transport roles. These challenges, combined with an ageing workforce and the need for upskilling due to automation, threaten future recruitment and sector sustainability.

Table 15: Vulnerabilities and challenges identified in the 10 most common broad ISCO occupations in the transportation and storage sector, EU-27, Q2 2024

Occupation	Main subsectors	Women in the workforce	Education levels	Workers aged 29 years or younger	Workers aged 50 years or older	Challenges identified
Drivers and mobile plant operators	Land transport, water transport, warehousing and storage, postal and courier activities	5 %	64 % medium (ISCED 3–4)	12.5 %	41 %	Unattractive working conditions, poor work–life balance, shift work, night work, entry costs (e.g. licensing)
Labourer in mining, construction, manufacturing and transport	Warehousing and storage	29 %	50 % medium (ISCED 3–4) 43 % low (ISCED 1–2)	28 %	28 %	Unattractive working conditions, poor work–life balance, shift work, night work
Numerical and material recording clerks	Land transport, water transport, air transport, warehousing and storage	48 %	60 % medium (ISCED 3–4)	19 %	33 %	Automation
Other clerical support clerks	Postal and courier activities	61 %	56 % medium (ISCED 3–4)	20 %	35 %	Automation
Refuse workers and other elementary workers	Postal and courier activities	24 %	49 % medium (ISCED 3–4) 44 % low (ISCED 1–2)	18 %	42 %	Unattractive working conditions, night work
Business and administration associate professionals	Land transport, water transport, air transport, warehousing and storage, postal and courier activities	55 %	50 % high (ISCED 5–8) 45 % medium (ISCED 3–4)	14 %	35 %	–
Science and engineering associate professionals	Water transport, air transport	20 %	51 % medium (ISCED 3–4) 41 % high (ISCED 5–8)	26 %	31 %	Poor work–life balance, shift work, night work, entry costs (e.g. licensing)
General and keyboard clerks	Land transport, water transport, warehousing and storage	78 %	59 % medium (ISCED 3–4)	14 %	40 %	Automation
Personal service workers	Air transport	59 %	61 % medium (ISCED 3–4)	26 %	32 %	Poor work–life balance, shift work, night work
Business and administration professionals	Air transport	24 %	82 % high (ISCED 5–8)	15 %	28 %	–

Sources: Eurostat dataset lfsq_egai2d (25 March 2025); EU-LFS special data extractions.

Figure 42: Average weekly hours worked per employee in transportation and storage subsectors in the EU-27, 2014–2023 (people aged 15–64 years)



Source: EU-LFS special data extractions.

Atypical work contracts are both a consequence of high-competition business models and a way to fill labour shortages in the short term. Overall, they can further exacerbate shortages, as this approach tends to lower wages and worsen working conditions, reinforcing the sector's low attractiveness and making recruitment even more difficult.

Undeclared work practices are common in the transportation and storage sector, and in particular in the air and land transport subsectors, although they are difficult to quantify (Haidinger, 2018; Turnbull, 2020). Notably, bogus self-employment is commonly understood as involving workers registered as self-employed but whose conditions of employment are de facto those of dependent employment. This practice can be used to circumvent tax and/or social insurance liabilities, or employers' responsibilities with respect to workers' employment rights (Haidinger, 2018; Turnbull, 2020). It can also be combined with multilevel subcontracting, under-reported worked hours or non-declaration of posted workers when they perform both cross-border and transnational transport services. These practices can contribute to lower salaries due to the under-reporting of hours worked, and higher vulnerability to variations in activity, in particular in seasonal industries such as the air transport subsector (Turnbull, 2020).

In warehousing, storage and support activities for transportation, stakeholders noted that large firms increasingly rely on subcontractors and employment agencies to remain flexible and respond to fluctuating demand. This is often linked to precarious working conditions, high turnover rates and a growing reliance on temporary contracts. In railway transport, outsourcing has also become more common, particularly in maintenance and support roles. Stakeholders warned that essential railway jobs that were previously regarded as stable and central to operations are now being handled by external contractors that offer lower wages and weaker employment protections. This has fragmented the workforce, creating a secondary labour market with poor conditions.

In air transport, outsourcing is even more pronounced, with stakeholders identifying wet leasing and bogus self-employment as major concerns. Wet leasing, where airlines rent an aircraft and crew from other operators, has increased in recent years, enabling airlines to avoid direct employment costs. Stakeholders expressed concerns that this practice facilitates social dumping and deteriorates working conditions. They also highlighted that self-employed pilots (often hired through staffing agencies) face job insecurity, a lack of social protection and even pressure to work while unwell, raising safety concerns.

In road transport, stakeholders pointed out that subcontracting in small goods delivery services has created extreme working conditions, particularly during peak periods. Subcontracted drivers often work excessively long

hours, sometimes up to 16 hours a day, delivering hundreds of parcels. In the postal and courier activities subsector, stakeholders argue that such practices, in addition to self-employment and other practices to reduce wages and benefits, are leading to a race to the bottom, further depreciating the attractiveness of the transportation and storage sector.

In the water transport subsector, stakeholders consulted highlighted that social dumping is closely linked to issues around contractual arrangements, particularly self-employment, and working conditions. There is a growing reliance on intermediary agencies in the maritime industry. For instance, a German shipowner may contract a crew through a Slovakian agency, which in turn provides workers under contracts registered in Cyprus. This complex arrangement makes it difficult to ensure that workers receive fair wages and benefits, as it often involves different national labour laws and regulations, creating loopholes that can be exploited to undercut workers' rights. Exploitation and precarious working conditions are exacerbated by practices such as flying flags of convenience and recruiting cheaper labour from non-EU countries for cost efficiency. These practices not only undermine the legitimacy of workers' basic rights but also diminish the long-term attractiveness of careers in the sector.

Digitalisation in the warehousing and storage subsector is noted to have potential negative implications for working conditions and the overall attractiveness of the sector. While digital tools are used for safety, they are also used to control various aspects of workers' performance, including work processes, breaks and the number of goods stowed, picked and packed (Team Hub, 2024). This level of monitoring has raised privacy concerns among workers and could potentially contribute to stress or physical strain due to the pressures of forced productivity and surveillance (European Transport Workers' Federation, 2024). Warehouse workers have reported significant issues stemming from these practices, highlighting the need for a balanced approach to digitalisation (European Transport Workers' Federation, 2024). Companies must ensure that while they leverage digital tools for efficiency and safety, they also consider the well-being and privacy of their employees.

Digitalisation is also leading to skills gaps in many subsectors. For example, occupations such as freight handlers across the transportation sector need retraining to keep their skills relevant. There is currently a surplus of freight handlers at their current skill level, while there are shortages of more highly skilled workers in warehousing and support services for transportation (e.g. in ports or rail depots). Furthermore, some occupations risk disappearing altogether as digitalisation and automation improve. Stakeholders across the transportation sector point out skills mismatches and the need for upskilling as issues driven by innovation and digitalisation.

Box 10: Measures implemented to address labour imbalances in the transportation and storage sector

Across the transportation and storage sector, a range of measures have been considered and implemented to address the structural factors leading to workforce imbalances. More detailed examples are provided in Section 6.2. These measures can be grouped into the following categories.

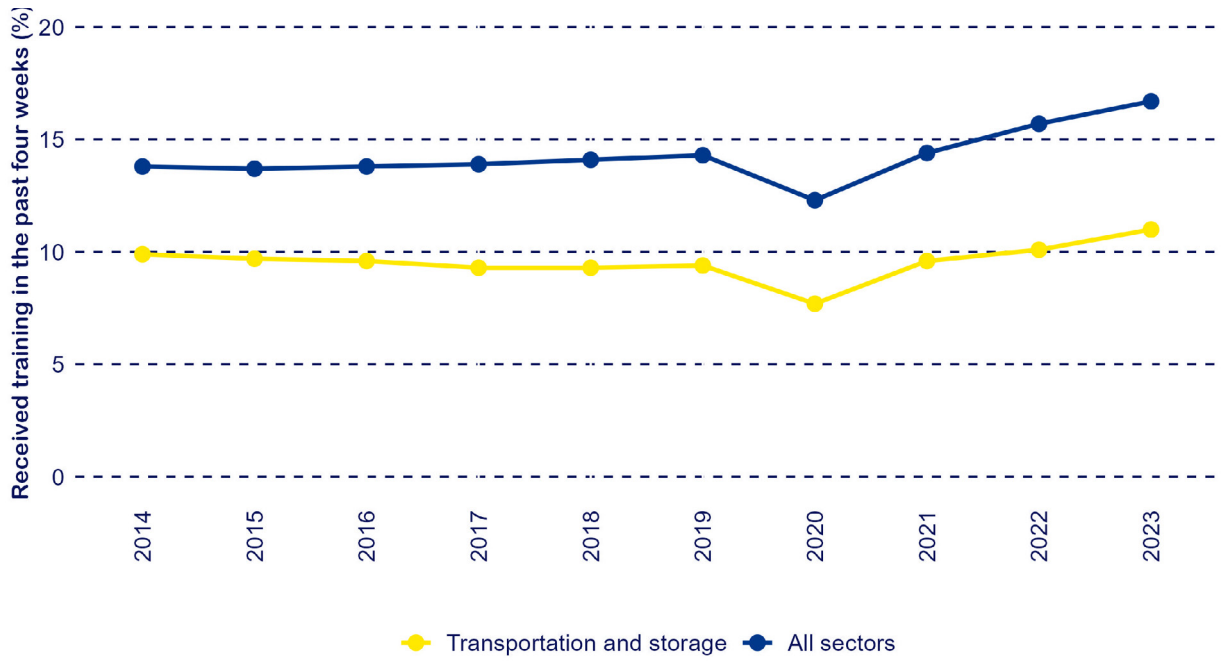
- Strengthening reputation and optimising communication: awareness campaigns and unified communication platforms are promoting career opportunities and particularly targeting younger workers.
- Promoting gender representation: efforts to increase the visibility of and opportunities for women in the sector include financial grants, leadership and mentoring programmes, awards, communication campaigns, equal pay initiatives, bias-free recruitment practices and the implementation of flexible policies.
- Improving education: actions include aligning training qualifications with employer requirements, fostering cooperation between employers, authorities and educational institutions, offering employer-provided upskilling and reskilling opportunities and developing attractive training programmes.
- Improving working conditions: improvements are being made with regard to workplace and rest facilities, workplace accessibility and wages, and digitalisation is being used to enhance the quality of occupations.
- Implementing wage increases: raising wages for severe shortage occupations aims to attract workers to the sector and retain them.
- Enforcing and implementing legislation: measures include data sharing between government institutions to enable effective inspections, and the strict regulation of zero-hour contracts.
- Creating legislation: public and private stakeholders are collaborating to establish EU-level policies on working conditions in subsectors, alongside improvements to legislation concerning qualification and safety requirements.

5.3. The future of work in the transportation and storage sector

The transportation and storage sector is facing numerous transformative and intersecting challenges, which include the green and digital transitions and the emergence of new services and business models in urban mobility and logistics.

The digitalisation of the transportation and storage sector is transforming the work environment and the tasks conducted by workers. In 2021, 59 % of workers in the transportation and storage sector stated that the introduction of new computer programs or new computerised machinery had led to them doing new or different tasks, and 44 % reported doing new tasks (Cedefop, n.d.-b). Similarly, 31 % of the sector's workers had to learn to use a digital technology when starting their job (Cedefop, n.d.-b). Moreover, 78 % believed that current or future digital technologies used in their company would require skills that they do not currently have (Cedefop, n.d.-b). This highlights the importance of reskilling the workforce in the transportation and storage sector. However, as seen in Figure 43, the transportation and storage sector is characterised by low levels of participation in training compared with other sectors. In 2023, 10.8 % of workers in the transportation and storage sector had engaged in education or training over the last four weeks, compared with 16.5 % across all sectors.

Figure 43: Rate of participation in training in the last four weeks in the transportation and storage sector versus all sectors, EU-27, 2014–2023 (people aged 18–64 years)



Source: Eurostat dataset trng_lfs_08b (12 December 2024).

The digital transition and the occurrence of labour market imbalances are closely linked. Despite the large shift expected in skills needs in technical and administrative roles (European Commission, 2024b), training currently focuses on present and immediate skills needs, partly due to labour shortages (European Commission: Directorate-General for Employment, Social Affairs and Inclusion, 2024a). Concomitantly, the demand for low-skilled workers is likely to decrease across the transportation and storage sector as complex human–machine interactions become more widespread in the medium term. This trend is already being observed among warehouse workers and freight handlers in ports (WEF, 2024). Notably, according to Cedefop (2024), 10 % of jobs in the sector are at risk of being automated. Overall, employment could decline by 7 % in water transport, air transport, warehousing and postal activities, as well as by 6 % in land transport. For example, in the railway transport subsector, administrative staff are expected to decrease by 9.8 % by 2030, from 322 065 in 2010 to 290 490 (European Transport Workers' Federation, 2023). This could result in labour surpluses if not addressed by adequately reskilling the existing workforce.

The digital transition could enhance the attractiveness of transportation and storage jobs. As discussed in Section 5.2,

a key driver of labour shortages in the sector is its difficulty appealing to younger workers and women. Automation and digitalisation may facilitate a better work–life balance, for example by enhancing the potential to have part-time or more flexible working hours. They could also have positive effects on occupational safety and health. Moreover, digitalisation and automation technologies could take over manual and physical tasks, which may be an incentive for women workers and those for whom these tasks represent a barrier or discouraging factor. Similarly, increased opportunities for flexible working hours and part-time or remote work could contribute to a higher number of women, especially those with family and primary-carer duties, taking on transport-related jobs or training (European Commission: Directorate-General for Mobility and Transport et al., 2021). In general, a positive relationship between the digitalisation intensity of establishments and indicators like employment growth and workplace well-being has been noted. However, the transportation and storage sector has a low share of highly digitalised establishments (Eurofound, n.d.-b).

Stakeholders consulted through focus groups emphasised the urgent need to equip workers with digital and green skills. Automation, AI and electrification are transforming job roles, creating a pressing need for reskilling and upskilling initiatives. The growing demand for expertise in data analytics, cybersecurity and sustainable energy solutions highlights the importance of industry–education collaboration in closing the skills gap.

From a sectoral perspective, stakeholders noted significant transformations across transportation and storage.

- In air transport, stakeholders predict a shift towards more fuel-efficient aircraft and sustainable aviation fuels, while the competitive landscape will be influenced by regulatory frameworks enforcing carbon reduction. These shifts will require the upskilling of pilots and aircrew to ensure safe handling.
- In the water transport subsector, decarbonisation is driving a shift towards alternative fuels like hydrogen and ammonia. Stakeholders highlight the impact of stringent emissions regulations on business models, emphasising the need for companies to invest in fleet modernisation to remain competitive. The industry anticipates a growing demand for skilled mechanics proficient in emerging technologies. In addition, there is an expected increase in onshore employment opportunities. Conversely, the demand for low-skilled workers is projected to decline, as technological advancements may render certain roles obsolete.
- The road transport subsector is witnessing a rapid shift towards electrification and autonomous vehicles. Stakeholders emphasise the changing roles in vehicle maintenance, logistics planning and fleet management. Traditional fuel-based supply chains will be disrupted, affecting small and medium-sized enterprises. Digital platforms are becoming central to urban mobility solutions, requiring regulatory adaptations and workforce retraining.
- Railway transport is positioned as a sustainable option for long-haul freight and passenger travel. Stakeholders expect increased investment in high-speed rail and digital signalling systems. Automation in operations and predictive maintenance will reshape the workforce, driving a greater demand for ICT and engineering expertise.
- In the postal and courier activities subsector, service diversification is reshaping workforce requirements. Stakeholders emphasise the need for broader skills, with delivery workers requiring vehicle licences, digital proficiency and customer interaction skills, while post office employees shift towards service and sales roles. Back-office staff must also develop ICT and analytical skills as digital tools become standard.
- In warehousing, storage and support activities for transportation, job roles are also changing, requiring workers to transition from lower-skilled positions to more highly skilled technical roles. Warehouse and logistics companies also face a growing demand for skills in quality and safety, environmental knowledge, material handling and ICT.

Box 11: Sociaal Fonds Mobiliteit and the 'Sterk aan het stuur' programme in the Netherlands

Sociaal Fonds Mobiliteit, an education and development fund in the Netherlands, was established by social partners in the Dutch taxi sector. This initiative aims to enhance the sustainable employability of workers in the coach and taxi industry. Both employers and workers are required to contribute to the fund, granting them access to its training and development services. This sector-specific fund offers the advantage of tailoring education and vocational training to meet the unique needs of industry workers.

Sociaal Fonds Mobiliteit is advancing its 'Sterk aan het stuur' ('Strong at the wheel') programme, funded by the European Social Fund until November 2025. This programme includes an employability screening to identify potential training pathways, and offers coaching support to help workers navigate their career trajectories in the framework of lifelong learning.

Sources: European Commission: Directorate-General for Mobility and Transport et al. (2021); Sociaal Fonds Mobiliteit (n.d.).

Furthermore, occupations in the transportation and storage sector may become more focused on operating, maintaining and repairing machines. This increase in task complexity will contribute to the polarisation of jobs and workers; simple, low-paid jobs are carried out alongside highly specialised ones that require new skill sets. In particular, ICT and data proficiency, together with soft skills such as communication, problem-solving and creativity, are expected to be important in future transport-related occupations (European Commission: Directorate-General for Mobility and Transport et al., 2021). The increased demand for highly skilled workers could make it even more difficult to recruit staff in some key occupations for the transportation and storage sector, such as science and engineering associate professionals (which include, for example, ship and aircraft controllers and technicians). In the railway transport subsector, the number of mobile and technical staff is expected to grow. Similarly, in the water transport subsector, reskilling needs could affect some 250 000 seafarers in the EU over the coming years (DNV, 2022).

Table 16 displays different potential future trajectories for three key broad occupations in the transportation and storage sector: science and engineering associate professionals, drivers and mobile plant operators and numerical and material recording clerks. Over 30 % of workers in these occupations are aged over 50 years, raising concerns about workforce replacement as they retire. The shortage intensity for drivers and mobile plant operators is already high, and despite only 12 600 new jobs expected to be created by 2035, shortages may worsen, especially for heavy truck, lorry, bus and tram drivers (Cedefop, n.d.-a). With drivers and mobile plant operators making up 69 % of the land transport workforce, the sector faces significant labour market challenges due to an ageing workforce and low appeal to younger generations.

While labour and skills shortages are of lower intensity for science and engineering associate professionals, this occupation will experience considerable pressure as digitalisation and the green transition drive up demand for technical skills. The Cedefop Skills Forecast (n.d.-c) predicts the creation of 84 900 new science and engineering associate professional jobs in the transportation and storage sector by 2035. This represents an increase of 26.3 % relative to current employment levels, which could prove difficult to fill, especially with the pressure of an ageing workforce taken into account. This would particularly affect the water transport subsector (where this occupation makes up 44 % of the workforce) and the air transport subsector (where it accounts for 30 % of the workforce). Finally, numerical and material recording clerks represent a substantial share of the workforce in almost all subsectors: 23 % in warehousing, storage and support activities for transportation, 7 % each in air and water transport and 6 % in land transport. However, the Cedefop (2025b) Skills Forecast indicates that 33 000 numerical and material recording clerk roles may be cut from the transportation and storage sector by 2035. In this context, the potential development of labour market imbalances in this broad occupation is unclear. Numerical and material recording clerks face diverging tensions across EURES countries, with transport clerks in shortage in 12 countries and in surplus in six, while stock clerks show the opposite trend, being in surplus in 13 countries and in shortage in seven.

Table 16: Potential trajectories of some of the most common shortage occupations in the transportation and storage sector (broad ISCO categories), EU-27, 2023

	Science and engineering associate professionals	Drivers and mobile plant operators	Numerical and material recording clerks
Overall current employment in the transportation and storage sector	322 267	4 666 003	1 094 994
Job creation expected by 2035	+ 84 900	+ 12 600	– 33 000
Subsector with largest share	Water transport (44 % of workforce)	Land transport (69 % of workforce)	Warehousing, storage and support activities for transportation (23 % of workforce)
Share of workers aged 50 years and over	33.3 %	37.7 %	31.5 %
Cedefop Labour and Skills Shortage Index score	2.67	3.00	1.33

Sources: EU-LFS special data extractions; Cedefop (n.d.-a, n.d.-c).

Box 12: The transition to CCAM

The combination of AI, machine learning and automation will result in a number of changes and developments in the transportation and storage sector, among which is the use of self-driving or autonomous vehicles in the near future (Soori et al., 2023). The deployment of new mobility solutions enabled by CCAM has the potential to revolutionise the entire transportation and storage sector, and in particular its employment structure (Karolemeas et al., 2024). Driving functions will eventually become shared between mobility operators and automated systems.

As a consequence, CCAM-based mobility solutions are expected to reduce shortages of drivers and contribute to the better inclusion of groups of workers not usually associated with the sector, notably women. It is also expected that automation and digitalisation will increase the demand for more highly qualified workers (Eurofound, n.d.-a). The emergence of CCAM will, therefore, significantly alter the employment structure of the sector and has the potential to affect jobs in the medium and long terms, as these transformations will entail new requirements for workforce skills and knowledge and a growing demand for new competencies (Beede et al., 2017; European Commission: Directorate-General for Mobility and Transport, 2018).

The transportation and storage sector is expected to experience deep changes through the continuous education, training and qualification of professionals in the sector. For instance, conventional drivers will need to be reskilled and relocated to other professions where possible, shifting from manoeuvring vehicles to supervising the automated systems and monitoring the environment (Ecorys et al., 2020).

5.4. Chapter summary

The transportation and storage sector employs over 11 million people, accounting for 5.2 % of the EU workforce. It has demonstrated resilience and growth post-pandemic, despite encountering significant challenges. Notably, the sector experiences a high rate of job vacancies and labour shortages in skilled occupations. These imbalances are driven by perceived unattractive working conditions and concerns around job strain and safety, which deter potential workers, particularly women and younger individuals. However, this situation varies between subsectors. For example, the share of younger workers has remained stable over the past decade in the water transport subsector, while it has declined substantially in the land transport subsector.

Structural factors are driving the labour shortages in the transportation and storage sector. Among them, demographic shifts and occupational safety affect the age and gender balance in the sector's occupations. Changes in the business models are also leading to poorer working conditions and unstable contractual arrangements. Finally, increasing digitalisation will further affect job security and deepen skills gaps.

Looking ahead, the transportation and storage sector is undergoing significant transformations due to digitalisation, automation and the green transition, presenting both opportunities and challenges. The sector faces a growing need for reskilling, as many workers must adapt to new digital tools and technologies. However, training participation remains low compared with other industries, and a shortage of skilled workers is expected, especially in technical and engineering roles. In addition, the workforce is ageing, with a substantial proportion of workers aged over 50 years in the sector, further exacerbating recruitment challenges. Digitalisation could improve job appeal by offering better work–life balance and enhancing safety, which may attract more women and younger workers. Despite these potential benefits, the sector faces difficulty in filling emerging roles, particularly highly skilled technical positions, as the demand for advanced skills rises while lower-skilled roles are at risk of automation. Addressing these imbalances through targeted training and reskilling programmes will be essential to meet future workforce needs and ensure the sector's competitiveness in the evolving labour market.

6. Summary of findings and policy pointers

6.1. Summary of main findings

6.1.1. Labour shortages and surpluses in the European labour market

The NCOs' data reveal labour shortages in at least one country in 98 % of all four-digit ISCO 2008 occupations in 2024. The concentration of shortages in southern and eastern European countries, such as Bulgaria, Italy, Malta and Slovakia, points to regional disparities in labour market dynamics. The most affected occupation groups – professionals, craft and related trades workers, and technicians and associate professionals – indicate that both highly skilled and technical roles are in critical demand, reflecting broader economic and demographic pressures.

The COVID-19 pandemic has been associated with an impact on three critical sectors – healthcare, construction and hospitality – exacerbating existing structural shortages and creating new labour market challenges. In the healthcare sector, shortages of nursing professionals, specialist medical practitioners and healthcare assistants have worsened across the EU. Nursing professionals moved up from the fifth most widespread shortage occupation in 2023 to the second in 2024. The OECD (2022, 2024a) highlights that the pandemic intensified worker shortages, as burnout and deteriorating working conditions prompted many professionals to leave the healthcare sector. The resulting staff deficits have created a vicious cycle, where fewer workers lead to increased workloads and further resignations. This persistent trend suggests that shortages in healthcare are structural rather than transient, compounded by the ageing population and the long training requirements for medical professions.

Labour shortages in the construction sector have also intensified since the COVID-19 pandemic, with shortages now three times higher than they were a decade ago (European Commission, 2023a). The demand for skilled trades such as welders and flame cutters (23 countries report shortages, 32 % of which are high severity), plumbers and pipe fitters (21 countries report shortages, 29 % of which are high severity) and building and related electricians (22 countries report shortages, 27 % of which are high severity) has surged due to major infrastructure investments and green transition policies.

The hospitality sector continues to struggle with shortages of cooks (22 countries report shortages, 18 % of which are high severity), chefs (17 countries report shortages, 18 % of which are high severity) and waiters (18 countries report shortages, 39 % of which are high severity), as the post-pandemic recovery led to a rapid rebound in demand that outpaced the labour supply (OECD, 2022, 2024a). Many workers left the sector during the pandemic, and the industry has struggled to reattract them.

Like shortage occupations, the distribution of surplus occupations was highly concentrated in a few countries. Spain, Latvia, Austria, Portugal and Finland accounted for 52 % of all reported surpluses. Occupations in the broad groups of clerical support workers, elementary occupations and design-related professions were often identified as in surplus. These occupations tend to have low skill barriers to entry.

Automation and digitalisation contribute to this trend, as routine tasks are becoming more easily replaced by automated systems. In addition, technological advancements enable the automation of creative processes, leading to surpluses in design-related occupations, such as graphic and multimedia designers and product and garment designers.

Intra-EU labour mobility can help address labour shortages by enabling workers to relocate or commute to where they are most needed. Of the 429 occupations in shortage in at least one country, 99 % (425) are in surplus in at least one country. However, challenges such as the recognition of qualifications, the lack of awareness/information and language barriers continue to hinder mobility.

6.1.2. Characteristics of workers employed in imbalanced occupations

The proportion of workers with a tertiary education level (ISCED 5 and above) was 29 % in shortage occupations, compared with 20 % in surplus occupations. In contrast, the share of workers with a medium level of education (ISCED 3–4) was 52 % for shortage occupations and 58 % for surplus occupations. The proportion of workers with a low level of education (ISCED 0–2) was 19 % in shortage occupations and 22 % in surplus occupations. The higher share of the highly educated in shortage occupations is mainly driven by shortages in the healthcare sector.

In line with past trends, there is a persistent and significant under-representation of women workers in shortage occupations, and a persistent and significant over-representation of women workers in surplus occupations. Women represented only 29 % of those in widespread shortage occupations, while their representation in surplus occupations was 62 % in 2023. The over-representation of women in surplus occupations makes them more vulnerable to unemployment compared with men.

The analysis reveals a low proportion of workers under the age of 30 years in most shortage occupations, particularly healthcare. The lengthy education and training required for doctors, specialist doctors and professional nurses undoubtedly influence the age profile of qualified individuals in health-related occupations. Consistent with past trends, the low share of craft workers aged under 30 years across shortage and surplus occupations indicates a declining preference for apprenticeships and vocational education pathways in Europe (Markowitsch and Hefler, 2019; Cavaglia et al., 2022). This under-representation of young workers in shortage occupations is concerning, suggesting that shortages will persist unless measures such as upskilling, reskilling, improving working conditions, running information/awareness campaigns and improving the reputation of education and work in these sectors are implemented to boost the supply of workers in these roles.

The analysis of the demographic characteristics of workers in widespread shortage occupations reveals a combination of vulnerabilities that exacerbate labour market imbalances. Occupations with widespread shortages, such as heavy truck and lorry drivers, specialist medical practitioners and nursing professionals, have ageing workforces and unattractive working conditions. For instance, 43 % of heavy truck and lorry drivers and specialist medical practitioners are aged 50 years or older, and their future retirements will further strain these sectors. The high proportion of women in nursing professions (87 %) contrasts sharply with their under-representation in other shortage occupations, highlighting gender imbalances that persist across the labour market. Occupations in the transport sector are also associated with another vulnerability in that they have a high share of workers with low educational attainment and low digital skills.

Table 17: Vulnerabilities identified among workers in widespread and high-severity shortage occupations

Occupation	Number of countries reporting a shortage	Percentage of women in workforce	Most common education level in workforce	Percentages of workforce aged 50 years and older and aged under 30 years	Number of current job vacancies (three-digit ISCO 2008 groups)	Severity of shortage (two-digit ISCO 2008 groups) (1)	Percentage of migrant and mobile workers
Heavy truck and lorry drivers	21	1 %	Medium (ISCED 3–4)	43 % and 9 %	153 354	Severe shortage	10 %
Specialist medical practitioners	21	47 %	High (ISCED 5–8)	43 % and 8 %	65 716	Moderate to severe shortage	15 %
Nursing professionals	22	87 %	High (ISCED 5–8)	35 % and 15 %	57 777	Moderate to severe shortage	< 10 %
Welders and flame cutters	23	2 %	Medium (ISCED 3–4)	31 % and 16 %	114 184	Moderate to severe shortage	21 %
Plumbers and pipe fitters	21	1 %	Medium (ISCED 3–4)	34 % and 19 %	114 565	Severe shortage	12 %

(1) Qualitatively assessed based on Cedefop's Labour and Skills Shortage Index, where each occupation's shortage is ranked from 1 to 4, with 1 indicating no shortage and 4 indicating a severe shortage.

Sources: Data submitted by EURES NCOs; EU-LFS special data extractions; EURES job vacancy insights; Cedefop (2025a, 2025c).

Conversely, many shortage occupations have a high proportion of older workers who are likely to retire soon, which will probably exacerbate labour shortages in the future. In addition, these widespread and high-severity shortage occupations are shown to have high levels of EURES vacancies and moderate shortages predicted in their corresponding two-digit ISCO 2008 occupation groups.

Similarly, the analysis of the demographic characteristics of workers in widespread surplus occupations reveals vulnerabilities that could contribute to labour market imbalances. Occupations with widespread surpluses, such as cleaners and helpers in offices, hotels and other establishments, graphic and multimedia designers, and secretaries (general), are particularly affected by an ageing workforce and unattractive working conditions. A common vulnerability across many of these surplus occupations is the presence of a high proportion of women, which contrasts with their lower representation in other sectors. For example, occupations such as graphic and multimedia designers have high shares of young, highly educated women who are seeking work in a surplus occupation.

Interestingly, the surplus occupation of cleaners and helpers in offices, hotels and other establishments had 271 249 EURES vacancies in 2024 (2.5 % of total vacancies). This occupation (while currently categorised as in widespread surplus) will face moderate shortages by 2035, which reflects a high demand for expansion, a high need for replacements and a moderate supply–demand imbalance. In addition, this occupation can be identified as facing four different vulnerabilities, with high shares of low-educated workers, older workers, mobile/migrant workers and women workers who have sought work in unskilled occupations.

Table 18: Vulnerabilities identified among workers in widespread and high-severity surplus occupations

Occupation	Number of countries reporting a surplus	Percentage of women in the workforce	Most common education level in the workforce	Percentages of the workforce aged 50 years and older and aged under 30 years	Number of current job vacancies (three-digit ISCO 2008 groups)	Prospects of future shortage (two-digit ISCO 2008 groups) (1)	Percentage of migrant and mobile workers
Graphic and multimedia designers	19	47 %	High (ISCED 5–8)	16 % and 25 %	33 633	Uncertain	15 %
Cleaners and helpers in offices, hotels and other establishments	16	84 %	Low (ISCED 0–2)	51 % and 9 %	202 232	Moderate shortage	35 %
Freight handlers	15	20 %	Medium (ISCED 3–4)	27 % and 25 %	65 716	Moderate shortage	32 %
Secretaries (general)	15	89 %	Medium (ISCED 3–4)	40 % and 18 %	54 131	No shortage	< 10 %
General office clerks	15	73 %	Medium (ISCED 3–4)	40 % and 13 %	89 475	No shortage	< 10 %

(1) Qualitatively assessed based on Cedefop's Labour and Skills Shortage Index, where each occupation's shortage is ranked from 1 to 4, with 1 indicating no shortage and 4 indicating a severe shortage.

Sources: Data submitted by EURES NCOs; EU-LFS special data extractions; EURES job vacancy insights; Cedefop (2025a, 2025c).

6.1.3. Labour market imbalances in the transportation and storage sector

Employing over 11 million people, the transportation and storage sector represents 5.2 % of the EU workforce. Despite resilience and growth after the COVID-19 pandemic, it faces notable challenges, particularly high JVRs and shortages in skilled roles. These issues stem from perceived unattractive working conditions and concerns around job strain and safety that deter potential workers, especially women and younger individuals. However, this varies across subsectors. For instance, the proportion of younger workers has remained stable in the water transport subsector over the past decade, while it has significantly declined in the land transport subsector.

Key changes, such as privatisation, increasing competition and evolving regulatory frameworks – especially in the land transport subsector – are reshaping the sector. In addition, the emergence of platform work and the rise of digital business models are altering traditional employment structures. Shifts in consumer behaviours, such as the growing demand for online shopping, are placing additional pressure on selected subsectors to deliver faster and more efficiently, further contributing to recruitment and retention challenges.

While science and engineering associate professionals in the sector are expected to see a significant increase driven by digitalisation and the green transition, persistent recruitment difficulties among drivers and mobile plant operators could exacerbate existing sector shortages, particularly in land transport. At the same time, numerical and material recording clerks face an uncertain trajectory, with both shortages and surpluses reported across the EU, and a projected employment decline of 33 000 (10 %) by 2035. The need for large-scale reskilling, particularly among seafarers and technical staff, makes clear that workforce reskilling is a pressing concern. Meanwhile, digitalisation and automation are set to reshape job roles, potentially easing shortages in some automatable occupations, such as drivers, while also improving job attractiveness through better work–life balance and safety. However, the sector's currently low level of digitalisation could limit these benefits in the short term, even as increased flexibility and safety improvements may help attract younger and female workers.

Table 19: Overview of transport occupations' current challenges and expected future trends

Occupations	Challenges	Future trends
Science and engineering associate professionals	33.3 % of the workforce is aged 50 years and over 2025 Cedefop Labour and Skills Shortage Index score: 2.67 (1)	High demand due to digitalisation and the green transition 84 900 new jobs by 2035 (+ 26.3 %) Recruitment challenges in water and air transport (where this occupation makes up 44 % and 30 % of the workforce, respectively)
Drivers and mobile plant operators	37.7 % of the workforce is aged 50 years and over 2025 Cedefop Labour and Skills Shortage Index score: 3.00 Widespread shortage	12 600 new jobs by 2035 High recruitment difficulty, particularly in land transport (where this occupation makes up 69 % of the workforce) Risk of worsening shortages
Numerical and material recording clerks	31.5 % of the workforce is aged 50 years and over 2025 Cedefop Labour and Skills Shortage Index score: 1.33 Facing both shortages and surpluses across the EU	33 000 expected job losses by 2035 Uncertain labour balance, with divergences among EURES countries Critical for warehousing, storage and support activities (making up 23 % of the workforce)
Heavy truck and lorry drivers and bus and tram drivers	High pre-existing shortage intensity Ageing workforce concern	Recruitment challenges expected to worsen Critical for land transport (drivers account for 69 % of the workforce)
Seafarers	250 000 EU workers need reskilling in the coming years	Reskilling needed due to digital and automation advancements High impact in water transport (making up 44 % of the workforce)
General transport sector workforce	Low share of highly digitalised establishments (2) 1 % share of women	Digitalisation could improve work–life balance, safety and flexibility Potential for the increased workforce participation of women

(1) In this index, each occupation's shortage is ranked from 1 to 4, with 1 indicating no shortage and 4 indicating a severe shortage. The index is an invaluable resource for targeted workforce planning and policy development.

(2) European Labour Authority (2024c).

NB: This assessment was based on matching different metrics from across Chapter 5.

Sources: Data submitted by EURES NCOs; EU-LFS special data extractions; EURES job vacancy insights; and Cedefop (2025a, 2025c).

The widespread use of outsourcing, subcontracting and temporary agency work has significantly affected job stability, working conditions and workforce retention across various transportation and storage sectors. As companies reallocate essential tasks to external contractors, particularly in maintenance and support roles, the workforce becomes more fragmented. This creates a secondary labour market with poor conditions, contributing to overall dissatisfaction and making it harder to retain workers. In addition, these practices are linked to increased workload pressures, long working hours and reduced job security, all of which further exacerbate labour shortages in the industry.

Looking ahead, the sector is undergoing major transformations driven by technological advancements and the EU's decarbonisation goals. These changes may also lead to job polarisation, where simple, low-paid jobs coexist with highly specialised roles requiring new skills. ICT and data proficiency, along with soft skills like communication, problem-solving and creativity, are anticipated to become increasingly crucial in future transport-related occupations.

In parallel, there is a growing emphasis on the sector's green transition as part of the EU's decarbonisation goals. This shift towards sustainability will require workers to gain expertise in sustainable energy solutions, alternative fuels and green technologies such as electrification and hydrogen-powered transport. As industries move towards more eco-friendly practices, reskilling and upskilling initiatives focused on environmental knowledge, energy efficiency and emissions reduction will be crucial.

6.2. Policy pointers

6.2.1. Increased participation in education and improved training

This report identifies the need to foster STEM talent to meet the growing demand for skilled professionals in engineering and software development. Occupations in engineering and software development face severe shortages, highlighting a gap in the development of STEM talent, particularly among women and young people (Haesen and Van de Put, 2018; Bacovic et al., 2022).

Key challenges identified include:

- the decline in the share of STEM graduates in relation to total tertiary graduates despite increasing educational investments;
- a significant gender gap, with women under-represented in shortage occupations such as scientists and engineers, representing only 41 % of these roles in 2022, a modest increase of just 2 percentage points over the past decade.

Key policy advocacy initiatives include the following.

- Promote STEM skills and literacy by disseminating findings on labour shortages and the growing need for STEM skills to educational institutions, social partners and students.
- Address the gender gap in shortage occupations, particularly in STEM fields, where women remain under-represented despite their increasing participation in science and technology sectors. An interesting policy example is the proposed German federal equality strategy ([25]), which includes 27 measures to attract women to critical sectors, with a focus on balancing paid work and unpaid care work. Mainstreaming such policies across Member States would enable more women to access affordable childcare, facilitating higher participation in the workforce, particularly in STEM and digital professions.
- Implement gender-sensitive curricula in educational institutions, aimed at encouraging more women to pursue STEM subjects; this would involve fostering more inclusive learning environments and providing additional support to help women enter and succeed in STEM schools and careers. In addition, measures should be taken to increase men's participation in sectors with traditionally more women in the workforce, including through the national-level implementation of initiatives like the European care strategy ([26]) to attract more men to the healthcare sector and ensure better distribution of care duties within households.

Attracting young people and women to STEM careers requires not only targeted education policies but also improvements in working conditions, career progression opportunities and the overall attractiveness of STEM professions. Targeted information campaigns can play a key role in reshaping perceptions by highlighting the dynamic and innovative nature of STEM careers, showcasing diverse role models and emphasising long-term job prospects. Collaborations with industry and social partners to promote STEM through scholarships, competitions and outreach initiatives in schools and universities can further encourage participation. In addition, a multi-policy approach should integrate measures to support career transitions and lifelong learning, ensuring that professionals can continuously upskill and reskill to meet evolving labour market demands.

To address the imbalances stemming from mismatches between labour market needs and the skills supply, labour market policies should also focus on expanding vocational training and apprenticeships, aligning curricula with industry needs and providing targeted reskilling and upskilling opportunities. Strengthening hands-on experience and incentivising apprenticeships can develop practical skills that are directly applicable to the workplace. Collaboration with industry leaders and training centres can ensure that curricula remain relevant and reflect industry advancements. Integrating digital skills training at all levels of education and vocational training is also essential as technological advancements reshape labour market demands.

To address these imbalances, key policy advocacy initiatives include:

- expanding vocational training to better align educational curricula with industry needs;
- providing targeted reskilling and upskilling opportunities to the unemployed;
- strengthening hands-on experience through practical apprenticeships that develop skills directly applicable to the workplace;
- collaborating with industry leaders and training centres to ensure curricula remain relevant and reflect industry advancements.

25. https://eige.europa.eu/gender-mainstreaming/countries/germany?language_content_entity=en.
26. https://www.eesc.europa.eu/en/our-work/opinions-information-reports/opinions/european-care-strategy.

Another policy recommendation is to expand digital education in schools, apprenticeships and vocational training programmes tailored to widespread shortage occupations such as technicians, engineers and systems administrators to better prepare young workers for these roles. Aligning EU initiatives like the youth guarantee ([27]) with widespread shortage occupations could be a key step in attracting young people to and training them for these fields. Specifically, improving digital skills for young people in education, and upskilling those not in education, employment or training, can help them obtain relevant qualifications for software-related and other shortage occupations.

From a policy perspective, improving working conditions in physically demanding sectors with widespread shortage occupations such as transportation and storage would involve supporting the integration of automation, robotics and AI. While full automation in passenger transport remains a long-term prospect, the increasing use of automated processes – such as predictive maintenance – can improve efficiency and reduce workforce gaps in roles like motor vehicle mechanics and repairers, mail carriers and sorting clerks. However, the growing reliance on automation will heighten the demand for digital competencies among transportation and storage sector workers. To address this shift, targeted upskilling and reskilling initiatives should be implemented to equip workers with the technical and digital skills required for emerging roles driven by the green and digital transitions.

Expanding the reach of career pathways programmes is essential for fostering flexible career transitions and addressing labour market imbalances. Effective implementation will require both the institutional capacity to support workers and students in making these transitions and a sufficient demand for retraining opportunities (Herdman et al., 2024). Improving access to reskilling programmes can facilitate the movement of workers from surplus occupations, such as house builders, to high-demand roles, such as building electricians and construction labourers. To support this process, EURES can collaborate with national PES to develop and disseminate clear career pathway information, helping workers navigate transitions and improving labour market alignment among Member States.

Good efforts demonstrated by Member States in relation to the above include the following.

- Spain's *programa de formación profesional para el empleo* ([28]) (vocational training for employment programme) offers reskilling and upskilling opportunities for workers, including those from surplus occupations. It aims to enhance employability and facilitate transitions into sectors such as construction and digital technologies.
- Poland's Krajowy Fundusz Szkoleniowy (National Training Fund) supports reskilling and upskilling initiatives, helping workers transition from surplus occupations to high-demand occupations. It collaborates with EURES and national PES to provide training opportunities and clear career pathway information.
- In Italy, the digital green innovative tourism initiative, coordinated by X23, focuses on integrating digital, green and innovative skills into tourism curricula. It has developed a competency framework, training materials and an online course available in multiple languages to promote sustainable tourism practices. Similarly, in Malta, the Institute of Tourism Studies offers a diploma in climate-friendly travel.
- The Lab Hotel at Hotelfachschule Thun, Switzerland, provides hands-on hospitality training in a real-life hotel setting. Students gain practical experience and experiment with new technologies, such as robots and high-tech systems for monitoring air quality, to address the shortfall in digitally trained hospitality professionals.

In addition, it is important to circulate the findings from this report to relevant stakeholders to encourage them to bridge the gap in the digital literacy demand and supply in Europe by reskilling and upskilling to improve the existing workforce's digital skills. It is also vital for employers to provide on-the-job digital training to the existing workforce to cater to these changing skills requirements.

6.2.2. Strengthening labour mobility

The report suggests that improved labour mobility and transnational matching could address some of the labour market imbalances in the EURES countries, that is, the labour surpluses in some countries can alleviate the labour shortages in others. To facilitate this, labour mobility can be supported through the use of technology as an instrument for enhanced matchmaking:

- collecting data faster through AI tools and machine learning techniques;
- disseminating job opportunities through user-friendly and accessible dashboards;
- providing information and support for potential mobile workers, such as information on working conditions in other regions, the accessibility of housing and the calculation of post-tax wages;

27. https://employment-social-affairs.ec.europa.eu/policies-and-activities/european-employment-strategy/youth-employment-support/reinforced-youth-guarantee_en.
28. https://planderecuperacion.gob.es/politicas-y-componentes/componente-20-plan-estrategico-de-impulso-de-la-formacion-profesional.

- collecting, compiling and publishing real-time data that describe the characteristics of the shortage occupations, notably including any potential concerns;
- disaggregating labour demand and supply data by the geographical location of the workplace, the skills requirements and the educational attainment necessary.

Another key policy recommendation in EURES's mandate is to strengthen labour mobility to address regional imbalances in the labour supply and demand. However, there is evidence that the guarantees for EU citizens provided by the Treaty on the Functioning of the European Union are sparsely implemented, particularly in terms of the recognition of qualifications (European Court of Auditors, 2024). Key policy solutions would be to enhance the focus on skills and skills-based matching rather than on certificates, and to advocate for EU-wide policies for the recognition of qualifications and language differences to encourage transnational mobility and employment. This would be particularly useful in certain regulated professions in healthcare that are facing shortages.

To facilitate this, electronic procedures and the standardisation of fees charged for the recognition of professional qualifications by Member States can be considered. A notable example of an information-sharing initiative is Cedefop's work to enhance the readability and comparability of qualifications between countries, including the European Qualifications Framework (EQF) ([29]). By January 2024, 36 countries had formally linked their national qualifications frameworks to the standardised EQF. Disseminating information about such standardisation to both employers and jobseekers can help remove barriers to labour mobility. Building on the EQF, Cedefop's project to compare vocational education and training (VET) qualifications facilitates cross-country comparisons of VET programmes and qualifications ([30]). This enables a clearer understanding of how these align or differ, and the extent to which similarities can be standardised.

Another recommendation is to offer customised support to jobseekers in surplus occupations on how to find/identify job opportunities in other regions that match their skills and education level. This could include support (both monetary and informational) in relocating to the destinations with corresponding labour shortages.

Finally, customised skills matching to support interoccupational mobility by identifying the occupations with close skills proximity is recommended. This would enable a faster transition from surplus to shortage occupations through skills acquisition.

6.2.3. Transportation and storage sector initiatives

The report highlights that the transportation and storage sector is experiencing a high rate of labour shortages in skilled occupations, necessitating a strong emphasis on upskilling and reskilling. Industries are investing in training programmes that equip workers with the essential skills needed to adapt to changing demands, including digital transformation, automation and emerging technologies. Such education programmes should be implemented widely for occupations experiencing shortages. The following examples demonstrate these efforts.

- The Irish Road Haulage Association's traineeship programme ([31]) offers a six-month training programme fully funded by the An tSeirbhís Oideachais Leanúnaigh agus Scileanna (Further Education and Skills Service) traineeship scheme, providing participants with heavy goods vehicle licences and practical experience through company placements (International Road Transport Union, 2024).
- France's Groupement d'Employeurs pour l'Insertion et la Qualification (Employers' Group for Integration and Qualification) transport logistics initiative ([32]) promotes integration for workers outside the labour market through structured training that results in direct employment as a driver (International Road Transport Union, 2024).
- Spain's Asociación del Transporte Internacional por Carretera (International Road Transport Association) education cycle ([33]) combines classroom learning with practical industry experience in transport and logistics to encourage young people to join the sector (International Road Transport Union, 2023b).
- PostEurop, a collective body representing postal operators, emphasises the importance of lifelong learning. By fostering continuous education and training, PostEurop aims to bridge the gap between current skill levels and evolving job requirements, ensuring employees remain competitive and adaptable in dynamic labour markets (Copenhagen Economics and European Commission: Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs, 2022).

29. https://www.cedefop.europa.eu/en/projects/european-qualifications-framework-eqf#group-details.
30. https://www.cedefop.europa.eu/en/projects/comparing-vet-qualifications.
31. https://www.irha.ie/professional-hgv-training-programme/.
32. https://geiq-transports-rhone-alpes.fr/geiq/.
33. https://astic.com.es/astic-impulsa-la-fp-dual-para-atraer-a-profesionales-de-transporte-y-logistica-imprescindibles-para-nuestra-economia-2/?utm_source=-chatgpt.com.

- Cyprus introduced the bus driver apprenticeship programme, which supports candidates through the licensing process, covering administrative and training costs while offering in-work training and guaranteed employment after programme completion (Eurofound, 2024a).

Strategic partnerships between employers in the transport sector and national authorities, educational institutions and industry organisations are important to develop solutions for labour shortages. Furthermore, stakeholders call for collaborative efforts to harmonise qualifications across the EU for increased labour mobility. Relatedly, the International Road Transport Union suggests that facilitating access for non-EU drivers can help address shortages (2025). The Steer2EU fact-finding study is setting the basis on which EU decision-makers can work towards better non-EU driver integration policies.

As each country has a unique context leading to certain imbalances, there should be national and regional efforts between stakeholders to understand the structural factors that should be addressed. A notable initiative in this regard was conducted in Romania by the European Inland Waterway Transport Platform, an extension of the European Barge Union and the European Skippers' Organisation that advocates for inland navigation in European and national transport policies. The initiative was a fact-finding mission for collecting information regarding labour shortages and the state of training material available in the inland waterway transport sector in Romania (Sahitava, 2023). The objective of the mission was to prepare for building collaborative strategies to strengthen the workforce and enhance career opportunities in the EU.

An important driver of labour shortages regards the working conditions and attractiveness of the industry. Companies should therefore invest in creating better work environments, focusing on aspects like health and safety, comfortable facilities and flexible working arrangements. The International Road Transport Union (2023a) survey suggests that steps to increase women's participation in shortage occupations such as truck driving, where they make up only 4 % of workers, could include secure working conditions, safe parking areas (ensured by fleet operators) and access to well-equipped rest zones (to be implemented by EURES countries). In support services for air transport, some companies have attempted the strategy of increasing salaries and providing private bus transport from surrounding areas to the airport to facilitate commutes (European Transport Workers' Federation, 2023). Similarly, a report on good practices in the warehousing sector identifies efficient transport connections to work through, for example, bike paths, shuttle buses or car sharing as a way to attract and retain workers (Prologis, 2019). Some warehousing sector stakeholders have been investing in more and higher-quality amenities such as food, social areas, childcare and opportunities to play sports to increase attractiveness (Prologis, 2019). In the logistics field, United Parcel Service is offering flexible working arrangements and competitive compensation packages (Supply Chain Council of the European Union, 2024). Expanding recruitment campaigns to untapped groups is also a potential measure to attract new entrants to the sector, especially women and highly skilled workers.

In addition, subsectors like warehousing, storage and support activities could benefit from increased automation to ease physically demanding aspects of work such as load lifting and transfer.

Legislative initiatives have also contributed to improving working conditions. For example, a 2020 law in Spain prohibited drivers from engaging in loading and unloading tasks; by reducing physical strain, this reform has made the freight transport occupation more appealing, particularly to women (International Road Transport Union, 2024). In Spain also, efforts to lower the minimum driving age for bus drivers from 22 to 21 years aim to make it easier for young workers to enter the occupation (International Road Transport Union, 2024). At the EU level, new driving licence rules are coming into effect to lower the minimum age for obtaining a truck licence from 21 to 18 years, and for a bus licence from 24 to 21 years (European Parliament, 2025). Some countries may allow youth aged 17 years to drive trucks in national territory under the condition that they are accompanied. Some stakeholders such as the European Transport Workers' Federation believe longer-term solutions should be geared towards improving working conditions. In air transport, legislation exists to uphold employment standards by banning bogus self-employment. The Airline Coordination Platform gives examples of good practices related to self-employment. These include Spain's coordinated exchange of data between the labour inspectorate, the social security treasury, the tax revenue department and transport companies; targeted inspections such as Germany and the United Kingdom's joint inspections; and Slovenia's legal amendments to shift the burden of proof to lie with the employer and to implement higher fines for 'disguised employment relationships' (Airline Coordination Platform et al., 2020).

To increase the participation of young people in the land transport subsector and other shortage occupations, steps need to be taken to reduce the cost of obtaining a licence and professional qualifications. In addition to reduced costs of entry, youth employment in the transportation and storage sector can be increased through the implementation of the EU Driving Licence Directive, which aims to eliminate crucial barriers discouraging entry into the driver profession (European Parliament, 2023).

There should be widespread measures to increase the visibility of women in the transportation and storage sector and to facilitate opportunities for them to participate. These initial measures have the potential to make the sector more attractive to women and thus contribute to reducing shortages. Examples of such measures include the Women in Rail Agreement, which sets out binding gender equity targets for the EU (Broughton et al., 2024).

The enforcement of existing legislation protecting workers' rights can improve the attractiveness of the sector.

In addition, creating new legislation can help improve working conditions to attract new entrants. In the postal and courier activities subsector, legislative initiatives have contributed to improving working conditions. In November 2019, Germany introduced the Parcel Delivery Personnel Protection Act (Paketboten-Schutz-Gesetz), which extends subcontractor liability for the proper payment of social security contributions to the courier, express and parcel industry. This measure, already applied in the meat processing and construction industries, holds the main contractors accountable if their subcontractors fail to pay these contributions. By encouraging parcel service providers to select subcontractors more carefully, the law aims to protect employees and prevent unfair competition based on driving down labour costs. Subcontractors are increasingly seeking prequalification and adhering to proper payment practices. This has helped improve working conditions for parcel delivery personnel, particularly in last-mile delivery, while addressing issues like undeclared work and fraud in the sector (Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology, 2024).

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8. Annexes

Annex 1: Methodology of the study

Data collection questionnaire for National Coordination Offices

The questionnaire (see Annex 2) was distributed to the NCOs of 30 countries and four regions, encompassing the EU-27, Iceland, Liechtenstein, Norway and Switzerland. Belgium's NCOs from the Flemish Region, the Brussels Region and the Walloon Region provided separate regional data ([34]). Each NCO was tasked with supplying information on the (mis)match status of each of the 436 occupations at the four-digit ISCO 2008 level in their respective areas. In addition to the (mis)match status, which indicated whether an occupation was in balance, in shortage, in surplus or in both shortage and surplus, additional contextual information was requested. This information was intended to clarify the nature (labour or skills shortage/surplus) ([35]) and extent of the mismatch, where applicable. The requested data were to be presented using the four-digit ISCO 2008 classification system to ensure consistency with previous reports.

Acknowledging the necessity for methodological improvements, modifications were implemented to increase the accuracy, relevance and user-friendliness of the data collection procedure. Specifically, in 2024, the data collection questionnaire included additional answer options to the question on the (mis)match status of each occupation. Where in the past, valid answers included only 'Shortage' or 'Surplus' (with a separate question requesting clarification on whether the mismatch was regional or national), in 2024, the set of valid answers was expanded to include 'Both shortage and surplus (e.g. regional differences)' and 'In balance'. The latter option, introduced as a component of comprehensive information on (mis)match statuses, was included for all 436 occupations at the four-digit ISCO 2008 level, whereas in the past, NCOs had only provided information on those occupations that had been identified as either in shortage or surplus. It should be noted that these amendments to the data collection method for the 2024 edition resulted in a substantial discrepancy in the number of occupations in shortage or surplus as reported by individual NCOs. Generally, the number of occupations identified as experiencing mismatches is larger than in the past. As per clarifications from NCOs, this was largely attributable to the changes in the data collection methodology, namely requesting information on all occupations, rather than to a real increase in labour market mismatches.

Once received, the data were subjected to thorough quality checks to ensure completeness and consistency. Where needed, NCOs were contacted for clarifications, resulting in adjustments to enhance comparability. As a result, the number of shortage and surplus occupations identified in the national questionnaire responses may sometimes differ from the figures entered into the database for the analyses. The introduction of an additional (mis)match status as a valid answer option in 2024, namely 'Both shortage and surplus (e.g. regional differences)', required special treatment in the data processing. Specifically, occupations with this status were assigned to both occupations in shortage and occupations in surplus. This means that an occupation in one country can be included in both categories simultaneously, although these cases make up only a marginal share of all mismatches identified.

34. The NCO of the German-speaking region in Belgium did not provide data.
35. Due to the limited information received on the nature of mismatches, that is, whether they were mismatches of labour or skills, this element was excluded from the analysis in this report.

Box 13: Notes on data cleaning

Czechia

The list of shortage and surplus occupations received from the NCO in Czechia was altered before the analysis. Specifically, occupations in mismatch for which the absolute number of vacancies or jobseekers was very low were excluded. The rationale behind this decision was that for these occupations, the indicator used to identify the mismatch, namely the ratio of jobseekers to vacancies, was deemed to be not robust enough. This resulted in the list of shortage occupations being reduced from 149 to 120.

Moreover, while the NCO did not explicitly state the magnitude of mismatches (i.e. low, medium, high), the ratio of jobseekers to vacancies was provided, enabling the derivation of an indication of mismatch magnitude based on terciles.

Belgium

The lists of shortages and surpluses obtained from the three autonomous regions in Belgium were merged into a unified national Belgian response. The responses from the Brussels, Flemish and Walloon Regions were consolidated by applying the following rules:

- if an occupation is reported to be in shortage/surplus by any single region, the occupation receives this mismatch status for the country overall;
- if at least one region reports an occupation to be in shortage, while at least one other region reports the same occupation to be in surplus, the occupation receives the mismatch status 'Both shortage and surplus (e.g. regional differences)'.

With regard to other information provided, such as the type of shortage, the indicator, etc., instances where information did not align were addressed. For example, if the same shortage occupation received a high-magnitude ranking from one autonomous region and a low-magnitude ranking from another, the national result was designated as 'No clear convergence'. These particular outcomes, characterised by a lack of consensus, were subsequently excluded from the analysis to maintain the integrity and reliability of the overall findings.

General

A few NCOs provided information on additional occupation groups, beyond the 436 occupations at the four-digit ISCO 2008 level. These entries corresponded to variations in the application of ISCO classification frameworks at the national level. They were removed from the dataset before the analysis. These additional groups are listed below.

Norway:

- 2223 (Nurses);
- 2224 (Social care workers).

Romania:

- 2429 (Administration professionals not elsewhere classified);
- 3414 (Teaching staff in primary education);
- 3415 (Teaching staff in preschool education);
- 3416 (Instructors and assimilated in education);
- 3419 (Teaching staff not elsewhere classified).

Slovenia:

- 2147 (Logistics and transport technology professionals);
- 2357 (Counselling and organisation of educational work professionals);
- 3335 (Logistics and transport technology technicians and associate professionals);
- 7129 (Building finishers and related trades workers not elsewhere classified).

Qualitative information on the transportation and storage sector

The qualitative analysis aimed to gain deeper insights into the root causes of persistent shortages in the transportation and storage sector. The analysis was disaggregated by subsector based on NACE classifications: land transport, air transport, postal and courier activities, warehousing, storage and support activities for transportation, and water transport.

To support this analysis, an extensive literature review was conducted at both the national and international levels, serving as the foundation for the development of discussion guides for the six focus groups (see Annex 3).

The focus groups were held online in November 2024. One session was organised for each subsector, except for land transport, which required two separate discussions: one for road transport and another for railway transport.

The stakeholders invited included representatives of trade unions, key industry operators, PES and employer organisations. Each focus group comprised 7 to 12 participants. In addition, four supplementary interviews were conducted to ensure broader stakeholder input on the study. Participants for the focus groups were identified and recruited through two main channels: the contractor's own networks and European Labour Authority contacts. The contractor engaged with potential participants by outlining the study's objectives and providing a copy of the discussion guide to ensure a clear understanding of the discussion's scope.

Beyond the literature review and the input provided by stakeholders, the analysis relied on the information provided by the EURES NCOs in the open questionnaire (see Annex 4).

These three sources were triangulated to inform the five sectoral analyses, which cover the following topics:

- the influence of sectoral trends on labour market imbalances;
- the implications of recent global crises for the labour market;
- workforce demographics and related issues;
- labour migration and mobility;
- working conditions and their impact on the industry's reputation and the role of social dialogue;
- skills and qualifications gaps;
- recruitment practices to fill labour and skills gaps;
- measures to tackle labour market imbalances.

Data on characteristics of workers in widespread shortage/surplus occupations

The analysis includes an exploration of the characteristics of workers employed in occupations that are characterised by widespread shortages or surpluses, that is, occupations with shortages or surpluses in more than half of all participating countries. This analysis involved the combination of the mismatch data from the NCOs' responses with EU-LFS data. Given that the widespread shortage/surplus occupations presented in this report are classified at the four-digit ISCO 2008 level, a special data request was placed with Eurostat to obtain data at the required level of detail.

The scope of the study's data is limited to the EU due to the unavailability of a suitable aggregate for the EURES countries within the required time frame. Specifically, data for a European Free Trade Association aggregate (which aligns with EURES countries) was requested from Eurostat on 18 November 2024. However, a data quarantine imposed by Eurostat from 28 November 2024 to 13 December 2024 prevented the timely acquisition of this aggregate for the report.

Data for all four-digit ISCO 2008 occupations were requested on age, gender, skills and country of origin at the EU aggregate level. Country-level observations were successfully obtained for all characteristics except age. Although no explanation for the missing country-level data was received, this absence could be attributed to the small size of observation cells when analysing four-digit ISCO 2008 data.

The only significant modification to the characteristic groups was related to age. The age groups requested from Eurostat were 15–29 years, 30–49 years, 50–64 years and 65 years and over. For the analysis, the last two groups were combined into one (50 years and over). No other changes were made to the grouping of characteristics, except for the removal of uncategorised values ('Not stated').

As aggregates may vary slightly between datasets due to data availability for each characteristic, shares for each characteristic were calculated using the total of the corresponding dataset. That is why different age groups are used in different sections of the report: the group aged 20–64 years was used in the Eurostat-based indicator to reflect European targets, while the group aged 15–64 years has been used in the sections using Eurostat special extractions to reflect vulnerabilities.

Analysing drivers of shortages in transport and storage occupations

Based on a review of relevant literature, the following indicators were identified as drivers of unemployment in transportation and storage sector occupations:

- the year-on-year sectoral employment growth;
- the labour costs growth rate (selected as an imperfect proxy for wages);
- the work hours index, measured as the ratio of the average hours worked in the sector to the total hours worked;
- the share of part-time work in the sector, measured as the ratio of workers with part-time contracts to total employment;
- the year-on-year growth of the working-age population;
- the percentage of temporary employment agency workers in the sector;
- the percentage of workers with precarious employment in sectors G–I.

Data were collected from the EU-LFS for the EU-27 using the online Eurostat database and ad hoc extractions on unemployment by occupation at the two-digit ISCO 2008 level. A panel data analysis was conducted to identify the factors driving unemployment in transport occupations, which are associated with high JVRs. Employment growth was used as a proxy for job vacancy statistics to address missing data issues, given the strong correlation between these two indicators.

Annex 2: Standardised questionnaire for data collection

Occupation	Information sought	Possible answers
ISCO 2008 code and title at the four-digit level	Indicate the status applicable to the occupation, namely whether it is in labour shortage, in labour surplus or in balance or whether information is not available. Please assign a status for each occupation.	Shortage
		Surplus
		Both shortage and surplus (e.g. regional differences)
		In balance
		Information not available
	If the occupation is in shortage, please indicate whether it is a labour or skills shortage.	Labour
		Skills
		Information not available
	If the occupation is in shortage, using an objective source or criterion (e.g. average time to fill a vacancy), please indicate whether the labour shortage is high, medium or low. Otherwise, answer 'Information not available'.	High
		Medium
		Low
		Information not available
	If the occupation is in surplus, using an objective source or criterion (e.g. average time to fill a vacancy, labour market study), please indicate whether the labour surplus is high, medium or low. Otherwise, answer 'Information not available'.	High
		Medium
		Low
		Information not available

Annex 3: Discussion guide for focus groups

Name of the session	Discussion points

Trends in labour shortages and surpluses in the air transport subsector	• Development trends in labour shortages and surpluses in the transportation and storage sector:
	  o the medium-term impact of COVID-19 on labour availability and sector stability;
	  o the impact of Russian aggression against Ukraine;
	  o the impact of megatrends like ageing, greening, digitalisation and decarbonisation.
	• The impact of policies and regulations.
	• The impact of migration flows of workers to other countries (both intra-EU movers and non-EU nationals), particularly for addressing shortages in certain professions (e.g. aircraft pilots).
	• Trends in the posting of workers for accessing skilled labour and creating job opportunities, and challenges arising from the highly mobile nature of aircrew roles.
	• Shifts in the economic sector, including changes in consumer behaviour, market demands, the competitive landscape and energy and fuel costs.
	• The impact of increased competitiveness in the sector, including challenges related to skills mismatches, wage pressures and unstable employment conditions.

Challenges in labour recruitment and retention	• Challenges faced in attracting and retaining skilled workers (e.g. skills gaps, job perceptions and industry attractiveness, work–life balance in long-haul jobs). • Recruitment channels and practices, including the role of temporary work agencies and subcontracting in managing fluctuating demand and addressing temporary skills shortages, and the implications of the rise of bogus self-employment (particularly for pilots and cabin crew). • The role of social dialogue (e.g. collective bargaining, negotiations, cross-border agreements) in ensuring fair conditions for the highly mobile air transport workforce.
Qualifications and skills, including the role of technology	• Evolving skillsets for the digital and green transitions. • Solutions for addressing skills gaps, including upskilling and reskilling programmes. • Access to required licences and qualifications, that is, addressing the costs and certification processes for the necessary training of the sector workforce.

Working conditions	• The well-being of the workforce:
	  o extended time away from home;
	  o unpredictable shifts and irregular working hours required by changeable schedules.
	• Health and safety issues.

Labour market policies and support instruments	• Practices aimed at tackling labour market imbalances, including in the field of labour mobility, and targeting specific vulnerable groups (e.g. upskilling and reskilling initiatives, relocation incentives, subsidies, collaboration with educational institutions).

Annex 4: Open questionnaire

European Employment Services Report on Labour Shortages and Surpluses – 2024

Country:

Respondent name and organisation:

Focus on labour mobility

It is difficult to track and assess the role of the movement of workers in the EURES labour market (the EU-27 plus Iceland, Liechtenstein, Norway and Switzerland) and the labour markets outside of EURES countries. The questions below are designed to inform the European Labour Authority with regard to the potential of cross-border mobility to alleviate labour shortages, with a special focus on neighbouring regions.

Q1: Please identify the countries and regions with which your country shares cross-border mobility.

In your answer, please reflect on the following:

- *the type of mobility – inward or outward;*
- *the most relevant sectors;*
- *the most relevant occupations;*
- *the frequency of mobility (daily, weekly or monthly commuting or more permanent relocation);*
- *employer characteristics (e.g. the size of company, experience with engaging in recruitment from abroad / cross-border mobility);*
- *worker demographics (e.g. sex, age, level of education), experience with engaging in recruitment from abroad / cross-border mobility).*

Q2: Which occupations in your PES jobseeker register contain the highest shares of foreign workers (i.e. people who are not nationals of your country)?

Identify as many occupations as needed, and if possible, give an indication of the countries of origin of these workers, differentiating between workers from the EU / EURES countries and non-EU nationals.

Focus on the transportation and storage sector

In the previous editions of this report, the ISCO group of plant and machine operators and assemblers was often identified as a shortage occupation, and within that, heavy truck and lorry drivers and bus and tram drivers in particular. To assist us in understanding why there are shortages of transport workers in Europe, we ask you to provide us with some contextual information that will be used in the section focusing on the transportation and storage sector in the Report on Labour Shortages and Surpluses – 2024.

The questions below focus on the transportation and storage sector in general, but we acknowledge that the occurrence of and reasons for shortages/surpluses may differ across its subsectors. In your replies, if relevant, you may wish to specify which subsector(s) or occupation(s) your answer relates to. Please use the NACE classification of economic activity to narrow down your answer (within H – Transportation and storage are categories 49 – Land transport and transport via pipelines, 50 – Water transport, 51 – Air transport, 52 – Warehousing, storage and support activities for transportation and 53 – Postal and courier activities).

Q3: What do you think are the main reasons for shortages/surpluses in the transportation and storage sector in your country?

According to the European Labour Authority's preliminary consultations with trade unions and employer organisations, among the main reasons could be irregular working times, long periods away from home, the unattractive image of the job/sector, health and safety issues (e.g. the lack of secure parking, the lack of adequate facilities like restaurants and toilets), the licences and qualifications required (and the related costs thereof for the workers), low wages, employment instability, the difficulty of attracting young employees (e.g. drivers), the lack of awareness/information about job opportunities, the low share of women in the sector, the emigration of workers to other countries and workers changing occupation/sector during COVID-19.

If possible, please try to link the reasons in your answer to specific occupations and subsectors in transportation and storage. Please focus on the occupations and subsectors with the most significant shortages/surpluses in your country.

Q4: Are there any relevant national studies, official estimates or other sources that might help explain the shortages/surpluses in transportation and storage in your country?

Q5: Are there any policy interventions that aim to tackle labour shortages and surpluses in the transportation and storage sector?

In the European Labour Authority's preliminary consultations with stakeholders, awareness-raising campaigns, programmes for staff retention, collective bargaining agreements, the mobility package and automation have been mentioned.

Annex 5: Transnational matching possibilities to alleviate labour market imbalances in the European Employment Services countries

Table 20: Transnational matching possibilities, 2024

OCCUPATION	COUNTRIES REPORTING A SHORTAGE	COUNTRIES REPORTING A SURPLUS
Accountants	AT, BE, CH, DE, DK, MT, NL, NO, PT, RO, SE, SI	BG, CY, CZ, ES, LV, SK
Accounting and bookkeeping clerks	BG, DE, DK, FI, FR, IT, MT, NO, PL	BE, CZ, EE, ES, LT, LV, PT, RO, SE, SI, SK
Accounting associate professionals	AT, BE, BG, DK, FR, LU, MT, NL, NO, PL	CY, EE, EL, ES, LV, PT, RO, SK
Actors	ES, IT, MT	AT, CZ, DK, EL, FI, LV, RO
Administrative and executive secretaries	IT, MT, NL, RO	AT, BG, DK, EE, FI, LT, LV, PT, SI, SK
Advertising and marketing professionals	MT, RO, SE	AT, BG, CY, CZ, ES, FI, LT, LV, PT, SI, SK
Advertising and public relations managers	EL, IT, SK	AT, BE, BG, CZ, DK, EE, ES, LV, MT
Aged care services managers	BG, DE, FI, MT	AT, DK, ES
Agricultural and forestry production managers	DK, EL, MT, PT	AT, BG, ES, LV
Agricultural and industrial machinery mechanics and repairers	AT, BE, BG, CZ, DE, DK, EE, FR, IT, LT, LU, MT, NL, NO, PT, SI	ES, FI, LV, RO, SK
Agricultural technicians	CH, DE, FR, MT, SK	AT, CZ, DK, ES, HU, LV, RO, SE
Air conditioning and refrigeration mechanics	AT, BG, CY, DE, DK, HR, HU, IT, LU, MT, NL, PL, RO, SI	ES, FI, LV
Air traffic controllers	BE, ES, LV, MT, SK	AT, DK, RO
Air traffic safety electronics technicians	DE, EL, ES, FI, RO	AT, DK, HU, LV, MT
Aircraft engine mechanics and repairers	AT, BE, DE, HU, LT, LU, LV, MT, RO, SK	CZ, DK, FI
Aircraft pilots and related associate professionals	DE, DK, LV, MT	AT, CZ, ES, RO
Ambulance workers	BE, BG, DE, DK, FR, NL, RO, SK	AT, ES, MT
Animal producers not elsewhere classified	EL, MT	AT, DK, ES, LV
Announcers on radio, television and other media	FI	EL, ES, MT
Apiarists and sericulturists	CZ, FI	AT, ES, HU, LV, RO
Applications programmers	AT, BE, BG, CH, CY, DE, FR, HR, IT, NL, RO, SI, SK	CZ, EL, ES, FI, LV, PT
Aquaculture and fisheries production managers	DK, EL, MT	BG, ES
Aquaculture workers	BG, FR	AT, ES, FI, HU, MT, NO, RO
Archivists and curators	DK, MT, SE	AT, BG, ES, FI, RO

OCCUPATION	COUNTRIES REPORTING A SHORTAGE	COUNTRIES REPORTING A SURPLUS
Armed forces occupations, other ranks	DK, LV, PL, SI	AT, CZ, ES
Assemblers not elsewhere classified	CZ, DK, LT, NL, NO, RO, SE	AT, ES, FI, LV, MT
Astrologers, fortune-tellers and related workers	HU	EL, ES
Athletes and sports players	DK, IT, MT	AT, CZ, ES, FI, LV, RO
Audiologists and speech therapists	AT, BE, BG, CH, DE, EE, EL, FI, IT, LV, MT, NL, PT, SI	CZ, ES, RO
Bakers, pastry cooks and confectionery makers	BG, CY, CZ, DE, DK, FR, HR, IT, LT, LU, MT, NL, NO, RO, SI	ES, FI, LV, PT, SE
Bank tellers and related clerks	DK, EL, IT, LU, MT, RO	AT, CY, CZ, ES, LV, PT, SE
Bartenders	BG, CY, DE, EL, FI, IT, MT, NL, NO, RO, SK	AT, CZ, ES, LV
Beauticians and related workers	CZ, DK, IT, MT	AT, DE, EL, ES, FI, LU, PT, RO, SI
Bicycle and related repairers	DE, DK, NL	AT, ES, FI, HU
Biologists, botanists, zoologists and related professionals	IE, MT, SI	AT, CZ, DE, EL, ES, FI, LV, PT, RO
Blacksmiths, hammersmiths and forging press workers	BG, CZ, DK, IT, LV, SK	AT, ES, FI, MT, RO
Bleaching, dyeing and fabric-cleaning machine operators	AT, BE, CZ, FI, LT, MT, RO, SK	BG, ES, LV
Bookmakers, croupiers and related gaming workers	CZ, DK, IT, MT, RO, SK	AT, DE, ES, FI, LV
Bricklayers and related workers	BE, BG, CZ, DE, FR, HR, LT, MT, PL, RO, SE, SI	AT, EL, ES, FI, PT
Broadcasting and audiovisual technicians	DE, DK, MT, RO, SK	AT, CZ, ES, FI, LV, PT, SI
Building and related electricians	AT, BE, BG, CY, CZ, DE, DK, EE, FR, HR, HU, IT, LT, LV, MT, NL, NO, PL, RO, SE, SI, SK	ES, FI, PT
Building architects	IT, MT, SK	AT, BG, CZ, DK, EL, ES, FI, LV, NO, PT, SI
Building caretakers	RO	AT, CZ, DK, EL, ES, FI, FR, MT, NO, PT, SE
Building construction labourers	BG, CY, CZ, DE, DK, FI, HR, HU, IT, LU, LV, MT, PL, SI	AT, EE, EL, ES, LT, PT, RO
Building frame and related trades workers not elsewhere classified	BE, BG, CZ, DE, DK, FI, FR, HU, LT, MT, NL, NO, PL, RO	EL, ES, SK
Building structure cleaners	BE, CZ, DK, HU, LT, LU, MT, PL	AT, BG, ES, FI, LV
Bus and tram drivers	BE, BG, CZ, DE, EE, FR, IE, IT, LT, MT, NL, NO, PL, PT, RO, SE, SI, SK	AT, EL, ES, FI
Business services agents not elsewhere classified	RO, SK	AT, BG, CZ, DK, ES, FI, LT, LV
Business services and administration managers not elsewhere classified	AT, EL, FR, MT, RO	BG, CY, CZ, LV, PT, SK
Butchers, fishmongers and related food preparers	AT, BG, CY, CZ, DE, FR, HR, IT, LT, MT, NL, NO, RO, SE, SI, SK	DK, ES, LV

OCCUPATION	COUNTRIES REPORTING A SHORTAGE	COUNTRIES REPORTING A SURPLUS
Buyers	AT, BE, DK, IT, LU, MT, NL, NO, RO, SK	CZ, ES, LT, LV, PT, SI
Cabinetmakers and related workers	AT, BE, BG, DE, DK, FR, IT, LT, MT, SI	ES, FI, HU, LV, PT, RO, SK
Car, taxi and van drivers	DE, IT, MT, NL, NO, PL, RO, SE	AT, BG, CZ, DK, EL, ES, FI, HU, LT, LU, LV, PT, SK
Carpenters and joiners	AT, BG, CY, CZ, DE, FR, HR, IE, IT, NL, NO, PL, RO, SI	EL, ES, FI, HU, LV, MT, PT, SE
Cartographers and surveyors	BE, BG, DE, DK, FR, MT, NL, RO, SE	AT, EL, ES
Cashiers and ticket clerks	DK, IT, LT, MT, NL, RO, SK	AT, BE, BG, CZ, EL, ES, LU, LV, PT, SI
Cement, stone and other mineral products machine operators	BE, BG, DE, DK, IT, LT, MT, SK	AT, EL, ES, LV
Chefs	AT, BE, BG, CZ, DE, DK, EL, FI, FR, HR, IE, IT, MT, NL, SE, SI, SK	ES, LV, PT
Chemical and physical science technicians	DE, IE, IT, NL	AT, CZ, EL, ES, FI, LV, MT, PT, RO
Chemical engineering technicians	DE, IT, MT, PT, SK	AT, BG, CZ, EL, ES, LV, RO
Chemical engineers	AT, CH, DE, DK, NL, SI, SK	CZ, EL, ES, LV, MT, PT, RO
Chemical processing plant controllers	DE, FI, LT, MT, NL	AT, LV
Chemical products plant and machine operators	CZ, EL, ES, FR, IT, LT, MT, NL, SK	AT, LV, NO, RO
Chemists	DK, IE, MT, SI	AT, BG, CZ, DE, ES, FI, LV, PT, RO
Childcare services managers	BE, DE, FI, MT	DK, ES
Childcare workers	DE, DK, FR, MT, NL, RO, SK	AT, CZ, EL, ES, FI, HU, LT, LV, PT, SE
Civil engineering labourers	BE, BG, DK, FI, FR, HU, IT, MT, NL, SI, SK	AT, EL, ES, LT, LU, PT, RO, SE
Civil engineering technicians	AT, BE, BG, DE, DK, FR, LU, MT, NL, NO, RO, SI, SK	CZ, EL, ES, LV
Civil engineers	BE, BG, CH, CZ, DE, HU, IE, IT, LT, LU, NL, PT, RO, SI, SK	EL, ES, LV
Cleaners and helpers in offices, hotels and other establishments	FR, IT, MT, NL, RO, SI	AT, BG, CZ, DE, EL, ES, FI, LU, LV, NO, PT
Cleaning and housekeeping supervisors in offices, hotels and other establishments	DK, EL, ES, MT, NL, SK	AT, CZ, LV, PT, RO
Clearing and forwarding agents	BE, DK, MT, NL, SK	BG, ES, LV
Clerical support workers not elsewhere classified	DK, MT	AT, BG, CZ, DE, EL, ES, FI, LV, RO, SK
Client information workers not elsewhere classified	FI, SK	DK, ES, PT
Coding, proofreading and related clerks	MT	AT, DK, EL, ES, LV
Commercial sales representatives	BG, FR, MT, NL, RO	AT, CZ, ES, LT, LV, PT, SI, SK
Commissioned armed forces officers	AT, NL	ES, LV
Community health workers	BG, DE, LT	MT, RO
Companions and valets	BG, HU, IT, PL	AT, CY, ES, LV, SI
Computer network and systems technicians	AT, BG, CZ, DE, EL, IT, MT, NL, SK	ES, PT

OCCUPATION	COUNTRIES REPORTING A SHORTAGE	COUNTRIES REPORTING A SURPLUS
Computer network professionals	AT, BE, BG, CH, CZ, DE, EL, NL, RO, SK	ES, LV, MT, PT
Concrete placers, concrete finishers and related workers	BE, BG, CY, CZ, DE, FR, HR, HU, IT, LT, LV, NL, NO, RO, SE, SI, SK	AT, DK, EL, ES, FI, MT, PT
Conference and event planners	DK, FI, MT, RO, SK	AT, BG, ES, HU, LT, LU, LV, PT, SI
Construction managers	BE, DE, FR, IE, MT, NL, NO, RO, SK	AT, BG, ES, LV
Construction supervisors	AT, BE, BG, DE, EL, FR, IT, NL, NO, SE, SI	ES, FI, PT
Contact centre information clerks	EL, IT, NL, SK	AT, BG, EE, ES, FI, LV, MT, SI
Contact centre salespersons	CZ, EL, ES, FI, FR, LV, MT, NL, NO	AT, BG, LT, PT, SI
Cooks	AT, BG, CY, CZ, DE, DK, EL, FR, IT, LT, LU, MT, NL, NO, PL, RO, SE, SI	ES, FI
Craft and related workers not elsewhere classified	BG, DE, ES, NO, PT, SK	AT, EL, LV
Crane, hoist and related plant operators	BE, BG, CZ, HR, IT, LT, NL, RO, SI, SK	AT, DK, ES, FI, LV, MT
Creative and performing artists not elsewhere classified	ES, MT	AT, DE, DK, EL, FI
Credit and loans officers	BE, DE, LU, NL	AT, BG, DK, EL, ES, LV, MT
Crop farm labourers	BG, CY, DK, FI, LV, SK	AT, BE, CZ, EL, ES, LT, MT, PT
Customs and border inspectors	AT, MT, PL, SE, SK	DK, ES, RO
Dairy products makers	BG, CZ, ES, IT, LT, MT, SK	AT, DK, FI, LV, RO
Dancers and choreographers	ES, HU, IT, MT, SK	AT, CZ, DK, EL, FI, LV, RO
Data entry clerks	DK, EL, IT, MT, SK	AT, BG, CZ, DE, EE, ES, FI, LT, LU, NL, PT, RO
Database and network professionals not elsewhere classified	AT, BG, CH, CZ, DE, EL, HU, IE, MT, NL, SK	ES, LV
Database designers and administrators	AT, BE, BG, CH, DE, EL, MT, NL, RO, SE, SK	CZ, DK, ES, FI, LV
Debt collectors and related workers	IT, NL	AT, DK, ES, LV, MT
Deep-sea fishery workers	MT	ES, LV
Dental assistants and therapists	BG, DE, DK, FI, MT, NL, SE, SI, SK	AT, ES, LV, PT, RO
Dentists	CH, CZ, DE, DK, EE, EL, ES, FI, LV, MT, NL, SE, SI, SK	AT, RO
Dieticians and nutritionists	BG, CH, DK, EL, MT, SK	AT, ES, LV, PT, RO
Dispensing opticians	AT, BE, DE, FR, IT, NL, RO, SK	ES, LV, MT
Domestic cleaners and helpers	BE, CY, FI, FR, MT, NL, RO, SE	AT, BG, CZ, DE, DK, EL, ES, HU, LV, PT
Domestic housekeepers	DE, IT, MT, SK	AT, EL, ES, HU, LV, PT, RO
Door-to-door salespersons	EL, ES, FI, IT, NO, RO	BE
Draughtspersons	BE, BG, FR, IT, LU, MT, NL	AT, DK, EL, ES, FI, LV, PT, RO
Drivers of animal-drawn vehicles and machinery	SE, SK	AT, EL, ES, MT
Driving instructors	BE, IT, LV, MT, PT, RO, SE, SI	AT, CZ, DK, ES, FI, HU

OCCUPATION	COUNTRIES REPORTING A SHORTAGE	COUNTRIES REPORTING A SURPLUS
Early childhood educators	AT, BE, DE, EE, FI, IT, LT, LU, MT, NO, PL, SI, SK	CY, CZ, EL, ES, LV, RO
Earth moving and related plant operators	BE, BG, CZ, DK, FR, HR, IT, LT, NL, NO, PL, RO, SE, SI, SK	AT, ES, FI, MT, PT
Economists	MT, NL, SK	AT, BG, CZ, EL, ES, FI, HR, LV, PT, RO
Education managers	BE, CH, NL, NO, PT	BG, DK, ES, LV, MT
Education methods specialists	BE, IT, MT, NO, RO	AT, BG, DK, EL, ES
Electrical and electronic equipment assemblers	BE, BG, CZ, DE, FR, IT, LU, LV, NO, RO, SE	AT, DK, ES, FI, MT, PT
Electrical engineering technicians	AT, BE, BG, CY, DE, DK, EE, FR, IT, LT, MT, NL, NO, PL, SE, SI	EL, ES, RO, SK
Electrical engineers	AT, BG, CZ, DE, DK, IE, IT, LT, MT, NL, NO, RO, SE, SI, SK	ES, LV
Electrical mechanics and fitters	AT, BE, BG, CZ, DE, EE, FR, HR, IT, LT, LU, MT, NL, NO, PL, RO, SI	DK, ES, SK
Electronics engineering technicians	AT, BE, BG, DE, HU, IT, LU, MT, NL, NO, SK	EL, ES, FI, LV
Electronics engineers	AT, BG, CZ, DE, NL, NO, RO, SK	ES, MT
Electronics mechanics and servicers	AT, BG, CZ, DE, DK, EL, FR, HR, IT, LT, MT, NO, SI, SK	ES, FI
Elementary workers not elsewhere classified	DK, ES, MT, PT, RO	AT, BE, BG, CZ, DE, LT, LV, SI
Employment agents and contractors	CZ, MT, SK	AT, BE, BG, DK, ES, LV, SI
Engineering professionals not elsewhere classified	AT, CH, DE, FR, IE, MT, PT, RO, SI, SK	BG, DK, EL, LV
Environmental and occupational health and hygiene professionals	BE, BG, CH, DK, EL, IT, LU, MT, NL, RO	AT, ES, HR, LV
Environmental and occupational health inspectors and associates	BE, CZ, IT, LU, MT, NL	ES, LV, PT, RO
Environmental engineers	CH, DE, DK, NL	AT, EL, ES, FI, PT, RO
Environmental protection professionals	DE, DK, IT, MT, NL	AT, BG, CZ, EL, ES, FI, LV, RO
Farming, forestry and fisheries advisers	DK, MT, SI, SK	AT, BG, CZ, EL, ES, FI, LT, LV, RO
Fashion and other models	ES, MT	AT, CZ, DK, FI
Fast food preparers	BG, CZ, DK, EL, ES, FI, HU, LT, LU, MT, NL, RO, SE, SI	AT
Fibre preparing, spinning and winding machine operators	BE, HU, LT, SK	AT, ES, FI, LV
Field crop and vegetable growers	DK, SK	AT, CZ, ES, RO
Filing and copying clerks	HU	AT, DK, EL, ES, LV, RO
Film, stage and related directors and producers	DK, MT	AT, CZ, EL, ES, FI, LV, PT, RO, SE
Finance managers	EL, LU, MT, RO, SK	AT, BE, BG, CY, CZ, ES, LV, PT
Financial analysts	BE, DK, ES, MT, NL, RO, SI, SK	AT, BG, CY, CZ, FI, LV
Financial and insurance services branch managers	AT, DK, MT, SK	BG, CY, CZ, ES, LV

OCCUPATION	COUNTRIES REPORTING A SHORTAGE	COUNTRIES REPORTING A SURPLUS
Financial and investment advisers	BE, MT, NL, NO, SK	AT, BG, CY, DK, ES, LV, PT, RO
Firefighters	AT, DE, DK, FI, IT, LT, MT, NO, PL, RO	CZ, ES, LV
Fishery and aquaculture labourers	BG, DK, ES, LV, MT, PT	EL, FI, RO
Fitness and recreation instructors and programme leaders	DK, IT, MT, NL	AT, BG, DE, ES, LT, LV, RO, SE
Floor layers and tile setters	BE, BG, DE, HR, IT, LV, MT, NL, PL, RO, SI, SK	AT, EL, ES, FI, PT
Food and beverage tasters and graders	BG, CZ, FI, LT, MT	ES, LV
Food and related products machine operators	BG, CZ, FI, FR, IT, LT, MT, NL, NO, RO, SI, SK	AT, DK, ES, PT
Food service counter attendants	CZ, DK, IT, MT, NL, NO, RO, SK	AT, BG, ES, LV, PT, SE
Forestry and related workers	BG, CZ, DE, FR, NL, SI	AT, ES, FI, LV, PT, RO, SK
Forestry labourers	BG, DK, LV, PT	CZ, EL, ES, FI, RO, SK
Forestry technicians	BG, CH	AT, DE, ES, LV, RO
Freight handlers	CY, HU, MT, NL	AT, BE, BG, DE, DK, EL, ES, FI, LT, LU, LV, NO, PT, RO
Fruit, vegetable and related preservers	BG, CZ, IT, PT	AT, ES, LV, MT, RO
Fumigators and other pest and weed controllers	CZ, FI, IT, LV, NL	AT, ES, MT
Fur- and leather-preparing machine operators	FI, IT, MT	AT, ES, RO
Gallery, museum and library technicians	MT	AT, CZ, DK, EL, ES, FR, LV
Garbage and recycling collectors	BG, CY, IT, LT, MT, NL, RO, SE, SI	AT, BE, DK, EL, ES, FI, LU, LV
Garden and horticultural labourers	BE, BG, DE, DK, FI, IT, LT, SK	AT, EL, ES, LU, PT
Gardeners and horticultural and nursery growers	DE, FI, IT, LT, MT, NL, NO	AT, BG, CZ, ES, LU, LV, PT, RO, SI
Garment and related patternmakers and cutters	BG, IT, LT, MT, RO	AT, EL, ES, FI, HU, LV, PT
General office clerks	MT	AT, BE, BG, CY, CZ, EL, ES, FR, HR, LU, LV, PT, RO, SK
Generalist medical practitioners	AT, BE, BG, CH, CZ, DE, EE, EL, FI, IE, MT, NL, NO, PL, PT, SE, SI, SK	RO
Geologists and geophysicists	BE, DE, LV, RO	AT, CZ, DK, ES, FI
Glass and ceramics plant operators	BG, CZ, DK, IT, LT, RO, SK	AT, ES
Glassmakers, cutters, grinders and finishers	BG, FI, MT, SI, SK	AT, DK, ES, RO
Glaziers	BE, CZ, DE, DK, MT, NL, NO	AT, EL, ES, FI, LV
Government licensing officials	MT, NL	ES
Government regulatory associate professionals not elsewhere classified	EL, FI, PL	AT, DK, ES, MT
Government social benefits officials	IT, SK	BG, ES, LV
Government tax and excise officials	BE, DK, MT	BG, ES, LV
Graphic and multimedia designers	MT	AT, BG, CY, CZ, DK, EE, EL, ES, FI, FR, HR, HU, LT, LU, LV, NO, PT, RO, SK
Hairdressers	DK, FR, IT, MT, NO, SE	AT, CZ, EL, ES, FI, LU, LV, PT, RO

OCCUPATION	COUNTRIES REPORTING A SHORTAGE	COUNTRIES REPORTING A SURPLUS
Hand and pedal vehicle drivers	IT, NL	AT, CZ, EL, ES, MT, RO
Hand launderers and pressers	HU, LT, NL, RO, SE, SK	AT, BE, BG, DK, ES, LV, MT, PT
Hand packers	DK, FI, HU, IT, MT, RO, SK	AT, BE, BG, CZ, EL, ES, LT, LV, PT, SE, SI
Handicraft workers in textiles, leather and related materials	BG, MT	AT, DK, ES, FI, LV, RO
Handicraft workers in wood, basketry and related materials	BG, IT, LV, MT, SK	AT, CZ, DE, ES, FI, RO
Handicraft workers not elsewhere classified	FI, HU, MT, RO	AT, ES, LV
Health associate professionals not elsewhere classified	BG, DE, DK, FI, MT, NO, SK	CZ, ES, LT, LV, RO
Healthcare assistants	AT, BE, BG, CY, DE, EE, FI, FR, IE, IT, LU, MT, NO, PL, RO, SE, SI, SK	EL, ES, LV, PT
Health professionals not elsewhere classified	AT, BE, CH, CZ, DE, EL, LU, MT, SE, SI	RO
Health services managers	BG, CH, DE, MT, RO, SK	AT, ES, LV
Heavy truck and lorry drivers	BE, BG, CY, CZ, DE, DK, FR, HR, IE, IT, LT, LV, MT, NL, NO, PL, RO, SE, SI, SK	AT, EL, ES, FI, LU
Home-based personal care workers	BG, CY, DE, EE, IE, IT, MT, NL, PL, SE, SI	AT, CZ, EL, ES, LV, PT, RO
Hotel managers	BE, BG, MT, NL, SK	AT, CZ, ES, FI, LU, LV, PT, RO
Hotel receptionists	BG, DK, EL, FI, FR, IT, MT, NL, SE, SK	AT, CZ, ES, HR, LV, PT
House builders	CZ, MT, PL, SE, SK	AT, BE, BG, EL, ES, FI, LV, RO
Human resource managers	EL, FR, LU, MT, NL, SK	AT, BG, CY, DK, ES, FI, LV, PT, RO
Hunters and trappers	EL, ES	DK
Incinerator and water treatment plant operators	DE, LT, MT, RO, SK	AT, ES, LV
Industrial and production engineers	AT, BE, BG, CH, DE, EE, FR, HU, IE, IT, MT, NL, NO, RO, SK	CZ, EL, ES
ICT installers and servicers	BE, BG, CZ, DE, EL, MT, NL, SK	DK, ES, FI, LV, NO, PT, RO
ICT operations technicians	AT, BG, DE, EL, ES, FR, IT, LT, LU, MT, SK	CZ, DK, LV, PT, RO, SE, SI
ICT sales professionals	CY, CZ, MT, SK	AT, ES, LV, PT
ICT services managers	AT, BE, BG, CH, CY, CZ, DE, LU, MT, NL, RO, SK	ES, LV, PT
ICT user support technicians	AT, BE, BG, DE, DK, EL, MT, NL, RO, SK	ES, FI, LV, PT
Information technology trainers	BG, DE, ES, MT	AT, EL, FI, LV
Inland and coastal waters fishery workers	ES, PT	AT, DK, FI, LV, MT
Inquiry clerks	EL, IT, LV, MT, NL, RO	BG, CZ, ES, LT, LU, PT, SK
Insulation workers	BG, CZ, DE, DK, HR, HU, IT, LV, NL, NO, PL, RO, SE, SI, SK	AT, EL, ES, FI, MT, PT
Insurance representatives	BE, CZ, DE, DK, FR, LU, MT, NL, SI	AT, BG, ES, LV, PT

OCCUPATION	COUNTRIES REPORTING A SHORTAGE	COUNTRIES REPORTING A SURPLUS
Interior designers and decorators	IT, MT	AT, CZ, EL, ES, FI, LT, LU, LV, RO, SI
Jewellery and precious metalworkers	IT, MT	AT, ES, FI, HU
Journalists	MT	AT, CZ, DK, EE, ES, FI, FR, LU, LV, NO, PT, RO, SI
Judges	MT	DK, ES, RO
Kitchen helpers	BG, CY, EL, MT, NL, RO, SE, SI	AT, CZ, DE, ES, FI, LU, LV, PT
Landscape architects	BG, DE, NL	AT, CZ, DK, EL, ES, FI, LV, RO
Laundry machine operators	BE, BG, CZ, LT, MT, SK	AT, ES, LU, LV, PT
Lawyers	CH, LU, MT, NL, NO, SI	AT, BE, BG, CY, CZ, DK, ES, LV, PT, RO, SK
Legal and related associate professionals	DK, MT	AT, BE, BG, CZ, ES, LT, LV, RO
Legal professionals not elsewhere classified	EL, FR, MT, NL, RO, SI	AT, BG, CZ, ES, PT
Legal secretaries	DE, DK, MT, NL	AT, BG, CZ, ES, HU, LV, PT
Legislators	MT, RO	BG, ES, LV
Librarians and related information professionals	LU, MT	AT, BG, DK, ES, FI, LV
Library clerks	BG, IT, MT	AT, CZ, DE, DK, EL, ES, FI, LV, RO
Life science technicians (excluding medical)	CH, DK, NL, SE	AT, CZ, ES, FI, LV, MT, RO
Lifting truck operators	BG, CZ, DK, IT, MT, NL, PL, RO, SK	AT, ES, FI, HU, LV, PT
Livestock and dairy producers	CZ, DK, HU, LT, MT, NL, NO, SK	AT, ES, LV, RO
Livestock farm labourers	BG, CZ, FI, LT, SK	AT, DE, EL, ES, LV, RO
Locomotive engine drivers	AT, BE, DE, DK, EL, IT, LU, NL, RO, SK	ES, LV, MT
Mail carriers and sorting clerks	BE, BG, IT, RO, SI, SK	AT, CZ, DK, EL, ES, LU, LV, MT, PT
Management and organisation analysts	CH, CZ, ES, MT, NL, RO, SI	AT, BG, CY, LV, PT, SK
Managing directors and chief executives	DK, IT, MT, SK	AT, BG, CY, ES, FI, LV, PT, RO
Manufacturing labourers not elsewhere classified	DK, MT, SI	AT, BG, CZ, EL, ES, LT, PT, RO
Manufacturing managers	BE, DK, FR, LU, NL, NO, RO, SI, SK	AT, BG, CZ, DE, ES, LV, MT, PT
Manufacturing supervisors	BE, BG, CZ, DK, EL, FR, NL, SK	AT, ES, FI, LV, MT, PT
Mathematicians, actuaries and statisticians	DE, DK, EE, LU, MT, NL, SK	AT, BG, ES, LV, RO
Mechanical engineering technicians	AT, BE, BG, CY, DE, DK, EE, FR, HU, LT, LU, MT, NO, SE, SI	EL, ES, RO, SK
Mechanical engineers	AT, BG, CZ, DE, IE, IT, MT, NL, SE, SI, SK	EL, ES, LV, RO
Mechanical machinery assemblers	BE, BG, DE, DK, FR, IT, MT, NL, NO, RO, SE, SK	AT, CZ, ES, FI, PT
Medical and dental prosthetic technicians	AT, BE, BG, DE, EL, MT, NL, SK	CZ, ES, FI, LV, RO
Medical and pathology laboratory technicians	BE, BG, DK, EL, IE, MT, NL, NO, SE	CZ, ES, LV, PT
Medical assistants	BG, CZ, DE, MT, NL, NO, SK	LU, PT
Medical imaging and therapeutic equipment technicians	AT, BE, BG, DE, EL, IT, LV, MT, NL, SE	ES

OCCUPATION	COUNTRIES REPORTING A SHORTAGE	COUNTRIES REPORTING A SURPLUS
Medical records and health information technicians	BG, CZ, SK	AT, ES
Medical secretaries	BG, IT, MT, NL, RO, SK	AT, ES, LU, LV, PT
Messengers, package deliverers and luggage porters	CY, DK, HU, IT, MT, RO, SK	AT, BG, CZ, ES, LT, LV, PT
Metal finishing, plating and coating machine operators	BG, CZ, DE, EL, LT, LV, NO, SI, SK	AT, ES, FI, MT
Metal moulders and coremakers	BG, CZ, DE, PT, SI, SK	AT, ES, FI, LV, MT, RO
Metal polishers, wheel grinders and tool sharpeners	BG, CZ, DE, DK, EE, LT, MT, PL, SI	AT, ES, FI, PT, RO
Metal processing plant operators	BG, CZ, DK, EL, ES, FR, IT, MT, PT, SI, SK	AT, FI, RO
Metal production process controllers	BE, BG, DE, DK, FI, LU, PT	ES, LV, MT
Metalworking machine tool setters and operators	AT, BE, BG, CZ, DE, EE, FR, HR, IE, LT, LU, NL, PL, RO, SE, SI	ES, FI, LV, MT
Meteorologists	SK	DK, ES, RO
Meter readers and vending-machine collectors	BG, DK, IT, RO	AT, CZ, DE, ES, LV, MT
Midwifery professionals	AT, BG, CH, CZ, DE, EL, IE, MT, PL, SK	ES, LV, RO
Mineral and stone processing plant operators	DK, SK	AT, EL, ES, LV, RO
Miners and quarriers	IT, RO, SK	AT, EL, ES, FI, LV
Mining and metallurgical technicians	DE	AT, DK, EL, ES, LV, RO
Mining and quarrying labourers	FI, HU, LV, MT, PT, SK	AT, CZ, EL, RO
Mining engineers, metallurgists and related professionals	CH, DE, MT, NO, PT, SK	BG, EL, ES, RO
Mining managers	MT, RO	BG, ES, LV
Mining supervisors	EL, MT, SK	ES
Mixed crop and animal producers	MT, NO, RO	AT, ES, FI, PT
Mixed crop and livestock farm labourers	BG, CZ, ES, FI, SK	AT, EL, PT, RO
Mixed crop growers	FI, HU, MT, SK	CZ, ES, LU, LV, PT
Mobile farm and forestry plant operators	FR, MT, NL, SE, SK	AT, ES, FI, LV, PT, RO
Motor vehicle mechanics and repairers	AT, BE, BG, DE, DK, EE, FR, HR, IT, LT, MT, NL, NO, PL, SE, SI	ES, FI, RO, SK
Motorcycle drivers	MT, PT	CZ, EL, ES, LU, SE
Musicians, singers and composers	ES, IT, LU, MT, SE, SK	AT, CZ, EL, FI, LV, RO, SI
Non-commissioned armed forces officers	CZ, DK, NL	AT, ES, LV
Nursing associate professionals	AT, BE, BG, CZ, DE, EE, EL, FI, FR, IT, LU, MT, NL, SI	RO
Nursing professionals	AT, BE, BG, CH, CY, CZ, DE, EE, EL, ES, FI, IE, IT, LT, MT, NL, NO, PL, PT, SE, SI, SK	RO
Odd-job persons	ES, FI, MT, PT, RO, SK	AT, LT, SI

OCCUPATION	COUNTRIES REPORTING A SHORTAGE	COUNTRIES REPORTING A SURPLUS
Office supervisors	ES, FR, MT, NL, SE	AT, BG, CY, CZ, LT, LV, PT
Optometrists and ophthalmic opticians	AT, BE, CH, CZ, EL, ES, IT, MT, RO	LV
Other artistic and cultural associate professionals	ES, IT, MT	AT, BG, CZ, DK, EL, FI, FR, LU, LV, PT, RO
Other arts teachers	DK, MT, SK	AT, BG, CZ, EL, ES, FI
Other cleaning workers	ES, FI, MT, NL	AT, BG, LV, PT, SK
Other language teachers	CH, DE, EE, IT, MT, NL, PL, RO, SK	AT, CY, CZ, EL, ES, FI
Other music teachers	BE, CZ, DK, IT, MT	AT, BG, EL, ES, FI, FR, LV
Packing, bottling and labelling machine operators	BE, BG, CZ, IT, LT, RO, SK	AT, DK, ES, LV, MT, PT
Painters and related workers	BG, DE, FR, HR, IT, LV, MT, NL, PL, RO, SE, SI	AT, CZ, EL, ES, FI, LT, LU, PT
Paper products machine operators	CZ, DE, EL, ES, IT, LT, MT, RO, SK	AT, FI
Paramedical practitioners	BG, DE, EL, NL	DK, LV
Pawnbrokers and moneylenders	RO	ES, LV, MT
Payroll clerks	AT, BG, IT, MT, NL, NO, PL, SE	CZ, ES, LV
Pelt dressers, tanners and fellmongers	BG, PT	AT, DK, EL, ES, FI, HU
Personal care workers in health services not elsewhere classified	BG, DE, DK, MT, NL, PL, SK	AT, CZ, EL, ES, LV, PT, RO
Personal services workers not elsewhere classified	ES, FI, HU, MT, NO, PT, SK	BG, RO
Personnel and careers professionals	LU, NL, RO, SI	AT, BE, BG, CZ, DE, ES, LV, MT, PT, SK
Personnel clerks	MT, SK	AT, BG, CZ, DK, EL, ES, FI, LT
Pet groomers and animal care workers	MT, SE, SK	AT, CZ, DK, ES, FI, LV, NL, PT
Petroleum and natural gas refining plant operators	DE, MT	AT, ES, FI, LV, RO
Pharmaceutical technicians and assistants	DE, DK, EL, FR, MT, NL, SE, SI, SK	AT, ES, LV, RO
Pharmacists	BE, BG, CH, DE, DK, EE, EL, IT, LU, MT, NL, RO, SE, SI, SK	AT, CZ, LV
Philosophers, historians and political scientists	MT	AT, EL, ES, FI, LT, LV, RO, SI
Photographers	IT, MT, SK	AT, CZ, DE, DK, EL, ES, FI, HR, HU, LT, LV, PT, RO, SI
Photographic products machine operators	CZ, EL, FI, MT	AT, ES, HU, LV
Physical and engineering science technicians not elsewhere classified	AT, BG, DK, FR, IE, MT, NO	EL, ES, LV, PT, RO, SK
Physicists and astronomers	DK, LU, LV	AT, ES, FI, RO
Physiotherapists	AT, BE, BG, CH, CZ, DE, EL, ES, FR, IT, LU, LV, MT, NL, PL, PT, SE, SI, SK	RO
Physiotherapy technicians and assistants	BG, CY, CZ, DE, HU, IT, MT, PL, SE, SK	AT, DK, ES, LV, PT, RO
Plasterers	BE, BG, CZ, DE, HU, LT, LU, LV, MT, PL, RO, SI, SK	AT, DK, EL, ES, FI

OCCUPATION	COUNTRIES REPORTING A SHORTAGE	COUNTRIES REPORTING A SURPLUS
Plastic products machine operators	AT, BE, CZ, DE, EL, IT, LT, PT, RO, SE, SI, SK	BG, DK, ES, FI, MT
Plumbers and pipe fitters	AT, BE, BG, CY, CZ, DE, EE, FR, HR, HU, IE, IT, LT, MT, NL, NO, PL, RO, SE, SI, SK	EL, ES, FI, PT
Police inspectors and detectives	DK, FI, LT, LV, PL	AT, ES, MT
Police officers	BE, CZ, DE, LT, MT, NL, PL, SI, SK	AT, DK, ES, RO
Policy administration professionals	CH, CZ, DE, IT, MT, NL, SI, SK	AT, BE, ES, LV, RO
Policy and planning managers	EL, LU, MT, RO, SK	AT, BG, ES, LV, PT
Potters and related workers	BG, MT	AT, CZ, ES, HU, RO
Poultry producers	HU, LT, PT, RO, SK	AT, ES, LV
Power production plant operators	BE, DE, DK, FR, PL	ES, LV, MT
Precision-instrument makers and repairers	DK, NL, RO	AT, ES, FI, LV, MT
Pre-press technicians	DK, EL, LT, MT, SK	AT, BG, CZ, ES, FI, LV
Primary school teachers	BE, BG, DE, EE, IT, LT, MT, NL, NO, PL, SI	AT, CZ, EL, ES, PT, RO
Print finishing and binding workers	BE, EL, FR, IT, MT, RO, SK	AT, BG, ES, FI, LV, PT
Printers	BE, CZ, DK, EL, FR, IT, LT, MT, RO, SK	AT, BG, ES, FI, LV, PT
Prison guards	BE, BG, CZ, HU, LT, LV, NL, NO, PL	AT, DK, ES, MT
Process control technicians not elsewhere classified	AT, BE, DK, EL, FI, FR, LT, LU, MT, RO, SK	CZ, ES, LV
Product and garment designers	MT, SK	AT, BG, CZ, DK, EE, EL, ES, FI, HR, HU, LT, LV, PT, RO
Product graders and testers (excluding foods and beverages)	BE, MT, RO	CZ, DE, ES, LV, PT, SK
Production clerks	BE, BG, DK, IT, LU, MT, NL, RO, SK	CZ, ES, FI, LV, PT
Professional services managers not elsewhere classified	ES, MT, NL, NO, SK	AT, BG, CZ, DK, LV
Protective services workers not elsewhere classified	BG, FI, MT	AT, CZ, EL, ES, LV
Psychologists	EE, FR, IT, LT, LU, LV, MT, NL, NO, PL, SI, SK	BG, EL, ES, PT, RO
Public relations professionals	CZ, DK, IT, NL, RO	AT, BG, EE, ES, FR, LU, LV, MT, PT
Pulp and papermaking plant operators	BE, EL, FR, HU, LT, SK	AT, ES, LV, RO
Railway brake, signal and switch operators	AT, DE, IT, NL, RO, SK	BG, CZ, DK, ES, LV
Real estate agents and property managers	BE, DK, FR, IT, MT	AT, BG, CZ, ES, HU, LT, LU, LV, PT, RO
Receptionists (general)	EL, IT, MT, RO	BE, BG, CZ, DE, ES, LV, NO, PT, SE, SI
Refuse sorters	CY, CZ, HU, LV, SK	BG, EL, ES, FI
Religious associate professionals	DK, ES	AT, CZ, RO
Religious professionals	DK	AT, CZ, EL, LV, MT, RO

OCCUPATION	COUNTRIES REPORTING A SHORTAGE	COUNTRIES REPORTING A SURPLUS
Research and development managers	BE, CH, EE, EL, LU, MT, NL, RO, SK	AT, BG, CZ, DK, ES, LV
Restaurant managers	BE, BG, FI, IT, MT, NL, RO, SK	AT, CY, CZ, ES, LV, PT
Retail and wholesale trade managers	BE, MT, RO, SK	BG, ES, LU, LV, PT
Riggers and cable splicers	BE, CZ, DE, HU, MT, SK	AT, BG, ES, FI, RO
Roofers	AT, BG, DE, FR, HR, LU, NL, PL, RO, SI, SK	CZ, DK, EL, ES, FI, LV, MT
Rubber products machine operators	CZ, DE, EL, IT, LT, RO, SI, SK	AT, DK, ES, FI, LV, MT, PT
Sales and marketing managers	BE, EL, IT, MT	AT, BG, CY, CZ, ES, LV, PT, RO, SI, SK
Sales demonstrators	DK, ES, IT, MT	BG
Sales workers not elsewhere classified	CZ, ES, FI, MT, NO	AT, BG, LV, PT, SK
Secondary education teachers	BE, BG, DE, EE, IE, IT, LT, MT, NL, PL, SI	AT, CY, CZ, EL, ES, PT, RO
Secretaries (general)	IT	AT, BE, BG, CY, CZ, EL, ES, FI, HR, LU, LV, MT, PT, RO, SI
Securities and finance dealers and brokers	DK, IT, LU, MT, RO	AT, BG, CZ, DE, EL, ES, LV
Security guards	DK, EE, FI, FR, IT, MT, NL, NO, PL, RO, SI	AT, BG, CZ, DE, ES, HU, LU, LV, PT, SK
Senior government officials	AT, BE, DK, MT	BG, ES, LV, RO
Service station attendants	BG, FI, IT, LT, MT, NL, SK	AT, ES, LV
Services managers not elsewhere classified	EL, MT	AT, BG, CZ, DK, ES, FI, LV, PT, RO, SK
Sewing machine operators	BE, BG, FR, IT, MT, RO, SK	AT, DE, ES, FI, LV, PT
Sewing, embroidery and related workers	BG, DK, IT, LT, MT	AT, CZ, EL, ES, LV, PT, RO, SK
Sheet metalworkers	AT, BE, BG, CZ, DE, DK, EE, FR, IE, IT, LU, MT, NL, PL, RO, SE, SI, SK	ES, FI, PT
Shelf fillers	CZ, HU, MT	AT, DE, EL, ES, FI, LT, LU, LV, PT, SK
Ships' deck crews and related workers	BE, BG, CY, EL, IT, MT, NL, SK	AT, CZ, DE, DK, ES, FI, LV, RO
Ships' deck officers and pilots	BE, DE, MT, NL, SK	AT, DK, ES, FI, LV, RO
Ships' engineers	BE, DK, EE, ES, NL, SK	AT, FI, HU, LV, RO
Shoemakers and related workers	AT, BG, IT, NL, SK	DK, EL, ES, FI, HU, LV, PT, RO
Shoemaking and related machine operators	BG, IT, SK	AT, ES, FI
Shop sales assistants	DK, IT, MT, NL, NO, RO	AT, BG, CZ, EL, ES, FI, HU, LU, LV, PT, SE, SK
Shop supervisors	AT, BE, IT, NO	BG, CY, CZ, EL, ES, FR, LV, MT, PT, SK
Shopkeepers	BE, DE, IT, MT	AT, BG, CZ, EL, ES, HU, PT, RO
Signwriters, decorative painters, engravers and etchers	BG, MT	AT, CZ, DK, ES, FI, HU, RO
Social welfare managers	BG, DE, MT	AT, ES
Social work and counselling professionals	BE, DE, EE, FI, FR, IT, LT, LU, SI	AT, BG, CZ, DK, EL, ES, MT, PT, RO
Social work associate professionals	BG, DE, DK, EE, FR, IT, MT, PL, SE, SK	AT, CZ, ES, PT, RO

OCCUPATION	COUNTRIES REPORTING A SHORTAGE	COUNTRIES REPORTING A SURPLUS
Sociologists, anthropologists and related professionals	MT, SK	AT, CZ, DK, EL, ES, FI, PT, RO, SI
Software and applications developers and analysts not elsewhere classified	AT, BG, CH, CZ, DE, DK, FR, LU, NL, PT, RO, SI, SK	EL, ES, FI, LV
Software developers	AT, BE, BG, CH, CY, CZ, DE, IE, IT, MT, NL, NO, RO, SI, SK	EL, ES, LV, PT
Special needs teachers	BE, CH, DE, EE, FI, IT, LT, LV, NL, NO, PL, SI	AT, CZ, DK, EL, ES, MT, RO
Specialist medical practitioners	AT, BG, CH, CZ, DE, DK, EE, EL, ES, FI, IE, LT, LU, LV, MT, NL, NO, PL, PT, SI, SK	RO
Sports coaches, instructors and officials	DK, IT, MT, SK	AT, CZ, DE, ES, FI, LV, PT, RO
Sports, recreation and cultural centre managers	EL, MT, SK	AT, BG, CZ, DK, ES, LV
Spray painters and varnishers	AT, CY, CZ, DE, DK, EE, FR, HR, IT, LT, MT, NL, NO, RO, SI, SK	EL, ES, FI, PT
Stall and market salespersons	BG, FI, HU	AT, ES, LT, LV, MT, PT
Stationary plant and machine operators not elsewhere classified	CZ, ES, FI, FR, NO, RO, SE	AT, DK, LV, PT
Statistical, finance and insurance clerks	BE, BG, DK, IT, MT, SK	AT, CY, CZ, ES, LV, PT, SI
Statistical, mathematical and related associate professionals	MT, NL, RO, SK	CZ, EL, ES, FI, LV
Steam engine and boiler operators	CZ, IT, MT	ES, LV, RO
Stock clerks	IT, MT, NL, PL, RO, SI	AT, BE, BG, CZ, ES, FI, LT, LU, LV, NO, PT, SE
Stonemasons, stonecutters, splitters and carvers	BE, BG, CZ, DE, DK, FR, HR, IT, LU, LV, RO, SK	AT, EL, ES, FI, HU, MT
Street and related services workers	CZ, EL, FI, MT	AT, ES, LT
Street food salespersons	BG, HU, MT, SK	AT, ES, FI, LV, PT, RO
Street vendors (excluding food)	EL, ES, MT	BG, PT, RO
Structural metal preparers and erectors	AT, BE, BG, CZ, DE, DK, FR, HR, IT, LT, LU, LV, MT, NL, NO, SI, SK	ES, RO
Subsistence crop farmers	MT	PT
Supply, distribution and related managers	FR, MT, NL, RO, SK	AT, BG, ES, LT, LV, PT
Survey and market research interviewers	EL, PT, SK	AT, CZ, DE, DK, ES, LV, MT
Sweepers and related labourers	BG, DK, IT, RO	AT, CZ, EL, ES, LT, LV, MT, PT, SI, SK
Systems administrators	AT, BG, CH, CZ, DE, EL, HR, IE, IT, LU, MT, NL, SE, SI, SK	ES, LV
Systems analysts	AT, BG, CH, CY, DE, IE, MT, NL, RO, SE, SI	EL, PT, SK
Tailors, dressmakers, furriers and hatters	BG, FR, IT, LT, MT	AT, CZ, DE, DK, EL, ES, FI, LV, NO, PT, RO, SE
Teachers' aides	DE, IT, MT, RO, SK	AT, BE, BG, CZ, EL, ES, FI, LV, PT, SE

OCCUPATION	COUNTRIES REPORTING A SHORTAGE	COUNTRIES REPORTING A SURPLUS
Teaching professionals not elsewhere classified	MT, NO	AT, BE, BG, CZ, DK, EL, ES, LV, PT, RO
Technical and medical sales professionals (excluding ICT)	BE, CZ, DK, EE, FR, NL, RO, SK	AT, ES, LV, MT, PT
Telecommunications engineering technicians	BE, BG, DE, EE, LU, MT, SI	AT, ES, LV, PT, RO
Telecommunications engineers	BG, CZ, DE, FR, LU, NL, RO, SK	ES, FI, LV
Telephone switchboard operators	CZ, EL, IT	AT, BG, DK, ES, LV, MT, PT, SI
Textile, fur and leather products machine operators not elsewhere classified	BG, CZ, ES, FR, MT, RO	AT, FI
Tobacco preparers and tobacco products makers	BG, MT	AT, ES
Toolmakers and related workers	AT, BG, CZ, DE, EE, IT, LT, LU, NL, PL, PT, SI	DK, ES, LV, MT
Town and traffic planners	DK, FI, NL	AT, BG, EL, ES, LV, MT
Trade brokers	BE, DK, MT, RO, SI, SK	AT, BG, CZ, ES
Traditional and complementary medicine associate professionals	BG, DE, EL, FI	ES, LV
Traditional and complementary medicine professionals	BG, EL, IT, MT	DE, DK, ES
Training and staff development professionals	DK, ES, MT, RO, SK	AT, BE, BG, CZ, LV, PT
Translators, interpreters and other linguists	BG, MT, SE	AT, CZ, DE, DK, ES, FI, LU, LV, PT, RO, SI
Transport clerks	BE, DE, DK, FR, IT, LU, MT, NL, RO, SI	AT, BG, ES, LV, PT
Transport conductors	AT, CZ, MT, RO, SK	BG, DK, ES, LV
Travel attendants and travel stewards	DK, HU, IT, MT, SK	AT, BG, ES, FR, LV, PT, RO
Travel consultants and clerks	BE, DK, EL, LV, MT, NL, SK	AT, BG, CZ, ES, FI, HU, LT, LU, PT, RO, SI
Travel guides	FI, IT, MT, SK	AT, BE, BG, CZ, DE, DK, ES, LV, PT, RO
Tree and shrub crop growers	CZ, IT, NL, SK	AT, DK, ES, HU, LV, PT, RO
Typists and word processing operators	EL, IT, MT, SK	AT, BG, ES, FI, RO
Undertakers and embalmers	FI, IT, RO, SK	AT, DK, ES, LV, MT
Underwater divers	MT, SK	AT, DK, ES, FI
University and higher education teachers	CH, EE, ES, MT, RO, SI, SK	AT, CZ, DE, LV
Upholsterers and related workers	AT, BG, CZ, LT, MT, NL, RO, SK	DK, EL, ES, FI, HU, LV
Valuers and loss assessors	DK, NL	AT, EL, ES, FI, LV, MT
Vehicle cleaners	BG, CY, CZ, DK, HU, IT, MT, NL, RO, SK	AT, FI, LV, PT
Veterinarians	BE, BG, DE, EL, MT, NL, PT, RO, SE, SI	AT, DK, ES, LV
Veterinary technicians and assistants	EL, SE, SK	AT, BG, DK, ES, LU, LV, MT, PT, RO
Visual artists	BG, MT	AT, CZ, DK, EL, ES, FI, FR, LV, PT, RO

OCCUPATION	COUNTRIES REPORTING A SHORTAGE	COUNTRIES REPORTING A SURPLUS
Vocational education teachers	BE, BG, DE, DK, EE, FR, IT, LV, NL, NO, PL, SE, SI, SK	AT, EL, ES, PT
Waiters	BG, CY, DE, DK, EL, FI, FR, HR, IT, MT, NL, NO, RO, SI	AT, CZ, ES, LV, PT, SE
Water and firewood collectors	RO	LV
Weaving and knitting machine operators	AT, BE, CZ, IT, LT, MT, RO, SK	ES, FI, LV
Web and multimedia developers	BE, BG, CY, CZ, DE, HR, MT, NL, RO, SK	AT, DK, EL, ES, FI, HU, PT, SI
Web technicians	BG, DE, DK, EL, IT, LU, MT, SK	AT, CZ, ES, LV, PT
Welders and flame cutters	AT, BG, CY, CZ, DE, DK, EE, FR, HR, IE, IT, LT, LV, MT, NL, NO, PL, RO, SE, SI, SK	ES, FI, PT
Well drillers and borers and related workers	CZ, DK, MT, SK	AT, EL, ES, FI, RO
Window cleaners	BE, BG, CZ, DK, FI, LV, MT, NL, RO	AT, ES
Wood processing plant operators	BG, CZ, DK, EL, FR, IT, LT, SK	AT, ES, FI, LV, NO, RO
Wood treaters	BG, DE, ES, MT	AT, CZ, LV, PT
Woodworking machine tool setters and operators	AT, BE, BG, DK, LT, MT, NL, SI, SK	ES, FI, LV, PT

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