

Labour shortages and labour market inequalities: Evidence and policy implications

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ABSTRACT/RÉSUMÉ

Labour shortages have reached historically high levels over the past decade. While recent labour market adjustments have eased some of this tightness, several sectors continue to struggle with significant shortages. This persistent issue can hinder productivity growth, exacerbate supply chain bottlenecks, and ultimately contribute to inflationary pressures. Against this background, this paper examines labour shortages from a distributional perspective, focusing on the wage, non-wage and sociodemographic dimensions of affected jobs. A key driver of these shortages, among others, is poor job quality, deterring workers from entering or remaining in these roles. Sectors experiencing persistently high shortages, across all countries studied, include healthcare, transportation and storage, accommodation and food, and construction, where women and migrants are overrepresented. Despite these shortages, widespread real wage improvements in these sectors have been largely absent, though some country-specific variations exist. Regarding non-wage job quality dimensions, sectors and occupations with higher shortages tend to exhibit a higher incidence of shift work. Likewise, workers in these sectors experience greater exposure to both mental and physical health risks. Based on cross-country analysis, supplemented by country-specific studies, the paper proposes areas of policy interventions. These include supporting efficient labour market reallocation, prioritizing job quality improvements over simply increasing job quantity, and mitigating regional disparities in shortages.

JEL: E24, J31, J32, J63, J81

Keywords: Labour shortage, job quality, policy analysis

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Les pénuries de main-d'œuvre ont atteint des niveaux historiquement élevés au cours de la dernière décennie. Bien que les récents ajustements du marché du travail aient atténué une partie de cette tension, plusieurs secteurs continuent de faire face à d'importantes pénuries. Ce problème persistant peut entraver la croissance de la productivité, exacerber les goulots d'étranglement dans les chaînes d'approvisionnement et, en fin de compte, contribuer à des pressions inflationnistes. Dans ce contexte, ce document examine les pénuries de main-d'œuvre dans une perspective distributionnelle, en se concentrant sur les dimensions salariales, non salariales et sociodémographiques des emplois concernés. Un facteur clé de ces pénuries est la mauvaise qualité des emplois, qui dissuade les travailleurs d'entrer ou de rester dans ces fonctions. Les secteurs connaissant des pénuries importantes de travailleurs sont la santé, le transport, l'hébergement et la restauration, et la construction. Les femmes et les migrants y sont surreprésentés. Malgré ces pénuries, les salaires réels n'ont pas augmenté, bien qu'il existe des variations spécifiques selon les pays. En ce qui concerne les dimensions non salariales de la qualité de l'emploi, les secteurs et les professions connaissant des pénuries plus importantes ont tendance à présenter une incidence plus élevée de travail posté. De même, les travailleurs de ces secteurs sont plus exposés aux risques pour la santé mentale et physique. Sur la base de cette analyse transnationale, complétée par des études spécifiques à chaque pays, le document propose des pistes de politiques publiques. Il s'agit notamment de soutenir des allocations efficaces sur le marché du travail, de donner la priorité à l'amélioration de la qualité de l'emploi plutôt qu'à la simple augmentation de la quantité d'emplois, et d'atténuer les disparités régionales en matière de pénuries de travailleurs.

JEL: E24, J31, J32, J63, J81

Mots clés: Pénurie de travail, qualité de l'emploi, analyse des politiques

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Labour shortages and labour market inequalities: evidence and policy implications

Orsetta Causa, Emilia Soldani, Maxime Nguyen and Tomomi Tanaka¹

Introduction and motivation

Labour markets continue to perform strongly, with many countries seeing historically high levels of employment and low levels of unemployment. Amid the general slowdown in economic growth, labour market tightness - measured by the number of vacancies per unemployed person - has eased in recent quarters but remains above or close to the relatively high pre-COVID-19 levels in many countries (OECD, 2024^[1]). In fact, labour shortages are pervasive in a number of economic activities, as firms face recruitment difficulties which hamper their capacity to satisfy existing demand, to expand production and to innovate. This situation can hamper productivity growth, aggravate supply bottlenecks, and eventually contribute to inflationary pressures.² The post COVID-19 period has been characterised by a peak in labour shortages, in a context of strong rebound in consumer demand, particularly for contact-intensive services such as accommodation and food.

Labour shortages can be driven by cyclical factors, with the topical case of the demand spike in the aftermath of the pandemic (Causa et al., 2022^[2]; Duval et al., 2022^[3]); and by structural factors, in particular population ageing (André, Gal and Schief, 2024^[4]) and the digital and green transitions (Dorville, Filippucci and Marcolin, forthcoming^[5]; CEDEFOP, 2022^[6]). The adoption and expansion of working from home and new hybrid working models has provided forms of flexibility to attract workers in teleworkable jobs, for instance individuals who need to combine work with caring for family members, and those living in remote

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² Tight labour markets may also have positive effects such as stimulating firms' productive investments, including in AI and other technologies which may augment workers' productivity, or enhancing workers' bargaining power (Dueholm, Kalyani and Ozkan, 2024^[150]; Newman and Jacobs, 2023^[151]). That said, there is little evidence that the recent period of intense labour shortages has had a significant impact on investment, which has remained weak at the aggregate level in a majority of advanced economies.

areas. Yet workers in contact-intensive activities, such as nurses and midwifery professionals, are less likely to access new hybrid working models and this, coupled with difficult working conditions, may explain a decline in the attractiveness of these fundamental jobs (OECD, 2024^[7]).

This paper looks at labour shortages from a distributional perspective, focusing on those jobs that workers may be unwilling to enter or stay in, due to poor job quality.³ Job quality is not only determined by pay but also, importantly, non-pay-conditions, including job insecurity, poor working hours arrangements, limited flexibility and strenuous working conditions exposing individuals to significant health risks. The health risks include mental health risks associated with work pressure and overload. The paper also uncovers the sociodemographic composition of these jobs, in particular their incidence among women, migrants, and older workers. In doing so, it complements recent and ongoing work by the OECD on the impact of structural-trends, such as digital and green transformations as well as ageing, on labour shortages and skill mismatches, with a consequent emphasis on high-skill jobs (Dorville, Filippucci and Marcolin, forthcoming^[5]).

This paper addresses the following main questions and policy issues:

- What are recent developments in labour market dynamics over the past decade in terms of employment, participation and hours worked, and labour market tightness across OECD countries? How have labour shortages developed across industries and occupations, relative to the immediate aftermath of COVID-19 period and in a longer-term perspective; and how do countries differ in this respect?
- Have wages increased relatively more in economic activities where demand for labour is elevated? How do wage developments fare with respect to comparable activities, and how does this vary across countries?
- What do the data say about non-pay aspects of job quality in these industries? In particular, in terms of job security, working hours arrangement and flexibility, exposure to health risk - not least mental health issues – and physical safety concerns.
- What policy implications can be drawn to address labour shortages and enhance equality of opportunities, better integrate international migrants, and support job quality beyond pay? For instance, which policies can help ensure less strenuous and more balanced working conditions for healthcare workers, most of whom are women?

The analysis relies on official labour market statistics and data sources, harmonized across countries whenever possible, and in particular OECD labour force statistics and micro-based labour force survey data for EU member countries (EULFS).⁴ These sources are complemented by high-frequency data on online job postings. In a context of measurement issues associated with the use of job vacancy data, this paper provides a cautious assessment and tries to interpret these data in combination with relevant labour

³ The notion of job quality in this paper is consistent with various approaches in the literature, in particular, the [OECD Job Quality Framework](#). The current analysis is designed to study labour shortages from a distributional angle, complementing the OECD framework by going granular in terms of e.g. sociodemographic groups, industry/occupation, and workers' health and safety information. Country coverage can therefore be limited in some cases, due to lack of consistent data.

⁴ Alternatively, some indirect information on labour market tightness can be obtained through employers' survey, as elaborated in ongoing work by Filippucci, Laengle and Marcolin (forthcoming^[47]). This allows for a timely and granular picture of firms' recruitment difficulties, yet with a risk of self-reporting and small sample biases in the resulting metrics of labour shortages (Frohm, 2024^[141]; Handel, 2024^[142]; Filippucci and al., forthcoming^[143]).

market indicators. The analysis covers advanced economies due to significant data gaps in emerging economies, especially for official job postings and vacancies data.⁵ Yet emerging economies face important challenges in this area, including the risk of systematic brain drain towards advanced economies attracting high-skilled foreign workers to alleviate labour shortages, particularly in healthcare – as emphasized in this work and covered in great detail in dedicated OECD publications.⁶

The rest of this paper is organised as follows. Section 1 provides an overview of labour market developments, tightness, and shortages by delivering: i) a picture of changes in employment, unemployment, wages, participation and hours worked, at the economy wide-level and at the level of targeted socioeconomic groups, and ii) a comprehensive analysis of patterns of labour shortages across countries and economic activities and occupations, based on official statistics complemented with online job vacancies data. Section 2 focuses on labour shortages from a distributional perspective, framing the analysis along two angles: i) the sociodemographic composition of jobs in increasing demand, for instance the incidence of women and migrants, and ii) an assessment of the quality of jobs in increasing demand, along relevant aspects that can be covered in a comparable and consistent way across countries. Such aspects include pay, job security, working hours arrangements, and safety at work. Section 3 discusses policy implications to mitigate both labour shortages and inequalities, drawing from the analysis in this paper and from the literature, including relevant country-specific examples and case studies.

An overview of labour market developments, tightness and labour shortages

Setting the scene

Labour markets have recovered strongly from the COVID-19 crisis, with increases in employment rates and a general decline in unemployment rates (Figure 1, Panels A and B), to a good extent thanks to massive policy interventions to preserve jobs and incomes. Yet there are different patterns and dynamics across OECD countries, reflecting different structural conditions and policy interventions (OECD, 2020^[8]; Calligaris et al., 2023^[9]; Lam and Solovyeva, 2023^[10]; OECD, 2021^[11]).

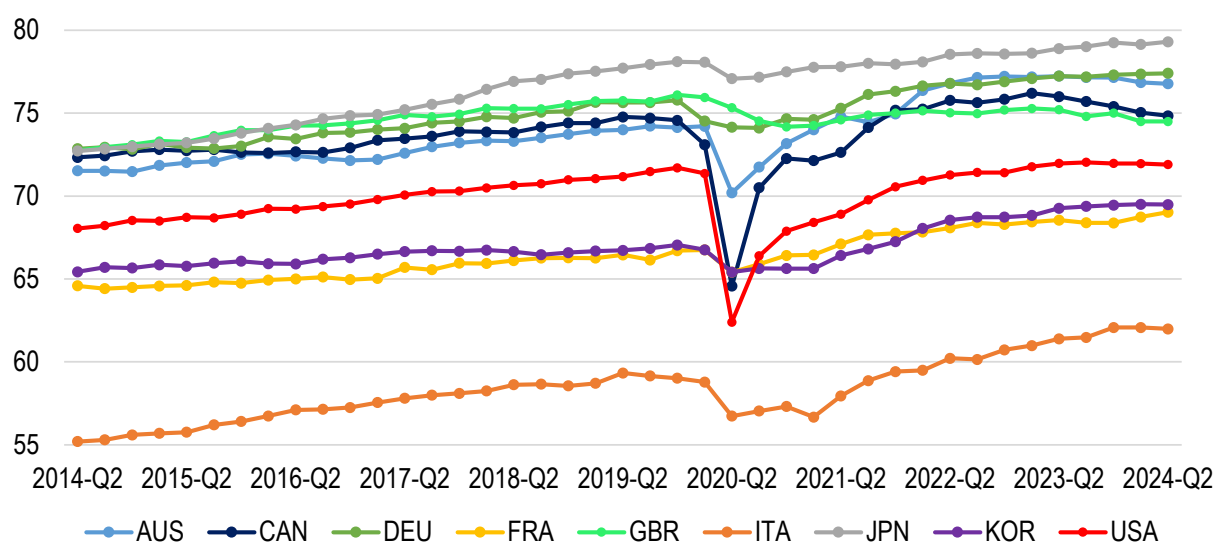
Real wages were severely hit by the spike in inflation in the aftermath of the pandemic and following Russia's war of aggression against Ukraine. They have been recovering since then, though differently across countries; for example, real wages have been consistently stagnant in Italy over the last decade and even trending down since the pandemic (Figure 1, Panel C).

⁵ An attempt was made to analyze emerging economies based on data produced by Revelio Labs, which gathers information from public LinkedIn profiles and other sources. These data have been used in the academic literature, mostly in the case of the US to study workforce dynamics at the enterprise level and patterns of job search and application (e.g. Bernstein et al. (2023^[155]), Frank et al (2024^[156])). The analysis of Revelio Labs vacancy numbers for emerging economies, e.g. Colombia, Mexico and India, points to major data quality issues, likely reflecting the weak representativeness of LinkedIn profiles in these countries, making it impossible to measure and study labour shortages.

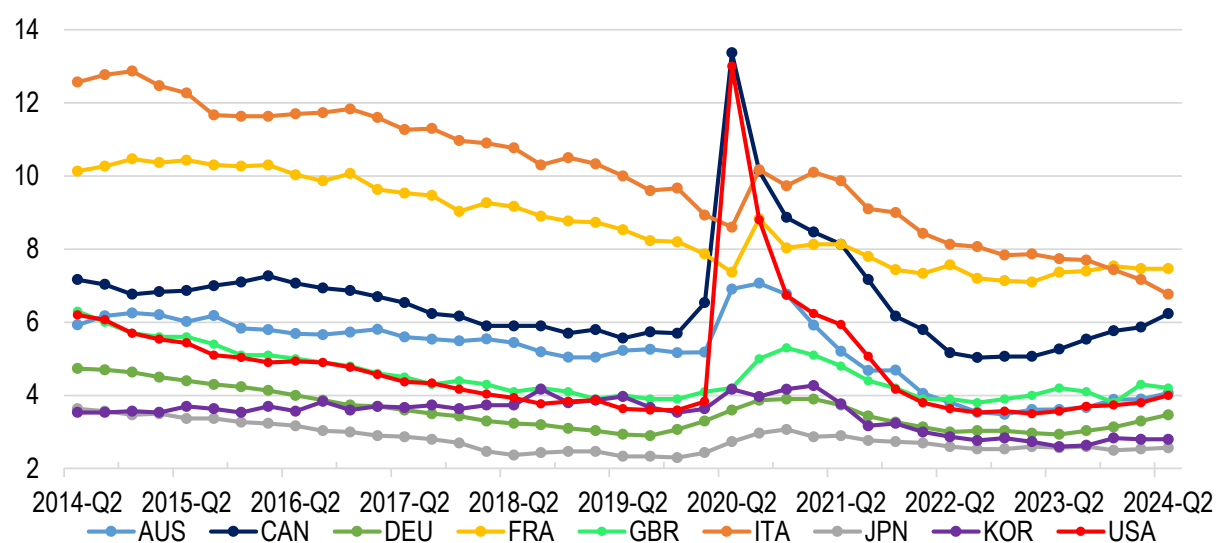
⁶ See Socha-Dietrich and Dumont (2021^[131]) for a comprehensive report on International migration and movement of nursing personnel to and within OECD countries, and OECD (2023^[64]) for more recent data and discussion on international migration of doctors and nurses.

Figure 1. Developments in employment, unemployment and real wages

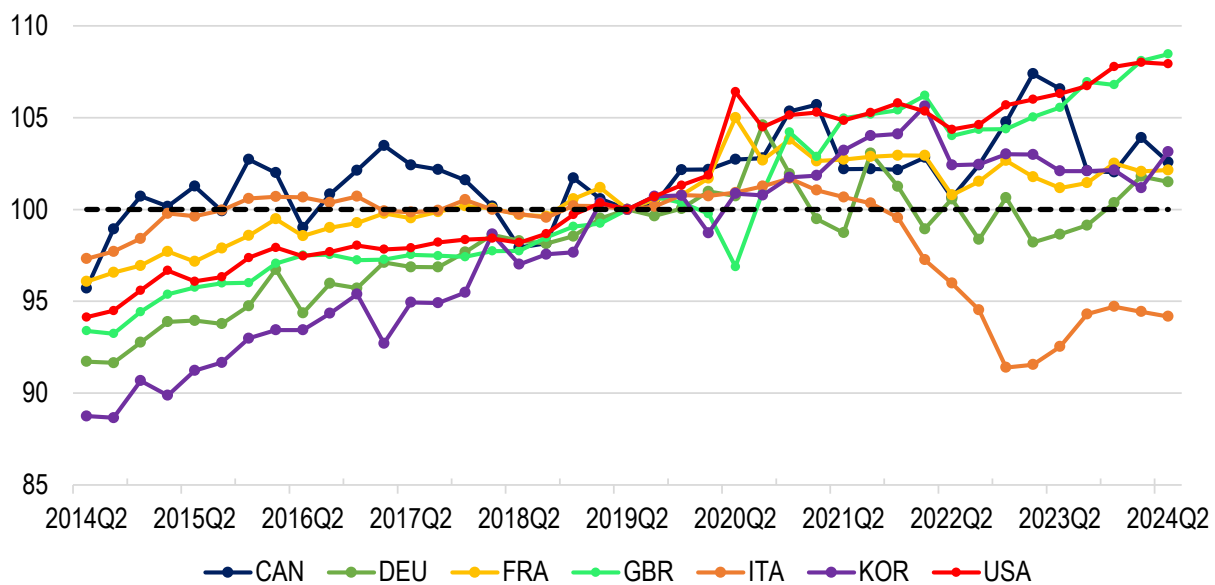
Panel A. Employment rate, 2014Q2-2024Q2



Panel B. Unemployment rate, 2014Q2-2024Q2



Panel C. Real wages, 2014Q2-2024Q2, index 2019Q2=100



Note: Employment and unemployment among the working-age population. Real wages indexes are measured by hourly earnings deflated by consumer prices. Seasonally adjusted average total earnings paid per employed person per hour, including overtime pay and regularly recurring cash supplements. Data for France, Germany, Korea and Sweden, the United Kingdom and the United States refer to the private sector wages. Data for Australia, Canada and Italy refer to the manufacturing sector.

Sources: OECD Labour Force Short-term statistics. OECD Hourly Earnings dataset; OECD Consumer price statistics.

The analysis of labour shortages and their policy implications requires an understanding of the joint dynamics of labour demand and labour supply: Box 1 offers an overview of such patterns across a selected sample of OECD economies. The box shows that, while labour demand (proxied by the sum of employment and job openings) reached all-time highs in the aftermath of the COVID-19 pandemic - as businesses tried to keep up with record high consumer demand - in most countries the upward trend started much earlier. In some countries, labour supply has been trending upward at a similar pace to labour demand, while in others the gap between the two has narrowed significantly in the last few years. The main implication from this macro-level illustrative exercise is that labour shortages may reflect in part a narrowing gap between labour supply and labour demand, and in part more structural factors: the relative importance of these different factors varies across OECD economies. Structural explanations include skill shortages and mismatches, e.g. associated with digital and green transformations and affecting mostly high-skilled jobs.⁷ Yet there are concomitant explanations that are both sizeable and policy-relevant: labour shortages associated with poor job quality and unattractive working conditions, typically affecting middle and low-skilled jobs in major service activities such as health and social care, hospitality, transportation and storage, where workers have been increasingly reluctant to enter or stay. This job quality angle, along with its distributional dimensions, is the focus of the current analysis.

⁷ See Dorville, Filippucci and Marcolin (forthcoming_[5]) for a complementary focus on megatrends and structural transformations, including an analysis of skill shortages and mismatches.

Box 1. Are labour supply and labour demand out of balance? An illustrative exercise

The emergence of growing mismatches between available jobs and workers to fill them has attracted interest in the academic community as well as among policy makers and spurred parallel discussions about the reliability and representativeness of job vacancy data (Mongey and Horwich, 2023^[12]), and around possible imbalances between labour demand and supply (St. Louis FED, 2024^[13]).

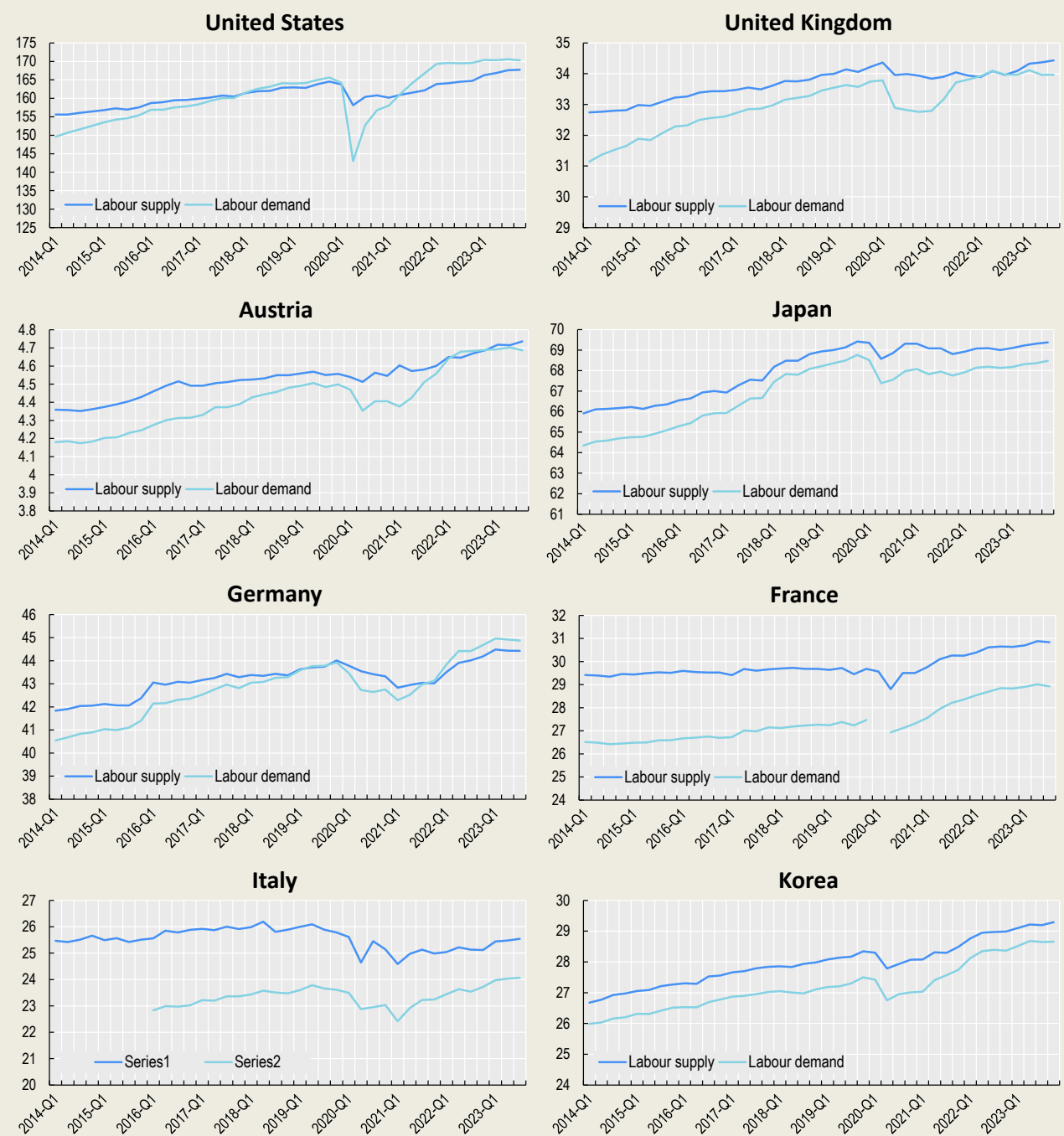
While the first point is discussed in this paper, this box addresses the second point by comparing the time series of labour supply and labour demand. The former is proxied by the civilian labour force, and the latter by the sum of employment and job openings, following the literature in this area. When labour demand exceeds local labour supply, firms struggle to fill job openings, calling for expanding international labour migration, increasing domestic labour supply, but also enhancing working conditions and revising production technologies. As the St. Louis FED pointed out, this has been the case for the US through the last three years (St. Louis FED, 2024^[13]), in each State (Fuller and Jefferson, 2023^[14]). In September 2024, the employment level plus job openings was at 169.3 million while the total civilian labour force is at 168.7 million, indicating a gap of around 0.6 million workers. This is a decline with respect to January 2023, when the gap was 4.7 million, but it was nonetheless considerable.⁸ In addition, labour shortages are further exacerbated by the decline in average hours worked following the pandemic (Lee, Park and Shin, 2023^[15]). While this imbalance became salient in the aftermath of COVID-19, the time series in Figure 2 show that the growth in demand in the US was outpacing the supply even before then. The gap between labour supply and demand has also changed sign in Germany, and it shrunk in a number of other economies, including Austria, Japan and the United Kingdom (Figure 2). In the United Kingdom, this has been attributed to the sharp decline in labour force participation among older workers (Boileau and Cribb, 2022^[16]). Countries with a narrow (or negative) gap between aggregate supply and aggregate demand of workers are particularly likely to face labour shortages, which may be further exacerbated by geographical, skill and occupational mismatches.

In other countries such as France, Italy and Korea, depicted in the bottom portion of Figure 2, the gap between labour supply and demand remained approximately stable over the past decade. The increase in labour shortages in these countries is therefore likely not due to a significant excess demand of workers at the aggregate level, but rather linked to mismatches in location, skills, or qualifications in certain occupational sectors, or to differences between the wages and job qualities offered by employers and those demanded by workers.

⁸ Labour supply is measured by labour force from St Louis FED (CLF16OV series for Civilian Labour Force Level), while labour demand is measured as the sum of job openings (from the JTSJOL series published by the Bureau of Labour Statistics based on the Job Openings and Labor Turnover Survey, JOLTS) and the Employment Level (CE16OV series from the St. Louis FED).

Figure 2. Patterns of labour supply and labour demand: selected countries

Labour demand and labour supply (millions individuals)



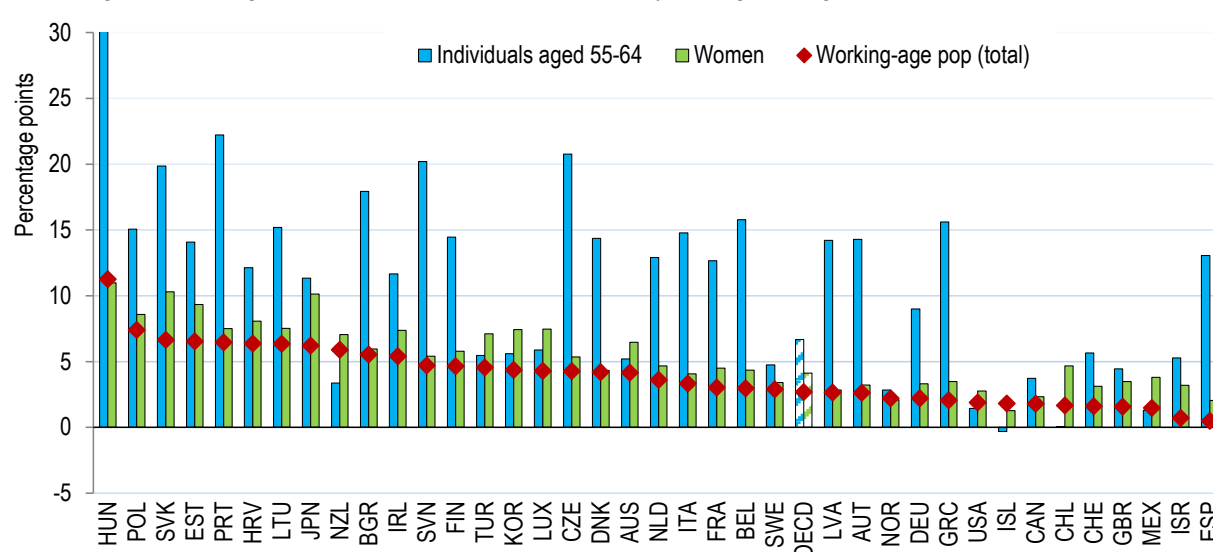
Note: Labour demand is proxied by the sum of the number of employed and the number of vacancies. Labour supply is proxied by the Labour force headcount.

Sources: OECD Labour Force Statistics dataset, quarterly data, DARES (FRA), Office for National Statistics (GBR), Official Statistics of Japan (JPN), Statistics Korea (KOR) and US Bureau of Labor Statistics (USA).

There have been significant increases in labour force participation rates across OECD countries over the last decade (Figure 3), notwithstanding a temporary decline in the COVID-19 context (Abraham and Rendell, 2023^[17]). This significant increase in participation rates has been largely driven by older workers, whose participation rates have increased significantly in a number of OECD economies, partly driven by pension reforms to encourage longer working lives (OECD, 2023^[18]; OECD, 2024^[19]).⁹ Nonetheless, some countries experienced persistent declines in older workers' participation in the aftermath of the pandemic, notably the United Kingdom and the United States, raising the question of the possible policy and non-policy drivers of this decline; the latter including lifestyle choices to retire in light of changed preferences or priorities, possibly in combination with changes in the nature of work post-pandemic (Boileau and Cribb, 2022^[16])¹⁰.

Figure 3. Developments in labour force participation

Percentage point change in labour force participation rates, by demographic group, 2013-2023



Source: OECD Labour Force Statistics.

Migrant workers are also an increasingly important source of labour supply, especially for ageing advanced countries. Over the last decade, international migration for work reasons has been on the rise across OECD economies – albeit with a temporary halt during the pandemic (Figure 4, Panel A). In fact, over the past decade and especially more recently, foreign born individuals have been the main contributors to labour force growth (Figure 4, Panel B): in many countries, the increasing number of foreign-born active individuals has been large enough to compensate the contemporaneous decrease in that of native-born

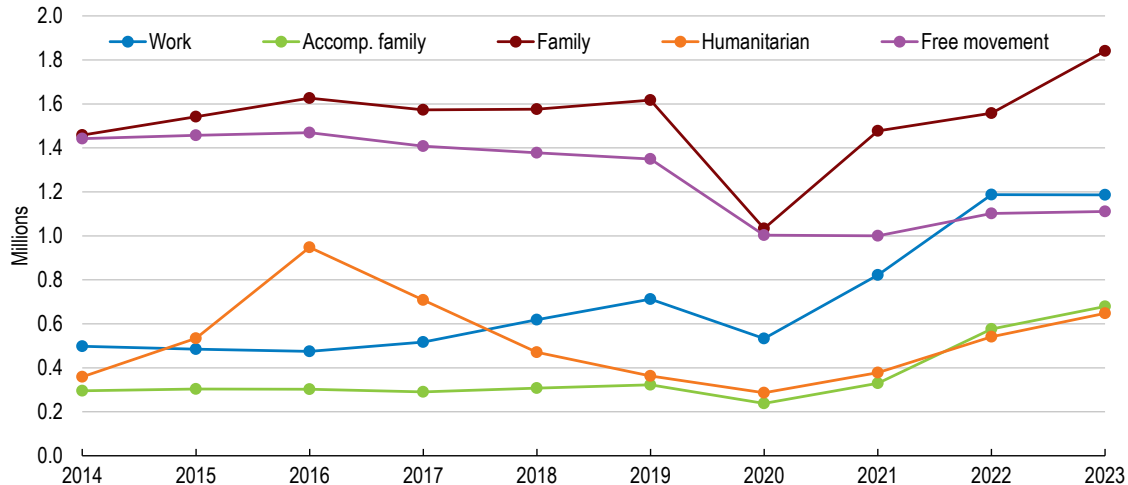
⁹ For a recent in-depth analysis of ageing alongside productivity, health and inclusiveness challenges, see André, Gal and Schief (2024^[4]).

¹⁰ While cross-sectional data suggests that the drop in labour supply among elderly workers might be due to the increased incidence of long-term sickness (Institute for Employment Studies, November 2022^[145]), the analysis of unemployed workers surveys data and panel data rather points to the role of early-retirement (Boileau and Cribb, 2022^[146]; Ferguson Melhorn, 2024^[147]), a view also shared by the UK House of Lords Economic Affairs Committee ([UK labour supply - Committees - UK Parliament](#)) and the US Chamber of Commerce ([Understanding America's Labor Shortage | U.S. Chamber of Commerce](#)).

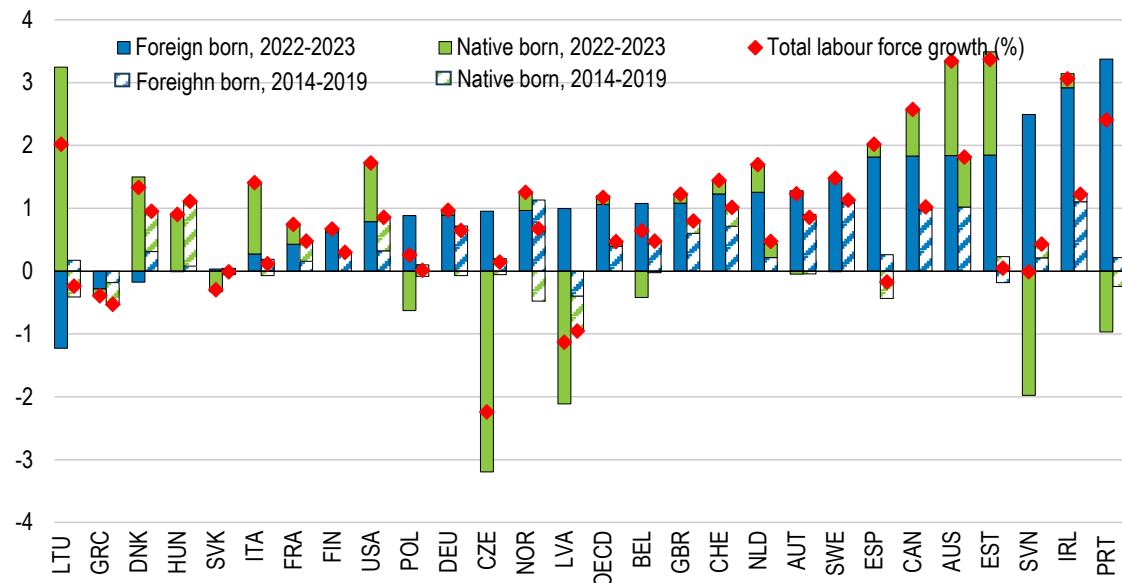
workers (see e.g. Belgium, Poland, and Portugal). At the same time, this country-level picture still masks regional differences within countries, underscoring the need to articulate national and local-level policies to promote migrants' integration (OECD, 2023^[20]).

Figure 4. International migration and labour force growth

Panel A. Permanent migration to the OECD by category of entry, level in millions



Panel B. Foreign-born contribution to labour force growth, 2014-2019, 2022-2023 (percentage points)



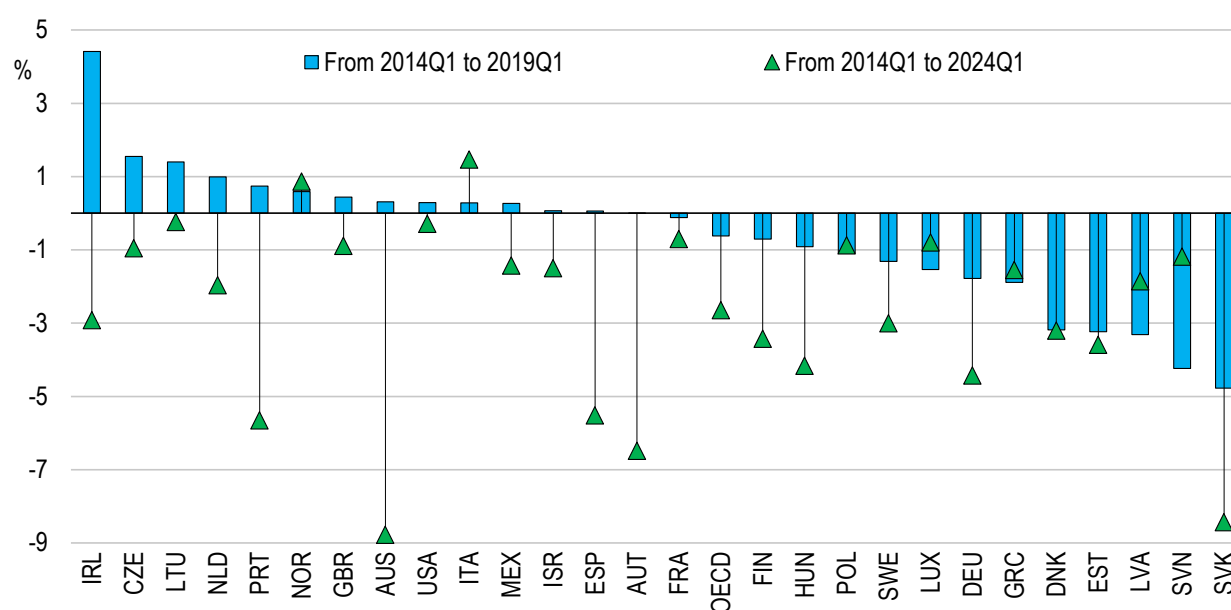
Note: Panel A: Includes only countries for which data on standardised permanent-type migration are available (AUS, AUT, BEL, CAN, CHE, CZE, DEU, DNK, ESP, EST, FIN, FRA, GBR, IRL, ISR, ITA, JPN, KOR, LTU, LUX, MEX, NLD, NOR, NZL, PRT, SVK, SVN, SWE, USA). 2023 data are estimates on the basis of preliminary data covering about two thirds of OECD countries. Panel B: Total labour force growth represents the overall percentage change in the size of the labour force over the relevant time period. In each time period, foreign (native) born contribution indicates the absolute change in the number of foreign (native) individuals in the labour force, divided by the absolute change in the total number of individuals in the labour force, and further divided by the size of the labour force in the previous year. The sum of the foreign and native components equals the total labour force growth.

Sources: OECD (2024^[21]), Eurostat Labor Force Statistics (EU), Australian Bureau of Statistics Labor Force Statistics (AUS), Statistics Canada Labor Force Statistics (CAN), Office for National Statistics Labor Force Survey (GBR), US Bureau of Labor Statistics Current Population Survey (USA).

Assessing labour market developments and possible supply-demand imbalances requires looking not only at the “extensive margin”, that is, activity and employment headcounts, but also at the “intensive margin”, that is, hours worked. Average hours worked per employed have declined in a number of countries over the last decade (Figure 5), including after the COVID-19 pandemic.¹¹

Figure 5. From extensive to intensive margins: developments in hours worked

Percentage change between 2014Q1 and 2024Q1, seasonally adjusted



Note: Average annual hours worked is defined as the total number of hours actually worked per year divided by the average number of people in employment per year. Actual hours worked include regular work hours of full-time, part-time and part-year workers, paid and unpaid overtime, hours worked in additional jobs, and exclude time not worked because of public holidays, annual paid leave, own illness, injury and temporary disability, maternity leave, parental leave, schooling or training, slack work for technical or economic reasons, strike or labour dispute, bad weather, compensation leave and other reasons. The data cover employees and self-employed workers. This indicator is measured in terms of hours per worker per year.

Source: OECD National Accounts database

The persistence of lower hours worked even as labour markets remain relatively tight might be linked to structural changes: for example an increase in labour hoarding (Arce et al., 2023^[22]), discussed below, or a change in workers’ preferences over work-life balance, in a context where lockdowns gave impulse to

¹¹ See e.g. Chapter 1 in OECD (2023^[33]) and Boppart and Krusell (2020^[158]). The general decrease in (nominal) hours of work may have been partially or fully compensated by changes in the composition (and productivity) of hours of work, as revealed by recent estimates of “composition-adjusted” measures of hours of work - i.e., metrics which attempt to consider differences in quality or productivity of hours of work by weighting workers’ hours by their respective shares in total wages (Ward and Zinni, 2024^[132]).

different work modalities, with increases in workers' demand for and, at least initially, firms' offering of flexible working hours and tele-working arrangements (Adrian et al., 2021^[23]).¹²

Stylized facts on labour shortages and tightness

The widespread increase in vacancy-to-unemployed ratios across OECD economies in a decade perspective (Figure 6) reflects the growing difficulties faced by employers to recruit and retain workers. While shortages have generally cooled down after the post COVID-19 peak, they remain high, especially in the United States and Germany, where aggregate labour demand has grown faster than aggregate labour supply (Box 1). Labour market tightness varies at the sub-national level within countries, but the cross-country data do not allow a consistent cross-country analysis beyond the national level. Recent work in this area shows that some countries, like the Netherlands (Uitvoeringsinstituut Werknemersverzekeringen (UWV), 2023^[24]) and Denmark (Klein and Smith, 2024^[25]), feature relatively widespread vacancy rates across regions, while others, like Italy and Spain, feature marked cross-regional heterogeneities, partly reflecting differences in economic dynamism and sectoral specialisation (EURES, 2022^[26]).

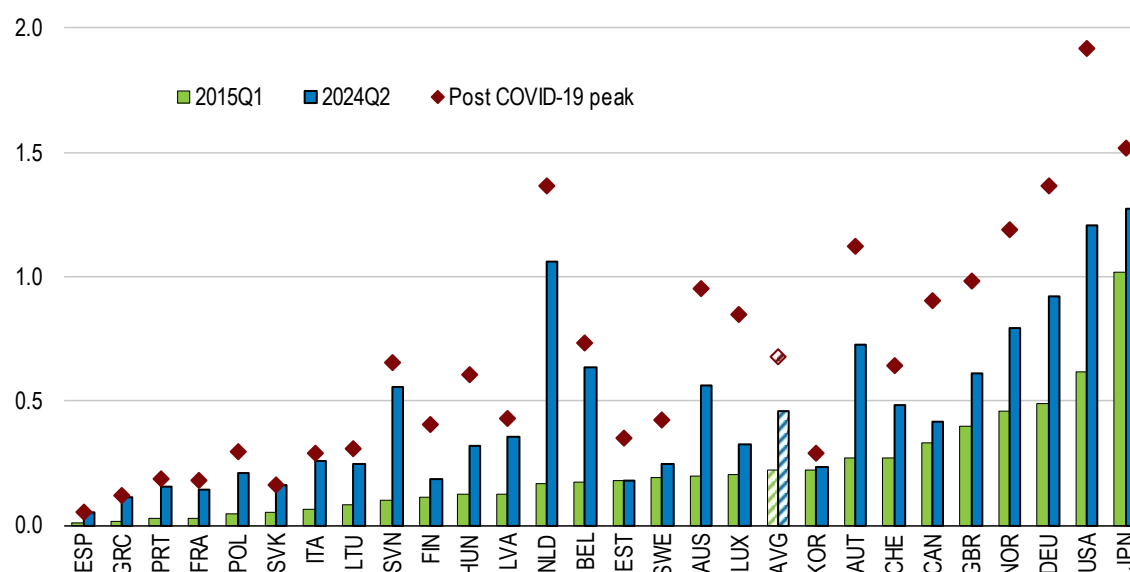
The analysis of job vacancies requires a note of methodological caution: these data have been increasingly used in the academic literature and policy-oriented research to monitor the state of labour markets, based on the prior that job vacancies are good proxies of unmet labour demand (Barnichon and Shapiro, 2024^[27]; Causa et al., 2022^[2]; Domash and Summers, 2022^[28]; Federal Open Market Committee, 2022^[29]). Yet this approach has been raising some concern under the argument that digitalisation makes it cheaper and easier to post vacancies online, inflating the apparent number of vacancies. A related argument is that firms can adjust labour demand by changing their recruitment strategies, by e.g. lowering hiring standards or increasing compensation for existing positions, instead of posting additional vacancies (Employ America, 2022^[30]; Federal Reserve Bank of Minneapolis, 2023^[31]). While these concerns are understood and legitimate, this paper argues that job vacancy data remain the best source to assess labour shortages at a granular level (by industry and, possibly, occupation), and provides a cautious analysis of these data on the grounds that (i) the evolution of job vacancy rates over time is highly correlated with that of the share of firms reporting labour shortages,¹³(ii) cross-country comparisons in a given period should be little affected by the effect of rising online job platforms. The rest of this paper relies on official statistics on vacancy-to-unemployment ratios, job vacancy rates as well as online job postings from Indeed (Box 2).

¹² As mentioned above, hours of work have been on a downward trend across many advanced economies including, after COVID-19. See Lee, Park and Shin (2023^[15]) for an in-depth analysis of post-pandemic developments in the United States.

¹³ For instance EC Business and consumer surveys (https://economy-finance.ec.europa.eu/economic-forecast-and-surveys/business-and-consumer-surveys_en). See Figure 2.1 in European Commission (2023^[164]).

Figure 6. Vacancy-to-unemployed ratios

Peak since Covid and level in 2015 Q1 and latest available point



Note: Ratio between the number of vacancies and that of unemployed in selected countries. The peak since Covid period is 2020Q1 – 2024Q2. Seasonally adjusted data are used except for CAN due to the data unavailability. For ITA, the number of vacancies is calculated using the job vacancy rate and the number of employed workers. 2015Q1 data is replaced by 2016Q1 data for ITA due to data availability. Sources: Vacancy and Unemployment data: Australian Bureau of Statistics (AUS), Statistics Canada (CAN), DARES (FRA), Office for National Statistics (GBR), Official Statistics of Japan (JPN), Statistics Korea (KOR), US Bureau of Labor Statistics (USA), and Eurostat (OECD-EU).

On average across OECD countries covered, job vacancy rates were higher in 2023 and 2024 relative to 2015 across most broadly-defined industries, with the highest levels in accommodation and food, ICT and professional services, transportation, and construction (Figure 7A). The rise in labour shortages in scientific and technical activities is likely due to changes in labour demand associated with the digital and green transformations (Dorville, Filippucci and Marcolin, forthcoming^[5]). Construction-related jobs postings have been rising for some time now (Causa et al., 2022^[2]; EURES, 2022^[26]), possibly reflecting renovation and sustainable construction needs associated with the green transition. Vacancies in healthcare and social services have also been on an upward trend, and the demand for these services is likely to continue growing with population ageing. As analysed and discussed later in this paper, the imbalance between supply and demand for jobs in healthcare is, at least in part, a reflection of poor job quality and unattractive working conditions in this sector.¹⁴

Looking at country-specific patterns and more narrowly-defined industries confirms the average picture but also provides nuances in terms of commonalities and differences across countries (Figure 7B):

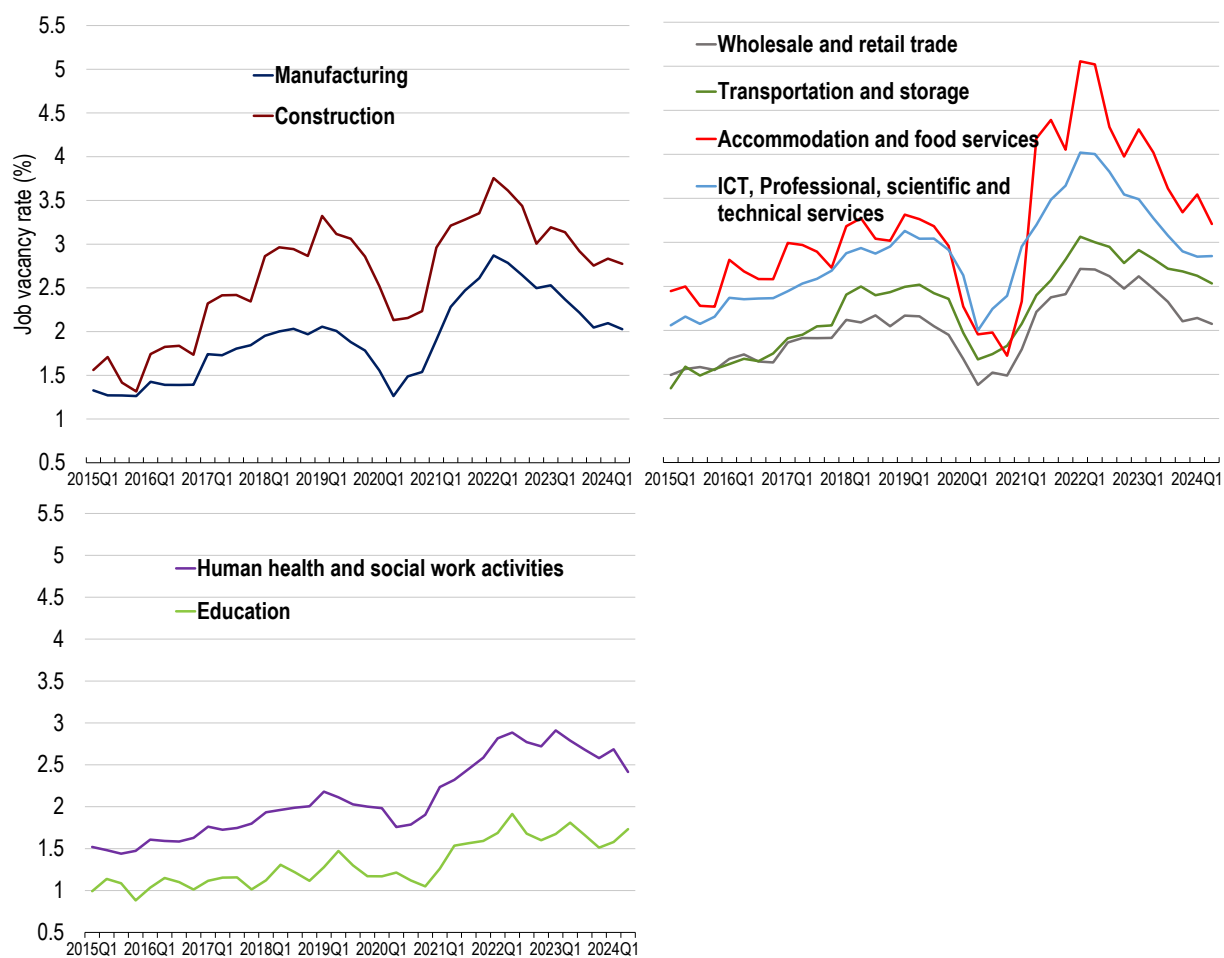
¹⁴ Another possible factor underlying the differences in labour shortages across industries, echoing “Baumol disease” considerations (Baumol, 1967^[153]; Nordhaus, 2006^[154]; Hartwig and Krämer, 2023^[152]), is the fact that productivity growth varies across industries and tends to be lower in services, e.g. accommodation and food, personal and home care activities, restricting these sectors’ ability to offer attractive wages relative to sectors where productivity (and potentially wages) grow faster. This situation may contribute to rising shortages of workers in associated jobs, a question beyond the scope of this paper, and which would require granular data on wages and productivity.

- The healthcare industry, which features a major employment share, e.g. around 14% in France, Germany, and the United States, displays high and increasing vacancies in all countries considered.
- The accommodation and food sector has experienced significantly higher-than-average vacancy rates and employs between 4% and 9% of workers across countries under consideration, for example 7% in Australia and 9% in the United States.
- Construction workers have also been on rising demand, and already represent a significant portion of employment, over 6% across the OECD economies under consideration, reaching 9% in Australia.
- Vacancy rates tend to be also high in high-skill, technologically advanced sectors, like scientific services and information and communication activities.
- Cross-country patterns feature visible heterogeneities: in the level of vacancy rates, which are generally higher in the United States than elsewhere, in the relative changes in vacancies, with stronger increases in France and Italy, and in the dispersion of vacancies across industries, with for example wider dispersion in Germany than in Australia and Italy.¹⁵

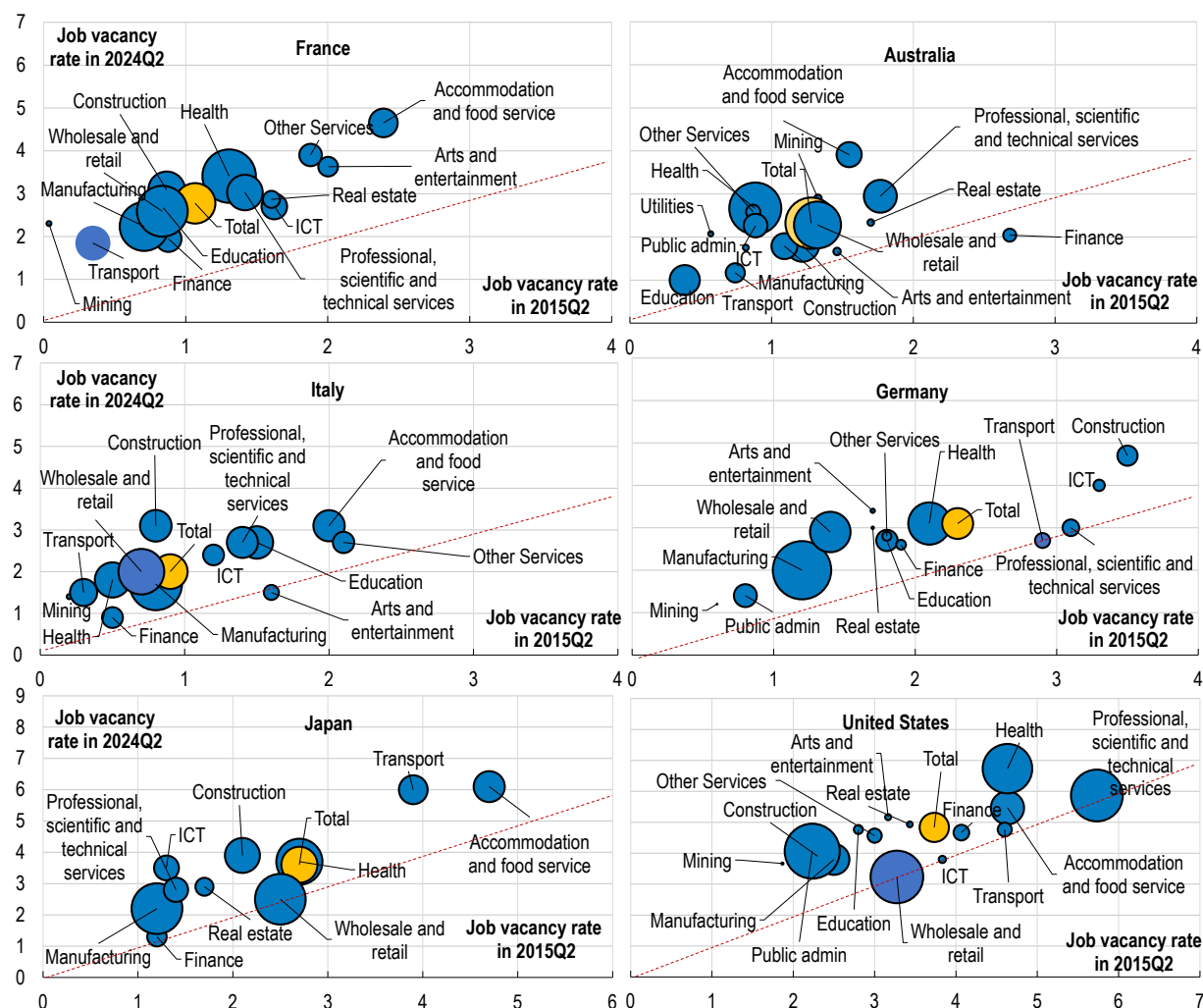
¹⁵ These countries feature the same industry classification and aggregation.

Figure 7. Job vacancies across industries and countries

Panel A. OECD average



Panel B. Country-specific patterns



Note: Job vacancy rate data are defined on a quarterly basis and are seasonally adjusted, with the exception of France. The unweighted cross-country average covers the following countries: AUS, BEL, CAN, CZE, CHE, DNK, EST, FIN, FRA, ESP, GBR, DEU, HUN, ITA, JPN, KOR, LVA, LTU, LUX, NLD, NOR, POL, PRT, SVK, SVN, SWE and USA. Panel A does not cover Utilities (i.e. Electricity, gas, and steam and air conditioning supply; Water supply, sewerage, waste management and remediation activities) and mining & quarrying, because relevant data are not consistently available across OECD countries. Data for the Health sector are not available for Denmark. Panel B: for each country, the size of the bubble represents the importance of the industry as measured by its employment share. The "Total" bubble is included as a reference point: its size is not to be interpreted.

Sources: Eurostat, Job vacancy statistics by NACE Rev.2 activity - quarterly data; Australian Bureau of Statistics (August 2024), Labour Account Australia, ABS Website; Statistics Canada, Table 14-10-0400-0. Job vacancies, payroll employees, and job vacancy rate by industry sector, quarterly, adjusted for seasonality. US Bureau of Labor Statistics, Job Openings and Labor Turnover Survey; Office for National Statistics (ONS), released 12 November 2024, ONS website, statistical bulletin, Vacancies and jobs in the UK (Dataset VACS02: Vacancies by industry); La Dares, Les emplois vacants au 2e trimestre 2024, provisional data (released on 13 September 2024); Ministry of Health, Labour and Welfare of Japan, Survey on Labour Economy Trend, Portal Site of Official Statistics of Japan website; Ministry of Employment and Labor, Republic of Korea, Labor Force Survey at Establishments, MOEL website.

Box 2. Going granular on the nature of jobs in shortage of workers based on online job postings

Online job postings data have been increasingly used in policy-oriented economic analysis, not least in the aftermath of the COVID-19 crisis in a context of supply disruptions and subsequent labour shortages (Causa et al., 2022^[2]; Duval et al., 2022^[3]; Jaumotte et al., 2023^[32]; OECD, 2023^[33]; OECD, 2024^[34]; Pizzinelli and Shibata, 2023^[35]; Dorville, Filippucci and Marcolin, forthcoming^[5]). They have relevant advantages compared to official job vacancy data, in particular their timeliness, high-frequency, and consistent granularity across different economic activities. These come with some limitations, including: i) their taxonomies, which are close but not equal to standard international industry/ occupation classifications, making it difficult to directly compare and transpose to official data on job postings; and ii) their limited national representativeness, since not all job positions are posted online, and the selection is not random. High-skilled occupations tend to be over-represented in online job postings, while jobs in small businesses and in agriculture, as well as low-skilled occupations, tend to be under-represented, implying risks of upward biases.¹⁶

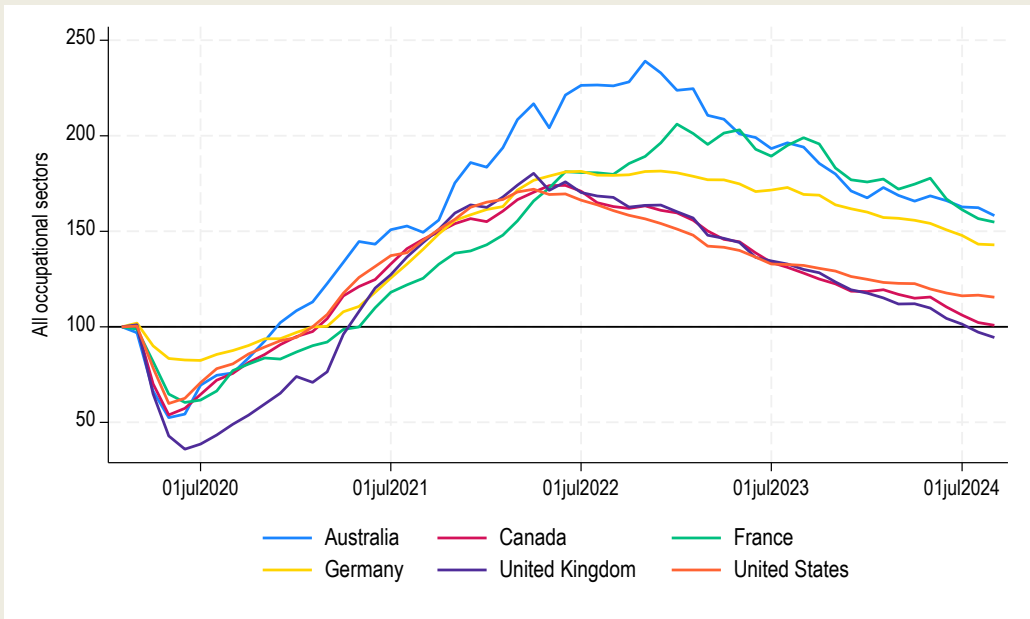
Against this background, this box relies on online job postings data from Indeed, the world's largest job advertisement platform operating in multiple countries, to provide an overview about the specific nature of jobs for which firms face increasing recruitment difficulties. Indeed data is collected daily and distributed weekly, with one-week lags, since February 2020. This box covers data up to September 2024 for the following available countries: Australia, Canada, France, Germany, the United Kingdom, and the United States. The main insights are (Figures 8 & 9):

- Across all countries covered, online job posting data confirm an easing of labour shortages since the 2022 peak (Figure 8). As of September 2024, job postings were below or near pre-pandemic levels in Canada, the United Kingdom, and the United States; but still persistently above in Australia and France. This picture is broadly in line with previously-reported job vacancies' data from official sources (Figure 6).¹⁷
- In most countries, including those experiencing an overall easing in labour shortages, health and care-related job categories, such as "Personal Care & Home health", "Physicians & Surgeons", and "Nursing", have been facing a continuous rise in labour demand – as can be seen in e.g. France and the United States (Figure 9). Again among contact-intensive occupations, and, in this case, mostly belonging to low-paid occupations, online job vacancies have been on the rise in "Cleaning & Sanitation" – as can be seen in e.g. Australia and France. The next section of this paper will try to assess the quality of these jobs, with a view to understand whether poor working conditions could explain the pervasive shortfall of labour supply relative to demand.

¹⁶ For example, see Bellatin and Galassi (2022^[124]), Cammeraat and Squicciarini (2021^[125]), Carrillo-Tudela, Kaas and Lochner (2023^[126]), Napierala, Kvetan and Branka (2022^[140]). Nonetheless, empirical evidence shows that aggregate-level job postings tend to track well job vacancies from government sources, suggesting that they are broadly comparable with official estimates (Adrián and Lydon, 2023^[127]; Adrián et al., 2021^[23]; Bellatin and Galassi, 2022^[124]; Ciminelli et al., 2024^[128]).

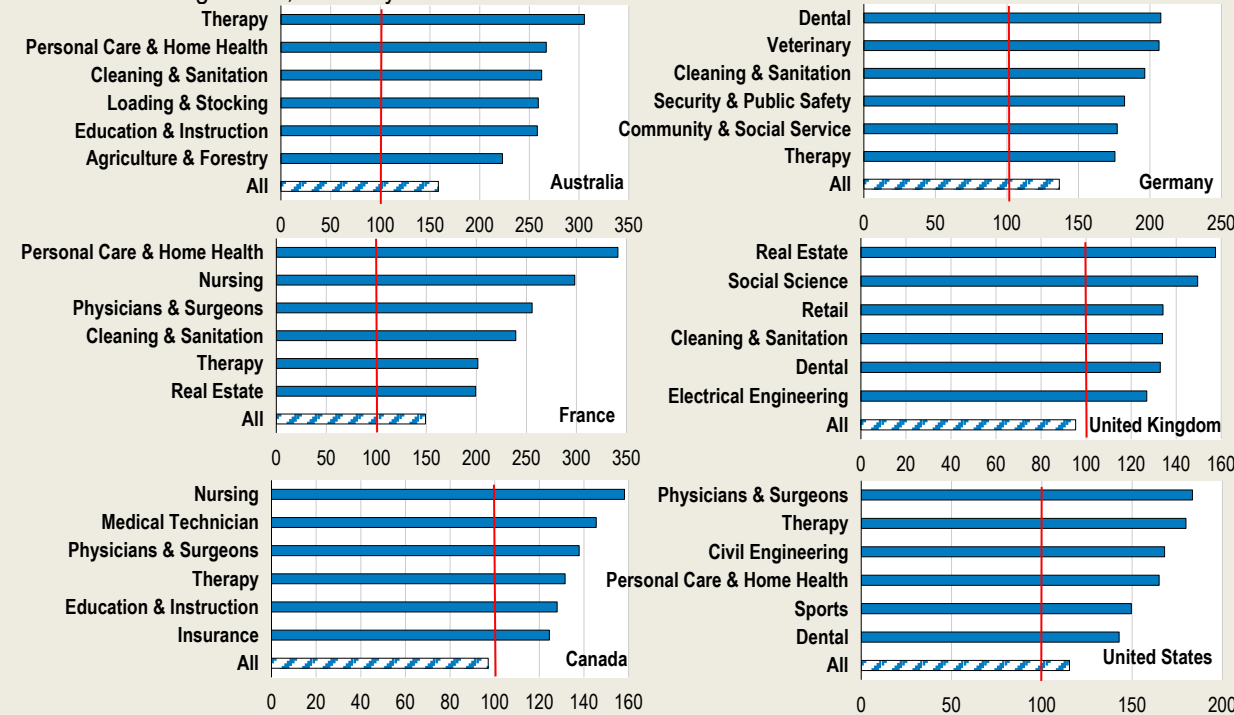
¹⁷ Germany does not seem to follow the same pattern as official statistics on job vacancies indicate a return to pre-pandemic levels as of 2024Q2. This difference between official and online vacancy data could reflect differences in measurement and therefore compositional effects: as explained in the text, the available literature in this area shows that online data tend to over-represent high-skilled jobs and under-represent low-skilled/ manual jobs, consistent with evidence about differential adoption of digital tools among firms, so including for recruitment purposes. See OECD (2024^[129]) for a comprehensive picture of digital adoption across OECD countries.

Figure 8. Developments in online job postings since COVID-19
Indeed Job Postings Index, February 1st 2020=100



Note: Data are seasonally adjusted. Figure shows unweighted average of all job categories on 1st of each month.
Source: Indeed. https://github.com/hiring-lab/job_postings_tracker

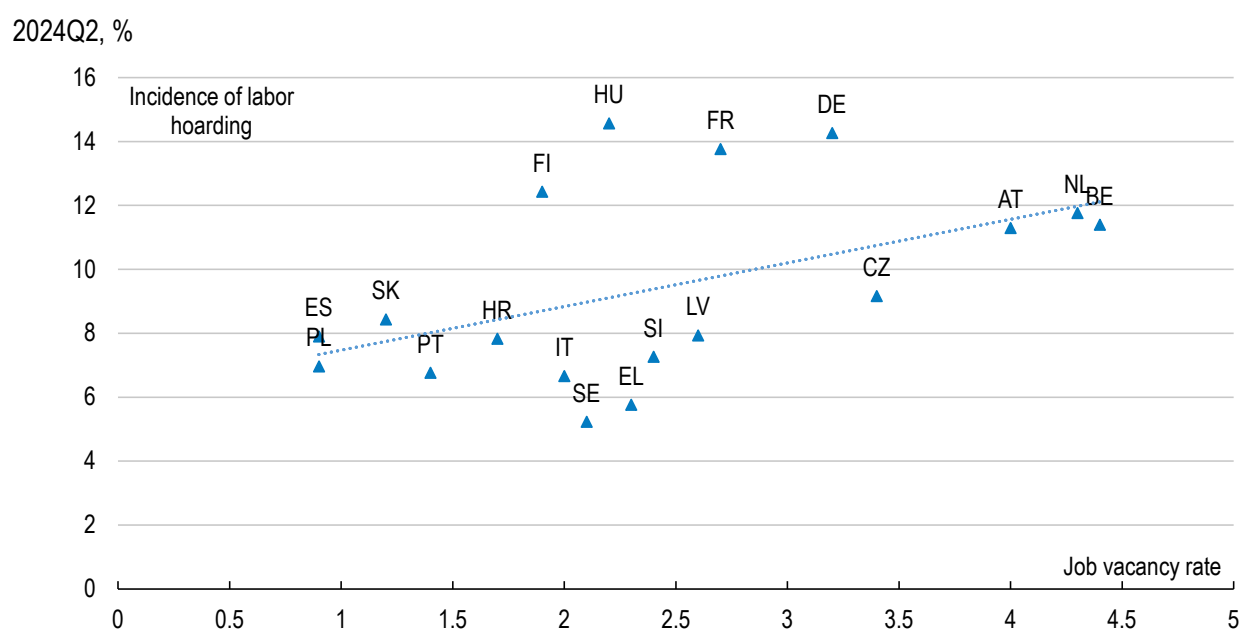
Figure 9. Occupational sectors with largest increases in online job postings, by country
Indeed Job Postings Index, February 1st 2020=100



Note: Figures show monthly average (September 2024) for the top 6 job categories and monthly unweighted average of all job categories for each country.
Source: Indeed. https://github.com/hiring-lab/job_postings_tracker

In a context of tight labour markets and recruitment obstacles, firms may be encouraged to hoard labour, that is, to retain workers more than necessary, especially where framework conditions make it relatively costly to adjust the number of employed workers (Génin and Scott, 2022^[36]; ECB, 2003^[37]). Recent evidence shows that more and more firms have been engaging in labour hoarding since the COVID-19 period (Arce et al., 2023^[22]; Botelho, 2024^[38]). This can be partly traced down to pandemic-related policy support measures which, at least in some countries, successfully prevented job separations and labour market disruptions. While previous rises in the incidence of labour hoarding were associated with a fall in vacancies in the background of economic contractions, more recent data do indicate on the contrary a significant positive correlation between job vacancy rates and the incidence of labour hoarding across EU countries (Figure 10).¹⁸ France and Germany feature for instance higher than average incidence of labour hoarding and of job vacancy rates, while the opposite holds for Poland and Spain. While this evidence is far from causal, it suggests the existence of a link between labour market tightness and hoarding, possibly reflecting the effect of policies and institutions associated with hiring and separations.

Figure 10. Labour shortages and labour hoarding across EU countries



Note: The labour hoarding indicator reports the percentage of companies which expect their output to decrease, weighted by firms employment share and the value added of the firm's sector, but their employment to remain stable or even increase. Seasonally-adjusted 2024Q2 data.

Source: Eurostat Labour Hoarding Index, Eurostat Job Vacancies Dataset.

¹⁸ This paper relies on the newly-developed labour hoarding indicator published by the EU as part of its Business and consumer survey database. For an overview of this metric, see https://economy-finance.ec.europa.eu/economic-forecast-and-surveys/business-and-consumer-surveys/download-business-and-consumer-survey-data/time-series_en#labour-hoarding-indicators.

Labour shortages, labour market inequalities and job quality

The scene setting and stylised facts reported in the first part of this paper show that, across advanced OECD countries, labour shortages are concentrated in certain industries and occupations, in particular contact-intensive services sectors, like accommodation and food, health and social care, and industries, like construction, transportation and storage. The agricultural sector cannot be systematically covered in this paper due to data availability issues, but it is covered when possible, in a context where available data do indicate significant labour shortages along with unattractive working conditions.

Overall, this section shows that jobs in shortage of workers tend to be characterized by: i) an over-representation of specific, often more vulnerable sociodemographic groups such as women and migrant workers; and ii) poor job quality¹⁹ in terms of pay and non-pay dimensions—the latter referring to job security, working time flexibility, access to training and, last but not least, safety at work (based on available data on exposure to health risks and work accidents). The present analysis focuses on labour shortages that are associated with poor job quality and possible distributional concerns, yet labour shortages associated with technological megatrends and skill mismatches are also significant, as suggested by vacancy rates in sectors like ICT and scientific services (Figure 7). The structural and, importantly, policy factors driving them are different in nature, which is why they are not covered in the present analysis. Complementary work by the OECD provides an analysis and policy discussion about labour shortages in high-skill and technologically advanced sectors.²⁰

Sociodemographic aspects

The analysis starts from the sociodemographic composition of the workforce in industries experiencing labour shortages, highlighting country-specific patterns, yet with a deliberate focus on those economic activities likely to raise policy-relevant distributional concerns. The main stylised facts are (Figure 11):

- Across all countries covered, by and large, women are highly overrepresented among healthcare workers, where their employment share is often very high, being for example almost 4 times higher than in the overall economy in Italy and Japan. Women also tend to be overrepresented in accommodation and food activities and are largely underrepresented in construction and transportation.
- The analysis of migrants' employment patterns reveals more heterogeneity across the countries featuring consistent data.²¹

¹⁹ As mentioned earlier in this paper, the measurement approach to job quality is broadly consistent the [OECD Job Quality Framework](#); it is designed to address the topic of labour shortages along the distributional dimension in the most relevant way, considering data availability conditions.

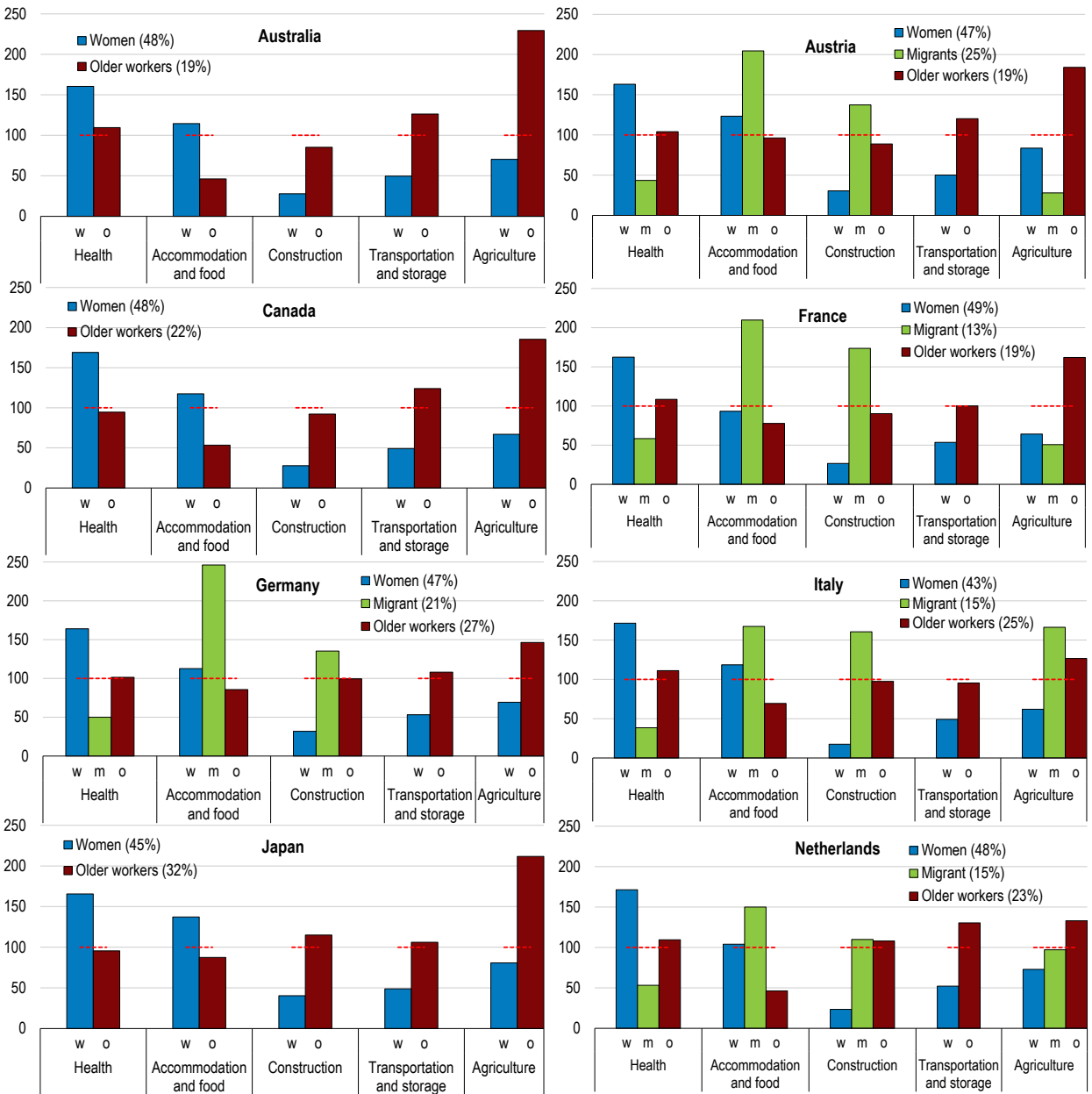
²⁰ See OECD (2024_[1]). For a discussion of the characteristics of labour shortages in high-skill and technologically advanced sectors and of possible policy solutions, see Filippucci, Längle and Marcolin (forthcoming_[47]).

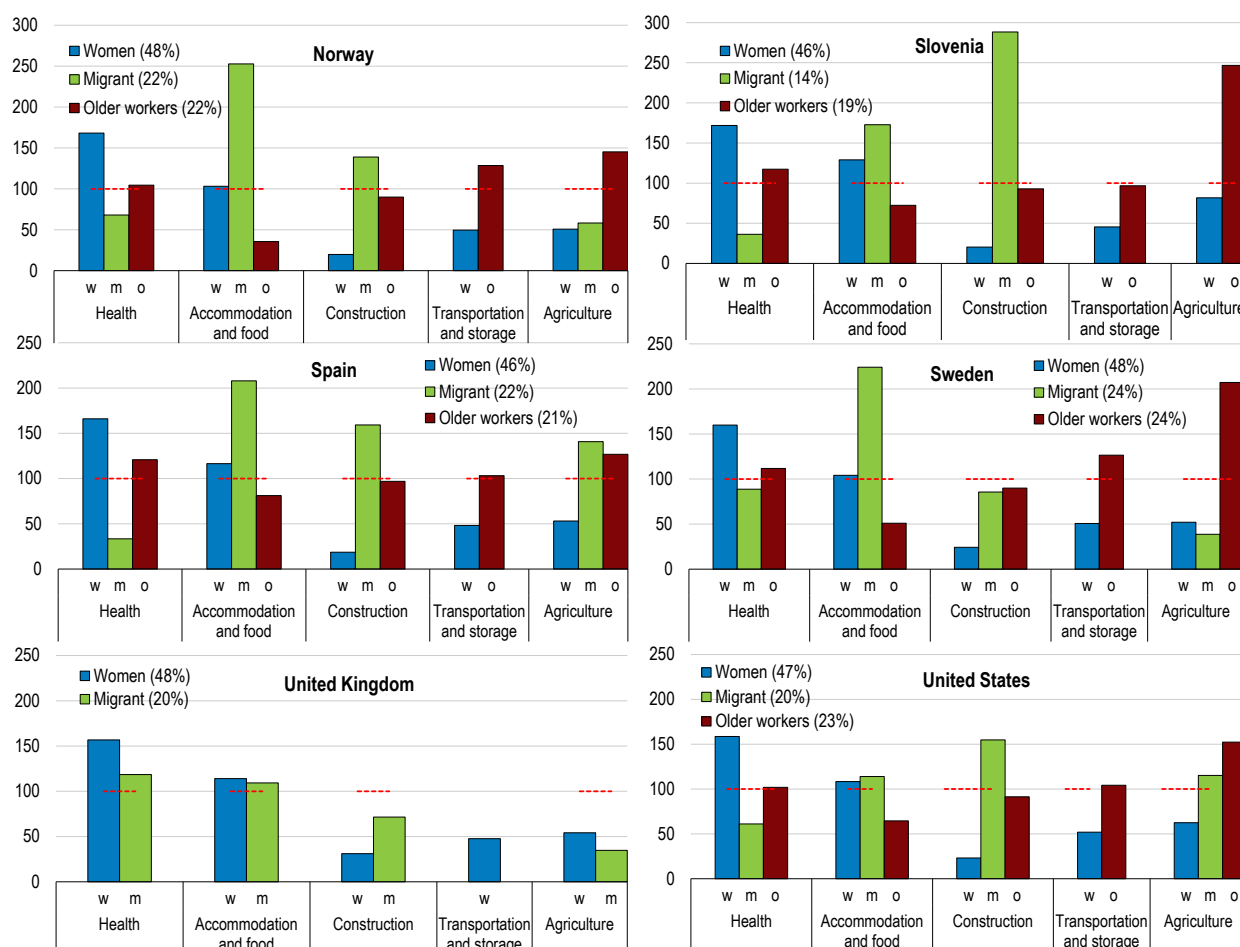
²¹ This picture is based on official data on migrant workers' "stocks" measured on an annual basis; yet migrant workers' "flows" tend to be highly responsive to cyclical conditions, for instance in the construction sector (see e.g. Fromentin (2014_[157])). This implies that employment shares could be understated in situations of rising demand in this sector, an argument that also applies to agriculture for seasonality reasons. Related and in addition to this point, the prevalence of informality in some countries is likely to imply an underestimation of migrants' employment shares, especially in sectors most exposed to demand conditions and seasonality.

- Migrants are overwhelmingly overrepresented in accommodation and food activities, where their employment share is more than double than in the total economy, as can be seen in the case of e.g. Austria, Germany and Norway.
- Migrants are generally overrepresented in construction, in particular in France, Italy, Slovenia, and the United States. Southern European countries covered by the data, such as Italy and Spain feature a high incidence of migrants - many of which likely hired seasonally - among agricultural workers, by contrast with other European countries featuring a relatively large agricultural sector, like France.
- The healthcare workforce is largely reliant on migrants in some countries, in particular the United Kingdom and, to a lesser extent, Sweden; but not in other countries with shortages in this sector, like Italy and Spain.
- Older workers are systematically overrepresented in agriculture: this is true across all countries covered, both those featuring a relatively low share of older workers in total employment, like Australia, Austria and France, and those featuring a relatively high share of older workers in total employment, like Canada, Germany and Japan.

Figure 11 The incidence and over/under representation of women, migrants, and older workers across industries, by country

Index 100 = Share of migrant/women/older workers across all industries, 2023





Note: The number in parenthesis for each sociodemographic group represents its share in employment across all industries. Migrants are defined as foreign-born workers, based on official data from the OECD International Migration Outlook. Older workers are defined as in the age range 55 and above. How to read: in Germany, migrant workers represent around 20% of total employment; they are over represented in accommodation and food activities, where their employment share is nearly 2.5 times larger than their share in all activities so around 50%; in Sweden, older workers represent around 24% of total employment, they are over represented in agriculture, where their employment share is more than double their share in all activities so around 48%. Data on migrants is missing for some countries e.g. Japan, and some industries e.g. Transportation & Storage and Agriculture for some countries. Data on older workers is missing for the United Kingdom.

Sources: OECD (2024^[21]) (Annex Table 1.A.6 for employment of foreign-born persons by industry), Australian Bureau of Statistics (AUS), Statistics Canada (CAN), Office for National Statistics (GBR), Official Statistics of Japan (JPN), US Bureau of Labor Statistics (USA), and Eurostat (OECD-EU).

This evidence is broadly in line with comparable literature on women labour market integration and gender gaps, for instance the fact that women represent the bulk of healthcare workers. This is particularly relevant in a context where demand has been on the rise relative to supply, as jobs in this area, in particular nursing, have been losing attractiveness among young people.²² The picture on migrants in the workforce is also consistent with previous evidence by the OECD²³ and other international organisations (European Commission, 2023^[39]). The policy discussion on international migration is receiving increasing attention in debates across advanced economies, where population ageing implies a shrinking labour force and an increased demand for specific goods and services such as health and social care.

The agricultural sector has been facing increasing challenges in a context characterized by globalisation, also domestic retrenchment associated with COVID-19 (OECD, 2020^[40]), and the need to expand and develop greener production techniques to reduce air emissions and environmental damages associated with, for example, the use of harmful pesticides.²⁴ This sector is also suffering from labour shortages, all the more because it is dominated by older workers: as those workers approach retirement, there is an increasing risk that underlying agricultural activities disappear, as younger generations are not sufficiently attracted by the profession. Economic, social and policy challenges are acute in this area, especially in countries characterised by an historically large agricultural sector like e.g. Greece, Ireland, and Italy. While being very important, the analysis of labour shortages in agriculture is hampered by a lack of comparable data. However, in-depth studies of a more qualitative nature allow to shed some light in this area: Box 3 relies on this literature to summarise key facts and policy issues.

Box 3. Labour shortages in agriculture, evidence & intergenerational implications

Employment in the agricultural sector has been on a long-term downward trend across OECD countries. This has been taking place in a context where the interaction of structural and technological changes in the farming industry,²⁵ along with changes in consumer preferences,²⁶ have been transforming the agricultural landscape and consequently labour demand.

Ensuring an adequate supply of labour to the agricultural sector is a high policy priority issue in many advanced economies. Recent OECD reports (Campi et al., 2024^[41]; OECD, 2023^[42]; Ryan, 2023^[43]) identify key factors characterising labour shortages in agriculture, and provide an overview and discussion of concrete policy actions to address associated challenges. The evidence about the nature and drivers of labour shortages can be summarized as follows:

- **Characteristics of the workforce:** while the incidence of family workers in the farming industry remains predominant, the share of workers hired outside the family has increased, with a growing reliance on temporary, seasonal, and part-time workers, mostly migrants. A steadily

²² See e.g. OECD (2023^[64]) and OECD (2024^[7]).

²³ See e.g. the OECD International Migration Outlook series (OECD, 2023^[74]).

²⁴ See for instance recent evidence on ammonia emissions by the agriculture sector <https://www.eea.europa.eu/en/newsroom/news/emissions-of-key-air-pollutants>. For EU level stated priorities in the area of agriculture and the green transition: https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal/agriculture-and-green-deal_en.

²⁵ Structural factors include a trend increase the size of farms along with changes in ownership structure, in a context of demographic changes associated with ageing. Technological factors include the rising use of automation, robotics and drone technologies.

²⁶ Changes in consumer preferences are driven by e.g. concerns about food quality, environmental footprint and animal welfare.

ageing workforce, the underrepresentation of women, and lower formal education and training are common issues across OECD countries.

- **Labour and skills shortages:** labour shortages in agriculture are significant for both low and high-skilled jobs, with the former requiring manual tasks such as harvesting fruits, vegetables and horticulture, and the latter requiring non-manual tasks, such as spurring the adoption of new technologies and running business operations with entrepreneurial and management skills, along with marketing experience. Importantly, the sector suffers from skills misalignment, with over 40% of workers being considered as mismatched.²⁷
- **Entry barriers and weak incentives:** several obstacles can explain the low number of new entrants to the sector, including capital constraints, limited access to land and regulatory complexities, along with weak economic incentives associated with low profitability. A generational renewal (i.e., the retirement of older farmers to be replaced by younger cohorts) is also critical for the sustainability of farming, because farm succession and inheritance are the primary means of accessing agriculture. Meanwhile, the incentives for workers to enter the sector tend to be low, due to poor remuneration and working conditions, hard physical work and high risks of work accidents, as shown later in this paper. This is compounded by a negative perception of agriculture as a professional career, especially among young people.

Turning to the discussion about **concrete policy actions to address labour shortages in agriculture**, main highlights and examples of government interventions are:

- **Specialised training** and agricultural education programmes have been introduced, for example, in Japan, Spain, the Netherlands and the United States to ensure a better alignment of education and skills and enhance life-long learning and training.
- **Policy measures to improve the perception and inclusiveness of the sector**, with the purpose of attracting and retaining a more diverse workforce, especially youth, including the following measures: income support for young entrants (Japan); improving wages, working conditions and career paths (New Zealand); targeted education and training for migrants (the Netherlands); support payments and tax incentives (Ireland); changing legislation to create formal farming ownership and increase managerial capacities for women (Spain); issuing special visas to facilitate migrant employment (the United States); giving priority access to measures for investment, advisory services and business start-up aid to young farmers (European Union); and linking EU Common Agricultural Policy²⁸ payments to compliance with European labour laws related to working and employment conditions (European Union).

Beyond these measures, the literature in this area calls for complementary policy actions, including supporting the adoption of new technologies while strengthening the capacity of national farm advisory services, and measures to support farmers' income and reduce monopsony power by food products distributors (Moreddu, 2011^[44]). Last but not least, priority should be given to enhancing the availability and comparability of granular data about the agricultural sector, for instance in terms of granular information about the composition of the workforce as well as job characteristics associated with job quality, e.g. pay, contractual arrangements, job stability and working conditions.

²⁷ The finding is based on the OECD Skills for Jobs database, providing information on the misalignment between the quantity and quality of education credentials of workers and those required by their jobs. Among the 40% of mismatched workers in the agriculture, forestry and fishing sector, nearly half is under-qualified, meaning that the education qualification of those workers is lower than that required in the job. See [OECD Skills For Jobs](#).

²⁸ The Common Agricultural Policy 2023-27 (and 2014-22) is the central agricultural policy package in the European Union, which represents about one-third of the EU budget, financing direct payments to farmers and market support measures as well as co-financing rural development activities together with Member States.

Pay and broader job quality aspects

Developments in real wages across countries and the pay distribution

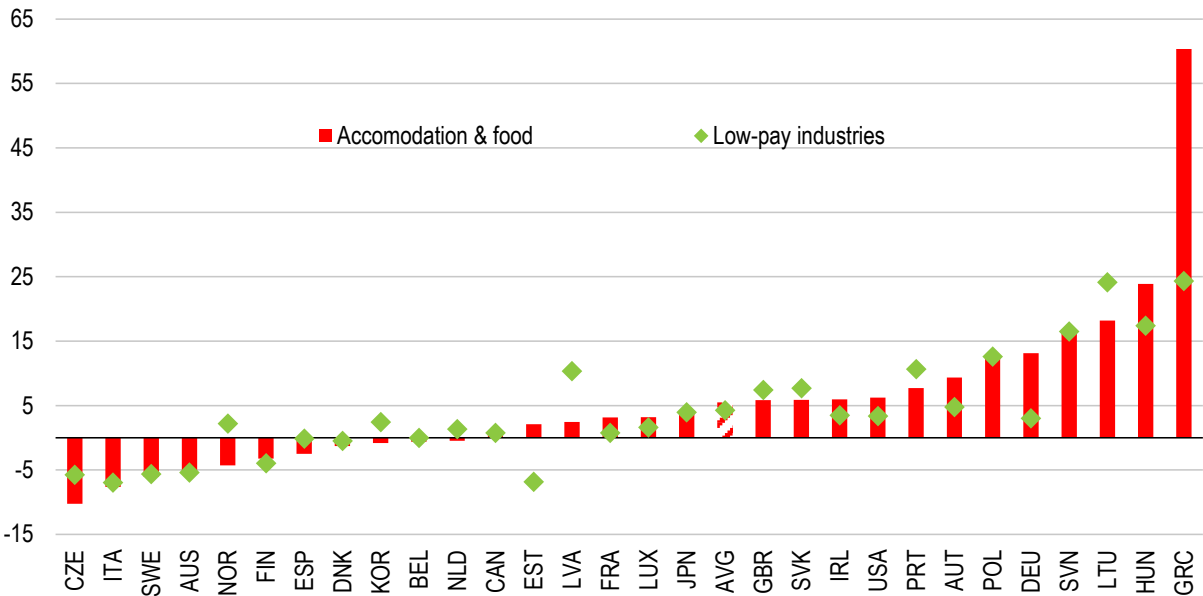
Assessing the quality of jobs in sectors with high vacancy rates requires looking at wage and non-wage dimensions, as drivers of workers’ willingness to enter or stay in those activities and occupations. This analysis starts by key stylised facts on real wage developments since 2019 Q2 across low, middle and high-pay industries facing labour shortages (Figure 12):²⁹

- Real wages in accommodation and food have increased across OECD countries, both in absolute terms and relative to wages in low-pay industries; yet with significant differences across countries, with major rises in e.g. Greece, Hungary, Lithuania, Slovenia and Germany, and losses in e.g. the Czech Republic, Italy, Norway, and Sweden.
- Workers in construction and in transportation and storage have experienced little or no gains in real wages, on average across OECD countries, in line with the broader group of middle-pay industries. The situation however differs across countries, with substantive improvements for both industries in e.g. Lithuania, and deteriorations in e.g. the Czech Republic.
- Wages in health and social work activities have declined in real terms in a number of OECD economies, in particular in Italy, Greece, and Sweden. However, healthcare workers in some Central European and Baltic countries have experienced gains in real wages higher than or in line with high-pay industries’ workers, as e.g. in Hungary and Poland.

Figure 12. Wage developments across low, middle and high-pay industries facing labour shortages

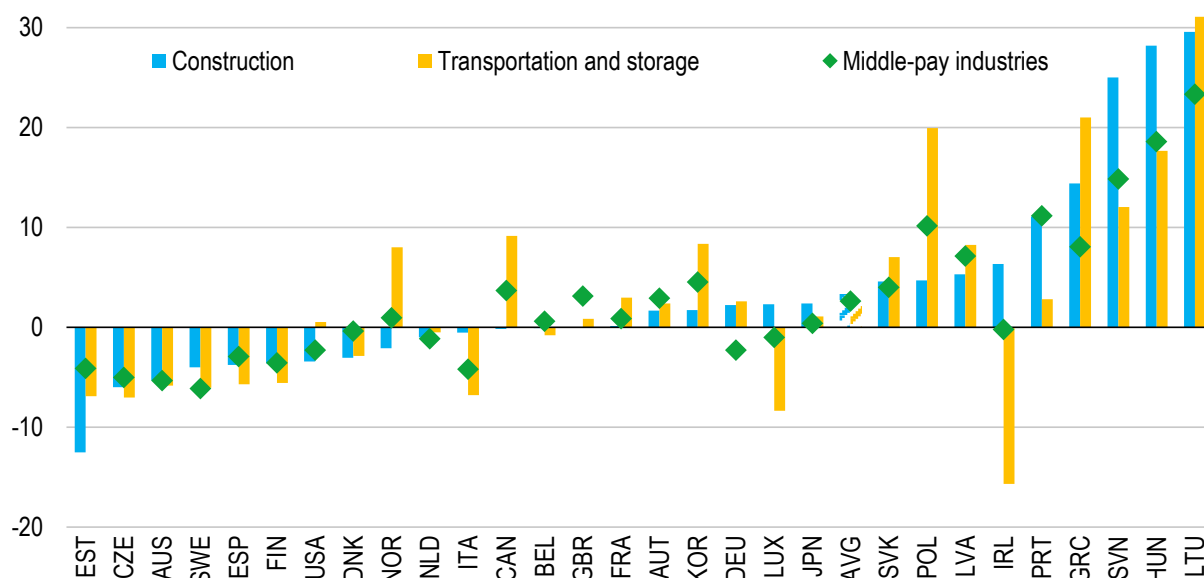
Percentage change in real hourly wages between 2019 Q2 and 2024 Q2

Panel A. Accommodation and food; Low-pay

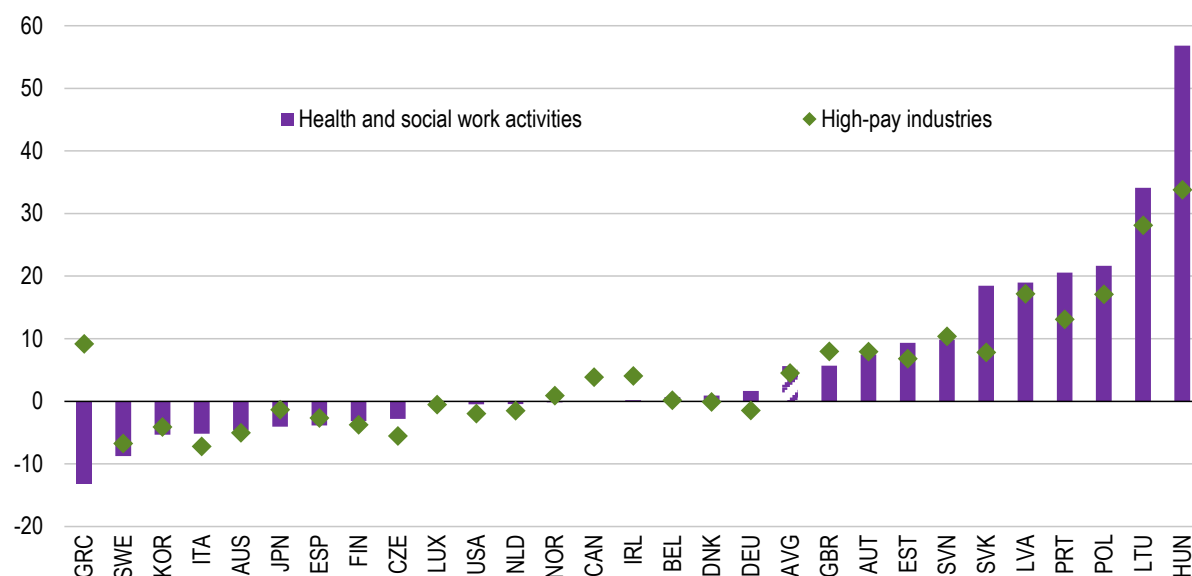


²⁹ The classification of low, middle and high-pay industries follows standard practice in the literature, for instance in OECD publications by the directorate for labour and social affairs, see e.g. 2023 and 2024 editions of the OECD Employment Outlook (for most recent analysis see Chapter 1 in OECD (2024_[34])).

Panel B. Construction, Transportation and storage; Middle-pay



Panel C. Health care and social assistance; High-pay



Note: Real wages are obtained by deflating nominal wages by consumer price inflation (all items). The average is a simple cross-country average. Low-pay industries include Accommodation and food service, Administrative and support service, Arts, entertainment and recreation and Wholesale and retail trade. Middle pay industries include Transportation and storage, Manufacturing, Other service, Real estate activities and Construction. High-pay industries include Human health and social work, Education, Professional activities, Information and communication and Finance and insurance, following the classification found in previous OECD Employment Outlook editions (OECD, 2024^[34]; OECD, 2023^[33]). Sources: Eurostat Labour Cost Index (OECD-EU countries), Australian Bureau of Statistics Wage Price Index (AUS), US Bureau of Labor Statistics Employment Cost Index (USA), Office for National Statistics Average Weekly Earnings by Industry (GBR), Statistics Canada Fixed weighted index of average hourly earnings for all employees (CAN), Official Statistics of Japan Wage indices of Total cash earnings (JPN), Statistics Korea Wage and Hours worked by industry/size of establishment (KOR).

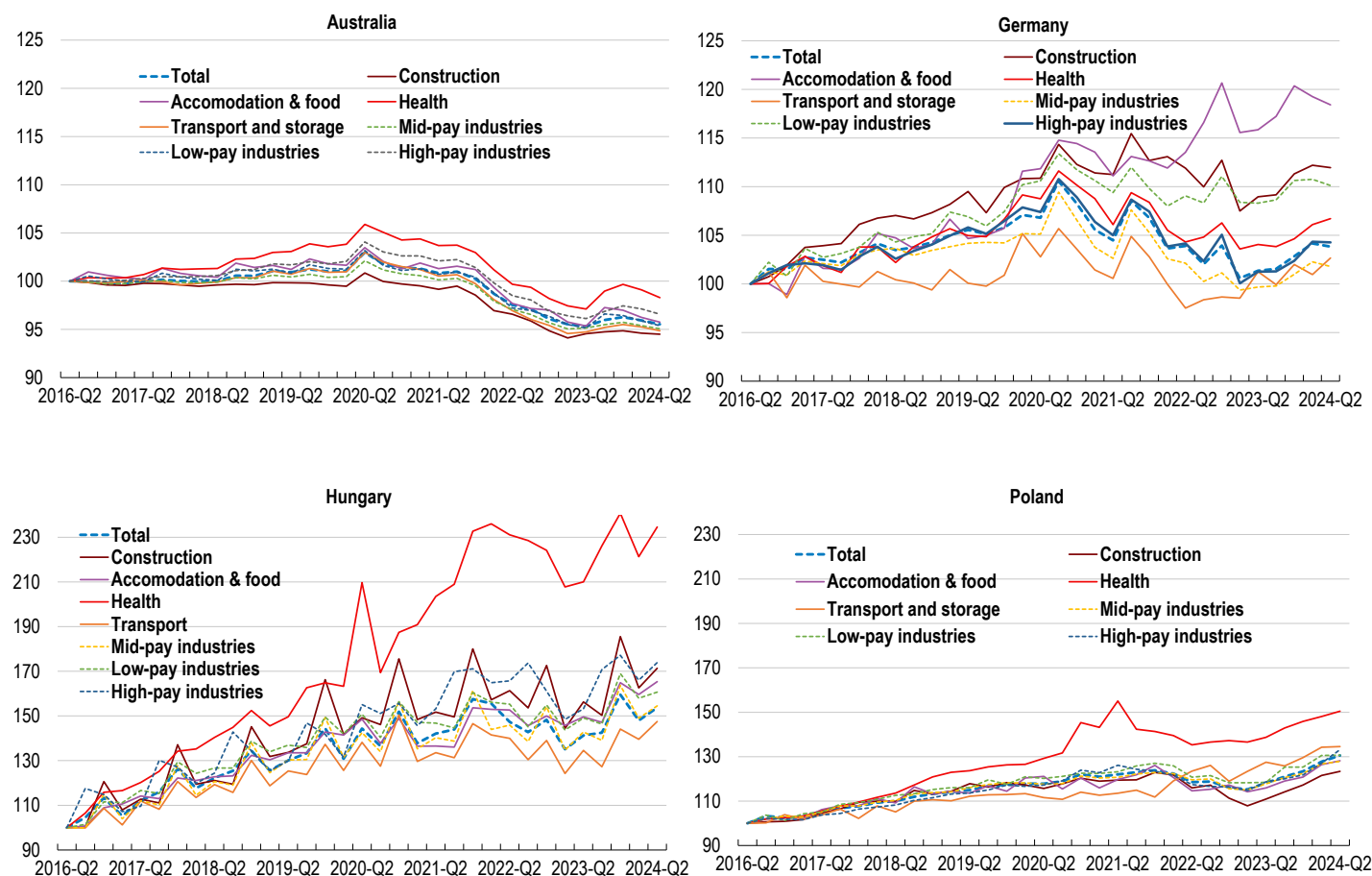
This evidence suggests a pattern of compression of pay levels, as wages in low-pay industries have fared better than middle and high pay industries in a number of countries, in line with earlier initial findings in OECD (2024^[34]). While this picture indicates a decline in labour market inequality, real wages remain overall below pre-pandemic levels³⁰ in a number of countries, including in those industries experiencing rising labour shortages. While aggregate sector data are too coarse to provide any relevant insights on the link between wage developments and labour shortages, research building on firm microdata has found a positive correlation between wage growth and labour shortages, after controlling for a range of fixed effects (Frohm, 2020^[45]; Groiss and Sondermann, 2024^[46]). Consistently with this, a recent firm survey administered by the OECD Global Forum on Productivity (Filippucci, Laengle and Marcolin, forthcoming^[47]) shows that firms declare raising wages as their preferred solution to recruitment difficulties. Zooming in on country-specific developments reveals a non-negligible amount of heterogeneity (Figure 13):

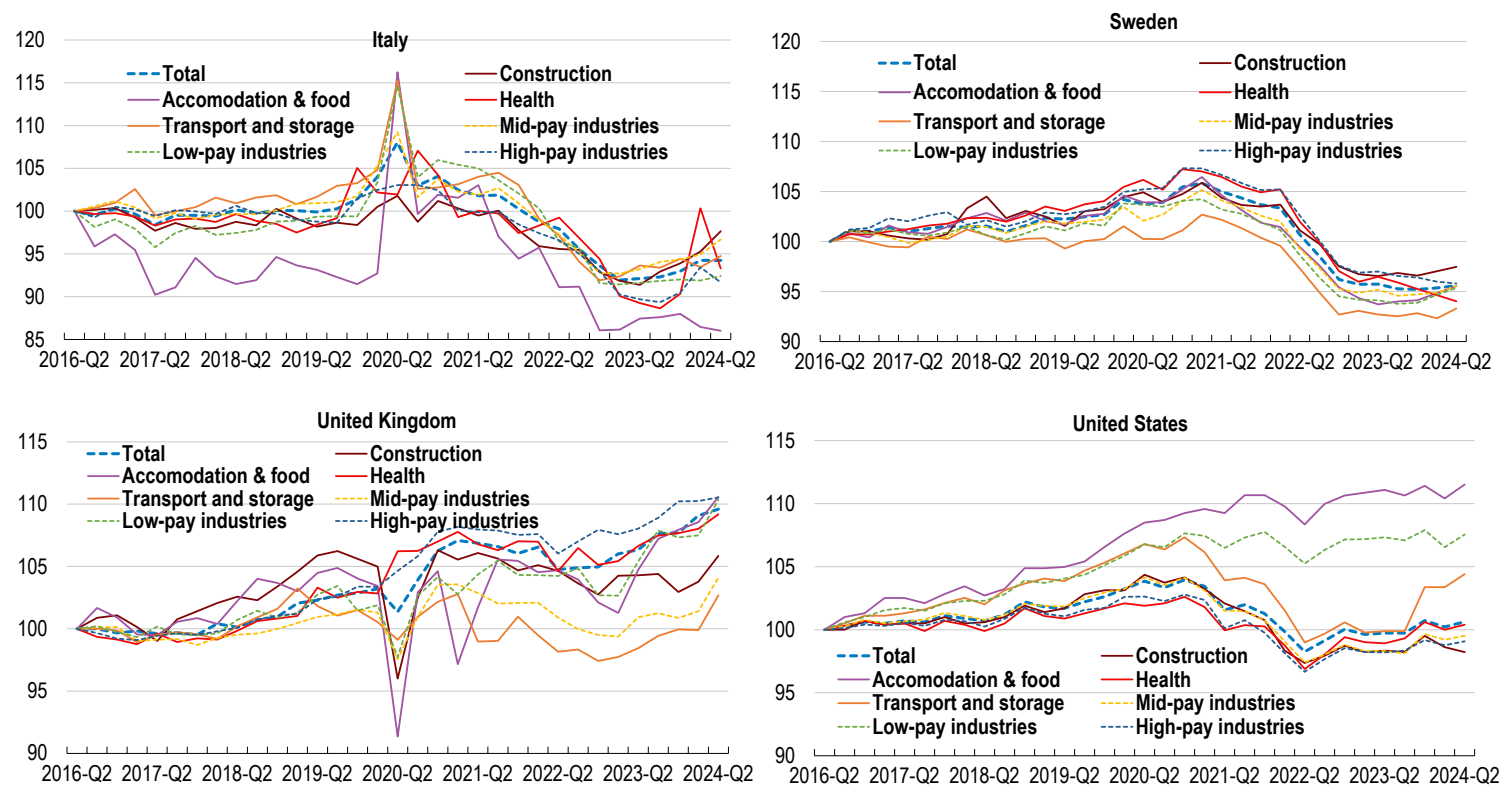
- Real wages have been on an overall declining trend in countries like Australia, Italy and Sweden, with little differences across industries – for instance, since 2016, Italian workers have suffered a 6% decline in real wages, on average, and even more in large industries such as hospitality and healthcare.
- The United States experienced a period of wage compression, as real wages increased by around 11% since 2016 in low-pay industries like accommodation and food, while high-pay industries have seen little change on average over the period, in line with initial evidence (Autor, Dube and McGrew, 2023^[48]).
- Pay developments across industries have been heterogenous in Germany and the United Kingdom. Like in the United States, wages in low-pay industries, especially accommodation and food, have risen, but wages in mid-pay industries, for instance in transportation and storage, have been stagnant. For example, in the case of the United Kingdom, the data indicate a progressive deterioration of wage growth in transportation and storage relative to other industries.
- Real wages have been on a rising trend in Hungary and Poland, most notably in the health sector, confirming previous evidence in this area (OECD/European Observatory on Health Systems and Policies, 2023^[49]; OECD, 2023^[50]; Government of Hungary, 2023^[51]; OECD/European Observatory on Health Systems and Policies, 2023^[52]).

³⁰ This finding that overall wages tend to remain below pre-pandemic levels is in line with the latest edition of the OECD Employment Outlook (OECD, 2024^[34]); and with the latest edition of the OECD Economic Outlook, which shows that real wages per employee have remained subdued in many countries (OECD, 2024^[1]).

Figure 13. Wage developments across low, middle and high-pay industries: country profiles

2016Q2 = 100





Note: Real wages are obtained by deflating nominal wages by consumer price inflation (all items). Low-pay industries include Accommodation and food service, Administrative and support service, Arts, entertainment and recreation and Wholesale and retail trade. Middle pay industries include Transportation and storage, Manufacturing, Other service, Real estate activities and Construction. High-pay industries include Human health and social work, Education, Professional activities, Information and communication and Finance and insurance.

Sources: Eurostat Labour Cost Index (OECD-EU countries), Australian Bureau of Statistics Wage Price Index (AUS), US Bureau of Labor Statistics Employment Cost Index (USA), Office for National Statistics Average Weekly Earnings by Industry (GBR).

Broader dimensions of job quality: job security, working hours arrangements and flexibility, access to training, safety at work

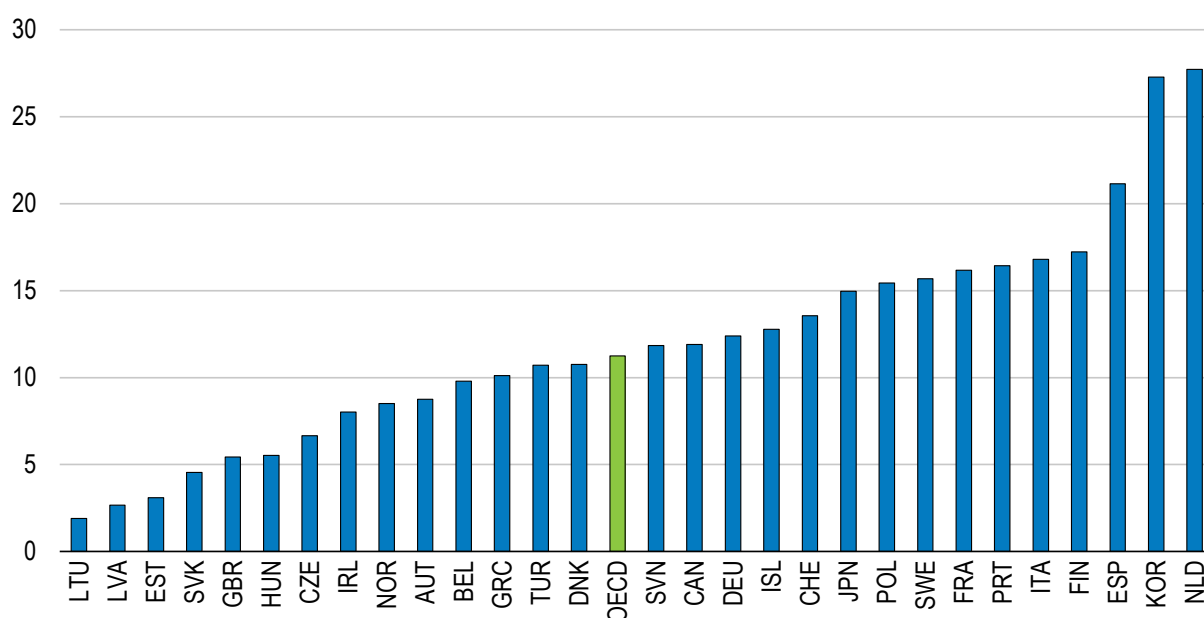
Temporary contracts

Whether a worker receives a permanent or a temporary contract is an important dimension of job quality (OECD, 2014^[53]). This reflects various factors: workers under temporary contracts typically have little access to social protection and training, and they are the first to be laid-off during downturns (OECD, 2021^[54]). The resulting lack of job security weighs on workers' willingness to apply for and accept a temporary contract, in particular in a context of tight labour markets allowing for alternative, more stable, opportunities.

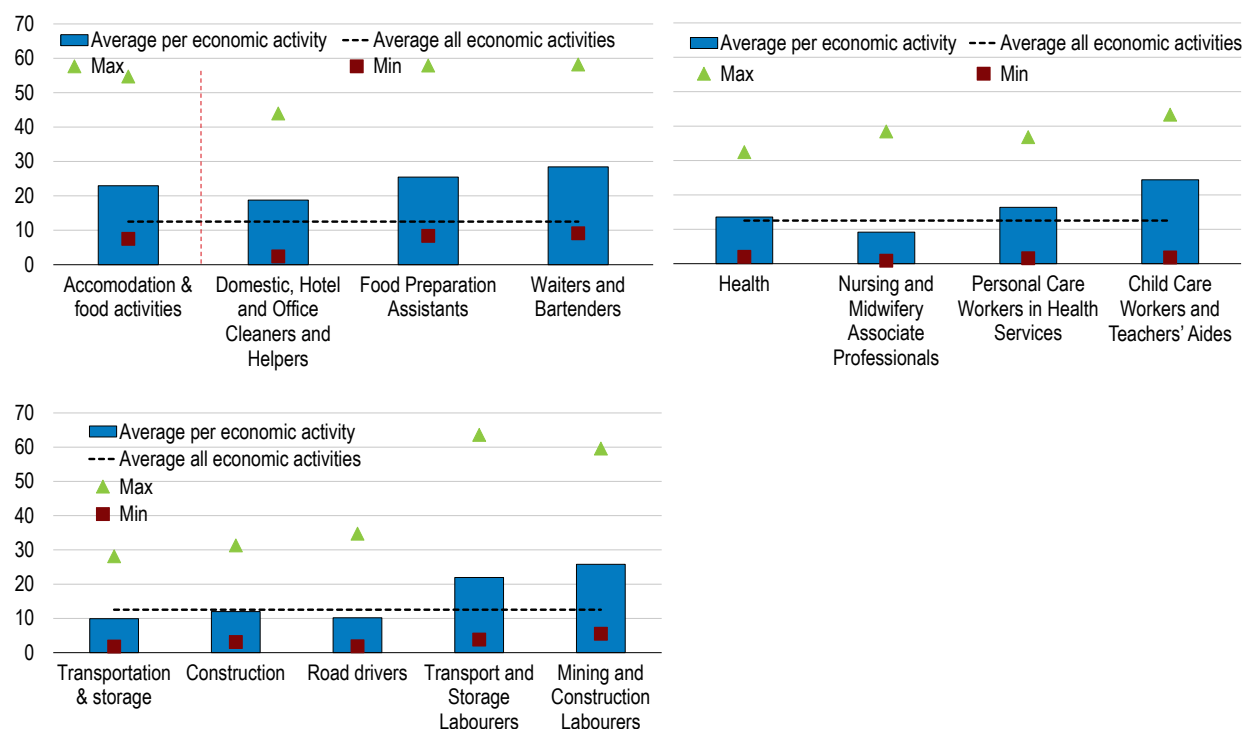
OECD countries exhibit stark variation in the incidence on temporary jobs, ranging from less than 5% in Estonia and the Slovak Republic to more than 27% in Korea and the Netherlands (Figure 14, Panel A), in line with previous evidence (Causa, Luu and Abendschein, 2021^[55]). Yet there are large differences across economic activities and, importantly for the purpose of the current paper, temporary contracts are over-represented in a number of jobs in shortage of workers (Figure 14, Panel B). This is particularly evident in the case of accommodation and food where, on average across EU countries, the share of temporary jobs among waiters and bartenders is around 30%, with peaks of 60% in some countries, more than double the share across all industries. Health and social care workers are also highly exposed to job insecurity risks, with around one fourth of employees under temporary contracts. A similar proportion applies to construction workers.

Figure 14. Temporary jobs

Panel A. The incidence of temporary jobs across OECD countries (%)



Panel B. Temporary jobs across selected industries and occupations, share of dependent employment (%), EU average and dispersion



Note: Panel A. Share of dependent employment, OECD countries. Panel B. Share of dependent employment by industry or occupation, EU average and min-max dispersion. How to read (Panel B): on average across EU countries, the share of temporary jobs is around 12%; this share is around 28% among waiters and bartenders, and it reaches almost 60% in some countries.

Sources: Panel A: OECD data on Employment by permanency of the job, 2022. Panel B: Secretariat calculations based on EULFS data. 2021-2022 average.

Working-time arrangements

Working time arrangements and employees' autonomy are an increasingly relevant dimension of job satisfaction and well-being, especially since the surge in use of flexible hours and teleworking arrangements in the aftermath of the COVID-19 crisis (Cazes et al., 2022^[56]). The literature shows that non-standard work schedules such as shift work and night work tend to trigger problems for workers in different areas including health and work-life balance.³¹ Against this background, one question is whether the shortage of workers in some industries and occupations is, to some extent, related to individuals' reluctance to accept non-standard work schedules. Figure 15 sheds some light on this question, based on available data on the incidence and distribution of shift work.³² The main stylised facts are:

³¹ See for example Silva and Costa (2023^[122]).

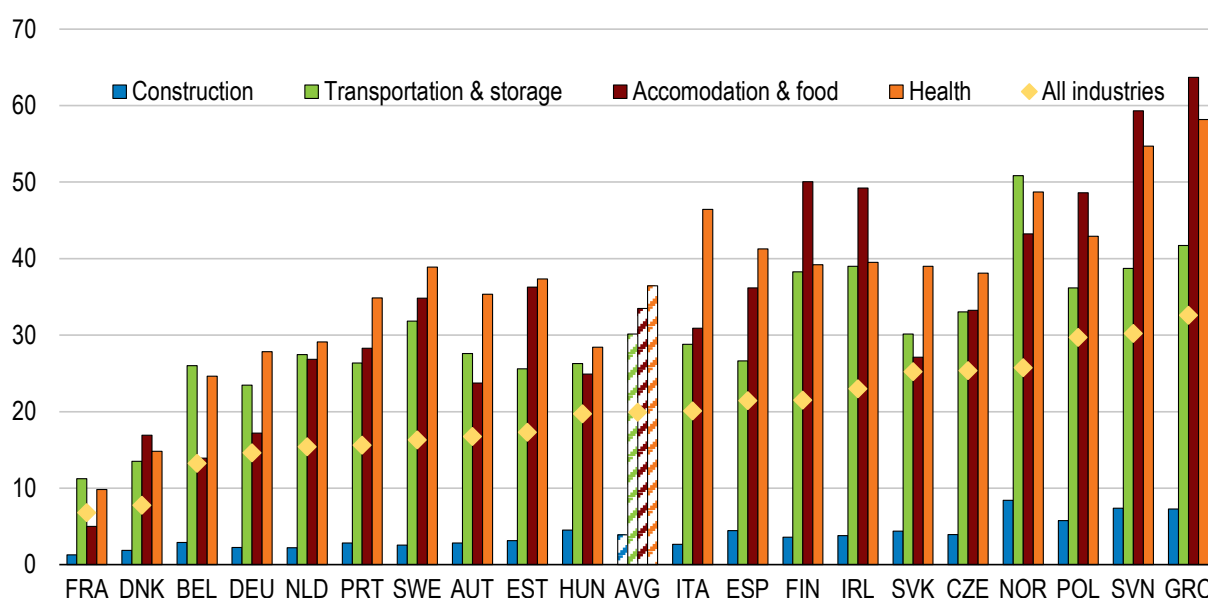
³² Shift work is defined as any method of organising work in shifts whereby workers succeed each other at the same work stations according to a certain pattern, including a rotating pattern, and which may be continuous or discontinuous, entailing the need for workers to work at different times over a given period of days or weeks (definition of the Directive 2003/88/EC).

- EU countries feature stark differences in the share of shift work: ranging from around 7% of dependent employees in France and Denmark, to around 30% in Slovenia and Poland. These differences tend to hold within (broadly-defined) industries (Figure 15, Panel B).
- Across all countries, industries facing labour shortages tend to exhibit higher incidence of shift work, in particular in healthcare, accommodation and food and transportation and storage. For example in Italy, around 46% of workers in the health sector are subject to shift work, compared to an average of around 20% across all sectors.
- Women represent the bulk of shift workers in nursing and personal healthcare work and in occupations like waiters, food preparation assistants and cleaners, reflecting their overrepresentation in these important activities. This implies challenging work and life balance organization, weighting especially heavily on working mothers. Yet some occupations subject to shift work are male-dominated, for example road drivers and transport and storage laborers.³³
- Overall, these jobs, often characterized by face-to-face interactions and/or by weak autonomy over worktime schedules, have seen increasing labour shortages over the last years.

Figure 15. Working hours arrangements: shift work and associated gender divides

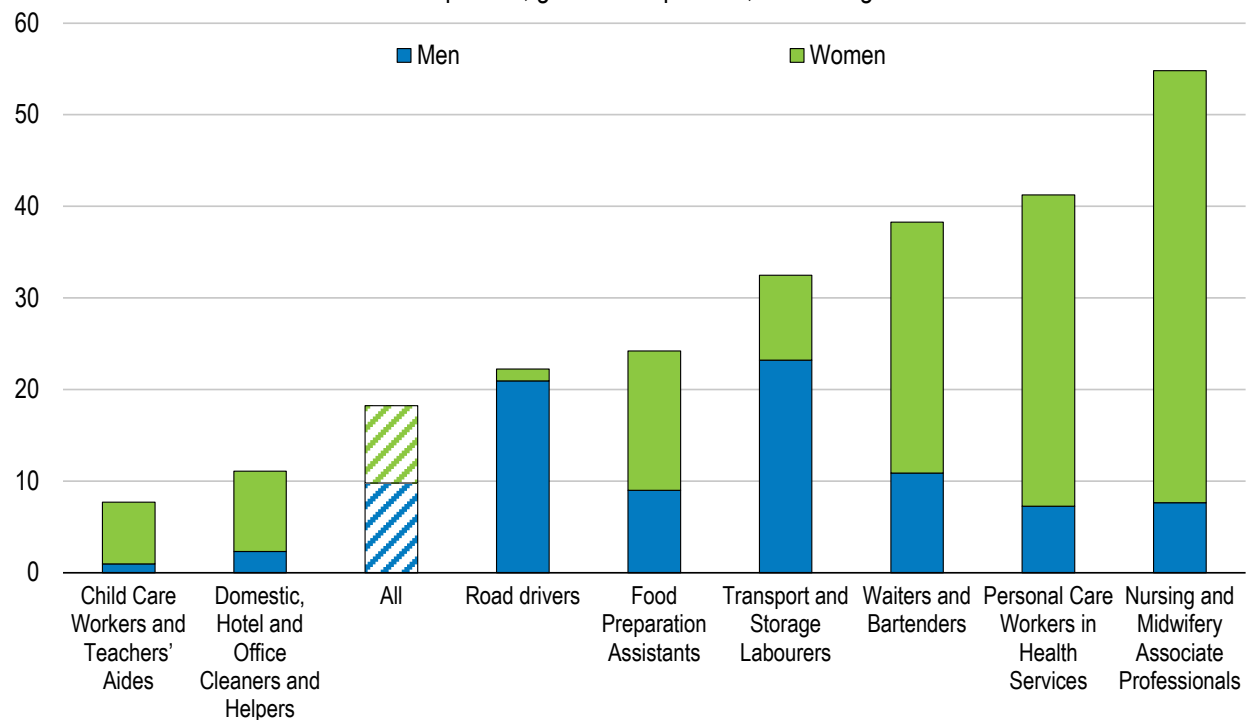
Share of dependent employment (%)

Panel A: Shift work across EU countries and selected industries



³³ The incidence of shift work is additionally related to regulatory settings concerning working hours. See OECD (2021_[11]) for a discussion, including effects on workers' wellbeing and work-life balance.

Panel B: Shift work across selected occupations, gender composition, EU average



Notes: Share of dependent employees who usually do shift work. The data refer to 2021 (and the picture is robust to using another year unaffected by Covid-19 lockdowns). Panel B: Simple average across the following countries: Austria, Belgium, Czechia, Germany, Denmark, Spain, Finland, France, Hungary, Ireland, Italy, the Netherlands, Poland, Portugal, Sweden, Slovak Republic. The data is not available for FIN and ESP for Waiters and Bartenders, for CZE and PRT for Transport and storage laborers, and for CZE, PRT and FIN for Food preparation assistants. How to read: on average across available EU countries, 55% of nursing and Midwifery Associate Professionals do shift work, the vast majority of which are women (47%).

Source: Authors' calculations based on EULFS.

Non-standard contracts

Labour market insecurity associated with non-standard contracts (such as temporary, part-time jobs, and self-employment positions) reflects the fact that such contracts are often characterized by limited access to social and job protection (Machin and Giupponi, 2022^[57]), as became politically salient in the context of the COVID-19 crisis (Causa and Cavalleri, 2020^[58]). Among the various forms of non-standard work, zero-hours contracts represent a notable form of job insecurity. Zero-hours contracts offer employers maximum workforce flexibility, for example where labour demand is unpredictable. These contracts do not guarantee workers a set number of hours, and employees are paid only for the hours worked. While suitable for some, such as students, semi-retirees or individuals pursuing additional interests, zero-hours contracts can often result into low-quality jobs for various reasons: job instability and insecurity, working hours hindering life planning and poor access to social protection.

Zero-hours contracts exist in a few OECD countries, including the United Kingdom, the United States, Canada and Australia, though with differences in their regulations both across countries and within countries, ie across regions or states. Box 4 provides a brief overview of the situation regarding zero-hours contracts in the United Kingdom, thanks to the availability of publicly-available official statistics by sector; yet in a context where these contracts may experience major regulatory changes or even disappear in the

United Kingdom to the extent that the government pledged to end “exploitative” zero-hours contracts that give no guarantee of working hours and reduce employment rights.

Box 4. Zero-hours contracts: stylised facts and recent policy developments in the United Kingdom

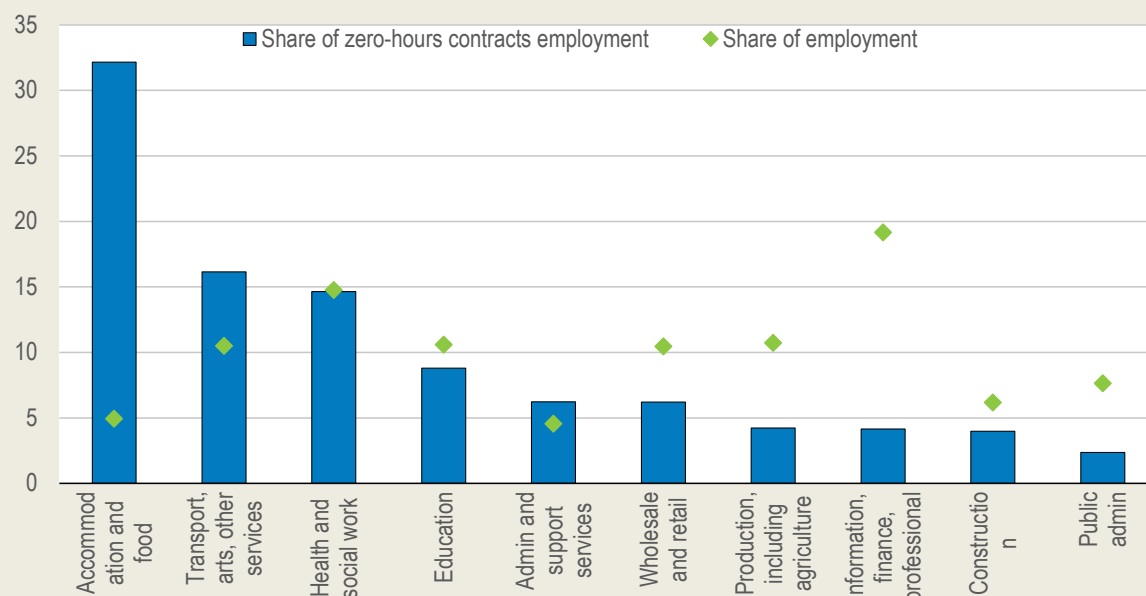
Zero-hours contracts have been under increasing attention in the United Kingdom, in a context of rising concerns about job insecurity. True, one advantage of zero-hours contracts is their flexibility for workers, who can decline any extra workload and thus choose their working hours. Yet official self-reported statistics from the 2023 Annual Population Survey (APS) shed light on the relatively poor job quality of zero-hours contracts. In addition to little job security and high financial unpredictability, workers under zero-hours contracts reported three times more often earning a low pay compared to regular job holders (31.6% vs 10.3%), considered there were fewer opportunities for career progression (15.3% vs 31.7%), and expressed higher dissatisfaction regarding the number of hours worked (25.4% vs 15.4%) (ONS, 2023^[59]).

The incidence of zero-hours contracts has risen quickly over the past few years, reaching in 2024 more than 1M workers (or 3% of employment), up from 170k workers (or 0.6% of employment) in 2010. Some industries, such as accommodation and food, transportation and storage, as well as health, rely disproportionately on these contracts (see Figure 16 and ONS (2024^[60])).

In this context, the UK authorities have pledged to undertake an important reform of employment and labour laws, including changes to zero-hours contracts to address labour market insecurity concerns. The Employment Rights Bill presented to the parliament on October 10th 2024 lays out the proposed overhaul of the regulations governing these contracts. Suggested reforms would in practice ban “exploitative” zero-hours contracts by: (i) offering the possibility for workers to enter a contract ensuring a minimum number of hours worked, based on the number of hours regularly worked in the last 12 weeks, and (ii) implementing a notice period for unplanned changes in workers’ shifts, with an appropriate proportionate compensation for cancelled, moved or curtailed shifts (UK Parliament, 2024^[61]). Progress in this area would improve financial security and income predictability for workers, as well as, importantly, their bargaining power, with positive effects on the enforcement of employment law (Low Pay Commission, 2024^[62]; Resolution Foundation, 2023^[63]).

Figure 16. Stylized facts about zero-hours contracts in the United Kingdom

Share of employment by industry (%)



Note: How-to-read: in the United Kingdom, the accommodation of food industry represents 4.9% of employment and 32% of the employment under zero-hours contracts in Q2-2024; the information and finance industry represents 19% of employment and 4% of the employment under zero-hours contracts.

Source: ONS Employment by industry EMP13, ONS People in Employment on zero-hours contracts EMP17. The data refer to April-June 2024. Release date : 13 August 2024.

Training opportunities

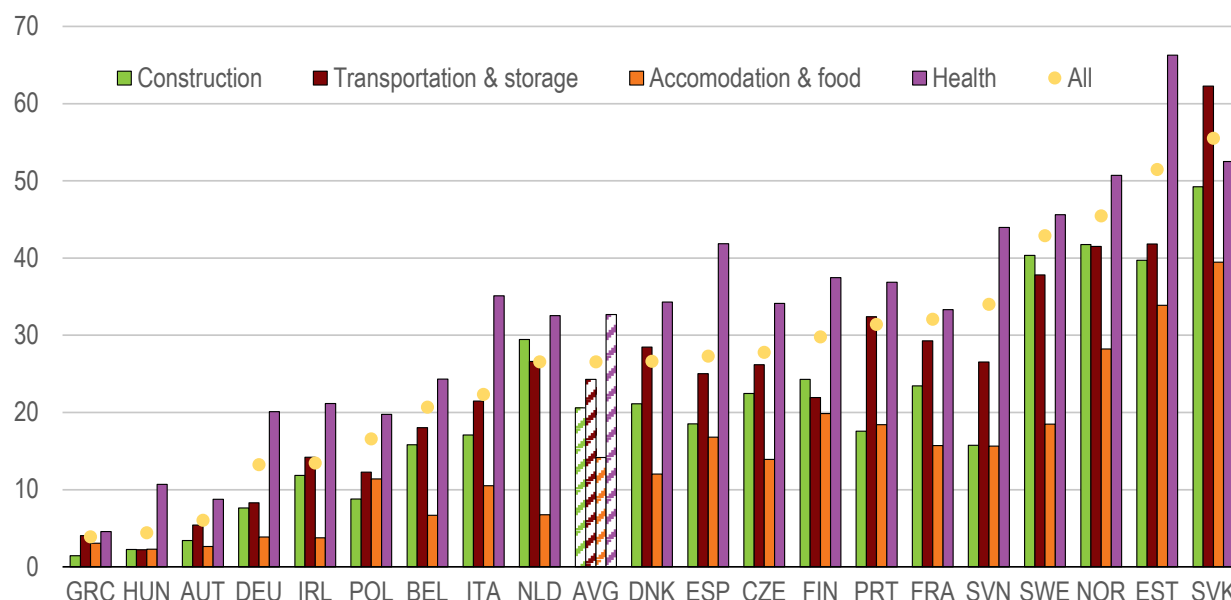
Workers' training is an increasingly relevant aspect of job quality and a crucial tool to support economic growth and inclusiveness, in particular in a context of structural trends such as population ageing, digitalisation and the green transition,³⁴ which calls for policies to focus on lifelong learning and requalification. Zooming in on workers in industries facing increasing labour demand, the data indicate low participation in training in a number of such activities; yet, even more striking, remarkable differences across countries (Figure 17):

- Workers' actual participation to job-related training varies substantially across EU countries, ranging from around 55% of all employees in the Slovak Republic to around 4% in Greece.
- Differences across industries are significant: healthcare workers are the most likely, and accommodation and food workers the least likely, to participate in training. The magnitudes tend to follow cross-country patterns, with training rates being relatively low among workers in high-shortage industries, as can be observed in Austria and Germany.

³⁴ See e.g. OECD (2023^[130]), OECD (2024^[34]), Causa, Nguyen and Soldani (2024^[68]), and Causa et al. (2024^[69]) for analysis and discussion on workers' training and reskilling in the context of the green transition.

Figure 17. Workers' participation to training activities across EU countries, selected industries

Share of workers who participated to at least one job-related non-formal training activity in the last 12 months



Notes: Share of dependent employees who participated in at least one job-related non-formal education or training activity in the last 12 months. This EULFS measure of training refers to institutionalized taught learning activities outside the formal education system which the respondent has attended during the last 12 months. Data refers to 2022. Panel B: Simple average across the following countries: Austria, Belgium, Czechia, Germany, Denmark, Estonia, Spain, Finland, France, Hungary, Ireland, Italy, the Netherlands, Norway, Poland, Portugal, Sweden, Slovak Republic. The data does not cover Waiters and Bartenders for Finland and Spain, Transport and storage labourers for Czechia, Estonia, Ireland and Norway; Food preparation assistants for Czechia, Estonia, Finland and Norway.

Source: EULFS. See Eurostat: EU Labour Force Survey, Explanatory Notes for additional information on this measure.

Health risks

Exposure to health risks³⁵ and unsafe working conditions is another fundamental dimension of job quality; not only because it affects well-being and productivity, but also, because it affects individuals' incentives to remain and join those professions most exposed to such risks. Job strain can be associated to difficult work environments and working times, as discussed before; yet this at least in part relates to health risks, including physical and the increasingly recognized mental risks factors, such as work pressure and overload. This type of exposure is very likely to contribute to labour shortages, especially among low-paid occupations characterised by job strain, as highlighted in the literature and in policy discussions, especially in the aftermath of the COVID-19 pandemic: with the heavy price paid by healthcare and other "frontline" workers, as well as the detrimental effect on mental health among populations (OECD, 2023^[64]; OECD, 2021^[65]).³⁶

³⁵ See the [OECD webpage on health and work](#) for a comprehensive overview, infographics and discussion.

³⁶ This detrimental effect has especially marked for youth, more than for adult workers, in part due to the lack of social interactions resulting from the necessary lockdowns (Bell et al., 2023^[134]). In that sense, it is probably too early to provide a robust picture on longer-term consequences for young cohorts of workers.

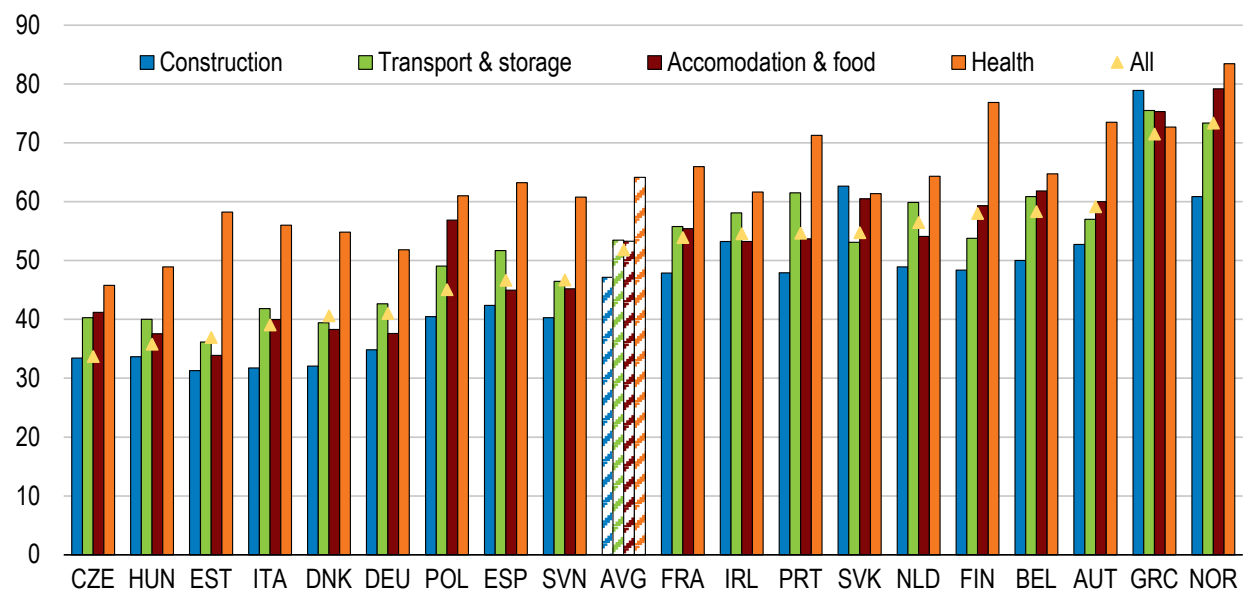
The latest EULFS special module on health at work provides a granular picture on workers' exposure to mental risks, zooming in on those usually low-paid jobs identified as being under significant shortage. The analysis of these data indicates that work-related mental health concerns are pervasive in the EU workforce, and particularly among those contact-intensive jobs in higher demand of workers (Figure 18, Panels A & B):

- Exposure to mental health risks affects around half of employed individuals, on average in the EU; with significant differences across countries, as the share of workers reporting exposure to such risks ranges from 34% in Czech Republic to 77% in Sweden.
- Workers in the health sector are most likely to face mental health risks, with reported exposure reaching 60% of employment in the vast majority of EU countries.
- Zooming in on specific occupations and on specific mental health risk factors indicates that nurses and personal healthcare workers are particularly affected, especially by pressure or work overload: on average across the EU this factor is reported by around 34% of nurses and midwifery professionals, well above the economy-wide average of 22%.
- Beyond the healthcare sector, workers in other contact-intensive activities facing labour shortages also report high exposure to mental health risks, due to e.g. difficult interactions with customers among waiters and bartenders and pressure or work overload among road drivers.
- Job insecurity is also one frequent reason to report exposure to mental health risks among high-shortage occupations, which is consistent with previous findings about the high incidence of temporary contracts in some of these occupations, e.g. among workers in food and hospitality.

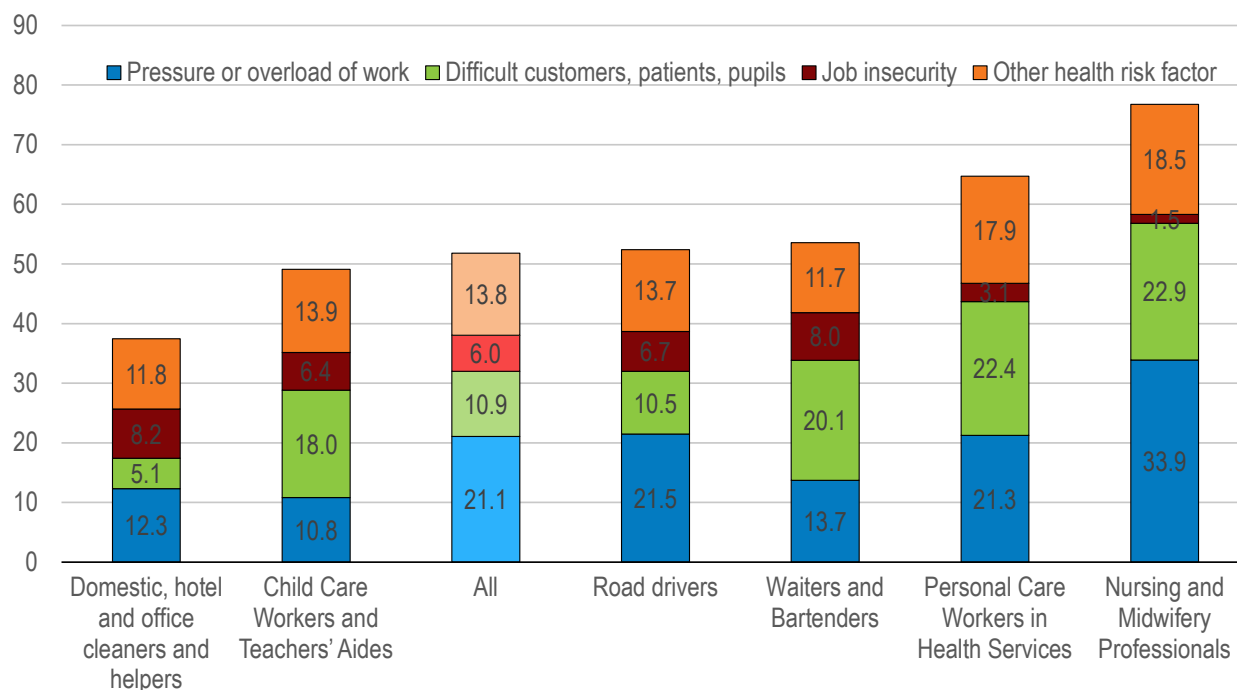
Figure 18. Exposure to mental health risks for workers in industries and occupations facing labour shortages

People reporting exposure to risk factors that can adversely affect mental well-being (% of employed)

Panel A. Exposure to mental health risks, selected industries, across EU countries (% of employed)



B. Exposure to mental health risks by factor, selected occupations, EU average (% of employed)



Note: Share of workers self-reporting exposure to mental well-being risk factors. The sample consists of working individuals. In Panel A, exposure to mental well-being risk factors is defined as the occurrence of the following risk factors: severe time pressure or overload of work, violence or threat of violence, harassment or bullying, poor communication or cooperation within the organization, dealing with difficult customers, patients, pupils, etc., job insecurity, lack of autonomy, or lack of influence over the work processes, another significant risk factor for mental well-being. Panel B consists of a simple average across the countries present in Panel A. Other health risk factors include violence or threat of violence, harassment or bullying, poor communication or cooperation within the organizational of autonomy, or lack of influence over the work processes, another significant risk factor for mental well-being.

How to read: Panel A: in France, 54% of workers report exposure to risk factors that can adversely affect mental well-being, this proportion is 65% among healthcare workers. Panel B: on average across EU countries, around 77% of Nursing and Midwifery Professionals report exposure to risk factors that can adversely affect mental well-being, the first risk factor being Pressure or overload of work (33% of workers in this occupation), followed by Difficult customers, patients (around 23% of workers in this occupation).

Source: EULFS 2020 special module on health at work and authors' calculations.

Mental health risk factors are clearly a major concern for workers' well-being, as well as for productivity and economic prosperity. Rising awareness of these factors is likely to further deter workers from entering or staying in highly-exposed jobs. Such risks add on to the "better known" physical health risks, which are generally higher in high-shortage jobs, as can be seen by analysing the ILO accidents data (Figure 19):

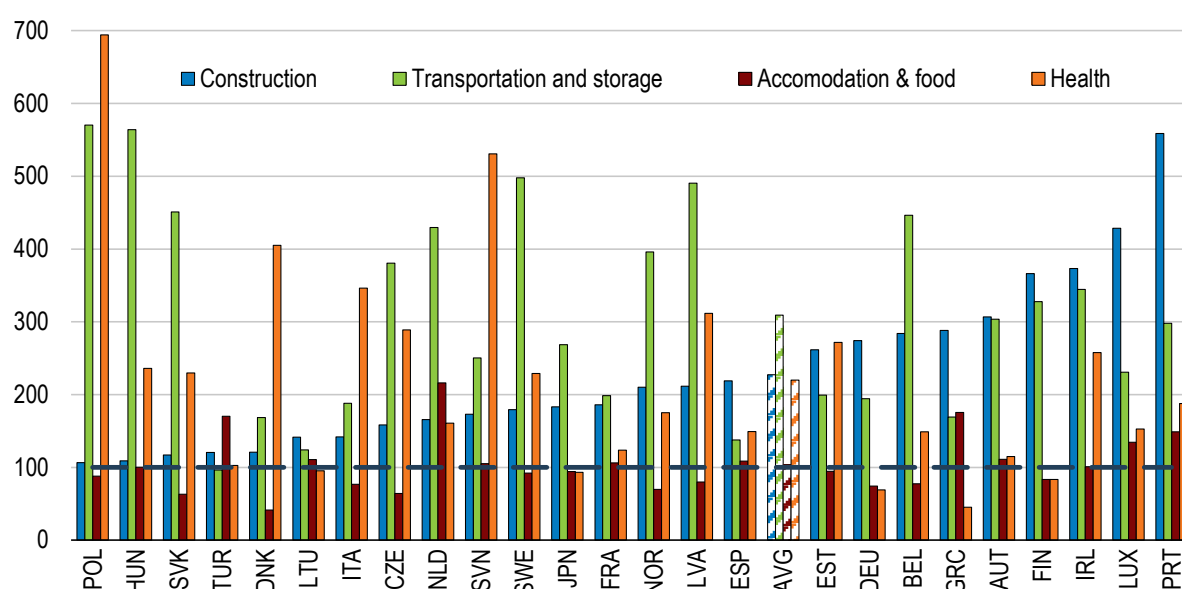
- Healthcare workers face significantly higher work accident risks than other workers: on average across OECD countries, the risk of a non-fatal accident for a healthcare worker is around double that of another worker – yet with significant cross-country differences, with largest relative risks in e.g. Poland and Slovenia and lowest in e.g. Germany and Greece (Figure 19, Panel A).
- Transportation, storage and construction workers are overwhelmingly more likely to experience work accidents, especially fatal ones: those are for instance around five times more likely among construction workers, on average across OECD countries; even ten times more likely in e.g. Greece and Portugal (Figure 19, Panel B).

Workers in agriculture also face major risks of work accidents, especially fatal ones (Asai and Antón, 2024^[66]). The data cannot be properly reported in Figure 19 due to possible measurement comparability issues linked to the small size of the sector in most countries. Yet looking at countries featuring relatively high employment shares in agriculture, the data indicate the following order of magnitude: in Poland (resp. Spain), the risk of a fatal accident is around 9 (resp. almost 5) times higher for a worker in agriculture than for an average worker, and that of a non-fatal accident around 3 (resp. one and a half) times higher. While the agricultural sector could not be systematically covered in this paper due to data availability issues, the evidence reported earlier shows that: i) the sector suffers from severe labour shortages in some countries, ii) older workers are over-represented, and, iii) work strain such as exposure to health risks is one of the reasons why individuals, especially youth, are reluctant to engage or stay in the profession. This, taken together with work accidents data, strongly suggests that the strenuous working conditions and health risks are major dimensions of job quality in agriculture,³⁷ and probably amongst the major factors driving labour shortages in this area.³⁸

Figure 19. Work accidents

Accidents, per 100 000 workers, index (all industries=100)

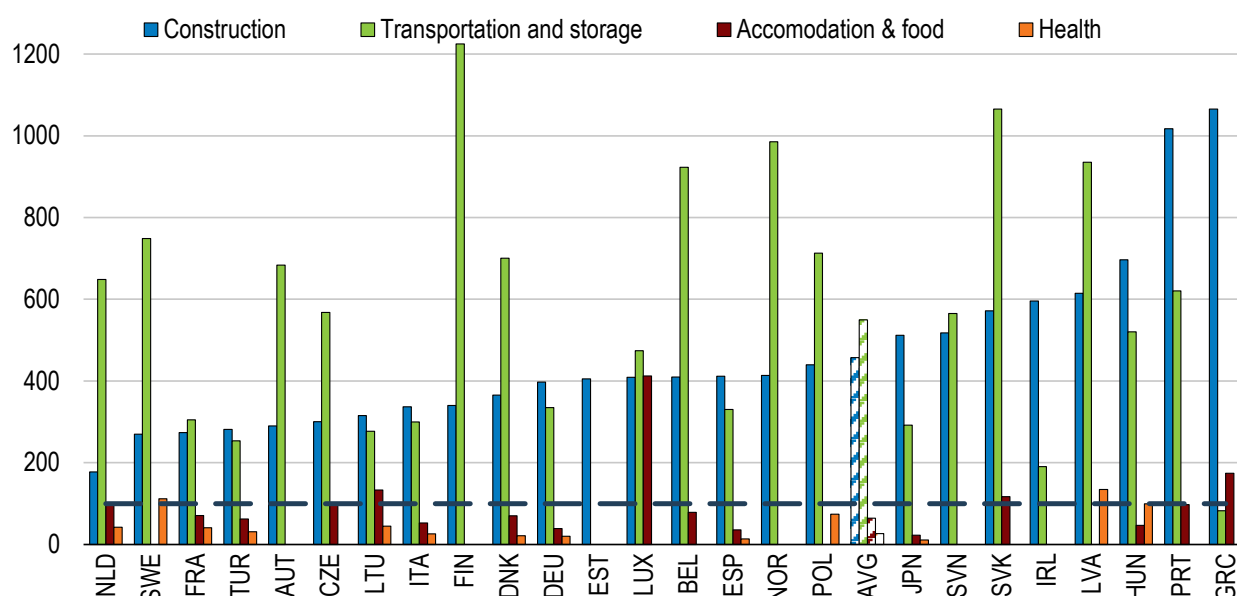
Panel A. Non-fatal work accidents



Panel B. Fatal work accidents

³⁷ Consistent with this, Eurostat data show that workers in agriculture are most likely to report exposure to physical health risks: around 80% on average across the EU, a slightly higher proportion than that of construction workers. In addition, agriculture tends to suffer from higher suicide rates as well, as discussed in recent OECD work on social issues in agriculture in rural areas (Asai and Antón, 2024^[66]).

³⁸ In addition, recent research suggests that the agricultural sector will be hit particularly hard by the negative consequences of climate change, not only in terms of output but also working conditions and health risks for employed workers (Hodok and Kozluk, 2024^[144]).



Note: Data on work accidents per industry are presented relative to total work accidents (that is, across all industries), for each country. This presentation reflects comparability issues in the reporting of work accidents across countries, in turn reflecting cross-country differences in the compilation of occupational injuries depending on underlying data sources (e.g. administrative records, establishment surveys and household / labour force surveys). These differences do not allow delivering a confident comparative analysis of work accidents across countries. The Annex reports additional data on work accidents in agriculture, based on availability in the ILO official dataset.

How to read: on average across OECD countries covered, transportation and storage workers are around three times more likely to have an accident at work than other workers. In Japan, construction workers are twice as likely to have an accident at work than other workers, while health and accommodation and food workers around as likely as other workers. An accident here is defined as an unexpected and unplanned occurrence, arising out of or in connection with work, which results in one or more workers incurring a personal injury, disease or death.

Sources: ILOSTAT safety at work Database. The data refer to 2022 for all countries with the exception of Japan (2023), France, Mexico and Greece (2021).

Policy implications to mitigate both labour shortages and inequalities

The evidence gathered in this paper shows that advanced economies still face large and growing labour shortages in a number of economic activities, despite job vacancy rates being below the post-COVID-19 peak.³⁹ This suggests the existence of structural components in labour shortages, beyond the cyclical ones. Such components include changes in technology, in the context of the digital and green transitions which affect the skill and task-component of labour demand;⁴⁰ in demography, as population ageing reduces labour supply and modifies the composition of consumer demand; and in workers' preferences, following the profound changes in working arrangements during the pandemic. In addition, the structure and the functioning of labour markets, especially in terms of the ability to match workers to jobs, have an important role in determining the incidence of labour shortages and their effects on wages and productivity.

³⁹ See e.g. Causa et al. (2022_[2]) and Duval et al. (2022_[3]).

⁴⁰ See ongoing complementary work by the Global Forum on Productivity, focusing on labour shortages in the context of megatrends, including digital and green transformations (Dorville, Filippucci and Marcolin, forthcoming_[5]). On tasks and skills required in the green transition, see Causa, Nguyen and Soldani (2024_[68]).

The analysis in this paper focuses on labour shortages in industries characterised by low-quality jobs: not only in terms of pay but also, and possibly even more, non-pay-conditions. The latter include job insecurity, poor working hours arrangements and limited flexibility to reconcile work and life; and, last but not least, strenuous working conditions, often leading to important and quite widespread mental health issues associated with e.g. work pressure and overload, on top of exposure to physical risks and work accidents. While priorities will vary depending on country-specific context, this section draws some policy implications from the analysis by discussing policy issues to address labour shortages from a distributional angle, to achieve more efficient and inclusive labour markets.

Support efficient labour market allocations by promoting equality of opportunities

Policies to enhance equality of economic opportunities are key levers to address labour shortages while boosting growth and reducing inequalities. These include institutional settings to support labour market efficiency and inclusiveness for the sociodemographic groups that are either under-represented or mismatched to their current job, in particular: ⁴¹

- Women, who still face important barriers to “full” labour market participation and hence still have relatively low rates of labour force participation and high incidence of involuntary part-time in many OECD countries (OECD, 2023^[67]).⁴² Policies to reduce such barriers, and, more broadly, to address gender gaps, span a wide array of areas, from childcare, taxation, parental leave and work-schedule flexibility, to initiatives aimed at curbing the underrepresentation of girls and women in STEM-related activities, which is all the more important in the digital and green transitions (Causa, Nguyen and Soldani, 2024^[68]; Causa et al., 2024^[69]).
- Older workers, too often confronted with weak work incentives and opportunities in a context of rising legal retirement age and declining early retirement schemes (OECD, 2023^[70]). Policies to retain talents at all ages include reforms to enhance access to relevant lifelong learning in order to increase reskilling and redeployment, to combine work and retirement income and flexible work arrangements.⁴³
- International migrants, increasingly recognised as important to alleviate labour shortages in advanced economies, but still suffering from major integration hurdles, including in terms of poor recognition of qualifications and perceived discrimination. Box 5 provides a short overview of recent evidence and policy avenues to support the integration of international migrants in advanced economies, especially in a context of significant labour shortages and population ageing.

⁴¹ The labour market situation of young people is of primary importance but not discussed in this paper, which focuses to a large extent on job quality (pay and non-pay aspects) for those individuals that have already entered the labour market, rather than on new young entrants. For an overview of stylised facts and policy recommendations in this area, see the dedicated OECD webpage <https://www.oecd.org/en/topics/policy-issues/youth.html>; for analysis of transitions from study to jobs (Causa et al., 2022^[94]), and “green” jobs (Causa et al., 2024^[69]).

⁴² See OECD gender equality and related data: <https://www.oecd.org/en/topics/policy-issues/gender-equality.html>, and <https://www.oecd.org/en/data/dashboards/gender-dashboard.html>.

⁴³ See André, Gal and Schief (2024^[4]) for a recent overview of key mechanisms and policy options.

Box 5. Supporting migrants' economic integration can help alleviate sectoral recruitment tensions and make labour markets more inclusive

Against the background of stagnating productivity growth (Soldani et al., 2024^[71]), population ageing and fertility decline (André, Gal and Schief, 2024^[4]), OECD countries have increasingly relied on foreign workers to alleviate labour shortages. In the EU for instance, about two-thirds (or 2.7 million) of the jobs created since 2019 have been filled by non-EU citizens (Caselli, 2024^[72]). Relying on the inflow of foreign workers has the potential to boost labour supply, ease labour market pressures and foster economic growth in the receiving countries. Yet this requires a holistic approach encompassing carefully designed policies to address the obstacles faced by migrant workers in their integration process.

In fact, evidence suggests that OECD countries have room for improving migrants' integration: recent survey data shows that about 27% of foreign-born workers in Europe have faced obstacles during their job search. The lack of language skills comes as the first obstacle, with 23.1% of foreign workers who faced an obstacle mentioning it as the main hurdle. The absence of a suitable job (15.7%), the poor recognition of qualifications (14.9%) and perceived discrimination (7.3%) are the other main hurdles faced by foreign workers (EULFS, 2021 Special Module on migrants' integration). These obstacles translate into poor and inefficient labour market outcomes: for instance, in 2023 in the European Union, 39.5% of individuals born outside of the EU had a job for which they were overqualified, double the proportion of native-born individuals (Eurostat, 2024^[73]).

A whole-of-society approach, involving all levels of government across policy domains ranging from training to labour market policies and housing, is needed to remove the barriers preventing the integration of migrants to the labour force. Recent examples of policies implemented in this direction are:

- **Streamlining and facilitating the recognition of foreign degrees and qualifications**, for instance in sectors with high licensing requirements and acute labour shortages, such as the health sector. Germany has recently standardised and simplified the recognition of foreign nursing degrees and trainings. In Austria, a decree adopted in 2022 accelerates the recognition of qualifications for health sector workers (OECD, 2023^[74]). In Poland, the Special Law in Assistance to Ukrainian Citizens allows Ukrainian doctors to practice, with low levels of formalities when applying for the right to practise (Eurofound, 2024^[75]).
- **Expanding the access to continuous general and vocational language training**. Since 2015, Sweden offers refugees joint language and vocational training tailored to occupations in shortages of labour. In Estonia, a two-year programme for nurses offers language and practical training to Ukrainian nurses, with the possibility of employment at the end of the programme (Eurofound, 2024^[75]). Likewise, Korea announced plans to provide long-term vocational training courses combined with language courses for foreign workers (OECD, 2023^[74]).

Boosting housing efficiency and affordability. In many OECD countries, migrant workers are more likely to live in segregated areas with poor housing and, more generally, living conditions. For instance, across OECD countries, more than 15% of immigrants live in overcrowded accommodations (OECD, 2023^[74]). Reforming housing policies to increase the responsiveness of housing supply to demand, through changes in rental market regulations, in land-use, and property taxation can foster the integration of migrant workers and their descendants (OECD, 2021^[76]). Countries have been developing policy interventions to address the housing issue for migrants. For example, in Germany a general agreement across all government levels allowed the extension of a special rule in the German Building Code that makes it possible to bypass parts of the planning law for the construction of accommodation

for refugees. Countries such as Australia, Canada, and Korea, have put in place incentives for the relocation of migrants outside of segregated areas to facilitate their long-term integration (Eurofound, 2024^[75]; OECD, 2023^[74]).

Enhancing migrants' integration in receiving countries is important from the perspective of growth and inclusiveness, but relying on foreign workers cannot be the only solution to labour shortages. One key reason is the risk of exacerbating labour shortages and brain drain in emigration countries, especially low-income ones. This possible tension is particularly salient in the case of the healthcare sector, which is in high-shortage sector in advanced economies, and likely to remain so with population ageing. While advanced countries need to support the integration of foreign healthcare workers, for instance through the recognition of foreign qualifications, they should avoid active recruitment of health workers in countries with the most severe shortages, especially in Africa (OECD, 2019^[77]). Another reason is that migration can only be a temporary fix, which does not substitute for addressing underlying structural issues behind labour shortage, namely in terms of job quality aspects.

Target job quality beyond job quantity and encourage dialogue among the social partners

The evidence in this paper makes clear that there are pervasive and widespread job quality issues underlying labour shortages, in particular for jobs in the lower or middle part of the earnings distribution. Some of these jobs require lower levels of formal skills, like waiters, food preparation assistants and cleaners, while others require higher levels of formal skills, like personal care workers in health services, childcare and nursing. Attracting and retaining people in these activities requires policies to lift the quality of their jobs, in both the pay and non-pay dimensions. While priorities vary across occupations and countries and local situations, some key areas of policy interventions are:

- Reviewing the design of labour market and bargaining institutions to promote constructive dialogue between social partners in terms of pay and working conditions. This applies for instance to activities that are both essential and increasingly demanded, like health and social care, with a number of countries featuring little improvement or even some deterioration in real wages, alongside with difficult working conditions in terms of work life balance and exposure to excessive work pressure and overload, as discussed in the core of this paper and in Box 6.
- Addressing rising mental health risk factors associated with poor working conditions, due to work pressure and overload: these risks are for instance associated with atypical and fragmented working hours. As women are often over-represented in jobs characterised by shift work, in particular nursing and more broadly care-related functions (Figure 15), they tend to be more exposed to such issues, with a risk to further amplify gender gaps in labour markets. Box 6 zooms on job quality issues in the healthcare sector along with its gender dimension, and concrete policy actions introduced by countries to address them.
- Enhancing access to social protection, for instance in terms of sickness for workers that are highly exposed to health risks and work accidents (Figure 19). This is especially necessary given the particularly high incidence of non-standard forms of employment, such as temporary and casual work, in highly-exposed jobs like construction and agriculture. These sectors often employ relatively high proportions of international migrants (Figure 11). As a result, the workers who would mostly need social protection are actually those that are least likely to be covered by adequate safety nets. See OECD (2024^[78]) for a comprehensive discussion about modernising social protection.

Box 6. Lifting the quality of jobs can help mitigate labour shortages and labour inequalities: the case of female-dominated healthcare jobs

Despite a continuous increase in employment numbers, the health and social care sector has been persistently understaffed, even before the outbreak of the COVID-19 pandemic (OECD, 2023^[79]). Nurses and personal care workers account for the majority of workforce in this sector, providing care services in hospitals and long-term care facilities. Women represent the bulk of healthcare workers in the vast majority of OECD countries, mostly concentrated in nursing and caring occupations. A significant number of countries is also increasingly relying on foreign-born workers to meet domestic demand for healthcare. The analysis in this paper suggests that care-related work performed by nurses and personal care workers is to good extent undervalued: in terms of inadequate pay and non-pay dimensions, including strenuous working conditions and inflexible work arrangements, with this situation weighting disproportionately on women. It may then come at little surprise to observe increased labour shortages in this sector, especially as the pandemic acted as an eye opener about the pressures endured by the profession amidst its essential societal value (OECD, 2023^[80]).

Improving job quality in health and long-term care sectors also matters for attracting and retaining workers and for ensuring quality care, all the more in ageing societies. According to OECD (2023^[79]), workload and pressure are increasingly causing burnouts and leading health and long-term care workers to quit their jobs, exacerbating the already-high staff shortages. Recent PISA data consistently show that the share of 15-year-old students expecting to become a nurse has declined between 2018 and 2022. Moreover, high turnover and incidence of physical and mental health problems among workers come with private and public costs, in terms of absenteeism and sick leave, etc. (de Bienassis, Slawomirski and Klazinga, 2021^[81]).

Main policy-relevant issues and examples of associated policy interventions by OECD countries are:

- Poor job quality and its negative consequences:** on average across OECD countries, wage levels of nurses working in hospitals were 20% higher average wages in 2021, yet this number partly reflects the one-off COVID-19 bonuses that a large proportion of nurses and other health workers received in 2020 and 2021 (OECD, 2023^[64]). As shown in this paper, workers in healthcare and social activities have seen little improvement in real wages over the recent years, on average across OECD countries, albeit with significant cross-country heterogeneities. Zooming again on hospital nurses, data gathered in OECD (2023^[64]) indicate a stagnation of real wages pre-COVID-19 (between 2010 and 2019) with some exceptions, e.g. rises averaging 4-5% per year in some Central European countries such as Hungary and Poland, contrasting with amid declines in real terms other countries such as Italy and Greece. As part of their job, nurses and personal care workers tend to be exposed to higher physical and mental risks (see Figure 18 on mental health risks). Recent OECD work (2023^[80]) reports that, on average across EU countries, 72% of nurses and personal care workers in health and long-term care sector reported risks to their physical health, compared to 59% of all employees, for reasons such as handling heavy loads and tiring or painful positions. Night and week-end work is also prevalent among nurses and personal care workers, making difficult for them to reconcile with family responsibilities and social activities. EULFS data used in this work indicate for example that nurses and midwifery professionals are more than twice as likely to work in the evening than other workers; e.g. in Germany an incidence of evening work of around 70% among nurses and around 30% in total.
- Possible explanations why persistent labour shortages have not led to substantial improvements in job quality:** according to economic theory, sectoral labour shortages should trigger sectoral improvements in job quality, in particular wage increases to attract prospective entrants. This does not seem to have taken place on a broad scale, and many countries have been struggling with the persistent staff shortages in health and long-term care sector. This situation may in part reflect the fact that dependent employees in this sector, for instance nurses

and personal care workers, the majority of which are women (Figures 11 and 15), do not have adequate bargaining power to negotiate pay and non-pay conditions with their employers. Another relevant feature of the health and long-term care sector is the key role played by the State, not last as a source of financing: covering 73% and 82% of health and long-term care spending in OECD countries, respectively (2021 data, OECD (2023^[64])). One possible implication is that public spending on health may come under pressure with tightening budgetary constraints, as observed recently in a number of EU countries in the process of designing fiscal consolidation plans to address debt sustainability concerns.⁴⁴

- **Policy tools:** governments have used various policy interventions to improve job quality in the healthcare sector. One first strategy targets workers' pay. For example, in 2020⁴⁵, France introduced a new multiyear plan to strengthen public hospitals, including significant pay rises for nurses (OECD/European Observatory on Health Systems and Policies, 2021^[82]; OECD/European Observatory on Health Systems and Policies, 2023^[83]). Similar government-led initiatives of promoting pay increase in health and long-term care sectors have been introduced in other countries, including Belgium, Chile, the Czech Republic, Hungary, Latvia, Slovenia and Switzerland (OECD, 2023^[79]). Increases in minimum wages have also been considered to boost pay for personal care workers, in particular for long-term care workers (LTC) whose wage level is close to the minimum level. This is the case of the United Kingdom,⁴⁶ but it is not an isolated situation: OECD (2023^[80]) provides a comprehensive analysis of wage disadvantages and poor working conditions for long-term care (LTC) workers.

Another strategy targets workload among healthcare workers, by acting on staff numbers. For example, Japan, Lithuania, the Netherlands and Slovenia introduced guidelines on staff ratios during the pandemic (OECD, 2023^[79]). More recently, Finland implemented a reform gradually increasing the nurse-patient staffing ratios (under the Older Pension's Care Act, OECD (2023^[79])). While setting minimum staff requirements may reduce workload for existing staff and improve the quality of care and patient safety, the risk is to create inefficiencies due to lack of flexibility in work organisation (Chen and Grabowski, 2014^[84]).

Other policy approaches aim at improving job quality by targeting workers' wellbeing, not least mental wellbeing. According to OECD (2023^[85]), at least two-thirds of OECD countries provided mental health support to health workers during acute phases of the pandemic: through dedicated mobile applications, websites, or phone lines, including consultations with specialists such as psychologists. Examples in this area of intervention include the Netherlands, with the development of specific coaching programmes, and Japan, with the development of workplace counselling services to prevent accidents and burnout.

OECD countries have been implementing alternative approaches, as discussed in OECD reports (OECD, 2024^[86]; OECD, 2024^[7]). This includes: i) conducting national survey to assess and monitor healthcare workers' situations and job satisfaction;⁴⁷ ii) promoting the adoption of new technologies allowing to reduce workload, for instance through digital tools and the

⁴⁴ This point is particularly relevant in the context of the possible Baumol disease effects mentioned earlier in the text.

⁴⁵ In 2021, the government moved to the second step of the ambitious plan, allocating an additional EUR 19 billion over 10 years.

⁴⁶ See Vadean and Allan (2020^[138]) for an analysis and quantification of the effects of minimum wage policy on the long-term care sector in England.

⁴⁷ Implemented in the United Kingdom, the Netherlands, Ireland, Belgium, and the United States.

automation of some tasks (Lee, Iizuka and Eggleston, 2025^[87])⁴⁸; iii) supporting public information campaigns⁴⁹ to improve the image of health and long-term care work, especially for a better gender balance; and iv) promoting life-long training for healthcare workers.

Mitigate regional disparities in labour shortages, reduce barriers to workers' mobility

Labour shortages at the country-level are often the result of significant spatial differences, across regions and between urban and rural areas, as emphasized earlier in this paper. Available data do not allow a consistent assessment of labour shortages across regions/territories within countries. Yet available evidence, for instance from country-specific studies and data, sheds some light on these territorial differences, delivering the following main insights:

- Some countries feature major differences in labour shortages across regions. Such is the case of the United States, where the Chamber of Commerce, based on data provided by the Bureau of Labour Statistics (BLS), has been reporting marked labour shortages in some States, e.g. Virginia and Georgia, and little or no shortages in other States, e.g. Washington, New Jersey and New York.⁵⁰ Data assembled by the DARES⁵¹ for the Ministry of Labour in France also suggest relatively large differences in labour shortages across regions, with major pressures in Auvergne-Rhône Alpes, and lower in Ile-de-France and Hauts-de-France.⁵²
- The structure of labour shortages also varies within countries, depending at least in part on the structure of local demand: regions with a high proportion of older workers and retirees are likely to require more health-related services than regions with a high proportion of youth or students. One major issue in this context is that remote areas, relatively far from urban centers, tend to suffer from an insufficient provision of local healthcare services. OECD data shed light on these geographical disparities in access to healthcare services: for example, in the Czech Republic and in Greece, physician density (per 1000 population) varies from around 8 in the capital regions to around 3 in remote regions (see Figures 8.9 and 8.10 in OECD (2023^[64])).

Mitigating regional differences in labour shortages can support a more efficient geographical allocation of workers and economic activities, as well as alleviate regional imbalances and inequalities (Causa, Abendschein and Cavalleri, 2021^[88]). Empirical evidence and policy-oriented literature and recommendations in this area are relatively abundant, with key findings and messages summarized in Box 7. As is the case in all policy domains, country-specific challenges and policy requirements will depend on

⁴⁸ Lee, Iizuka and Eggleston (2025^[165]) find that the increasing use of robots to relieve care workers from their monitoring functions in order to allow more time for care functions has tended to improve health outcomes, workers' productivity and retention.

⁴⁹ For example, Austria, Germany, Japan and Luxembourg have been or are running public information campaigns with the double goal of improving the public image of long-term care work and enticing in particular young people to choose for a career in the sector. The campaign is combined with financial measures (Australia, Austria, Germany and Luxembourg) and with both financial and educational measures (Japan). Moreover, to attract more boys into nursing, the United Kingdom launched the "We are the NHS" public awareness campaign in 2018.

⁵⁰ See <https://www.uschamber.com/workforce/the-states-suffering-most-from-the-labor-shortage?state=>.

⁵¹ DARES stands for «Direction de l'animation de la recherche, des études et des statistiques».

⁵² <https://dares.travail-emploi.gouv.fr/publication/les-tensions-sur-le-marche-du-travail-en-2022>.

the economic and social context, along with social preferences and political economy considerations. Yet this paper provides an overview of major policy challenges and possible policy actions to tackle them, the relative mix of which will need to be tailored on country-specific circumstances.

Box 7. Addressing the spatial dimension of labour shortages can help tackle territorial inequalities

Addressing labour shortages will require tackling the geographical aspect of labour market tightness. Indeed, labour shortages measured at the national level mask important heterogeneities inside countries, namely between urban and rural areas. This geographical disparity highlights structural issues related to regional attractiveness, worker mobility, and the quality of public services.

While official data provide a general overview at the national level, regional-level surveys and qualitative evidence offer a more nuanced understanding of labour shortages. Studies in the United States and United Kingdom consistently indicate that rural areas and smaller cities face greater challenges in recruiting and retaining suitable workers compared to urban areas (Federal Reserve Bank of Richmond, 2024^[89]; NICRE, 2024^[90]). In the United Kingdom, 37% of interviewed rural firms faced difficulties in recruiting suitably skilled workers (29% for firms in urban areas), and 52% reported challenges in both recruiting and retaining talent (47% in urban areas) (NICRE, 2024^[90]). This pattern is particularly marked in the health sector: OECD data indicates an unequal distribution of health professionals across urban and rural areas in all member countries. In 2023, across 14 countries covered, there were 3.2 physicians per 1000 inhabitants in remote areas, while the rate reached 4.5 for urban areas (OECD, 2023^[64]). Without targeted policy interventions, these shortages are likely to worsen, especially with population ageing and with rural areas tending to host a large proportion of older people.

Regional shortages often stem from the challenges faced by some regions in attracting and retaining workers. Common reasons include a lack of public services and infrastructure, poor public transport, and difficulties finding suitable affordable accommodation (Almeida et al., 2024^[91]; NICRE, 2024^[90]). In the health sector, research suggests that factors such as proximity to family, access to quality public services, work-life balance, and the presence of other health facilities are key determinants of doctors' location choices (DREES, 2021^[92]; Ono, Schoenstein and Buchan, 2014^[93]).

To address regional labour shortages, policymakers must implement structural policies that remove the obstacles to mobility and support the supply of amenities in underserved regions. This includes:

- **Housing market reforms:** removing restrictive land-use regulations contributing to rigid housing supply could tackle housing unaffordability and house price divergences. Likewise, reviewing local rental market regulations that curtail the size of the rental market have the potential to reduce obstacles to mobility as well as to make housing markets more efficient and affordable in the long term (Causa, Abendschein and Cavalleri, 2021^[88]; Causa et al., 2022^[94]).
- **Labour and product market reforms:** reforming labour and product market regulations can reduce spatial misallocation by creating a level-playing field for incumbents and new entrants and by promoting labour and business dynamism (Causa, Abendschein and Cavalleri, 2021^[88]; Causa et al., 2022^[94]).
- **Place-based policies:** boosting the provision of local amenities can directly ease shortages in some occupations (e.g. healthcare professionals) while improving the attraction of a region. OECD countries have implemented comprehensive policies to ensure the satisfactory supply of health workers across regions, through targeted policies like financial incentives, training reforms, the introduction of geographical constraints and tailored support for health workers moving to rural areas (Ono, Schoenstein and Buchan, 2014^[93]). France offers a relevant example of multiple policy actions to address spatial disparities in the provision of health services: public authorities provide financial incentives up to EUR 50k for doctors settling in an

underserved region, while doctors that remain in these areas are entitled to bonuses and pay rises by around 10%. In 2021, the government initiated a revision of the geographical distribution of medical students, and took parallel action to diversify their recruitment channels, in a bid to increase the supply of doctors in rural areas. The “Contrat d’Engagement de Service Public”, implemented in 2009 has so far offered 4 000 scholarships for medical students, in exchange of a commitment to then practise in an underserved region. Finally, the 2017 “Plan pour renforcer l’accès aux soins” facilitates the installation of doctors by providing readily equipped offices and already employed administrative assistants (DREES, 2021^[92]).

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