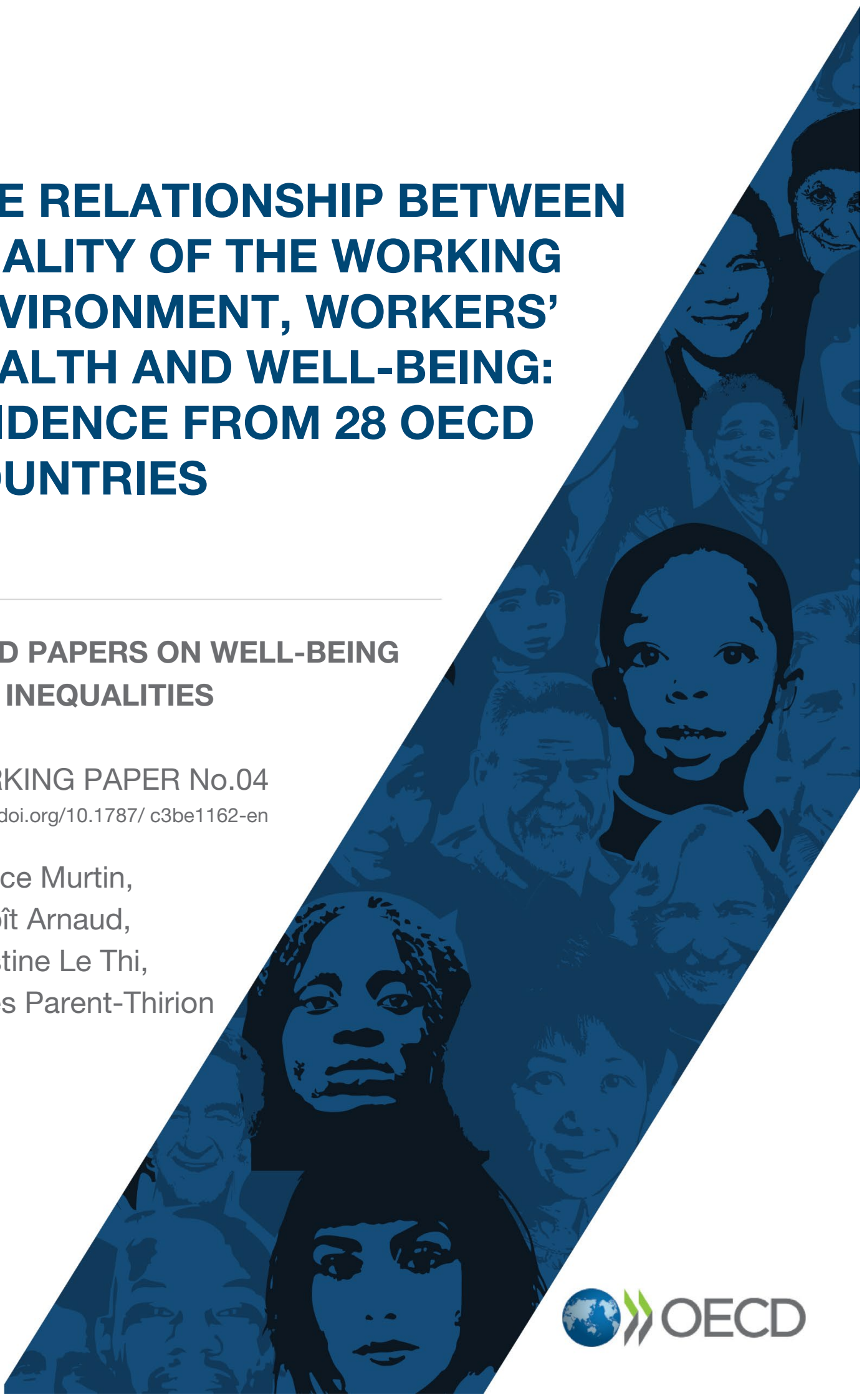
THE RELATIONSHIP BETWEEN QUALITY OF THE WORKING ENVIRONMENT, WORKERS' HEALTH AND WELL-BEING: EVIDENCE FROM 28 OECD COUNTRIES



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The relationship between quality of the working environment, workers' health and well-being: Evidence from 28 OECD countries

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Abstract

This paper operationalises the OECD *Guidelines for Measuring the Quality of the Working Environment* (OECD, 2017[1]) to describe job characteristics among European countries, the United States and Korea in 2010 and 2015. The analysis extends the range of aspects of quality of the working environment beyond those featuring in the Job Strain index presented by (Cazes, 2015[2]), which is used to monitor implementation of the OECD Job Strategy, but at the cost of a more limited country coverage. While the two indices of job strain are largely consistent both across countries and over time, all of the job characteristics included in the "extended" index turns out to matter for workers' well-being. The framework uses the *job demands-resources model* (Demerouti, 2001[3]) that stresses the importance of balancing the demands of the job and the resources that are available to workers to meet those demands. Workers are classified as (heavily) strained when the number of job demands they face (largely) exceeds the number of job resources they benefit from, and conversely, they are classified as (very) well-resourced when their job resources (largely) exceed their job demands.

On average among 28 OECD countries, about one third of employees are (moderately or heavily) strained at work, while one half are well-resourced. The share of employees that are heavily strained is close to 10%. Job strain is relatively more frequent among employees with low education and low occupational skills, and it is relatively less frequent in the service sector and in the public sector. Due to composition effects, women hold on average slightly less strained jobs than men. The share of strained workers has slightly declined on average over the 2010-15 period, falling in a majority of countries. The improvement in working conditions is related to better prospects of career advancement, higher take-up of training, stronger social support and organisational participation at work, higher flexibility of working time, as well as lower exposure to physical risk factors, hard physical demands and unsocial work schedule. On the other hand, perceptions of job insecurity, intimidation and discrimination, as well as work intensity have been on the rise. Finally, quality of the working environment is strongly associated with workers' well-being as measured by mental and physical health, days of sickness, job satisfaction as well as job motivation, and the associated effects are potentially large. For most outcomes, perceived intimidation and discrimination at work is one of the most powerful predictor of workers' well-being.

Résumé

Cette étude applique les *Guidelines for Measuring the Quality of the Working Environment* de l'OCDE (OECD, 2017[1]) pour décrire les caractéristiques des emplois au sein des pays Européens, des Etats-Unis et de la Corée entre 2010 et 2015. Cette analyse étend le nombre de caractéristiques de la qualité du travail au-delà de celles considérées dans l'indice du Stress au Travail présenté par (Cazes, 2015[2]), lequel est utilisé pour suivre l'implémentation de la Stratégie de l'Emploi de l'OCDE, mais au détriment d'une couverture pays plus limitée. Alors que les deux indices de stress au travail sont largement cohérents entre pays et dans la dimension temporelle, toutes les caractéristiques incluses dans l'indice « élargi » sont des déterminants significatifs du bien-être des travailleurs. Le cadre analytique utilise le modèle de demandes et ressources au travail (Demerouti, 2001[3]), lequel insiste sur l'importance d'équilibrer les demandes au travail avec les ressources dont dispose les employés pour satisfaire à ces demandes. Les employés sont classés comme (très) stressés quand le nombre de leurs demandes au travail dépasse (largement) le nombre de ressources dont ils disposent, et réciproquement, ils sont classés comme (très) bien dotés lorsque le nombre de leurs ressources excède (largement) le nombre de leurs demandes au travail.

En moyenne parmi les 28 pays de l'OCDE, environ un tiers des employés sont (modérément ou très) stressés au travail, alors qu'une moitié est bien dotée. La part des employés qui sont très stressés est proche de 10%. Le stress au travail est relativement plus fréquent parmi les employés avec un faible niveau d'éducation ou un poste à faible valeur ajoutée, il est relativement moins fréquent dans le service des secteurs et dans le secteur public. Par effet de composition, les femmes sont en moyenne un peu moins stressées que les hommes au travail. La part des employés stressés a légèrement reculée de 2 points de pourcentage entre 2010 et 2015, et a baissée dans une majorité de pays. L'amélioration des conditions de travail s'explique par de meilleures perspectives de carrière, un plus fort taux de formation, un soutien social sur le lieu de travail plus solide et une participation collective plus forte, par une plus grande flexibilté du temps de travail, ainsi que par une moindre exposition aux facteurs de risque physiques, aux fortes demandes physiques et aux horaires de travail atypiques. D'un autre côté, les perceptions de l'insécurité du travail, de l'intimidation et de la discrimination, ainsi que l'intensité du travail ont augmenté. En dernier lieu, la qualité de l'environnement du travail est fortement associée au bien-être des employés, à l'aune de mesures incluant la santé mentale et physique, le nombre de jours d'absence maladie, la satisfaction et la motivation au travail, et les effets associés à ces mesures sont potentiellement importants. Pour la plupart de ces mesures, la perception de l'intimidation et de la discrimination au travail est l'un des facteurs prédictifs les plus importants.

Table of contents

FIGURES

TABLES

1. Introduction

1. Improving the quality of the working environment has been recognised as a policy priority in recent years. One of the goals of the 2030 Agenda, agreed by the UN General Assembly in September 2015, is to "Promote inclusive and sustainable economic growth, employment and decent work for all" (Goal 8), with more specific targets to "protect labour rights and promote safe and secure working environments for all workers". Reflecting this development, the OECD revised its "Job Strategy" (OECD, 2018[4]) to recognise the critical role of Job Quality, which includes the quality of the working environment as one of its three dimensions, alongside earnings quality and labour market security (Cazes, 2015[2]). This implies that labour market conditions are no longer assessed by the OECD only in terms of quantity of jobs but also by looking at their quality, and at whether jobs provide the basis for a dignified existence for workers and their families.

2. A lot of evidence and statistical practice already exist in the field of the working environment, largely reflecting long-established regulations to address health and safety concerns in the workplace. However, the nature of the working environment has evolved radically over time, well beyond the physical risk factors that were the focus of traditional health and safety regulations. Also much of the available evidence is based on surveys with limited comparability, with comparative evidence covering a broad range od dimensions of the working environment largely limited to European countries. The indicator of "job strain" used by the OECD to monitor implementation of its revised "Job Strategy" overcomes the limits of available evidence by combining information from two different surveys (the European Working Conditions Survey and the International Social Survey Programme, covering a number of non-European countries) but at the costs of limiting the range of aspects considered. Comparable evidence on the broader range of socio-environmental aspects that shape working conditions remains limited, despite evidence of their importance for both workers' well-being and firms' productivity. On today's labour markets, the consequences of a poor working environment include burnout, disengagement, absences from work and mental health problems among workers. This paper contributes to broadening comparable evidence, by extending the range of aspects of quality of the working environment beyond those featuring in the OECD Job Strain index, and by looking at the relationships between quality of the working environment and several well-being outcomes.

3. The paper is structured as follows. Section 2 presents the motivation and key results from the analysis. Section 3 describes in more detail the measurement framework and the data used. Section 4 compares quality of the working environment across countries, sectors, population groups and years, while Section 5 looks at the relationships between workers' health and well-being and their job characteristics.

2. Motivation and key results

4. This paper is based on the OECD *Guidelines for Measuring the Quality of the Working Environment* (OECD, 2017[1]) that aimed to support statistical offices and other data producers in their efforts to measure the quality of the working environment through surveys of people with paid jobs. The Guidelines take stock of the measurement initiatives undertaken in this field by UNECE, ILO and the EU in the past, provide a general conceptual framework to operationalise this concept, discuss a range of methodological issues, and propose three survey modules that could be included by national statistical offices (NSOs) in their various surveys vehicles. In these Guidelines, the "working environment" is understood as a *combination of job characteristics* defining the setting where workers operate. The concept is multidimensional and encompasses a broad range of non-pecuniary characteristics of jobs including: i) the nature of the work tasks assigned to each worker; ii) the physical and social conditions under which these tasks are carried out; iii) the characteristics of the firm or organisation where work takes place; iv) the scheduling of working time; v) the prospects that the job provides to workers; vi) the intrinsic rewards associated with the job. The concept denotes those *observable characteristics* of the job as they are experienced by workers. The OECD Guidelines recommend that job characteristics are measured by looking at *outcomes* rather than *procedures* (e.g. labour codes or firm-level practices); that they refer to experiences of *individual workers* rather than what is observed at the aggregate level; and that they capture *objective* aspects of the job rather than purely *subjective* evaluations.

5. An impressive body of research, reviewed in the Guidelines, has demonstrated the relevance of the quality of the working environment for workers' well-being and health conditions. In particular, the *job demands-resources model* (Demerouti, 2001[3]) stresses the importance of balancing the demands of the job and the resources that are available to workers to meet those demands.

6. This model underpins the OECD Job Quality Framework and constitutes the background upon which the OECD Guidelines have been developed (Cazes, 2015[2]). This paper operationalises the latter model by calculating for each worker the difference between their job resources and job demands. Job demands refer to aspects of the job that require sustained physical and/or psychological efforts or skills, and that have psychological and physiological costs (Bakker, 2007[5]). Resources are aspects of the work that reduce job demands or their costs in terms of efforts, help workers in achieving one's 'work goals' and/or foster personal growth.

7. Workers are classified as (heavily) strained when the number of job demands they face (largely) exceeds the number of job resources they benefit from, and conversely, they are classified as (very) well-resourced when their job resources (largely) exceed their job demands. Taken together, this assessment of the working environment is suitable for comparing countries, sectors and population groups within countries.

8. The paper makes two key contributions. First, it provides comparable measures of the quality of the working environment for European countries, the United States and Korea, based on highly comparable surveys that cover the full spectrum of job dimensions included in the OECD Guidelines. Second, it documents changes over time (between 2010 and 2015) in the quality of the working environment. This is possible as comparable questions across three surveys (the European Working Conditions Survey, the American Working Conditions Survey and the Korean Working Conditions Survey) are now available.

9. The main results are as follow:

- On average among 28 OECD countries, about one third of employees are strained at work, while one half are well resourced. The share of employees that are severely strained is close to 10%.
- There are important regional disparities, with a low degree of job strain being recorded among Northern European countries, a medium degree of strain observed in Continental European countries and the United States, and a high degree of strain in some Southern and Eastern European countries as well as Korea and Turkey.
- Job strain is relatively more frequent among employees with low education and low occupational skills, and it is relatively less frequent in the service sector and in the public sector. Due to composition effects, women hold on average slightly less strained jobs than men. There are negligible differences by age or size of worksite.
- The share of strained workers has slightly receded (by 2 percentage points, on average) over the 2010-15 period, falling in a majority of countries. The improvement in working conditions is related to better prospects of career advancement, higher take-up of training, stronger social support and organisation participation at work, higher flexibility of working time, as well as lower exposure to physical risk factors, hard physical demands and unsocial work schedule. On the other hand, perceptions of job insecurity, intimidation and discrimination and work intensity have been on the rise.
- Quality of the working environment is strongly associated with workers' well-being as measured by self-reported mental and physical health (see Section 5 for an exact definition of scores), days of sickness, job satisfaction as well as job motivation, and the associated effects are potentially large. For most outcomes, perceived intimidation and discrimination at work is one of the most powerful predictors.
- The job strain index used in the Job Quality Framework (Cazes, 2015[2]) and this index based on the Guidelines are largely consistent across countries (with a correlation of 0.94 in 2015) and across time, with changes displaying a 0.72 correlation over 2010-15. However some differences arise as the Guidelines index includes more job characteristics, which incidentally are found to be strong predictors of workers' well-being.

10. The COVID-19 pandemic highlighted the importance of health conditions (mental and physical) and prevention measures. It has made more visible the multiple relationships between work, health and well-being, and their several links: healthier workers engage more in work, but work conditions also impact on their health. The pandemic is also showing how workers – depending on their occupations, employment conditions, working conditions, and places of work – were differently affected by health risks through higher exposure to COVID-19, concerns on "overload pathologies" (MSDs, fatigue or burnout) and mental health issues. Considerations about the quality of the working environment should hence play a critical role in the design of policies to recover from the pandemic and accelerate the digital and greening transitions.

3. Measuring quality of the working environment based on the OECD Guidelines

3.1. The setup

11. The OECD Guidelines (OECD, 2017[1]) present recommendations to better understand and measure quality of the working environment. These Guidelines define the working environment as a combination of job characteristics, ranging from the nature of the work to the tasks assigned to each worker and the physical and social conditions under which these tasks are carried out. The Guidelines also recommend that job characteristics be measured by looking at outcomes rather than procedures, and that they refer to experiences made by individual workers rather than what is observed at the aggregate level. When it comes to operationalisation into synthetic statistics, the OECD Job Quality framework as well as the OECD Guidelines rely on the "job demands-resources model" proposed by Bakker and Demourouti (Bakker, 2007[5]). The demands-resources model summarises quality of the working environment as the difference between the number of job resources (constituting an asset for workers) and the number of job demands that affect workers negatively.

12. In this paper, we build on the job strain indicator included in OECD Job Quality Framework (Cazes, 2015[2]) and expand on it by considering a larger set of job characteristics, in line with the recommendations of the OECD Guidelines (OECD, 2017[1]). The job strain index used to monitor the OECD Job Quality framework relies on three demands and three resources: "physical demands", "work intensity" and "unsocial work schedule" for the former; and "task discretion and autonomy", "training" and "opportunity for career advancement" for the latter.

13. In turn, the framework used by the OECD Guidelines to describe the quality of working environment (Table 3.1) considers six job dimensions, including the nature of physical and social environments, job tasks, firms' organisational characteristics, working-time arrangements, job prospects for workers and intrinsic aspects of the job. For each of these six dimensions, the OECD Guidelines identify the job demands and resources affecting workers negatively and positively respectively. The survey data used to operationallise this framework allows measuring seven types of job demands and seven types of job resources (i.e. 14 items), relative to the three job demands and three job resources considered by (Cazes, 2015[2]). More than one question contribute to the measures of the six job dimensions (Annex A) yielding a more comprehensive picture of the quality of working environment suitable for describing the increasing complexity and diversity of working lives.

Table 3.1. The job characteristics shaping quality of the working environment according to the OECD Guidelines

Job dimensions	Job demands	Job resources
A. Physical and social environment	i) Physical risk factors	i) Social support at work
	ii) Physical demands	
	iii) Intimidation and discrimination at the workplace	
B. Job Tasks	iv) Work intensity	ii) Task discretion and autonomy
	v) Long working hours	
C. Organisational characteristics		iii) Organisational participation and workplace voice
D. Working-time arrangements	vi) Unsocial work schedule	iv) Flexibility of working hours
E. Job prospects	vii) Perceptions of job insecurity	v) Training and learning opportunities
		vi) Opportunity for career advancement
F. Intrinsic job aspects		vii) Opportunities for self-realisation

14. The **physical and social working environment** dimension captures the exposure, at workplaces or team level, to

- *physical risk factors* (such as noise, smokes and fumes, chemical products, high and low temperatures, vibrations and tobacco smoke) that may impair workers' physical health;
- *physical demands* while performing work such as painful or tiring positions, lifting people or patients, carrying or moving heavy loads and repetitive hands or arm movements. These demands measures work that require hard physical efforts;
- *intimidation and discrimination at the workplace* measures instances of violence (psychological, physical or sexual) and feeling of being treated unfairly due to some personal characteristics (such as race, gender, age, nationality, ethnicity, religion, disability and sexual orientation);
- conversely, *social support at work* from managers and workers constitute a resource. It can take many forms, from help to achieve some work tasks to moral support in challenging work situations.

15. The conditions under which **job tasks** are carried vary hugely from one workplace to another as well as within workplaces. They are framed by workplace and individual characteristics:

- *Work intensity* captures work at high speed, work to tight deadlines and with high efforts (not enough time to do the job).[1]
- *Long working hours* capture the proportion of people who report long working hours (over 48 hours per week) as their usual working hours.
- *Task discretion and autonomy* measure the ability of workers to use their skills and meet the demands in their tasks.

16. **Organisational characteristics** refer to the possibility for employees to influence decisions at the workplace through direct consultation rather than through their representative. It is operationalised through measures of the opportunities given to workers for *organisational participation and workplace voice* and is captured by assessing whether they have been consulted on objectives and targets for work, their influence on decision that are important for their work, and their involvement in improving the work organisation and work process. The importance of tacit knowledge owned by workers for innovation, creativity and well-being has long been recognised in workplace innovation programs. Organisational characteristics are shaped by strategic decisions and by models of work organisation used by companies.

[1] While the European survey used for this paper includes question capturing this aspect, both the US and the Korean surveys did not collect information on emotionally demanding work.

17. **Working time arrangements** connect the experience of work with workers' preferences, their household commitments and, more generally, the "time systems" outside work (such as school and the ability of workers to engage into other activities such as volunteering, training and sports):

- *unsocial work schedule* refers to night work and long working days (over 10 hours). Although these long days can reflect individual preferences, research has demonstrated, on average, their negative impact on health and well-being, family relationships and social life.
- *flexibility of working hours* refers to the ability of workers to choose or influence their working hours and working time arrangements.

18. **Job prospects** refer to the wider role of work in supporting a career, providing security and the opportunities that work allows to grow. It encompasses:

- *job insecurity,* which refers to workers anticipation or fear of losing their jobs in the foreseeable future and their perceived employability (whether it would be easy for them to find a job with a similar salary if they were to lose their current job);
- on the positive side, *access to training and learning opportunities* (paid for or provided by the employer) is a critical element for advancing in one's career or for moving on to a better job;
- similarly *opportunities for career advancement,* whether in the same or a different job, relates to people's aspirations for better earnings, self-esteem and identity)..

19. **Intrinsic job aspects** refer to the role of work as contributing to personal fulfilment. It is operationalised by *opportunities for self-realisation,* measured in this context by the opportunity to apply one owns idea into work, which enables people to contribute to work tasks and shape the product of their work..

20. The job demands and job resources making up the quality of the working environment shape, positively or negatively, workers physical and psychological health and well-being in the short, medium and long term. Epidemiological evidence support their selection; all of them are closely connected with motivation, quality and efficient performance of work, creativity and innovation, performance of the labour market. They matter for higher levels well-being of countries.

21. These job demands and job resources are all measured at the level of the job but have at the same time a wider significance for workers, the households they belong to, the companies in which they operate and the countries in which they are based.

22. To construct the "extended" Job Strain indicator, individual workers are classified into categories according to the difference between the number of resources they enjoy and the number of job demands they face. Workers are considered as 'strained' when the number of demands they experience is higher than that of resources. In more detail, five categories are identified in this paper. A worker i having R_i resources and facing D_i demands will be classified as:

- highly strained if $R_i - D_i \leq -3$;
- moderately strained if $-2 \leq R_i - D_i \leq -1$;
- balanced if employee faces equal demands and resources;
- moderately resourced if $1 \leq R_i - D_i \leq 2$; and
- highly resourced if $R_i - D_i \geq 3$.

3.2. The data

23. The data used in this paper rely on three different sources: the American Working Conditions Survey (AWCS), the European Working Conditions Survey (EWCS) and the Korean Working Conditions Survey

(KWCS). The final database covers 28 OECD countries, of which 26 European countries come from the EWCS survey.

24. The structure of EWCS, KWCS and AWCS enables to classify the seven types of job demands and job resources in a consistent manner, based on the inventory of questions proposed in the OECD Guidelines (OECD, 2017[1]). In other terms, measures of the seven job demands and job resources that collectively define the quality of working environment are based on comparable questions (in terms of question wording and response scales) across the three data sources.

25. Harmonized and comparable data are available within the EWCS survey that covers only European countries. Integrating Korea and the United States into the analysis requires investigating the consistency of questions across the three surveys. The KWCS referred entirely to the design and structure of the 2010 EWCS questionnaire; as a result, the questions wording of the KWCS and EWCS surveys are fully consistent. However, for two questions of the KWCS survey in 2010, answers were scaled differently from the EWCS.[2] By contrast, a few questions in the AWCS were worded in a slightly different manner. For instance, on the social support component, the questions in the EWCS read as “your manager helps and supports you” and “your colleagues help and support you”, while in the AWCS the questions have been reduced to, respectively, “ your immediate boss is helpful” and “there is good cooperation between you and colleagues”.

26. Some questions display a significant number of missing data. To avoid eliminating a significant share of the sample, we imputed values by using a predicting model. For instance, for the question on training opportunities in EWCS 2015, the missing 15% of the observations were predicted via individual characteristics such as sex, age and education.

27. Finally, the analysis is restricted to employees, i.e. self-employed workers have been excluded. A comparison of the prevalence of resources and demands among workers in each of these two status is presented in the next Section.

[2] Questions in relation to job insecurity (“I might lose my job in the next 6 months” and “If I were to lose or quit my current job, it would be easy for me to find a job with my similar salary”) in the KWCS survey (2010) were scaled with two possible answers “Yes/No” while the same questions were scaled with 5 possible answers in the EWCS survey.

4. Quality of the working environment: Results based on an extended set of dimensions

4.1. Cross-country comparison of quality of the working environment in 2015

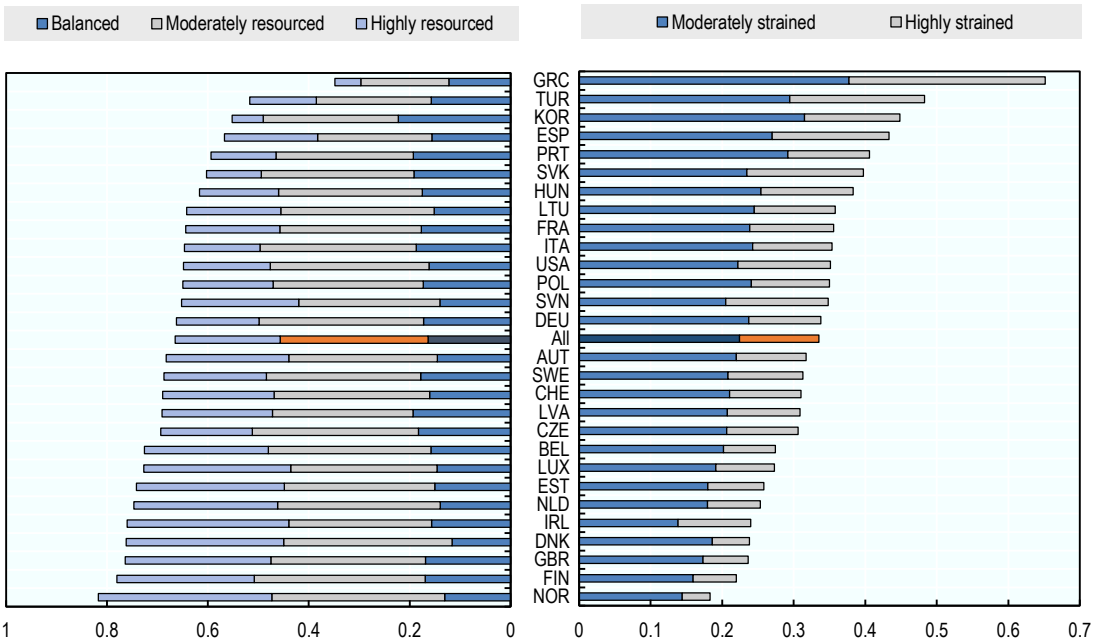
28. Previous studies have underlined the importance of the quality of the working environment (ILO and Eurofound, 2019[6]). For instance, (Stiglitz, 2009[7]) notes that "paid work contributes to quality of life, both positively and negatively. Paid work provides income as well as identity and social interactions, but it may also be a source of negative experiences". When workers are strained, work performance is lower as much of their energy is directed at meeting demands at work. Conversely, well-resourced jobs support performance and allow workers to adapt and develop.

29. The main result of the paper is that, based on the broad range of job dimensions described above, about one third of employees are (moderately or highly) strained at work (34% on average). Conversely, 50% of employees are well or very well resourced, while 16% of employees have equal numbers of resources and demands.

30. As shown on Figure 4.1, there are notable differences in the share of strained employees across countries. Less than 25% of employees report being strained in Norway, Finland, United Kingdom, Denmark and Ireland. By contrast, more than 40 % of employees experienced strain at work in Portugal, Spain, Korea, Turkey and Greece (up to 65%).

Figure 4.1. Distribution of strained and resourced employees

Selected OECD countries, 2015



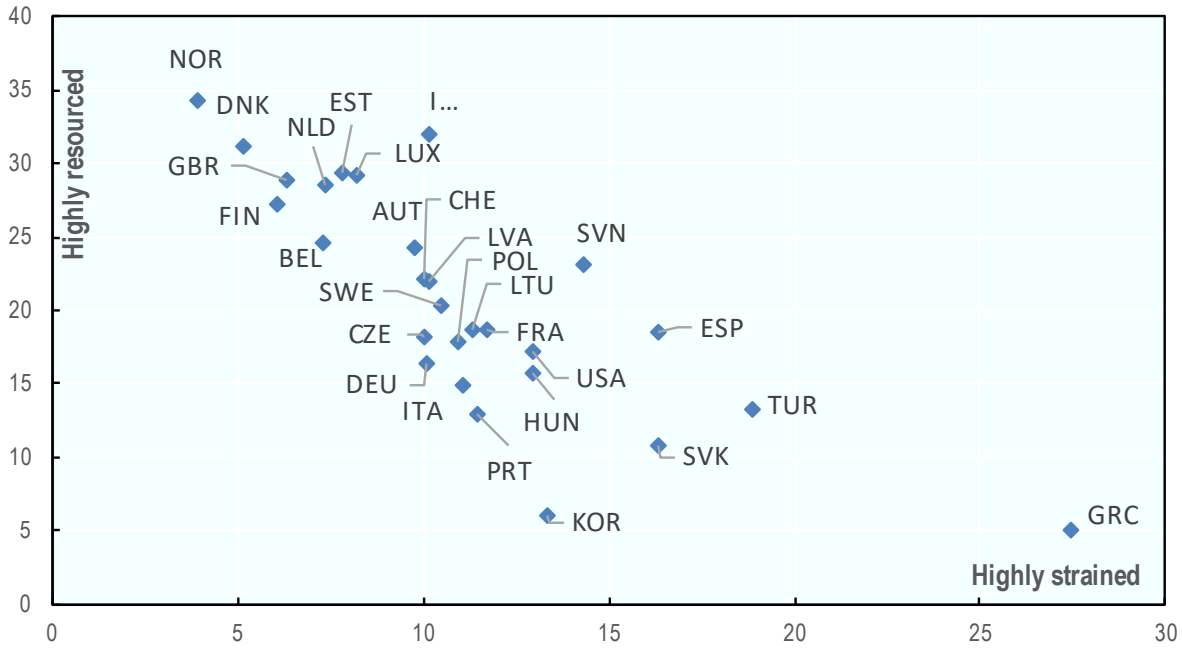
Note: The average "All" refers to the 28 selected countries.
Source: Authors' calculations based on data from EWCS, KWCS and AWCS.

31. Countries with the largest (respectively lowest) shares of well-resourced employees are those with the lowest (respectively highest) shares of strained employees. Focusing on the shares of highly resourced and highly strained employees (Figure 4.2), three groups of countries emerge:

- Several countries from Northern Europe, including Norway, Denmark and the United Kingdom, record both very low shares of highly strained employees and very large shares of highly resourced employees.
- A group of Western, Continental and Southern European countries (plus Sweden) as well as the United States display average performance, with about 18% of employees having high resources and 12% being highly strained.
- Finally, a small group of countries, including Korea, the Slovak Republic, Spain, Turkey and especially Greece are characterised by a very large share of highly strained employees.

Figure 4.2. Proportion of high strain and high net resources at work

2015



Source: Authors' calculations based on data from EWCS, KWCS and AWCS.

32. Heterogeneous performance across countries highlights the scope for improvement in terms of limiting the incidence of strained jobs. In that regard, analysis by job dimension allows identifying priority issues within countries, as well as domains with potential for policy exchange and policy transfer. Table 4.1 identifies which type job demands and job resources impacts the most on the overall assessment of the quality of the working environment for each country.[3] In terms of balancing job demands and resources, countries are in different situations:

- In Denmark, Finland, Ireland and Norway, the comparatively low level of strain is mainly due to the larger-than-average amount of resources (between three and five) enjoyed by employees; in these countries, practices supporting the development of job resources are widely spread.
- The low level of job strain in the United Kingdom is due to the cumulated positive impacts of high job resources with lower exposure to physical demands, lower job insecurity and higher exposure to social support and training.
- In Greece, the high level of job strain is due to a very high level of physical demands and perceptions of job insecurity but also to lower access to all job resources, particularly task discretion and autonomy and organisational participation, suggesting a very centralised system of work organisation.
- In Turkey and Spain, the high value of the job strain measure is mostly due to the negative impact of jobs demands. By contrast, in Portugal and Korea, the quality of working environment is negatively impacted by the low levels of several resources.

33. Overall, this analysis by country illustrates that all seven indicators play a role in making up quality of the working environment.

[3] Annex C presents for each job demand (respectively resource), the percentage of employees reporting that they face the demand (or are provided with the resource) for each country.

34. Improving the quality of the working environment can be done in many different ways: by limiting exposure to job demands but also by increasing access to job resources. Workplace practices and policies can support successfully actions in each of the job domains identified in Table 4.1. The comparative analysis of country performance suggests that there is scope for policy exchange and cross-learning amongst countries. Identifying country-specific drivers of the quality of the working environment can hence support the selection of priority thematic policies.

Table 4.1. Domain-specific performance of countries regarding quality of the working environment

Selected OECD countries, 2015

Country	% strained employees	Job Demands							Job Resources						
		Physical risk factors	Physical demands	Intimidation and discrimination at the workplace	Work intensity	Long working hours	Unsocial work schedule	Perceptions of job insecurity	Social support at work	Task discretion and autonomy	Organisational participation and workplace voice	Flexibility of working hours	Training and learning opportunities	Opportunity for career advancement	Opportunities for self-realisation
Austria	31.7			-											
Belgium	27.4														
Czech Republic	30.6			+	+					-					
Denmark	23.8		+				-			+	+	+		+	
Estonia	25.8				+					+					
Finland	22						-			+		+	+		
France	35.6	-	-	-											
Germany	33.8								-		-				-
Greece	65.2		--		-			--		--	--	-	-	-	-
Hungary	38.3			+									-		
Ireland	24								++		+		+	+	+
Italy	35.3	+					+		--		-			-	-
Korea	44.8	+			+	--		+	--	-	-	-	-	-	-
Latvia	30.9				++		+								
Lithuania	35.8											-		-	-
Luxem-bourg	27.3			-								+			+

Country	% strained employees	Job Demands							Job Resources						
		Physical risk factors	Physical demands	Intimidation and discrimination at the workplace	Work intensity	Long working hours	Unsocial work schedule	Perceptions of job insecurity	Social support at work	Task discretion and autonomy	Organisational participation and workplace voice	Flexibility of working hours	Training and learning opportunities	Opportunity for career advancement	Opportunities for self-realisation
Nether-lands	25.3		+	-				-			+	+			
Norway	18.3		+				-			+	+	+	+		
Poland	35			+				+							
Portugal	40.6			+			+	--		-	-		-		
Slovak Republic	39.8								-		-	-		-	-
Slovenia	34.8							-							++
Spain	43.3	-	-		-			-	+						
Sweden	31.3						-					+			
Switzer-land	31	+													
Turkey	48.3	---	-		--	---							-	++	
United Kingdom	23.6		+					+	+				+		
United States	35.1		-	--	-		--	+				+	+		

Note: The table reports the relative performance of countries in terms of lower job demands and higher job resources. +/- indicate respectively positive and negative impacts on the quality of the working environment. They correspond to a percentage of employees larger or lower by one standard deviation than the average percentage of employees across the sample. For instance, a "-" for physical demands in the United States implies that the share of employees reporting high physical demands is larger than the cross-country average by one standard deviation; it would hence suggest that this issue is greater concern in the United States, and that policies and actions aimed at reducing exposure to physical demands should be prioritised. Conversely, the "+" observed for job resources in this country means that the share of employees who report to benefit from these job resources is larger than the sample's average by one standard deviation. Similarly, "++" indicate a benefice larger than the samples' average by two standard deviations, and so on.
Source: Authors' calculations based on data from EWCS, KWCS and AWCS.

4.2. Quality of the working environment across socio-economic groups

35. The socio-economic characteristics analysed in this paper include:

- Gender and age (with three age bands, i.e. 18-29[4]; 30-49 and 50-64).
- Occupation (three levels of skills based on the 2008 International Standard Classification of Occupations – ISCO : "high", "medium" and "low") and educational attainment (i.e. "Primary", "Secondary" or "Tertiary").
- Sector of employment ("Agriculture", "Industry", "Construction", "Market services" and "Non-market services", on the basis of the International Standard Industrial Classification – ISIC Rev. 4).
- Type of ownership (i.e. "Public", "Private" or "Other") of the employer institution.
- Size of the worksite (with three size-class based on the total number of people working at the respondent workplace, i.e. 1-9 ("Small worksite"), 10-49 ("Medium worksite") and 50 and over ("Large worksite")).
- Type of job contract ("Temporary", "Permanent" and "Other").

36. Lists of occupations, sectors of activities and education attainment levels included in the various groups for AWCS, EWCS and KWCS are available in Annex B.

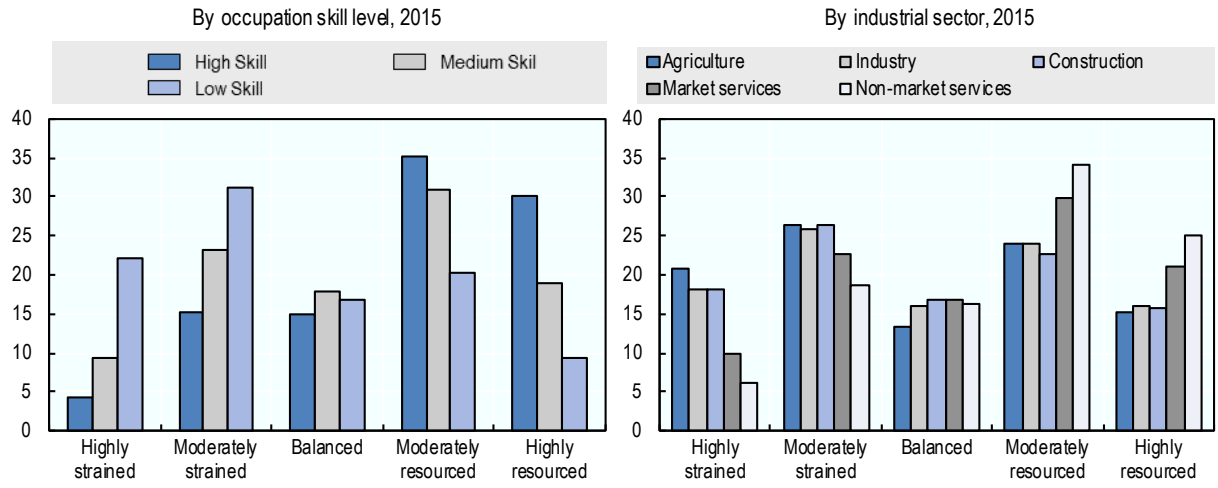
37. A detailed comparison across socio-economic groups highlights that low-educated and low-skill employees, as well as employees in agriculture, industry and construction, are the most likely to experience high strain at work. As shown on Figure 4.3, there are stark differences in the prevalence of strain between high-skill and low-skill employees. The share of highly strained among employees in low-skill occupation (22.2%) is more than five times larger than among those in high-skill occupations (4.3%).[5] Conversely, the proportion of (highly or moderately) resourced employees within high-skill occupation employees (65.4%) is more than twice as large as within the population of low-skill occupation employees (29.6%). The proportion of employees in balanced jobs across all socio-demographic groups considered is quite similar across the different categories.

38. Sector-wise, almost half (47.3%) of employees in agriculture experience strain. In this sector of activity, the share of highly strained employees (20.8%) is higher by almost 10 percentage points than that of the whole population of employees (11.1%). The prevalence of (highly or moderately) strained employees is also high in construction (44.7%) and industry (44%). By contrast, the share of strained employees is lower in services (32.5% in market services; 24.6% in non-market services), where most employees report being well-resourced (50.7% in market services; 59% in non-market services). These findings illustrate the strong occupational dimension of the quality of the working environment, with agriculture, industry and construction still involving a high level of exposure to risks. Yet about 15% of the jobs in these three industries are highly-resourced, and about 25% are moderately resourced, demonstrating that the quality of the working environment can be improved in these industries as well. The same argument can be made for low-skill job; indeed, a third of them are highly or moderately resourced.

[4] The lower age limit was imposed by the minimum age (18) observed in the AWCS survey results.

[5] Percentages shown in this section are simple (i.e. unweighted) averages of the percentages recorded in the 28 individual countries of this paper.

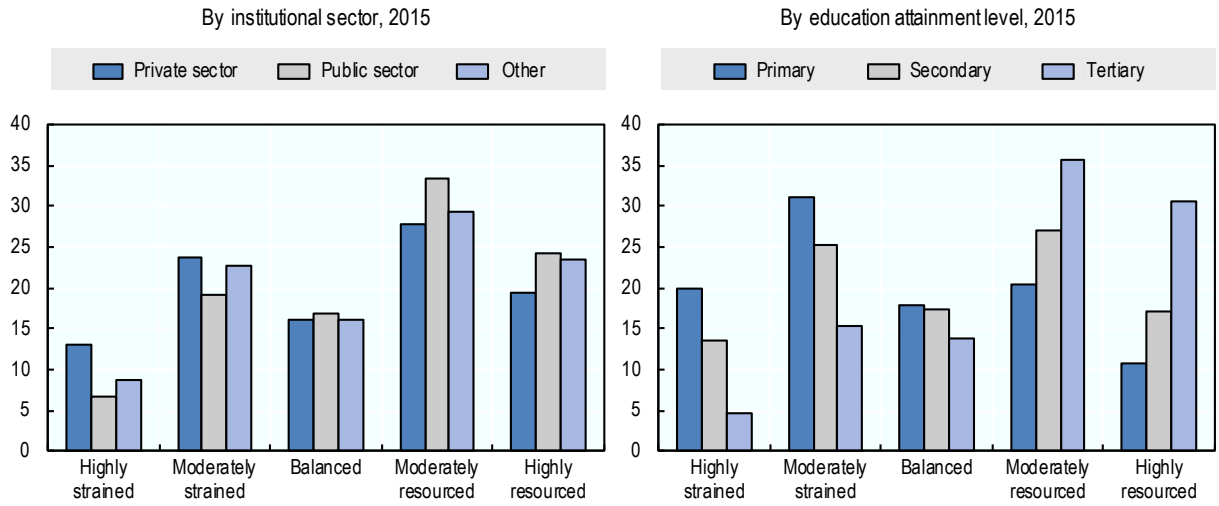
Figure 4.3. Share of employees facing different levels of job strain by occupation and sector of employment



Note: Lists of occupations and activities included in the various categories shown in this charts are available in annex.
Source: Authors' calculations based on data from EWCS, KWCS and AWCS.

39. Figure 4.4 shows that the level of strain declines with higher educational attainment. About two-third (66.1%) of employees with tertiary education level are either moderately or highly resourced. The proportion (30.6%) of highly resourced employees among those with tertiary level of education is almost three times higher than among those with primary level of education (10.6%). By contrast, half (51.1%) of employees with primary level of education experience strain. These findings confirm the role that education plays in access to quality jobs. There are also noticeable differences between public and private sectors, where the shares of highly strained employees are equal to 6.7% and 13% respectively. The public sector continues to play a role in promoting jobs with a higher quality of the working environment.

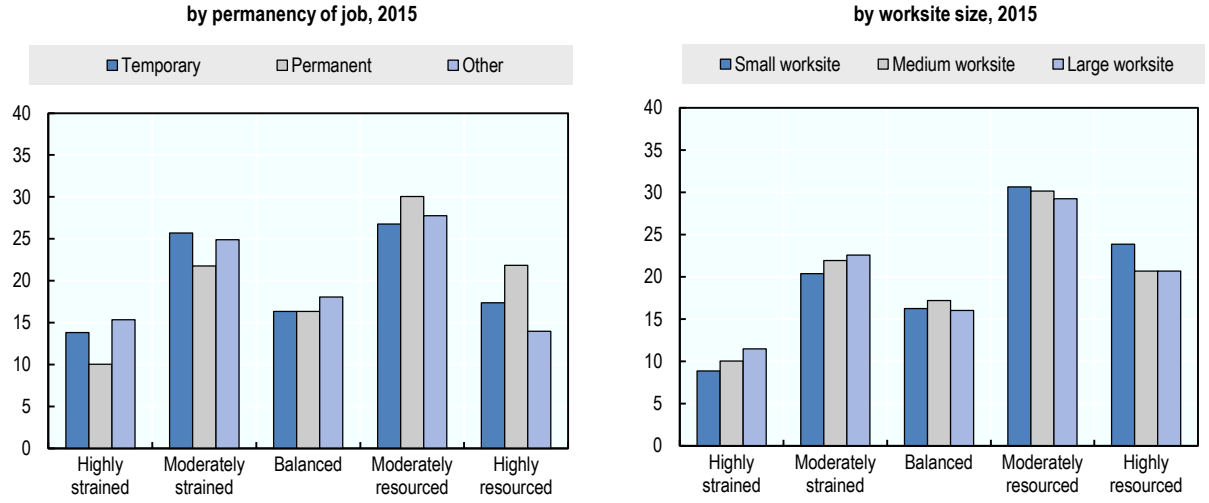
Figure 4.4. Share of employees facing different levels of job strain by type of ownership of the firm and educational attainment of the worker



Note: Lists of education attainment levels classified as “Primary”, “Secondary” and “Tertiary” are available in Annex.
Source: Authors' calculations based on data from EWCS, KWCS and AWCS.

40. Figure 4.5 illustrates the impact of contract's type and worksite size on the quality of the working environment. With respect to contract type (left-hand panel), on average across 27 OECD countries with available data[6], more than half (51.9%) of employees with permanent contract report fewer job demands than job resources, which is nearly 8 percentage points above the proportion recorded within employees with temporary contracts. The highest share of either highly or moderately strained employees (40.2%) is recorded among employees classified as "Other" (i.e. in apprenticeship, training scheme or without contract), slightly above the corresponding share among employees with temporary contracts (39.5%). This confirms previous findings that temporary workers and workers in atypical employment status experience on average less favourable working conditions (see for example (Eurofound, 2018[8]), with lower task discretion and autonomy, organizational participation and workplace voice, higher perceptions of job insecurity and lesser working time flexibility. In terms of size of the worksite, the larger the worksite the higher the share of strained workers (right-hand panel). However, differences are rather small in terms of the share of employees experiencing both "high" and "moderate" strain (29.2% in small worksites, 32% in medium ones and 34% in large ones) and "high" and "moderate" resources (respectively 54.5%, 50.8%, 49.9%). Access to resources may be easier in smaller establishments where work can be organised and jobs adapted to workers preferences and companies circumstances. Conversely, the more structured policies and processes supporting the development of human resources in bigger establishments seem to translate into higher job strain.

Figure 4.5. Share of employees facing different levels of job strain by type of work contract and worksite size



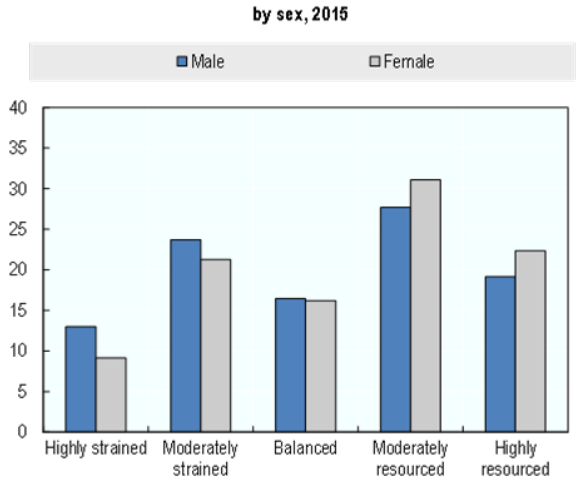
Note: Left-hand panel: Cross-country average value excluding the United States; "Other" refer to an apprenticeship or other training scheme or to the absence of contract. Right-hand panel: Small worksite' refer to workplaces were the total number of people working is between 1 and 9; "Medium worksite", between 10 and 49; "Large worksite", 50 and over.
Source: Authors' calculations based on data from EWCS and KWCS.

41. By contrast, employees' age and of gender do not yield much difference in the prevalence of job strain. The difference between the share of 18-29 (the age group the most affected by strain) and that of 30-49 (the less affected) experiencing high or moderate strain is only 1.7 percentage points. Conversely, the proportion of fairly resourced employees among the 30-49 (51.1%) is hardly higher than among the 50-64 (49.7%) and 18-29 (48.4%) year-old. In terms of gender, Figure 4.6 shows that the proportion of women in highly and moderately

[6] The United States are excluded since information for this socio-economic characteristic is not available in AWCS.

strained jobs (9,1% and 21.3% respectively) is, on average, slightly lower than that of men (13.0% and 23.7% respectively).

Figure 4.6. Share of employees facing strain or having resources



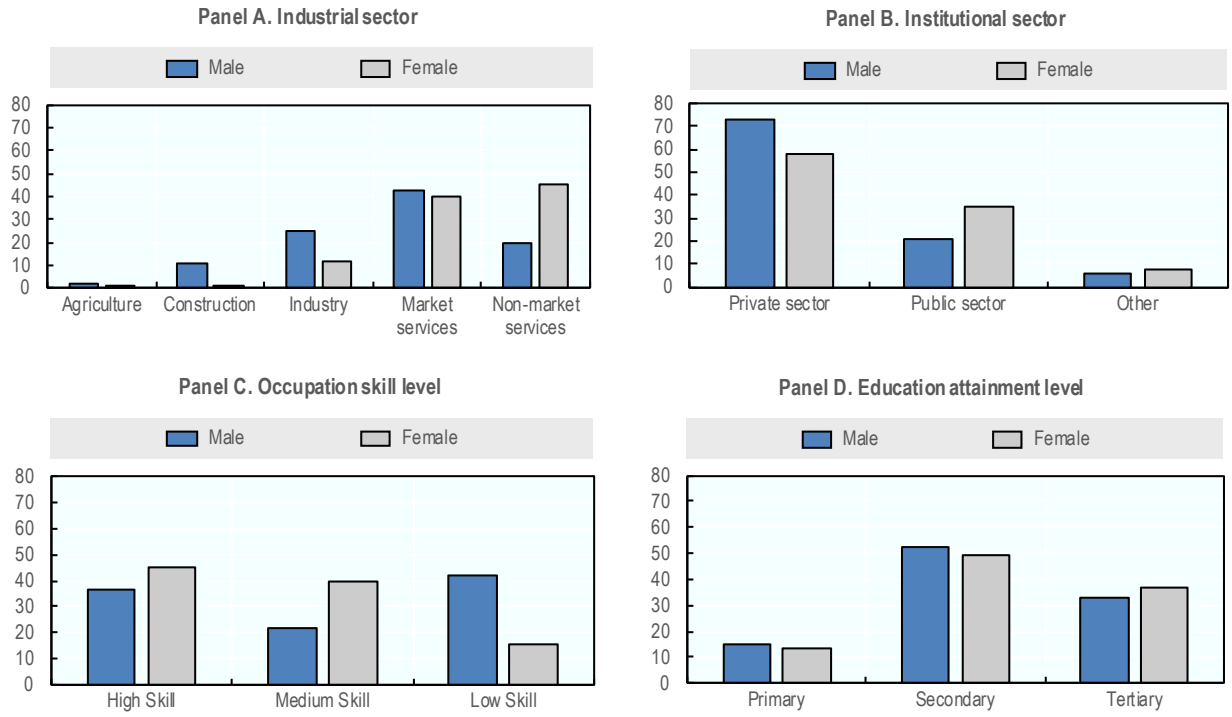
Source: Authors' calculations based on data from EWCS, KWCS and AWCS.

42. The latter result is partly explained by sample composition effects, as women are more represented than men in well-resourced groups such as the service sector, the public sector as well as high and medium skill occupations. Figure 4.7 shows that on average only 1.3% of women are employed in agriculture, 1.4% in construction and 12% in industry, as compared to 2.3%, 10.9% and 24.7% of male employees. Conversely, the share of women working in market or non-market services is above 85% on average. Likewise, almost three-quarters of men are employed in the private sector (where the prevalence of strain is the highest) compared to 60% of women. The higher proportion of men in low-skill occupations (42% versus 15.6% for women) also contributes to explain the gender gap in job strain.

43. Overall, this evidence points to important differences in the quality of the working environment across education, industry, occupation and employment status, with low skill and low educated workers in agriculture, construction and industry reporting above average highly and moderately strained jobs. Conversely, there are only minor differences when considering ownership of the companies or size of the worksite. Due to composition effects, women hold on average slightly less strained jobs than men, while there are negligible differences by age.

Figure 4.7. Work characteristics by gender, 2015

In percentage of population of men or women in the sample



Source: Authors' calculations based on data from EWCS, KWCS and AWCS.

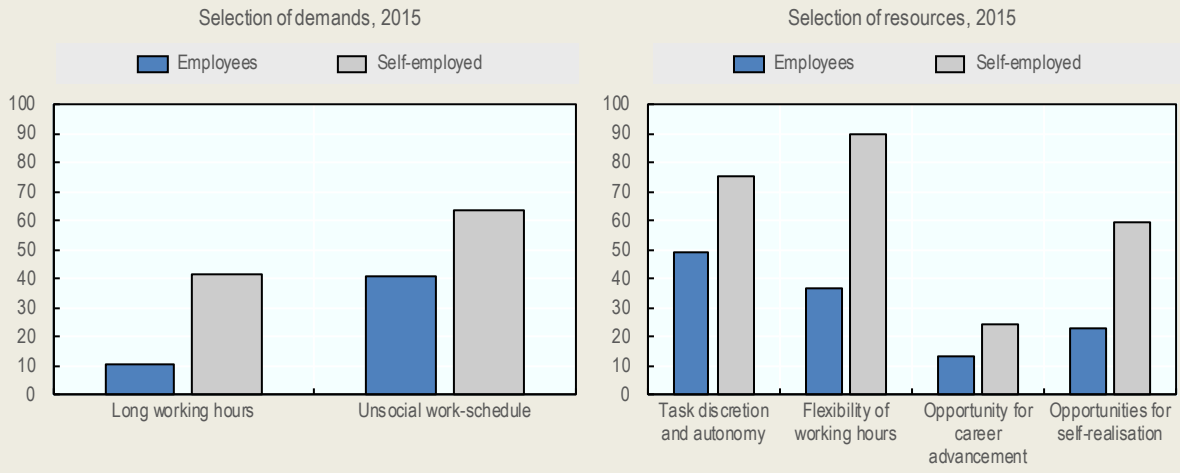
Box 4.1. Quality of the working environment: how do employees and self-employed fare?

There are important differences in the quality of the working environment experienced by employees and the self-employed. Figure 4.8 shows that, in comparison with employees, the prevalence of several job resources and job demands is significantly higher among self-employed.

On the demands side, the proportion of workers experiencing long working hours is almost four times higher among self-employed (41.7%) than among employees (10.8%), while the share of self-employed facing unsocial work-schedule (63.6%) is more than 20 percentage points higher than that of employees.

On the other hand, a very large majority of self-employed (89.5%) benefit from flexible working-time, while this is the case for less than half (37.0%) of employees. Self-employed typically report that they are free to organise their daily work (this is the case for 75.4% of them against 48.8% among employees) and able to apply their own ideas in their work (59.3% against 23.1% for employees). The proportion of self-employed considering that their job offers good prospects for career advancement (24.6%), albeit lower than for other job resources, was also higher than that of employees (13.5%).

Figure 4.8. Demands and resources: Comparison between employees and self-employed



Source: Authors' calculations based on data from EWCS, KWCS and AWCS.

4.3. Changes in quality of the working environment between 2010 and 2015

44. On average, there have been small changes between 2010 and 2015 in the quality of working environment of employees: the share of strained employees has fallen by 2 percentage points (to 33.5%) over the 2010-15 period, with the share of highly strained employees decreasing by 0.6 percentage point (to 11.1%). Over the same period, the proportion of well-resourced employees has increased by 1.2 percentage points (to 50.1%), almost entirely due to the increase in the share of highly resourced employees (up 1.1 percentage points to 20.8%).

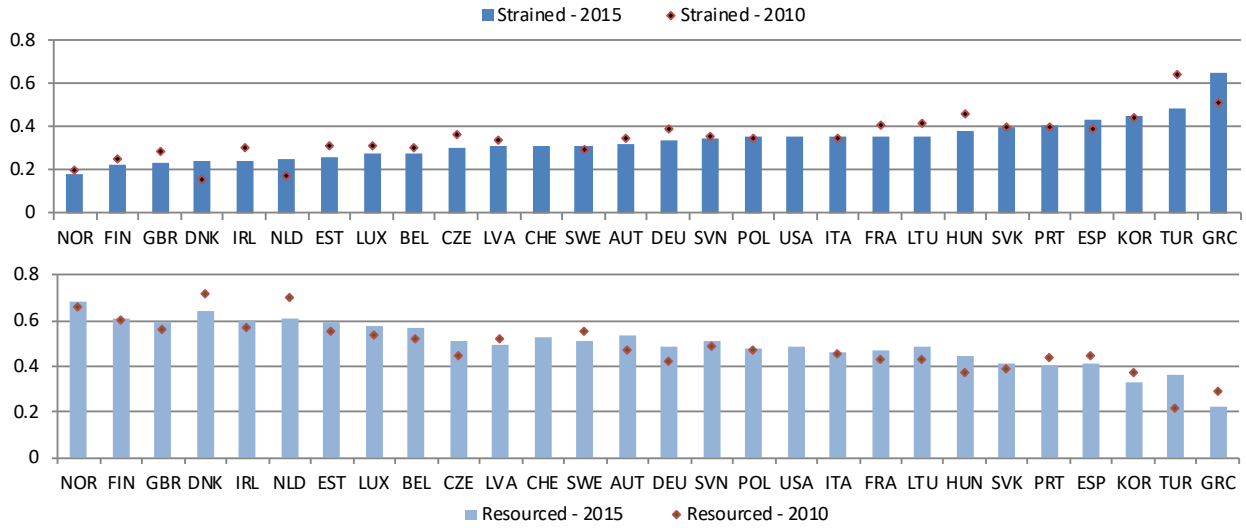
45. Over the period, differences across countries have slightly decreased and their performance has converged. Considering the 26 countries[7] for which data are available for both years (results for the United

[7] Results for Switzerland and the United States, not available for 2010, are not taken into account in this comparison.

States and Switzerland are not available), the difference in the share of highly or moderately strained employees between the highest and the lowest country narrowed by 1.7 percentage points (from 48.6% in 2010, to 46.9% in 2015). Over the same period the difference in the share of highly or moderately resourced employees between the highest and the lowest country's narrowed by 3.7 percentage points (from 49.7% to 46%).[8] Most progress have come through the reduction in exposure to job demands than through increase in job resources.

46. Figure 4.9 shows that the strongest decreases in the share of highly or moderately strained employees occurred in Turkey (down by 16.1 percentage points, to 48.3%) and Hungary (down by 8 percentage points, to 38.3%). Other strong declines (by more than 5 percentage points) occurred in the Czech Republic, Germany, Estonia, France, the United Kingdom, Ireland and Lithuania. The largest increase in the share of well-resourced employees over this period also occurred in Turkey (by 13.9 percentage points, to 36%). Increases of more than 5 percentage points occurred in Austria, the Czech Republic, Germany, Hungary and Lithuania.

47. By contrast, Greece, Denmark and the Netherlands have recorded large increases in the share of strained employees (by respectively 13.6, 8 and 7.5 percentage points), together with strong falls in the proportion of well-resourced employees (down by respectively 6.8, 7.2 and 9.6 percentage points) between 2010 and 2015. This is also the case, to a lesser extent, in Spain. In Korea, the relatively strong decline (of 4.9 percentage points) in the share of well-resourced employees has not been reflected in the share of strained employees, which increased by only 0.3 percentage point.



Note: Strained (respectively resourced) includes highly and moderately strained (respectively resourced) employees.
Source: Authors' calculations based on data from EWCS and KWCS.

48. Digitalisation, the diversification of employment conditions and changes in work organisation have multiple and different impacts on the job demands and job resources that make up quality of the working environment. As can be observed in Figure 4.10, these changes are mainly reflected by the rise in the prevalence of five Job resources ("career advancement", "received training", "social support", "organisational participation" and "flexibility of working time") and the fall in three job demands ("physical risk factors", "physical demands" and "unsocial work schedule"). Physical risks factors, physical demands and unsocial work schedules are long standing areas of public policies, collective bargaining, companies' policies and individual practices.

[8] The standard deviation across countries of the share of employees strained (respectively well-resourced) also slightly declined, from 10.1 in 2010 to 9.7 in 2015 (respectively from 11.3 to 10.3).

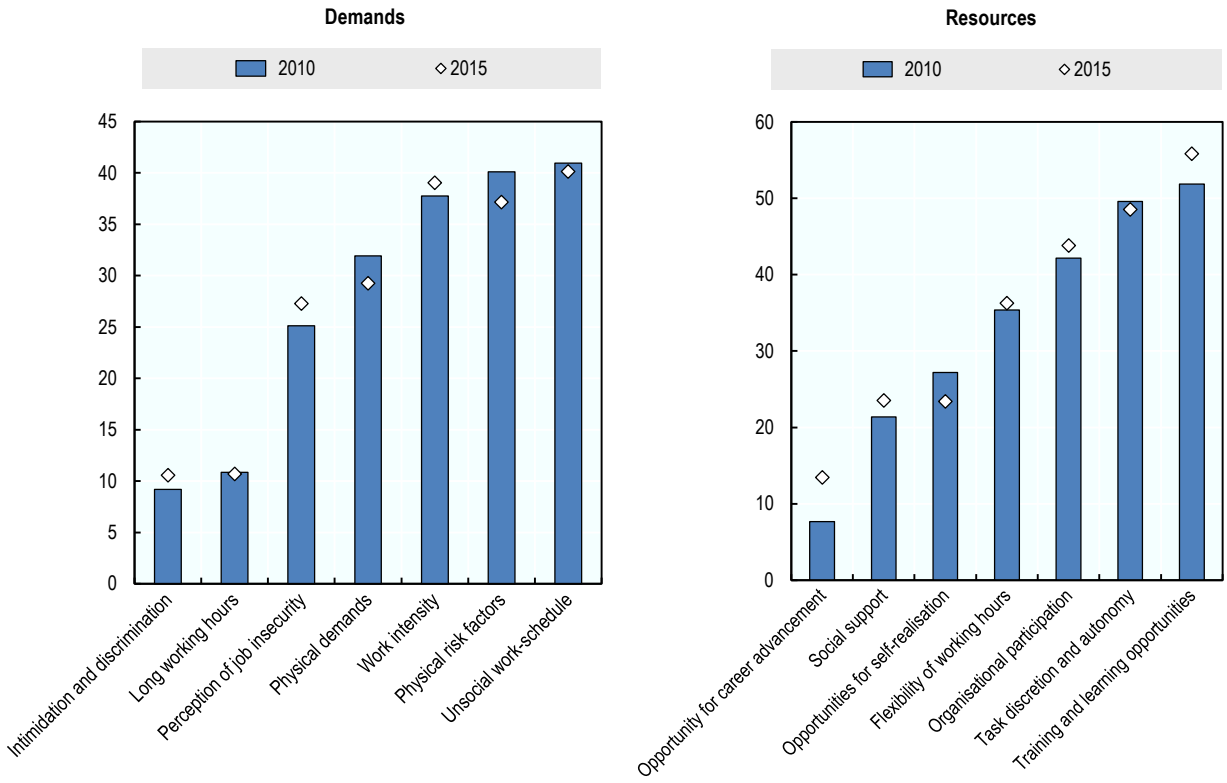
49. On average over this period, employees reported greater access to training, better flexibility of working time and better prospects for career advancement, developments which are well aligned with a policy agenda promoting “lifelong learning”, “work life balance” and “secure and adaptable employment”. Social support at work has also improved. While this job resource plays an essential role in making work safe, healthy and enjoyable, it is often invisible in conventional statistics.

50. The increase in organisational participation over the period is another reason for optimism; indeed the tacit knowledge of workers and the actions that support their involvement in decision-making have the potential to ensure that changes can be adapted to their preferences and to new circumstances. They are also associated with skill development of the workforce, reduction of inequalities between groups of workers as well as creativity and innovation at the workplace (Eurofound, 2020[9])

51. At the same time, three job demands have increased (“perception of job insecurity”, “intimidation and discrimination” and “work intensity”), and two job resources declined (“opportunities for self-realisation” and “task discretion and autonomy”). The increase in job insecurity, in the period 2010-15, reflects partly a turbulent labour market in the aftermath of the Great Recession and the different recovery trajectories of countries, but it may also reflect growing automation of jobs and changing forms of work. By the same token, the increase in work intensity, the reduction in task discretion and autonomy, as well as reduced opportunities for self-realisation, may reflect structural changes affecting the labour market. Indeed, work intensity has been shown to increase in periods of restructuring where learning is needed and new procedures and practices are adopted. Finally, the increase in intimidation and discrimination may be due to more frequent reporting in a changing societal environment. The difficulties in integrating a more diverse workforce and supporting an inclusive labour market have gained in visibility and have become less acceptable as demonstrated by the scale and take up of public campaigns like #Metoo or #blacklivesmatter.

52. A detailed analysis of changes in risks and resources indicate that significant transformations took place with both progress and declines in some of the dimensions making up the quality of the working environment. Altogether, all dimensions of the quality of working environment but one (long working hours) have changed significantly (in positive or negative ways) during the period considered.

Figure 4.10. Job demands and job resources in 2010 and 2015



Note: For each demand (respectively resource), data refer to a percentage of employees reporting that they face the demand (respectively are provided with the resource). This percentage is an average of percentages observed in the 26 countries for which data are available for both 2010 and 2015.
Source: Authors' calculations based on data from EWCS and KWCS.

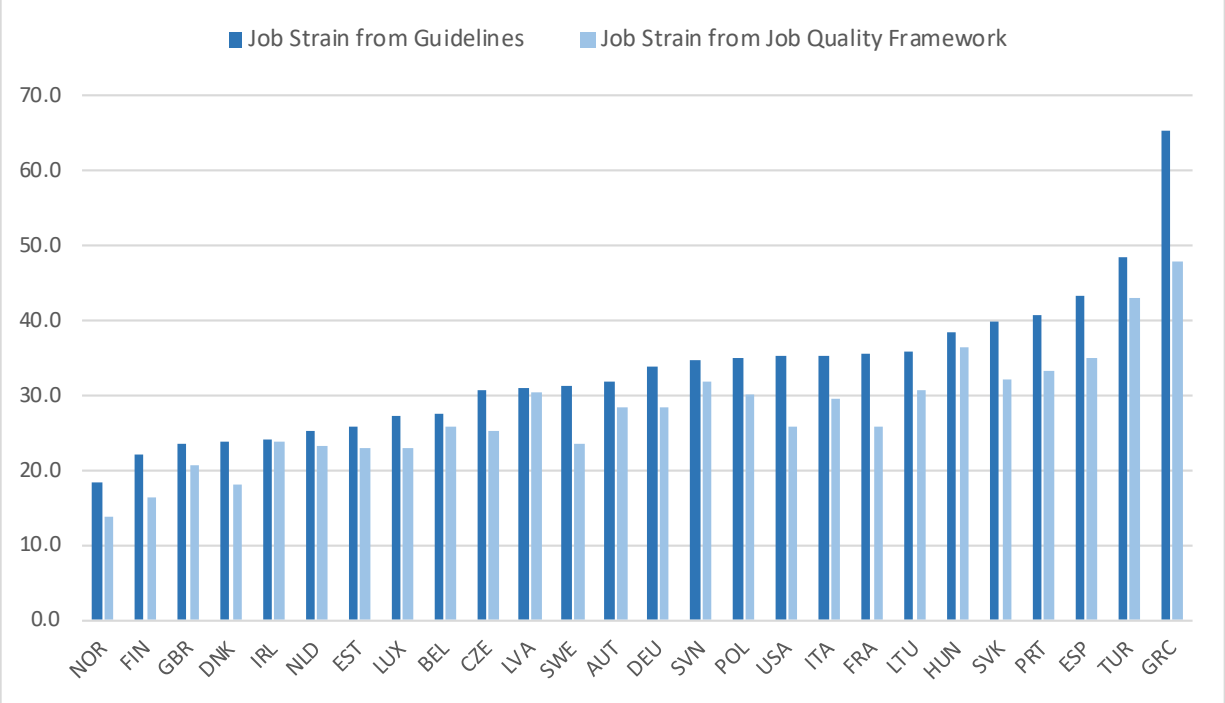
4.4. A comparison between the "expanded" job strain index used in this paper and the one used to monitor implementation of the OECD Job Strategy

53. As explained above, the job strain index presented in this paper is based on seven job demands and seven job resources drawn from the *OECD Guidelines* (OECD, 2017[1]). This index differs from the indicator included in OECD Job Quality Framework (Cazes, 2015[2]) and used to monitor the OECD Job Strategy, which relies on three job demands and three job resources (i.e. "physical demands", "work intensity" and "unsocial work schedule" for the former; "task discretion and autonomy", "training" and "opportunity for career advancement" for the latter).

54. As shown by Figure 4.11, there are only few differences in the level of job strain across the two methodologies in 2015. The cross-country correlation is high (0.94), and both measures provide consistent classification of countries with high or low job strain. Yet there are some differences: i) the average job strain across OECD countries is slightly higher in our approach than in (Cazes, 2015[2]) (33.2% vs. 27.9%), due to the introduction of new job demands that are more frequent than new job resources; ii) the level of job strain as measured in this paper is significantly higher in Greece, Spain, France and the United States than in (Cazes, 2015[2]).

Figure 4.11. Comparison of Job Strain Index from OECD Job Quality and OECD Guidelines Frameworks

Percentage, 2015

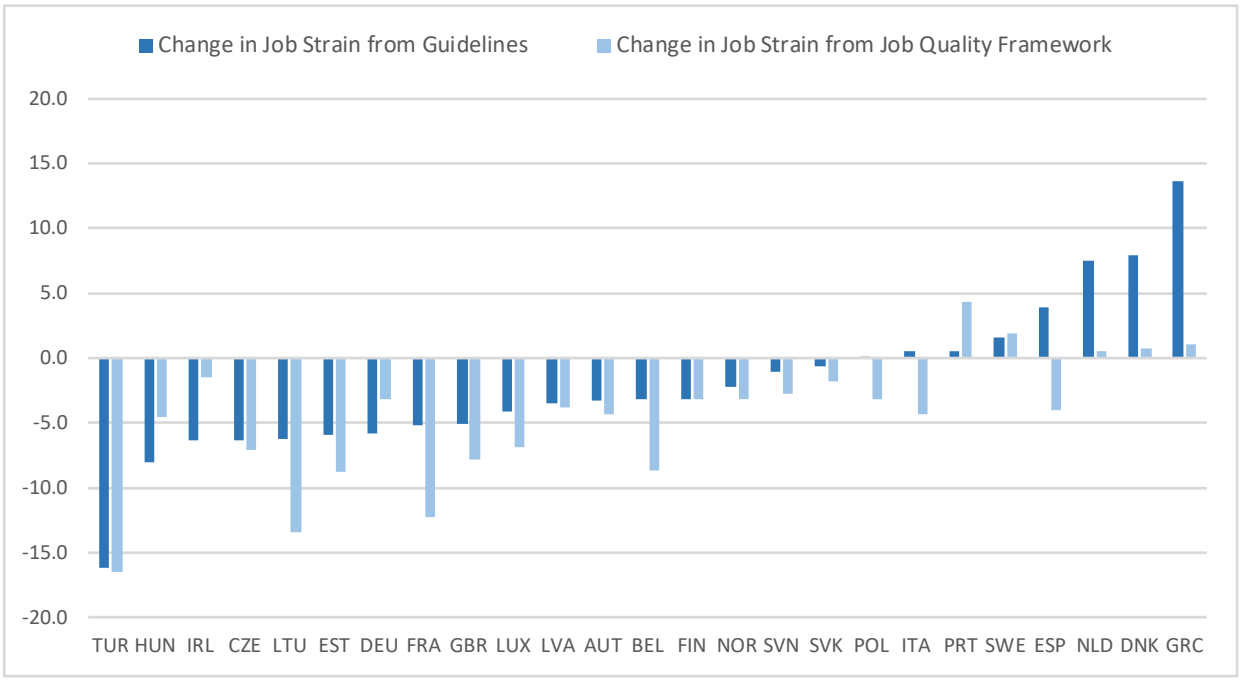


Source: Guidelines Job Strain Index: Authors' calculations based on data from EWCS and AWCS; Job Strain Index from Job Quality Framework: *OECD Job Quality Database*, https://stats.oecd.org/Index.aspx?DataSetCode=JOBQ.

55. Figure 4.12 compares the change in the job strain index between 2010 and 2015 across the two methodologies. The cross-country correlation is still high (0.72) but lower than in level. Job strain displays the same direction of change in 22 out of 25 countries, and differs significantly only in Spain (+4% vs -4%). The average change across all OECD countries is also consistent, with a fall of -2% for the our index and of -4.5% in (Cazes, 2015[2]). However, some noticeable differences emerge, as our index points at : i) significantly larger increases of job strain in Spain, Netherlands, Denmark and Greece; ii) significantly smaller decreases in job strain in Lithuania, France and Belgium.

Figure 4.12. Change in Job Strain Index between 2010 and 2015

Percentage points



Source: Guidelines Job Strain Index: Authors' calculations based on data from EWCS and AWCS; Job Strain Index from Job Quality Framework: *OECD Job Quality Database*, https://stats.oecd.org/Index.aspx?DataSetCode=JOBQ.

5. The relationship between quality of the working environment, workers' health and well-being

56. One of the rationales for measuring the quality of the working environment is its expected relationship with workers' health and well-being. This section examines the relationship between the various job characteristics making the quality of working environment and well-being measures. This allows identify the role of the various job characteristics in relation to the well-being of the workforce. As workers' health and well-being have been associated with performance of companies and positive societal outcomes, this section helps assess the benefits stemming from higher quality of the working environment.

57. Health is more than the absence of disease or infirmity; it is defined by the World Health Organization, as "a state of complete physical, mental and social well-being". In order to address such multi-dimensionality, this section focusses on two indicators measuring physical and mental health[9,10] as well as days of absence due to sickness, and two measures of job satisfaction and job motivation. The methodology consists of regressing well-being outcomes[11] on the set of job demands and resources, while controlling for a range of individual factors as well as the log of hourly wage.

58. Table 5.1 reports the results. On the first column, job satisfaction is one of the most reported indicators of well-being related to working life (Brown, 2012[10]). It captures a self-evaluation of jobs by workers and measures the satisfaction of workers with an important domain of their lives. Thirteen out of the 14 job resources and demands are statistically significant at a 1% confidence level and display the expected sign on their

[9] Mental health is constructed as a score ranging from 0 to 1. It is based on the question "Please indicate for each of the five statements which is the closest to how you have been feeling over the last two weeks [All of the time / Most of the time / More than half of the time / Less than half of the time / Some of the time / At no time]: A - I have felt cheerful and in good spirits (mha); B - I have felt calm and relaxed (mhb); C - I have felt active and vigorous (mhc); D - I woke up feeling fresh and rested (mhd); E - My daily life has been filled with things that interest me (mhe)". The mental health variable was constructed as follows: for each of the five statements, a value of 1 was imputed for answers (All of the time / Most of the time) and 0 for other answers. The mental health score is the average across components: MH = (mha + mhb + mhc + mhd + mhe) / 5.

[10] Physical health is constructed as a score ranging from 0 to 1. It is based on the question "Over the last 12 months, did you have any of the following health problems? [Yes/No]: A - hearing problems (ph2a); B - skin problems (ph2b); C – backache (ph2c); D - muscular pains in shoulders, neck and/or upper limbs (arms, elbows, wrists, hands etc.), as well as E - muscular pains in lower limbs (hips, legs, knees, feet etc.), with D and E being grouped together (ph2de); F - headaches, eyestrain (ph2f); G - injury(ies) (ph2g); I - overall fatigue (ph2i)". The physical health variable was constructed as follows: For each health item, a value of 1 was imputed to "No" and 0 to "Yes". The physical health score is the average across those 7 components: PH=(ph2a+ph2b+ph2c+ph2de+ph2f+ph2g+ph2i)/7.

[11] Regressions have been carried out on pooled years 2010 and 2015, except for USA where data are only available in 2015.

coefficient, which is mostly consistent with findings in (OECD, 2014[11]). As all job characteristics are dummies taking value one if the job demands or resources are observed, it is straightforward to compare the relative magnitude of their coefficients. The largest coefficients are observed for "opportunity for career advancement" (1.05), "intimidation and discrimination at the workplace" (-0.97), "social support at work" (0.81), "organisational participation and workplace voice" (0.49), "physical risk factors" (-0.46), "physical demands" (-0.44) and "long working hours" (-0.42). Overall, the potential effect of quality of the working environment on job satisfaction is very large. If taken at face value, these estimates suggest that getting rid of all job demands simultaneously would imply an increase in job satisfaction by 3.2 points on a 0-10 scale, while providing all job resources to all workers would increase it by 3.1 points. This would also indicate that the balance between job demands and job resources in the quality of the working environment is quite right. By contrast, the log hourly wage is not a significant determinant of job satisfaction.

59. With regards to job motivation, whose results are displayed on column 2, 11 out of the 14 resources and demands are statistically significant at a 5% confidence level and display the expected sign. The Job - Demands Resource model, the workhorse on which the measurement framework of the OECD Guidelines is built, predicts a positive impact on motivation when resources exceeds demands. The demands that show the highest coefficient are "intimidation and discrimination at the workplace" (-0.074), "physical demands" (-0.047) and "work intensity" (-0.039) while the resources that show the highest coefficients are "social support" (0.056), "opportunity for career advancement" (0.054) and "organisational participation and workplace voice" (0.047). The log hourly wage is significant at a 5% confidence level and display a positive sign. Two demands and one resource are not significant: all of these relate to working time ("long hours of work", "unsocial working hours" and "flexibility of working hours"). This result is not unexpected as working time is more of a variable of adjustment rather than a key determinant of motivating work.

60. Table 5.1 also reports the relationships between health outcomes, job demands and resources. Health outcomes include self-reported mental and physical health, as well as days of absence from work due to sickness. Turning to mental and physical health, the same demands are significantly related to workers' health. "Intimidation and discrimination at the workplace" has by far the largest association with these two outcomes (-0.085 on mental health and -0.088 on physical health), followed by "unsocial work schedules" and "physical demands" – as seen in (Arends, Prinz and Abma, 2017[12]; Kim, H. et al, 2009[13]). Conversely, there are significant differences in the relationships between these two health outcomes and job resources: "training and learning opportunities" and "task discretion and autonomy" are significantly related to mental health while "organisational participation and workplace voice" and "opportunity for career advancement" are significantly related to physical health. The positive relationship between "organisational participation and workplace voice" and physical health may be linked to a lower gap between actual and desired amount of work when workers' voices are heard (see (Bassanini and Caroli, 2014[14]) and (Gallie, 2013[15])). "Social support at work" is also a key resource to alleviate mental health and physical health issues of workers, as shown in (Arnold, 2016[16]; Cullen, 2018[17]).

61. Turning to days of sick absence[12], most jobs demands and resources are significantly related to it. The regression coefficients have the expected sign and are in line with those reported by (Schaufeli, 2009[18]), except for "unsocial work-schedule" and "perceptions of job insecurity", which are only weakly significant. "Social support" plays an important role in buffering the days of sick absence relatively to the other resources while "intimidation and discrimination at the workplace" increases substantially the days of sick absence among the other demands. The "physical risk factors", "physical demands" and "work intensity" are also positively associated to number of sick absence days. These factors are also known to increase "sick presenteeism" (Miraglia and Johns, 2016[19]), which suggests a negative influence on health as a whole (whether at the workplace or on sick leave).

[12] The average number of sick days taken by employees over the last 12 months.

62. Figure 5.1 to Figure 5.5 provide a graphical representation of the estimates shown in Table 5.1, i.e. the average effect of each demand or resource on the five well-being outcomes. The results are strikingly similar across those five well-being indicators. In each case, "social support" and "opportunity for career advancement" are the main predictors of well-being with a positive coefficient. The positive relationship between sick absence and "perceptions of job insecurity" is an exception, but job insecurity cannot really be considered as a "positive" reason to reduce sickness absence, while this association can be explained by the fear of workers of being absent in a context where their job is at risk.

63. Likewise, "intimidation and discrimination at the workplace" is always the biggest contributor to lower workers well-being. "Physical risk factors" and "physical demands" are almost always coming in second and third rank – except for mental health, to which "unsocial work schedule" and "long working hours" are more detrimental.

Table 5.1. The relationship between quality of the working environment and workers' well-being

	Job satisfaction	Job motivation	Mental health	Physical health	Sick absence
Physical risk factors	-0.463***	-0.0223***	-0.0175***	-0.0455***	0.154***
	(0.0481)	(0.00403)	(0.00514)	(0.00725)	(0.0430)
Physical demands	-0.441***	-0.0471***	-0.0253**	-0.0787***	0.185**
	(0.0283)	(0.00430)	(0.0121)	(0.00757)	(0.0853)
Intimidation and discrimination at the workplace	-0.968***	-0.0737***	-0.0853***	-0.0887***	0.392***
	(0.135)	(0.00835)	(0.0200)	(0.00497)	(0.110)
Work intensity	-0.342***	-0.0388***	-0.0260**	-0.0240***	0.146***
	(0.0689)	(0.00515)	(0.00977)	(0.00396)	(0.0232)
Long working hours	-0.417***	-0.00783	-0.0339***	-0.0195***	0.00642
	(0.0276)	(0.00941)	(0.00548)	(0.00229)	(0.0186)
Unsocial work schedule	-0.306***	-0.00483	-0.0413***	-0.0379***	-0.0548***
	(0.0336)	(0.00403)	(0.00742)	(0.00352)	(0.0159)
Perceptions of job insecurity	-0.255***	-0.0200**	-0.0234***	-0.0193***	-0.251*
	(0.0889)	(0.00737)	(0.00724)	(0.00303)	(0.128)
Social support at work	0.809***	0.0555***	0.121***	0.0272***	-0.0818**
	(0.122)	(0.00529)	(0.00620)	(0.00635)	(0.0383)
Task discretion and autonomy	0.215***	0.0118***	0.00861*	-0.00605***	-0.00560
	(0.0428)	(0.00408)	(0.00471)	(0.00182)	(0.0263)
Organisational participation and workplace voice	0.489***	0.0466***	0.0877***	0.0112***	-0.0628***
	(0.0391)	(0.00381)	(0.0106)	(0.00202)	(0.0204)
Flexibility of working hours	0.0276	-0.000607	-0.00927	-0.0116	-0.0219
	(0.0439)	(0.00330)	(0.00782)	(0.00704)	(0.0297)
Training and learning opportunities	0.298***	0.0301***	0.0294**	-0.0149**	0.0338
	(0.0516)	(0.00427)	(0.0125)	(0.00575)	(0.0439)
Opportunity for career advancement	1.045***	0.0543***	0.106***	0.0198*	-0.410***
	(0.0316)	(0.00721)	(0.00376)	(0.00979)	(0.127)
Opportunities for self-realisation	0.227***	0.0334***	0.0930***	0.00644	-0.00168
	(0.0591)	(0.00334)	(0.00605)	(0.00394)	(0.0574)
log wage	0.00554	0.0155**	-0.000177	-0.00127**	0.0483***
	(0.00824)	(0.00560)	(0.000401)	(0.000533)	(0.00732)
Controls for age, gender, education, sector	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	82,727	19,607	81,124	82,669	82,763
R-squared	0.161	0.210	0.193	0.243	0.119

Note: Robust standard errors clustered at country level; *** p<0.01, ** p<0.05,* p<0.1.
Source: Authors' calculations based on data from EWCS, KWCS and AWCS.

Figure 5.1. Average effects of resources and demands on job satisfaction

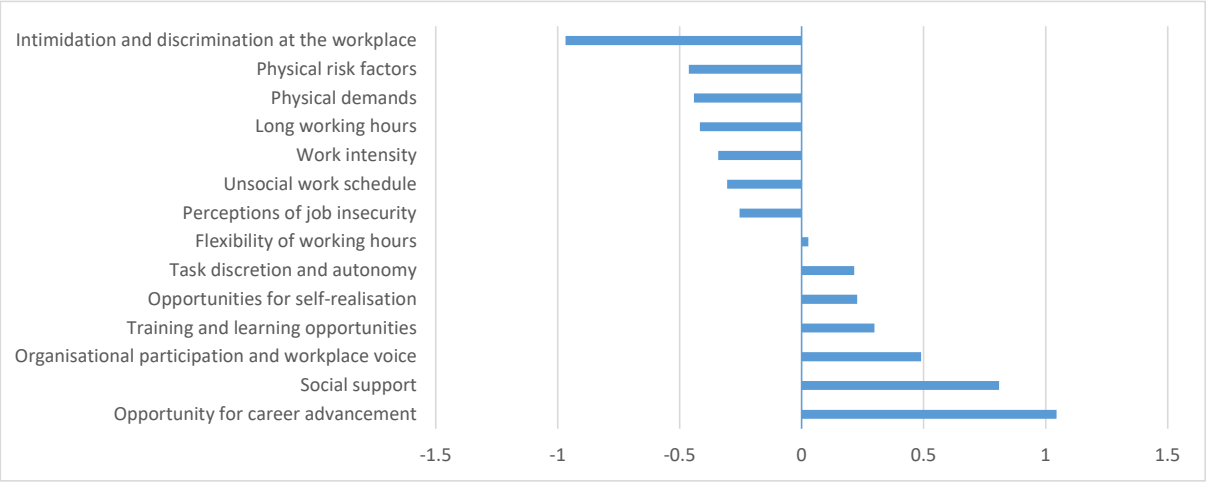


Figure 5.2. Average effects of resources and demands on job motivation

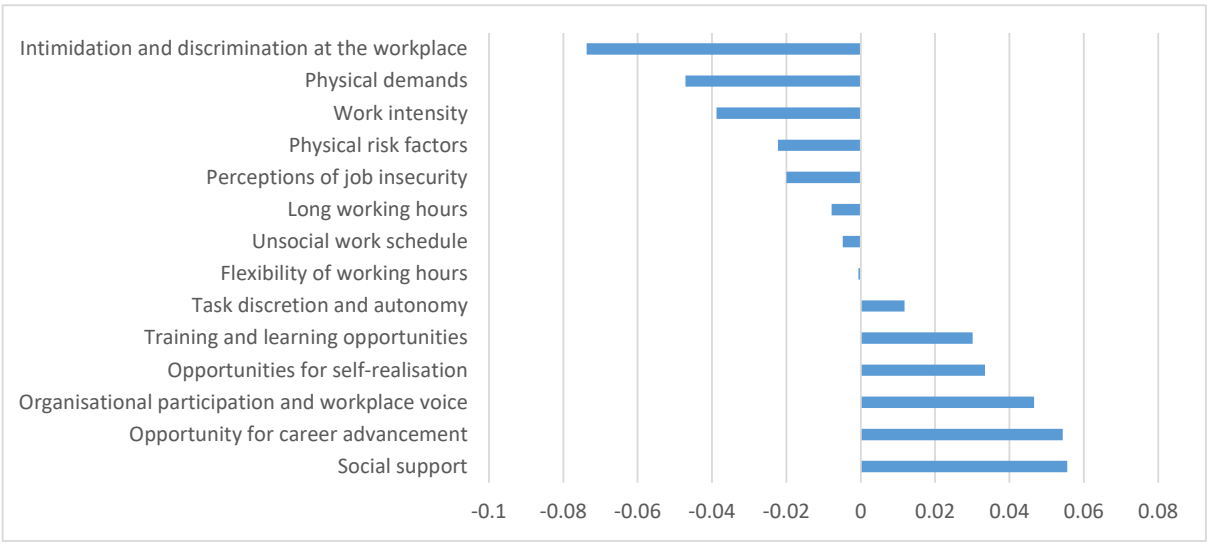


Figure 5.3. Average effects of resources and demands on mental health

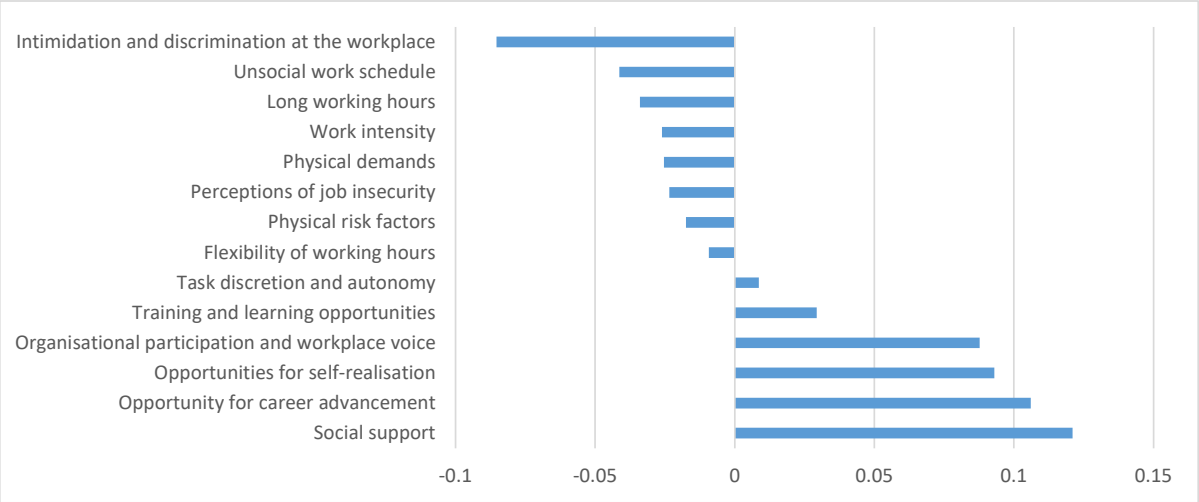


Figure 5.4. Average effects of resources and demands on physical health

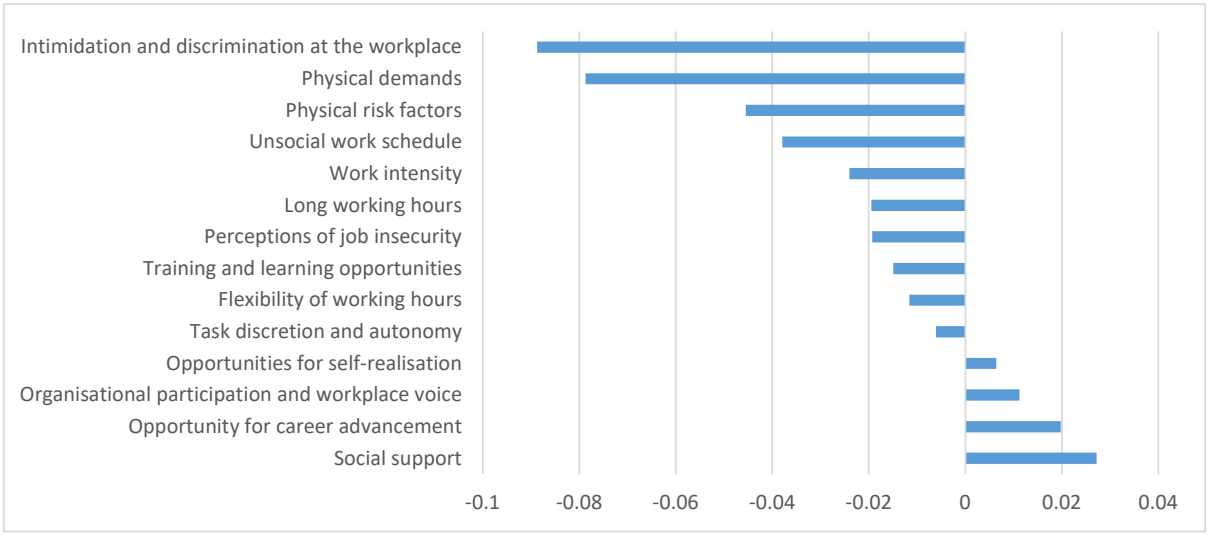
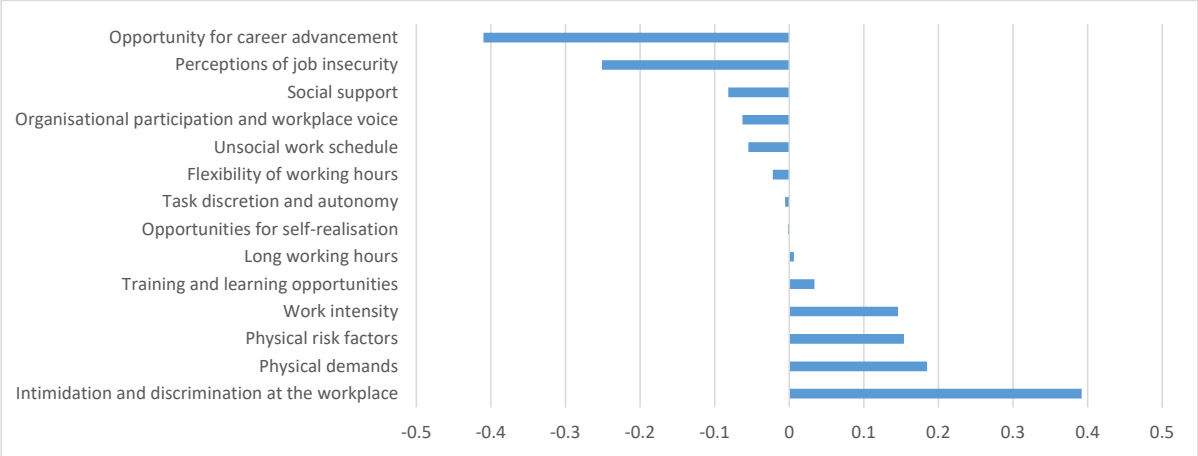


Figure 5.5. Average effects of resources and demands on sick absence



6. Conclusion

64. This paper contributes to the study of job quality in OECD countries through on a comparison between the United States, Korea and OECD Member States in Europe. It examines differences in access to quality jobs across countries, sectors, and populations groups, maps progress over time and examines the relationship between the quality of the working environment and the health, well-being and motivation of workers. The following results emerge.

65. On average, 50% of employees are well or very well resourced, while 16% have equal numbers of demands and resources. About one third of employees are (moderately or highly) strained. In terms of cross-country differences, three groups of countries emerge: several countries from Northern Europe record both very low level of highly strained employees and very large shares of highly resources employees. A group of Western, Continental and Southern European countries as well as Sweden and the United States, display average performance. Finally, a small group of OECD countries are characterised by a very large share of highly strained employees.

66. There are important differences in the distribution of strained and resourced jobs across education, industry, occupation and employment status categories, with low skill and low educated workers in the agriculture, construction and industry reporting more frequently being highly or moderately strained. There are minor differences when looking at the working environment by ownership of the companies. Due to composition effects, women hold on average slightly less strained jobs than men, while there are negligible differences by age or size of worksite. All groups of employees report strained and resourced jobs, suggesting that actors, policies and practices at the different level of intervention can make a difference to the working environment across all groups of the population.

67. Over the period between 2010 and 2015, small progress is reported on average over countries and their performance has slightly converged. Both the share of strained employees has fallen and the proportion of well-resourced employees has increased. Altogether, all dimensions of the quality of working environment but one (long working hours) have changed significantly during the period considered. Changes over this period are characterised by the rise in the prevalence of five job resources (“career advancement”, “received training”,”social support”, “organisational participation” and “flexibility of working time”) and the fall in three job demands (“physical risk factors”, “physical demands” and “unsocial work schedule”). At the same time, three job demands have increased (“perception of job insecurity”, “intimidation and discrimination” and “work intensity”), and two job resources have decreased (“opportunities for self-realisation” and “task discretion and autonomy”).

68. Empirically, the relationships between these job characteristics and workers’ well-being measures are confirmed by our analysis, with job demands and resources associated to well-being in the expected direction most of the time. This confirms the relevance of non-monetary elements of jobs to support workers’ physical and mental health, well-being, work motivation and job satisfaction. All these indicators have been associated with work performance and positive societal outcomes. This confirms the suitability of the quality of the working environment to support the 2030 sustainable development goals.

69. When the specific role of each job demand and job resource is considered in relation to the health and well-being measures, a similar ranking is observed. “Intimidation and discrimination at the workplace” is always

the biggest contributor to a decrease in well-being. “Physical risk factors” and “physical demands” are coming in second and third position – except for mental health, to which “unsocial work schedule” and “long working hours” are more detrimental. On the positive side, “social support” and “opportunity for career advancement” are the main contributors to an increase in well-being. Importantly, the job strain index measured in this paper, which adheres more closely to the OECD Guidelines, includes some important job characteristics that are missed by the measure discussed by (Cazes, 2015[2]) (e.g. “Intimidation and discrimination at the workplace”, “physical risk factors” and “social support”) and that are crucially important for workers’ well-being. That said, the two measures are largely consistent across countries both in terms if level (with a correlation of 0.94 in 2015) and across time, (with a 0.72 correlation over 2010-15).

70. Regarding the statistical agenda going forward, the *OECD Guidelines for Measuring the Quality of the Working Environment* (OECD, 2017[1]) provide a framework for measuring a key aspect of job quality. This is best done in coordination with NSOs that could implement the shorter modules included in the OECD Guidelines (the core module contains 4 items, the condensed one, 13 and the extended one, 25) in existing statistical surveys. Comparative survey like the EWCS developed by Eurofound could also be used to increase country coverage and explore in-depth issues around job quality and changes in work and working life. In a context where all countries are addressing digital and decarbonisation transitions while recovering from the pandemic, monitoring the quality of the working environment will be useful to provide an assessment of the direction and impact of changes.

Annex A. Questions on job demands and resources in AWCS, EWCS and KWCS

Table A A.1. Questions in relation to the demands and resources in AWCS, EWCS and KWCS

Job dimensions	Job demands		Job resources	
	Job Characteristics	Questions	Job Characteristics	Questions
A. Physical and social environment	A1: Physical risk factors	Are you exposed at work to vibrations from hand tools, machinery, etc.	A4: Social support at work	Your colleagues help and support you
		Are you exposed at work to breathing in smoke, fumes, powder or dust, etc.		Your manager helps and supports you
		Are you exposed at work to handling or being in skin contact with chemical products or substances		
		Are you exposed at work to high temperatures which make you perspire even when not working		
		Are you exposed at work to low temperatures whether indoors or outdoors		
		Are you exposed at work to noise so loud that you would have to raise your voice		
		Are you exposed at work to tobacco smoke from other people		
	A2: Physical demands	Does your main paid job involve tiring or painful positions		
		Does your main paid job involve lifting or moving people		
		Does your main paid job involve carrying or moving heavy loads		
		Does your main paid job involve repetitive hand or arm movements		
	A3: Intimidation and discrimination at the workplace	And over the past 12 months, during the course of your work have you been subjected to:		
		Bullying /harassment		
		Sexual discrimination/discrimination linked to gender		
		Age discrimination		
		Discrimination linked to nationality		
		Discrimination linked to ethnic background/race		
		Discrimination linked to religion		
		Discrimination linked to disability		

Job dimensions	Job demands		Job resources	
	Job Characteristics	Questions	Job Characteristics	Questions
		Discrimination linked to sexual orientation		
B. Job Tasks	B1: Work intensity	Does your job involve working at very high speed	B3: Task discretion and autonomy	Are you able to choose or change your order of tasks
		Does your job involve working to tight deadlines		Are you able to choose or change your methods of work
		Have you enough time to get the job done		Are you able to choose or change your speed or rate of work
	B2: Long working hours	How many hours do you usually work per week in your main paid job		
C. Organisational characteristics	*No characteristics on demand part*		C1: Organisational participation and workplace voice	You are consulted before targets are set for your work
				You are involved in improving the work organisation or work processes of your department or organisation
				You can influence decisions that are important for your work
D. Worktime arrangements	D1: Unsocial work schedule	Normally, how many times a month do you work at night, for at least 2 hours between 10:00 p.m. and 05:00 a.m.	D2: Flexibility of working hours	You can take a break when you wish
		And how many times a month do you work more than 10 hours a day		How are your working-time arrangements set
E. Job prospects	E1: Perceptions of job insecurity	I might lose my job in the next 6 months	E2: Training and learning opportunities	Over the past 12 months, I have undergone training:
		If I were to lose or quit my current job, it would be easy for me to find a job with my similar salary		Training paid for or provided by your employer, or by yourself if you are self-employed
				On-the-job training
			E3: Opportunity for career advancement	My job offers good prospects for career advancement
F. Intrinsic aspects	*No characteristics on the demand part*		F1: Opportunities for self-realisation	You are able to apply your own ideas in your work

Annex B. Category groupings for some socio-economic characteristics used in the study

Table A B.1. Occupation skill level

Occupation skill level groups used in the study

Occupation skill level	Korean Working Conditions Survey (KWCS) 2015	American Working Conditions Survey (AWCS) 2015	European Working Conditions Survey (EWCS) 2015
High Skill	Administrator Professional Engineer and Semi-professional	Managers/sr. officials/legislators Professionals Technicians/assoc professionals	Managers Professionals Technicians and associate professionals
Medium Skill	Office worker Service worker Sales worker Agriculture, forestry and fishery industry skilled worker	Clerks Services/sales workers Skilled agricultural/fishery workers	Clerical support workers Service and sales workers Skilled agricultural, forestry and fishery workers
Low Skill	Technical skilled worker and related skill worker Equipment-machinery operator and assembly worker Simple labour worker	Craft/related trade workers Plant/machine operators/assemblers Elementary occupations	Craft and related trades workers Plant and machine operators, and assemblers Elementary occupations

Table A B.2. Industrial sector

Industrial sector groups used in the study

Industrial sector	Korean Working Conditions Survey (KWCS) 2015	American Working Conditions Survey (AWCS) 2015	European Working Conditions Survey (EWCS) 2015
Agriculture	Agriculture, forestry and fishery	Agriculture, forestry, fishing and hunting	Agriculture, forestry and fishing
Industry	Mining Manufacturing Electricity, gas, waterworks Waste, environment restoration	Mining / Quarrying / Oil / Gas extraction Utilities Manufacturing	Mining and quarrying Manufacturing Electricity, gas, steam and air conditioning supply Water supply; sewerage, waste management and remediation activities
Construction	Construction	Construction	Construction
Market services	Whole sale and retail Transportation Accommodations and restaurant services Publishing, video, information, etc. Finance, insurance Real estate, leasing Professional, sciences, technology Enterprise facilities, enterprise	Wholesale trade Retail trade Transportation and warehousing Information Finance and insurance Real estate and rental and leasing Professional, scientific and technical Management of companies and enterprises Administrative / Support / Waste	Wholesale and retail trade; repair of motor vehicles and motorcycles Transportation and storage Accommodation and food service activities Information and communication Financial and insurance activities Real estate activities Professional, scientific and technical activities Administrative and support service activities

Industrial sector	Korean Working Conditions Survey (KWCS) 2015	American Working Conditions Survey (AWCS) 2015	European Working Conditions Survey (EWCS) 2015
	support	Management / Remediation services Accommodation and food services	
Non-market services	Administrative, national defense, social security Educational services Health and social welfare Arts, sports, leisure Association, repairs, individual International and overseas institutions Self-consumption production activity	Educational services Health care and Social assistance Arts, entertainment, and recreation Other services Public administration	Public administration and defence; compulsory social security Education Human health and social work activities Arts, entertainment and recreation Other service activities Activities of households as employers; undifferentiated goods-and services-producing activities of households for own use Activities of extraterritorial organisations and bodies

Table A B.3. Education attainment

Education attainment level groups used in the study

Education level	Korean Working Conditions Survey (KWCS) 2015	American Working Conditions Survey (AWCS) 2015	European Working Conditions Survey (EWCS) 2015
Primary	No education or lower than primary education Primary education (special school curriculum included) Lower secondary education (every kind of lower secondary school's curriculum included)	Less than 1st grade(1) 1st,2nd,3rd,or 4th grade(1) 5th or 6th grade 7th or 8th grade 9th grade 10th grade 11th grade 12th grade NO DIPLOMA	Early childhood education Primary education Lower secondary education
Secondary	Upper secondary education (every kind of upper secondary school's curriculum included)	HIGH SCHOOL GRADUATE high school DIPLOMA or the equivalent (For example: GED) Some college but no degree Associate degree in college Occupational/vocational program Associate degree in college Academic program	Upper secondary education Post-secondary non-tertiary education
Tertiary	Community college University-undergraduate Graduate or above	Bachelors degree (For example: BA, AB, BS) Masters degree (For example: MA, MS, MEng, Med, MSW, MBA) Professional School Degree (For example: MD, DDS, DVM,LLB, JD) Doctorate degree (For example: PhD, EdD)	Short-cycle tertiary education Bachelor or equivalent Master or equivalent Doctorate or equivalent

Note: (1) No occurrence in the sample.

Annex C. Country-specific demands and resources

Table A C.1. Country-specific prevalence of demands and resources

Selected OECD countries, 2015

Country	% strained employees	% resourced employees	Demands							Resources						
			Physical risk factors	Physical demands	Intimidation and discrimination at the workplace	Work intensity	Long working hours	Unsocial work schedule	Perceptions of job insecurity	Social support	Task discretion and autonomy	Organisational participation and workplace voice	Flexibility of working hours	Training and learning opportunities	Opportunity for career advancement	Opportunities for self-realisation
Austria	31.7	53.7	35.6	28.2	16.3	37.4	6.1	34.9	26.0	22.4	44.4	50.7	43.6	54.2	13.2	22.3
Belgium	27.4	56.8	33.1	28.3	14.6	38.3	5.8	34.5	28.2	23.0	55.8	49.4	45.0	61.8	12.1	25.3
Czech Republic	30.6	51.1	35.6	23.0	6.3	28.8	14.6	42.2	27.6	22.7	38.8	43.2	24.4	67.5	10.5	20.8
Denmark	23.8	64.6	38.2	18.1	8.5	45.6	5.5	56.1	22.8	24.7	65.6	56.7	60.2	68.0	22.9	26.1
Estonia	25.8	59.2	38.1	29.7	11.4	27.9	5.8	45.2	23.2	23.1	59.2	52.4	42.6	69.4	13.4	20.9
Finland	22.0	61.1	34.6	26.8	12.6	37.8	5.7	51.2	29.0	25.6	61.2	52.8	54.9	72.0	14.8	28.8
France	35.6	46.7	43.3	38.1	19.7	37.5	7.2	45.0	29.8	17.0	51.2	43.4	50.3	56.8	11.9	21.9
Germany	33.8	49.0	33.1	23.4	9.6	40.7	4.7	32.4	18.2	11.4	47.3	32.5	30.4	59.8	9.6	11.0
Greece	65.2	22.6	41.5	44.4	10.3	50.6	16.5	31.7	47.5	22.8	23.7	23.7	13.1	29.0	7.8	8.4
Hungary	38.3	44.2	33.5	26.0	6.0	47.5	14.2	35.0	27.2	28.9	40.6	47.5	25.4	33.8	16.9	21.8
Ireland	24.0	60.3	31.7	24.2	14.3	40.9	10.6	48.8	28.4	42.0	51.0	55.2	37.8	71.8	19.0	34.8
Italy	35.3	46.0	30.1	25.7	7.8	36.9	5.2	21.8	27.2	6.7	49.3	34.2	25.8	43.0	5.7	14.7
Korea	44.8	32.9	27.4	28.7	7.5	21.6	26.8	42.5	7.2	3.5	34.4	28.7	10.9	37.0	5.4	8.0
Latvia	30.9	49.8	40.5	30.9	10.3	19.9	9.4	27.9	27.1	26.7	43.0	38.9	33.3	49.6	14.8	27.2
Lithuania	35.8	49.0	37.9	33.1	8.6	34.0	5.4	32.9	20.6	27.3	50.0	37.4	18.7	54.7	7.2	13.0

Country	% strained employees	% resourced employees	Demands							Resources						
			Physical risk factors	Physical demands	Intimidation and discrimination at the workplace	Work intensity	Long working hours	Unsocial work schedule	Perceptions of job insecurity	Social support	Task discretion and autonomy	Organisational participation and workplace voice	Flexibility of working hours	Training and learning opportunities	Opportunity for career advancement	Opportunities for self-realisation
Luxem-bourg	27.3	58.1	34.9	33.1	18.0	36.5	5.0	34.0	30.1	27.5	55.7	46.8	52.6	60.7	16.5	34.8
Nether-lands	25.3	60.7	31.7	19.3	18.5	35.2	7.1	46.5	36.4	20.7	57.0	59.9	54.3	66.4	15.7	26.4
Norway	18.3	68.6	35.3	17.7	10.5	40.6	6.0	53.6	20.9	31.0	67.3	58.0	60.3	70.7	16.1	29.1
Poland	35.0	47.6	40.6	31.3	3.4	32.6	14.0	37.3	14.7	17.8	49.5	39.8	29.3	52.4	11.4	17.8
Portugal	40.6	40.1	32.4	33.9	3.8	40.1	6.0	24.5	48.2	28.9	37.0	32.3	22.6	34.5	11.9	28.1
Slovak Republic	39.8	41.1	39.3	25.7	8.1	34.2	12.5	42.6	28.7	14.1	40.7	29.8	17.0	68.0	5.3	13.7
Slovenia	34.8	51.2	42.6	34.0	11.5	40.1	12.9	46.0	45.6	30.4	47.0	51.2	34.4	59.2	14.6	41.2
Spain	43.3	41.1	47.3	43.9	7.4	52.2	9.1	33.1	38.4	31.7	42.9	40.1	28.0	45.8	16.6	29.2
Sweden	31.3	50.9	36.9	30.9	12.1	49.4	7.9	59.1	21.2	20.3	46.4	43.0	59.2	62.5	10.4	25.8
Switzer-land	31.0	52.9	30.5	26.6	12.9	42.4	6.4	34.9	18.9	18.5	47.9	50.5	36.2	49.1	16.3	18.7
Turkey	48.3	36.0	57.6	40.4	8.9	65.2	41.9	35.6	20.1	29.9	50.7	41.1	25.7	29.9	28.3	29.7
United Kingdom	23.6	59.5	32.9	22.3	9.0	43.6	12.0	49.1	15.0	31.4	52.7	50.2	43.2	73.1	18.3	27.3
United States	35.1	48.7	41.0	42.5	21.7	58.3	17.0	61.5	12.0	24.6	54.9	42.4	55.5	71.8	12.2	19.5
Average (28 countries)	33.5	50.1	37.0	29.6	11.1	39.8	10.8	40.7	26.4	23.4	48.8	44.0	37.0	56.1	13.5	23.1

Note: For each demand (respectively resource), data refer to a percentage of employees reporting that they face the demand (respectively are provided with the resource).
Source: Authors' calculations based on data from EWCS, KWCS and AWCS.

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