WORKFORCE DIVERSITY AND DIGITAL LABOUR PLATFORMS: IMPLICATIONS FOR OCCUPATIONAL SAFETY AND HEALTH

1 Introduction

As the digital transformation continues to accelerate, digitally enabled employment forms, such as digital platform work, are gaining in importance and are reshaping labour markets in the EU. Already in 2015, digital platform work was identified as a major emerging 'new form of employment', and by 2020, digital platform work existed in almost all Member States (Eurofound, 2020). Recent estimates show that currently more than **500 digital labour platforms** and **28 million digital platform workers**[1] are active in the EU (European Commission, 2021). There is a lot of heterogeneity in the types of digital platform work, the business models of digital labour platforms and the profiles of digital platform workers.

In December 2021, the European Commission launched a Communication and a proposal for a directive aimed at **improving the working conditions of people working through digital labour platforms**.[2] With this proposal, the Commission acknowledges digital labour platforms as an important player in the changing world of work, and it recognises the opportunities and challenges associated with digital platform work. On the one hand, digital platform work creates possibilities to earn an (additional) income and to develop entrepreneurial activities, also for **persons who face barriers in access to the labour market**, such as migrants, persons with disabilities or poor health, youth and persons with caring responsibilities. Digital platform work offers higher flexibility and autonomy, which may result in a better work-life balance. Digital platform work could thus also **ease the working conditions** for vulnerable groups, who typically are overrepresented in atypical forms of work (Pesole et al., 2018). Being able to earn an income through flexible work, indeed, is among the main reasons for workers to choose digital platform work (ILO, 2021).

On the other hand, digital platform work present challenges, affecting the **wellbeing, health and safety of digital platform workers**. Among the challenges are difficulties in determining the legal employment status (which in turn affects the applicability of EU and national occupational safety and health (OSH) legislation), related inadequate access to social protection, overall poor working conditions, increased OSH risks, job and income insecurity, and so on (EU-OSHA, 2021a; European Commission, 2020, 2021; ILO, 2021). These issues are more prevalent in some types of digital platform work than in others. Especially lower-skilled on-location (e.g. food delivery) and lower-skilled online (e.g. clickwork) digital platform work are associated with high risks concerning working conditions and OSH (EU-OSHA, 2021a). Furthermore, previous research suggests that specific groups of digital platform workers, such as migrants, are more vulnerable and at high risk of being engaged in the poorest quality jobs with the highest OSH risks (EU-OSHA, 2021a, 2022a; Holtum et al., 2021). In this context, the Commission's proposal for a directive presents measures for all types of digital platform work (e.g. algorithmic transparency), as well as measures addressing specific issues or types of digital platform work (e.g. reclassification of legal employment status).

The aim of this article, which is a follow-up to previous European Agency for Safety and Health at Work (EU-OSHA) research on OSH and digital platform work,[3] is **to investigate the working conditions,**

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[1] Of the 28 million digital platform workers, six million are active on digital labour platforms intermediating on-location work and 22 million are active on platforms intermediating online work. For definitions on on-location and online work, see section 2.2.

[2] COM(2021) 761, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on Better working conditions for a stronger social Europe: harnessing the full benefits of digitalisation for the future of work, and Proposal for a Directive of the European Parliament and of the Council on improving working conditions in platform work. See: https://ec.europa.eu/commission/presscorner/detail/en/ip_21_6605

[3] This article is a follow-up to a study by EU-OSHA on OSH policies, research and practices in the context of digital platform work, which findings are publicly available as (please see the references list for more details and links to all publications): EU-OSHA (2021a) (literature review), EU-OSHA (2021b) (policy brief), EU-OSHA (2022a) (final report), EU-OSHA (2022b) (summary),

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OSH and outcomes of digital platform work from a workforce diversity perspective. In this article, workforce diversity is understood as the heterogeneous composition of the workforce of digital platform workers in terms of their individual characteristics (e.g. gender, age, ethnicity, disability, etc.). For **some groups of digital platform workers, the opportunities brought by digital platform work could be high**, but at the same time, **the risks stemming from digital platform work could be worse for them than for other groups of platform workers**. In this article, the groups under focus are migrants and ethnic minorities workers (i.e. native-born workers belonging to an ethnic minority), persons with a disability, chronic illness or condition, and women. For example, digital platform work can serve as an important stepping stone into the labour market for migrants, but the types of digital platform work in which migrants are engaged can be of a lower quality (e.g. low pay, limited flexibility, high OSH risks, strong dependency on the platform to get work). In such cases, digital platform work can be a dead end rather than a jumping board. By collecting and making available evidence on working conditions and OSH risks and opportunities in digital platform work, this article also aims to support policymakers and digital labour platforms to better prevent and manage those. Specific attention is paid to the COVID-19 pandemic and its impact on workers.

This article is structured around the following **research questions**:

- What is the composition of the digital platform workforce? How diverse is it?
- Which worker profiles are most often found in which types of digital platform work?
- What are the working and employment conditions (including OSH) of digital platform work?
- Is digital platform work a stepping stone or a dead end for the involved workers?
- What policies and practices are conducive to overcome the challenges in digital platform work and to seize the opportunities it brings? Are these sufficient in light of the diversity of the digital platform workforce?

To answer these research questions, this article is based on a **search and evaluation of the academic and grey literature** and a **review of the available statistical data** on digital platform work.

The remainder of this article is structured as follows. Section 2 defines concepts such as digital platform work, digital labour platform and digital platform worker, and presents a digital platform work taxonomy. Section 3 examines the diversity of the digital platform workforce, describing its size, composition and the distribution of workers across digital platform work types. The section also highlights the situation of specific groups of digital platform workers: migrants and ethnic minorities workers, persons with a disability, chronic illness or condition, and women. Section 4, first, explores to what extent digital platform work is a stepping stone for labour market participation, and, then, assesses to what extent it is a jumping board for career progression. Section 5 analyses working conditions and OSH in digital platform work in general, and examines opportunities and risks specific to migrants and ethnic minorities, individuals with a disability, chronic illness or condition, and women. Section 6 is dedicated to discrimination, unfair treatment and harassment. Section 7 reviews policies and practices targeting working conditions and OSH in digital platform work, highlighting measures targeting the groups in scope when they exist. Section 8 concludes this article with a summary of the main findings and key takeaways.

2 Understanding digital platform work

This section presents definitions of key concepts that are used in this article, as well as a digital platform work taxonomy. These definitions and taxonomy are derived from previous EU-OSHA work on this topic (see EU-OSHA, 2021a, 2021b, 2022a-k; among other publications).

2.1 Defining digital platform work and the involved parties

Digital platform work refers to all paid labour that is provided through, on or mediated by a digital labour platform (EU-OSHA, 2021a). Paid labour is organised or coordinated through a platform,

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EU-OSHA (2022g) (policy brief), EU-OSHA (2022c-f) (detailed studies on particular legislation, regulation and practices), and EU-OSHA (2022h-k) (case studies on specific types of digital platform work).

in order to perform specific tasks or to address specific problems. At least three parties are involved in this type of work: a digital labour platform, a client and a digital platform worker. A **digital labour platform** is an online facility or marketplace operating on digital technologies (including mobile apps) that are owned and/or operated by an undertaking, facilitating the matching between labour demand and labour supply (EU-OSHA, 2021a). A **digital platform worker** is an individual who provides labour, intermediated with a greater or lesser extent of control via a digital labour platform, irrespective of their legal employment status (EU-OSHA, 2021a). Digital platform workers can thus have a legal employment status of employee, self-employed or any third-category status.

Digital platform work is characterised by the use of **algorithmic management**. Algorithmic management concerns 'the oversight, governance and control practices conducted by software algorithms over many remote workers' (Möhlmann & Zalmanson, 2017, p. 4). In the context of digital platform work, algorithms are used by digital labour platforms to allocate, monitor and evaluate work carried out by digital platform workers, as well as to influence digital platform workers' behaviour and performance (EU-OSHA, 2021a). More specifically, algorithmic management involves the **continuous tracking of workers' behaviour**, the **continuous evaluation of workers' performance**, and **(semi-)automatic decision-making often without human intervention**, with workers having to interact with a system (EU-OSHA, 2021a; Möhlmann & Zalmanson, 2017). Algorithms take over the managerial role. Digital labour platforms, however, typically do not provide much or any insight into the rules or principles set by the algorithm, which leads to information and power imbalances between platform and platform workers (EU-OSHA, 2021a, 2022a; Möhlmann & Zalmanson, 2017). It is, therefore, no surprise that the European Commission's proposal for a directive aiming to improve the working conditions in digital platform work has concrete measures on algorithmic transparency (see section 7).

In algorithmic management, digital labour platforms use a range of **technologies and techniques**, fed with data gathered from tasks, clients and platform workers (e.g. number of tasks completed, speed or accuracy of task completion, etc.). Well-known examples are tracking of workers through screenshots, mouse clicks and keystrokes (as in the case of online platform work), or the Global Positioning System (GPS) installed on their device (as in the case of on-location platform work), surge pricing, nudging and gamification (Bérastégui, 2021; EU-OSHA, 2021a, 2022a; ILO, 2021). Digital labour platforms use these data to create a ranking of the digital platform workers on their platform, which in turn informs the work allocation and workers' income.

Another aspect of digital platform work is the **prevalence of non-standard working and employment arrangements** (EU-OSHA, 2021a). Digital platform work is characterised by arrangements like atypical working times, flexible work schedules, unconventional workplaces and so on. In addition, most digital platform workers are categorised as self-employed by the platforms' terms and conditions of use. In some cases, however, this can be a misclassification. Of the 28 million digital platform workers in Europe, 5.5 million or about 20%, are estimated to be incorrectly classified as self-employed (European Commission, 2021). This, however, has important consequences for these platform workers as the legal employment status determines one's rights and obligations in the area of working conditions, OSH and social protection.

2.2   Digital platform work taxonomy

Concerning the types of digital platform work that are covered, this article takes a broad perspective and does not exclude any type of platform work by default. To structure the discussion below and to provide concrete examples, the taxonomy developed by EU-OSHA (2021a) is used here (Table 1). EU-OSHA's taxonomy distinguishes **four types of digital platform work that differ from each other along three dimensions**.

The first dimension is the **format of labour provision**: on-location or online. In both cases, the matching between labour demand and supply is done online. On-location platform work involves tasks carried out in the physical world (e.g. transport), whereas online platform work involves tasks that can be executed 'virtually' on an electronic device (e.g. programming) (EU-OSHA, 2021a).

The second dimension captures the **skills level required to do the work**, and provides insight into the nature, scale and complexity of the task. Examples are whether a task can be done by anyone or instead requires specific skills and whether it concerns a micro-task or large project.

The third dimension refers to **the level of control exercised by the digital labour platform**. It captures the hierarchical power and managerial prerogatives used by digital labour platforms over the workers — which are proxies for the **degree of subordination** and could help determine the employment status. This dimension also reflects the usage of **algorithmic management** by digital platforms. This dimension has **three subdimensions**, capturing the level of control that platforms exert concerning the: (i) work allocation, (ii) work organisation, and (iii) work evaluation.

Table 1: Digital platform work taxonomy

Dimension	Type 1 (e.g. Uber)	Type 2 (e.g. RingTwice)	Type 3 (e.g. AMT)	Type 4 (e.g. 99designs)
Format of labour provision	**On-location**	**On-location**	**Online**	**Online**
Skill level required	**Lower**	**Higher**	**Lower**	**Higher**
Level of control	**High**	**Moderate**	**High**	**Low**
- Work allocation	High	Low	High	Low
- Work organisation	High	Moderate	Moderate	Low
- Work evaluation	High	Moderate	High	Moderate

Source: EU-OSHA (2021a).

3   Workforce diversity in digital platform work

3.1   Size and composition of the digital platform workforce

Although data on digital platform work are still relatively scarce, there are multiple EU-wide surveys that provide insight into the size and composition of the digital platform workforce. Below, mainly the results of two COLLEEM surveys (Pesole et al., 2018; Urzi Brancati et al., 2020), two European Trade Union Institute (ETUI) Internet and Platform Work Surveys (Piasna & Drahokoupil, 2019; Piasna et al., 2022), a survey conducted as part of a study informing the impact assessment of the proposed directive on digital platform work (Barcevičius et al., 2021), a recent survey on artificial intelligence and digital platform work covering 10 EU Member States (EIGE, 2022), and an International Labour Organisation (ILO) survey with a global scope (ILO, 2021) are described.

These seven surveys were selected because of their coverage in terms of countries, time period and types of platform work. All supply data on the size and composition of the digital platform workforce. Together, they provide a broad and up-to-date picture on the state of play of digital platform work in the EU and its development. Although all of them are based on a robust methodological approach, the data on the size of the digital platform workforce diverge depending on the survey methodology, the countries and timeframe covered, the definitions or concepts used, and so on. Data regarding women digital platform workers, for example, seem to diverge depending on the sector and types of work in focus (EIGE, 2022; Gerber, 2022). The data presented below should be interpreted with these caveats in mind. Results on the composition of the platform workforce are more aligned across surveys.

3.1.1 Size of the digital platform workforce

In terms of the **size of the digital platform workforce**, the share of persons who have ever gained an income by providing digital platform work stood at 9.5% in 2017 (Pesole et al., 2018, based on the COLLEEM survey covering 14 EU Member States) and 11% in 2018 (Urzi Brancati et al., 2020, based on the COLLEEM II survey in 16 EU Member States). In 2018, 1.4% of the working age population had digital platform work as their main form of employment (Urzi Brancati et al., 2020). The first ETUI Internet and Platform Work Survey targeted five central and eastern European countries (Bulgaria, Latvia, Hungary, Poland and Slovakia). It found that between 1.9% and 7.8% of the population aged 18-64 had tried digital platform work, with 0.4% to 3% doing it on a weekly basis (Piasna & Drahokoupil, 2019). In

the second ETUI Internet and Platform Work Survey, 14 countries are covered. Of the respondents, 4.3% had done digital platform work in the last year, 2.8% did digital platform work at least monthly and 1.4% at least weekly (Piasna et al., 2022). Barcevičius et al. (2021) ran an online panel survey in nine EU Member States. The authors found that 17% of daily Internet users engaged in digital platform work at least once in the past six months, and 11% had done platform work at least once in the past month. For 3% of respondents, digital platform work is their main occupation. The European Institute for Gender Equality (EIGE, 2022) survey covers 10 countries and was executed with the specific aim to capture the gender dimension in platform work. The survey was completed by 4,932 digital platform workers aged 16-54 years. About two-thirds of the digital platform workers indicated to have worked through digital platforms at least occasionally in the past six months. According to the survey, 80% of men and 76% of women digital platform workers hold another full-time or part-time job or are self-employed in another job. Finally, another major effort to assess the size of the digital platform economy in terms of platforms and workers was undertaken by the ILO (ILO, 2021), involving 12,000 platform workers and 16 platforms in 100 countries. The ILO (2021) finds that over 750 platforms are active globally. For Europe, 11% of the working-age population indicated having done digital platform work in the past year, 8.6% in the past month and 12% in the past week.

3.1.2 Composition of the digital platform workforce

In terms of the **composition of the digital platform workforce**, there seems to be a consensus that the 'typical' platform worker is young, male, relatively highly educated and living in an urban environment, and that many digital platform workers have a family and children (Barcevičius et al., 2021; EIGE, 2022; ILO, 2021; Pesole et al., 2018; Piasna & Drahokoupil, 2019; Piasna et al., 2022; Urzi Brancati et al., 2020).[4]

▪   **Women digital platform workers**

Most empirical studies on digital platform work find that **more men than women are engaged in digital platform work** and that **this difference becomes larger with the intensity of participation in digital platform work** (Barcevičius et al., 2021; EIGE, 2022; Huws et al., 2016, 2019; ILO, 2021; Pesole et al., 2018; Piasna & Drahokoupil, 2019; Piasna et al., 2022; Urzi Brancati et al., 2020).

Pesole et al. (2018), for example, report that 40.2% of digital platform workers who have done platform work but who neither earn at least 25% of their income in this way nor work at least 10 hours per week on a platform are women. Of the digital platform workers who earn more than 25% but less than 50% of their income via platform work and/or perform platform work at least 10 hours per week, 31.2% are women. Finally, the share of women declines to 26.3% among those who earn at least 50% of their income via platform work and/or do this for over 20 hours per week. The largest difference in digital platform work participation exists between young men (highest) and older women (lowest) (Pesole et al., 2018).

In the literature, there is consensus that the **share of women digital platform workers is rising over time** (Barcevičius et al., 2021; EIGE, 2022). This trend, moreover, **accelerated due to the COVID-19 pandemic** (EIGE, 2022). This explains why earlier surveys, such as the two COLLEEM surveys and the first ETUI Internet and Platform Work Survey, find that women are underrepresented in digital platform work, whereas later studies, such as the EIGE (2022) survey, report more equal shares of men (58%) and women (42%) digital platform workers. The average age of women is 30 years and the average age of men is 32 years in the EIGE (2022) survey. However, differences between countries, sectors and types of digital platform work remain.

How do these developments compare with the labour market participation of **women** more generally? Despite the tremendous rise in women's labour market participation since the 1960s, there are still major gender gaps in terms of employment rate (77.2% versus 66.2% respectively for men and women aged 20-64 in the EU), working hours and earnings (Eurostat, 2022). The share of women with young children who are outside of the labour force is much higher than the share of men with young children. For those aged 25-54, in 2020, the share of women with children aged six or under outside of the labour

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[4] Pesole et al. (2018), for example, confirm that digital platform workers tend to be younger, higher educated and less experienced than the comparable population not working on digital labour platforms.

force was 28.3% (versus 17.8% among women without children), while for men it was 4.5% (versus 10.1% among men without children).

- **Migrant and ethnic minorities digital platform workers**

Migrant workers are more likely to engage in digital platform work than those locally born, especially migrants from outside the EU (Barcevičius et al., 2021; ILO, 2021; Piasna et al., 2022; Urzi Brancati et al., 2020). According to the survey run by Barcevičius et al. (2021), 16.3% of digital platform workers in the EU are migrants.[5] Similar figures are reported by Urzi Brancati et al. (2020) for those digital platform workers who do platform work at least monthly: depending on the degree of participation in digital platform work (e.g. number of hours, share of income earned through platform work, etc.), between 13% and 16% of digital platform workers are migrants. Also outside the EU, migrant workers are overrepresented among platform workers, especially recent immigrants compared to the native population (Holtum et al., 2021; Lam & Triandafyllidou, 2021). In the literature, this overrepresentation of migrants in digital platform work has been interpreted in two ways. First, digital platform work brings opportunities for labour market access for migrants, serving as a **new pathway** supporting integration in the labour market and society (van Doorn & Vijay, 2021). Second, rather than serving as a tool for integration and inclusion, digital platform work may be **unattractive for those with alternative (and presumably better) employment options** (Urzi Brancati et al., 2020). In the latter case, digital platform work may augment existing inequalities and prejudices.

More generally, the participation of **migrant workers** (first and second generation) and refugees in the labour market is on the rise. In 2020, labour market participation rates of the working-age population were 78.3% for the native population, 80.0% for migrants born in the EU but not in their EU country of residence, and 71.9% for migrants born outside of the EU (Eurostat, 2022). Compared to 2010, the activity rates of both the native-born population and intra-EU migrants went up. Among migrant workers, important gender gaps arise as regards labour market participation: the activity rate for migrants born outside the EU was 82.6% for men and 61.9% for women in 2020; for migrants born in the EU but residing in another EU Member State, the activity rate was 86.4% for men and 73.9 % for women (this is on par with the gender gap for the native-born population). When migrants are employed, they are more likely than natives to be in low-pay and low-quality jobs, characterised by both job and income insecurity. Some of these dynamics are perpetuated in the digital platform economy as well.

- **Digital platform workers with a disability, chronic illness or condition**

Although in the EU about one in six individuals of age 15 or up have a **disability, chronic illness or condition**, the labour market participation of this group is significantly lower than that of individuals without a disability (~50% versus ~75%) and, when working, these persons often have non-standard jobs and face job insecurity (Emerson et al., 2018; Eurostat, 2022; Schur, 2003). Similarly, the unemployment and inactivity rates are much higher for them. In such jobs, the risk of not having their accommodation needs met is higher (Shuey & Jovic, 2013). Finally, it must be recognised that employment opportunities differ across types of disability, chronic illness or condition; for example, persons with hearing impairments record higher employment rates than persons with psychological disabilities (Boman et al., 2015). These trends may be perpetuated in digital platform work.

Only few studies, however, provide data on the share of digital platform workers with a **disability, chronic illness or condition**, although in most studies health and disability reasons are recognised as factors motivating individuals to take up digital platform work. Looking at the reasons for choosing digital platform work, a survey by Berg (2016), for example, finds that 36% of those who do platform work so they can work from home do so due to health issues. A proportion of up to 9% of the respondents had a disability, chronic illness or condition (Berg, 2016). In the ILO (2021) survey, up to 4% of the workers in the countries covered reported having a disability, chronic illness or condition. The EIGE (2022) study reports similar numbers, but adds that especially women who are unable to work because of a health issue are more likely to take up digital platform work as their main activity.

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[5] This percentage should be interpreted with caution: the survey was only available in the official languages in each country, so those who do not speak the language most likely did not complete the survey.

3.2 Worker profiles in different types of digital platform work

This section examines what types of digital platform work digital platform workers with different profiles are entering. Its aim is to understand whether **employment segregation patterns that exist in the labour market are replicated in the digital platform economy**.

What tasks do digital platform workers do and what does this mean for OSH?

From the definition and taxonomy of digital platform work presented in section 2, it is clear that digital platform work is highly heterogeneous and involves a wide variety of tasks. Examples include clerical and data entry tasks, translation work, professional services, household services, transportation and delivery tasks, and so on (Eurofound, 2018; Urzi Brancati et al., 2020). Most digital platform workers perform different sorts of tasks. Most of the tasks that are carried out as digital platform work are very similar or identical to tasks that are performed in the traditional labour market (EU-OSHA, 2021a, 2022a). Only very few tasks can be considered new (e.g. online content review).

Although the working and employment conditions under which tasks are executed differ from platform to platform, the task itself matters for the OSH risks that digital platform workers are exposed to. More specifically, given that the tasks themselves are the same or similar, so are the OSH risks (EU-OSHA, 2017, 2021a; Samant, 2019). However, digital platform work usually comes with extra tasks that are not common in comparable jobs, such as setting up and maintaining an account on the platform's website to attract clients, competing for tasks, administrative work and so on (EU-OSHA, 2021a, 2022a). These tasks bring their own OSH risks. Digital platform workers may not be aware of such extra tasks when registering as a worker with the platform.

All three groups in the scope of this article — migrants and ethnic minorities, persons with a disability, chronic illness or condition, and women — are found across all four types of platform work (section 2.2).

Migrants working as digital platform workers carry out on-location as well as online digital platform work, at various skills levels, though **several studies point to an overrepresentation of migrants in lower-skilled digital platform jobs**. Such jobs are often less attractive for natives, not only when offered as digital platform work but also in the context of the traditional labour market. Eurostat data for 2020 show that non-EU citizens were overrepresented in the accommodation and food services, administrative and support services, domestic work and construction sectors, and in occupations like cleaners and helpers, personal service workers, personal care workers, labourers in construction and transport (including delivery).[6] Many of these sectors and occupations are characterised by a high degree of informality and relatively weaker regulatory frameworks. In addition, many of them were considered 'essential' services at the height of the COVID-19 pandemic (e.g. healthcare).

The main motivation for migrants to engage in digital platform work is **earning an income** (Berg, 2016; EIGE, 2022). For some, **being able to escape informal work** is a reason to do similar work through a digital labour platform (Eurofound, 2018). Some digital platforms even promote themselves as being a 'responsible alternative to informal work' (van Doorn & Vijay, 2021). Looking at the **participation of migrants in digital platform work**, ILO (2021) reports that online digital platform work is particularly appealing for this group, as 17% of those active on platforms intermediating online digital platform work are migrants. In developed countries, this share stands at 38% (39% migrant women and 36% migrant men). These figures suggest that online digital platform work offers opportunities especially for migrant women, who face difficulties in accessing work. For on-location work, large differences exist between countries in the ILO survey, yet, the share of migrants in delivery work is estimated at 15% (ILO, 2021). **As digital platform work becomes more widespread, the digital platform workforce is changing too and may become even more vulnerable** (weaker labour market profiles, higher job and income insecurity, and worse conditions when in digital platform work). For example, whereas at first most food delivery riders were students, as the working and employment conditions worsened, migrants and later even undocumented migrants have moved into this line of work (Altenried, 2021; van Doorn & Vijay, 2021). Finally, these issues affect ethnic minorities too.

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[6] See: https://ec.europa.eu/info/strategy/priorities-2019-2024/promoting-our-european-way-life/statistics-migration-europe_en

As the participation of women in digital platform work increases, **digital platform work is becoming less gender-segregated, also in comparison with the traditional labour market** (EIGE, 2022). Gender segregation in occupations and sectors is a major issue hindering gender equality. Traditionally, in the EU, female-dominated occupations and sectors are characterised by lower employment rates, fewer working hours, lower pay, and higher levels of temporary or flexible contracts (Baiocco et al., 2020). Well-known examples include the care and education sectors and occupations. Next to such forms of 'horizontal segregation', women workers are also confronted with 'vertical segregation': fewer women are in leadership positions and in decision-making roles than men (Baiocco et al., 2020).

The first empirical studies on digital platform work identified similar segregation patterns as in the wider labour market, reporting that in the digital platform economy women are underrepresented in male-dominated sectors and jobs, such as delivery or IT, and overrepresented in female-dominated sectors and jobs, such as childcare and domestic services (Piasna & Drahokoupil, 2019). A more recent EIGE (2022) study overall confirms these findings, but also reports that the **gender balance is becoming more equal** and that **workers seem to feel less restricted than in the traditional labour market to enter occupations that are traditionally dominated by the other gender** (especially when platform work is their main activity, for example, construction and repair work). Among the regular platform workers, women indicate earning an income, flexibility and work-life balance more frequently than men as motivations to engage in digital platform work (EIGE, 2022). Higher-educated women living in families with a partner and children, in particular, value flexibility. The COVID-19 pandemic has reinforced these dynamics. However, more women than men report being overqualified for the tasks they do as a digital platform worker (EIGE, 2022).

Finally, besides migrants and women, the article addresses the situation of **digital platform workers with a disability, chronic illness or condition**. According to the ILO (2021) survey, up to 4% of the workers engaged in online digital platform work reported having a **disability, chronic illness or condition**. For on-location digital platform work, this share ranged between 0% and 4% for app-based taxi services, and between 0% and 2% for app-based delivery services, depending on the country. With regard to the specific tasks that are performed, much will depend on the nature of the disability, illness or condition that the worker has, as is the case in the traditional labour market.

4   Is digital platform work a stepping stone or a dead end?

One of the main strengths of digital platform work is that it **lowers the barriers** to labour market (re)entry, including for vulnerable and marginalised groups, such as persons with a disability, chronic illness or condition , and migrants (Harpur & Blanck, 2020; Holtum et al., 2021; Lee et al., 2019). Vulnerable workers are overrepresented among the inactive and unemployed in the labour market, and, when employed, they are often engaged in non-standard forms of employment (Dobson, 2017; Harpur & Blanck, 2020; van Doorn & Vijay, 2021; Yu et al., 2019). Some even work in the informal economy, without access to labour and social protection rights, and are exploited as cheap labour. Common barriers that these groups face include difficulties related to the work itself, the workplace (e.g. organisation of work, workplace set-up, accommodations), unfair treatment, discrimination, disincentives to work linked to existing regulations (e.g. restricted working hours or income when work is combined with disability benefits), and others.

For such vulnerable or marginalised groups, **digital platform work could be an attractive (additional or alternative) income source, with low barriers to entry and better working and employment conditions** (Adermon & Hensvik, 2022; Harpur & Blanck, 2020; Lam & Triandafyllidou, 2021; van Doorn & Vijay, 2021). Being able to choose the tasks, schedule and workplace is valued by migrant workers, workers with a disability, chronic illness or condition, and women workers, who often face constraints in those areas in the traditional job market (Gouskova, 2020; Maritz & Laferriere, 2016; Pagán, 2009). As platform work continues to become more and more common, it spreads to new sectors and jobs, opening up new opportunities at a global scale. The wide heterogeneity in the available tasks in digital platform work, at different skills levels, hints that there are **opportunities for everyone**.

Digital labour platforms also have a **high absorption capacity**, in the sense that platforms generally do not restrict the number of people who can sign up. One of the reasons is that platforms are managing two-sided markets and need to ensure a sufficiently large labour supply in order to attract and retain clients and keep prices affordable. As such, for digital labour platforms, the workforce that struggles to

get into the traditional labour market may be an excellent source to tap into. In urban and suburban areas, there often is a large labour supply offered by migrant workers and ethnic minorities workers (van Doorn & Vijay, 2021). For them, digital platform work could function in a similar way as other, often low-paid and flexible, entry-level jobs. As will be discussed below, however, this also means that digital platform work could present similar challenges as other forms of non-standard work, notably that the risks and costs associated with this type of work are pushed onto the worker.

Following this logic, digital platform work could serve as a **stepping stone into the labour market** and a **jumping board to other career opportunities**, inside or outside of the digital platform economy. Digital platform work allows workers to gain experience, develop their skills, build up a portfolio, grow a clientele and so on. Furthermore, a Cedefop (2020) study on skills development and matching in online digital platform work confirms that workers continuously develop their skills through their work, in particular platform-specific skills (e.g. creating an attractive profile), non-cognitive skills (e.g. communicating with clients), organisational skills (e.g. time management), and freelancing-specific skills (e.g. how to get tasks assigned). Workers also report being able to **develop their personal dispositions or attributes** by doing platform work, such as confidence, resilience and independence. Such dispositions and attitudes can also help overcome workers' own perceptions about their abilities and limitations in the world of work. This is highly relevant from a workforce diversity perspective, and especially for workers with somewhat weaker labour market profiles, such as persons with a disability, chronic illness or condition and migrant workers (Kilhoffer et al., 2019). Being able to earn an income can contribute to workers' financial independence (Altenried, 2021; Harpur & Blanck, 2020; Vyas, 2021).

All these aspects could be **valued by employers in the traditional labour market or function as key building blocks for a career in self-employment**. For example, having experience with digital platform work can reflect workers' skills, motivation, entrepreneurial spirit and so on (Adermon & Hensvik, 2022). As is common in labour market integration processes, these transitions may not be linear: for example, workers can start or stop with digital platform work multiple times and/or combine it with other work (Lam & Triandafyllidou, 2021; van Doorn & Vijay, 2021).

For some groups of workers, especially migrants and ethnic minorities workers, digital platform work is **becoming part of the pathway to the labour market**, which has been referred to as the 'platformisation of migration pathways' (van Doorn & Vijay, 2021). Digital labour platforms could replace other types of intermediaries, such as temporary work agencies, or exist alongside them, 'enabling new strategies, routes and pathways for migrant workers' (Altenried, 2021, p. 6). Some migrants even appear to register on a digital platform before moving abroad (Altenried, 2021).

Notwithstanding the potential benefits, **digital platform work can also become a trap**. Digital platform work may already be or become a **new form of low-paid work with very poor working conditions including severe OSH risks**, which substitutes or complements existing forms of low-paid work offered by employers or available under self-employment or another status (Harpur & Blanck, 2020; Lam & Triandafyllidou, 2021). Platform work is not always as free or flexible as is often perceived: workers may become dependent on the income earned through digital platform work, or even on a single platform or client. Furthermore, looking or waiting for assignments may prevent digital platform workers from being available for other (better) work opportunities. In many cases, workers do digital platform work out of a lack of alternatives, and for some, it turns into a long-term job (Adermon & Hensvik, 2022; Holtum et al., 2021; ILO, 2021; Lam & Triandafyllidou, 2021). This also applies to individuals with stronger labour market profiles than their counterparts, such as high-skilled migrants who could find better quality jobs (Lam & Triandafyllidou, 2021).

To further delve into this question, the following section: first, documents barriers in the traditional labour market that digital platform work could help to tackle (thus focusing on potential opportunities or benefits); second, describes barriers in digital platform work that may particularly affect the groups in focus in this article; and third, considers the medium- to long-term effects of engaging in digital platform work, to the extent these have been analysed. Challenges and issues related to working and employment conditions and to OSH in digital platform work are discussed in section 5; discrimination is discussed in section 6.

4.1   Overcoming barriers in the traditional labour market …

4.1.1 Job content, skills, knowledge and qualifications

In most cases, workers can easily set up an account on the digital labour platform's website or app and start working, oftentimes **without having to provide any proof of their qualifications, knowledge or skills, and without being subjected to a formal recruitment process**. A lack of experience in a specific task also is not a barrier to be allowed to sign up to a platform. In digital platform work, the onboarding process is typically short and relatively straightforward (e.g. completing basic questions, uploading identity documents) (van Doorn & Vijay, 2021). There are no 'gatekeepers' such as hiring managers in traditional companies. Once an account has been created, workers are free to decide what tasks to accept.

The relatively straightforward recruitment and onboarding process also has advantages, for example, as it can help overcome discrimination by recruiters, and lower the barriers to entry for those without formal qualifications, licences or certificates. Migrants may face challenges concerning the recognition of foreign qualifications in their new country of residence (Lam & Triandafyllidou, 2021; van Doorn & Vijay, 2021).

Being able to choose the tasks can be particularly helpful for persons with a disability or chronic illness or condition, as they are best placed to assess which work is feasible, without having to disclose their disability or their health issues (Kilhoffer et al., 2019; Van Herreweghe et al., 2021). For migrant workers, having control over which tasks to do can be beneficial as well (Lam & Triandafyllidou, 2021). For example, migrants who do not speak the local language can select tasks that involve minimal contact with others, where not knowing the language would not be an issue, or tasks that they can do in their native language or a foreign language they have mastered (e.g. English) (Altenried, 2021; Lam & Triandafyllidou, 2021; van Doorn & Vijay, 2021).

The high reliance on digital technologies or tools in digital platform work can be an advantage to persons with a disability (Fundación ONCE & ILO Global Business and Disability Network, 2021; Harpur & Blanck, 2020). Digital tools and technologies not only facilitate communication between digital platform workers, on the one hand, and digital labour platforms and clients, on the other hand, but also support workers in the execution of tasks. On this note, the use of browser extension tools and automated scripts appears to be quite common among digital platform workers. Digital platform workers using Amazon Mechanical Turk, for example, use a range of tools and scripts to help reduce unpaid time looking for tasks, to review and evaluate tasks and clients, to automate (parts of) the task execution and so on (Kaplan et al., 2018).

The use of digital technologies and tools can be beneficial for all platform workers, and can certainly make a difference from a workforce diversity perspective. Digital technology and tools may enable workers to perform tasks that would otherwise be inaccessible to them, or which they could not do as effectively or efficiently in a traditional work environment. In online digital platform work, for example, auto-captioning software can help persons who are deaf or hard of hearing to better understand video content. Being able to adjust tasks to one's needs without having to disclose a disability can help lower the barriers to work (Harpur & Blanck, 2020; Kilhoffer et al., 2019). A similar example for on-location digital platform work is found on Uber: drivers who are hard of hearing or deaf can indicate this in the app, which also alerts riders (Lee et al., 2019). A final benefit of the use of digital technologies and tools for all platform workers is that training relating to OSH is also often provided online (EU-OSHA, 2022a).

4.1.2 Working time and work pace

Digital platform work may provide flexibility regarding working times that is not available elsewhere (Fundación ONCE & ILO Global Business and Disability Network, 2021). This is one of the main reasons for workers to engage in digital platform work (EIGE, 2022). Besides being able to choose work activities and tasks, in principle, digital platform workers can **determine if, when and how long to work**. This enables people to work, also when they cannot do so at set times or full-time (e.g. plan work around medical treatments or care responsibilities) (Fundación ONCE & ILO Global Business and Disability Network, 2021; Gerber, 2022; Harpur & Blanck, 2020). Atypical working times, such as working on the weekends or at night, are quite common in digital platform work. Although this is sometimes referred to as working during 'asocial' hours, some digital platform workers may perceive it

as a benefit, as it implies they can do digital platform work whenever it best suits them (Eurofound, 2018). Working hours can vary on a daily basis.

Digital platform workers additionally have some control over the **pace of work**. The work pace and how it is determined are important factors contributing to the work intensity. A high work intensity is exciting, stimulating and rewarding, but can also cause stress and has a negative effect on workers' mental and physical health and wellbeing (Eurofound & ILO, 2019). A too low work intensity, however, is detrimental as well. Much will depend on how the pace of work is set: by the management, following the demands of clients, based on inputs or requests of colleagues, or by a machine (Eurofound & ILO, 2019). Some types of platform work allow workers to determine the work pace to a large extent (e.g. designing a logo, or programming a website): setting their own deadlines or negotiating reasonable deadlines with clients, determining how fast to work and so on. Furthermore, digital platform work is typically done in isolation, which means that the workers are not dependent on inputs from colleagues.

Having control over working times and work pace can help reduce stress and anxiety and contribute to a better work-life balance (Harpur & Blanck, 2020). Workers can spread out tasks as it best fits with their schedule. Flexible working times may present opportunities for women workers in particular, considering that women take on most care responsibilities (Berg, 2016). Working time flexibility and control over the work pace may also decrease the need for formal accommodations and disclosure for workers with a disability, chronic illness or condition (Berg, 2016; EIGE, 2022; Harpur & Blanck, 2020; Kilhoffer et al., 2019). Workers are able to connect or disconnect whenever they prefer, without having to provide a justification. Also in more traditional work contexts, working time flexibility is a key component of work accommodations (Kilhoffer et al., 2019).

4.1.3 Workplace and physical work environment

Another area in which digital platform work can help lower the barriers to labour market participation is the workplace and the physical work environment. Next to working times flexibility, some types of digital platform work offer flexibility regarding the **place where work activities are performed**. In general, the use of digital technologies and tools in the work environment, coupled with remote working and more flexibility in the place of work, can open up opportunities for more inclusive labour markets (Fundación ONCE & ILO Global Business and Disability Network, 2021).

Online digital platform work can be carried out in any location, and it is most often performed in workers' homes (EU-OSHA, 2022a). This has several advantages, for example, workers can adapt their work environment to their own preferences and needs (e.g. assistive devices), and in that way avoid having to work in a space made available by an employer or client that is not or only poorly adapted (Berg, 2016; Fundación ONCE & ILO Global Business and Disability Network, 2021; Harpur & Blanck, 2020; Kilhoffer et al., 2019). Furthermore, not everyone may have access to a vehicle or holds a drivers' license, or may have a drivers' license that is not officially recognised in their new country of residence in the case of migrants. Especially for tasks where speed matters, and where one has to move between locations, this can be problematic (Van Herreweghe et al., 2021). Working from home facilitates combining working with other activities and/or needs, such as care tasks or household chores. This may be particularly beneficial to women workers, who tend to take up the majority of the care work in most households, people providing care for a family member or workers receiving care (e.g. due to a disability, chronic illness, etc.).

In contrast, with on-location work, the main activity is carried out at the client's premises, in public spaces or elsewhere, whereas the part of the work relating to finding new tasks and managing the account can be done from the worker's home (or another location). Also in this case, workers could select the tasks in locations that are accessible to them (e.g. accessible by public transport, client's homes on the ground floor, etc.).

4.1.4 Social work environment

Another potential barrier relates to the social environment, which refers to the interpersonal relationships between workers, their clients and their organisation (colleagues, management) (Eurofound, 2018). In digital platform work, **interpersonal relationships tend to be more restricted** than in traditional work contexts, though it also depends on the type of digital platform work. Most digital

platform workers have little interaction with the platform and interactions may not involve any direct contact with a human being.

Although restricted interpersonal relationships at work can be problematic and lead to professional and social isolation, it can also be a way to **overcome negative perceptions or prejudice from colleagues, managers or others** and be a **solution for individuals who struggle with social interactions** (Van Herreweghe et al., 2021) (see section 6 on discrimination). There is ample research on the attitudinal barriers that migrants, women and individuals with a disability, chronic illness or conditions encounter (Kilhoffer et al., 2019). Attitudinal barriers may withhold them from working altogether or from taking up specific roles or tasks, as their colleagues or management do not believe it is a good fit for them. There may be feelings of guilt and resentment, communication difficulties, conflicts or misunderstandings, and so on. Workers fear being treated differently, getting fewer training and work opportunities, and so on. Overcoming such barriers is not straightforward, which is why some workers turn to self-employment, or to digital platform work specifically (Gouskova, 2020; Maritz & Laferriere, 2016; Pagán, 2009). Doing so can give workers back control, empowers them, and guarantees their autonomy and independence.

The degree of interaction with the client, the digital labour platform and digital platform workers depends on the type of digital platform work (Eurofound, 2018). In general, digital platform workers have **limited contact with the digital labour platform**. The use of algorithmic management implies that workers do not have direct contact with a human supervisor or manager but interact with a system (e.g. get automatic messages). This can be problematic when workers run into an issue that cannot simply be addressed. At the same time, some see this as a sign of workers' freedom and autonomy, which can give them peace of mind (van Doorn & Vijay, 2021).

Most platform workers also have **limited contact with other platform workers**. This is because digital platform workers tend to be anonymous, geographically spread, and may have few opportunities to run into each other (except in the case of on-location platform work such as food delivery, where workers are asked to wait for their next assignment at a fixed meeting point). In addition, the worker turnover in digital platform work is quite high (Pesole et al., 2018; Urzi Brancati et al., 2020), which makes it difficult to establish relationships. That being said, there are several examples of platform workers exchanging information, supporting each other, building online communities and so on (Eurofound, 2018). In food delivery and passenger transport, for example, communities are often built among groups of migrants and ethnic minorities. For some workers, it may be easier to establish relationships with others through virtual (online) communication than in real-life situations.

Finally, in online digital platform work, workers generally have no face-to-face **contact with the client**. In low-skilled online work, there also may not be any direct contact through virtual means either (e.g. in content review work) (EU-OSHA, 2022k). In high-skilled online work, there is direct contact with the client through virtual means, such as email exchanges or video calls to discuss a client's wishes (e.g. graphic design, website programming). In on-location digital platform work, platform workers do have direct contact with the client face to face, but this can be very limited (EU-OSHA, 2022a).

4.1.5 Employment conditions and remuneration

Digital platform work gives rise to new work opportunities and allows to gain footing in the labour market (Lam & Triandafyllidou, 2021). In many cases, this is on the basis of self-employment. For many workers, even when digital platform work is only a secondary source of income, digital platform work provides job and income security. It is a 'safety net' for those who may otherwise have no work at all. Migrant workers, for example, may struggle to access paid employment (Lam & Triandafyllidou, 2021; van Doorn & Vijay, 2021). Platform work can also contribute to the formalisation of activities that are carried out in the grey economy, for example, domestic work (EU-OSHA, 2022a), and allows to make a living out of odd jobs (Eurofound, 2018).

The low barriers to entry and to exit digital platform work, without administrative burden, could help those with negative past labour market experiences, for example, in their previous job(s). Such workers could be tempted to leave the labour market altogether. For them, digital platform work can be an opportunity to ease back into work, as it allows to try out different types of activities, without many constraints or commitments to an employer (Van Herreweghe et al., 2021). In case the work turns out to be too heavy, difficult, stressful or not suitable in any other way, it is easier to stop than in the case

of a regular employment relationship (Van Herreweghe et al., 2021). Digital platform work provides opportunities for individuals to try out a range of activities, without being pushed in one direction (which tends to happen to, for example, persons with a disability, migrants and so on). This also makes it possible to build up confidence and overcome any barriers that workers impose upon themselves. This may be an issue particularly from a workforce diversity perspective, for example, for migrants or persons with a disability, who often faced challenging education and labour market experiences in the past.

Another feature is that starting as a digital platform worker requires few resources, also when compared with starting as an entrepreneur or self-employment. This is an advantage for migrants and persons with a disability, chronic illness or condition, who often have little resources (Fundación ONCE & ILO Global Business and Disability Network, 2021; van Doorn & Vijay, 2021). Digital labour platforms, however, charge fees either upon registration as a digital platform worker or linked to transactions made.

All these aspects are highly relevant for individuals with weaker labour market profiles, who are overrepresented in the grey economy and often need to combine activities to make a living. Studies focusing on migrant workers doing digital platform work confirm that many perceive it as a safety net, though a temporary one (Lam & Triandafyllidou, 2021; van Doorn & Vijay, 2021). Being able to earn an income through digital platform work gives these workers some control over their livelihoods and job and income security (e.g. working a few days in passenger transport or food delivery may be sufficient to make the rent or pay for food). On the other hand, migrant workers in digital platform work are aware that this can be a dead end and realise they are highly dependent on the platform and its algorithmic management to get work (Lam & Triandafyllidou, 2021; van Doorn & Vijay, 2021). For some, however, low pay, income insecurity and precarious conditions at work are nothing new (Altenried, 2021).

For some, digital platform work may present an opportunity to earn an income that would not be possible or difficult to achieve through regular work (Berg, 2016; Dobson, 2017; Harpur & Blanck, 2020). Persons who receive government benefits may be restricted in how much they can work or earn (e.g. illness or unemployment benefits) and often face other constraints as well. Finding a job that is sufficiently flexible to handle such rules or restrictions is hard (Dobson, 2017). Digital platform workers, however, may be able to control how much they work and earn more easily, to ensure it stays within the limits (e.g. when income earned from other sources is capped at a certain level). As such, digital platform work opens up new opportunities. Also, by being able to try out work on a more casual basis, digital platform work can help to overcome the so-called benefit cliff (Dobson, 2017; Harpur & Blanck, 2020): this means that persons who receive government benefits may refrain from raising their labour market participation to avoid their benefits possibly being reduced or cut. Related to this point, there is some evidence that workers with a disability, chronic illness or condition sometimes do not receive the support they need from public employment services to be able to enter the labour market (Dobson, 2017; Kilhoffer et al., 2019). The work opportunities that are offered to them may not be a good fit, but are rather aligned with the conditions of specific employment programmes (e.g. a high minimum hours of work) (Dobson, 2017). In such cases, digital platform work could be an interesting alternative.

4.2 … but facing barriers in the digital platform economy

While the barriers to labour market entry and participation may be lower in the digital platform economy compared to the traditional labour market, it may still be difficult to get started as a digital platform worker. These difficulties may be particularly high for some groups of workers (e.g. depending on their ethnicity, disability, gender and socioeconomic status) (Yu et al., 2019).

Digital platform work is often very competitive. In many types of digital platform work, the digital platform worker has **little control over the process of task allocation**, and tasks are assigned by the digital labour platform or selected by the client. In only one of the 10 types of digital platform work identified by Eurofound (2018) could platform workers determine the task allocation. In five types, the client selects the worker; in four types, platforms match workers with clients (Eurofound, 2018). **Getting assignments is, therefore, not obvious**, but strongly depends on the strength of the workers' profile (e.g. having good ratings and reviews from previous clients), their availability and speed when tasks are posted on the platform, and so on (Kilhoffer et al., 2019; Van Herreweghe et al., 2021). When the platform matches digital platform workers with clients, workers have no autonomy regarding the task

allocation. When clients select the digital platform worker of their choice, digital platform workers may have some room for negotiation.

It is also important to mention here that the use of **'supply chains'** of workers providing labour is on the rise (Bertolini et al., 2022). As starting as a digital platform worker is not easy, especially in lower-skilled platform work where a high number of workers are competing for the same tasks, some workers turn to working as a subcontractor. This occurs in online and on-location platform work. In some cases, workers are subcontractors to an individual platform worker with a high ranking, for whom it is easier to get tasks, while in other cases workers are subcontracted through intermediaries such as specialised companies, temporary work agencies and so on. In some countries like Poland, for example, Uber drivers can sign up with Uber directly as self-employed or choose to sign up with an intermediary as an employee or worker (EU-OSHA, 2022d). Although in the latter case these workers have the legal status of employee, working via this system has several downsides too, for example, remuneration is typically lower as the intermediary deducts part of the fee as a payment for its services. Subcontracting has also been reported among food delivery platforms (van Doorn & Vijay, 2021). In online work, this appears to be quite a common practice in micro-tasking, such as online content review and moderation platform work (EU-OSHA, 2022a). Working with subcontractors enables platforms to avoid employer responsibilities but further complicates the different relationships between the parties involved (Arets, 2022; Bertolini et al., 2022). The risk of exploitation is high. What is more, especially workers with weaker labour market profiles and fewer outside options appear to fall victim to these kinds of frameworks. This includes newly arrived (undocumented) migrants and ethnic minorities workers, who get referred to platform work through their networks (Altenried, 2021; Bertolini et al., 2022; van Doorn & Vijay, 2021). In some cases, these supply chains also have a cross-border dimension, with digital platform workers based in a different country than the client and the subcontractor — this means that the international, EU and national OSH legislation may not be applicable.

Irrespective of how tasks are allocated, however, it is key that sufficient work of choice is available. Otherwise, digital platform workers may need to accept any task that becomes available, including those that are not a good fit with their knowledge, skills and needs (Fundación ONCE & ILO Global Business and Disability Network, 2021; Kilhoffer et al., 2019; Van Herreweghe et al., 2021). As digital labour platforms have to maintain a two-sided market, there is an incentive for them to have a persistent oversupply of workers available to take on assignments, which raises the competition among workers and deteriorates both pay and working conditions (Muller, 2020). In practice, the 'flexibility' that digital platform work offers may thus also imply that workers cannot work when they wish or need to, causing job and income insecurity.

Another issue goes back to the **use of digital technologies or tools in digital platform work**. Already today, some groups in the labour market experience digital exclusion in several ways: no or limited access to a computer or mobile phone, no or limited access to the Internet or only Internet provision of poor quality (poor connection, limited mobile data offer), lack of access to digital payment systems and so on. This has also been described as the **'digital divide'**. People in such situations may not be able to access digital platform work at all, or with severe constraints. Furthermore, the digital labour platform's website or app may not be accessible to persons with disabilities, chronic illnesses or conditions, including those who use assistive technology (e.g. screen reader, magnification tool, listening device) (Harpur & Blanck, 2020; Lee et al., 2019). When a platform is developed, the focus appears to be on making it as user-friendly and attractive as possible for clients, whereas the workers' side is somewhat overlooked (Kilhoffer et al., 2019). Digital platforms may not be legally required or even willing to provide accommodations, for example, arguing that this calls for individual adjustments to their algorithm and technology that is too complicated, too costly or undesired (Kilhoffer et al., 2019). Similarly, clients may not foresee any accommodations, adjustments or support.

Even if measures to improve a digital labour platform's accessibility are in place, some issues may arise. Lee et al. (2019), for example, looked at Uber's measures targeting drivers who are hard of hearing or deaf. Usually, drivers receive a sound notification of a new ride request. In order to accommodate the deaf or hard of hearing drivers, in addition to emitting the sound, the app now provides a visual cue — a flashing light. Although drivers see this as a major step forward, the flashing light is not always sufficiently noticeable, for example, in bright sunlight. To avoid missing rides, drivers need to constantly look at their phone and keep it with them at all times, also when helping clients with their luggage. This causes eye fatigue and distracts drivers from paying attention to the traffic. Lee et al. (2019) further find that communication with clients remains a challenge for drivers, even after indicating

in the app that they are hard of hearing or deaf. The main form of communication between drivers and passengers is sending text messages. Conveying to clients that texting is the only form of communication that works is also not straightforward. Many drivers said that clients still try to call them or do not respond to text messages (Lee et al., 2019). These communication difficulties with clients could lead to dangerous and illegal situations (e.g. texting while driving), cancelled rides (e.g. when drivers fail to find the pick-up point), and poor reviews (e.g. as drivers may fail to follow clients' directions or fail to engage in small talk). In order to overcome these issues, some drivers use assistive technologies on their own initiative (e.g. voice recognition apps) (Lee et al., 2019).

Closely linked to the previous points, the next issue relates to the **skills, knowledge and qualifications** that digital platform workers possess. Research by Cedefop (2020) on skills development and skills matching in online digital platform work confirms that *'prior education and training, and work experience, provide a baseline level of marketable skills that are necessary in digital platform work'* (Cedefop, 2020, p. 20). Skills such as technical, communication and organisational skills, and to some extent also language skills, personal dispositions and digital literacy, are developed before undertaking digital platform work. **Based on these findings, Cedefop (2020) concludes that — like in the traditional labour market — in digital platform work, those who are less educated or experienced are disadvantaged.**

This affects migrant workers and workers with a disability, chronic illness or condition , who often already encounter(ed) barriers in accessing education or training (e.g. due to segregation into educational tracks or schools at a young age), and experience difficulties in building skills that match demand (Kilhoffer et al., 2019). The formal education for individuals with a disability, chronic illness or condition may be outdated and not up-to-speed with recent technological developments (Kilhoffer et al., 2019). As a result, some groups of workers, including migrants and individuals with a disability, chronic illness or condition, often are lower-educated than others. Some platform workers, therefore, may be missing technical, digital and certain soft skills critical for digital platform work. This influences the types of tasks such groups can perform as digital platform workers, pushing them towards lower-skilled online or on-location work. In addition, some of these workers may depend on the income gained through digital platform work to earn a living, and will therefore be reluctant to turn down work opportunities, even those that they are not qualified for or have no or only little experience with (EU-OSHA, 2022a).

On the other hand, many platform workers are **overqualified** for the tasks they accept (Cedefop, 2020). **The competition for lower-skilled platform work is thus very tough, to the detriment of lower-skilled workers.** However, the fact that many digital platform workers are overqualified can also be interpreted as a sign that platforms offer low-level entry jobs that provide sufficient flexibility for workers to gain an income while requalifying for their profession, for example, in the case of migrant workers whose diplomas are not recognised (Lam & Triandafyllidou, 2021; Zhang & Banerjee, 2021). Such jobs may not be easily available in traditional labour markets. This could be a good strategy — in the short run — to gain host-country work experience (Zhang & Banerjee, 2021). A final point relating to skills and knowledge is that digital platform work tends to require a different set of skills than when the same task is carried out in a more traditional context (EU-OSHA, 2022a; Harpur & Blanck, 2020). For example, platform workers may have to deal with clients, do administrative tasks and keep records to be compliant with tax legislation, and so on. Workers with weaker labour market profiles may be less equipped to do so than others (Harpur & Blanck, 2020).

Another important barrier relates to a **lack of financial means** to start as a digital platform worker. Even though the resources needed to start as a platform worker may be lower than for self-employment, some resources are still necessary. Digital platform workers are generally responsible for providing the tools, materials and equipment necessary for the tasks. For example, in on-location platform work, workers generally have to use their own vehicle to execute the work (e.g. use their own bicycle for parcel and food delivery) or to reach the work location (e.g. to reach a client's home to do handiwork). In addition, to be able to access the platform, workers need a computer or a mobile phone. Workers bear not only the costs of acquiring such tools and equipment but also the costs of their maintenance or upkeep. From a workforce diversity perspective, some groups of workers, such as migrants, persons with a disability, chronic illness or condition, and women, may lack the financial resources necessary to enter digital platform work or to get started as self-employed, more so than others (Harpur & Blanck, 2020; Lam & Triandafyllidou, 2021).

One final point is a **lack of awareness** about the opportunities that digital platform work holds. As digital platform work is still a relatively small phenomenon, not everyone may be aware of its existence, nor of

the wide variety of work opportunities that are available (Kilhoffer et al., 2019). Workers may be deterred from digital platform work as they believe it only involves delivery or passenger transport services. These services have received much more attention from policy and the media than other types of platform work. Migrants entering a country may also not be aware of the different platforms that operate there, although, in some cases, there is some evidence that migrants can fall back on their networks to get such information (Lam & Triandafyllidou, 2021).

4.3 … as well as medium- to long-term consequences

In spite of the opportunities that it brings, digital platform work presents barriers itself that may be difficult to overcome (as discussed in section 4.2), and engaging in digital platform work does not guarantee a successful labour market integration in the long term. For many, digital platform work will be a dead end, and this is an issue that digital platform workers themselves are often aware of (Gerber, 2022; Harpur & Blanck, 2020; Lam & Triandafyllidou, 2021, 2022; van Doorn & Vijay, 2021).

A key issue relates to skills development and valorisation of digital platform work experience. Digital platform work provides few opportunities for training and skills development and for career progression (EU-OSHA, 2022a; Gerber, 2022). Research on how knowledge, skills and experience gained in digital platform work translates into knowledge, skills and experience that is valued in other contexts, however, is scarce, but several issues have been identified.

First, **proving that one acquired certain skills or experience as a digital platform worker is difficult**. Digital platform workers cannot easily transfer their portfolio from one platform to another or include it into their CV. Getting access to their own data can already be a challenge for digital platform workers (Arets, 2021). At the same time, having a good reputation on a platform is critical to get work assigned by this platform or by the clients. Being able to transfer one's profile outside of the platform economy is key to making digital platform work function as a stepping stone, where one can develop new skills, build up a portfolio and so on. This would make digital platform workers less dependent on a single platform or client. In an attempt to overcome these issues, GigCV was created (Arets, 2021).[7] GigCV serves as a tool for digital platform workers to download their reputation and transaction data. It is currently being piloted among four digital labour platforms operating in the Netherlands. However, there are some caveats to bear in mind. For instance, it could raise the competition between workers and thus complicate the situation of new digital platform workers without any reputation and transaction data.

Second, it has been established that **many digital platform workers are overqualified** for the work they perform (see above, EU-OSHA, 2022a; Gerber, 2022). Furthermore, many platform workers take up a range of activities that may or may not be related to each other and to their formal education (EU-OSHA, 2022a). **Such skills mismatches and education-occupation mismatches, however, have long-term consequences such as negative effects on earnings, occupational status and job satisfaction** (Somers et al., 2016). Closely related to this, the fact that digital platform work is not a full-time job for most workers can have long-run consequences. Research on migrant workers, for example, confirms that doing non-standard work (such as part-time work) and occupational mismatches can have scarring effects and hamper long-term outcomes (Zhang & Banerjee, 2021). For workers with limited alternative options for work (such as migrants, but also women with care tasks), digital platform work is a trap they cannot get out of, but that still may be perceived as the best option out of a bad lot (Gerber, 2022; van Doorn & Vijay, 2021).

> **Does listing experience as a digital platform worker on one's resume help to get invited for job interviews? It might for natives, but not necessarily for migrant workers.**
>
> Digital platform workers may not list their digital platform work activities on their resume, for example, as they think this experience is not valuable for the line of work they want to move into, out of shame and so on (Eurofound, 2018). However, even when workers put their experiences as digital platform workers on their resume, it may not be perceived positively by potential employers, for example, as this could point to them having a weaker labour market profile (Adermon & Hensvik, 2022). Until now,

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[7] See: https://gigcv.org/

it has rarely been tested whether mentioning digital platform work experience can ease the job application process, but there is evidence of this from a Swedish experiment. Adermon and Hensvik (2022) sent 10,000 fictitious job applications to 3,300 vacancies for low-skilled jobs in Gothenburg, Mälmo and Stockholm. Jobs without any requirements of previous experience or post-secondary education, posted on the largest Swedish job board between March and October 2018, were targeted. Fictitious job applicants either had 7-15 months of digital platform work experience, 7-15 months of traditional work experience or experienced a period of 7-15 months of unemployment. The digital platform work experience was in food delivery, while the traditional work experience was in postal services. Adermon and Hensvik (2022) report that among native Swedes, previous experience in both traditional work and digital platform work raised the call-back rate from employers versus being unemployed, but the effect was much larger and only statistically significant for traditional work. For workers with a migrant background (Arabic-sounding name), neither traditional work experience nor digital platform work experience raised the call-back rate from employers versus unemployment. The authors conclude, therefore, that digital platform work does not function as a stepping stone for these workers.

5 OSH challenges in digital platform work

A central question in research and policy on digital platform work is **whether the jobs that are available are good quality jobs that are healthy, safe and sustainable in the long run**. In cases where digital platform work is a stepping stone to work, it is not certain that this concerns decent work. Moreover, issues regarding OSH and the working and employment conditions are at the heart of the debate on platform work. Especially low-skilled platform work has been criticised for its precarious conditions and high level of job and income insecurity, with detrimental effects on workers' safety, health and wellbeing.

Indeed, previous research has shown that **digital platform workers encounter a range of psychological and physical safety and health risks that directly relate to the activities performed**. Examples of physical risks include ergonomic risks, safety risks (e.g. slips, trips, falls), and risks of being in an accident (e.g. due to fatigue, poor weather conditions). Psychological risks involve stress, due to algorithmic management, long working hours, emotionally demanding work, excessive workload, loss of job autonomy, isolation and a lack of social support, harassment and verbal abuse, and so on (Kim et al., 2022). Being exposed to such risks can cause musculoskeletal disorders, headaches, visual fatigue, diabetes and cardiovascular diseases (EU-OSHA, 2021a, 2022a). Those risks are exacerbated due to the working and employment conditions of digital platform work, and they complicate risk prevention and management (EU-OSHA, 2021a, 2022a). At the same time, some groups of workers may already be exposed to higher OSH risks than others, for example, due to language issues or related to the sectors and occupations in which they work. This section, therefore, lays out the main findings on OSH in digital platform work and discusses the particular impacts for such workers. As section 4 mainly highlighted opportunities, this section will mostly describe challenges in platform work.

5.1 Issues related to employment conditions

5.1.1 The legal employment status of digital platform workers

Digital platform workers are usually classified as **self-employed** by platforms in their terms and conditions (EU-OSHA, 2022a; European Commission, 2020). Of the 28 million digital platform workers active in the EU, the vast majority are self-employed (about 90% according to estimates on the use of service contracts in digital platform work by De Groen et al. (2021)). Some 5.5 million platform workers are believed to be misclassified as self-employed (Barcevičius et al., 2021), mostly workers engaged in lower-skilled on-location or online digital platform work. For this group in particular, research suggests that workers not only lack rights that they should be entitled to as employees but also face constraints that the self-employed are commonly not faced with, for example, lack of autonomy (Barcevičius et al., 2021). As indicated above, migrants and ethnic minorities are overrepresented in this type of digital platform work.

Workers' legal employment status is key as it determines the rights and obligations of the digital labour platforms and digital platform workers, including on OSH matters (see section 5.1.2). For instance,

being self-employed could imply that some anti-discrimination laws are not applicable and that platforms are not accountable for any issues in this regard (Kilhoffer et al., 2019) (see section 6). Another example is the limited access to social protection and issues regarding the building up of social protection rights through digital platform work (Van Herreweghe et al., 2021). The issue of **undocumented migrant workers** in digital platform work is gaining importance (Altenried, 2021; van Doorn & Vijay, 2021). This group is incredibly vulnerable, often fully dependent on the income earned in digital platform work, and does not have any work opportunities in the regular economy. Despite digital labour platforms' claims that undocumented migrants doing platform work is a marginal issue that is monitored closely and addressed swiftly, there are more and more reports of such cases — for example, in Belgium, France, Italy, Spain and the United Kingdom (Altenried, 2021). Usually, workers buy or rent an account set up by someone who is legally residing in the country and allowed to work, sharing it with others (Altenried, 2021). Renting out accounts to work via a platform has become a business model in itself. This raises the dependency and job and income insecurity of migrants even more.

Some digital platform workers may not even be aware they are working illegally. van Doorn and Vijay (2021), for example, discuss the case of a migrant worker who only found out after months that the work permits submitted to the platform were not in order and that they had worked illegally all this time. This suggests that while platforms may provide some basic information on such topics, close follow-up and verification of documents provided by digital platform workers appears limited. Some persons may fall between the cracks in a context where digital platform work is largely left unregulated and where responsibilities and risks are shifted onto them (Altenried, 2021; van Doorn & Vijay, 2021).

5.1.2 The OSH regulatory framework at EU and national levels

Being self-employed also has **major consequences for digital platform workers in the area of OSH**. The EU OSH Framework Directive and its daughter directives, as well as national OSH legislation, in principle only apply to dependent employment relationships in most EU countries (EU-OSHA, 2022a). Consequently, the vast majority of the digital platform workers are not covered by this legislation, in cases of misclassification unrightfully so, and are themselves responsible for all aspects regarding their OSH. Research, however, has shown that the awareness of OSH risks and their prevention and management among digital platform workers is generally limited, especially among groups such as young workers, migrants and ethnic minorities workers, and so on (EU-OSHA, 2021a, 2022a). Furthermore, the nature and conditions of digital platform work may also make it difficult for workers to take appropriate measures, for example, because they are sent to a workplace they are not familiar with or to work in public spaces, due to the speed with which tasks have to be executed and so on. Some digital labour platforms take actions to help improve the OSH of workers using their platform, but these are often limited to offering basic safety training, basic insurance, and some guidance or instructions.

The OSH Framework Directive, its 'daughter directives' and national OSH legalisation

Directive 89/391/EEC — also known as the OSH Framework Directive — lays down the main principles for encouraging improvements in the safety and health of workers. This includes general principles on risk assessment, prevention and control measures, as well as principles concerning the informing, consultation, balanced participation and training of workers and their representatives. The OSH Framework Directive holds obligations for employers, workers and in some cases for subcontractors. The OSH Framework Directive is accompanied by single directives (daughter directives) that make the principles and instruments of the OSH Framework Directive more concrete regarding the specific hazards at work, single tasks and different workplaces with elevated risks. Examples of daughter directives are Directive 1989/654/EEC (minimum safety and health requirements for the workplace), Directive 2009/104/EC (minimum safety and health requirements for the use of work equipment by workers at work), Directive 1989/656/EEC (minimum health and safety requirements for the use by workers of personal protective equipment), Directive 1990/270/EEC (minimum safety and health requirements for work with display screens), and Directive 1998/24/EC (protection of the health and safety of workers from the risks related to chemical agents at work).

Regarding OSH, and again bearing in mind the high diversity in the digital platform workforce, some groups of workers are exposed to several challenges and risks, which are exacerbated in the context of digital platform work. Besides the hazards and risks that are directly related to such work, these groups encounter issues with the prevention and management of said hazards and risks. Already in traditional work contexts, the need for sensitive risk prevention and management (e.g. with regard to gender, ethnicity, disability) is often overlooked. As OSH risk prevention and management in digital platform work is left to the workers, it can be assumed that such sensitivities are overlooked by platforms too. Moreover, as stated before, workers with weaker labour market profiles tend to be overrepresented in jobs with poor conditions, higher levels of income and job insecurity, and higher OSH risks — also in digital platform work, and at the same time they are often dependent on the income earned through this work. This can push workers to do more or longer hours, to work faster, to accept work they are not trained for or not familiar with, and to take more risks overall.

Migrant workers and ethnic minorities workers additionally face difficulties with communication as well as language barriers, have different cultural values and perceptions about work and OSH, and have a more limited knowledge and understanding of the (local or national) OSH regulations (EU-OSHA, 2007, 2009; Starren et al., 2012). With regard to **women digital platform workers**, it is important to note that women tend to take up jobs that are in some cases wrongfully regarded as healthy and safe. It is often overlooked that female-dominated jobs tend to involve direct contact with clients, exposure to dangerous substances, ergonomic risks and so on (Messing, 1998). Similarly, whereas **workers with a disability** face the same risks as other workers doing the same job, they may be exposed to additional risks depending on their health issue or disability, the task at hand, and the work environment and culture (EU-OSHA, 2009). Moreover, no accommodations may be put in place by the platform or client (Kilhoffer et al., 2019).

5.1.3 Remuneration, working times and work-life balance

Although digital platform work can offer opportunities to earn an income through flexible work, in many cases digital platform workers have little to no control over whether or not one can work, or when to work, how many hours to work, the remuneration per task and so on (EU-OSHA, 2021a, 2022a; Fundación ONCE & ILO Global Business and Disability Network, 2021). This can lead to situations where pay is (very) low and working hours are either very long or very short. In terms of working times, the start and end times and duration of work could be restricted by the platform (e.g. food and parcel delivery riders who are allotted shifts), which reduces workers' flexibility. This can lead to highly fragmented working hours (Van Herreweghe et al., 2021).

Digital platform workers are generally paid per task rather than by the hour. Some tasks are paid very little, especially in cases where many platform workers are competing for the same work (no specialised skills or experience required to execute the task), and where microwork is concerned (in which case the workers are paid just a few cents per task). In addition, platform workers spend a lot of unpaid time on the digital labour platform, for example, when looking for new assignments, communicating with potential clients or moving between locations to start the next task.

In general, workers faced with job and income insecurity are more likely to accept poor conditions in digital platform work, out of a lack of alternatives (Van Herreweghe et al., 2021). On this note, it has been documented that **migrants and ethnic minorities workers** take up low-paid tasks in the digital platform economy and often work during asocial hours (e.g. weekends, nights) (Eurofound, 2018). **Women digital platform workers** are found to choose flexible, home-based digital platform work regardless of the legal employment status and the conditions that come with it, as this is perceived as the only activity they can combine with their care obligations (Gerber, 2022; Vyas, 2021). At the same time, however, it does not solve the issue of the 'double burden' of having to combine work activities with care and domestic work and could negatively affect their work-life balance (Vyas, 2021). Similar to migrant and ethnic minorities workers, many women digital platform workers find themselves in low-paid platform jobs, which in turn increases their dependency on platform work (Gerber, 2022). It is important to note here that this willingness to accept low-paid digital platform work is not only linked to the limited alternative options in the traditional labour market but also with the conditions set by the social security scheme that these individuals can fall back on (Gerber, 2022).

Related to this, although digital platform work may offer opportunities to earn an income while receiving government benefits, digital platform workers may accidentally break the rules or cross the income caps

of the benefits programme (Dobson, 2017). It is not always easy to keep track of hours worked or income earned through digital platform work, especially when using multiple platforms. While some digital labour platforms do inform workers who are about to exceed certain thresholds, platforms have no information about workers' activities on other digital labour platforms or outside of platform work. The consequences can be devastating and far-reaching. Besides having benefits reduced or removed, workers' eligibility for other programmes may be affected too, for example, housing, child support and healthcare.

5.2 Issues related to working conditions

5.2.1 Algorithmic management and digital surveillance

The use of algorithmic management to allocate, monitor and evaluate the behaviour and performance of digital platform workers in real time has a significant impact on their physical and psychological health, safety and overall wellbeing (Bérastégui, 2021; EU-OSHA, 2021a, 2022a; ILO, 2021). Due to algorithmic management, the autonomy and flexibility that digital platform workers have can in fact be very limited, whereas their workload and speed pressure tend to go up. Workers need to maintain a good ranking on the digital labour platform, first, to be able to continue working, and second, to get assigned the 'best' work opportunities on the platform (e.g. best paid routes on a transport platform). As explained in section 2, rankings can be based on a variety of parameters, such as client reviews and data on tasks (number of completed tasks, speed, accuracy, availability for work, etc.). This means that digital platform workers have to be at their best in several domains at the same time. All this causes anxiety and stress (Bérastégui, 2021; Möhlmann & Zalmanson, 2017). The use of algorithmic management implies that the managerial role is taken up by an algorithm, with an unequal power balance between platform and platform workers as a result. Digital platform workers are typically not informed or consulted, and they are not involved in the decision-making. Due to the COVID-19 crisis, the use of algorithmic management is becoming more widespread, also outside of the digital platform economy (EIGE, 2022).

Workers with weaker labour market profiles are more likely to be active on digital labour platforms that exercise even more control over their workers, which is linked to the types of digital platform work they do (e.g. migrants are overrepresented in passenger transport and parcel and food delivery work) (Bérastégui, 2021; EU-OSHA, 2021a, 2022a). In addition, algorithmic management is more difficult to handle for workers already facing constraints. For example, individuals combining digital platform work with care, notably women, are interrupted more frequently and are less available than their competitors (EIGE, 2022). Similarly, digital platform workers with a disability or health issue may need more frequent or longer breaks, are less available overall or may take more time to complete a specific task (Van Herreweghe et al., 2021). All of these elements could result in a more negative rating and ranking and thus lower remuneration and fewer opportunities to work. The use of algorithmic management can also lead to direct and indirect discrimination, which again affect some groups more (EU-OSHA, 2022a, 2022l). As elaborated in section 6, the use of algorithmic management puts significant pressures on the health and wellbeing of workers, as it involves the collecting of private and sensitive data and uses them to make (semi-)automated decisions (EU-OSHA, 2022l). These decisions, however, can be biased if the underlying data or the assumptions made by the algorithm are biased (e.g. assumptions based on workers' characteristics). This may lead to a preferential treatment of some workers, or discrimination against others (EU-OSHA, 2022l).

5.2.2 Work environment and equipment, materials and tools

As indicated above, digital platform work is often executed outside of the context of a 'conventional' workplace (at home, at a client's premises, in a public space, etc.), which may not be known beforehand and is typically not adjusted to a platform worker's needs (EU-OSHA, 2021a, 2022a). There is no common workplace where digital platform workers can meet in most cases. Digital platform workers also have to bring the materials, tools and protective equipment necessary to execute the task. These, however, may not be appropriate for the task at hand, and they can be expensive to acquire (e.g. purchasing a specific type of vehicle, investing in specialised tools) (EU-OSHA, 2021a, 2022a).

Some groups of workers, however, may not have the means to set up a proper work environment that is adapted to their needs or to buy the tools and equipment required (Fundación ONCE & ILO Global Business and Disability Network, 2021; Van Herreweghe et al., 2021). The latter is an issue for workers with a disability who rely on accommodations and assistive tools to be able to work. In addition, as the overall awareness on OSH among digital platform workers is low, many may not be aware that they need protective equipment for certain tasks. For migrant workers and ethnic minorities workers, differences in cultural values and perceptions on a safe work environment can come into play here too.

5.2.3 Labour relations and social support

On a final note, digital platform work tends to be carried out by a single worker in isolation, without much interaction with and support of other digital platform workers, the client and the digital labour platform. This causes exhaustion, anxiety, stress and depression and has a negative impact on workers' health and wellbeing (Bérastégui, 2021). It also makes it difficult to identify and organise digital platform workers, to tackle issues collectively and to ensure an effective participation of the workers on OSH issues (EU-OSHA, 2021a, 2022a).

Some workers, in particular, may get or feel disconnected from the platform, clients and colleagues, and become invisible and forgotten. In such cases, digital platform work may help foster economic and labour market inclusion of workers such as persons with a disability or health issue, but it would hamper their societal inclusion more broadly (Fundación ONCE & ILO Global Business and Disability Network, 2021; Kilhoffer et al., 2019).

6 Discrimination, harassment and unfair treatment

As evidenced in research, women, migrants, and persons with a disability, chronic illness or condition are **more likely to face discrimination, harassment and unfair treatment** in the labour market. This includes, for example, bullying, exclusion, abusive behaviour and hostility.

Discrimination, harassment and unfair treatment: How big is the issue? Who is most affected?

Data from the 2015 European Working Conditions Survey (EWCS) indicate that 7% of the surveyed workers felt having been discriminated against in the past year, on grounds of their age, sex, race, nationality, religion, sexual orientation or disability (Eurofound, 2017): 3% reported being exposed to age discrimination, 2% to sex discrimination (3% of women, 1% of men), 2% to racial discrimination, 2% to discrimination based on nationality, 1% to discrimination based on religion, 1% to discrimination based on sexual orientation and 1% to discrimination based on disability. The 2015 EWCS data also document workers' experiences with unwanted behaviour and harassment. In this case, 12% of the surveyed workers reported having faced verbal abuse in the past year, while 6% reported humiliating behaviour, 5% bullying/harassment, 4% threats, 2% physical violence, 2% unwanted sexual attention and 1% sexual harassment (Eurofound, 2017). With the exception of threats, far more women workers than men workers said to have encountered unwanted behaviour and harassment. In addition, service and sales workers and workers in the health sector — predominantly women — appear most affected.

In the context of digital platform work, there is no conclusive evidence about **discrimination, harassment and unfair treatment** of platform workers compared with workers in **the traditional labour market**, depending on a wide range of factors, such as the matching process (matching done by platform, client or worker), the format of labour provision (on-location or online work), the type of services provided (female-dominated or male-dominated traditionally), the interaction between the involved parties (high or low), and workers' characteristics (Codagnone et al., 2016; EU-OSHA, 2021a, 2022a; Eurofound, 2018; Graham et al., 2017; Lam & Triandafyllidou, 2022; Vyas, 2021). Although anecdotal evidence of discrimination, harassment and unfair treatment is provided in a number of studies on digital platform work, estimates of how many platform workers are affected are scarce.

On the one hand, digital platform work can **be a lever to escape from discrimination, unfair treatment or harassment** in several ways (Eurofound, 2018; Van Herreweghe et al., 2021). On most platforms, digital platform workers can set up an anonymous profile, or can leave out or change information they do not wish to share (e.g. not sharing a photograph, not disclosing information on a disability or health issue, using a different name, age, location in the profile) (Harpur & Blanck, 2020; Kilhoffer et al., 2019; Van Herreweghe et al., 2021). This makes it (more) difficult for both clients and digital labour platforms to discriminate. For example, online workers in developing countries often change their location to avoid being discriminated against (EU-OSHA, 2022a). Digital labour platforms can match clients with workers directly, which again reduces the risk of discrimination by clients and levels the playing field between digital platform workers (Van Herreweghe et al., 2021). This occurs, for example, in food delivery and passenger transport, where the platform determines which worker should do which task and the client has no say in this. Some forms of digital platform work involve no or very minimal interaction between worker and client. Digital platform workers' perception of facing discrimination is likely also different. One example is that of on-location work being executed in workers' own local communities, which makes workers feel they face less discrimination than in other settings (Eurofound, 2018).

On the other hand, **discrimination, harassment and unfair treatment may be more widespread in digital platform work**, as existing inequalities or social norms are reinforced (Eurofound, 2018; Graham et al., 2017; Lam & Triandafyllidou, 2022; van Doorn & Vijay, 2021). Several studies find anecdotal evidence of platform workers experiencing discrimination on the grounds of their ethnicity, gender, not speaking the national language and so on, or a combination of these features (Vyas, 2021). Such treatment and discrimination may come from both platforms and clients. In addition, digital platform work tends to be concentrated in sectors or occupations where workers are already more vulnerable to harassment, discrimination and unfair treatment, for example, in transport and care (EIGE, 2022). The use of digital technologies also increases the risks of exposure to online bullying and harassment.

In many cases, digital platform workers depend on clients to get tasks assigned (e.g. handiwork). Some digital labour platforms oblige workers to disclose personal information on their account, and encourage them to link it up with their social media accounts on Facebook and so on (Eurofound, 2018). Having a profile that is as complete as possible is also important to gain the trust of potential clients. Clients can choose a worker based on their own preferences, which can be racist, sexist or discriminatory in any other way. In some cases, this may even happen unconsciously. For example, certain tasks may be traditionally female- or male-dominated, leading clients to choose a worker accordingly (e.g. selecting a male worker for handiwork but not for babysitting tasks) (Vyas, 2021). Discrimination is not only reported in cases where clients select workers. Even when the platform assigns a worker to a task and hence to a client, discrimination can occur. For example, passengers may refuse to enter a driver's vehicle based on their skin colour, gender or disability (Lee et al., 2019).

The use of algorithmic management may also be a factor that aggravates bias and discrimination (EIGE, 2022) (also see section 5.2.1). Algorithms and artificial intelligence can be developed using biased or incomplete data in which some groups are underrepresented, and as such perpetuate historical biases that are discriminatory or lead to unfair treatment of workers (EIGE, 2022; Fundación ONCE & ILO Global Business and Disability Network, 2021). While removing the 'human bias', new ones can be created (Muller, 2020). A well-known example is a recruiting tool developed by Amazon: the company had created such a tool based on artificial intelligence, but abandoned it as the tool yielded gender-biased results — women were left out as the tool used data on resumes submitted to Amazon in the past decade and these were dominated by men (Dastin, 2018).

Furthermore, algorithmic biases may be introduced based on measurable factors, such as the speed or accuracy of task completion. For example, consider a worker with a disability who is able to do a task achieving the same quality as a worker without a disability, but at a slower pace. When the platform's algorithm is programmed so that fast task completion is rewarded with a higher rating, workers with a disability will receive lower ratings than others, which in turn affects their chances to get tasks. Clients' ratings may also be biased in such situations. One example is Uber: on average, female drivers tend to drive more slowly than male drivers, and are thus allocated 'slower' routes that may be less profitable for the driver and thus lead to gender pay gaps (e.g. high-fare trips to the airport are typically assigned to fast, mostly male drivers) (Muller, 2020). Cases of indirect discrimination are difficult to tackle (Van Herreweghe et al., 2021).

Finally, it is important to note that digital platform workers may **not report discrimination, harassment and unfair treatment** for several reasons: out of shame, out of fear of not being able to work anymore through the platform or for a particular client, because platforms do not have adequate mechanisms or procedures in place to report or address such issues, and so on.

7 Policies and practices for OSH in digital platform work

Rising concerns about the working and employment conditions and OSH of digital platform workers have put digital platform work high on the agenda of policy- and decision-makers in several EU Member States, and more recently also at the EU level.

On 9 December 2021, the European Commission published a **proposal for a directive to improve the working conditions of people working through digital labour platforms**.[8] Along with the proposal, draft guidelines on the application of EU competition law to collective agreements of solo self-employed individuals were published.[9] These guidelines also apply to digital platform workers. The proposed directive aiming to improve the working conditions in digital platform work was launched following a two-stage consultation of the European social partners and is currently under discussion in the European Parliament and the European Council.

The proposed directive focuses on three main areas of concern in relation to digital platform work, all of which are connected with OSH. First, the **legal employment status of digital platform workers**: the proposed directive recognises that the lines between dependent employment and self-employment are blurred in the context of digital platform work, which makes it difficult to categorise workers. It also leads to misclassifications, which must be addressed to ensure the labour and social rights (and OSH) of workers. To this end, the proposed directive provides a list of five control criteria: if at least two of these five criteria are met, the digital labour platform is legally presumed to be the employer, workers are to be classified as employees, and the burden of proof falls on the platform in case it wants to contest this conclusion. This helps avoid that workers fall outside of, among others, the scope of the EU and national OSH legislation because of misclassification issues. Second, the proposed directive aims to increase transparency in the use of **algorithmic management** and gives workers the right to contest automated decisions. In addition, there must be human oversight. All these aspects are important to give workers more information about the way they are monitored and evaluated and should also help improve their physical and psychological health, safety and wellbeing. Third, the proposed directive aims at **better enforcement, more transparency and higher traceability**, by imposing reporting obligations and encouraging data exchange. This is key for OSH risk prevention and management, for example, as it could facilitate labour inspections and monitoring and enforcement.

All digital platform workers would benefit from improvements in those areas. For some digital platform workers (especially those with weaker labour market profiles), in particular, there could be a big impact as these workers today appear to be faced with the highest risks. For example, the clarification of employment status would be most beneficial in the case of lower-skilled online and on-location platform work, in which migrant and ethnic minorities workers are currently overrepresented, as misclassifications are believed to be most prevalent here and many court cases on the legal employment status involved lower-skilled digital platform work. Similarly, as documented above, there are many reasons why the OSH risks in digital platform work are higher for some workers and why, for them, digital platform work often becomes a trap rather than a jumping board. At the same time, however, there is also some criticism about the proposed directive, for reasons that have already been mentioned above. Some authors have argued that if digital labour platforms are obliged to hire the workforce as employees, rather than doing so, platforms would instead collaborate with subcontractors or employment agencies, who would take on this responsibility (Arets, 2022; Bertolini et al., 2022). Besides leading to potentially worse conditions (see the Polish example mentioned earlier), mandatory employment could reduce the available work opportunities, as was reported for UberEats Switzerland: when the platform had to hire its riders as employees, only one-fourth actually received an employment contract (Arets, 2022). Finally, the most vulnerable persons are likely (still) left out (e.g. undocumented migrants) (Arets, 2022). Ponce Del Castillo and Naranjo (2022) further see room for improvement when

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[8] See: https://ec.europa.eu/commission/presscorner/detail/en/ip_21_6605/
[9] See: https://competition-policy.ec.europa.eu/public-consultations/2021-collective-bargaining-2_en

it comes to making the proposed directive more coherent with the General Data Protection Regulation and the draft Artificial Intelligent Act[10].

The proposed directive is a major step forward as it directly addresses digital platform work and focuses on improving the working and employment conditions and OSH in digital platform work. Although many Member States have adopted measures and initiatives in response to the rise of digital platform work in the past years (see the reports by the European Commission (2020), Hauben et al. (2021) and EU-OSHA (2022a) for an overview), it is clear that: (i) only a few of these measures target digital platform work directly, whereas most touch on digital platform work indirectly (e.g. by targeting all self-employed, which includes the self-employed in the digital platform economy); and that (ii) OSH was largely overlooked; if it is addressed, again this is mostly indirectly. The overall attention to OSH and awareness about OSH is limited (among all involved parties and stakeholders).

Very few of the measures, initiatives and actions taken by EU Member States specifically account for the challenges faced by digital platform workers from a workforce diversity perspective. Most measures, initiatives and actions target a specific type of digital platform work or a specific type of digital labour platform, in that way often addressing OSH issues indirectly among some groups of workers. One example is inspections carried out in Poland in the passenger transport sector, which revealed that about 10% of the workers who were checked were illegally residing third-country nationals or legally residing third-country nationals without proper work permits (EU-OSHA, 2022a).

On this note, it is important to highlight that most measures, initiatives and actions that directly address platform work **appear to tackle the most visible forms, in particular: low-skilled on-location digital platform work**. However, research suggests that women workers and workers with a disability, chronic illness or condition may be less active in this type of platform work but engage in online digital platform work, which they can perform at home and may be easier to combine with care responsibilities or needs.

More generally, policies to foster labour market integration of persons with a distance to the labour market are built on the logic of dependent employment relationships and traditional work contexts (Harpur & Blanck, 2020). While opportunities offered by digital platform work are increasingly discussed in this context, the knowledge about this topic and awareness about pitfalls seems limited. For example, many migrants and persons with a disability, chronic illness or condition are supported by different public and private organisations, such as the public employment services. Such organisations, however, seem to have little knowledge about and experience with digital platform work (Dobson, 2017; Kilhoffer et al., 2019). Nevertheless, these organisations are likely to receive an increasing number of questions about digital platform work as more and more people are engaging in it. This could range from legal questions about combining income earned through digital platform work with government benefits, to questions on what to do in case of non-payment, discrimination or OSH risks and impacts on workers' health.

8   Conclusions and takeaways

OSH has emerged as a key issue in the debate on digital platform work, as it is by now well understood that digital platform workers are subject to a wide range of risks with potentially detrimental effects for their physical and mental health and overall wellbeing in both the short and longer run. These OSH risks arise from the extensive use of algorithmic management, the non-standard work and employment arrangements (e.g. workplace, working times, pay, professional and social isolation, work-life conflicts, etc.), high levels of job and income insecurity, and, last but not least, challenges with regard to the correct determination of legal employment status in digital platform work.

While, at the moment, the prevention and management of OSH risks is largely left to the digital platform workers themselves, irrespective of their legal employment status and potential misclassification issues, at the same time the vast majority of digital platform workers and digital labour platforms appear to have little knowledge and awareness about OSH in general. Moreover, policy- and decision-makers as well as key stakeholders also lack a good understanding of the OSH risks presented by digital platform work, as well as insight into how these risks appear to affect some workers in particular.

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[10] See: https://artificialintelligenceact.eu/

This study has, indeed, shown that OSH risks are aggravated for particular groups of workers, such as migrant and ethnic minorities workers, women workers, and workers with a disability, chronic illness or condition. This is related to the types of digital platform work in which these workers are engaged, their personal characteristics and other factors. However, little or no policies and practices devote attention to OSH in digital platform work, and even fewer tackle the specific challenges faced by such groups.

Table 2 summarises the main risks and opportunities of engaging in digital platform work from a workforce diversity perspective.

Table 2: Summary of the main opportunities and risks of digital platform work that are specific to migrants and ethnic minorities, women, and persons with a disability, chronic illness or condition

	Opportunities	Risks
Migrant and ethnic minorities workers	- Earning opportunity for those with few or no alternative work options (formalisation of work in the grey economy) - Choose tasks without language barriers - Choose tasks that are accessible in terms of workplace (e.g. public transportation) - Providing evidence of qualifications is not required, issues with recognition of foreign qualifications are circumvented - No disclosure of migrant status or ethnic minority during job application	- Being trapped in 'supply chain' of workers due to difficulties in getting tasks (depend on others with good reputation) - High risk of being misclassified as self-employed digital platform workers - Growing prevalence of undocumented migrants engaged in digital platform work - (Very) low pay, long and fragmented working hours - High exposure to significant levels of algorithmic management - High dependency on digital platform work - Occupation-education mismatch - Employment status of self-employed may affect eligibility for benefits or programmes - National and international OSH legislation may not apply - Limited awareness of OSH risks and their prevention and management - Communication and language barriers, different cultural values and perceptions about work and OSH, limited knowledge and understanding of the (local or national) OSH regulations - Discrimination by platform, clients, third parties and due to algorithmic biases
Women workers	- Choose working times that fit with care responsibilities, improving work-life balance - Option to work from home	- Accepting poor overall conditions in return for flexible, home-based work (e.g. pay) - High dependency on digital platform work - Occupation-education mismatch - More difficulties in handling algorithmic management due to frequent interruptions - Employment status of self-employed may affect eligibility for benefits or programmes

	Opportunities	Risks
		- National and international OSH legislation may not apply
		- Limited awareness of OSH risks and their prevention and management
		Discrimination by platform, clients, third parties and due to algorithmic biases
Workers with a disability, chronic illness or condition	- Earning opportunity for those with few or no alternative work options, which allows to ease (back) into work with few constraints and to try out (new) tasks - Choose tasks that are feasible given disability or condition - Choose tasks that are accessible in terms of workplace (including own home) - No disclosure of disability, illness or condition during job application or work execution - Use digital technologies and tools to support work unnoticed - Choose working times that fit with care needs, medical treatments, etc. - Less need for formal accommodations due to flexibility and autonomy	- Platforms may not be accessible (e.g. for those using assistive technologies) - Difficulties of combining (income earned through) digital platform work with benefits (e.g. disability benefits, sick leave) - More difficulties in handling algorithmic management due to frequent interruptions - Employment status of self-employed may affect eligibility for benefits or programmes - National and international OSH legislation may not apply - Limited awareness of OSH risks and their prevention and management - Lack of means to assure themselves accommodations and assistive tools - Discrimination by platform, clients, third parties and due to algorithmic biases

Source: Authors' own elaboration.

In what follows, the main findings and takeaways of the study are presented.

- **Making entry and intermediation in digital platform work inclusive**

Digital platform work can **lower the barriers to labour market entry**, by making available work opportunities that offer higher levels of flexibility than similar opportunities in more traditional work contexts and environments. At the same time, digital platform work poses barriers that seem to affect some groups more. This includes (but is not limited to) barriers to enter the platform and to get work assigned, as well as issues related to discrimination and unfair treatment. It is, therefore, important to ensure that both the entry and intermediation in digital platform work are inclusive. One way to achieve this is to establish accessibility requirements for digital labour platforms and to encourage them to adopt broad gender and diversity policies. Such requirements and policies would benefit all using the platform.

- **Platform work as a jumping board**

Digital platform work could, in theory, be a jumping board to a sustainable career within or outside of the digital platform economy, especially for workers who struggle with this already in the context of the traditional labour market. However, in practice, it seems that several **key conditions to this end are not (always) fulfilled**. This includes issues related to the development of knowledge and skills (lack of training), the certification of skills and experience acquired during digital platform work, limited opportunities for career progression in digital platform work, concerns about the required financial means to start as a digital platform worker, concerns about the financial sustainability of working as a digital platform worker or the repercussions thereof, and so on. Several initiatives regarding the validation of skills and experience exist (e.g. KlusCV) and could be explored further. In addition, further data collection and knowledge exchange on digital platform work is key, to ensure that important labour

market actors, such as public employment services, companies and others, are aware of digital platform work and existing and/or potential issues therewith.

- ▪ **Ensuring safe and healthy work in the digital platform economy**

As indicated above, evidence suggests that **many of the so-called strong points of digital platform work turn out to be disadvantageous or downright pitfalls for persons with weaker labour market profiles** for whom those, in theory, would be beneficial (e.g. the 'flexibility' in digital platform work can turn out to be mere 'job and pay insecurity' in some cases). Although ensuring fair working and employment conditions in digital platform work will benefit all workers concerned, it is critical for such groups. The reason is that those workers in particular seem to be at high risk of ending up in precarious situations, *also* in digital platform work, as they are more likely to accept poor conditions (including in relation to OSH) due to a lack of alternatives, and so for them digital platform work ends up replacing other forms of low-paid precarious work. On the one hand, the **correct classification of legal employment status of platform workers** can make a big difference (also for migrants, of whom many work on platforms where bogus self-employment seems more prevalent). It is key concerning the applicability of the OSH regulatory framework. On the other hand, policymakers should look beyond the question of legal employment status and aim to **improve the working and employment conditions and OSH overall**. Especially regarding OSH risk prevention and management, much work remains to be done, such as raising awareness, sharing knowledge and data, ensuring monitoring and enforcement when the OSH regulatory framework is applicable, and so on.

- ▪ **Prioritising the fight against discrimination, harassment and unfair treatment**

The evidence on discrimination, harassment and unfair treatment in digital platform work is rather scarce and it does not reach consensus on whether such issues are better or worse compared to the traditional labour market. Arguments and examples in both directions are presented. That being said, **any case of discrimination, harassment and unfair treatment is one too many**. It is critical to recognise the benefits that workforce diversity brings to digital platform work. On this note, the specific challenge of algorithmic management in digital platform work warrants attention, not in the least with regard to topics such as OSH.

A key step in tackling this issue is raising awareness (of all stakeholders concerned) and ensuring transparency. Digital labour platforms should be aware that their design, functionalities, algorithms and other features matter and have a great impact on workers in particular and society in general (e.g. issues with road traffic safety due to too much emphasis on speed of delivery workers). Digital platforms should also foresee options to report any issues with discrimination, harassment and unfair treatment as well as mechanisms to address and follow up on them. Platforms should also make efforts to measure the prevalence of discrimination, harassment and unfair treatment and to determine who is most affected by it. In some cases, small changes could have a big impact (e.g. removing sensitive data such as the option to add a photograph to a worker's profile). Finally, policymakers should prioritise this topic and foresee provisions to enforce existing legislation in this area.

- ▪ **Ensuring that the voices of digital platform workers are heard**

Although there is a growing literature on workforce diversity in digital platform work, this **topic appears somewhat less addressed in policy, notably in the context of OSH**. It is, therefore, imperative that the challenges are better understood and addressed also from this perspective. Collecting data on digital platform work that allow disaggregation by age, gender, ethnicity, nationality, country of birth, family status, disability and so on, and looking at combined vulnerabilities is a first important step to this end. This is key to further help map the issues. In addition, digital platform workers should be informed and involved in the prevention and management of OSH risks in digital platform work in any initiatives undertaken by platforms and policymakers. What could help in this respect is to make sure platforms allow for easy communication between workers, which would also be beneficial in the prevention or notification of OSH risks and of worker organisation, an aspect that is also in the field of OSH, and an important factor.

On this note, it is important to involve representative organisations for different groups of workers in policy discussions on digital platform work and to foster collaboration. Organisations such as the public employment services, trade unions and other actors could help to identify digital labour platforms that offer safe and healthy work opportunities that are accessible and realistic for workers with weaker labour market profiles. Increasing the knowledge about digital platform work and the OSH risks connected to

it among these key players in the labour market and improving collaboration between them on these topics is, therefore, critical. The Fairwork project from the Oxford Internet Institute and the WZB Berlin Social Science Center could provide inspiration here.[11]

Glossary

EC	**European Commission**
EIGE	European Institute for Gender Equality
ETUI	European Trade Union Institute
EU	European Union
Eurofound	European Foundation for the Improvement of Living and Working Conditions
EU-OSHA	European Agency for Safety and Health at Work
EWCS	European Working Conditions Survey
ILO	International Labour Organisation
OSH	Occupational safety and health

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[11] Fairwork evaluates the working conditions of digital platforms and ranks them based on five principles: fair pay, fair conditions, fair contracts, fair management and fair representation. For more information, please see: https://fair.work/en/fw/homepage/

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