Swedish Agency for Work
Environment Expertise

# Occupational safety and health on digital labour platforms

Systematic literature review 2025:13

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ISBN 978-91-990701-3-1
Published in 2025

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# Foreword

The rapid digitalization of society has significantly changed both our communities and work life. New technological solutions, artificial intelligence, and digital platforms offer opportunities for greater flexibility, efficiency, and access to employment—but they also present new challenges for the work environment. Work that is mediated and organized through digital platforms differs in many ways from traditional employment, especially in terms of responsibility distribution, social protection, and conditions impacting occupational health and safety.

This systematic literature review emphasizes aspects of the work environment in platform work, especially how conditions impact the health, safety, and well-being of those working through digital platforms. By summarizing existing research, the systematic literature review helps deepen understanding of how the new world of work is transforming the relationship between labor, technology, and people. At the same time, the compilation indicates that research on platform work is still evolving. Many questions remain about how responsibility for the work environment should be understood and enforced within these new forms of work. To establish sustainable conditions, ongoing research, collaboration, and a clear focus on the long-term needs of both individuals and society are necessary.

The authors of this systematic literature review are Professor Dr. Adrian Todolí-Signes (Project Leader), Ph.D. Ángela Martín-Pozuelo, Doctoral Candidate David Crespo-Ortiz, and Doctoral Candidate Paula López-Aguado, all from the Department of Labor Law and Social Legislation at the University of Valencia. Professor José María Peiró-Silla of the University of Valencia and Simon Taes of the University of Leuven provided valuable input. The report was peer-reviewed by Professor Bengt Sandblad of Uppsala University.

The responsible project leader at the Swedish Agency for Work Environment Expertise has been Associate Professor Robert Ljung, and Axel Wiman has served as communications lead. I would like to sincerely thank the external researchers, peer reviewers, and colleagues at the Agency for their dedication and professional contributions to the development of this important report on platform work and the work environment.

Gävle, december 2025

Nader Ahmadi, Director-General

# Authors

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*The expert group would like to express its deepest gratitude to Professors José María Peiró-Silla, from the University of Valencia, and Simon Taes, from the University of Leuven, for their invaluable comments and suggestions, which have greatly contributed to the preparation of this report*

# Abstract

Platform work relies on algorithmic management to allocate tasks, monitor performance and facilitate payment, thereby creating a triangular relationship between platform, worker, and client. The rapid expansion of platform work, particularly across Europe, has raised urgent questions regarding labour classification, working conditions and occupational safety and health (OSH) protection. As platform-mediated work becomes increasingly central to the functioning of modern economies, there is a pressing need to understand the specific risks it poses to workers' health and well-being and to formulate appropriate regulatory responses that safeguard labour rights without stifling innovation.

## Aim of the study

This systematic literature review aims to identify the specific risks faced by digital platform workers as documented in the literature. It seeks to explore the effects of these risks on workers' health and determine the most effective measures that states, trade unions and digital platforms can adopt to mitigate them and promote the health of these workers. Finally, this paper highlights gaps of knowledge in the literature.

## Methodology and sources

This systematic literature review builds upon the conceptual framework developed in *"Platform Work: What It Is and How It Works from an OSH Perspective"* (The Swedish Agency for Work Environment Expertise 2025:14) and presents a systematic review of academic and grey literature on OSH and platform work. The review includes:

- **26 peer-reviewed papers** selected through a formal inclusion process.
- **Grey literature** drawn from sources such as Policy Commons, the ILO, EU-OSHA, the European Commission, Eurofound, and the OECD.

This mixed-source approach ensures both academic rigour and practical policy relevance.

## Findings

### 1. Risk factors identified in the literature

Nine major risk categories were identified in the literature:

- **Algorithmic management.** This is consistently cited as a core risk factor. Platforms use algorithms to monitor every aspect of task execution, transforming worker actions into data that influence real-time decisions. This model severely restricts worker autonomy, increases stress, and reduces job satisfaction.
- **Gamification and behavioural control.** Platforms often use reward systems, performance metrics, and competitive rankings to motivate workers. While seemingly engaging, these systems can result in toxic competition, psychological pressure, and performance anxiety.
- **Client-dependent rating systems.** Workers' access to tasks often hinges on client ratings. Low ratings may lead to penalties or deactivation. This creates emotional strain and encourages risky behaviours aimed at pleasing clients, such as skipping safety breaks.
- **Excessive workload and long hours.** Piece-rate pay and job insecurity force workers to take on long, irregular shifts with little rest. This leads to chronic fatigue, diminished attention, and higher accident risks.
- **Unpredictable and unsocial working hours.** Many platform workers face irregular schedules, making it difficult to maintain a healthy work-life balance and adequate rest. The unpredictability of assignments further aggravates mental and physical health conditions.
- **Isolation and lack of social support.** Platform work often involves little or no human interaction. This is especially true for online tasks. The absence of physical workplaces, team dynamics and mentorship opportunities increases loneliness and psychological vulnerability.
- **Economic insecurity.** Low, inconsistent income encourages workers to accept unsafe tasks and avoid breaks. The fear of losing income can drive neglect of health and safety standards.
- **Self-employment status and regulatory exclusion.** Misclassification as independent contractors means workers are excluded from OSH regulations, PPE provision, and employer-supported training, placing the burden of safety entirely on the worker.
- **Unsafe working environments.** Workers operating in public spaces, such as delivery personnel, are exposed to extreme weather, traffic, and urban hazards without adequate shelter or infrastructure. Remote digital workers may face ergonomic risks when working from inadequately equipped home offices.

## 2. Health consequences

The health consequences documented in the literature are multi-dimensional and include:

- **Physical symptoms.** These range from musculoskeletal disorders (back/neck pain), chronic fatigue, eye strain, heat and cold stress, to cardiovascular diseases linked to stress and inactivity. Delivery workers also face increased exposure to traffic accidents and weather extremes.
- **Stress-related symptoms.** Common complaints include persistent headaches, stomach pain, fatigue, substance abuse, and exposure to violence in public spaces, particularly among ride-hailing and delivery workers.

- **Psychological disorders. Anxiety, depression, and burnout are prevalent.** These stem from constant surveillance, income insecurity, lack of support, and poor work-life balance.
- **Emotional and social effects.** Workers report emotional exhaustion, low self-esteem due to competitive rankings, isolation, and strained peer relationships, particularly in fragmented and competitive platform environments.
- **Cognitive impacts.** Task fragmentation, algorithmic control, and skill underutilisation contribute to depersonalisation, deskilling, and reduced decision-making capacities.

## 3. Health promotion and mitigation measures

The literature proposes a series of concrete measures to mitigate the OSH risks of platform work:

- **Presumption of employment.** The most consistent recommendation is to legally classify platform workers as employees, ensuring access to OSH protections, collective bargaining rights, and social security.
- **Transposition of the EU Platform Work Directive.** National implementation by December 2026 is essential to guarantee minimum standards for algorithmic transparency, employment classification, and worker protections.
- **Collective representation.** Even if employment status remains ambiguous, workers should have the right to organise and bargain collectively.
- **Platform responsibilities.** Platforms should provide clear risk notifications, enforce mandatory rest periods, and offer safety training and equipment.
- **Worker empowerment tools.** Platform apps should include panic buttons, GPS safety alerts, and allow workers to rate clients. Transparent algorithms and the right to appeal performance-related sanctions are also crucial.
- **Shared workspaces and support networks.** Establishing communal hubs or virtual forums would facilitate peer support, information-sharing and mental health resilience.

These recommendations align with emerging EU regulations and aim to create a more balanced and equitable platform work environment.

## Gaps and limitations in the literature

Despite the breadth of findings, the literature reveals several important research gaps.

- **Geographical bias.** Most studies focus on Western countries, neglecting platform work in emerging economies where legal, social, and infrastructural factors differ significantly.

- **Occupational bias.** Research has disproportionately focused on ride-hailing and delivery work. Less attention has been paid to other sectors such as care work, education, and remote freelance services.
- **Lack of causal evidence.** Most studies are correlational, limiting the ability to establish causality between risk factors and health outcomes.
- **Insufficient longitudinal data.** Few studies have tracked health impacts over time, which restricts understanding of chronic effects.
- **Absence of intersectional analysis.** The influence of gender, age, race, and socio-economic background on OSH outcomes in platform work remains largely unexplored.

## Conclusions

This literature-based assessment has identified critical OSH risks associated with platform work. It has clarified their health implications and outlined strategic measures for mitigating these challenges. It stresses the need for risk-specific assessments and proactive health monitoring. Similarly, the study reveals persistent gaps in the evidence base, particularly concerning long-term health effects, cross-sector comparability, and intersectional vulnerabilities. Addressing these shortcomings will require more diverse, rigorous and longitudinal research approaches.

Ultimately, ensuring that platform work evolves into a sustainable, inclusive model depends on aligning innovation with worker protection. By turning the recommendations from this review into specific policies and practices, stakeholders can build a regulatory framework that protects health, preserves dignity, and fosters equity in the platform work economy.

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# 1. Introduction and background

Digital labor platforms refer to online systems and mobile apps that facilitate the exchange of labor services through algorithmic management These platforms allow businesses and individuals to tap into a diverse workforce to complete tasks, whether in person or remotely (Berg et al., 2018). Examples of digital labour platforms include Upwork and Amazon Mechanical Turk, which facilitate remote freelance work and microtasking, as well as Uber and TaskRabbit, which connect workers with clients for transportation and on-demand physical tasks in specific geographic areas.

This new type of service provision has seen rapid growth in Europe over the last decade, accounting for a significant part of the labour market (Eurofound, 2019; European Commission, 2020). In 2015, platform work was recognised as an emerging form of employment, and by 2020 it was present in nearly all EU member states (Eurofound, 2020). The growth of these platforms has sparked extensive interest among researchers, policymakers and the media, given their novel operating model and the associated challenges they bring in terms of work conditions and labour rights (Farrell et al., 2018; Jing et al., 2023).

Platform work represents a new way of accessing and performing employment tasks that have been enabled by advances in information and communication technologies (ICTs) (Urzì Brancati et al., 2020). The development of artificial intelligence, cloud computing and the proliferation of smartphones has facilitated the creation of digital environments that connect workers with employers and clients (ILO, 2021a). Under this model, platforms act as intermediaries, enabling transactions between workers and customers to perform various tasks and services (Hauben, Lenaerts, & Waeyaert, 2020). Platform work is distinct in its triangular structure in that platforms mediate between workers and clients, organising tasks and evaluating performance, while also processing payments (Hauben, Lenaerts, & Waeyaert, 2020). Tasks may be completed online or at specific physical locations, creating flexibility in service delivery (Todolí-Signes et al., 2020). Unlike traditional labour market intermediaries, platforms manage specific tasks and services rather than formal jobs (Urzì Brancati et al., 2020).

Estimating the scale of platform work is challenging due to inconsistent definitions of what it actually is, task fragmentation and varying survey methodologies (Eurofound, 2019). Surveys such as COLLEEM[1] reported that platform work in the EU increased from 9.5% in 2017 to approximately 11% in 2018, with 1.4% of the working population relying on platforms as their primary source of employment (Pesole et al., 2018; Urzì Brancati et al.,

1 The JRC-COLLEEM (COLLaborative Economy and EMployment) surveys, launched in 2017 and 2018, respectively, were among the first surveys to estimate the size of the platform economy at the European level, and to analyse the socio-economic profiles and working conditions of platform workers in Europe.

2020). Additionally, 10% of workers engaged in platform work as a source of supplementary income (Eurofound, 2019; Lenaerts et al., 2022).

Sweden's statistics align with this growth rate. In 2017, 2.5% of the working age population performed platform work, while 10% had engaged in this activity at some point (Eurofound, 2018a). In 2021, the EU played host to over 500 labour platforms, serving an estimated 28 million platform workers, including 791,575 in Sweden (European Commission, 2021d), where platform work reflects broader European trends but also demonstrates regional nuances. In 2017, platform work had a moderate foothold, with 2.5% of the workforce actively engaged in this activity, whilst a larger segment was exploring or considering platform-based employment (Eurofound, 2018a). The Swedish labour market, characterised by strong social safety nets and collective bargaining traditions, involves unique challenges and opportunities for integrating platform work into the economy. Sweden's regulatory framework has yet to fully address its complexities, including employment classification and OSH standards. However, the country's stance on social dialogue and innovation positions it as a potential leader in crafting balanced solutions. Policymakers in Sweden and across Europe must navigate these dynamics to ensure that platform work aligns with labour rights and economic sustainability.

The success of digital platforms can be attributed to their efficiency in reducing transaction costs, creating economies of scale, and recruiting workers in lower-cost locations (OECD, 2016; ILO, 2021a). Platforms also classify workers as independent contractors, a practice that minimises operational expenses but raises legal and social concerns (European Commission, 2020). In fact, this duality — flexibility versus precarity — defines much of the discourse around platform work (Tran & Sokas, 2017). This kind of labour service provision offers opportunities for supplementary income, entrepreneurial activities, as well as we all improved labour market access for vulnerable groups, including migrants, young people and individuals with disabilities and caregiving responsibilities (EU-OSHA, 2023; Lenaerts et al., 2021). Flexible work arrangements promote a better work-life balance and may provide a pathway to higher-paying jobs through skill acquisition (World Bank, 2023). However, these benefits are counterbalanced by significant downsides.

Platform work involves numerous risks to workers' well-being, health and safety. The widespread classification of workers as independent contractors leads to ambiguous employment relationships, often undermining social protection and labour rights (Pulignano, 2019). Challenges include legal ambiguities affecting the application of occupational safety and health (OSH) regulations, poor working conditions and job insecurity, limited access to social protection and benefits, and increased occupational risks, particularly in high-intensity tasks (EU-OSHA, 2021). These issues are exacerbated in cross-border scenarios, where platforms, workers and clients may be located in different legal jurisdictions. This transnational nature complicates the enforcement of labour and tax laws, highlighting the need for comprehensive regulatory frameworks (ILO, 2021a).

Digital labour platforms represent a transformative shift in employment, offering flexibility and new income opportunities, while introducing significant challenges to worker protection and regulatory compliance. In Europe and Sweden, the rapid expansion of platform work underscores the urgent need for adaptive policies that address legal ambiguities, enhance OSH standards and ensure equitable labour practices. By balancing innovation with social responsibility, policymakers can harness the potential of platform work while safeguarding workers' rights and well-being.

This report builds upon a previous study commissioned by SAWEE entitled "Platform work: what it is and how it works from an OSH perspective" (The Swedish Agency for Work Environment Expertise 2025:14), which defined platform work, explained its functioning, and categorised the different types of digital platforms. This study serves as the theoretical framework for the present systematic review.

## 1.1 Literature review goals

Syftet med kunskapssammanställningen är att kartlägga de risker som arbetstagare på digitala plattformar utsätts för, enligt litteraturen, att undersöka riskernas effekter på arbetstagarnas hälsa och att fastställa de effektivaste åtgärder som stater, fackföreningar och digitala plattformar kan vidta för att minska riskerna och främja arbetstagarnas hälsa. Slutligen uppmärksammas även kunskapsluckor i litteraturen.

# 2. Literature review

## 2.1 Methodology

A systematic literature review was conducted to identify the risks, challenges and opportunities to improve occupational safety and health in digital platforms. Systematic literature reviews involve a comprehensive search for articles that compile and analyse numerous studies and summarise their information to obtain an overview of the research in the field of interest. This paper is based on the Prisma protocol for systematic literature reviews, which comprises four steps: identification, scanning, eligibility and inclusion (see www.prisma-statement.org for further information) (Page et al., 2021).

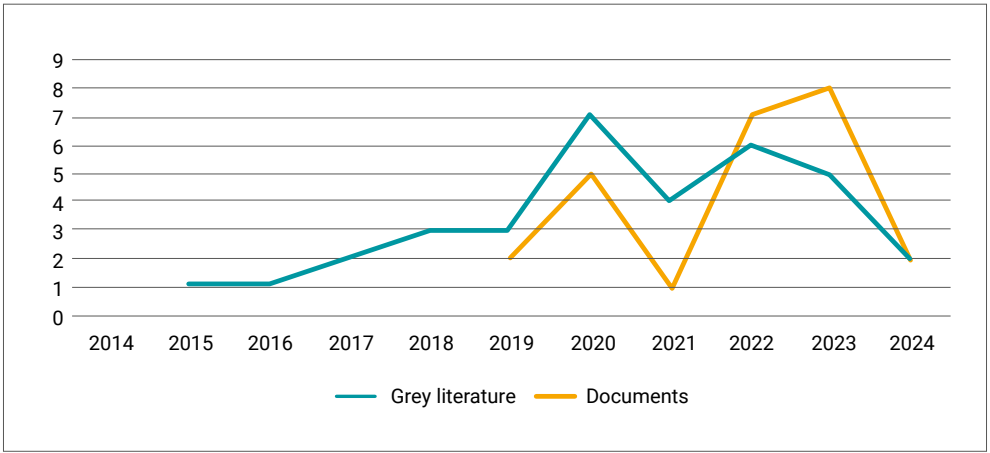
This type of methodology provides a systematic approach to literature searches and includes both qualitative and quantitative studies based on different designs. This systematic review does not include a weighted assessment of the findings of the studies included but instead aims to obtain an overview of the knowledge gained in a particular field or on a particular research question. In this case, it centres on the prevention of occupational risks on digital labour platforms.

In this study, a systematic review of the international scientific literature was carried out using the Scopus, Web of Science, PsycINFO and Pubmed-Medline databases.

This search was supplemented by grey literature from the Policy Commons database and by checking the publication databases of the main international organisations active in the field of workers' labour rights, such as the International Labour Organization (ILO), Eurofound, the European Commission, the EU-OSHA and the Organisation for Economic Co-operation and Development (OECD).

### 2.1.1 Inclusion and exclusion criteria

This systematic literature review includes studies that investigated risk and health-promoting factors among digital labour platform workers, and which were published in peer-reviewed journals up to March 2024. No geographical or date restrictions were imposed, although most papers were published after 2017, given the novelty of the phenomenon (Figure 1).




**Figur 1.** Publication dates.

This is an integrative review, meaning no papers were excluded because of the type of study.

Inclusion and exclusion criteria were decided according to the population, exposure, outcome (PEO) model.

The inclusion and exclusion criteria were drawn up prior to the actual search.

**Table 1.** Inclusion and exclusion criteria

| | Inclusion | Exclusion |
|---|---|---|
| **Population** | Digital labour platform workers. | Workers employed by other types of organisations such as oil-platform companies, and self-employed individuals who do not work on platforms. |
| **Phenomenon of interest (Exposure)** | Activity on digital labour platforms. | Studies unrelated to occupational risk factors and digital platforms. |
| **Results** | Studies examining health risk factors and ways to prevent work-related risks. | Studies unrelated to health and safety at work and the prevention of occupational risks. |
| **Other** | Articles available which were written completely in English. | Articles in other languages or without full text availability. |

### 2.1.2 Search strategy

Literature searches were conducted in the international Scopus, Web of Science, PsycINFO and Pubmed-Medline databases. They were limited to population, phenomenon of interest, design, evaluation/outcome and type of research. The inclusion and exclusion criteria (based on SPIDER) are listed in the table above. We included articles exclusively written in English and published before 6 March 2024.

The search strategy was initially constructed in the Scopus database, gradually bringing the different parts together. The strategy was then adapted to search the Web of Science database and, finally, to search the PsycINFO and Pubmed-Medline databases.

**Table. 2.** Search words

| Keyword | Synonyms | Related to |
|---|---|---|
| **Platform work** | App?based Work<br>App?driven work<br>On?demand econ*<br>Task?based work<br>collaborative econ*.<br>crowd econ*<br>crowd?work*<br>crowdsourcing<br>gig job<br>gig work<br>gig?econ*<br>internet?mediated work<br>just?in?time?workforce<br>micro-task<br>on?demand econ*<br>participative econ*.<br>platform econ*<br>platform work*<br>platform?based work<br>uber econ*<br>work?on?demand | Population |

*Table 2 continued*

| Keyword | Synonyms | Related to |
|---|---|---|
| **Occupational risk** | Employment Exposure<br>Employment risk<br>Job Disease*<br>Job Hazard<br>Job?Related Risk<br>Occupational Danger<br>Occupational Disease<br>Occupational Hazard<br>Occupational Safety<br>Occupational Threat<br>Occupational exposure<br>Occupational health<br>Work Peril<br>Work Risk<br>Work?Related Injuries<br>Work?related Peril<br>Workplace Exposure<br>Workplace Peril<br>Workplace Protection<br>Workplace Risk<br>Workplace Safety<br>Worksite Danger | Exposure |
| **Risk prevention** | Health?promoting<br>Buffering agent*<br>Health promotion<br>Health?boosting Factors<br>Health?care<br>Health?enhancing factors<br>Health?supporting factors<br>Protecting agent*<br>Protective element*<br>Protective factor*<br>Risk mitigation factor*<br>Safeguarding element*<br>Safety factor<br>Supportive factor*<br>Wellness factors | Exposure |

The initial search string was tested in the reference databases and refined to obtain more appropriate results.

**Table 3.** Initial Search strim.

| Initial search string |
| --- |
| ("Platform work*" OR "On?demand econ*" OR "collaborative econ*" OR "crowd econ*" OR "crowd?work*" OR "crowdsourcing" OR "gig job*" OR "gig work*" OR "gig?econ*" OR "just?in?time workforce" OR "micro-task" OR "on-demand econ*" OR "participative econ*" OR "platform econ*" OR "platform work*" OR "uber econ*" OR "work?on?demand") AND ("Health-promoting factors" OR "Buffering agent*" OR "Health promotion" OR "Health protection" OR "Protecting agent*" OR "Protective element*" OR "Protective factor*" OR "Risk mitigation factor*" OR "Safeguarding element*" OR "Safety factor*" OR "Supportive factor*" OR "Occupational risk" OR "Job?Related Risk" OR "Occupational Disease*" OR "Occupational Hazard" OR "Occupational Safety" OR "Occupational health" OR "Work?Related Injuries" OR "Workplace Exposure" OR "Workplace Protection" OR "Workplace Risk" OR "Workplace Safety" OR "Worksite Danger") |
| **Final search string** |
| ("Platform work*" OR "App?based Work" OR "App?driven work" OR "On?demand econ*" OR "Task?based work" OR "collaborative econ*" OR "crowd econ*" OR "crowd?work*" OR "crowdsourcing" OR "gig job*" OR "gig work*" OR "gig work*" OR "gig?econ*" OR "internet?mediated work" OR "just?in?time workforce" OR "micro?task" OR "on?demand econ*" OR "participative econ*" OR "platform econ*" OR "platform work*" OR "platform?based work" OR "uber econ*" OR "work?on?demand") AND ("Risk Prevention" OR "Health?promoting factors" OR "Buffering agent*" OR "Health promotion" OR "Health protection" OR "Health?boosting Factors" OR "Health?care" OR "Health?enhancing factors" OR "Health?supporting factors" OR "Protecting agent*" OR "Protective element*" OR "Protective factor*" OR "Risk mitigation factor*" OR "Safeguarding element*" OR "Safety factor*" OR "Supportive factor*" OR "Wellness factors" OR "Occupational risk" OR "Employment Exposure" OR "Employment risk" OR "Job Disease*" OR "Job Hazard" OR "Job?Related Risk" OR "Occupational Danger" OR "Occupational Disease*" OR "Occupational Hazard" OR "Occupational Safety" OR "Occupational Threat" OR "Occupational exposure" OR "Occupational health" OR "Work Peril" OR "Work Risk" OR "Work?Related Injuries" OR "Work?related Peril" OR "Workplace Exposure" OR "Workplace Peril" OR "Workplace Protection" OR "Workplace Risk" OR "Workplace Safety" OR "Worksite Danger") |

The search strings returned 412 articles (52 in PsycInfo, 136 in Pubmed-Medline, 157 in Scopus and 67 in Web of Science) in the search conducted on 6 March 2024.

Grey literature was obtained from the Policy Commons database in a search carried out on 4 June 2024. To complete this search, the websites of organisations and authorities such as the European Commission, EU-OSHA and the ILO were also searched for relevant publications. In addition, grey literature reports found through the bibliography of the reviewed articles were also included.

In the Policy Commons database (http://www.policycommons.net) the following search strings were used: ("Platform work*" OR "App?based Work" OR "App?driven work" OR "On?demand econ*" OR "Task?based work" OR "collaborative econ*" OR "internet?mediated work" OR "just?in?time workforce" OR "on?demand econ*" OR "participative econ*" OR "platform econ*" OR "platform work*" OR "platform?based work" OR "uber econ*" OR "work?on?demand") AND ("Occupational risk" OR "Employment

Exposure" OR "Employment risk" OR "Job Disease*" OR "Job Hazard" OR "Job?Related Risk" OR "Occupational Danger" OR "Occupational Disease*" OR "Occupational Hazard" OR "Occupational Safety" OR "Occupational Threat" OR "Occupational exposure" OR "Occupational health" OR "Work Peril" OR "Work Risk" OR "Work?Related Injuries" OR "Work-related Peril" OR "Workplace Exposure" OR "Workplace Peril" OR "Workplace Protection" OR "Workplace Risk" OR "Workplace Safety" OR "Worksite Danger")

### Risk and platform work search*

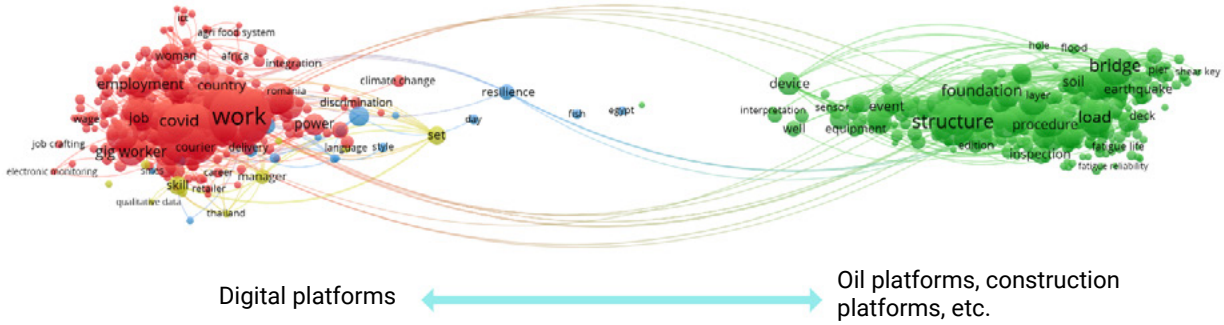



**Figure 2.** Initial literature mapping with all search results using VOSviewer.

### Digital Platform Cluster

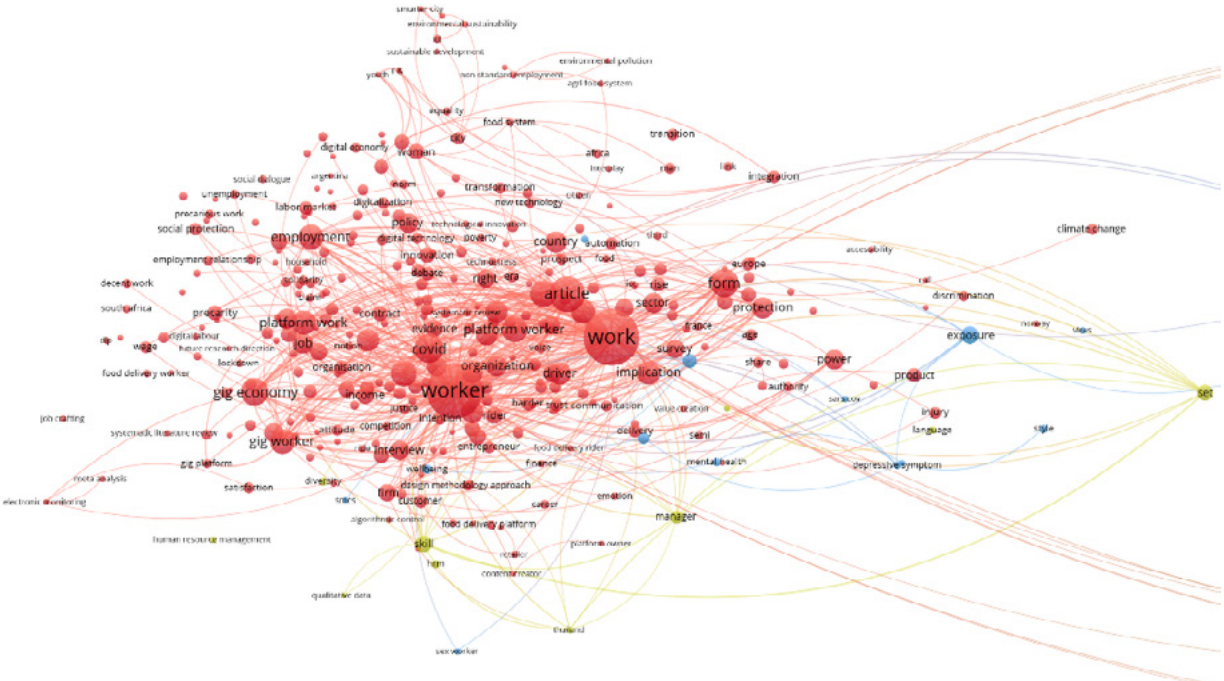



**Figure 3.** Detailed initial literature mapping

**Digital Platform Cluster**

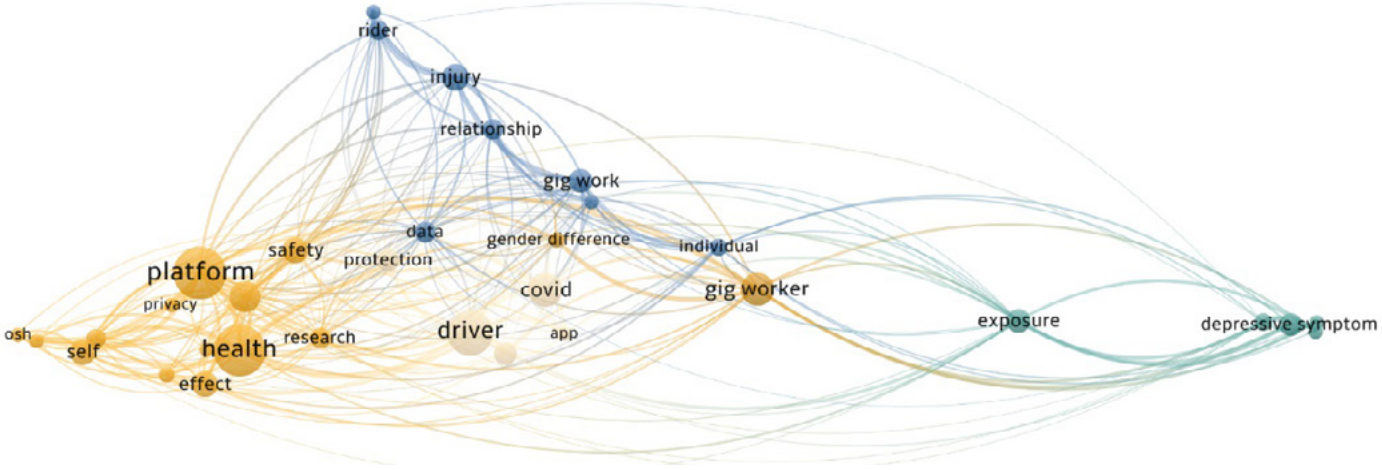



**Figure 4.** Final literature mapping using VOSviewer

## 2.1.3 Inclusion and exclusion of papers

The search yielded a total of 412 articles. These were transferred to the Parsifal programme (www.parsif.al), which was used to continue the process.

First, the tool was used to remove duplicate articles (115). Then, the title and abstract of the remaining papers (297) were read.

Each title and abstract were reviewed by two researchers, who independently assessed whether the papers were relevant to the purpose of this systematic literature review and whether they met the inclusion criteria. This process resulted in the exclusion of 239 papers.

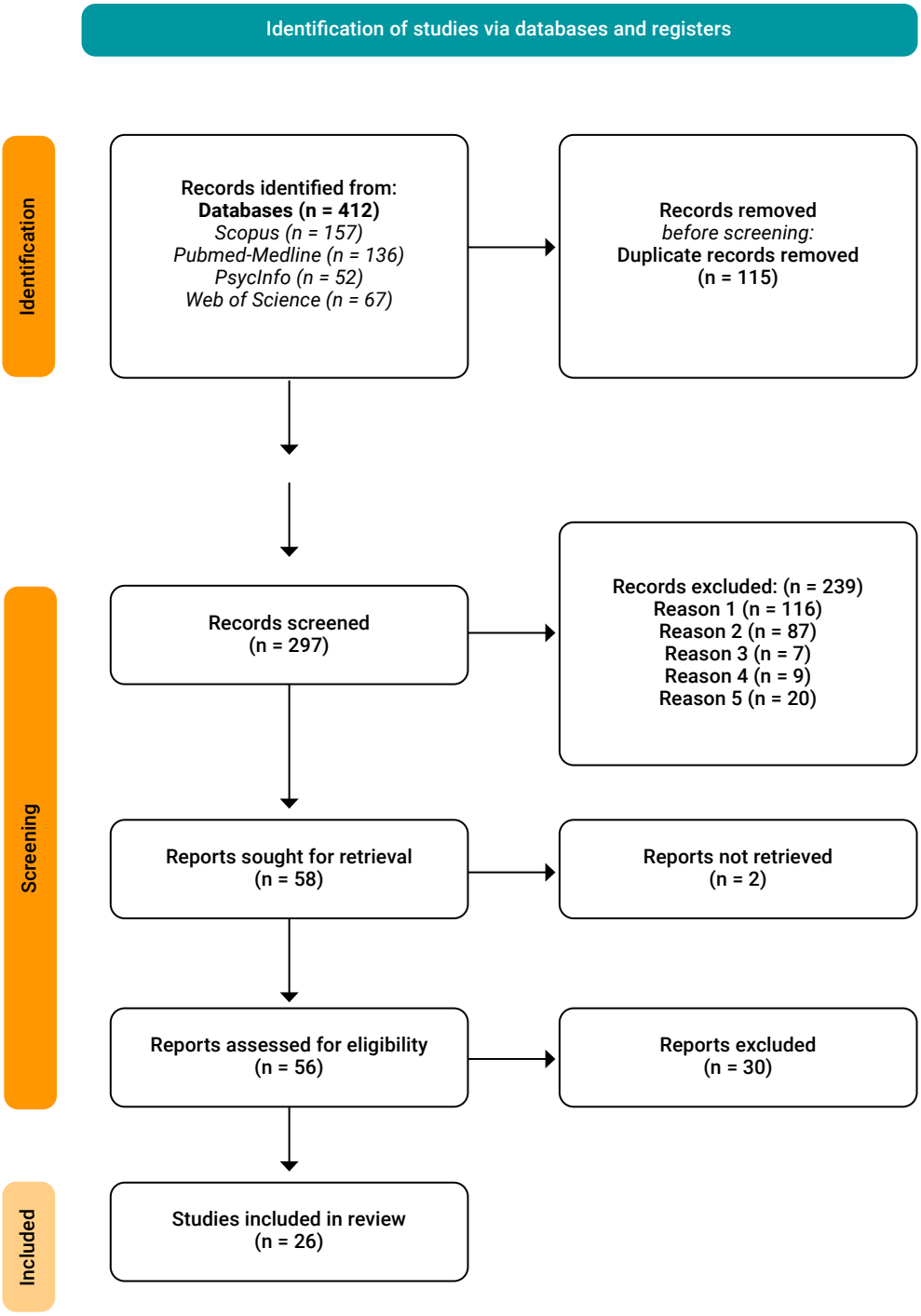
We excluded 116 papers because they did not deal directly or indirectly with occupational risks. 87 papers were excluded because they dealt with diseases and health challenges unrelated to platform workers, seven dealt with work on oil-platforms, nine papers studied platform workers but were not related to occupational risks, and the remaining 20 were excluded because they were not available in English.

The 58 papers that were not excluded were reviewed in their entirety, with the papers being read in full by two researchers, who re-evaluated them independently. At this point, two papers were excluded because the full version was not available on the internet, reducing the final figure to 56 papers, which were read in their entirety.

After reading all the papers, 26 were finally selected as meeting the inclusion criteria.

Appendix A: papers included in the Literature Review, detailing the full references of the 26 papers included.

**Table 4.** Identification of studies via databases and registers




Sourde. PRISMA 2020 Flow Diagram with authors´ data.

* The reasons for exclusion are detailed below:

- **Reason 1:** papers did not deal directly or indirectly with occupational risks or their prevention.
- **Reason 2:** papers focused on diseases and health challenges that were not related to platform workers.
- **Reason 3:** papers centred on oil-platform workers.
- **Reason 4:** papers centred on platform workers but were not related to occupational hazards.
- **Reason 5:** papers were not written in English.

A search for grey literature was conducted in the Policy Commons database on 4 June 2024. Studies were filtered by language (English). A total of 850 documents were obtained. After reading the title and abstract, 53 reports were selected.

We then proceeded to review the bibliography of the selected reports in the literature review, resulting in a further 27 reports.

Duplicate reports were then eliminated, and 78 reports were read in full, of which 36 were selected after reading.

The entire process was carried out independently by two researchers.

We found reports by searching for documents on the websites of different organisations (European Commission, EU-OSHA and ILO) and added seven documents that had not been previously located to the 36 grey literature reports selected. These additional files addressed specific points and were documents that had been cited in other articles. In short, they were deemed to be of interest in drawing up this report.

**Figure 5.** Word cloud of two terms

**Figure 6.** Word cloud of one term

### 2.1.4 Quality assessment

A preliminary assessment of the quality of the papers confirmed that the study had appeared in a reputable scientific journal with a peer-review procedure and that the article contained some kind of description of the study method used.

The quality of the studies was then assessed using the 2018 Mixed Methods Assessment Tool (MMAT) (Hong et al., 2018).

This tool was chosen because it reviews the quality of studies using different designs and methods. MMAT was ideally suited to assess quality in this case given the heterogeneity of the studies and methods used in the publications selected in this systematic review.

However, the use of other tools to assess the quality of the selected papers, such as the Downs and Black Checklist, which features in other systematic reviews (Downs & Black, 1998), was not considered appropriate because these tools are specifically designed to be used in medical studies.

The MMAT does not calculate ratings or provide overall assessments such as low, medium or high quality, yet it does provide a detailed picture of study quality. This was reviewed in two stages: First, two general questions discerned whether there were clear research questions and whether these questions could be investigated with the data available in the study. A second stage used questions specific to the study design.

The assessment of the first phase questions determined whether the study should be included or excluded on the grounds of unreliability. All studies whose quality was reviewed were considered reliable and were incorporated into the systematic literature review. The high proportion of studies included is probably due to the inclusion and exclusion criteria applied in this review, which also indirectly set certain quality requirements for the studies (e.g. peer-reviewed articles).

In the second phase, the included studies were assessed using five additional specific questions on study design, to gain greater insight into study quality.

In this phase, adapted templates were used for qualitative, quantitative and mixed-method studies. Purely doctrinal studies were not evaluated in this second phase and were considered to be of sufficient quality in the first phase.

The results of this second phase revealed that, in general, all studies were deemed to have a satisfactory level of quality. All questions were answered in the affirmative in the case of the qualitative studies. In the mixed-method studies, doubts arose as to whether divergences and inconsistencies between the qualitative and quantitative results had been adequately addressed because, in most cases, the studies did not refer to this issue, as the qualitative interviews were used to complement the quantitative analysis. The quantitative studies had not been carried out on a representative sample of the population, which reduced their overall quality.

The results of both phases are presented in Appendix B: Quality assessment results.

### 2.1.5 Analysis and synthesis

All studies that were considered to be of sufficient quality were jointly categorised by the researchers.

Many of the studies dealt with the occupational hazards of platform work, the consequences of these hazards on workers' health, and the factors to promote health and prevent occupational risks. Thus, instead of categorising the studies according to the topic they examined, we chose to extract the information from the studies for each of the sections of this report.

Each risk factor, health outcome and health-promotion factor addressed in the articles was then described and summarised by category. In other words, general thematic patterns were identified in order to contribute to a better understanding of the literature, and the aspects addressed by each of the studies were grouped together.

This gave rise to three main sections: 1) specific occupational hazards of platform work, 2) the effect of occupational hazards on platform workers' health, and 3) interventions designed to promote health and prevent occupational risks. Different occupational hazards, effects and interventions were grouped together in these sections to improve classification and understanding. It should be noted that the order in which the factors were dealt with did not reflect their relative importance.

Finally, the report concludes by mentioning the research gaps identified in the literature review.

## 2.2 Specific occupational hazards of platform work

This section outlines the main specific occupational hazards associated with platform work that were identified in the systematic literature review. It is important to note that many claims regarding the presence of specific occupational risks in platform work have been identified in the literature, but there is limited empirical evidence to support them. In other words, most of the studies found in the systematic review were observational and based on small sample sizes. Consequently, while their assertions may be logically deduced from the data, these studies lack sufficient empirical backing. We will comment on these issues further in the discussion and research gap section of this report.

### 2.2.1 Algorithmic management

Algorithmic management[2] is one of the issues most frequently highlighted by the authors as a risk factor for workers' health and safety in the context of

2 For more information about what "Algorithmic management" is and why it is relevant in the context of platform work and OSH, see Todolí, et al., 2025.

the digital platform economy[3]. There now seems to be a broad consensus that the use of algorithmic and artificial intelligence systems is one of the defining elements of digital labour platforms (EU-OSHA, 2021; Eurofound, 2018; ILO, 2024). This management model is characterised by automated task allocation, continuous performance monitoring and data-driven decision-making.

### *A) Automation, datafication and strict control*

The automation of management processes and decisions, such as task assignment and evaluation, as well as constant data collection (datafication), are the cornerstones of algorithmic management for digital labour platforms. In this context, workers' actions are all monitored and transformed into data that feed automated decisions, enabling platforms to exert unprecedented control over work processes (Cram et al., 2020; Sannon et al., 2022). For example, food delivery platforms such as those studied by Gomes de Oliveira and Roque Junges (2023) use algorithms to determine the fastest, most efficient routes, allocate orders, and monitor the time it takes each driver to complete their deliveries. This strict control is highly efficient from the platform's perspective, yet it seriously limits the autonomy of workers, who must follow algorithmic guidelines to the letter or be penalised (Cram et al., 2020; Sannon et al., 2022; Vignola et al., 2023).

This datafication of every aspect of work tends to turn workers into cogs in an automated system, where their performance is constantly compared and evaluated against algorithmic metrics (Taylor et al., 2023). Studies have shown that this can create a highly stressful work environment, where both the pressure to meet algorithmic standards and the perception of being constantly monitored significantly increase occupational safety and health risks (Cram et al., 2020; EU-OSHA, 2024; Vignola et al., 2023).

The Sannon & Cosley approach (2019) in Amazon Mechanical Turk also highlighted how datafication and automation can dehumanise work, turning work interactions into mere data exchanges that are managed and controlled without human interaction. This not only reduces autonomy but also increases the disconnection between workers and the platform, adding to feelings of alienation and stress.

The studies therefore highlight how algorithmic management generates a controlled and highly stressful occupational environment for workers. According to the authors, constant surveillance and the lack of autonomy resulting from this system can lead to significant negative consequences for workers' mental health and well-being (EU-OSHA, 2023, 2024; Rosen et al., 2022).

### *B) Gamification, rewards and penalties*

Gamification and the use of rewards and penalties are strategies that are widely used by digital platforms to motivate workers and influence their behaviour

3 For more information about the concept of algorithmic management, see Todolí, et al., 2025.

(Baiocco et al., 2022; Bérastégui, 2021; Kellogg et al., 2020). The reviewed studies point out that the use of these techniques turns work into a kind of ”game”, where workers compete to reach the goals set by the algorithm. The use of these behavioural modelling techniques can have a detrimental impact on health and safety in the working environment (EU-OSHA, 2024; Jing et al., 2023; Select Committee on Job Security, 2021; Taylor et al., 2023). For example, Mangan et al. (2023) described how delivery workers are encouraged to accept more trips in less time to earn additional bonuses, leading to work overload. The competition fostered by platforms through these strategies can lead to workers making risky choices, such as not respecting adequate rest times, speeding, as well as ignoring traffic regulations to complete more trips in the shortest possible time (Taylor et al., 2023).

Studies show that this gamification can result in a highly competitive, toxic working environment, where workers feel constant pressure to improve their performance in an uncertain market (Cram et al., 2020; Mangan et al., 2023). In this regard, Mangan et al. (2023) argued that gamification is prone to creating power structures where workers must adhere to algorithmic rules to avoid negative consequences, such as loss of access to new tasks and the deactivation of their account. The authors concluded that this reinforces workers' dependence on the system, limiting their ability to make autonomous decisions and generating higher levels of stress. Vignola et al. (2023) showed how the constant pressure to meet the goals set by the algorithm, along with the fear of possible penalties, such as being disconnected, the lack of future tasks and worse conditions, created an environment of increased stress. Conversely, Cram et al. (2020) pointed out that the use of algorithmic management to monitor working behaviour and outcomes can be positive as it provides motivational challenges to workers. However, they cautioned that certain measures, such as input controls and measures that limit productivity, can create stress and obstacles, contributing to a fiercely competitive, high-pressure environment.

In addition, the penalties for not meeting algorithmic goals, which can range from the reduction of assigned tasks to account deactivation, increase anxiety and stress. This, in turn, increases psychosocial and physical risks (Jing et al., 2023).

### *C) Ratings*

Rating systems are another tool that is widely used by digital platforms. The reviewed authors have identified these systems as a key factor in assessing the occupational safety and health risks of platform workers. Clients can rate workers' performance through these systems, and the platform takes action based on these ratings. Some authors have also pointed out that the existence of client-dependent ratings can create constant emotional pressure for workers, which can prove to be exhausting (Vignola et al., 2023).

A low rating often leads to serious consequences, such as a reduction in the number of tasks assigned, loss of access to certain platform functionalities, and deactivation of the worker's account. This leads the worker to take greater risks to avoid bad ratings (Jing et al., 2023; Moore, 2018; Vignola et al., 2023).

According to these authors, this increases the pressure on workers, who are not only forced to meet the expectations of the platform, but also the expectations of customers, often to the detriment of their own safety and well-being. They end up having to adjust their behaviour to avoid being given bad ratings (Sannon et al., 2023; Moore, 2018; Vignola et al., 2023) (Sannon et al., 2022). The need to obtain a good rating sometimes means accepting poor working conditions, unacceptable working times, and excessive workloads, which increases the risk of accidents and stress (Jing et al., 2022) (Jing et al., 2023; Moore, 2018; Sannon et al., 2022; Vignola et al., 2023).

The studies also highlighted instances of clients taking advantage of the rating systems (Moore, 2018; Select Committee on Job Security, 2021). This is compounded by a lack of transparency about how ratings work (Friedland & Balkin, 2023; Moore, 2018; Vandenbulcke, 2022; Vignola et al., 2023), and of feedback mechanisms and direct communication with the platform (Berg et al., 2018; Mpofu et al., 2020).

**Table 5.** Summary of algorithmic management

| Aspect | Description | Impact on workers' health and safety |
|---|---|---|
| **Automation, datafication and control** | - Automated task allocation and evaluation<br>- Continuous worker monitoring<br>- Data-driven decision-making | - Limits workers' autonomy.<br>- Increases stress due to constant surveillance. |
| **Gamification, rewards and penalties** | - Platforms use gamification, rewards and penalties to motivate workers and shape their behaviour.<br>- Competition is fostered through performance targets set by algorithms. | - Creates a competitive, high-pressure environment.<br>- Workers may take risks to obtain bonuses and avoid penalties.<br>- Increased stress and anxiety due to the fear of account deactivation and losing tasks. |
| **Rating systems** | - Client ratings are used to assess worker performance.<br>- Low ratings can result in fewer tasks and account deactivation. | - Constant emotional pressure to satisfy both the platform and customers.<br>- Workers may accept poor working conditions and excessive workloads to avoid bad ratings, increasing the risk of accidents and stress. |

### 2.2.2 Workload and pace of work

Another factor highlighted in the literature as an important source affecting the occupational safety and health of platform workers is the workload and the characteristics of the working day. In particular, over 20 of the studies analysed indicated that both workload and the characteristics of the working day can significantly impact workers' physical and psychological health.

***A) Work overload***

Workload can be divided into "quantitative overload" and "qualitative overload" (Bérastégui, 2021). The former refers to the total volume of tasks that a worker must complete in a given period and the intensity with which these tasks must be performed, whilst the latter refers to workers performing tasks that are beyond their abilities (Lenaerts et al., 2024). In the context of platform workers, this workload can fluctuate significantly due to the unpredictable nature of demand and the specific requirements of individual tasks (Berg et al., 2018). Major workload components include task volume, time pressure and the complexity of the assigned tasks, all of which can affect workers' physical and mental health (Lenaerts et al., 2022).

The studies indicated that platform workers are often overworked for a variety of reasons, including pay structure based on a piece rate, or task-based pay. Studies that were mainly focused on the transport and delivery sector point to the fact that workers are often forced to take on a large number of tasks to earn a reasonable income, implying they have to work long hours (Berg et al., 2018; Gomes de Oliveira & Roque Junges, 2023; Louzado-Feliciano et al., 2022). Mangan et al. (2023) reported that this is compounded by unpaid waiting times, which can account for between half and a third of their working day.

Another reason indicated by some studies is the lack of alternative employment and job security, which forces workers to accept every job that comes their way. A qualitative study of Brazilian delivery riders by Gomes de Oliveira and Roque Junges (2023) revealed that riders see their work on these platforms as their only available job option, especially in the context of high unemployment. This job insecurity leads to income insecurity which, in turn, increases the need to work and be available for many hours to guarantee a minimum income in the absence of other stable revenue (Berg et al., 2018; Garben, 2019; Eurofound, 2018; Select Committee on Job Security, 2021).

The third reason for work overload, according to the studies, is algorithmic management and automated task allocation. Algorithmic management is used to coordinate and maximise a platform's workload. As a result, workers may be assigned too many tasks or given tasks that are not in line with their skills, which leads to frustration, stress and anxiety (Lenaerts et al., 2024). In addition, this form of management can lead to work intensification, as workers come under pressure to complete tasks quickly and maintain good ratings to secure future jobs (Berg et al., 2018; Rosen et al., 2022).

### *B) Working time*

The length and characteristics of working time are two of the elements analysed in the literature that significantly affect the occupational safety and health of platform workers. Our review found that working hours in this sector are often irregular, long and unsocial (weekends, nighttime, etc.), which can have significant implications for workers' physical and mental health (Garben, 2019; Vignola et al., 2023).

A prominent feature is the lack of predictability, which leads to highly irregular working hours (Garben, 2019; Gomes de Oliveira & Roque Junges, 2023; Eurofound, 2018; Nielsen et al., 2022; Pesole, 2023; Select Committee on Job Security, 2021). In this context, studies pointed out that platform workers must be available over long periods of time to maximise their chances of receiving new orders. This may lead to a situation where workers end up extending their hours beyond what is healthy or sustainable in order to secure a sufficient income (Select Committee on Job Security, 2021; Urzì Brancati et al., 2020). For example, a study by Gomes de Oliveira and Roque Junges (2023) found that delivery workers in Brazil face unpredictable working days, with highly variable hours and earnings, which affects their ability to plan their personal lives. Similarly, a report by Urzì et al. (2020), using data from the COLLEEM survey, highlighted that flexible working hours on platforms often result in unstructured working times. This was also documented in an Australian context by the Select Committee on Job Security (2021), where platform workers reported extreme variability in their work schedules. This is exacerbated by the "always on" attitude demanded by many platforms, where workers must be constantly connected and ready to accept assignments at a moment's notice. This makes it difficult for workers to have quality time off (Pesole, 2023).

Another characteristic highlighted by some studies is the excessive length of working days (Garben, 2019; Gomes de Oliveira & Roque Junges, 2023; Jing et al., 2023; Louzado-Feliciano et al., 2022; Mpofu et al., 2020; Vignola et al., 2023). For example, Gomes de Oliveira and Roque Junges (2023) noted that delivery workers in Brazil often work up to 12 hours a day, with little or no rest, to earn an income to cover their basic needs. This phenomenon is not unique to Brazil. Studies in other contexts, such as in India (Iqubbal, 2021), indicated that delivery workers are forced to work excessive hours to compensate for low wages. Studies by Urzì Brancati et al. (2020), Hauben et al. (2020) and the Australian Senate Select Committee on Job Security (2021) indicated that this phenomenon is also present in Europe and Australia.

The literature reviewed also highlights that sometimes the working day takes place during hours that are considered unsocial, such as at night and at weekends (Berg et al., 2018; Garben, 2019; Moore, 2018; Urzì Brancati et al., 2020). The studies established that working at night or during non-standard hours not only impacts the mental health of workers, due to increased fatigue and sleep disturbances (Nielsen et al., 2022), but also increases their vulnerability to risks such as violence and harassment, especially during night shifts (Moore, 2018).

**Tabell 6.** Sammanfattning av arbetsbelastning och arbetstempo

| Aspect | Description | Impact on workers' safety and health |
|---|---|---|
| **Work overload** | - Quantitative overload: high volume of tasks and intensity of work.<br>- Qualitative overload: tasks beyond workers' skills.<br>- Caused by demand fluctuations, task-based pay, job insecurity and algorithmic management. | - Overwork leads to long hours and high pressure.<br>- Increases stress, frustration and anxiety.<br>- Pay based on task completion forces workers to take on more tasks to earn a sustainable income. |
| **Working time** | - Irregular, long working hours, often at unsocial times (nights, weekends).<br>- "Always on" expectation: workers must be available over long periods of time.<br>- Excessive working hours in some cases to compensate for low pay. | - Irregular hours cause difficulty in managing personal time and increase stress.<br>- Night and weekend work contribute to fatigue, sleep disturbances and the risk of violence and harassment, particularly during night shifts. |

### 2.2.3 Isolation

One of the elements also highlighted in the literature as a risk to occupational safety and health is the social and occupational isolationism facing digital platform workers. This phenomenon is multi-faceted and is a consequence of various dynamics inherent to the structure of platform work (EU-OSHA, 2023; Garben, 2017; Moore, 2018; Nilsen et al., 2020; Vandenbulcke, 2022; Vignola et al., 2023).

The studies reviewed highlight that platform work is sometimes characterised by a lack of personal interaction and often brings significant difficulties in sustaining a healthy work-life balance (EU-OSHA, 2023; Nilsen et al., 2022; Taylor et al., 2023). This is mainly due to factors such as working unsocial hours (Garben, 2019; Nielsen et al., 2022), the lack of shared physical spaces, and traditional work structures (Beckman et al., 2021; Nilsen et al., 2022), as well as the high turnover, competitiveness and youth of the workforce (Garben, 2019; Tran & Sokas, 2017).

Platform workers, who are often geographically dispersed and operate autonomously without direct contact with other coworkers and supervisors, lack the usual opportunities to establish social relationships in the working environment (Lane, 2020b; Lenaerts et al., 2022). The literature has pointed out that this situation is aggravated when communication is mostly through apps, chatbots and automated systems, with little or no human interaction (EU-OSHA, 2022a). Platform workers can become frustrated when they cannot contact another person, especially when they urgently need assistance, for example, due to an accident (Lenaerts et al., 2022). In this context, it has been pointed out that the lack of contact with peers and supervisors severely limits

platform workers from receiving professional support in the form of tutoring or mentoring which, according to some authors, aggravates their professional isolation, contributing to stagnation and job dissatisfaction (Lenaerts et al., 2022; Vignola et al., 2023). Finally, some of the studies reviewed also indicated that strong competition among platform workers for access to jobs increases social and professional isolationism, which is exacerbated among younger workers who lack previous experience and contacts in the working environment (Garben, 2019; Tran & Sokas, 2017).

Lack of social interaction and the resulting isolation are important risk factors for mental health. In this regard, studies have pointed to increased levels of stress, anxiety and depression among platform workers (Garben, 2019; Lenaerts et al., 2022; Vignola et al., 2023). In addition, the lack of support and supervision in the work environment means that the 'protective effect' of working with others and the ability to identify and mitigate potential risks is lost (Lenaerts et al., 2022).

### 2.2.4 Unpredictable income

Another of the most prominent factors revealed in the literature that significantly affects platform workers' health is the unpredictability and instability of income generation. The daily or weekly earnings of these workers fluctuate considerably, as a result of variable demand, competition between workers, and the characteristics of work allocation systems (Mpofu et al., 2020; Tran & Sokas, 2017). This uncertainty leads to considerable financial stress, as workers are unable to plan and secure a sufficient level of income to consistently cover their basic needs. This is particularly the case among workers who rely more heavily on income earned through the platform (Lenaerts et al., 2022; Sayre, 2022).

Although the studies do not establish a direct connection with specific mental health challenges, such as depression and anxiety, they suggest that this financial stress negatively affects workers' emotional well-being, impacts their quality of life and contributes to increased psychosocial vulnerability (Garben, 2019; Jing et al., 2023; Louzado-Feliciano et al., 2022).

The literature also points out how income instability not only affects the psychological and emotional well-being of platform workers but also has direct implications for their physical safety. In this regard, the need to maximise income in a context of constant economic uncertainty can lead to workers accepting work in adverse conditions and to work longer hours than recommended, thereby increasing the risk of fatigue and accidents (Jing et al., 2023; Lenaerts et al., 2022). The reviewed studies also pointed out that pressure to secure income in an uncertain economic environment can lead to workers neglecting to take the necessary precautions and making risky decisions, such as ignoring safety rules and not taking necessary breaks for fear of losing work opportunities (Garben, 2019; Louzado-Feliciano et al., 2022; Mpofu et al., 2020).

Moreover, the lack of a stable income may deter workers from seeking medical care when needed, which aggravates their health challenges and increases the risk of long-term health complications (Lenaerts et al., 2022).

The studies reviewed revealed that income instability negatively affects the health and safety of platform workers, both psychologically and physically (Garben, 2019; Jing et al., 2023; Mpofu et al., 2020). The literature argues that platform workers are constantly under financial stress, which is more severe when they are more dependent on platform revenues (Lenaerts et al., 2022; Sayre, 2022). This leads to adverse psychological and emotional well-being (Garben, 2017; Tran & Sokas, 2017). In addition, the need to secure sufficient income encourages workers to take greater risks, which increases the chance of accidents (Jing et al., 2023; Lenaerts et al., 2022; Mpofu et al., 2020). Finally, lack of income stability discourages workers from attending to work-related health challenges, exacerbating any issues and increasing long-term complications (Garben, 2019; Lenaerts et al., 2022).

### 2.2.5 Worker status

The literature has also pointed to how the employment status of digital platform workers has a significant impact on their occupational safety and health. In general, platforms often categorise their workers as independent contractors or self-employed individuals. However, while in some cases this categorisation may be the real situation of some workers, for many it is a misclassification (Au-Yeung et al., 2024; Eurofound, 2018; Hauben, Lenaerts, & Waeyaert, 2020; Ivanova & Sioufi, 2023; Taylor et al., 2023).

The authors have pointed out that this classification implies that the responsibility for ensuring a safe working environment rests entirely with the worker, without the support of an employer to provide training, personal protective equipment (PPE) and risk assessments, as well as limiting or preventing access to other types of social protection traditionally reserved for employees (Berg et al., 2018; Garben, 2017; Eurofound, 2018; ILO, 2022; Mangan et al., 2023; State of Victoria, 2020).

As these workers are classed as being self-employed, they must manage all their own safety concerns. This includes identifying risks, acquiring appropriate PPE, procuring training on how to use it and implementing preventive measures (Eurofound, 2018; ILO, 2019; Lenaerts et al., 2024). However, many of these workers lack the resources and knowledge to do this effectively (Gamboa, 2023; Garben, 2019; Gomes de Oliveira & Roque Junges, 2023; ILO, 2019; Lenaerts et al., 2024). The upshot of this is a lack of proper equipment, workplaces and work tools. In particular, some authors highlight the lack of ergonomic equipment, which can lead to musculoskeletal diseases (EU-OSHA, 2023; Garben, 2019; Louzado-Feliciano et al., 2022; Tran & Sokas, 2017).

The literature also indicates that the lack of an employment relationship between the worker and the platform means that there is no clear responsibility for preventing occupational risks (ILO, 2019; Lenaerts et al., 2024). This leads to the non-application of existing regulations and means the worker is not covered in terms of OSH (Cabrelli & Graveling, 2019; Crain et al., 2020; European Parliament, 2022; ILO, 2019; Louzado-Feliciano et al., 2022; Moore, 2018; Mpofu et al., 2020).

Another relevant aspect pointed out in the literature centres on deficient risk assessments, as platform workers do not always have the necessary training and skills to identify, understand and address the risks to which they may be exposed (Eurofound, 2018; ILO, 2019).

The authors also stated that as the workers are deemed to be self-employed, they are excluded from the social protection traditionally reserved for employees, such as retirement, unemployment and sickness benefits (ILO, 2019; Schmid-Drüner, 2017). In addition, they do not have paid rest breaks or holiday periods (Garben, 2019; Mangan et al., 2023).

Finally, another aspect mentioned by the studies analysed is the difficulties faced by platform workers in joining forces and taking collective action (Garben, 2019; ILO, 2022; Select Committee on Job Security, 2021). This produces a serious asymmetry in the relationship between workers and digital platforms, in favour of the latter, whilst workers tend to accept worse working conditions (ILO, 2022; Iqubbal, 2021). Moreover, self-employed workers often lack the trade union and collective bargaining rights available to employees which, combined with the lack of common spaces, high turnover, anonymity and high competitiveness (Cram et al., 2020; Vandenbulcke, 2022) exacerbates their weak position on the platform (ILO, 2022).

### 2.2.6 Workplace

The literature also points to physical work locations as one of the risk factors to be taken into account. Platform work is characterised by a wide variety of working environments.

In the study on the phenomenon of digital platforms that preceded this systematic review (Todolí et al., 2025), we established a classification of work on digital platforms based on two primary areas: whether the work is performed online or offline, and whether it requires high or low skills. This classification points to distinct work environments and locations where the activity is actually carried out, which play a decisive role in determining the presence of specific risks.

In the case of offline activities, the potential work environments are diverse and numerous, including public spaces, clients' homes, designated workplaces, third-party facilities and large-scale events, among others. These environments are generally characterised by minimal or zero control of platform workers and digital platforms. Workers often perform their tasks in public or external spaces in which they have little or no control, which means that they are more exposed to physical and psychosocial risks (Eurofound, 2018).

The literature found that platform workers who perform tasks in specific locations, such as food delivery workers, operate mainly in public spaces such as streets and roads. These environments entail exposure to traffic accidents and adverse weather conditions. In addition, they lack access to basic facilities such as toilets and shelters (Gomes de Oliveira & Roque Junges, 2023; Louzado-Feliciano et al., 2022; Mpofu et al., 2020).

Studies indicate that platform workers operating in open spaces are particularly vulnerable in adverse weather situations, such as storms, snow, ice and extreme heat. Significant pressure to perform tasks puts workers at risk (Garben, 2019; Moore, 2018) and the lack of shelters, safe places and suitable infrastructure to shelter in while waiting for orders or carrying out assignments exposes workers to additional risks such as cold and heat stress (Goodman et al., 2023; Eurofound, 2018).

Meanwhile, platform workers who perform their tasks in clients' homes (for example, in the care and housekeeping sector) are confronted with environments characterised by a lack of predictability and control. As a result, they are exposed to hazards that they cannot anticipate, where they lack the safety measures that are likely to be available in a more controlled work environment (Garben, 2019; Moore, 2018). These risks can be both physical and psychosocial. The former stem from a lack of physical control over the environment, tools and work equipment available on site, such as risks arising from exposure to chemicals, sub-optimal safety conditions and inappropriate tools and work equipment (Lenaerts et al., 2022; Nielsen et al., 2022). The psychosocial risks of working in other people's homes stem from contact with landlords and tenants, who exercise control over these spaces. This means that platform workers are exposed to abuse and harassment (Eurofound, 2018; Lenaerts et al., 2022) and to hate speech, violence, illegal content and pornography (Lane, 2020).

Finally, another of the most common workspaces for digital platform workers is their own home, especially for web-based platform workers. Although the worker's control over the environment is greater in this case, the studies consulted show that working from home also brings a number of occupational safety and health challenges (Garben, 2019; Lenaerts et al., 2022). The literature highlights that domestic spaces are often unsuitable as healthy working environments, due to poor lighting, unsuitable furniture, insufficient space, etc. which are likely to contribute to physical health challenges such as back pain and eye strain. In addition, the distinction between work and personal life can become blurred, negatively impacting the work-life balance (Lenaerts et al., 2022; Pesole, 2023). Equally, working in an isolated environment such as a worker's own home, without direct contact with clients, colleagues or supervisors, can lead to social and professional isolation, aggravating mental health challenges such as stress due to lack of social and professional support (Garben, 2019; Lenaerts et al., 2022; Pesole, 2023).

## 2.3 The effect of occupational hazards on platform workers' health

The boom in platform work has brought new occupational risks and exacerbated existing issues in various economic sectors. Although platform workers perform similar tasks to traditional employees, their working conditions bring distinct challenges. Factors such as algorithmic management, unpredictable workloads, poor ergonomic support and exposure to extreme environments contribute to

unique health risks. Additionally, the absence of standardised protection and the precarious nature of platform work often aggravate these hazards, bringing both physical and psychological consequences.

However, it is important to note that most of the studies analysed were correlational rather than experimental. As a result, causal relationships between occupational risks and adverse health outcomes have not been definitively established. Further research is necessary to clarify these causal links and to provide concrete evidence demonstrating the direct relationship between specific risks and the resulting damage. This section explores the primary health effects associated with occupational hazards faced by platform workers and acknowledges the need for more rigorous investigation to substantiate these findings.

### 2.3.1 Physical consequences

Platform workers face the same occupational risks as other workers performing the similar tasks within the same sector (Nielsen et al., 2022). However, in the case of platforms, these risks are compounded by algorithmic management, workload and work pace, isolation, unpredictability of income, work status, physical work environment and other factors described in the literature (EU-OSHA, 2022d, 2023; Lenaerts et al., 2022). The following section explores the main physical consequences of these risks according to the literature reviewed.

***A) Musculoskeletal disorders***

One of the physical effects most noted by the authors is the development of musculoskeletal disorders among platform workers. This leads to injuries and back pain that can become chronic if the necessary measures are not taken (Gomes de Oliveira & Roque Junges, 2023; Louzado-Feliciano et al., 2022; Nielsen et al., 2022).

Studies, mainly among food delivery and passenger transport workers, point to back and neck pain caused by a lack of ergonomic equipment, and to repetitive movements and long hours of sitting in the same position in a vehicle (IFAIT, 2020; Mangan et al., 2023; Nielsen et al., 2022). The lack of breaks and the pressure to complete tasks in the shortest possible time exacerbate this issue due to the constant stress and physical strain to which workers are subjected (Beckman et al., 2021; Lenaerts et al., 2022).

***B) Physical fatigue and eye strain***

Another challenge experienced by platform workers according to different studies is physical fatigue, extreme tiredness and exhaustion that reduce their ability to perform physical and mental tasks. Platform workers appear to be particularly susceptible to fatigue as a result of their long working hours and lack of sufficient rest breaks (Cox et al., 2024; Crain et al., 2020; Gomes de Oliveira & Roque Junges, 2023). Fatigue has also been linked to the irregular work schedules that are common in digital platform work, which prevent the establishment of healthy circadian rhythms and can lead to insomnia and other sleep disorders (Crain et al., 2020; Goodman et al., 2023; Nielsen et al., 2022).

Another type of fatigue related to platform workers is called eye fatigue or eye strain. This often leads to blurred vision and headaches and can be dangerous when performing activities that require sharp focus, such as driving. The studies reviewed indicate that platform workers often spend long hours without a break, performing activities that require continuous visual focus, such as driving and watching screens. In addition, they often work in environments with poor lighting, increasing the likelihood of suffering from blurred vision and headaches (EU-OSHA, 2023; Lenaerts et al., 2024; Louzado-Feliciano et al., 2022).

### *C) Cold and heat stress*

Several authors have identified heat stress as one of the potential adverse health effects for platform workers performing their tasks in open spaces.

Heat stress is the discomfort that occurs in the human body due to temperature imbalance, excessive heat accumulation or heat loss, and may seriously compromise safety and health (Goodman et al., 2023). Studies show that people who work outdoors, such as food delivery workers, for example, often work in adverse weather conditions, such as extreme heat and cold, without access to adequate shelter or the ability to take breaks in a safe environment. This not only compromises their immediate well-being, making them feel tired and overwhelmed, but also increases the risk of heat and cold-related illnesses, such as heat stroke and hypothermia (Gomes de Oliveira & Roque Junges, 2023; Goodman et al., 2023; Lenaerts et al., 2022)

### *D) Traffic accidents and physical injuries*

The literature also points to high exposure to traffic accidents as one of the most serious physical consequences for the health of platform workers engaged in passenger transport and goods deliveries. While these risks are present for all workers in the sector, regardless of whether there is a digital platform as an intermediary, this is exacerbated in the case of digital platform workers by algorithmic management, time pressure and work overload (IFAIT, 2020; Mangan et al., 2023; Mpofu et al., 2020).

Studies show that workers are exposed to road hazards ranging from collisions to road crashes that result in injury and even death (Select Committee on Job Security, 2021). Pressure from platforms to maintain high ratings and meet deadlines leads some drivers to ignore safety rules, such as complying with speed limits and traffic signs, which increases the likelihood of accidents (Garben, 2019; Lenaerts et al., 2022). In fact, some authors found links between increased economic dependence, implying a greater need to comply with platform targets and ratings and a greater likelihood of accidents (EU-OSHA, 2024; Jing et al., 2023). Some studies also noted that the lack of road safety training and PPE provided by the platform increased the risk of injury (Nielsen et al., 2022; Select Committee on Job Security, 2021).

Some studies indicated that platform workers are more likely to be injured. In a quantitative study, Morita et al. (2022) found that 27.8% of the platform workers surveyed had suffered minor injuries and 17.1% had suffered disabling

injuries, compared to 9.2% and 2.0%, respectively, for traditional employees. The authors related this difference to the inexperience of the workers and the type of tasks performed. In addition to the inexperience and youth of workers, other authors have pointed to the absence of an employment relationship that obliges the platform to deploy protective measures and reduce chronic job insecurity (Tran & Sokas, 2017).

***E) Development of diseases***

In addition to musculoskeletal diseases, some authors also found links between the activity of digital platform workers and various other disorders and diseases.

Some of the studies indicated that platform workers who suffer from chronic stress, a lack of physical activity and long working hours, are exposed to a significantly greater risk of developing coronary heart disease and hypertension. Lenaerts et al. (2022) noted that sedentary lifestyles, combined with the stress associated with continuous monitoring and pressure to meet deadlines, significantly increase the risk of developing cardiovascular disease among platform workers. Similarly, research by Beckman et al. (2021) on drivers working for companies such as Uber and Lyft highlighted that long periods of remaining seated and the unpredictable nature of the work increase the likelihood of hypertension and other heart diseases. These findings align with the perspective of the International Labour Organization, which identifies cardiovascular disease as a leading cause of work-related morbidity, exacerbated by physical inactivity and job strain (ILO, 2019).

Studies have also pinpointed digestive disorders as a consequence of the working conditions of digital platform workers, largely due to irregular working hours, lack of time and poor nutrition. They often have unbalanced diets due to poor access to healthy meals and a lack of time to eat properly, which can lead to digestive problems, disordered eating, poor nutrition, excess weight and diabetes (Crain et al., 2020; Kim et al., 2023; Louzado-Feliciano et al., 2022). In this regard, in a study of food delivery workers in India, the IFAIT (2020) found a link between working conditions and the development of liver disease and constipation. In addition, different authors pointed out that financial insecurity and chronic work stress, which are common in these jobs, contribute to the onset or exacerbation of gastrointestinal disorders (Lenaerts et al., 2022; Sayre, 2022).

No relevant information has been found in studies on respiratory diseases, although they have indicated that exposure to particulate matter and pollution in the work environment, such as in urban areas with high traffic density, is a critical factor in the development of these disorders (ILO, 2019).

Finally, studies indicated that platform workers face a significant risk of contracting infectious diseases, particularly in pandemic contexts. MacEachen et al. (2022a) noted that delivery workers on digital platforms faced an elevated risk of contracting COVID-19 due to frequent contact with different people and potentially contaminated environments. This risk is exacerbated by the lack of proper protection and the need to continue working during high exposure

situations. Louzado-Feliciano et al. (2022) highlighted the vulnerability of app-based drivers during pandemics, as they have to interact with multiple clients, which increases the risk of respiratory and infectious disease transmission.

***F) Stress-related illnesses***

Although stress is generally associated with psychological factors, it can also have a significant impact on physical health. The literature reviewed indicates that the high levels of stress experienced by platform workers, resulting from income instability, job insecurity and poor working conditions, can trigger a range of physical health challenges (Garben, 2019; Kim et al., 2023; Sayre, 2022).

These studies indicated that the chronic stress suffered by platform workers can manifest itself in a variety of physical ailments, primarily fatigue, headaches, stomach pain and eye strain (Sayre, 2022).

Huws (2016) also highlighted that individual platform workers can develop antisocial and unhealthy habits such as drug and alcohol abuse. In a normal work context, these habits would be quickly detected by coworkers and employers, yet in platform work, it is easy for them to go undetected and to escalate rapidly. High consumption of alcohol, tobacco and gutkha was also noted by IFAIT (2020) among home delivery platform workers in India.

***G) Injuries due to violence and harassment***

Platform workers also appear to be highly exposed to violence inflicted by third parties, mainly by clients or those who use services provided by location-based workers (Cox et al., 2024; EU-OSHA, 2023; ILO, 2019; Kim et al., 2023). This violence is particularly prevalent among workers in the goods delivery and passenger transport sector (Berg et al., 2018; European Parliament, 2022).

Some authors note that the risk of assault has increased in the platform economy as a result of the lack of protective structures, such as controlled workspaces, supervisors and coworkers, and public exposure (Lenaerts et al., 2024; Moore, 2018). Moreover, the need to avoid bad ratings and to accept the highest number of tasks leads workers to place themselves in dangerous situations, increasing the risk of assault and aggression (Moore, 2018; Mpofu et al., 2020). This has been noted as a major concern among food delivery workers in countries such as South Africa (Mpofu et al., 2020), Brazil (Louzado-Feliciano et al., 2022) and India (IFAIT, 2020).

In addition, in its new strategic framework for health and safety at work post-2020 (2022), the European Parliament also pointed out that platform workers, particularly those involved in transport and delivery services, are increasingly exposed to violence. In this regard, the Transport Workers' Union of Australia indicated that 17% of platform workers in inter-city goods deliveries had reported being physically assaulted in 2021, as detailed in the Australian Select Committee on Job Security (2021).

**Tabell 7.** Sammanfattning av arbetsriskernas effekt på plattformsarbetstagarnas hälsa

| Physical consequence | Description | Key findings and sources | Health impact |
|---|---|---|---|
| **Musculoskeletal disorders** | Platform workers, especially in the delivery and transport sectors, suffer from back and neck pain due to lack of ergonomic equipment and repetitive movements. | Lack of ergonomic support, repetitive movements, long hours in the same position, and insufficient breaks increase the likelihood of chronic back and neck pain. | Chronic pain, limited mobility, musculoskeletal disorders and long-term physical strain. |
| **Physical fatigue and eye strain** | Extended working hours and irregular schedules cause fatigue and eye strain, reducing workers' ability to perform tasks efficiently. | Fatigue is exacerbated by irregular schedules, long working hours, and insufficient breaks. Eye strain occurs due to prolonged visual focus on screens or whilst driving, leading to headaches and blurred vision. | Exhaustion, insomnia, headaches, blurred vision, and decreased physical and mental performance. |
| **Heat stress** | Outdoor workers, such as delivery personnel, are exposed to extreme weather conditions, which increase their risk of heat stress and other related illnesses. | Heat stress occurs in extreme weather when workers have no access to proper shelter or breaks, increasing the risk of heat stroke or hypothermia. | Heat stroke, hypothermia, fatigue and risk of long-term health issues related to exposure to extreme temperatures. |
| **Traffic accidents and physical injuries** | Platform workers involved in transport and delivery are exposed to a greater risk of traffic accidents due to time pressure and work overload. | Time pressure from algorithms and the need to meet deadlines increase the likelihood of ignoring traffic regulations, leading to accidents. Lack of safety training and protective equipment also increase the risk of injury. | Increased risk of injury or death, higher incidence of traffic accidents, especially among inexperienced and young workers. |
| **Development of diseases** | Sedentary work, poor nutrition, and long working hours increase the likelihood of heart disease, hypertension and digestive disorders. | Chronic stress, sedentary lifestyles, and lack of access to healthy meals contribute to cardiovascular diseases, hypertension and digestive problems such as constipation and liver disease. | Cardiovascular disease, hypertension, poor nutrition, digestive issues, excess weight, diabetes and increased risk of long-term health complications |
| **Stress-related illnesses** | Chronic stress from job insecurity, income instability and poor working conditions can lead to a variety of physical ailments. | Stress manifests itself as fatigue, headaches, stomach pain and eye strain. Some workers may develop unhealthy habits like substance abuse in an attempt to manage stress. | Chronic fatigue, headaches, gastrointestinal issues, and addiction-related issues (alcohol, tobacco, etc.). |
| **Injuries due to violence and harassment** | Workers, particularly those in the delivery and transport sectors, are at risk of violence from clients or third parties. | he lack of controlled workspaces and supervision exposes platform workers to a higher risk of assault, especially when under pressure to accept more tasks in unsafe conditions. | Physical injuries, mental trauma and increased risk of assault at work, particularly in high-risk environments. |

## 2.3.2 Psychological consequences

The psychological consequences of the occupational hazards faced by digital platform workers have also garnered attention in the academic literature reviewed. However, while some studies focused more directly on these issues (Cram et al., 2020; Kim et al., 2023; Moore, 2018; Taylor et al., 2023), the tendency has been to group different psychological disorders collectively, without differentiating between their specific types. Additionally, studies often lack specific data on these disorders, primarily relying on insights drawn from platform workers' personal experiences.

The studies analysed indicate that the working conditions that characterise this type of work can lead to various psychological conditions among workers, such as stress, anxiety, depression and burnout. The main psychological challenges identified are discussed below.

***A) Stress***

The papers reviewed point to stress as one of the most common psychological conditions among platform workers. This is the result of continuous exposure to stress factors such as job insecurity and unpredictability of income, algorithmic pressure, as well as isolation and lack of social support. These factors are particularly relevant to digital platform work, though they also exist in other jobs.

According to the studies consulted, the lack of a constant income, the amount paid per task, the volatility of demand and the unilateral assignment of tasks and pricing by the platform, make it difficult for workers to predict how much they will earn (Hauben, Lenaerts, & Waeyaert, 2020; Sayre, 2022; Vignola et al., 2023). This financial insecurity brings constant uncertainty to workers as they are unsure whether they will have enough work and income to be able to cover their daily needs (Beckman et al., 2021; Garben, 2017; Louzado-Feliciano et al., 2022; Vignola et al., 2023). This is exacerbated when the worker is highly dependent on the platform (Jing et al., 2023), becoming a constant source of worry and stress for the worker, who is forced to be constantly available and is unable to disconnect (Mangan et al., 2023).

Some authors also see overload and excessive work pace as stress factors (Jing et al., 2023; Vignola et al., 2023). However, in a study conducted among workers in the European Union, Eurofound (2018) indicated that the workers surveyed did not find their workload stressful, except at specific times when complications arose.

The pressure exerted through digital surveillance and algorithmic management has also been identified as another source of stress for platform workers (Lane, 2020b; Lenaerts et al., 2022; Moore, 2018). The need to maintain high ratings and meet performance standards imposes constant pressure, which becomes a major source of stress (Garben, 2017; Nielsen et al., 2022). This is often exacerbated by the opacity of rating systems (Berg et al., 2018). Other studies suggest that the difficulty of platform workers to maintain an appropriate work-life balance also constitutes a major stress factor (Kim et al., 2023; Lenaerts et al., 2022).

Finally, the literature points to isolation and the poor social support inherent to platform work as another source of stress. The lack of a support network made up of coworkers and supervisors increases stress among platform workers who cannot use social interaction or organisational support to express their concerns, seek guidance or receive help (Beckman et al., 2021; EU-OSHA, 2023; Garben, 2017; Eurofound, 2018; Lenaerts et al., 2022).

The reviewed studies point out that this creates a situation of continuous or chronic stress that impacts the individual's quality of life. This can manifest itself in numerous serious physical and mental health challenges (EU-OSHA, 2023; Lenaerts et al., 2022) and addictive behaviours (IFAIT, 2020).

***B) Anxiety***

Anxiety has been highlighted as one of the mental health challenges faced by platform workers. However, the literature reviewed has often failed to differentiate between anxiety and other illnesses such as stress and depression (European Parliament, 2022; Jing et al., 2023; Lenaerts et al., 2022; Moore, 2018).

According to the studies consulted, platform workers are susceptible to anxiety disorders for various reasons. One of the most prevalent reasons is digital surveillance and algorithmic management as this involves continuous monitoring of workers, determining their work pace and assigning tasks automatically, which has significantly reduced workers' autonomy (EU-OSHA, 2023; Sannon et al., 2022). This loss of control over their own work, combined with the pressure to meet predetermined and often opaquely assessed performance standards, contribute significantly to increased anxiety (Berg et al., 2018; EU-OSHA, 2022a; Lenaerts et al., 2022).

In addition to the loss of autonomy, Pesole (2023) found that the mere fact of being constantly observed, in what he defined as "anticipatory surveillance" (facilitated by technologies such as GPS, cameras and continuous data analysis), increases the perception of a lack of privacy and a lack of control over the work environment. This leads to a significant increase in workers' anxiety levels, and is exacerbated when the worker does not know what data are being collected, for what purpose, and by whom (Lenaerts et al., 2022).

Algorithmic management is also a key factor in increasing anxiety through the pressure to maintain high ratings and meet productivity standards (Berg et al., 2018; EU-OSHA, 2015; Lane, 2020b). Likewise, isolation and lack of social support makes workers feel lonely. They have no resources to cope with work difficulties, which increases their anxiety levels (Beckman et al., 2021; EU-OSHA, 2022a).

Other authors also pointed out that anxiety not only stems from surveillance and algorithmic management. It can also stem from the inappropriate use of technology. In the literature, some authors have defined this as "techno-anxiety", i.e. the use of technology that generates fear and apprehension in people who feel insecure or feel they lack the time to take in and remember everything related to technology and complete their tasks on time (EU-OSHA, 2022a, 2024).

Work overload has been considered a source of anxiety. In this sense, work overload can be both quantitative, due to a high volume of tasks, and qualitative, by demanding tasks that are beyond the worker's abilities. Both cases produce feelings of frustration and stress that increase the worker's levels of anxiety (Bérastégui, 2021; Lenaerts et al., 2022).

Other factors causing anxiety include the economic uncertainty resulting from job insecurity, unpredictable and unstable income (Gomes de Oliveira & Roque Junges, 2023; Sayre, 2022), the feeling that security measures at work are insufficient (Tran & Sokas, 2017) and the perception of an unequal balance of power vis-à-vis the platform (EU-OSHA, 2022a; Lenaerts et al., 2022).

***C) Depression***

According to the literature reviewed, the prevalence of symptoms related to depression in some platform work sectors is significantly higher than those symptoms found in traditional forms of employment. For example, in their study of platform workers in South Korea, Kim et al. (2023) found that these symptoms were more prevalent among platform workers compared to conventional employees (19% to 11%).

The same study pointed out how the move towards depressive states is related to exposure to various forms of violence at work. The onset of depression is much higher in workers who suffer physical and verbal aggression, harassment and humiliating treatment (Kim et al., 2023).

On the other hand, Lenaerts et al. (2024) linked the higher rate of depression among platform workers, compared to their traditional counterparts in the medical and care sector (up to 10% higher), to digital surveillance and monitoring.

Other factors that contribute to causing or aggravating the depressive states reported in the literature are the lack of a healthy environment due to the lack of social support and the feeling of isolation at work, exacerbated by algorithmic management and control, and constant competition between workers (EU-OSHA, 2022a, 2022d, 2023; Kim et al., 2023).

A poor work-life balance and the need to always be available without being able to switch off (Moore, 2018) were also reported as factors that influenced depression (Lenaerts et al., 2022).

***D) Burnout***

According to the authors reviewed, burnout is another psychological condition significantly related to platform workers, although the studies did not provide specific data about this phenomenon, nor did they distinguish between this syndrome and stress and depression (Cabrelli & Graveling, 2019; EU-OSHA, 2022d; Lenaerts et al., 2022).

The causes ascribed to burnout in the literature were algorithmic management and digital monitoring (Andjelkovic et al., 2023; Lenaerts et al., 2022), which

are associated with increased workloads and excessive work pace (EU-OSHA, 2022a; Moore, 2018; Sayre, 2022; Taylor et al., 2023). Burnout has also been related to the lack of mentors and supervisors, who play a key role in offering support and allocating resources, thereby mitigating the negative effects of job strain (Bérastégui, 2021; EU-OSHA, 2022a). Difficulties in achieving a proper work-life balance were also mentioned as being associated with burnout (Lenaerts et al., 2022).

Finally, the authors noted that workers who perceive unfair treatment in their relationship with the platform, or who lack trust in the organisation, may develop burnout (Bérastégui, 2021; Lenaerts et al., 2022).

**Tabell 8.** Sammanfattning av psykiska konsekvenser

| Psychological consequence | Description | Impact on mental health |
|---|---|---|
| **Stress** | High levels of stress due to income instability, algorithmic pressure, work overload and social isolation. | Chronic stress, increased risk of physical ailments (headaches, fatigue), anxiety and depression. |
| **Anxiety** | Anxiety caused by continuous monitoring, pressure to maintain high ratings and lack of autonomy. | Increased feelings of fear, panic and insecurity, leading to mental and physical exhaustion. |
| **Depression** | Symptoms of depression linked to job insecurity, isolation and lack of control over work conditions. | Low mood, decreased motivation, risk of self-harm and suicidal ideation |
| **Burnout** | Emotional and physical exhaustion due to excessive workload, lack of rest, and algorithmic management. | Decreased job performance, mental health deterioration and feelings of helplessness. |

### 2.3.3 Emotional impact

Negative social and emotional consequences were not extensively addressed in the literature, though various authors highlighted several related conditions that have an impact on the emotional well-being of platform workers and their social sphere.

#### *A) Emotional fatigue*

Behovet av att uppfylla arbetets krav, genom att hela tiden vara förekommande Some authors find that the need to suppress emotions in order to meet the demands of work by constantly displaying an affable, helpful attitude can lead to emotional exhaustion. This is exacerbated in the context of digital surveillance and algorithmic management (Garben, 2017; Huws, 2016; Vignola et al., 2023). In this regard, Lenaerts et al. (2022) argued that due to rating systems and their importance in task allocation, workers are instilled with a service-oriented mentality. The need to always be ready to respond to any customer request makes their work much more emotionally demanding than the work of

some of their counterparts in the traditional labour market. The precariousness and volatility of income has also been linked to the establishment of a scarcity mindset and significant emotional costs (Sayre, 2022).

***B) Low self-esteem***

The literature has also reported that platform workers are exposed to situations that favour the development of negative emotional responses that affect their self-perception. For example, low self-esteem has been linked to unhealthy competition between colleagues that favours the platforms, as well as to a lack of new technological skills (EU-OSHA, 2022a). The constant evaluation to which platform workers are subjected means they are exposed to a major erosion of self-perception and self-esteem due to excessive criticism and negative evaluations (Bérastégui, 2021; Xu et al., 2023). Moreover, when rejections and recriminations are perceived as unfair or unfounded, they produce negative emotional reactions in the worker (Fan et al., 2020).

*C) Social isolation and deterioration of working relations*

The literature has also pointed out that the absence of traditional organisational networks (coworkers, supervisors) when working on digital platforms generates social isolation and affects professional networks (Cabrelli & Graveling, 2019; EU-OSHA, 2022a; Eurofound, 2018; ILO, 2019; Vignola et al., 2023). This isolation and loneliness also affects workers' emotional well-being and has been linked to low job satisfaction and job retention, as well as implying a lack of development in terms of social skills (Lenaerts et al., 2022).

A report commissioned by EU-OSHA (2022a) emphasised that the lack of social support and communication between workers brings a lack of camaraderie and prevents the creation of close-knit communities. This leads to a lack of mentors and role models with whom to establish a consistent and strong professional identity. The same study also described a relationship between loneliness and increased systolic blood pressure, depression and the inability to make decisions or reason properly.

**Table 9.** Summary of emotional impact

| Emotional impact | Description | Effect on well-being |
|---|---|---|
| **Emotional fatigue** | Continuous emotional demands, such as maintaining a positive towards customers, and being under constant surveillance. | Exhaustion, feelings of detachment and emotional depletion. |
| **Low self-esteem** | Continuous evaluations and competition between colleagues may lead to a reduction in self-worth and confidence. | Erosion of self-esteem, increased feelings of inadequacy and frustration. |
| **Social isolation** | Lack of communication with colleagues and supervisors leads to professional and social isolation. | Loneliness, poor job satisfaction and weakened social and professional networks. |

### 2.3.4 Cognitive implications

***A) Depersonalisation and dehumanisation***

Algorithmic management can also dehumanise workers and, in the long term, force them to behave like machines or robots, reducing their cognitive and intellectual capacities, their creative and critical thinking, their lack of autonomy and independent thought (EU-OSHA, 2022a). In some cases, studies have shown that workers felt they were treated like objects (IFAIT, 2020). In this sense, automation based on algorithmic management can relegate workers' activities to simply responding to alerts and following machine-generated recommendations. This excludes workers from decision-making processes, and limits the use of their emotional and cognitive capacities (Rosen et al., 2022).

***B) Deskilling***

According to the studies, the phenomenon of deskilling, understood as the loss of professional skills, emerges as an undesirable consequence of working for digital platforms. The authors have indicated that this process manifests itself in the automation of tasks and the fragmentation of work ("unbundling of tasks"). Digital platforms tend to break down complex tasks into simple microtasks, which significantly reduces the need for workers to use advanced skills (Berg et al., 2018).

Digital platforms promote an environment in which workers are increasingly expendable in terms of complex technical skills by breaking down work into small, specific tasks. In addition to losing skills or limiting professional skill development (professional deskilling), this trend is also conducive to the emergence of what some authors term "moral deskilling" (Rosen et al., 2022). In this sense, what is eroded is the ability to make complex, ethical decisions due to increased reliance on algorithms and automated systems for decision-making (ILO & European Commission, 2021).

In addition, deskilling among digital platform workers is linked to a growing disconnect between educational training and the skills actually used in the labour market (Berg et al., 2018). This is especially relevant in contexts in which workers, despite possessing high levels of education and skills, are forced to perform routine tasks that do not reflect their level of education, displacing or substituting some forms of skilled labour with unskilled labour (Berg et al., 2018). This not only leads to the underutilisation of acquired skills, but also has psychosocial implications, such as increased stress and decreased job satisfaction (EU-OSHA, 2022a).

**Table 10.** Summary of cognitive/emotional impact

| Cognitive/emotional impact | Description | Effect on well-being |
|---|---|---|
| **Depersonalisation and dehumanisation** | Algorithmic management can make workers feel as though they are being treated as objects, reducing autonomy. | Reduced cognitive and emotional engagement, decreased critical thinking and loss of job satisfaction |
| **Deskilling** | Automation and task fragmentation reduce the need for advanced skills, leading to professional deskilling. | Loss of professional competence, reduced job satisfaction and less potential for career growth. |

## 2.4 Factors to promote health and prevent occupational hazards

The following section analyses the recommendations presented in the literature to mitigate the occupational hazards associated with platform work. The proposed solutions are the result of the examination of identified issues, grounded in logical reasoning, as well as inferences drawn from the findings of the reviewed studies. However, it is essential to emphasise that most of these recommendations lack any empirical evidence that could confirm their effectiveness.

The studies reviewed are primarily correlational or exploratory in nature, limiting any opportunity to establish direct causal links between the proposed measures and reducing occupational risks and their impact on workers' health. As a result, the recommendations presented should be viewed as preliminary insights that require validation through more rigorous and comprehensive research in the future.

This section aims to provide an overview of the main strategies identified, while highlighting the need for further investigation to evaluate their feasibility and effectiveness, ultimately contributing to the development of a more robust, evidence-based framework to protect platform workers.

### 2.4.1 Clarifying worker status

***A) Worker status***

In many cases, platform workers are classified as either self-employed or independent contractors. As a result, in many countries, they are not covered by occupational safety and health regulations or other labour rights and protection, creating potential risks at work (Bertolini, 2024).

Numerous studies have advocated that platform workers should be classified as employees, granting them access to the rights and protection afforded to this group (Crain et al., 2020; Garben, 2019; MacEachen et al., 2022b; Mangan et al., 2023; Tran & Sokas, 2017) as a way to address this issue and improve the occupational health of platform workers. In addition, several European Union policy initiatives have aimed to clarify platform workers' status to prevent the risk of bogus self-employment (Bertolini, 2024).

Classifying platform workers as employees is also a measure usually advocated by international and government actors to prevent occupational risks (Berg et al., 2018; EU-OSHA, 2023; European Parliament, 2022; Hotvedt, 2020; ILO, 2022; Ivanova & Sioufi, 2023; Kraatz, 2020; Lane, 2020b; Lenaerts et al., 2024; Schmid-Drüner, 2017; State of Victoria, 2020).

It is further suggested that a rebuttable presumption of employee status in platform work is necessary (Garben, 2019), along with a mechanism to challenge the classification (Au-Yeung et al., 2024). Many proposals have stated that the burden of proof should be reversed, requiring platforms to prove that they do not meet the criteria for employee classification (Schmid-Drüner, 2017). Countries such as Spain, with its Rider Law, and other countries such as Belgium, Greece, Malta, Portugal and Croatia have introduced reforms in order to apply the presumption of employment (ISSA, 2023).

Another proposed solution is the creation of an intermediate status between self-employment and the employed, such as "workers" in the UK and the Italian "para-subordinate" category (Au-Yeung et al., 2024; Garben, 2019; Mangan et al., 2023). Recommendations include extending the protection enjoyed by employees to these intermediate players (Au-Yeung et al., 2024; IBA Global Employment Institute, 2019; Schmid-Drüner, 2017).

However, some reports disagree with this view and are not in favour of creating a third intermediate category (Ivanova & Sioufi, 2023) as they consider that extending only part of the employment rights and benefits to platform workers creates second-tier workers and perpetuates precarity. Creating a third category would limit workers' access to rights without giving them any additional flexibility (Ivanova & Sioufi, 2023).

A third approach that has been highlighted in the literature is extending the protection of OSH regulations to workers who provide services through digital platforms, regardless of their employment status (Berg et al., 2018; EU-OSHA, 2022d; Gamboa, 2023; Garben, 2019; ILO, 2022; Ivanova & Sioufi, 2023; Mangan et al., 2023). This approach is justified by the unique social, economic and geographic status of platform workers (Gamboa, 2023). In this regard, France and Italy, for example, have made legislative changes to extend labour rights to platform workers (EU-OSHA, 2022b, 2022c). This aims to ensure that the platform bears the costs of OSH, to limit work intensity based on OSH, and to solve algorithmic management issues that encourage workers to engage in risky behaviour (Mangan et al., 2023).

Conversely, the International Bar Association (IBA) has advocated granting greater flexibility and fewer rights to general employees, reducing the benefits paid by a company in order to reduce the disincentive for platforms to hire employees and to provide minimum standards of protection (IBA Global Employment Institute, 2019). This report was also in favour of limiting protection for unfair dismissal to cases of discrimination, making it easier for platforms to dismiss workers.

The most widely supported approach in the literature is to classify platform workers as employees when they comply with the characteristics of this status. This requires setting up a test to ascertain when they are independent contractors and when they are employees (Ivanova & Sioufi, 2023). This reclassification of workers would reduce most health and safety risks in the workplace because it would mean that occupational safety and health laws were applicable to such workers. Thus, they could take collective action, demand the minimum wage and reduce unpredictable working hours and long working days (Bertolini, 2024).

***B) Responsibility for the prevention of occupational hazards***

In the literature review, the main disadvantage of being classified as self-employed was that, according to EU regulations and the regulations of many other countries, self-employed workers are responsible for their own health and safety at work and for preventing their own occupational risks.

Another factor in promoting occupational health highlighted by the authors has centred on clearly defining who is responsible for OSH in platform work (Nielsen et al., 2022), thereby increasing the responsibility of digital labour platforms in terms of occupational safety and health and involving them in reducing occupational risks (Ivanova & Sioufi, 2023; Mpofu et al., 2020; Nilsen et al., 2022). This would provide proper training for workers (Garben, 2019).

Specific measures have been proposed, such as 1) requiring the platform to indicate which tasks are psychologically stressful and damaging (Garben, 2019), 2) emphasising the fact that workers need to prioritise safety (Nilsen et al., 2022), 3) redesigning tasks to discourage risk-taking (Gamboa, 2023), 4) forcing the platform to monitor sedentary workers facing specific risks (Louzado-Feliciano et al., 2022), 5) adopting measures to protect workers from infectious diseases (Beckman et al., 2021), 6) providing them with protective equipment (e.g. safety helmets with a built-in navigation system, more stable smart vehicles) (Gamboa, 2023; Jing et al., 2023), 7) establishing mandatory minimum safety standards for compliance by platforms, such as maximum working hours and accredited training requirements for specific tasks, 8) building knowledge exchange networks on the prevention of occupational risks involving all stakeholders, including platforms and workers, and 9) generating, developing and sharing knowledge and data on the impact of digital platforms on occupational safety and health (EU-OSHA, 2022d).

These measures would force digital platforms to protect both customer and worker safety (Louzado-Feliciano et al., 2022).

Other options to promote occupational health put forward in the literature include creating specific legislation on the risks of working for platforms and the use of workplace monitoring technologies (Cabrelli & Graveling, 2019), providing occupational safety and health training for the general public (Gamboa, 2023; ILO, 2019), and educating workers about the need for protection and advancing their rights (Andjelkovic et al., 2023; EU-OSHA, 2022d).

### *C) Collective action*

The literature emphasises the need to promote collective action and worker interaction to improve the conditions of platform workers and reduce health and safety risks in the workplace (Berg et al., 2018; IBA Global Employment Institute, 2019). This would also reduce the risk of isolation and other related health challenges.

Promoting collective action among workers on digital labour platforms through trade unions or associations has been seen as desirable (Garben, 2019; Morita et al., 2022; Mpofu et al., 2020). This would require granting self-employed workers the right to form trade unions and take collective action, which is often reserved exclusively for employees (Garben, 2019; ILO, 2022; Ivanova & Sioufi, 2023). This could be achieved by adapting or interpreting existing competition laws to allow self-employed individuals to bargain collectively (Schmid-Drüner, 2017).

In a similar vein, it is perceived as beneficial for platform workers to have channels for continuous contact and information between colleagues (WhatsApp groups, Telegram, WeChat) so that they can inform each other about dangerous locations and warn and inform newcomers about best practices (Mpofu et al., 2020). Another option is for the platform to set up communication channels between workers (Andjelkovic et al., 2023).

The creation of communication channels increases relations between workers and is also an excellent way to provide information to the agencies tasked with implementing policies to better protect the health of this type of worker (Andjelkovic et al., 2023).

The creation of contact channels between workers, the existence of a common physical space and the use of uniforms to create a group identity are understood by the literature as good strategies to reduce occupational risks, i.e. greater job stability, better rates of pay and better and safer working conditions (Select Committee on Job Security, 2021), as well as reducing workers' sense of isolation (Nilsen et al., 2022).

In this regard, one of the studies pointed to communication and support between workers as a key mechanism to achieve improvements at work (Beckman et al., 2021). The authors highlighted that forms of social cohesion are seen as a solution to the challenges posed by the development of platform work because collaboration helps platform workers take collective action, defend their rights when dealing with policymakers, organise available resources, and provide legal and communication support.

Moreover, it has been estimated that enhancing communication between platform management and workers, fostering workers' sense of identity as employees, and moving away from the narrative of independent entrepreneurship promoted by platforms could help mitigate certain occupational risks (Mpofu et al., 2020; Nilsen et al., 2022).

Another collective action discussed in the literature review is the creation of individual safety-net accounts or the provision of benefits managed directly by workers (Au-Yeung et al., 2024). The authors proposed that when an independent contractor works for a digital labour platform, the platform would pay a certain amount into a worker's safety-net account based on the hours that they work for the platform, in addition to their wages. This account would pay for social protection programmes such as unemployment benefit and could also be used to cover paid sick days or holidays, or to purchase health insurance (Au-Yeung et al., 2024).

***D) Policy measures***

Finally, the authors listed a number of policy measures to improve the health and safety of platform work.

This points to the desirability of developing government policies to create health management programmes for platform workers (Kim et al., 2023), to regulate the market to prevent platform monopolies and oligopolies, as well as power imbalances between platforms and workers (Jing et al., 2023), and to cooperate globally to exchange beneficial practices and coordinate and adapt minimum standards (Garben, 2019).

Similarly, measures such as obliging workers to take out civil liability insurance have also been suggested (IBA Global Employment Institute, 2019). These include economic intervention to avoid labour market monopsonies (Kraatz, 2020; Lane, 2020b); creating mechanisms for evaluating and monitoring the implementation of worker protection policies (Andjelkovic et al., 2023), conducting studies through surveys and research on compliance with the relevant measures, and the needs of workers (Andjelkovic et al., 2023), and comparing the proposed measures across countries to assess which measures are the most effective and appropriate in each context (Andjelkovic et al., 2023).

The authors' main concerns in terms of policy action are preventing platform monopoly and encouraging cross-nation collaboration to ensure the measures are effective. For example, in the US, the platform economy has grown so rapidly that only a few labour platforms dominate the market, dictating *de facto* the terms that both providers and buyers of platform labour must follow (Gray & Suri, 2019). Moreover, it is considered conducive for similar measures to be adopted in most countries as a significant proportion of platform work is web-based (Friedland & Balkin, 2023).

### 2.4.2 Preventing work overload

The literature reviewed frequently mentioned that platform workers are overworked. This is due to several factors such as the piecework pay structure, the lack of alternative employment offering social security, which forces workers to accept all available jobs, and algorithmic management and automation in the assignment of tasks (Berg et al., 2018; Eurofound, 2018; Rosen et al., 2022).

To alleviate this work overload, the studies reviewed proposed measures such as informing workers of the risks of fatigue and sleep disturbances via apps, email or pop-up notifications (Crain et al., 2020), offering incentives for physical activity such as bonuses for those workers who go to the gym or use fitness apps, and requiring workers to take breaks and/or go for walks (Louzado-Feliciano et al., 2022).

In a similar vein, other authors have argued for the need to regulate working time (Lane, 2020) by establishing mandatory rest periods in relation to the amount, intensity and type of work performed (Gamboa, 2023). In addition to these platform-imposed measures, the literature recommends that workers be granted the right to self-manage, refuse tasks, and the right to disconnect without being penalised by the platform in any way (Bertolini, 2024).

### 2.4.3 Mitigating customer relationship risks

***A) Diseases***

The COVID-19 pandemic promoted platform work and, according to some authors, this led to platform workers being perceived as essential workers with a crucial role in society, especially helping vulnerable people and preventing them from being exposed to contagious diseases (Friedland & Balkin, 2023).

Workers on location-based platforms face greater health risks than the general public because of their constant contact with different kinds of people (Friedland & Balkin, 2023).

One approach discussed in the literature to prevent communicable diseases from spreading is to require customers to complete a health questionnaire. However, this method carries the risk of inaccurate responses and outdated information (MacEachen et al., 2022b). Other more effective measures include providing workers with protective equipment (masks and hand sanitisers) and allowing delivery workers to choose non-contact delivery. During the COVID-19 pandemic this option was only available to be chosen by customers, but not to be chosen by the platform workers (MacEachen et al., 2022b).

***B) Security***

In addition, constant contact with customers and third parties outside specific workplaces poses a risk to the health and physical integrity of platform workers, especially those engaged in location-based tasks.

The authors recommended initially mitigating these risks via a customer rating system, similar to the Turkopticon initiative,[4] which enables Amazon Mechanical Turk workers to review customers, thereby warning other colleagues of potential risks (Louzado-Feliciano et al., 2022; Mpofu et al., 2020; Sannon et al., 2022). This would provide platform workers with information about

4 Turkopticon is a website that aims to organise resources, mutual support and advocacy for the working conditions of Amazon Mechanical Turk workers. This website centralises comments and reviews on bad customers and tasks that workers can review before accepting jobs (accessible at: https://turkopticon.net/ )

previous services requested by the customer, and their behaviour, and enable them to opt out of performing services to clients with low ratings, reducing the risk to their physical safety (Louzado-Feliciano et al., 2022). Similarly, the authors also believed it would be beneficial to inform other coworkers or family members about the routes they were taking and the services provided in case they needed assistance. They also suggested installing a "panic button" in the application or device used to enable them to receive immediate assistance (Mpofu et al., 2020). The use of GPS and smartphones to track routes and identify passengers and the provision of safe areas for loading and unloading are also other measures mentioned in the literature (Gamboa, 2023; Select Committee on Job Security, 2021).

The location where workers provide services also constitutes a safety risk. In a similar vein to customer ratings, the authors proposed posting information about places where workers need to be especially careful, such as roads with poor surfaces and areas where vehicle theft is common (Nilsen et al., 2022). This would reduce risks by prohibiting or avoiding service provision in such areas (Louzado-Feliciano et al., 2022; Mpofu et al., 2020).

Finally, in countries where assaults on platform workers are frequent, the literature has mentioned that carrying weapons or pepper spray in the car and being compliant and submissive to the assailant to prevent their anger and irascibility mitigates safety risks. Not wearing a seatbelt is also mentioned as a way of preventing risks because it avoids restriction of movement and facilitates quicker action in the event of a threat (Mpofu et al., 2020).[5]

### 2.4.4 Reducing reputational risks

The authors pointed out that the vast majority of digital platforms use rating systems in which customers rate workers and the platform takes action based on these ratings (Vignola et al., 2023). For example, a low rating can lead to a reduction in the number of tasks assigned, the loss of access to certain platform functionalities, and even the deactivation of the worker's account (Jing et al., 2023; Moore, 2018).

The literature has highlighted that this situation leads workers to accept poor working conditions, unsustainable work pace and excessive workloads, etc. (Jing et al., 2023; Moore, 2018; Sannon et al., 2022; Vignola et al., 2023). The authors also pointed out that customer abuse of rating systems sometimes occurs (Moore, 2018; Select Committee on Job Security, 2021). This is aggravated by a lack of transparency about how ratings work (Friedland & Balkin, 2023; Lenaerts et al., 2022; Moore, 2018; Vignola et al., 2023), about feedback mechanisms and about direct communication with the platform (Berg et al., 2018; Mpofu et al., 2020).

5 This study was conducted in South Africa by asking drivers what measures they used to protect themselves. It was found that, as a personal protective measure, drivers avoided wearing their seat belts at night to prevent the seat belt from hindering their movements, so that they could turn around easily or exit the vehicle quickly in the event of a threat.

The literature suggested that it is essential to encourage accountability and reflective feedback from clients, while also managing the power balance between workers and clients to mitigate reputational risks such as the negative impact of poor ratings (Jing et al., 2023; Lenaerts et al., 2022).

Specific measures have been suggested to achieve this goal, such as 1) morally committing customers to responsible and reflective appraisal, 2) warning customers about the implications of writing a negative appraisal for a worker before sending it, 3) enabling customers to reward workers who perform better services through the platform, and 4) valuing and encouraging socially responsible choices such as performing the task in a green vehicle (Jing et al., 2023). The literature also recommends recording promised tips and ensuring their fulfilment, especially in light of workers' complaints that tips paid by clients through the app were not received. This measure would allow workers to verify tip payments, enhance transparency, and help rebalance the power relationship (Jing et al., 2023).

Similarly, client ratings of workers can impact their self-perception. Thus, one way of mitigating the negative health consequences of ratings would be to allow workers to participate in the assessment process (Friedland & Balkin, 2023).

Another option to ensure the correct performance and assessment of clients and to avoid unjustified complaints is the option of self-monitoring. This means workers constantly making a record of their work, so they can defend themselves against client demands (Sannon et al., 2022).

### 2.4.5 Reducing economic risks

Many platform workers are paid on a piece-rate basis, i.e. per task performed. This type of payment is generally low, forcing workers to work faster during a long working day, always be available and take more risks by increasing their speed to ensure a minimum income (Bertolini, 2024).

To alleviate this situation, the literature reviewed proposes several options. First, the minimum wage applicable to the worker's location should be mandatory to ensure platform workers receive a minimum income (Berg et al., 2018; Garben, 2019; Ivanova & Sioufi, 2023; Lane, 2020b). Other authors argued that the main source of income cannot be volatile, i.e. not all income can come from piecework wages (Ivanova & Sioufi, 2023; Sayre, 2022), or there must be a guaranteed fixed payment, at least during off-peak shifts, when a minimum number of orders is usually not met (Nilsen et al., 2022).

Second, part of the literature reviewed has argued that the platform should bear the cost of the activity and should therefore be responsible for any fines (Mpofu et al., 2020), pay for accident insurance (Garben, 2019; Jing et al., 2023; Nilsen et al., 2022) and cover the non-payment by customers (Mpofu et al., 2020). In this regard, where non-payment by customers is common, proposals include demanding payment prior to service provision or confiscating the belongings of clients who do not pay for a ride (Mpofu et al., 2020). In addition, it is argued that the platform should compensate workers for any work-related expenses they incur when they do not directly bear the costs of the activity (Ivanova & Sioufi, 2023).

In parallel to these solutions, the authors also proposed collective ways to mitigate the risks of low income stemming from platform work, such as groups of workers that share tasks and income equally (Fan et al., 2020), creating common financial pools of support among workers for contingencies, necessities, purchasing fleet vehicles, etc. (Mpofu et al., 2020) and maintaining communications and informing other workers about clients and defaults (Mpofu et al., 2020). For communication between workers to be effective in reducing economic risks, the cost of refusing tasks cannot be borne by the workers themselves (Berg et al., 2018).

The authors also stressed that increased transparency of earnings would be desirable, i.e. that workers are regularly informed about the hours they have worked and the wages they have received for the tasks performed, including everything that contributes to their wages, and that any deductions and the reason for such deductions are specified (Ivanova & Sioufi, 2023).

Finally, the volatility of income and piecework pay means that it is difficult for workers to generate income if there are unforeseen events that prevent them from working. In this scenario, the authors considered that the platform should compensate for losses or temporary sick leave and cover the worker's medical expenses, either directly or by taking out insurance to reduce and prevent the worker from experiencing financial hardship. Moreover, these periods of inactivity due to unexpected events or circumstances beyond a worker's control should not penalise them in terms of future job tasks (Gamboa, 2023).

### 2.4.6 Improving algorithmic management and transparency

Algorithmic management is characterised by the automation of task allocation, continuous performance monitoring and data-driven decision-making. There is broad consensus that the use of algorithmic and artificial intelligence systems is one of the defining elements of digital labour platforms and that this form of management is a risk factor for the health and safety of platform workers (EU-OSHA, 2021; Eurofound, 2018; ILO, 2024).

Few authors in the literature reviewed have analysed ways to reduce the occupational safety and health risks caused by algorithmic management and lack of transparency. However, it is an issue that is widely discussed in the grey literature.

Friedland & Balkin (2023) pointed out that greater transparency in the way workers are valued and in the distribution of rewards and tasks would help to reduce health risks. In a similar vein, Cram et al. (2020) advocated improving entry controls to working on platforms, because they hinder worker productivity, and on behaviour and exit, because they are challenging and generate technostress. They suggested that entry controls could be replaced by badges or bonuses for continued compliance with platform entry criteria, and behavioural and exit controls could be developed in ways that positively challenge and motivate workers.

On the other hand, authors such as Hauben et al. (2020) argued that it should be mandatory to have a "human in control" to reduce the risk factors associated

with algorithmic management. In other words, decisions should be taken by a person using the data collected by the algorithm.

Many of the authors argued that the transparency of algorithmic governance needs to be increased (Berg et al., 2018; EU-OSHA, 2023; Gamboa, 2023; Ivanova & Sioufi, 2023; Lenaerts et al., 2024) and uncertainty and imbalance in the information received has to be reduced (Berg et al., 2018). This can be achieved by ensuring that workers are heard and addressed by the platform, increasing data traceability and imposing reporting and data-sharing obligations (EU-OSHA, 2023). Workers can be protected against arbitrary disconnection and penalisation by the platform by forcing the platform to justify the disconnection in writing, giving workers the right to appeal the platform's decision, and treating these conflicts as labour disputes, so that the worker is compensated for unfair or unjust disconnection or suspension without cause, including unemployment compensation (Ivanova & Sioufi, 2023).

On the other hand, the literature reviewed has highlighted that these new forms of monitoring and management are also opportunities to implement occupational safety and health. Data can be used to reduce psychosocial and harassment risks, provide personalised advice on how to prevent risks in real time, and enable accurate and timely risk analysis, advanced workplace risk assessments and targeted safety and health inspections (ILO & European Commission, 2021).

For algorithmic management to be an opportunity rather than a risk to health in the workplace, prevention should be user-centred, and risk assessments of algorithmic management should not be delegated to technology. Instead, technology needs to become a tool at the service of the people in charge rather than replacing them. In addition, minimising data collection, increasing transparency and equal access to information, as well as increasing data protection awareness and training for all parties is seen as positive (ILO & European Commission, 2021).

In addition, new methods of digital management potentially lead to risky behaviour on the part of workers, due to the constant monitoring and surveillance to which they are subjected (Moore, 2018). The feeling that their every move is being watched and assessed leads workers to perform tasks faster and work harder, with the health and safety hazards that this entails. Yet, remote work, in particular teleworking, has also been seen to reduce the effects of both surveillance and algorithmic management practices on psychosocial risk (Lane, 2020b; Moore, 2018).

EU-OSHA has made a number of recommendations to mitigate these occupational hazards, including 1) incorporating OSH considerations in the early stages of the development and implementation of AI-based systems, 2) implementing decision- support systems that improve communication and cooperation in teams, and structuring the work process and mitigating stress related to lack of effective communication, 3) addressing cybersecurity at organisational and legislative levels to protect personal data and ensure OSH when using AI-based systems 4) integrating security measures from the design

stage to prevent cyber-attacks, 5) developing and using appropriate tools for specific risk assessment of AI-based systems, 6) ensuring transparency on what data are collected by AI-based systems, and 7) providing continuous training and education for workers, focusing on reskilling and upskilling to adapt to new technologies (Rosen et al., 2022).

### 2.4.7 Preventing accidents

In addition to training workers, providing suitable protective equipment and other protective measures derived from changing the worker's status and making the platform responsible for occupational hazards, the Occupational Safety and Health Administration and the National Institute for Occupational Safety and Health of Japan have made a number of recommendations, as reported by authors such as Morita et al. (2022), in order to prevent accidents at work. These consist of 1) assessing the workplace at which services are to be provided, 2) training workers to recognise safety and health hazards, 3) ensuring that an employer meets or exceeds the standards of other employers, 4) assigning OSH responsibilities and defining the scope of work in the contract and, 5) tracking injuries and illnesses.

### 2.4.8 Ensuring privacy

The risks to workers' privacy on platforms have also been analysed in the literature, especially with regard to microtasks, by conducting surveys that may affect the personal or private sphere of the workers who completed them.

The authors point out that workers are often reluctant to provide their personal details when completing surveys and sometimes lie to preserve their privacy. This is detrimental to workers. Completing multiple surveys for the same client may alert the client to the repetition and lead to the worker not being paid for the task. They also waste time selecting tasks that do not violate their privacy. In addition, clients who complete surveys about platform workers are also at a disadvantage as there is no guarantee that the answers are truthful or reliable.

The constant exposure of personal data, tracking of work patterns, and fear of surveillance contribute to increased stress, anxiety and mental exhaustion (Galvin et al. 2024). The inability of workers to control their own personal information can create a sense of helplessness, negatively impacting their well-being. Moreover, the risk of personal data being misused, including cases of harassment or retaliation based on the collected information, poses a direct threat to workers' security in digital labour environments.

The literature reviewed proposes training new platform workers on privacy and how to protect it so that they do not feel the need to seek advice from other workers in order to mitigate privacy risks (Sannon et al., 2022). Also, platforms must ensure they can prevent security breaches that expose workers' data. Clients should also verify that they meet security standards for storing the data requested (Sannon & Cosley, 2019). In this regard, the authors also proposed establishing a rating system for clients and for workers to warn other workers about privacy breaches (Sannon et al., 2022).

If workers do not wish to share their data, the authors suggested creating a separate virtual identity for each task they perform (Sannon & Cosley, 2019). Sometimes, minimal data are required but, as workers would have a single virtual identity, clients could track their performance or request different data through multiple tasks so that they receive comprehensive personal data about each worker (Sannon & Cosley, 2019). In the same vein, information about privacy violations and the need to provide personal data should be highlighted in each task to prevent the need to search for tasks that do not require the inclusion of personal data.

### 2.4.9 Measures taken by different countries

Throughout the analysis of the reviewed literature, some authors have highlighted how different countries have contributed solutions aimed at mitigating health and safety risks for platform workers. As these solutions may be useful for other stakeholders who deem their implementation appropriate, or for future research seeking to evaluate their effectiveness, some of these initiatives are outlined below.

Policymakers have also taken measures to reduce the risk factors for platform workers. In this regard, the literature reviewed suggests that governments must ensure that all workers, regardless of their type of contract or employment status, have access to a comprehensive range of rights and protections. In addition, it is crucial to ensure a level playing field for all companies, preventing platform operators from gaining competitive advantages by evading their obligations and responsibilities (Lane, 2020).

In this regard, for example, the UK has seen an increase in penalties and public exposure for those companies that are in breach of the rules with bogus self-employed contracts, and a third category of "limb-b workers" has been created (Lane, 2020). In Portugal, administrative simplification has taken place to enhance the correct classification of workers, and the presumption of employment of platform workers has been established. In Spain, Belgium, Greece, Malta and Croatia, measures have been adopted, such as reversing the burden of proof of employment (Bertolini, 2024).

In terms of the classification of platform workers, Italy, Austria, Norway and Portugal all use an intermediate category between employees and self-employed workers. Elsewhere, such as in Chile, two categories of people working for digital labour platforms have been created: dependent digital platform workers and independent digital platform workers (Bertolini, 2024).

In Italy and France, certain labour rights enjoyed by employees have been extended to platform workers (Lane, 2020). Nordic countries such as Denmark, Finland, Iceland and Sweden include extensive social security coverage regardless of the employment status of the individual, as is the case in Croatia, Hungary, Luxembourg and Slovenia (Bertolini, 2024).

In terms of other rights, France guarantees the right to refuse work and to disconnect and has also established the liability of certain platforms regardless

of workers' status. Workers on these platforms can also form associations and bargain collectively and have the right to training, accident insurance and sickness benefits (EU-OSHA, 2022d). Collective bargaining agreements in Italy and Denmark have established minimum wages for certain platform workers, and platforms in Italy are obliged to provide training and safety equipment free of charge (Bertolini, 2024). Similarly, in France, platform workers must be reimbursed by the platform for the training they undertake and for the professional certificates they are required to obtain (Bertolini, 2024).

**Table 11.** Summary of risk factors, proposed measures and health benefits.

| Factor/risk | Description | Proposed measures | Health and safety benefits |
|---|---|---|---|
| **Worker status** | Platform workers are often classified as self-employed or independent contractors, limiting their access to occupational safety protection and labour rights. | Classify platform workers as employees or create an intermediate category to ensure labour rights and protection. | Access to labour rights, occupational safety coverage, reduced risks and improved social security benefits. |
| **Platform responsibility for preventing risks** | Self-employed workers are responsible for their own safety, increasing occupational risks and the lack of preventive measures. | Shift the responsibility for OSH to platforms, requiring them to provide protective equipment, training and preventive measures. | Improved protection against accidents and occupational diseases, enhanced safety when performing tasks, and reduced exposure to risks. |
| **Collective action** | Platform workers lack the right to unionise and take collective action, which increases isolation and compounds precarious working conditions. | Grant platform workers the right to form unions, take collective action and facilitate communication among workers through digital platforms or messaging groups. | Less isolation, improved labour representation and enhanced emotional and physical safety in the workplace. |
| **Work overload** | Platform workers face excessive workloads due to task-based payment, lack of alternative employment, and algorithmic management that intensifies labour demands. | Establish mandatory rest periods, regulate working hours and allow workers to reject tasks without being penalised. | Prevention of fatigue, reduced risk of accidents due to overwork, and improved work-life balance. |
| **Algorithmic management and transparency** | Task assignment and performance evaluation are based on opaque algorithms that generate uncertainty, stress and technostress. | Increase transparency in the use of algorithms, ensure human control in decisionmaking, and provide workers with clear information on how they are evalu-ated and how tasks are assigned to them. | Reduced stress and anxiety, increased control of work, and mitigation of technostress caused by algorithmic management. |
| **Exposure to contagious diseases** | Workers who perform delivery and transportation tasks face a higher risk of contracting diseases due to constant contact with clients, especially in pandemic contexts. | Provide PPE, such as masks and hand sanitisers and allow for non-contact delive-ry options. | Reduced risk of disease transmission, and enhanced safety during interactions with clients, especially during high diseasetransmission periods. |

| Factor/risk | Description | Proposed measures | Health and safety benefits |
|---|---|---|---|
| **Security risks from client interactions** | Workers in direct contact with clients may be exposed to violence or harassment, especially when working in unsafe or unknown areas. | Implement client rating systems, use GPS tracking and panic buttons in apps for emergency assistance, and notify family or coworkers about work routes. | wer assaults and less violence, improved workplace safety, and reduced risk of working in dangerous areas. |
| **Reputational risks from rating systems** | Client rating systems can pressurise workers into accepting unfavourable working conditions to avoid poor ratings that affect job opportunities. | Establish transparency in the rating system, allow workers to participate in performance evaluation, and make clients aware of the impact of their ratings before confirming them. | Improved perception of fairness in the rating system, less pressure to accept unsafe tasks, and lower risk of unjustified poor ratings. |
| **Economic risks** | Workers who are paid per task often have to work faster and longer hours to ensure a minimum income, leading to financial insecurity and work overload. | Apply the minimum wage in force in the worker's location, ensure compensation for activity-related expenses, and offer fixed payments during low-demand shifts to stabilise income. | Less economic insecurity, improved quality of life. Reduced work overload and less physical and mental exhaustion as a result of having to work more hours. |
| **Provision of PPE** | Workers performing manual tasks, such as delivery and transportation, lack adequate protective equipment, increasing the risk of injury. | Provide safety helmets, gloves, masks and other appropriate protective equipment, along with training in their proper use. | Lower risk of injuries, occupational diseases and exposure to environmental, chemical and traffic-related hazards. |
| **Lack of rest breaks** | Platform workers, especially those performing manual or long-duration tasks, suffer from fatigue and physical exhaustion due to a lack of adequate breaks. | Establish mandatory rest periods throughout the working day, based on the intensity and duration of the work. | Prevention of fatiguerelated accidents, improved physical and mental well-being, and a guarantee that workers maintain healthy productivity without compromising their health. |
| **Workplace safety** | Platform workers often operate in uncontrolled and unsafe locations, increasing the risk of accidents and assaults. | Provide information about dangerous locations, allow workers to avoid certain areas, and provide safe loading and unloading areas to avoid hazardous-situations. | proved personal safe-ty, reduced exposure to assaults and greater predictability about work-place hazards. |
| **Lack of training** | Many platform workers lack proper training on how to recognise and mitigate occupational risks associated with their job. | Implement mandatory training programmes on occupational safety and health, recognising associated risks, and promoting safe practices. | Increased awareness of risks, greater ability to prevent accidents and improved overall workplace safety. |
| **Algorithms and decision-making** | The lack of human control in algorithmic management reduces workers' autonomy and increases pressure and work-related stress. | Ensure that important decisions related to workers (disconnections, penalties) are made by humans, and increase transparency about how algorithms assign tasks and evaluate performance. | Less stress related to automation, greater fairness and predictability in decision-making, and increased control of the work environment. |

# 3. Discussion

The objective of this study is to identify the risks, potential consequences for workers' health, and opportunities for improvement in occupational safety and health arising from work on digital platforms.

## 3.1 Specific risk factors

First, **algorithmic management** is one of the issues most frequently highlighted by the authors as a risk factor for workers' health and safety in the context of the digital platform economy. This management model is characterised by automated task allocation, continuous performance monitoring and data-driven decision-making. The literature highlights that every action carried out by workers is monitored and transformed into data that feed automated decisions, enabling platforms to exert unprecedented control over the work process. This intensive control, although efficient from the platform's perspective, severely limits workers' autonomy, as they must follow algorithmic guidelines to the letter under threat of being penalised. The observed studies have shown that this can create a highly stressful work environment, where the pressure to meet algorithmic standards and the perception of being constantly controlled significantly increases health and safety risks.

Second, **gamification and the use of rewards** and penalties are strategies widely used by digital platforms to motivate workers and influence their behaviour. The literature argues that the use of behavioural modelling techniques can have a detrimental effect on occupational safety and health. Studies show that such gamification can result in a highly competitive and often toxic work environment, where workers feel constant pressure to improve their performance in an uncertain market.

Third, **rating systems are another risk factor.** The rating systems allow clients to rate the performance of workers and enable the platform to react accordingly. Some authors have also pointed out that client-dependent ratings are likely to create an environment in which workers are subjected to constant emotional pressure that can be exhausting. A low rating often leads to serious consequences, such as a reduction in the number of tasks assigned, loss of access to certain platform functionalities and even deactivation of the worker's account. This leads to workers taking greater risks to avoid bad ratings.

Fourth, over 20 of the studies analysed indicated that **the workload** taken on by workers, as well as the length and characteristics of their working day, have significant implications for their physical and psychological health. The identified causes are a pay structure based on piece rates, job and income insecurity, and algorithmic management. All of these suggest that platform workers do not have control over their workload and the intensity of their work.

Fifth, the studies reviewed indicated that **working hours** in this sector are often irregular, long and unsocial, which can have significant implications for workers' physical and mental health. Another prominent feature is the lack of predictability in working hours, which leads to highly irregular working times. In this context, studies have pointed out that platform workers must be available for long periods to maximise their chances of receiving new assignments.

Sixth, the studies have stated that platform work is sometimes characterised by a lack of personal interaction (isolation), a lack of social support, and often entails significant difficulties in sustaining a healthy work-life balance, which can lead to stress. This is mainly due to factors such as unsocial hours, the lack of shared physical spaces, traditional work structures, as well as the high turnover, competitiveness and youth of the workforce. This primarily occurs when communication systems are online, especially affecting young workers with limited prior experience in how a workplace should operate.

Seventh, the **economic uncertainty** resulting from platform work can lead to workers accepting work in adverse conditions and to working longer hours than recommended, which increases the risk of fatigue and accidents. The reviewed studies have also pointed out that pressure to secure an income in an uncertain economic environment can lead to workers neglecting to take the necessary precautions and make risky decisions, such as ignoring safety rules and not taking necessary breaks for fear of losing work opportunities.

Eighth, the **independent contractor misclassification** pertaining to most platform workers implies that the responsibility for ensuring a safe working environment rests entirely with the worker, without the support of an employer to provide training, PPE and risk assessments. It also limits or prevents access to other kinds of social protection traditionally reserved for employees. This leads to the non-application of existing regulations and a lack of legal coverage for workers in terms of OSH.

Ninth, platform work is characterised by a wide variety of **working environments.** The authors indicated that platform workers who perform tasks in specific locations, such as food delivery workers, mainly operate in public spaces such as streets and roads. These environments entail exposure to traffic accidents and adverse weather condition such as storms, snow, ice and extreme heat. The lack of shelter, safe places and adequate infrastructure while waiting for orders or carrying out assignments exposes workers to additional risks such as cold and heat stress. Additionally, the most common workspace for digital platform workers is their own home, especially for web-based platform workers.

The risk factors identified in the literature reviewed in this study reflect significant concerns. However, persistent gaps in the research limit a comprehensive understanding of the phenomenon. The majority of existing studies devote little or no attention to regions beyond the so-called "Western" countries, thereby neglecting the specific characteristics of contexts in which platform work is expanding and unique risk factors may emerge. Furthermore, the scope of research has tended to predominantly focus on drivers and delivery

workers, disregarding the broader and more diverse nature of digital platform work, which represents a complex and multifaceted reality that is often overlooked.

## 3.2 Health effects

In this paper, we have compiled insights into the most common health effects associated with the risk factors discussed. We believe this list of symptoms and causes will be valuable for medical professionals, occupational safety and health specialists, workers, and those responsible for overseeing the health of platform workers, helping to facilitate early detection and the implementation of improved protective measures to safeguard their well-being.

The main symptoms highlighted in the literature are **musculoskeletal disorders** such as back and neck pain, chronic injuries due to repetitive movements and prolonged poor posture, **physical fatigue** due to long working hours and insufficient breaks, **eye strain** including blurred vision and headaches from prolonged visual activities in poor lighting conditions, **heat stress** including heatstroke from high temperatures, **cold stress** such as hypothermia from extreme cold, **traffic accidents** leading to injuries and fatalities, **cardiovascular diseases** such as hypertension and coronary heart disease caused by stress and physical inactivity, **digestive disorders** including poor nutrition, constipation and liver disease due to irregular schedules and unhealthy diets, **infectious diseases** such as COVID-19 due to high exposure and insufficient protection, and respiratory diseases related to exposure to pollution and particulate matter in dense urban environments.

The main stress-related symptoms that are useful for detecting and preventing this phenomenon are **fatigue** due to chronic stress, **headaches** linked to high stress levels, **stomach pain** caused by stress-related factors, **eye strain** from prolonged visual tasks, **antisocial habits** such as excessive use of drugs, alcohol, tobacco and gutkha, **injuries from violence** inflicted by third parties such as clients and users, **physical assaults** experienced by delivery and transport workers, and **a higher risk of aggression** due to lack of protective structures and exposure to dangerous situations.

**The main psychological symptoms** derived from the occupational hazards of digital platform work are stress due to job insecurity, income unpredictability, algorithmic pressure, isolation and poor work-life balance, **anxiety** caused by digital surveillance, algorithmic management, work overload and economic insecurity, **depression** linked to exposure to violence, lack of social support, isolation and poor work-life balance, as well as **burnout** stemming from excessive workloads, algorithmic management, lack of mentoring, as well as a perception of unfair treatment by the platform.

The primary emotional symptoms and social consequences identified are **emotional fatigue** from the constant need to suppress emotions and maintain an affable attitude, **low self-esteem** due to unhealthy competition, lack of

technological skills, and constant evaluations, **social isolation** caused by the absence of traditional professional networks, the **deterioration of working relationships** linked to a lack of social support and mentorship, and **negative emotional responses** resulting from the perception of unfair criticism and rejection.

The key cognitive implications are **depersonalisation and dehumanisation**, reducing autonomy, creative and critical thinking, and decision-making, and **deskilling**, involving the loss of professional and moral skills due to task automation, fragmentation and underutilisation of workers' qualifications.

However, although the reviewed literature identifies a wide range of adverse health effects faced by digital platform workers, it is important to acknowledge certain limitations within the studies examined. Most of the studies rely on correlational data which, while valuable for identifying associations, fail to establish direct causal links between risk factors and health outcomes. This raises concerns regarding the robustness and generalisability of the findings. Additionally, there are significant gaps in longitudinal research that could track the progress of these health issues over time, which is understandable given the relatively recent emergence of this phenomenon. Furthermore, there is a lack of intersectional analysis that accounts for how factors such as age, gender and socio-economic status may exacerbate or mitigate these risks. Addressing these deficiencies through more rigorous methodologies and diverse study populations will be essential to developing a clearer and more practical understanding of the real impact of platform work on health.

## 3.3 Health promotion measures

This study has identified and compiled the various measures recommended in the literature to improve and promote the health of platform workers. These recommendations aim to provide OSH specialists, policymakers and social partners with actionable strategies to reduce occupational risks and enhance the overall well-being of platform workers. This research seeks to contribute to the development of more effective health and safety policies tailored to this growing workforce by addressing the unique challenges faced in platform work environments.

Most of the literature indicates that the best way to reduce risks for platform workers is to **ensure they are classified as employees** rather than as self-employed individuals. It is understood that issues such as unpredictability of working hours, excessive workloads, income uncertainty, job instability and the lack of collective representation and specifically, as well as the lack of application of OSH laws, can largely be addressed by guaranteeing worker classification. For this reason, the literature recommends establishing **a presumption of employment.**

It should be noted that this approach aligns with the Platform Work Directive[6] approved by the European Union, which requires transposition into national laws by December 2026 in Sweden and other EU member states.

The literature also outlines alternative measures as a subsidiary approach. While guaranteeing employment status is prioritised, if this is not feasible, the literature highlights other legislative options that could also improve the health of platform workers. For instance, even if workers are classified as self-employed, they should still have access to collective labour rights, such as the ability to unionise and engage in collective bargaining. Additionally, the studies revealed that platform workers should be guaranteed the use of occupational safety and health regulations even under self-employment status, with the platform itself being held responsible for ensuring their safety and well-being.

The literature recommends creating channels that enable platform workers to communicate with one another, in terms of what platforms or social partners can do. Additionally, the creation of a shared space where platform workers can gather is encouraged so they can exchange information on the best practices for reducing occupational risks.

Another recommendation is to notify platform workers about the dangers of fatigue and lack of sleep through the platform's app and email notifications. Furthermore, it is suggested that the platform itself enforces mandatory breaks so workers can rest or take a short walk. At the same time, it is emphasised that workers should have the right to self-regulate their activity, including the option to decline tasks.

To address potential harm arising from interactions with end clients, the literature recommends that the client rating system should also allow platform workers to evaluate client behaviour. Additionally, the platform's app should include features such as a panic button to enable workers to request immediate assistance, and GPS tracking to monitor workers' locations and alert them to potential hazards in pickup or drop-off areas, which is relevant for taxi services. Lastly, the app should provide information to clients before they rate a platform worker, explaining the significant impact their rating could have on the worker.

Recommendations on algorithmic management in platform work include greater transparency, human oversight and protection against automated disconnection or penalisation by the algorithm. It should be noted that all these recommendations about algorithmic management in platform work have already been incorporated into the Digital Platform Work Directive, which must be transposed into national laws before 2 December 2026.

6 Directive (EU) 2024/2831 of the European Parliament and of the Council of 23 October 2024 on improving working conditions in platform work.

# 4. Research gaps

Digital platform work is a relatively recent phenomenon. Its relevance is growing given its rapid expansion and evolution. Early studies on digital labour platforms were somewhat limited and very few of them dealt with working conditions and health and safety at work on digital labour platforms (Eurofound, 2018; Lenaerts et al., 2017).

The health and safety of platform workers and the prevention of occupational risks in this sector has become a burgeoning issue due to the visibility of these workers, especially delivery riders, and the stories they have spread about their harsh working conditions (EU-OSHA, 2022d; Garben, 2017; Huws, 2016).

In their studies, the authors generally analysed some of the characteristics of working on platforms, such as algorithmic management and the classification of platforms according to their types of work (EU-OSHA, 2022a; Griesbach et al., 2019; Hill, 2021; Wood, 2021). Numerous studies have focused on analysing the employment situation of platform workers and how they should be classified in the social security system, as well as on earnings and working time, though to a lesser extent (Crain et al., 2020; European Commission, 2020; Sayre, 2022).

However, although this is a recurring theme in the literature reviewed and has had major outreach, there are numerous research gaps that have not been addressed or that need to be further explored.

## 4.1 Lack of uniform terminology

Different authors and researchers use different terminology and different concepts. There is no single concept of digital platforms or platform workers, which hinders the homogeneity and comparability of the different studies on the subject.

Different terms are used to refer to the same kind of work. The confusion between "gig worker" and "platform worker", for example, is common, and each study classifies platforms differently.

There is no uniform definition of terms that are often associated with working on digital platforms, such as *algorithmic management, artificial intelligence-based worker management and precarious work* (EU-OSHA, 2022a; Hauben, Lenaerts, & Waeyaert, 2020). Scholars have also stressed that there is a need for a more uniform, broader definition of the concept of worker at the EU level that takes into account economic dependency and resolves the confusion surrounding employment status (Hauben, Lenaerts, & Waeyaert, 2020).

The available studies on the working conditions of platform workers focus on different issues, platforms and countries, and also use slightly different

definitions of platform work. This makes it difficult to comprehensively assess the working conditions and social protection of platform workers (European Commission, 2020).

## 4.2 Lack of specific, representative and comprehensive data

Many of the studies that have been reviewed when discussing platform work highlight the difficulty of measuring the scope of the work, the number of platforms, the number of workers, and their economic contribution (EU-OSHA, 2024).

Most existing studies on platform working conditions are based on small or non-representative samples, which limit the generalisability of the findings to the platform work sector as a whole. Moreover, as many of the workers are independent contractors and informal workers, they are not included in labour statistics (European Commission, 2020).

There is a lack of studies measuring the current scale of platform work and analysing the working conditions of platform workers on a large scale and with a representative sample.

## 4.3 Lack of studies of the categories of platform work

Digital platform work encompasses a wide range of activities, from highly skilled tasks to simple microtasks. Despite this, research has tended to treat platform work as a homogenous phenomenon, leading to a poor understanding of the specific risks associated with different types of work in this ecosystem.

Studies examining the occupational hazards of platform workers mostly examine food delivery workers. They also look at those workers engaged in passenger transport and those workers performing microtasks online, though to a lesser extent. Studies analysing platforms offering other types of low-skilled work, such as care work and highly skilled jobs, have not been found (Figure 7).

The different types of services provided by platform workers generate different risks to workers' health and safety. For example, while care workers are exposed to the risks of performing their work in the customer's home, web-based workers are exposed to the physical risks of poor workplace ergonomics (Cox et al., 2024).

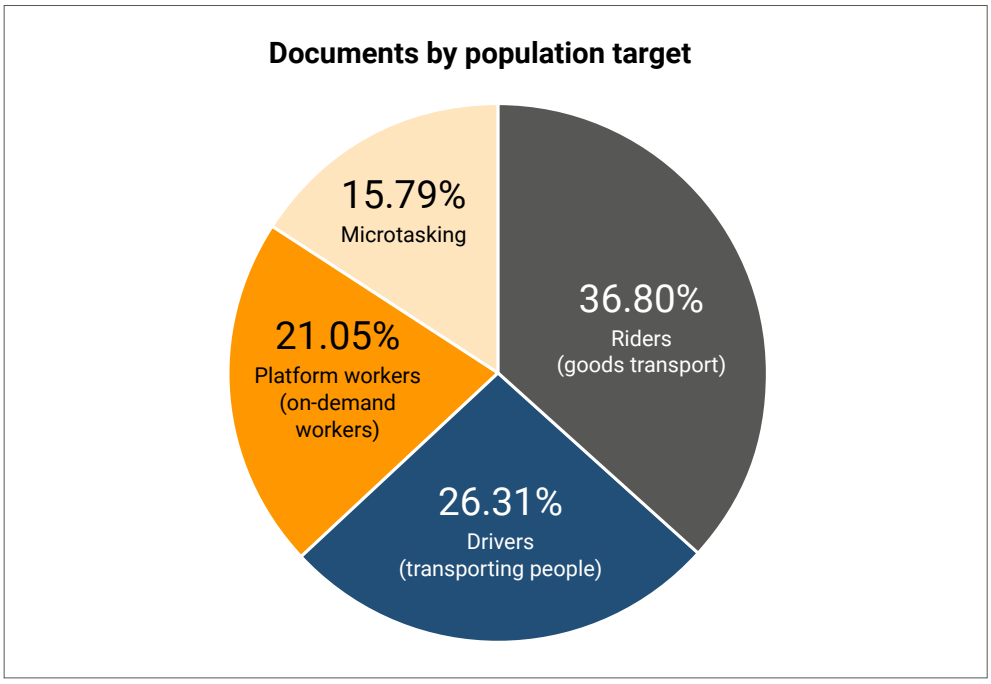



**Figure 7.** Literature search articles.

In this study, platforms have been classified into highly skilled location-based, low- skilled location-based, highly skilled web-based, and low-skilled web-based platforms. This classification is used a lot in the literature. However, most studies on occupational risks are limited to specific categories of low-skilled location-based and low-skilled web-based platforms, leaving part of the platform sector under studied and unaware of the impact it has on the health of its workers. Thus, although highly skilled platform workers are likely to face specific occupational hazards, no studies have been found about this issue in this literature review.

In this regard, the European Commission conducted a study analysing EU countries' policies and regulations on working conditions for platform workers. Few policies that addressed working conditions beyond worker status were found. More than half of the policies that were found were specific to personal transport and food delivery platforms. Thus, it was noted that the working conditions of web-based platform workers have not been addressed (European Commission, 2020).

Academic research has mainly focused on location-based platform work, meaning that there is very little evidence or research on totally web-based work (Hauben, Lenaerts, & Waeyaert, 2020; Lenaerts et al., 2017). The same is true when classifying workers into highly skilled and low-skilled. Research on those who need a certain level of education to perform their tasks is very limited.

Thus, the work of delivery riders has been studied more, and has been discussed and debated more frequently compared to online platforms, possibly because these platform workers are easier to identify and organise compared to other platform workers (Kilhoffer et al., 2017). However, in-depth studies on other types of platform workers are still needed.

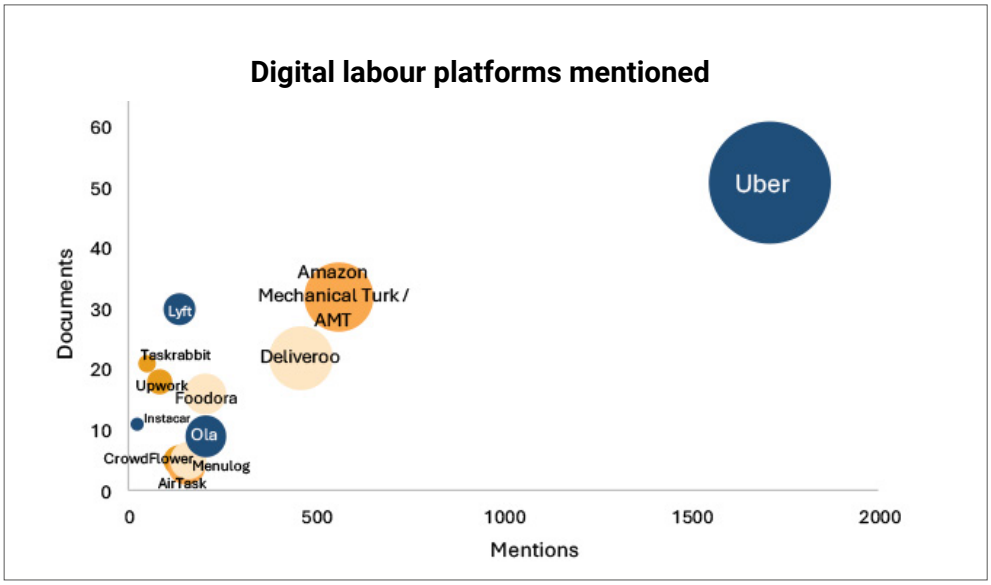



**Figure 8.** Most frequently mentioned digital labour platforms.

## 4.4 Gender-specific health risk analysis

There is a lack of studies exploring gender inequalities, how these manifest in platform work and how they influence exposure to occupational hazards.

Occupational hazards are sometimes gender-specific or are aggravated or mitigated by gender. For example, sexual harassment is mostly experienced by women.

However, the literature has rarely investigated the implications of worker gender on the occupational hazards of platform work. This lack of investigation limits the ability to design effective interventions that address both occupational safety and gender equity in this emerging context.

## 4.5 Study results are not always applicable to different contexts

Platform work is a global phenomenon with platforms operating all over the world. However, the OSH risks and solutions faced by platform workers differ greatly depending on the socio-economic and cultural context in which the worker operates. This context is shaped by unemployment rates, economic needs, the safety of the environment, the state of infrastructure, the existence and quality of care networks, training systems, etc., but also by legislation and demographics. Thus, in regions where there are higher levels of job insecurity, deficient infrastructures and poor health systems, there is a greater risk of experiencing violence or accidents that do not occur in countries that have better conditions. In addition, digital platform work is a relatively recent non-standard form of work whose workforce often has specific characteristics that differ from the characteristics of traditional work. In addition, the definition of the “typical

platform worker" also varies significantly from place to place. Whether the type of platform worker has one form or another is also influenced by the socio-economic and cultural context in which the platform operates when recruiting workers. For example, in the case of the EU, a typical platform worker is a young person with high socio-educational levels who generally uses platform work to supplement other income, rather than as a primary source of income. This implies that the risks associated with precarity and financial stress are less important in this environment, whilst conversely, the risks related to the lack of experience due to youth (lower capacity for prevention and foresight) are greater. These multiple facets of the reality of platform work mean that the conclusions of the studies cannot always be applied from one region to another.

In addition to the diversity of socio-economic contexts, there is also significant variation in regulatory frameworks. For example, although the EU has some common legislation, occupational safety and health regulations are country-specific. Nor is there uniformity in the legal nature of the relationship between workers and platforms. In this sense, we have found diverse interpretations depending on the different legal systems, ranging from employee to independent contractor, as well as a series of intermediate players. Given the huge relevance that much of the literature reviewed gives to labour status in terms of preventing occupational risks, the diverse interpretations in each jurisdiction also make it difficult to generalise the studies.

## 4.6 The connection between the characteristics of platform work, risk factors and health effects

Another aspect that has received little attention in research on platform work is the relationship between job characteristics, health and safety risk factors and the effects on workers' health. Furthermore, there has been no research on whether studies examining the relationship between these factors in other work contexts can be extrapolated to platform work.

Most of the studies reviewed have focused on one of these three factors in isolation, without making clear connections between them. Numerous studies have explored the distinctive features of working on digital platforms, such as flexible hours, reliance on user ratings, and algorithmic management. However, these studies have rarely analysed how these distinctive features can directly influence occupational safety and health factors.

On the other hand, studies dedicated to identifying the specific risks faced by platform workers, such as mental workload associated with the need to be constantly available, the precarious nature of work, and exposure to precarious conditions, have not explored how the structural characteristics of platform work contribute to the manifestation of health challenges.

In fact, when addressing the adverse effects on the mental health and emotional well-being of digital platform workers, discussions often resort to generalisations without distinguishing between different conditions such as anxiety,

depression and chronic stress. This lack of specificity hinders a comprehensive understanding of the phenomenon, especially when generic expressions such as “quality of life” and “worker well-being” are employed without clarifying the metrics used to assess these factors or provide real evidence of the specific areas that have been affected.

In turn, several studies have documented the effects of these risks on workers’ health, such as increased stress, chronic fatigue and emotional instability. However, few of these studies have analysed their connection with the characteristics of platform work and the risk factors previously identified. Moreover, little research has proposed specific measures to mitigate these negative effects.

# 5. Conclusion

In conclusion, this study has reviewed literature that highlights the risk factors associated with platform work, which should be carefully considered in specific risk assessments. The reviewed literature has also provided significant insights into the related health consequences, enabling experts and those responsible for worker health to remain vigilant, recognise early symptoms, and effectively implement preventive measures. The study also details measures to promote platform workers' health. Implementing these measures could potentially address the risks and OSH challenges faced by this group of workers, while also paving the way for a more sustainable and equitable framework that aims to safeguard their health, well-being and dignity in the evolving digital economy. Finally, this study has also identified significant research gaps that warrant further exploration. It is essential to investigate whether the specific risks associated with platform work apply consistently across different types of digital platforms and in various countries. Additionally, research is needed to determine whether these factors influence genders differently. Further studies are also crucial to establish a clearer causal relationship between the risks identified in platform work and the related health issues. A pressing need has also been identified to analyse and evaluate the effectiveness of proposed measures aimed at improving the health and well-being of platform workers.

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ISBN 978-91-990701-3-1