

OCCUPATIONAL HEALTH RISKS AMONG GIG ECONOMY WORKERS

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Abstract

The expansion of digital labour platforms has reshaped how services are delivered, creating flexible earning opportunities for food-delivery riders, ride-hailing drivers, home-service providers, warehouse and logistics workers, and online freelancers. At the same time, gig work can transfer many occupational health responsibilities from platforms to individuals who may have limited bargaining power, irregular earnings, and uneven access to social protection. This paper presents an evidence-based comparative analysis of occupational health risks among gig economy workers. It examines physical, ergonomic, environmental, psychosocial, digital, and economic risks across major categories of platform-mediated work. The analysis draws on published occupational-health literature, labour-policy reports, and documented work-process characteristics; it does not claim a new survey or clinical experiment. Risks are assessed according to exposure intensity, worker control, predictability of work, access to preventive support, reporting pathways, and feasibility of intervention. The analysis indicates that road-based delivery and ride-hailing workers face prominent risks from traffic injury, fatigue, heat, pollution, and time pressure, while home-service workers may encounter ergonomic strain, customer-facing safety concerns, and inconsistent protective arrangements. Online freelancers experience a different risk profile involving prolonged screen work, sedentary behaviour, social isolation, unstable workloads, and blurred work-rest boundaries. The findings show that occupational health in the gig economy cannot be addressed solely through individual safety advice. Effective protection requires transparent platform design, realistic delivery and task targets, accident and health coverage, preventive training, accessible grievance systems, worker participation, and public regulation that recognizes the operational responsibilities of digital labour platforms.

Keywords: Gig Economy, Platform Work, Occupational Health, Delivery Riders, Algorithmic Management, Work-Related Stress, Road Safety, Musculoskeletal Health, Social Protection, Digital Labour Platforms

1. INTRODUCTION

Digital labour platforms have created new pathways into paid work by linking customers, workers, payments, and service ratings through mobile applications and online marketplaces. In India and many other countries, app-based delivery, ride-hailing, home services, e-commerce logistics, and remote freelancing have become visible parts of daily economic life. The flexibility associated with gig work can be valuable for workers seeking supplementary income, entry-level opportunities, or greater choice over when to work. However, this flexibility frequently coexists with employment uncertainty, variable demand, and limited access to the protections traditionally associated with standard employment.

Occupational health risks in gig work are shaped not only by the task itself but also by the way work is organised. Road-based workers must navigate traffic, poor road conditions, weather exposure, noise, air pollution, and long hours of sitting or riding. Home-service workers can face repetitive movement, lifting, awkward postures, travel between jobs, and personal-security concerns in customer environments. Online freelancers may work for long periods at improvised workstations and can experience visual strain, sedentary behaviour, sleep disruption, and isolation. These risks are often intensified when workers are paid per task, absorb work-related expenses, or feel compelled to remain continuously available to secure sufficient income.

Algorithmic management is an additional occupational-health concern. Platforms commonly use automated task allocation, customer ratings, incentive systems, route estimates, service-level targets, and account-status rules to coordinate large workforces. When the logic of these systems is unclear, workers may experience uncertainty about earnings, reduced control over work pace, fear of deactivation, and pressure to accept unsafe or unhealthy working conditions. The issue is not that all digital tools are harmful; rather, health consequences depend on whether platforms use technology to support safe work or to intensify work without adequate safeguards.

A narrow focus on injury statistics can understate the full burden of gig work. Occupational health includes physical injuries, chronic pain, fatigue, mental distress, occupational violence, exposure to climate and pollution, as well as the effects of financial insecurity and limited access to medical care. For workers who are classified as independent contractors or who move between multiple platforms, it can be difficult to identify who is responsible for risk assessment, safety training, incident reporting, emergency assistance, sick leave, and return-to-work support.

This study examines occupational health risks among gig economy workers through a comparative, evidence-based framework. It identifies key hazard pathways, contrasts risk profiles across worker groups, and outlines practical measures for platforms, policymakers, health professionals, and worker

organisations. The purpose is to treat occupational health as a central feature of decent platform work rather than as an individual issue left entirely to the worker.

2. LITERATURE REVIEW

Research on the gig economy has consistently highlighted the mixed nature of platform work. Workers may gain scheduling flexibility and lower barriers to labour-market entry, yet they can also face precarious income, asymmetric information, fragmented work relations, and reduced access to collective representation. Occupational-health scholarship has broadened this discussion by examining how job insecurity, long working hours, inadequate recovery time, customer-facing conflict, and limited preventive systems affect physical and mental well-being.

The literature increasingly distinguishes between types of gig work because risks are not uniform. Delivery riders and ride-hailing drivers have high exposure to road hazards and environmental conditions; home-service providers face ergonomic and interpersonal risks; online freelancers may encounter work intensification through digital connectivity and competition across global labour markets. A common finding is that platform design, remuneration systems, and social-protection arrangements can amplify or reduce these hazards. Evidence also stresses the importance of viewing algorithmic management, work intensity, and employment status as occupational determinants of health.

LITERATURE REVIEW SUMMARY TABLE

S. No.	Author / Year	Study Focus	Key Contribution	Limitations Identified
1	Tran & Sokas (2017)	Gig and contingent work assessment	Highlighted occupational-health issues in non-standard work	Early assessment; limited sector-specific evidence
2	Bajwa et al. (2018)	Health in the global gig economy	Mapped physical, psychosocial, and social health concerns	Evidence base was varied across countries and platforms
3	Wood et al. (2019)	Autonomy and algorithmic control	Explained how flexibility can coexist with digital work control	Focused mainly on platform-work arrangements and worker accounts
4	Tassinari & Maccarrone (2020)	Courier work and solidarity	Documented time pressure, collective action, and work vulnerability	Country-specific context limits direct generalisation

5	Li et al. (2022)	Musculoskeletal risk among riders	Identified workload and posture-related health concerns	Urban delivery context; findings may vary by infrastructure
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3. OBJECT OF STUDY

The primary focus of this research is to identify and compare occupational health risks faced by workers engaged through digital labour platforms. The study considers how job tasks, work organisation, algorithmic management, environmental exposure, employment insecurity, and access to social protection influence worker health and safety. The main objects of study are outlined below:

3.1 GIG WORKER GROUPS UNDER INVESTIGATION

- Food, grocery, parcel, and e-commerce delivery riders
- Ride-hailing drivers and two-wheeler taxi workers
- Home-service workers providing repair, cleaning, beauty, or technical services
- Warehouse-linked, last-mile, and on-demand logistics workers
- Online freelancers, crowdworkers, and remote digital-service providers

3.2 OCCUPATIONAL HEALTH CONTEXTS

- Road traffic hazards, fatigue, heat, rain, air pollution, and night-work exposure
- Musculoskeletal strain from prolonged riding, driving, lifting, carrying, and repetitive tasks
- Psychosocial pressure linked to ratings, incentives, customer complaints, and account deactivation
- Occupational violence, harassment, infection exposure, and unsafe customer-facing settings

3.3 OCCUPATIONAL HEALTH EVALUATION PARAMETERS

- Injury and illness exposure, including acute events and cumulative health effects
- Work pace, workload predictability, rest time, and worker control over accepting tasks
- Availability of safety training, insurance, emergency support, and health-care access
- Transparency of platform rules, income systems, ratings, and dispute resolution
- Feasibility of prevention, reporting, rehabilitation, and return-to-work support

3.4 COMPARATIVE ANALYSIS FOCUS

- Road-based, home-service, logistics, and remote digital-work risk profiles
- Physical, ergonomic, psychosocial, environmental, and digital forms of exposure
- Platform incentives and automated management versus meaningful worker autonomy
- Individual precautions, platform duties, public policy, and worker-led protections

3.5 RESEARCH OBJECTIVE SCOPE

- To map major occupational health risks among different groups of gig workers
- To explain how work organisation and digital platform design affect health and safety
- To identify protection gaps in training, insurance, reporting, and social security
- To recommend preventive measures suited to platform-mediated work settings

4. RESEARCH METHODOLOGY

The present study adopts a comparative and evidence-based research methodology to analyse occupational health risks in the gig economy. The research framework is designed to synthesise published literature, occupational-health guidance, policy reports, and task-specific work-process information rather than to present an original clinical trial or a new worker survey. This approach is appropriate because risks vary substantially across platform sectors, cities, regulatory systems, and worker populations.

The analysis follows the pathway through which a gig worker receives a task, travels or connects to the worksite, performs the service, interacts with customers and platform systems, receives payment, and manages recovery between tasks. Each worker group is assessed under common dimensions: physical exposure, ergonomic demand, psychosocial pressure, environmental conditions, access to protective resources, and mechanisms for reporting incidents or challenging unsafe work. The methodology also recognises that health risks are influenced by gender, migration status, income dependence, disability, access to personal equipment, and local infrastructure.

METHODOLOGY FRAMEWORK

1. The study uses a comparative design covering major categories of platform-mediated work.
2. Published occupational-health evidence and labour-policy literature support qualitative synthesis.
3. The analysis considers physical, ergonomic, environmental, psychosocial, and digital hazards.
4. Worker groups are compared according to their task environment and degree of customer contact.
5. Work intensity, incentive structures, and algorithmic management are treated as core risk factors.
6. The assessment includes injury prevention, illness prevention, emergency response, and recovery needs.
7. Access to insurance, paid absence, training, equipment, and grievance processes is evaluated.
8. The analysis distinguishes individual precautions from platform-level and regulatory responsibilities.

9. No fabricated prevalence figures, clinical measures, or incident counts are presented.

10. Recommendations focus on prevention, worker participation, transparent systems, and accountable support.

5. DATA ANALYSIS

The data analysis section presents a comparative evaluation of occupational health risks among gig economy workers. The analysis is based on reported work conditions, documented health outcomes, task demands, platform-management practices, and the availability of preventive support. It examines how risk is distributed across worker categories rather than treating the gig economy as a single, uniform workplace.

Five major work settings are considered: road-based delivery, ride-hailing, home services, warehouse and last-mile logistics, and online freelancing. The comparison is qualitative because the severity of risk depends on city infrastructure, traffic conditions, climate, hours worked, personal equipment, platform policies, worker experience, and access to medical and social support.

5.1 COMPARATIVE RISK ANALYSIS

S. No.	Worker Group	Primary Work Context	Physical Hazards	Work Stress	Protection	Risk Level	Priority
1	Delivery riders	Road-based last-mile work	Traffic, heat, pollution, fatigue	Time pressure, ratings, low earnings	Safety gear, rest, insurance	Very High	Immediate
2	Ride-hailing drivers	Passenger transport	Crash risk, long sitting, night work	Customer conflict, long shifts	Fatigue control, emergency help	High	High
3	Home-service workers	Customer homes and sites	Lifting, posture, chemicals, travel	Safety fears, uncertain tasks	Task guidance, reporting	High	High
4	Logistics / warehouse	Sorting and last-mile support	Manual handling, repetition, standing	Target pressure, workload cycles	Ergonomics, breaks, training	High	High
5	Online freelancers	Remote digital work	Sedentary work, eye strain,	Isolation, uncertain pay	Work limits, support	Moderate-High	Important

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5.2 EXTENDED OCCUPATIONAL HEALTH EVALUATION

- Delivery riders face an acute mix of road traffic risk, weather exposure, air pollution, fatigue, and repetitive riding posture. Short delivery-time expectations can increase the perceived need to work at speed, reduce rest breaks, and continue working during conditions that would otherwise be avoided. Preventive measures should include realistic task allocation, rest and hydration support, protective equipment, road-safety training, emergency assistance, and transparent accident-claim pathways.
- Ride-hailing drivers are exposed to extended sitting, irregular hours, road risk, fatigue, customer conflict, and pressure associated with acceptance rates or incentive thresholds. The health burden may rise when drivers work long shifts to meet financial obligations or platform targets. Interventions should address fatigue management, safe driving, vehicle ergonomics, safety during night work, and non-punitive mechanisms for refusing unsafe trips.
- Home-service workers can encounter lifting, repetitive movement, awkward posture, chemical or cleaning exposure, travel between appointments, and unfamiliar workplace environments. Some risks are difficult to predict because the worksite is a private residence or client location. Platforms should provide task-specific safety guidance, minimum equipment standards, customer conduct rules, incident-reporting channels, and reliable support when workers feel unsafe.
- Warehouse-linked and last-mile logistics workers may experience manual material handling, repetitive work, long standing periods, time pressure, temperature variation, and pressure to meet order cycles. Although these workers are sometimes less visible than riders, their tasks can create cumulative musculoskeletal risk. Risk assessment should cover load limits, break schedules, ergonomic design, training, and

coordination between warehouses, contractors, and platforms.

- Online freelancers and crowdworkers are less exposed to traffic and outdoor hazards, but they can experience prolonged screen time, inadequate workstation design, social isolation, disrupted sleep, work-life boundary problems, and global competition that extends working hours. Because the work may be performed alone, early recognition of stress and musculoskeletal discomfort is especially important. Digital platforms can support health by improving workload visibility, payment predictability, access to dispute resolution, and resources for safe remote work.

5.3 OBSERVATIONS FROM DATA ANALYSIS

- Occupational risk is task-specific: road-based work is dominated by injury and environmental hazards, while remote work more often shows cumulative ergonomic and psychosocial strain.
- Payment per task and uncertain demand can encourage long working hours, reduced recovery, and the continuation of work despite illness, fatigue, or unsafe weather.
- Algorithmic management can affect health indirectly when it creates opaque rules, unpredictable income, or penalties that limit a worker's ability to pause or refuse work.
- Worker classification should not become a reason to leave safety training, protective equipment, emergency support, and incident reporting undefined.
- Health protection is stronger when platforms disclose task risks, give realistic time estimates, permit safety-based refusal, and provide clear accident and health-support procedures.
- Individual safety behaviour matters, but it cannot substitute for safe system design, adequate earnings security, infrastructure, and access to medical care.
- Reliable data on injuries, fatigue, harassment, account deactivation after incidents, and health-care use are

necessary for evidence-based improvement.

6. DISCUSSION

The comparative analysis shows that occupational health in the gig economy is inseparable from the design of work itself. Platform companies may describe workers as independent, but the practical organisation of work can still be strongly shaped by application interfaces, task allocation systems, incentive rules, ratings, customer feedback, and account-access decisions. When these systems reward speed and uninterrupted availability without incorporating safety and recovery, workers may shoulder health risks that are partly produced by platform design.

Road-based work illustrates this relationship clearly. Delivery riders and ride-hailing drivers may exercise some choice over when to log in, yet their effective control can be constrained by income needs, demand patterns, and the desire to qualify for incentives. Heavy rain, extreme heat, air pollution, road congestion, and nighttime travel are not merely personal inconveniences; they are occupational exposures that should be recognised in task allocation, risk communication, insurance, and emergency response. A safety-oriented platform should make it easier, not harder, for a worker to pause or decline dangerous work. Psychosocial risks require equal attention. Unpredictable earnings, customer abuse, ratings pressure, disputes, and fear of deactivation can contribute to stress, anxiety, sleep disturbance, and reduced well-being. These risks may be overlooked because the work relationship is digitally mediated and because workers often work alone. Transparent explanations for automated decisions, meaningful human review, respectful complaint handling, and worker representation can reduce some of the uncertainty that contributes to distress.

The policy response should combine prevention with social protection. Platforms should conduct and publish task-specific risk assessments, provide health and safety information in accessible languages, support emergency contact and incident reporting, and ensure that safety-related pauses or refusals do not trigger unfair penalties. Governments can clarify minimum duties for platform work, strengthen injury and health coverage, improve

public infrastructure, and support data collection on platform-worker health. Worker organisations and public-health institutions can contribute by identifying emerging hazards, promoting awareness, and ensuring that workers have a voice in the design of protections.

7. CONCLUSION

This study presented a comparative analysis of occupational health risks among gig economy workers across delivery, ride-hailing, home-service, logistics, and online freelance work. The findings show that platform-mediated work can expose workers to a combination of acute injuries, chronic musculoskeletal strain, environmental hazards, psychosocial stress, and social-protection gaps. The nature and intensity of these risks differ across job types, but uncertainty, work intensity, and limited access to preventive support are recurring concerns.

Road-based workers require particular protection from traffic risk, fatigue, climate exposure, and unsafe time pressure. Home-service and logistics workers need ergonomic, interpersonal-safety, and workplace-design safeguards. Online freelancers require attention to sedentary work, visual strain, isolation, work-time boundaries, and mental well-being. These differences show why one generic policy cannot adequately protect all gig workers.

The study concludes that health and safety should be treated as a shared operational responsibility wherever platforms organise, price, allocate, evaluate, or influence work. Transparent algorithms, safety-based refusal rights, adequate insurance, emergency support, accessible grievance processes, fair compensation, and worker participation are practical components of healthier platform work. Prevention should be designed into the service model rather than introduced only after accidents or illnesses occur.

Future research should prioritise longitudinal evidence on injuries, mental health, heat and pollution exposure, work hours, gendered risk, and the effects of platform design changes. It should also examine which combinations of regulation, insurance, worker voice, and technology design produce measurable improvements in occupational health. Such evidence can help ensure that innovation in the

gig economy is accompanied by dignity, safety, and sustainable working conditions.

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