



Urban Mobility and Safety: Traffic Risks for Migrant Food Delivery Workers in Romania. Case Study: Cluj-Napoca Municipality


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DOI: <https://doi.org/10.24193/JSSP.2024.1.05>

Received: 31 May 2024

Received in revised form: 25 June 2024

Accepted for publication: 28 June 2024

Available online: 30 June 2024

Keywords: gig economy, traffic incidents, rider behaviour, rider safety, food-delivery workers

ABSTRACT

The rapid expansion of the gig economy, particularly within the food delivery sector, has transformed urban mobility and employment landscapes globally. This study examines traffic incidents involving food delivery riders from Pakistan, Sri Lanka, and Bangladesh operating in Romania from 2017 to 2023. The research employs a mixed-method approach, using traffic incident records from the Romanian Traffic Police Directorate and a comprehensive survey conducted among delivery riders in Cluj-Napoca. The findings reveal a significant increase in traffic incidents, with notable fluctuations correlating with changes in behaviour and operational dynamics influenced by the COVID-19 pandemic. Key factors contributing to incidents include rider misconduct, inappropriate speed for road conditions, and high-pressure working environments. The study highlights the unsafe working conditions and elevated occupational risks faced by these gig economy workers, exacerbated by job demands and limited resources. The results advise policy recommendations aimed at improving the safety and working conditions of food delivery riders, emphasizing the need for enhanced educational campaigns, stricter enforcement of traffic laws, and infrastructure improvements.

1. INTRODUCTION

The gig economy generally refers to a labour market where individuals work on short-term contracts or freelance arrangements, often negotiating their terms independently rather than holding permanent positions. In this system, workers engage in various informal and precarious part-time jobs facilitated by mobile apps and websites that connect them with customers. Food delivery services, such as those provided by Bolt, Tazz

and Glovo, are a key component of the gig economy, where riders deliver orders from restaurants to customers. These riders are typically classified as self-employed, meaning they lack the benefits and protections of traditional employees, such as healthcare, guaranteed wages, and workers compensation.

These workers face unique risks, including navigating unfamiliar urban environments and overcoming cultural and language barriers, which

exacerbate the precariousness of their employment conditions. Understanding the characteristics of the gig economy and its impact on rider safety is crucial for developing effective policies to improve their working conditions and ensure overall traffic safety.

The rapid growth of the gig economy has transformed urban mobility and employment landscapes worldwide (Bai and Sze, 2020; Oviedo-Trespalacios et al., 2022; Zheng et al., 2019). A significant segment of this economy is the food delivery sector, which has seen a remarkable surge, particularly during the COVID-19 pandemic (Tran et al., 2022). This growth has led to an increased presence of bicycle delivery riders on urban roads, raising substantial concerns about traffic safety and incidents (Man et al., 2020). Romania, mirroring global trends, has experienced a significant increase in traffic incidents involving bicycle delivery riders from 2017 to 2023.

The expansion of platform-based food delivery services has resulted in a substantial increase in bicycle and motorized two-wheeler riders on city streets, leading to heightened safety concerns (Goods et al., 2019). Studies have consistently highlighted the precarious working conditions and high levels of occupational risk faced by gig economy workers, especially those engaged in delivery services. For instance, Aguilera et al. (2022) examined the profile and mobility practices of on-demand food delivery couriers in Paris, finding that these workers are frequently exposed to traffic hazards and accidents due to the high-pressure nature of their work. Numerous studies have documented the safety risks associated with food delivery work emphasizing that food delivery riders face significant road safety risks, which are exacerbated by job demands and limited job resources, leading to unsafe riding behaviours (Nguyen-Phuoc et al., 2024).

The study applied the Job Demands-Resources (JD-R) model to highlight how job burnout and insufficient resources contribute to these risks. The high incidence of traffic violations among delivery riders in China, Australia, and South Korea, attributing these violations to the pressures of meeting delivery deadlines and the high volume of orders have been highlighted by numerous studies (Chung et al., 2014; Goods et al., 2019; Hsu et al., 2024; Young et al., 2020; Zheng et al., 2019).

Migrant workers constitute a significant portion of the gig economy workforce, especially in the food delivery sector. These workers often face unique challenges, including cultural and language barriers, discrimination, and limited access to social protections. (Tran et al., 2022) noted that migrant delivery riders in Ho Chi Minh City were under greater financial and job pressure compared to local workers, which led to higher rates of risky traffic behaviours. This finding is particularly relevant for this study, as it focuses on riders from Pakistan, Sri Lanka, and Bangladesh who may experience similar challenges in Romania.

The COVID-19 pandemic has profoundly affected urban mobility patterns, with significant implications for public transportation and delivery services. Man et al. (2020) analysed the impact of the pandemic on public transport usage in Cluj-Napoca, Romania, finding a sharp decline in ridership and a shift towards more flexible, individualized modes of transport. This shift likely influenced the operational dynamics of food delivery services, contributing to changes in rider behaviours and safety practices (Bilaşco and Man, 2024).

Organizational practices within food delivery companies play a crucial role in shaping rider behaviours and safety. Studies suggest that companies with robust safety protocols, training programs, and support systems for riders tend to have lower rates of accidents and safety incidents (Costantini et al., 2022; Debnath et al., 2016; Delbosc et al., 2019; Lin et al., 2022; Nguyen-Phuoc et al., 2024; Rusli et al., 2022). A hierarchical online food delivery framework to reduce traffic violations and crashes by addressing the root causes of delivery pressures through organizational changes and consumer demand management was proposed (Christie and Ward, 2023). Comparative studies across different cities and countries provide valuable insights into the varying experiences of delivery riders. Comparing delivery riders in Brazil, Australia, Greece and Japan highlighted significant differences in the modes of transport used and the associated safety risks. In some countries motorcycles were the dominant mode, leading to higher accident rates compared to less developed countries where bicycles were more commonly used (Defosse, 2021; Lin et al., 2022; Papakostopoulos and Nathanael, 2021; Stimpson et al., 2016; Wang et al., 2022; Zheng et al., 2019).

The literature highlights the multifaceted challenges faced by food delivery riders in the gig economy. These challenges are amplified for migrant workers, who often operate under more precarious conditions (Zheng et al., 2019). The impact of the COVID-19 pandemic has further complicated the urban mobility landscape, affecting both public transportation and delivery services (Man et al., 2020; Tran et al., 2022). By examining the specific context of Romania and focusing on riders from Pakistan, Sri Lanka, and Bangladesh, this study aims to contribute to a deeper understanding of the factors influencing traffic incidents and rider safety in the gig economy. The findings will inform policy recommendations for improving the safety and working conditions of these essential, yet vulnerable workers. This study is especially relevant now, as the number of foreign workers has increased across nearly all European countries. The Romanian government plans to add another 40,000 to the current quota of 100,000 by 2024. Consequently, Romania is preparing to welcome a total of 140,000 foreign workers, primarily from Sri

Lanka, India, the Philippines, Malaysia, and Nepal, with the right to work in the country (Ministry of Labor and Social Solidarity, 2024).

The current research gap identified in the existing literature is the lack of comprehensive studies focusing on the traffic safety and working conditions of migrant food delivery riders in Romania. While previous research has highlighted the precarious working conditions and high levels of occupational risk for gig economy workers in various global contexts, there has been limited attention given to the specific experiences and challenges faced by migrant workers in the Romanian food delivery sector. The purpose of the article addresses this gap by examining traffic incidents involving these riders from 2017 to 2023, employing a mixed-method approach that includes traffic incident records and survey data. This study provides critical insights into the factors contributing to traffic incidents, such as rider misconduct, inappropriate speed for road conditions, and high-pressure working environments. By focusing on this under-researched group, the article aims to inform policy recommendations to improve safety and working conditions, thereby contributing to a safer and more equitable gig economy in Romania.

This study aims to analyse the traffic incidents implying food delivery riders from Pakistan, Sri Lanka, and Bangladesh operating in Romania during this 2017-2023. These riders constitute a significant portion of the workforce in Romania's food delivery sector.

2. METHODOLOGY

This study employs a mixed-method approach to analyse the increasing number of traffic incidents involving food delivery riders from Pakistan, Sri Lanka, and Bangladesh in Romania from 2017 to 2023. The research is based on two primary data sources: traffic incident records provided by the Traffic Police Directorate of Romanian Police and a questionnaire survey conducted among delivery riders in Cluj-Napoca, Romania.

The Traffic Police Directorate of Romanian Police provided detailed records of traffic incidents involving bicycle delivery riders. The data includes information on the date, time, and location of incidents, as well as the nature of the traffic incidents and the demographic details of the riders involved. Additionally, the data sets utilized in this study include detailed information about accidents, participants, and vehicles involved. Initially, this raw data was stored across several Excel spreadsheets. To facilitate a more efficient processing, a relational model was adopted, and these spreadsheets were imported into multiple tables within a relational database. We selected Microsoft SQL Server as the database server, given that both Excel and Microsoft SQL Server are products of Microsoft, which simplified the import process. A new database was

created, comprising three relational tables structured according to the characteristics of the raw data. The data from all Excel spreadsheets were then imported into these corresponding tables. Additionally, a new table was generated to specifically include participants involved in accidents from the selected categories, optimizing the subsequent queries required for data analysis. Compared to handling individual Excel spreadsheets, a relational database allows for more efficient storage, transformation, and querying of data. Query execution time is significantly reduced by applying appropriate indexing on each table, and stored procedures and user-defined functions can be created and utilized as needed to further enhance efficiency.

To gain insights into the behaviours and safety practices of the riders, a comprehensive questionnaire was conducted in Cluj-Napoca municipality. The survey targeted food delivery riders from India, Pakistan, and Nepal, capturing information on their demographic profiles, work conditions, riding behaviours, safety practices, and perceptions of risk. The survey included questions to allow for quantitative analysis and qualitative insights. A mixed study was conducted to examine the characteristics of delivery bicycle riders at ten sites in Cluj-Napoca, including areas with and without existing bicycle lanes. Observations took place over five days, between May 13 and May 18, 2024, during two time periods: 10 AM to 2 PM and 5 PM to 7 PM, to capture both lunch and dinner deliveries. One observer was stationed at each site, except for the very busy location in the city centre, where two observers were needed. Observers in Cluj-Napoca were instructed to observe and then address questions to the riders and fill in a Google form to determine the home country and general behaviour while working (speeding, sidewalk driving, running red lights, using mobile apps, texting, talking on the phone). Date and time were pre-recorded on the forms. Variables recorded included the type of vehicle (standard bike, electric bike), helmet status (worn, not worn), rider gender (female, male), and delivery company representation (Tazz/Glovo). Only riders who agreed to participate were included in the final dataset, resulting in a total of 168 responses. The questionnaire is available at <https://forms.gle/uWUev7mbDejWmzRF6>. Using these data sets a correlation matrix was employed to examine the relationships between various safety-related behaviours and demographic factors. Key analysed indicators include helmet use, interactions with pedestrians, running red lights, speeding, and mobile phone usage while driving. Descriptive statistics provided insights into the frequency and variability of these behaviours, while correlation analysis identified significant associations, such as the negative correlation between helmet use and speeding, and the positive correlation between mobile phone use and being the nationality of riders. Additionally, qualitative data from

open-ended survey responses offered contextual insights into the experiences of the riders and perceptions of safety. By integrating these quantitative and qualitative findings, the study provides a comprehensive understanding of the factors influencing traffic incidents and the safety behaviours of migrant food delivery riders in Romania.

3. RESULTS AND DISCUSSION

3.1. Traffic incidents trends in food delivery sector

Using the data set made available by the Traffic Police Directorate of Romanian Police, it is possible to detect the annual increasing trend in the number of traffic incidents involving food delivery drivers. This is mainly due to changes in behaviour as a result of the development of online platforms and changes in consumer behaviour during the pandemic of Covid-19.

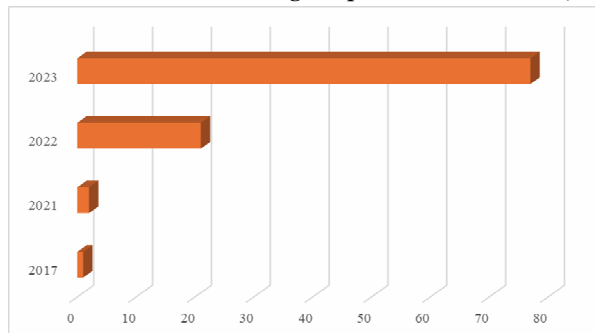


Fig. 1. The annual evolution of traffic incidents with food-delivery bicyclists in Romania.

The analysis of *annual trends* in incidents targeting food delivery riders from India, Pakistan, and Nepal reveals significant fluctuations over the years. The number of incidents recorded shows a sharp increase from just 1 case in 2017 to 2 cases in 2021, followed by a dramatic rise to 21 cases in 2022 and peaking at 77 cases in 2023. This trend indicates a period of escalating incidents, suggesting possible underlying issues such as increased number of food delivery riders from these countries, traffic behaviour, or changes in traffic patterns. The substantial rise in incidents highlights the need for targeted interventions to address the factors contributing to this upward trend.

The most common *causes of incidents* are bicyclists' misconduct and inappropriate speed for road conditions (each accounting for 20 cases). This highlights significant issues with cyclist behaviour and drivers not adjusting speed according to road conditions.

Disregarding vehicle priority and disregarding the change of direction (each with 6 cases) further underscore the need for better road rule adherence and signalling practices. Other notable causes include failure to keep distance between vehicles and disregarding pedestrian right of way pointing to the necessity of safe

driving practices and pedestrian protections. Less frequent, but still important causes, such as failure to change lanes and other violations of drivers and incomplete or insufficient traffic signs suggest areas for targeted improvements in driver education and infrastructure. Collectively, these findings suggest that enhanced educational campaigns, stricter enforcement of traffic laws, and infrastructure improvements are essential to mitigate these prevalent causes and improve overall road safety.

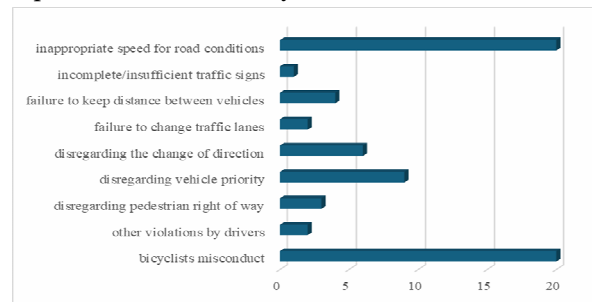


Fig. 2. Main causes of traffic incidents involving food-delivery bicyclists.

The investigation of specific contexts for primary responsible parties highlights the various scenarios in which incidents occur. The most frequent case is represented by falls from vehicles indicating a significant issue related to vehicle stability or occupant behaviour. Rear-end collisions suggest common problems with driver attention, while vehicle collisions and other unspecified circumstances point out the general traffic interactions as a source of incidents. This distribution emphasizes the need for targeted safety measures across diverse contexts, including enhancing safety features and promoting attentive driving to reduce the risk of such incidents.

The analysis of *secondary* responsible parties reveals a distribution across several key categories, each contributing to the incidents. There are equal occurrences of secondary responsibility attributed to other violations by drivers, disregarding vehicle priority, and disregarding the change of direction. Such a spread suggests that a range of driving behaviours contributes to incidents when secondary responsibility is considered. The examination of specific contexts for secondary responsible parties indicates that side collisions are the primary scenario, which may involve issues such as failure to check blind spots, improper lane changes, or inadequate signalling. The concentration of secondary responsibility in side collisions highlights the need for targeted interventions to address these specific driving behaviours.

The situational contexts of incidents reveal distinct patterns in when and where incidents occur. Most incidents take place in spare time and during working hours. This indicates that a significant segment of incidents occurs during personal time and professional activities. Incidents on the way to work and on business trips are much less frequent.

The analysis of the *age distribution of participants involved in incidents* reveals a varied spread across different age groups. Notable observations include a peak at age 29 followed by age 34, and age 27. The higher number of cases among these suggests that this demographic might be at greater risk, potentially due to factors such as inexperience, risk-taking behaviour, or lifestyle factors prevalent in this age group.

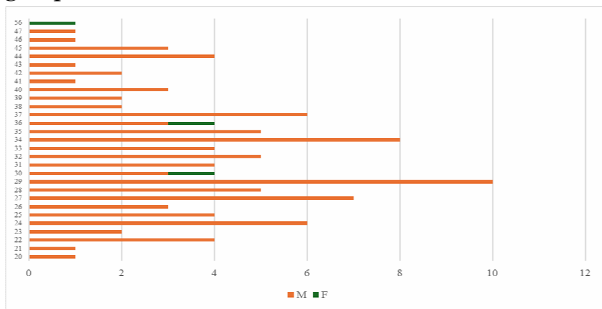


Fig. 3. Traffic incidents distributions by age and gender.

The combined *age and gender data* analysis for participants in traffic incidents reveals distinct patterns, males in their early twenties being the most frequently involved. Gender evaluation further highlights a significant trend where young males dominate this sector. Additionally, there is a noticeable migration to unskilled work that is gender-specific, predominantly involving men. These factors contribute to the higher incidence rates among young males, as they are more likely to be employed in high-risk, unskilled jobs such as food delivery, which involve increased exposure to road hazards and potentially unsafe working conditions.

This distribution of combined *age and profession* data suggests that younger adults in diverse, often unstructured, or less regulated job sectors, including self-employment and miscellaneous occupations, are more prone to incidents. The presence of unemployed individuals and students in the data indicates that even those not engaged in full-time work are at risk, potentially due to part-time jobs or other activities.

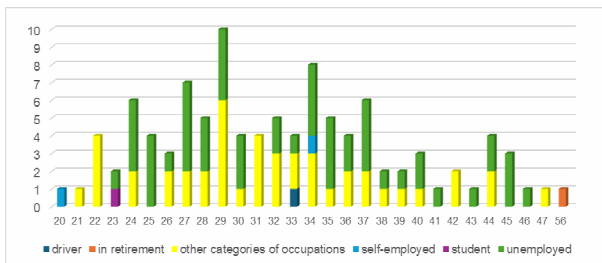


Fig. 4. The distribution of bicycle traffic incidents by age and profession of the driver.

The distribution of *incidents by days of the week* reveals notable variations, indicating specific days when incidents are more frequent. The pattern suggests that midweek days (Wednesdays and Thursdays)

register the highest incident rates, possibly due to increased work-related travel and higher activity levels during these days. The relatively lower number of incidents on Sundays may reflect reduced traffic and activity levels, typical of weekends.

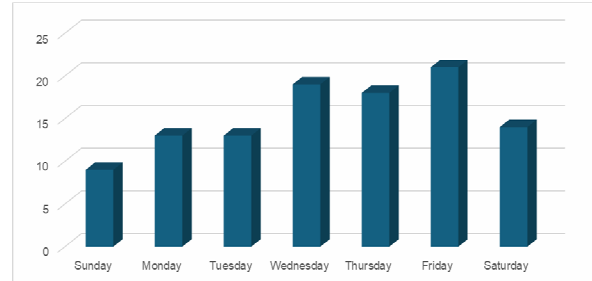


Fig. 5. The distribution of incidents by days of the week.

Hourly distribution of incidents shows a varied pattern throughout the day, with certain hours exhibiting higher frequencies. The significant increase in incidents during late afternoon hours, particularly around 17:00 and 18:00, coincides with the typical end-of-workday rush hour, when traffic congestion and driver fatigue may contribute to higher risk.

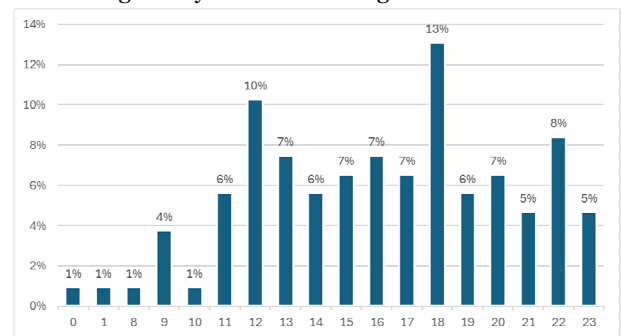


Fig. 6. Distribution of incidents by hours.

The analysis of the *usage of safety elements* among participants reveals significant insights into safety practices. Helmets are the most frequently used safety element, while a considerable number of participants did not use any safety measures at all, highlighting a significant gap in safety practices.

3.2. Analysis of safety behaviours among delivery personnel

This section is based on the results of the questionnaires and presents a detailed statistical analysis of safety behaviours among delivery personnel, focusing on variables such as helmet use, interaction with pedestrians, traffic violations, and mobile phone usage while driving. The analysis is based on data collected in Cluj-Napoca, Romania from delivery personnel coming from three countries: Bangladesh, Pakistan, and Sri Lanka. The descriptive statistics provide insights into the distribution of responses, while the correlation analysis explores the relationships

between various safety-related behaviours and demographic factors.

Table 1 provides a summary of the descriptive statistics for the key variables in the dataset. The data includes 168 responses, covering various safety behaviours.

Table 1. Descriptive statistics.

Variable	Count	Mean	Std. Dev
Helmet	168.0	0.607	0.490
Passing pedestrians	168.0	0.429	0.496
Run red	168.0	0.429	0.496
Speeding	168.0	0.143	0.351
Using mobile app or texting while driving	168.0	0.571	0.496
Talking on the phone while driving (without hands-free)	168.0	0.786	0.412

Helmet use is a critical safety measure and data shows that 60.7% of respondents reported wearing helmets, with a standard deviation of 49%. This indicates a significant variation in helmet use among the respondents. Notably, helmet use is predominant among standard bicycle users. Helmet use is significantly higher among standard bicycle users compared to electric bicycle users. The likelihood of helmet use is lower in delivery riders from Pakistan (-0.162) and Sri Lanka (-0.115) compared to Bangladesh. Additionally, there is a

slight positive correlation between helmet use and riding on the sidewalk (0.084), which may imply that riders on sidewalks are more cautious.

Interaction with pedestrians is a common occurrence for delivery personnel, with 42.9% of respondents reporting frequent encounters. The standard deviation of 49.6% suggests a high variability in pedestrian interactions, which could be influenced by the delivery routes and urban density. Passing pedestrians shows a strong positive correlation with riding on sidewalks (0.795), indicating that riders on sidewalks frequently encounter pedestrians. Conversely, there is a negative correlation with riding in traffic lanes (-0.641), suggesting fewer pedestrian interactions in these areas. Additionally, delivery respondents from Pakistan are more likely to encounter pedestrians (0.372), while those from Sri Lanka show a negative correlation (-0.101).

Running red lights is a critical safety concern, with 42.9% of respondents admitting to this behaviour and reflecting a potential area of concern for traffic law compliance among delivery personnel. Running red lights is slightly positively correlated with riding in traffic lanes (0.083). Interestingly, running red lights is negatively correlated with using mobile apps or texting while driving (-0.271) and talking on the phone without hands-free systems (-0.251). This suggests that those who use their mobile devices while driving might be less likely to run red lights, possibly due to divided attention reducing risky manoeuvres.

Table 2. Correlation Matrix.

Variable	Helmet	Passing pedestrians	Run red	Speeding	Using mobile app or texting while driving	Talking on the phone while driving (without hands-free)	Bangladesh	Pakistan	Sri Lanka	Side-walk	Traffic lane
Helmet	1.000	-0.190	0.106	-0.299	-0.106	0.115	0.174	-0.162	-0.115	0.084	-0.016
Passing pedestrians	-0.190	1.000	-0.021	0.059	-0.125	0.101	-0.070	0.372	-0.101	0.795	-0.641
Run red	0.106	-0.021	1.000	0.059	-0.271	-0.251	0.030	-0.230	0.092	0.022	0.083
Speeding	-0.299	0.059	0.059	1.000	-0.059	-0.036	0.240	-0.379	0.153	0.156	-0.234
Using mobile app or texting while driving	-0.106	-0.125	-0.271	-0.059	1.000	0.075	-0.138	0.346	-0.173	-0.022	-0.083
Talking on the phone while driving (without hands-free)	0.115	0.101	-0.251	-0.036	0.075	1.000	-0.060	0.426	-0.173	0.173	-0.137
Bangladesh	0.174	-0.070	0.030	0.240	-0.138	-0.060	1.000	-0.561	-0.561	-0.292	0.137
Pakistan	-0.162	0.372	-0.230	-0.379	0.346	0.426	-0.561	1.000	-0.561	0.487	-0.292
Sri Lanka	-0.115	-0.101	0.092	0.153	-0.173	-0.173	-0.561	-0.561	1.000	-0.173	0.137
Side-walk	0.084	0.795	0.022	0.156	-0.022	0.173	-0.292	0.487	-0.173	1.000	-0.739
Traffic lane	-0.016	-0.641	0.083	-0.234	-0.083	-0.137	0.137	-0.292	0.137	-0.739	1.00

Among the respondents speeding is less common, with only 14.3% of them admitting to this behaviour. The low mean and standard deviation of 35.1% indicate that most delivery personnel obey to speed limits. Speeding shows a negative correlation with helmet use (-0.299), indicating that those who

wear helmets are less likely to speed. Additionally, speeding is less common among delivery riders from Pakistan (-0.379) and more common among those riding on sidewalks (0.156). This highlights a potential safety risk for sidewalk riders who may feel less constrained by speed limits.

Mobile phone usage while driving is prevalent, with 57.1% of respondents using mobile apps or texting, and 78.6% talking on the phone without hands-free systems. These behaviours pose significant risks and highlight the need for stricter regulations and awareness campaigns. Using mobile apps or texting while driving is positively correlated with delivery riders originating from Pakistan (0.346) and negatively correlated with those from Sri Lanka (-0.173). This behaviour is also slightly less common among those riding on sidewalks (-0.022) and those who speed (-0.059). The correlations suggest that mobile phone usage patterns vary significantly across different regions and riding environments. Talking on the phone while driving without hands-free systems is positively correlated with being from Pakistan (0.426) and riding on sidewalks (0.173). It is negatively correlated with respondents from Sri Lanka (-0.173) and riding in traffic lanes (-0.137). These patterns indicate regional and situational differences in mobile phone usage while driving.

The analysis reveals notable differences in safety behaviours among delivery personnel from Bangladesh, Pakistan, and Sri Lanka. These differences highlight the influence of regional factors on road safety practices. Helmet use is positively correlated (0.174) with being from Bangladesh, suggesting a higher adherence to helmet-wearing regulations or greater awareness of helmet safety. However, speeding shows a positive correlation (0.240), indicating a potential risk factor.

Analysing the responses of riders from Pakistan, it can be noticed that helmet use is negatively correlated (-0.162), indicating lower helmet usage among delivery personnel. Additionally, passing pedestrians (0.372) and using mobile apps or texting while driving (0.346) are positively correlated. This suggests that delivery personnel from Pakistan frequently interact with pedestrians and use mobile devices while driving, which poses significant safety risks. Notably, talking on the phone while driving is also highly correlated (0.426), further emphasizing the need for targeted interventions to address mobile phone usage. Similarly, it can be observed that for delivery riders from Sri Lanka, helmet use is also negatively correlated (-0.115). However, the correlation with using mobile apps or texting while driving is negative (-0.173), indicating lower instances of this behaviour. Additionally, passing pedestrians shows a negative correlation (-0.101), suggesting fewer pedestrian interactions compared to those from Pakistan. The negative correlations with speeding and talking on the phone while driving (-0.173 for both) indicate a potentially safer driving environment in terms of these behaviours.

The results of this study align with and expand upon existing research regarding the safety risks and

working conditions of gig economy workers, particularly in the food delivery sector. Similar to findings by Aguilera et al. (2022) in Paris, our study reveals that food delivery riders in Romania face significant traffic hazards, with incidents rising sharply from 2017 to 2023. The primary causes of these incidents, such as rider misconduct and inappropriate speed for road conditions, echo the issues highlighted in previous studies (Nguyen-Phuoc et al. 2024; Hsu et al. 2024). Moreover, the heightened risks observed during the COVID-19 pandemic underscore the impact of increased job demands and limited resources, a theme consistent with global studies (Tran et al. 2022; Man et al. 2020). The unique focus on migrant workers from Pakistan, Sri Lanka, and Bangladesh in Romania, however, adds a new dimension to the literature by highlighting how cultural and language barriers, coupled with high-pressure working environments, exacerbate safety risks. This study's findings suggest the need for targeted policy interventions, including educational campaigns and stricter traffic law enforcement, to improve the safety and working conditions of food delivery riders, thereby reinforcing the conclusions drawn in previous research (Christie and Ward 2023; Oviedo-Trespalacios et al. 2022).

This study has several limitations that should be considered. First, the data on traffic incidents involving food delivery riders were limited to records from the Romanian Traffic Police Directorate and a survey conducted in Cluj-Napoca, which may not fully represent the experiences of riders in other regions of Romania. Additionally, the survey sample size of 168 responses may not capture the full diversity of the migrant rider population. Another limitation is the reliance on self-reported data, which can be subject to biases such as underreporting of risky behaviours. Future research should expand the geographic area to include multiple cities and regions in Romania and increase the sample size for greater representativeness. Transversal studies could provide deeper insights into trends and the effectiveness of implemented safety measures over time. Furthermore, exploring the impact of specific interventions, such as educational campaigns and infrastructural improvements, on reducing traffic incidents among food delivery riders would be valuable. Investigating the experiences of other migrant groups and comparing them with local riders could also offer a more comprehensive understanding of the unique challenges faced by different segments within the gig economy.

4. CONCLUSIONS

This study provides a comprehensive analysis of the increasing trend of traffic incidents involving food delivery riders from Pakistan, Sri Lanka, and Bangladesh in Romania between 2017 and 2023. The

data reveals a sharp increase in the number of incidents, peaking in 2023, which underscores the growing safety concerns within the gig economy. Several factors contribute to these incidents, including rider misconduct, inappropriate speed, and the pressures of meeting delivery deadlines.

Key findings indicate that a significant portion of incidents is due to falls from vehicles, rear-end collisions, and various unspecified traffic interactions, highlighting the need for targeted safety measures. The analysis also points to the importance of robust organizational practices, including safety protocols, training programs, and support systems, which can significantly reduce accident rates.

Furthermore, the study identifies distinct patterns in safety behaviour among delivery personnel from different regions, emphasizing the influence of regional factors on road safety practices. Notably, helmet use varies significantly, with lower usage among riders from Pakistan and Sri Lanka, correlating with higher instances of mobile phone use while driving.

The insights gained from this research highlight the necessity for comprehensive policy interventions to enhance the safety and working conditions of food delivery riders. Recommendations include the implementation of educational campaigns focused on safe riding behaviour, stricter enforcement of traffic laws, and infrastructure improvements tailored to the unique challenges faced by these workers.

By addressing these issues, policymakers can help mitigate the risks faced by food delivery riders, ensuring safer urban mobility and better working conditions within the gig economy. The study's findings are particularly relevant as Romania prepares to welcome an increased number of foreign workers, necessitating proactive measures to safeguard this vulnerable workforce. Therefore, studies should be further conducted for the other major cities in the country, based on larger data sets to explore the impact of safety interventions and diverse migrant experiences for a comprehensive understanding of this ongoing phenomenon.

5. ACKNOWLEDGEMENTS

Author contributions: all authors had equal contribution to the paper.

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