Vulnerable Road User Series:

Report 1

INJURIES RESOLUTION BOARD

BORD UM RÉITEACH DÍOBHÁLACHA PEARSANTA
PERSONAL INJURIES RESOLUTION BOARD

Accidents involving Cyclists and E-scooter Users

December 2024

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About the Injuries Resolution Board

Who We Are:

The Injuries Resolution Board is an independent State Body established in 2004 to support the fair, prompt, and transparent resolution of personal injuries claims without the need for unnecessary litigation.

Through the Injuries Resolution Board, personal injuries claims can be resolved impartially without the need for many of the costs and time associated with litigation. The Injuries Resolution Board is a self-funded public body and is a key pillar in contributing to reform of the insurance sector and the personal injuries environment.

The Injuries Resolution Board generates millions of euros in savings which would otherwise be spent on pursuing claims through litigation leading to higher costs for parties to claims and ultimately to policy holders, communities and businesses.

The Injuries Resolution Board collects comprehensive data on claims related to road traffic accidents, workplace accidents, Public Liability accidents and Garda Compensation Scheme claims. This data can contribute to accident prevention and road safety policy, through the identification of factors associated with an increased risk of personal injury.

About This Report:

Our Vulnerable Road User Series aims to maximise the value of personal injury claims data to enhance the safety of those most at risk of injury on our roads. By focusing on the specific types of road users who are more susceptible to sustaining severe and lifechanging injuries in road traffic accidents, this series aims to identify high-risk groups and provide crucial insights for developing effective road safety policies and public awareness campaigns.

Please refer to this report as follows:

Kedia, Shekhar; Swan, Lauren (2024). *Accidents involving Cyclists and E-scooter Users.* Vulnerable Road User Series, Report 1. Injuries Resolution Board, Ireland.

Executive Summary

As of December 9th, 2024, 167 people have tragically lost their lives on Irish roads this year, including 32 pedestrians, 17 motorcyclists, 10 pedal cyclists, and 4 e-scooter users[1]. Each statistic represents an individual, a family, and a community that has endured an immeasurable loss due to accidents on our roads this year. This report explores personal injury compensation awarded to cyclists and e-scooter users in 2023 for injuries sustained in road traffic accidents.

The heightened vulnerability of certain road users—pedestrians, cyclists, e-scooter users, and motorcyclists—to sustaining life-changing or fatal injuries in road traffic accidents has led to the use of the collective term 'vulnerable road users'. Recognising the importance of safeguarding this group, extensive research has been conducted to better understand the risk factors associated with accidents involving vulnerable road users. This report aims to build on existing evidence by analysing personal injury claims and medical data, incorporating both quantitative and qualitative insights. This report identifies high-risk demographic groups, detailed injury patterns, and specific risk factors of road traffic accidents involving vulnerable road users in Ireland. It is hoped that the findings will inform the development of road safety and accident prevention policy.

Key findings:

In 2023, the Injuries Resolution Board made 329 assessments of compensation for road traffic accidents affecting cyclists and 32 awards for injuries sustained by e-scooter users, totalling over €9.84 million in compensation. The following key findings are based on a comprehensive analysis of claims and medical data relating to each accident.

Demographic characteristics of injured cyclists and e-scooter users:

- The analysis highlights demographic differences between cyclists and e-scooter users. A majority of injured cyclists were aged between 36-60 years (54%), while most injured e-scooter users were aged between 18-35 years (59%).
- Injured e-scooter users were more likely to be students (16% vs. 9%) and minors aged under 18 years (13% vs. 5%) compared to cyclists.

These demographic differences underscore the need for tailored road safety awareness campaigns to effectively reduce injury risks for both groups.

Environmental risk factors of accidents involving cyclists and e-scooter users:

- E-scooter accidents are twice as likely to occur between 6 PM and 6 AM, with 31% occurring during these hours compared to 15% for cyclist accidents.
- Almost all accidents involved collisions with cars (90%), with 10% involving trucks, buses, or vans, and 1% involving motorcyclists.
- While specific location data was not available for every case, 11% of accidents occurred at junctions, 10% at roundabouts, and 6% within cycle-lanes.

1 Roads Policing fatalities to date for 2024 - Garda

- The frequency of accidents at roundabouts was higher among e-scooter users (16%), suggesting an increased accident risk at these locations for this vulnerable road user group.
- E-scooter users were more likely to report not wearing a helmet at the time of the accident than cyclists (34% vs. 19%, respectively).

The analysis identifies key risk factors for road traffic accidents among cyclists and e-scooter users, highlighting differences in accident locations and helmet usage and providing important insights for future policy development.

Severity of injuries sustained by cyclists and e-scooter users:

- Cyclists and e-scooter users are significantly more likely to sustain serious/severe injuries in road traffic accidents than motorists.
- Based on personal injury awards made in 2023, 11% of accidents involving cyclists and e-scooter users resulted in severe/serious injuries compared to just 1% of accidents affecting motorists.
- While orthopaedic injuries were most common among both groups, e-scooter users experienced higher rates of facial injuries (13% vs. 5%).
- 1 in 5 injured cyclists and e-scooter users reported psychological injuries, with higher rates among females (30% vs. 16%), and with close to half of all injured cyclists and e-scooter users aged under 18 years sustaining psychological injuries.
- 21% of cyclists and e-scooter users were hospitalised as a result of the accident, with cyclists experiencing a longer in-patient duration (4.5 days) than injured e-scooter users (1.5 days).

Impact on employment, quality of life, and personal relationships:

- 87% of injured cyclists and e-scooter users who were employed at the time of the accident experienced a negative impact on their employment, with 73% reporting absenteeism of one week to three months and 13% absent for six months to a year. Notably, 5% had ongoing absenteeism 1.6 years after the accident.
- Qualitative data from medical notes highlighted financial implications, limited work or loss of productivity, change of job, and change of commute/fear of commuting as consequences of accidents on occupational activities.
- 76% of injured cyclists and e-scooter users reported an impact on their quality of life, including inability to continue cycling, impact on fitness and physical activity, fear and anxiety, and consciousness of scarring, with the severity of injury increasing the likelihood of these negative impacts.
- 12% of injured cyclists and e-scooter users reported strained personal relationships as a result of their injuries, including strain on parenting, relationships with partners, and negative impacts on social relations.

Injured cyclists and e-scooter users reported reduced physical capabilities, psychological impacts, and strained personal relationships as a result of their accidents, highlighting the far-reaching consequences of road traffic accidents on vulnerable road user groups.

Cyclists and e-scooter users are significantly more likely to sustain serious/severe injuries in road traffic accidents than motorists.

Personal injury compensation for cyclists and e-scooter users:

- In 2023, a total of €9.8 million personal injury compensation was awarded to injured cyclists and e-scooter users, with €8.4 million for general damages (pain and suffering) and €1.38 million for special damages (financial losses).
- The average award among cyclists was €27,837 compared to €20,513 among injured e-scooter users

This report highlights the complex and multifaceted challenges faced by vulnerable road users in Ireland. The findings show that injured e-scooter users are significantly younger than injured cyclists, with 13% aged under 18 years old. E-scooter users are more likely to be students, report not wearing helmets, and be involved in night-time accidents and incidents at roundabout junctions than cyclists. In contrast, the majority of injured cyclists are aged between 36-60 years, are more likely to be employed, and sustain greater severity injuries, often requiring extended recovery periods. The findings underline the need to develop interventions around safety measures and educational campaigns specifically tailored to the risks and demographics of each group to effectively reduce road traffic accidents among vulnerable road users.

The report underscores the importance of enhancing road safety for vulnerable users through improved safety policies and targeted public awareness campaigns. To mitigate future risks, preventive measures—such as promoting helmet use and raising awareness of the long-term effects of accidents—should be prioritised. The findings also highlight the most frequent causes, locations, and impact of road traffic accidents involving cyclists and e-scooter users in Ireland.

Future research could build on the findings included in this report and explore additional information, including the nature of the journey, such as the purpose and distance of trips, the types of junctions and roundabouts encountered, and the quality of cycle lane infrastructure. A detailed understanding of these road usage patterns would contribute valuable insights for accident and injury analysis, supporting the development of targeted intervention strategies.

Infographic Summary

Personal Injury Compensation for Cyclists and E-scooter Users in 2023

€9.84M

in compensation awarded to injured cyclists and e-scooter users in 2023

Average age of injured cyclist

42 years old

Injured e-scooter users

59% aged 18-35 years

16% students

E-scooter accidents are twice as likely to occur between 6pm-6am

31% of e-scooter accidents

15% of cyclist accidents

Occurred between 6pm-6am

90%

of accidents involved collisions with cars

Common Accident Locations

- **11%** at junctions
- **10%** at roundabouts
- **6%** on cycleways
- **2%** on footpaths

13% of injured cyclists

9% of injured e-scooter users

1% of car drivers/ passengers

sustained severe or serious injuries in road traffic accident injury claims in 2023

Impact of accident on cyclists and e-scooter users

Psychiatric Damage Injuries

1 in 5

injured cyclists and e-scooter users sustained psychiatric damage injuries

48%

of injured cyclists and e-scooter users under 18 years sustained psychiatric damage injuries

Overarching Themes: The impact of accidents

Financial loss, including job loss

87% experienced a negative impact on their employment

Fear of cycling

"He used to enjoy cycling but feels as he got knocked off his bike it is now too dangerous"

Reduced quality of life

76% reported a negative impact on their quality of life

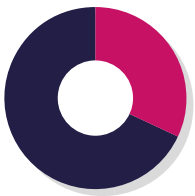
Strained personal relationships

This included strain on parenting and relationships with partners

E-scooter users were more than twice as likely to sustain facial injuries in road traffic accidents

On average, at 1.6 years post accident

32%



of injured cyclists and e-scooter users required further treatment

21%

injured cyclists and e-scooter users were hospitalised

Average length of in-patient stay

4.5 days

Cyclists

1.5 days

E-scooter

Table of Contents

List of Tables

List of Figures

List of Abbreviations

PPTs	Personal Powered Transporters
RTA	Road Traffic Accident
VRU	Vulnerable Road User
PTSD	Post-Traumatic Stress Disorder
VAS	Visual Analogue Scale
NDI	Neck Disability Index
GP	General Practitioner

Chapter 1:

Introduction

Road safety is a major public health priority that impacts all road users. With the increasing interaction of various modes of transportation—cars, public transit, bicycles, e-scooters, and pedestrians on our roads, the protection and safety of all road user groups has gained renewed focus. The global shift towards sustainable mobility has boosted the use of cycling and e-scooters, offering environmental and health benefits, but also introducing new safety challenges for commuters, particularly for vulnerable road users.

Cyclists and e-scooter users are defined as vulnerable road users due to the minimal physical protection offered by these modes of transport. The European Commission (2023) reports that vulnerable road users account for a significant portion of road traffic injuries and fatalities annually. In Ireland, road safety concerns have escalated with the rise in popularity of cycling and e-scooter use, particularly in urban areas (Road Safety Authority, 2023). The Irish Census (2022) reveals that approximately 3% of the workforce now commute by bicycle, a figure that is expected to rise as more people choose green and sustainable modes of transport. E-scooter use has similarly expanded, with the Road Traffic and Roads Acts (2023) officially classifying them as Personal Powered Transporters (PPTs) and introducing the first legal framework for their use on Irish roads. This legislation permits and regulates the use of e-scooters, marking a key step in their integration into Ireland's transportation system. While this shift toward cycling and e-scooter use reflects positive change in our environmental consciousness, this behavioural shift has outpaced the rate of research on the characteristics, mechanisms and factors influencing the risk of accidents for such groups.

The severity of injuries sustained by cyclists and e-scooter users in road accidents is influenced by several factors, such as speed at the time of collision, helmet use, and the availability of protective gear. A meta-analysis by Olivier and Creighton (2017)—which combines and reviews data from multiple studies on bicycle injuries and helmet use—found that wearing helmets reduces the risk of serious head injuries by nearly 70% and the risk of fatal head injuries by 65%.

Additionally, international research has identified adverse weather conditions, demographic characteristics such as gender and night-time use as contributing to an increased risk of accidents among cyclists and e-scooter users (Xinchi Dong, 2024). There is a need to explore a wider range of factors which may influence the likelihood and impact of accidents among this group, to enhance the safety of both cyclists and e-scooter users.

While the current body of research offers valuable insights into the risks faced by vulnerable road users, there is a growing need for updated studies, given the increasing popularity of e-scooters. This report aims to address this gap in the literature by providing a comprehensive and comparative analysis of incidents involving both cyclists and e-scooter users. It examines the circumstances of accidents, the nature and severity of the injuries sustained, the treatment and recovery processes, and the compensation awarded. It is hoped that the findings will serve as a vital resource for policymakers, urban planners, healthcare providers, and the general public, highlighting key areas for safety improvements. Ultimately, this report seeks to offer evidence-based recommendations that can guide the development of safer roads and reduce the risks associated with these emerging, and increasingly popular, modes of transport.

Chapter 2:

Study Methodology

Study overview

This study analyses claims-related and medical data related to a total of 361 assessments of compensation made by the Injuries Resolution Board in 2023 for injuries sustained by cyclists and e-scooters as a result of road traffic accidents, adopting a retrospective cohort design.

The primary aim of this study was to contribute to road safety policy through the description of road user groups with additional vulnerability to road traffic accidents in Ireland. Secondly, this study aims to identify factors associated with injuries of greater severity among vulnerable road users. This report forms the first iteration of a two-part series.

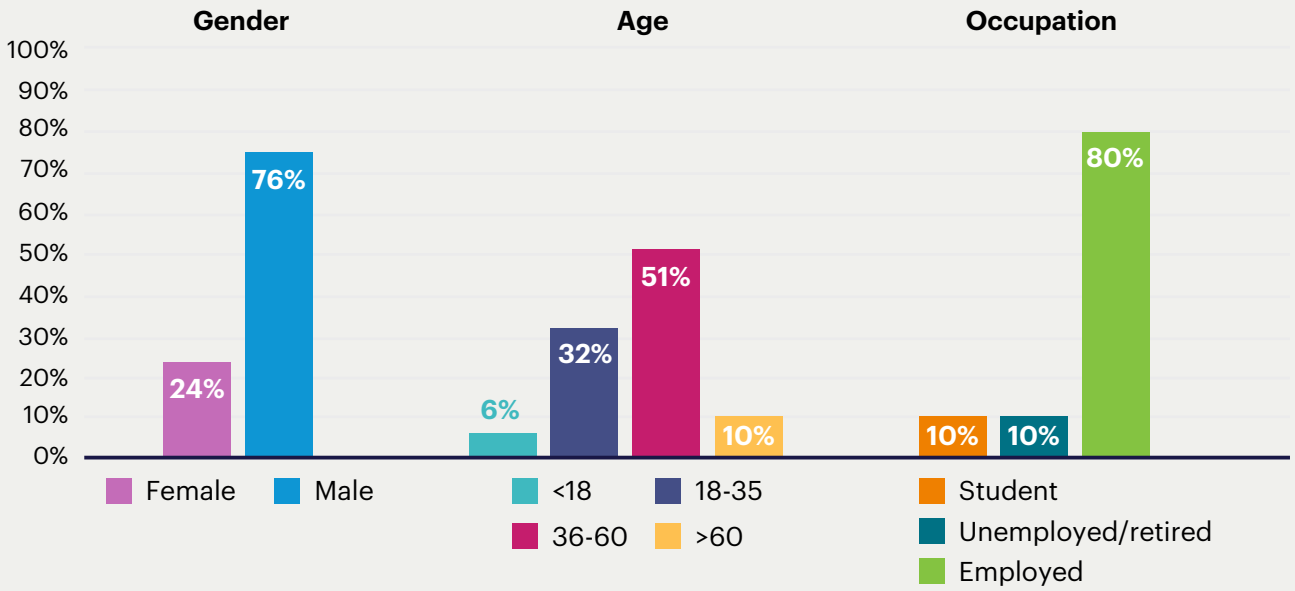
While this report focusses on e-scooter users and cyclists a subsequent report will focus on accidents involving pedestrians.

Study population

The study population consists of 329 assessments of compensation made for injuries sustained by cyclists in 2023 and 32 awards made for injured e-scooter users. The following figure provides an overview of the demographic profile of both road user groups, with a majority being male (76%) and aged between 36-60 years old (51%).

Figure 1

Demographic profile of the study participants



Study strength and limitations

This study comprehensively examines all road traffic accidents (RTAs) involving cyclists and e-scooter users that were assessed and ultimately awarded compensation by the Injuries Resolution Board between January 1st and December 31st, 2023. One limitation of this data source is that it only includes cases that were assessed through the Injuries Resolution Board's personal injury assessment process. This excludes accidents where the injured party did not seek compensation, such as single collisions, potentially underestimating the number of minor injury cases, as well as instances where the respondent to a claim did not provide consent for an assessment by the Injuries Resolution Board.

Another important consideration is that the findings on injury severity and its impact on injured cyclists and e-scooter users' lives are based on medical examinations conducted, on average, 568 days (approximately 1.6 years) after the accident. While this offers valuable insights into the medium- and long-term effects of injuries, it does not account for the immediate aftermath of the accidents, which could provide a different perspective on injury impact and recovery trajectories.

Further limitations arise from the lack of designated fields in medical reports to capture key accident details such as time, cause, and location, as well as whether the injured cyclists and e-scooter users were wearing a helmet. These details were gathered from brief descriptions provided by medical practitioners, leading to incomplete data for some accidents. The analysis presented in this study is based on data from a total of 361 injured cyclists and e-scooter users, with any missing information categorised separately as NA.

For consistency, the time of the accident was recoded into a six-hour format: 6–12 noon was categorised as "morning," 12–18 as "afternoon," 18–24 as "evening," and 24–6 as "night." If the accident brief provided by the medical practitioner lacked this information, it was sourced from the Injuries Resolution Board's database. Similarly, for the place of accident, if it was not specified in the brief, it was recoded as "road." This may have led to an overestimation of accidents happening on roads, as some could have occurred at junctions or in cycle lanes.

In conclusion, while some data limitations exist, particularly in capturing specific accident details, this study provides important insights into the nature of accidents and injuries, their impact on injured cyclists and e-scooter users' lives, and demographic variations, particularly between cyclists and e-scooter users. These findings contribute to a broader understanding of road safety challenges faced by vulnerable road users.

Data Analysis

As part of the Injuries Resolution Board's claim assessment process, claimants are generally required to attend a medical appointment which documents the accident details, the nature and prognosis of the injuries sustained, the impact of the accident on the injured party's functional independence and any required treatments. Medical practitioners are provided with a standardised template to use in compiling the medical report. The completed medical report includes both quantitative and qualitative details about the nature and impact of the accident.

Quantitative data analysis

This includes demographic details and information related to the injured cyclists and e-scooter users' accident, injury, impact of the accident on employment, personal activities and functional independence, healthcare utilisation following the accident, the estimated injury prognosis and any required treatments. The table in Appendix 1 lists all the quantitative data that was analysed as part of the study.

Descriptive statistics were employed to analyse the quantitative data, using both univariate and bivariate analyses. Univariate analysis provided insights into general trends, while bivariate analysis examined relationships between variables, revealing variations across different categories, such as gender, age, occupation, case severity, and user type.

It is important to note that there are 329 cyclist cases compared to only 32 e-scooter cases. Due to this significant imbalance, any statistical comparisons between the two groups should be interpreted cautiously, focusing on directional estimates or trends rather than generalisable conclusions.

Qualitative data analysis

The qualitative data for the study comprises of the medical practitioners' opinions and feedback regarding the injured cyclists and e-scooter users' injury, focusing on its impact on employment, quality of life, and personal relationships.

The qualitative data was analysed through thematic analysis, identifying recurring themes in the medical practitioners' assessments of the injury's impact on the injured cyclists and e-scooter users' life. The analysis was further contextualised in relation to the injured cyclists and e-scooter users' demographic details (gender, age, occupation) and severity of injury to provide a more nuanced and informative analysis rather than a standalone commentary of the top themes.

Results

This section provides an in-depth analysis of accident patterns, the nature and severity of injuries sustained by injured cyclists and e-scooter users, and the resulting impact on their lives. It also examines the treatment processes and the prognosis for recovery.

Chapter 3:

Demographic Characteristics of Cyclists and E-scooter Users

This study focused on vulnerable road users who were injured while cycling or using e-scooters[2], and subsequently awarded personal injury compensation by the Injuries Resolution Board in 2023. The findings show that 329 awards were made in 2023 for injuries sustained by cyclists, while 32 awards were made for injuries sustained by e-scooter users.

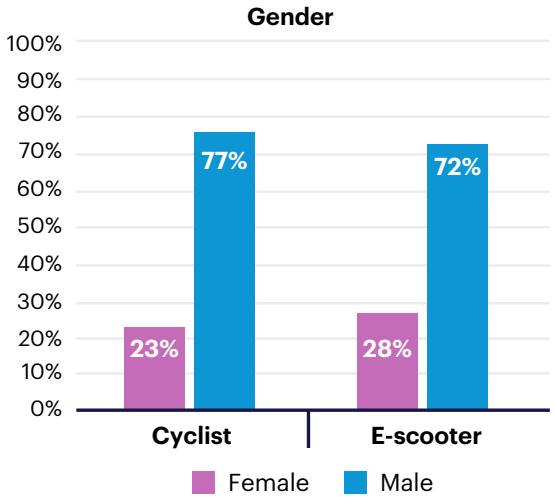
Analysis of the demographic characteristics of cyclists and e-scooter users identified several differences in the profile of both groups. The analysis showed that 23% of cyclists were female, compared to 28% of e-scooter users, suggesting a slightly higher preference for e-scooters among women. The average age of cyclists was 42 years, while e-scooter users averaged 31 years. In terms of age distribution, the majority of pedal cyclists (54%) were adults aged 36-60 years, whereas the majority of e-scooter users (59%) were young adults aged 18-35 years, indicating a stronger preference for e-scooters among younger individuals.

Although most injured road users were employed, there was a noticeable increase in the proportion of students among e-scooter users. Additionally, the findings show that approximately 10% of injured e-scooter users were under the age of 16. The compensation assessments included in this study relate to accidents which occurred during or prior to 2023, and at this time, no age restrictions were in place which enforced a minimum age for the use of e-scooters. In 2024, however, new Department of Transport regulations[3] set the legal age for e-scooter use at 16 years and older. Future studies should explore the impact of the regulations on e-scooter accidents among this age demographic.

The above findings are in line with previously published research by Rutgers University which states that the median age for injured adult cyclists is 45 years old compared to 32 years for e-scooter users. The study also found a greater preference for e-scooter among females compared to bicycles (Younes, Noland, & Hagen, n.d.).

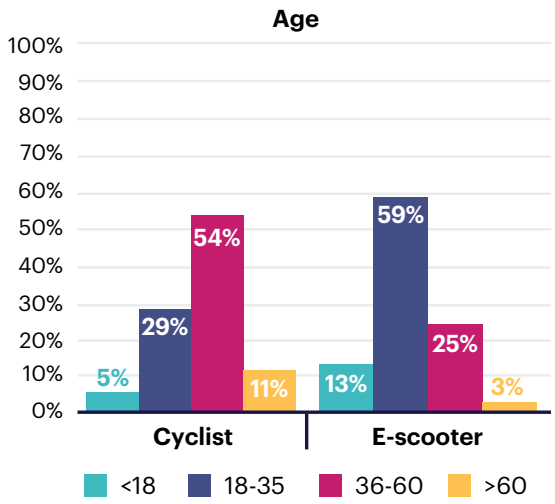
Figure 2

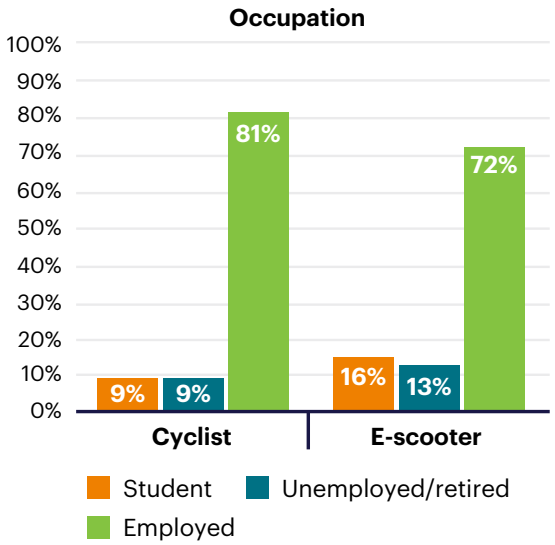
Type of vulnerable road user by key demographic variables



2 An e-scooter is a vehicle with a small standing platform and no seat, for use by one person only. An e-scooter may have two or more wheels and be propelled by an electric motor.

3 gov.ie - New regulations for e-scooters and e-bikes come into force next Monday (www.gov.ie)





There was a noticeable increase in the proportion of students among e-scooter users. Additionally, the findings show that approximately 10% of injured e-scooter users were under the age of 16.

Chapter 4:

Accidents affecting Cyclists and E-scooter Users

Accident details

This section focuses on the time at which accidents affecting cyclists and e-scooter users occurred, as reported in the claim application form, in addition to the accident cause, location and proportion of cases where the injured road user reported wearing a helmet.

Time of accident

The time of accident refers to the specific periods during the day, days of the week, and months of the year when accidents involving cyclists and e-scooter users are most likely to occur. This information can identify underlying patterns that indicate when cyclists and e-scooter users are particularly susceptible to accidents.

Figure 3

Accident cases by time of the day

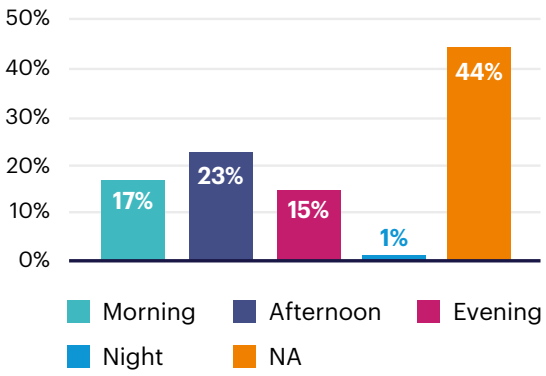
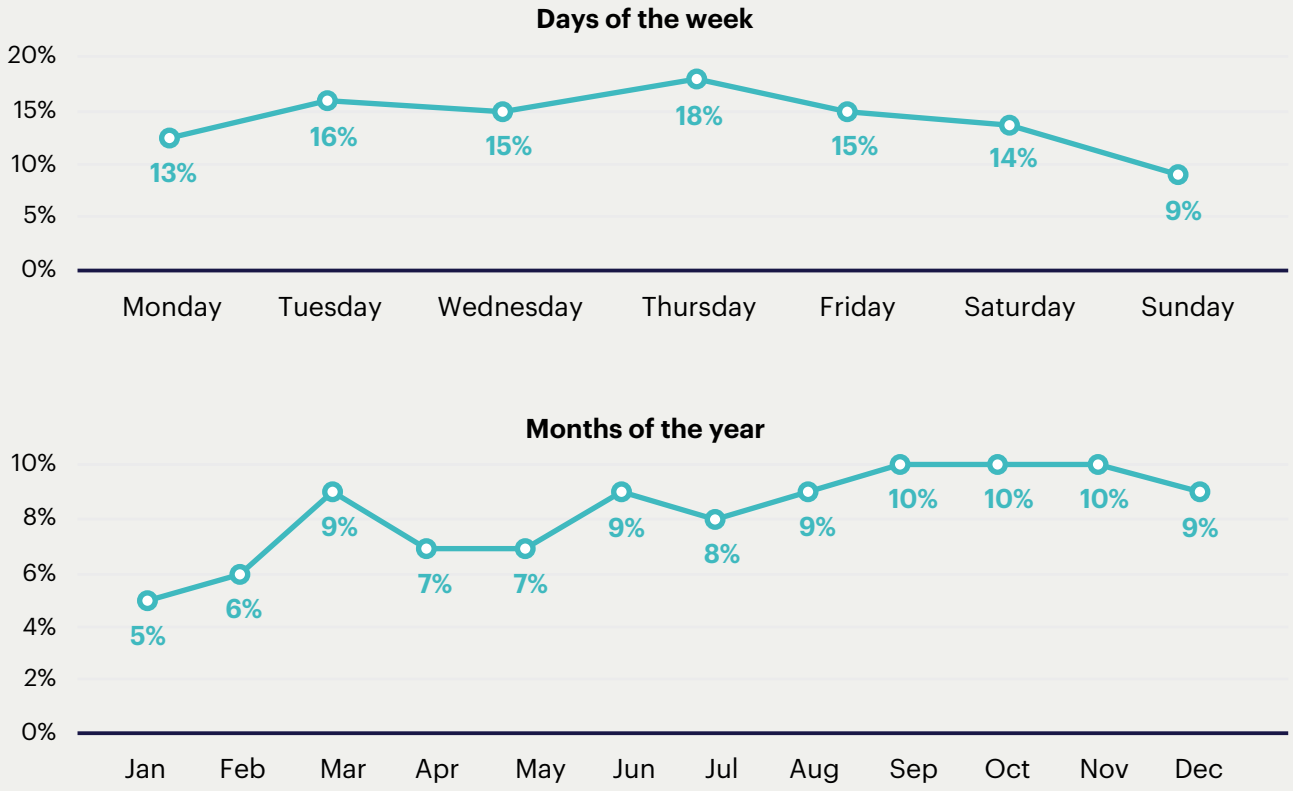


Figure 3 describes the distribution of accidents involving cyclists and e-scooter users based on the time at which each accident occurred. While data on time of accident was not available, for 44% of cases, among those with recorded time available 40% occurred during daylight hours, and 16% occurred between 6 pm and 6 am (evening and night). When this was explored further based on road user type, 15% of accidents involving cyclists occurred between 6 pm and 6 am, compared to 31% of e-scooter accidents during this period. This finding highlights an elevated risk of accidents during darker periods for e-scooter users in comparison to cyclists. Future research should investigate whether e-scooter users experience reduced visibility, including a review of light installation on these devices and the availability of high-visibility clothing.

When accidents are examined based on the day of the week on which they occurred, no clear pattern emerged. However, it is notable that the highest proportion of accidents (18%) occurred on Thursdays, while Sundays had the lowest accident frequency (9%). Analysis of accidents based on month of occurrence shows, the distribution of accidents is relatively consistent throughout, with a slight increase in reported cases from September to November, suggesting seasonal effects, however, this increase may simply reflect the specific dataset utilised in this study.

Figure 4

Accident cases by day of the week and month of the year

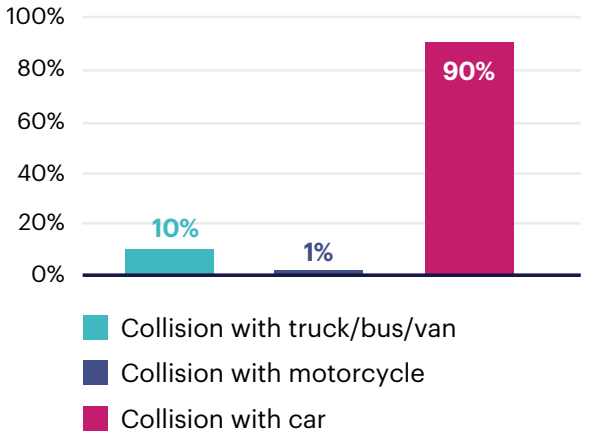


Cause of accident

The analysis revealed that 90% of accidents involving cyclists or e-scooter users involved collisions with cars, 9% with larger vehicles such as trucks, buses or vans, and 1% involved collisions with motorcycles. This is in accordance with the cyclist spotlight report prepared by the Road Safety Authority in 2023[4] which states that cars and light goods vehicles were most frequently involved in collisions with vulnerable road users.

Figure 5

Cause of accident



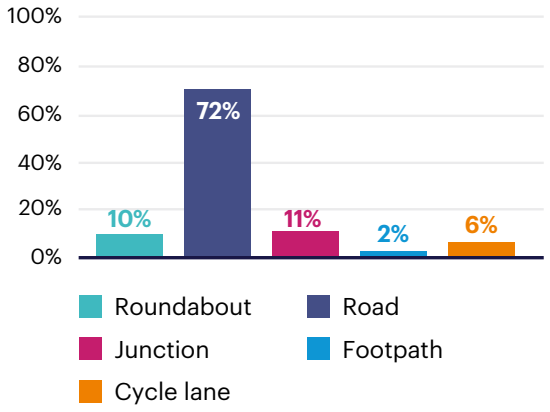
4 https://www.rsa.ie/docs/default-source/road-safety/r2---statistics/analysis-of-road-users/cyclist-spotlight-report-fatalities-and-serious-injuries-2018-202254c1fadd-3677-45a3-a36f-597f0968cc82.pdf?sfvrsn=617804d8_5

Place of accident

Analysis of accidents based on the specific place in which they occurred can identify vulnerable spots on the road that are more prone to accidents. The data shows that 72% of accidents affecting cyclists and e-scooter users occurred on roadways, while 21% took place at junctions and roundabouts—areas that pose an increased risk to vulnerable road users due to reduced visibility. This finding underscores the need for greater public awareness, particularly among motorists, of the increased risk posed to cyclists and e-scooter users at roundabouts and junctions.

Figure 6

Place of accident

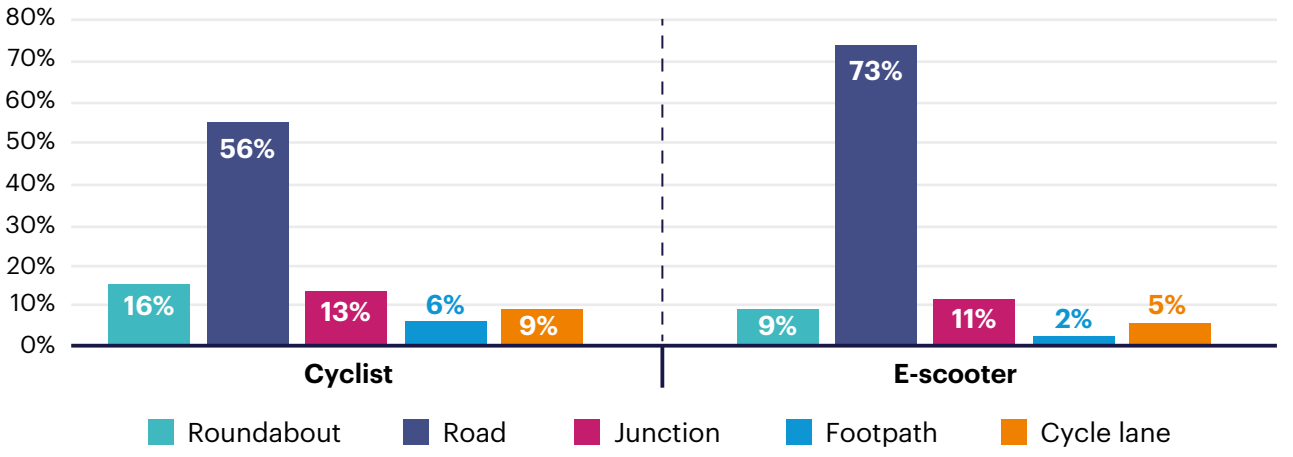


Additionally, cycle lanes, which provide designated spaces for cyclists on our roads, are not entirely free from risk. Overall, 6% of cyclist and e-scooter users reported accidents occurring within cycle lanes. These accidents often involved collisions with stationary vehicles when passengers opened doors into the cycle lane. This finding highlights the need for motorists to exercise caution, and to appropriately assess their surroundings when opening doors to avoid causing injury to cyclists and e-scooter users.

It's also important to consider whether cyclists and e-scooter users face different risks based on accident location. While roads are the most common site of accidents for both groups, the data suggests that e-scooter users experience a more varied distribution of accident locations. E-scooter users are more likely than cyclists to be injured on footpaths, potentially reflecting greater use of footpaths in comparison to cyclists. Additionally, e-scooter users report a greater proportion of accidents occurring at roundabouts (+5%), raising questions for policymakers about whether these intersections could be improved to support e-scooter safety.

Figure 7

Place of accident by VRU group



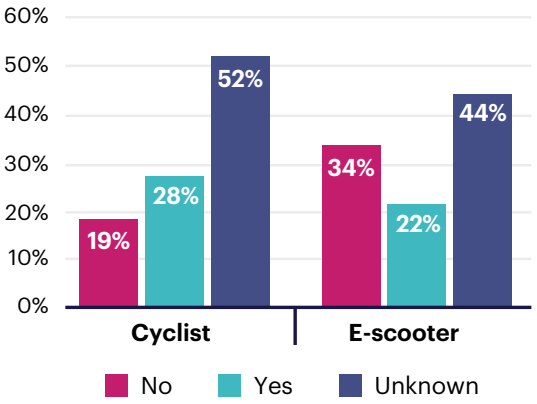
Proportion of Cyclists and E-scooter Users wearing helmets

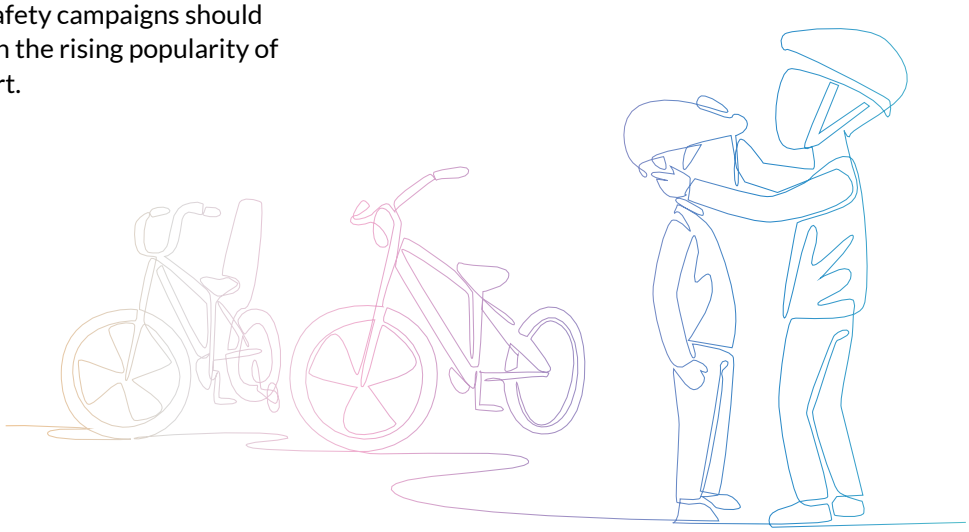
Helmets can significantly reduce the severity of head injuries sustained by users during accidents. Although the medical reports analysed in this study lack a designated field for recording helmet usage, many medical practitioners have included this information in their accident descriptions. This data was missing for 52% of files included in this study. Based on the available data, 28% of injured cyclists and e-scooter users reported wearing a helmet at the time of the accident, and notably, there were no significant differences in injury severity between those who wore helmets and those who did not.

When examining helmet usage by the type of vulnerable road user, the data shows that 19% of cyclists reported not wearing a helmet, compared to 34% of e-scooter users. This disparity raises significant safety concerns for e-scooter users, as head injuries can be particularly severe and potentially fatal. The findings highlight the urgent need for greater public awareness of the risks associated with not wearing a helmet. Interestingly, new regulations for e-scooters and e-bikes from the Department of Transport which came into force earlier this year, do not mandate the use of helmets[5]. Future road safety campaigns should consider this issue, given the rising popularity of these modes of transport.

Figure 8

Helmet usage by VRU





5 https://www.gov.ie/en/press-release/4ea3a-new-regulations-for-e-scooters-and-e-bikes-come-into-force-next-monday/

Chapter 5:

Injuries Sustained by Cyclists and E-scooter Users

The Personal Injuries Guidelines, introduced in April 2021, established an appropriate compensation range for common injury types arising from accidents, with higher award ranges corresponding to more severe injuries. While it is not possible to monitor changes in severity across all injury types, it is possible to examine the proportion of injuries classified as minor, moderate or serious/severe for the most common injury types. This includes ankle injuries, back injuries, knee injuries, neck injuries, psychiatric damage injuries, shoulder injuries and wrist injuries.

Injury severity

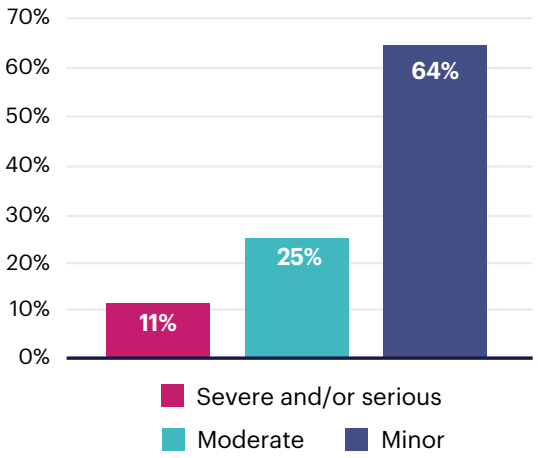
As per the Personal Injuries Guidelines, among the most common orthopaedic injuries, severity is generally classified as follows:

- **Minor severity** orthopaedic injuries typically include soft tissue injuries where a substantial recovery occurs within a maximum of five years.
- **Moderate severity** orthopaedic injuries often involve fractures that cause significant levels of pain and discomfort.
- **Severe and serious** orthopaedic injuries encompass injuries that cause severe levels of pain and discomfort and may lead to individuals experiencing impairments in their ability to complete tasks independently.

The study found that 64% of the cases were classified as minor severity, 25% as moderate, and the remaining 11% as severe and/or serious. A comparative analysis of all assessments of compensation made in 2023 for injuries sustained by motor vehicle drivers and passengers as a result of road traffic accidents was undertaken. The analysis found that in 2023, 1% of motorists sustained serious/severe injuries in comparison to 11% of cyclists and e-scooter users. This finding adds further evidence to the classification of some road users as vulnerable, with this study showing that more than 1 in 10 cyclists and e-scooter users sustained severe and/or serious injuries as a result of accidents in comparison to 1 in 100 motor vehicle users.

Figure 9

Injury severity



When analysing injury severity by vulnerable road user type, the distribution across the three severity categories—minor, moderate, and severe/serious—is relatively consistent. This uniform distribution suggests that the type of vulnerable road user group the injured cyclists and e-scooter user belongs to has minimal to no correlation with the severity of the case. This is also corroborated by the study conducted by Rutgers University where they suggest that e-scooter users do not sustain more severe injuries compared to cyclists and e-bike users (Younes, Noland, & Hagen, n.d.).

Figure 10

Injury severity by VRU

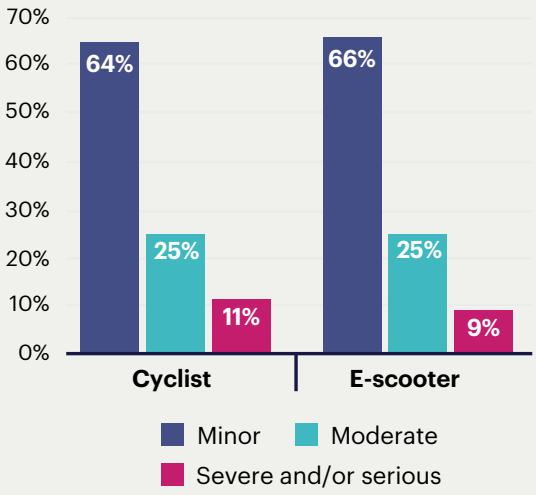
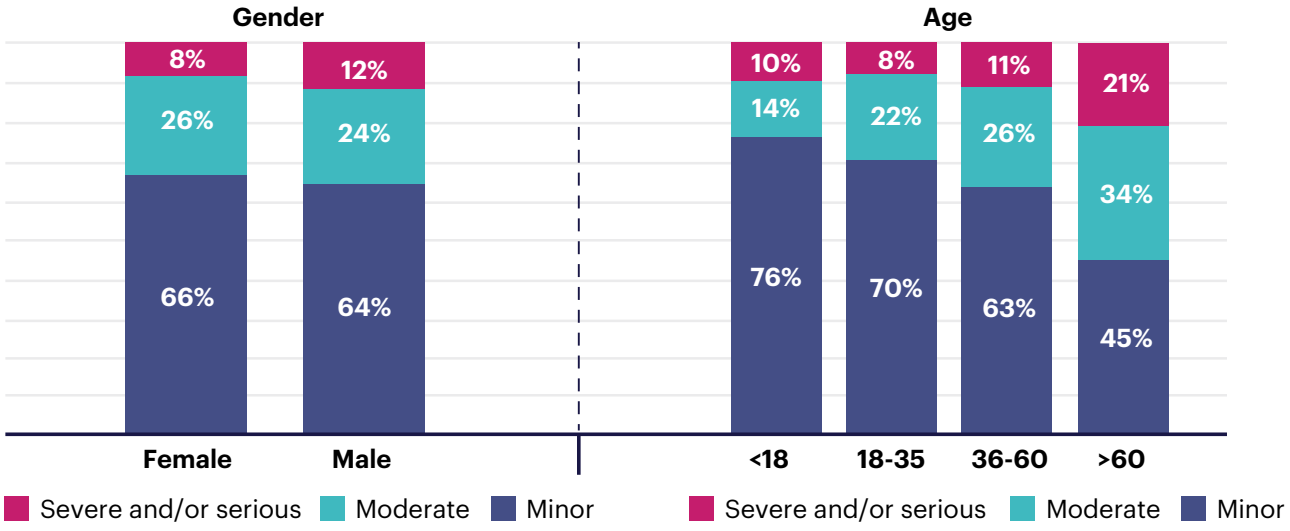


Figure 11

Injury severity by gender and age



A sub-analysis of the included files revealed that male injured cyclists and e-scooter users tend to experience slightly higher injury severity compared to females, with the most significant gender disparity observed in serious and severe cases. A greater proportion of males (12%) reported severe injuries compared to females (8%). In terms of age categories, adults aged 36-60 comprised the largest group, representing 51% of the total cases.

Injury severity showed a slight increase with age, and individuals over 60 were notably overrepresented in the severe and serious injury category, accounting for 21% of such cases—the highest among any age group. In contrast, young adults aged 18-35 were more likely to sustain minor injuries (76%).

Dominant/ Most Significant injury sustained

The Injuries Resolution Board makes an assessment of compensation for both general and special damages in respect of personal injury claims. The award of general damages is determined with reference to the Personal Injuries Guidelines, focusing on the Dominant/ Most Significant injury sustained.

Cyclists and e-scooter users sustained a wide variety of Dominant/ Most Significant injuries, with the "other" category encompassing less frequently occurring injuries, such as head injuries, fingers, thumbs, ankles, and chest injuries.

The most frequently reported Dominant/ Most Significant injuries were to the shoulder (16%) and back (15%), which may be typical in accidents where cyclists or e-scooter users fall to the ground following a collision. A closer look at the data shows that while the overall injury patterns are similar for cyclists and e-scooter users, e-scooter users are significantly more likely to sustain facial injuries (13%), compared to 5% for cyclists.

Figure 12

Dominant/ Most Significant Injury (Overall and by VRU)

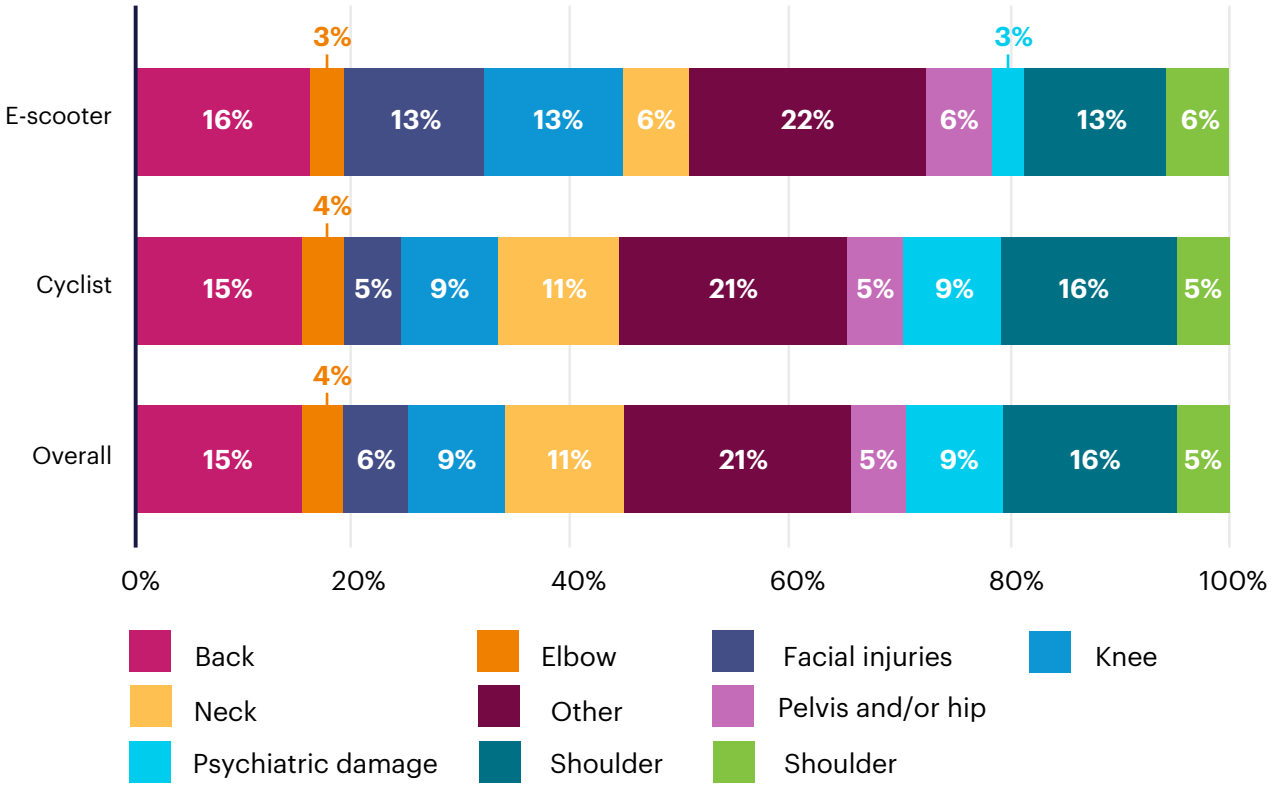
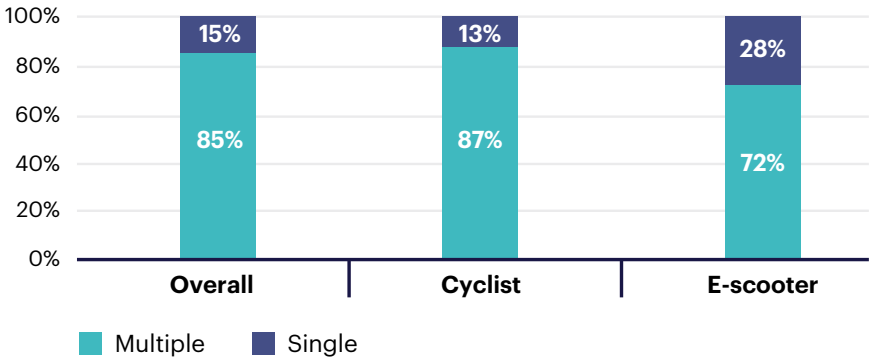


Figure 13

Cases with multiple injuries



Cases with multiple injuries

Cyclists and e-scooter users are particularly vulnerable because they are directly exposed to impact during an accident due to the reduced physical protection offered by these modes of transport in comparison to motor vehicles. This increased vulnerability is evident in the data, as 85% of cases sustained multiple injuries. A higher proportion of cyclists (87%) sustained multiple injuries compared to 72% of e-scooter users. One possible explanation for this difference could be the younger age profile of e-scooter users, which might reduce the severity of the injuries they sustain.

Cases with Psychiatric Injury

Being involved in an accident can often be a traumatic and life-changing experience for many. The study found that 20% of injured cyclists and e-scooter users reported sustaining a psychiatric injury — 9% as their primary injury and an additional 11% as a secondary condition arising from the accident. A notable gender disparity was observed, with 30% of female cyclists and e-scooter users sustaining psychiatric injury compared to 16% of males. The age of the injured road user was also identified as a contributory factor, with 48% of injured cyclists and e-scooter users aged under 18 years sustaining a psychiatric injury, while older age groups ranged between 16% and 20%. Overall, the prevalence of psychiatric injury was similar for both cyclists (20%) and e-scooter users (19%), indicating a significant psychological impact across both groups.

The qualitative data, which is explored in detail later in this report, further highlights the extensive psychological impact of accidents on cyclists and e-scooter users. The evidence shows how accidents can lead to long-term emotional distress, anxiety, and fear, highlighting the profound effects on the well-being of vulnerable road users beyond their physical injuries.

Chapter 6:

Measuring the Impact of Accidents on Cyclists and E-scooter Users

Physiological impact

The physiological impact refers to the physical consequences that cyclists and e-scooter users experienced as a result of the accident. This includes effects on physical mobility and the severity of pain, as assessed by the medical practitioner using standardised scales.

Degree of major symptoms reported

As part of the standardised medical report template which is provided to medical practitioners conducting medical assessments on behalf of the Injuries Resolution Board, the degree of impairment in 16 functional domains are assessed and recorded. This includes impairment in cognitive function such as learning, mental health, sensory functions, in addition to the ability to complete everyday physical tasks, such as climbing stairs independently. This questionnaire, completed by medical practitioners, is intended to provide an insight into the ongoing impact of the accident on the injured parties' independence in a wide range of everyday tasks and associated functions.

On average, injured e-scooter users and cyclists reported experiencing at least two major symptoms, on average, 568 days, or approximately 1.6 years, after the accident. Table 1 outlines the major symptoms and their severity as experienced by the injured road users during medical examinations. While many symptoms may have diminished over time, a significant number of this group continue to experience symptoms at a minor to moderate level at 1.6 years post-accident. The most commonly reported symptoms are related to impairments in physical mobility/function, such as difficulties with carrying or lifting, bending or stooping, sitting, standing, walking, and climbing stairs. Additionally, a notable proportion of injured cyclists and e-scooter users reported mental health symptoms, including post-traumatic stress disorder (PTSD), reflecting the broader impact of the accident on their overall well-being. It is important to highlight that many injured road users continue to experience moderate symptoms even 1.6 years after the accident, indicating the long-term impact on their daily lives. For some, these symptoms may become a permanent part of life, requiring ongoing management of pain and discomfort.

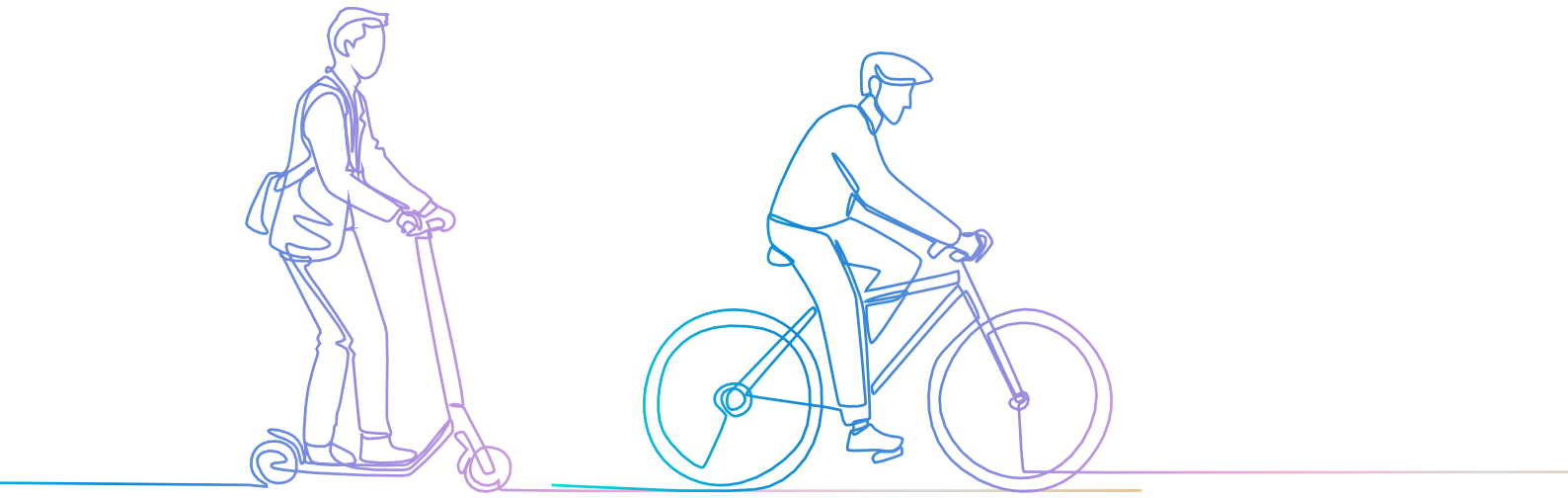


Table 1

Major symptoms and their degree of severity

Degree of Impairment	Normal	Minor	Moderate	Serious	N/A
Mental health	76%	13%	8%	1%	3%
Learning/intelligence	96%	1%	0%	0%	3%
Consciousness/seizure	97%	0%	0%	0%	3%
Balance/coordination	96%	1%	0%	0%	3%
Vision	96%	0%	0%	0%	3%
Hearing	96%	0%	0%	0%	3%
Speech	96%	0%	0%	0%	3%
Continence	97%	0%	0%	0%	3%
Reaching	82%	11%	3%	0%	3%
Manual dexterity	83%	10%	3%	0%	3%
Carrying/lifting	52%	33%	12%	0%	3%
Bending/stooping	70%	19%	8%	0%	3%
Sitting	78%	16%	3%	0%	3%
Standing	80%	15%	2%	0%	3%
Climbing stairs	83%	11%	2%	0%	3%
Walking	79%	14%	4%	0%	3%

Standard measures of mobility and pain

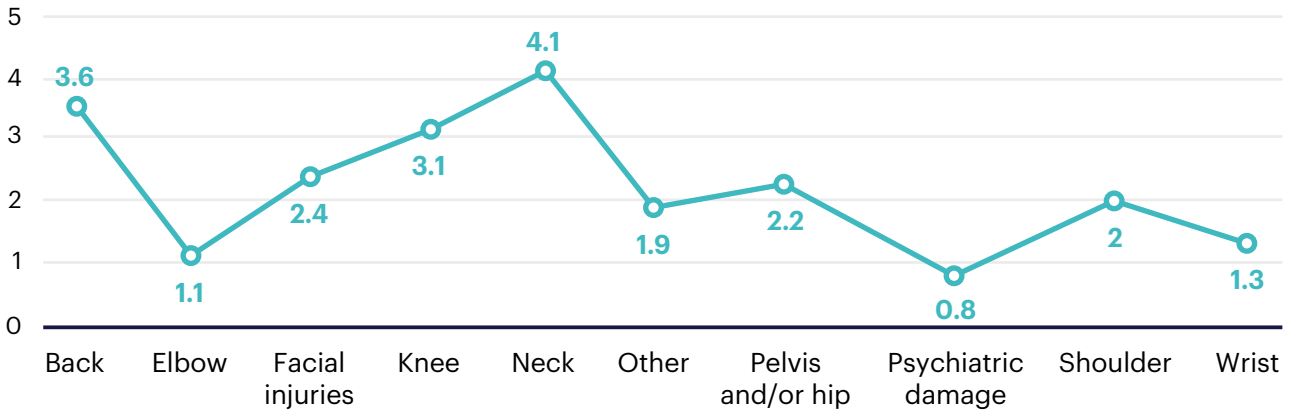
The **Visual Analogue Scale (VAS),** first introduced by Hayes and Patterson in 1921, is a tool commonly used in both epidemiological and clinical research to gauge the intensity of pain. Unlike categorical pain scales that divide pain into distinct levels such as no pain, mild, moderate, and severe pain, the VAS allows patients to express their pain on a continuous spectrum, reflecting the fluid nature of their experience. The VAS primarily measures pain intensity on a scale of 0-10 and is often used to record either the patient's current pain or the pain experienced in the past 24 hours[6].

The study shows that at 1.6 years post-accident, the average pain intensity (VAS) for injured cyclists and e-scooter users was 2.5, corresponding to mild pain, which is a level of pain that is noticeable and may cause discomfort, but which may not significantly interfere with daily activities. It is important to note that the pain intensity at the time of accident would have been higher. Moreover, it is important to contextualise the pain intensity with regard to the type of injury sustained. As shown in Figure 14, neck and back injuries correspond to higher long-term pain intensities on average, in comparison to other injury types.

6 Visual Analogue Scale - Physiopedia (physio-pedia.com)

Figure 14

Average VAS by injury type



The **Neck Disability Index (NDI),** developed in the late 1980s by Dr. Howard Vernon, is a 10-item patient-rated questionnaire for assessing self-rated disability due to neck pain of mechanical origin. It includes condition-specific functional status items like pain, personal care, lifting, reading, headaches, concentration, work, driving, sleeping and recreation. It covers conditions such as "non-specific neck pain," whiplash, whiplash-associated disorder, repetitive strain injury, sports-related neck pain, and neck and arm pain[7]. Overall, a higher NDI score indicates more patient-rated disability.

A total of 93 injured cyclists and e-scooter users sustained back or neck injuries as the dominant/most significant injury. The study data shows that the average NDI score for injured road users that sustained a back or neck injury was 36% which is considered to be within the moderate range.

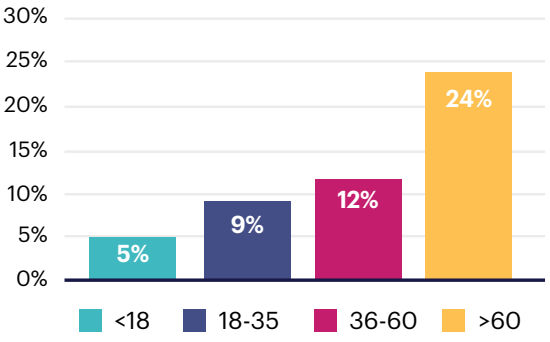
Other physiological impacts

Other physiological impacts of road traffic accidents include aggravation of pre-existing conditions. Approximately 12% of all injured cyclists and e-scooter users reported that their pre-existing condition was further aggravated as a result of the accident. The primary aggravated conditions reported by the injured parties include ankle and knee injuries, psychiatric and anxiety related issues, and back and spine injuries. There is a direct correlation between the age of the injured party and the frequency of reporting aggravation of pre-existing conditions.

As shown in Figure 15, as the age bracket of the injured road user increases so does the frequency of reporting an aggravation of a pre-existing condition. Nearly one in four injured road users aged over 60 years reported aggravation of an underlying condition as a result of an accident. The data shows that older individuals are more likely to have chronic conditions that can be aggravated by an accident, in additional to a longer substantial recovery period and healing process.

Figure 15

Aggravation of pre-existing condition by age categories



7 Neck Disability Index | SpringerLink

Impact on Employment/ Occupational Activities

The ability to work and perform effectively in one's job is closely tied to physical well-being, especially in jobs requiring physical exertion. The term "employment impact" refers to the challenges injured e-scooter users and cyclists experienced in their professional lives as a direct result of a road traffic accident. As the data shows, when an individual's capacity to work is compromised due to accident-related injury, it can lead to significant consequences, such as prolonged absenteeism, and reduced economic productivity.

This study shows that 87% of injured cyclists and e-scooter users who were employed reported that their employment was adversely affected by the accident. As shown in Figure 16, 73% experienced absenteeism ranging from one week to three months, 13% reported being absent for six months to 1 year, while 4% were absent for more than one year.

Figure 16

Period of absenteeism from work

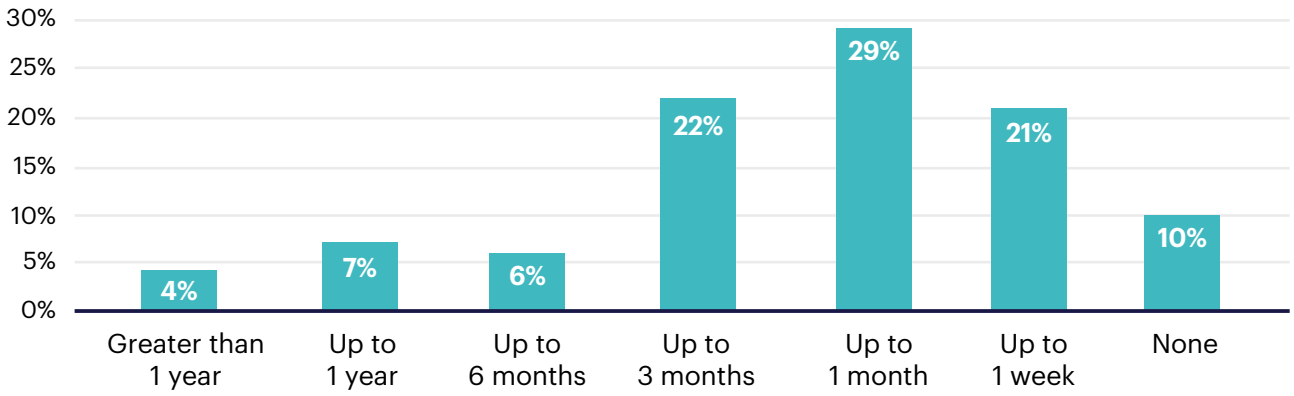
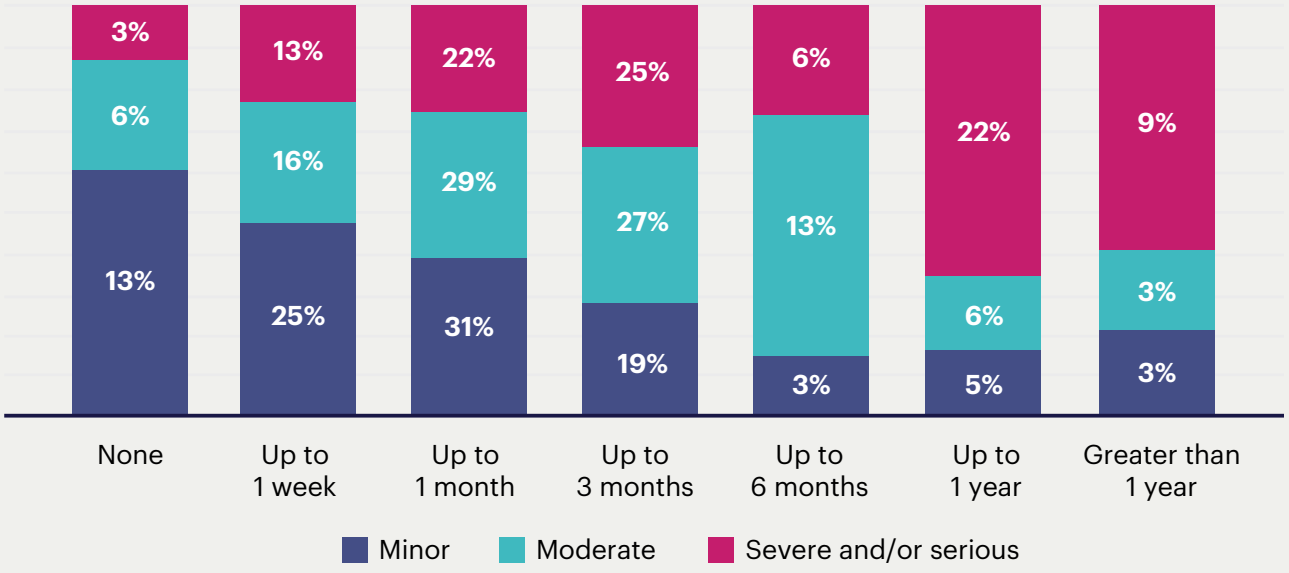


Figure 17

Period of absenteeism by injury severity



To better understand the relationship between injury severity and the duration of employment absenteeism, figure 17 shows that injured cyclists and e-scooter users who sustained more severe injuries reported longer periods of absence from work. While there was no significant difference in the frequency of ongoing absenteeism between minor and moderate severity injury cases, with 4% and 3% respectively, 16% of road users with severe injuries reported continued absenteeism at 1.6 years post-accident. The findings highlight the lasting impact that road traffic accidents have on cyclists and e-scooter users' lives.

The qualitative findings from medical reports provide further insight into the specific types of employment impacts experienced by injured cyclists and e-scooter users. These responses, recorded by medical practitioners, were qualitatively analysed to identify key themes related to employment challenges. Some of the key themes that emerged from this qualitative analysis included:

Financial implications including job loss

Reduced productivity

Forced job change

Change of commute/ fear of commuting

Financial implications including job loss

The injured cyclists/e-scooter users reported significant disruptions to their employment due to road traffic accidents, including cases in which the injured road user reported being dismissed from their employment following the accident, resulting in a substantial period with reduced income. Others experienced a forced career change, such as transitioning to less physically demanding roles or changing jobs entirely, often associated with a reduced income wage, resulting in increased financial strain. In some cases, the injured cyclists/e-scooter users also reported delayed job changes as a result of the injuries sustained, further exacerbating the loss of income during this period.

> "The claimant was not entitled to sick leave at the time of accident. This resulted in the claimant being 'dismissed' from the job after the accident. The unemployed phase continued for a couple of months resulting in loss of income."

Reduced productivity

Injured cyclists and e-scooter users reported a notable decrease in their work capacity and productivity following their accidents. Physical tasks such as lifting, carrying, and extended sitting or driving became more difficult, often requiring adjustments in work hours or regular use of pain medications such as analgesics. Certain activities, especially those involving overhead work or the use of power tools, were particularly impacted due to physical pain or weakness, indicating the broader impact of their injuries on job performance.

> "The claimant found it difficult to do some of the tasks in [type of employment] such as lifting and carrying patients."

> "The claimant has reduced working hours on certain days. Claimant also requires regular analgesia and has difficulty with sitting at desk or driving for long periods."

Forced Change of Job

Several injured cyclists and e-scooter users reported being forced to change jobs due to the impact of their injuries. They often reported shifting to less physically demanding roles or job locations closer to home, such as shop assistants, reflecting a significant change in their career paths due to ongoing physical and psychological symptoms.

> "The claimant was working in [place of employment] at the time of his accident. He had to resign from his job largely due to the fact that he wasn't willing to continue commuting by bike to it."

Change of commute/fear of commuting

Road traffic accidents also caused changes in how the injured cyclists/e-scooter users commuted, driven by fear or discomfort. Some who previously cycled to work reported transitioning to driving or using e-scooters, as they no longer felt safe on a bike. This shift was significant enough to influence employment decisions, with cyclists and e-scooter users reporting resigning from jobs that required cycling or seeking positions closer to home to avoid long commutes.

> "Claimant no longer cycles as he is nervous after his experience. Used to cycle to work, now drives."

> "She hasn't returned to cycling but uses e-scooter to go in and out of work at present."

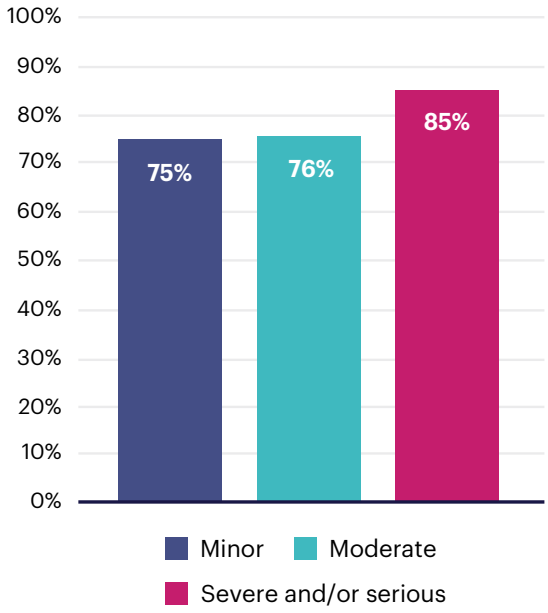
> "Claimant started a new job in a [place of employment] closer to home that involves commuting as a pedestrian."

Impact on quality of life

Quality of life refers to the overall well-being and life satisfaction of an individual, encompassing both physical and mental health. It includes a wide range of factors, such as the ability to perform daily activities, physical comfort, emotional stability, and the capacity to engage in meaningful and enjoyable experiences. When health is compromised, particularly due to injuries, it can significantly diminish an individual's quality of life, leading to limitations in physical abilities and emotional distress.

Figure 18

Impact on quality of life by injury severity



The data shows that 76% of injured cyclists/ e-scooter users reported that the injuries they sustained impacted on their quality of life. While 75% of road users with minor injury severity reported an impact on their quality of life, 76% with moderate injury severity and 85% with severe injuries reported reduced quality of life, showing a direct correlation between the severity of injuries sustained and the long-term impact of road traffic accidents on cyclists and e-scooter users.

The findings highlight the lasting impact that road traffic accidents can have on cyclists and e-scooter users' overall quality of life. The qualitative data extracted from medical reports also provided further insights into the impact of road traffic accidents on the daily activities of cyclists and e-scooter users, with some key themes detailed in this section.

Impact on cycling activities

Fear, anxiety and mental health

Mental and physical impact of scarring

Adjustments in daily life

Impact on cycling activities

Following a road traffic accident, many injured cyclists and e-scooter users made significant adjustments to their cycling routines. While some ceased cycling entirely, others reduced their frequency and length of time spent cycling in comparison to their pre-accident routines.

Loss of cycling as a recreational activity

For some injured road users, cycling had been a central part of their lifestyle, providing enjoyment and exercise, however, following the accident, several injured cyclists expressed concerns around the safety of cycling. Many reported avoiding cycling, with some attempting to return to using their bike but stopping due to fear and anxiety. This included experienced cyclists, who discontinued both cycling and mountain biking due to persistent anxiety about potential accidents. For many, cycling was a core recreational activity. Among which, the loss of cycling as a hobby or form of exercise has had a significant impact, with many describing feelings of frustration, sadness, and a diminished quality of life.

> "He used to enjoy cycling but feels as he got knocked off his bike it is now too dangerous, and he has not returned to this."

Other injured cyclists and e-scooter users reported significantly reducing their cycling activity. In one particular instance, the individual previously cycled extensively but now has cut back to only 50 kilometres per week, much of which is done on an indoor trainer rather than on the road. Another person, after the accident, only cycles on paths or trails and avoids roads to mitigate anxiety and avoid discomfort. The shift to less frequent or more cautious cycling reflects an ongoing struggle to regain confidence with cycling.

> "He has still not regained his confidence while cycling and only will cycle on paths or trails and keeps away from roads."

Fear, anxiety and mental health

Injured cyclists and e-scooter users reported experiencing a range of negative psychological impacts as a result of the road traffic accidents, with the most prominent effects relating to anxiety, fear and shame.

Fear and Anxiety

Many injured cyclists and e-scooter users experienced significant levels of fear and anxiety post-accident. Symptoms of PTSD, such as flashbacks, nightmares, and intrusive thoughts related to the accident were commonly reported by the injured cyclists and e-scooter users. Some injured cyclists and e-scooter users required treatment through professional counselling services to assist their recovery from the accident.

> "When claimant made attempts to get back on bike, she experienced the sensation of the car impact."

> "Claimant reported that even when she goes jogging or crossing the road, she would experience intrusive thoughts of being hit by a car – she stated "I'd almost feel [the car] hitting me."

This fear of cycling and a heightened perception of the associated safety concerns also extended to cyclists' friends and families, with one injured road user stating that he no longer allowed his children to cycle alone as a result of the accident.

> "He does not allow his children to cycle, only when accompanied by himself."

Furthermore, some developed a generalised fear of roads and vehicles, which influences their daily activities and travel habits. This includes avoiding walking near roads, being anxious about vehicles approaching too closely, and experiencing panic attacks or hypervigilance when traveling. Such fears have resulted in changes to their commuting habits, such as walking instead of cycling or driving and also reducing the overall amount of time spent on roads.

> "She has been slow to return to road surfaces and has a fear of junctions or a car approaching her closely. She has witnessed numerous accidents in the past months which have led to panic attacks and difficulty sleeping."

Guilt or shame

Feelings of guilt and shame have also been reported, with some expressing embarrassment and self-blame about their accidents. They described feeling stigmatised or judged by others, which only intensified their emotional distress. This sense of shame and self-criticism was considered a significant factor in their overall mental health impact.

> "Claimant reported feeling embarrassed, stupid, as if it was their own fault."

> "She described feeling shame and embarrassment – some people did not give her a lot of sympathy – saying what did she expect if she was on a bicycle."

The mental and physical impact of scarring

Injured cyclists and e-scooter users highlighted the significant impact of the scarring sustained in road traffic accidents on their overall physical and mental health. One injured road user expressed feeling discomfort and self-consciousness about a scar on their face and making efforts to conceal the scar at all times. Furthermore, other physical impacts resulting from accidents, such as noticeable bumps or redness of the skin, also contributed to feelings of discomfort and self-consciousness, with one injured road user expressing frustration about a non-facial injury and its impact on their body image, particularly in social or public settings.

> "Claimant tells me the scar to his [facial area] has attracted comments and he is conscious of its appearance."

Adjustments in Daily Life

This theme captures a variety of secondary impacts injured cyclists and e-scooter users reported, which extended beyond direct physical injuries. It also reflects a broad range of adjustments they were required to make in their daily routines, living situations, and personal activities as a result of their injuries.

Many injured cyclists and e-scooter reported significant challenges with completing routine domestic tasks and physical activities. This included difficulties with lifting and carrying objects, managing household chores such as changing bedding or cleaning, and performing everyday tasks like dressing or tying up hair. For instance, one individual struggled to complete basic domestic tasks, while another experienced pain that hindered their ability to perform tasks like kneeling or lifting objects. These limitations have notably affected their independence and quality of life.

> "Claimant has trouble with physical activity, sitting down, trying to lift and do other activities … He finds it difficult to carry out household chores, changing bedding, cleaning, or using a knife."

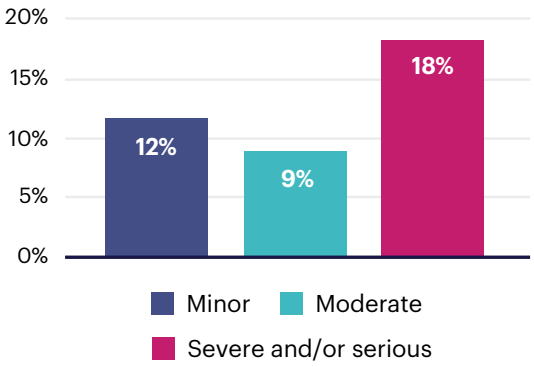
Impact on personal relationships

Personal relationships are the bonds and connections we form with others, including family, friends, partners, and colleagues. These relationships play a crucial role in our emotional well-being and overall quality of life. However, personal relationships can be strained or reshaped by changes in an individual's health, such as those caused by injury or illness. When someone is unable to participate in activities, fulfil roles, or communicate effectively due to sustaining a physical and/or psychiatric injury, it can affect the quality of their relationships.

The study reveals that 12% of injured cyclists and e-scooter users reported experiencing a negative impact on their personal relationships as a result of the accident. However, this proportion could possibly be higher as for 18% of the study group the status is unknown as this information was not present in the medical report. In relation to injury severity, it is observed that 12% of injured cyclists and e-scooter users that had minor injury severity reported a negative impact on personal relationships, rising to 18% among severely injured road users.

Figure 19

Impact on personal relationships by injury severity



The qualitative findings from medical reports provide further insight into the specific types of negative impacts on personal relationships experienced by injured cyclists and e-scooter users. These responses, recorded by medical practitioners, were qualitatively analysed to identify key themes related to personal relationships. Some of the key themes that emerged from the qualitative exercise are:

Impact on personal relationships

Loss of social opportunities

Impact on Personal Relationships

This theme addresses the broad impact of accidents on how injuries have disrupted interactions with partners and children. As evidenced in this report, road traffic accidents not only cause physical pain but also significant emotional and psychological challenges, which in some cases, can lead to strained family and relationship dynamics.

> "He states that his relationship with his girlfriend suffered a breakup as a result of this injury due to stress related issues."

Analysis of the medical files show that road traffic accidents may introduce substantial stress into the injured party's relationships. Individuals with severe injuries report increased tension, communication breakdowns, and a perceived lack of support from their partners, which compounds the difficult journey of recovery. Additionally, parents reported struggling with a diminished ability to engage in physical activities with their children, leading to a reduction in quality time and increased feelings of guilt and frustration.

> "She feels that she cannot lift and play with her daughter as much as she used to be able to."

Loss of Social Opportunities

Injured cyclists and e-scooter users reported negative impacts on social interactions and relationships outside the family, including friendships and community connections post-accident. This included reduced social interactions and fewer opportunities to participate in previously enjoyed social activities, such as cycling clubs or socialising with friends, contributing to feelings of isolation and decreased social engagement.

> "Claimant planned to join a social cycling club and this was becoming a very significant part of her life and now she cannot do it."

Chapter 7:

Healthcare Utilisation & Injury Prognosis

This section examines the percentage of cyclists and e-scooter users involved in road traffic accidents, who were hospitalised following the accident and the duration of their in-patient hospital stay. This section also provides a summary of the number of treatment sessions, including general practitioner visits, physiotherapy, and specialist consultations, that the injured cyclists and e-scooter users attended to aid their recovery.

Rate of Hospitalisation

Overall, 21% of injured cyclists and e-scooter users reported an in-patient hospital stay as a result of the injuries sustained. The average duration between the date of the accident and the date the first treatment sought was 1.2 days. The data shows a clear correlation between injury severity and the likelihood of hospitalisation: 55% with serious injuries were hospitalised, compared to 41% with moderate injuries and only 7% with minor injuries. Additionally, the duration between the accident and the first treatment was significantly shorter for more severe cases, averaging 0.2 days for serious injuries, 0.4 days for moderate injuries, and 1.6 days for minor injuries. This indicates that those with minor injuries often wait longer before seeking medical treatment, while severe and moderate cases typically require immediate attention.

When broken down by the type of vulnerable road user, 21% of cyclists were hospitalised compared to 19% of e-scooter users. While this difference is small, it may be attributed to the higher proportion of moderate and serious injuries among cyclists.

Furthermore, the average duration of in-patient hospital stays was found to be 4.2 days, with a clear correlation to the severity of the injury. Injured road users with serious injuries spent on average, 6.8 days in hospital, decreasing to 3.5 days among those with moderate injuries and 2.6 days among those with minor injuries. Cyclists, who generally sustained more severe injuries, spent an average of 4.5 days in the hospital, while e-scooter users spent 1.5 days on average.

Treatment sessions undertaken

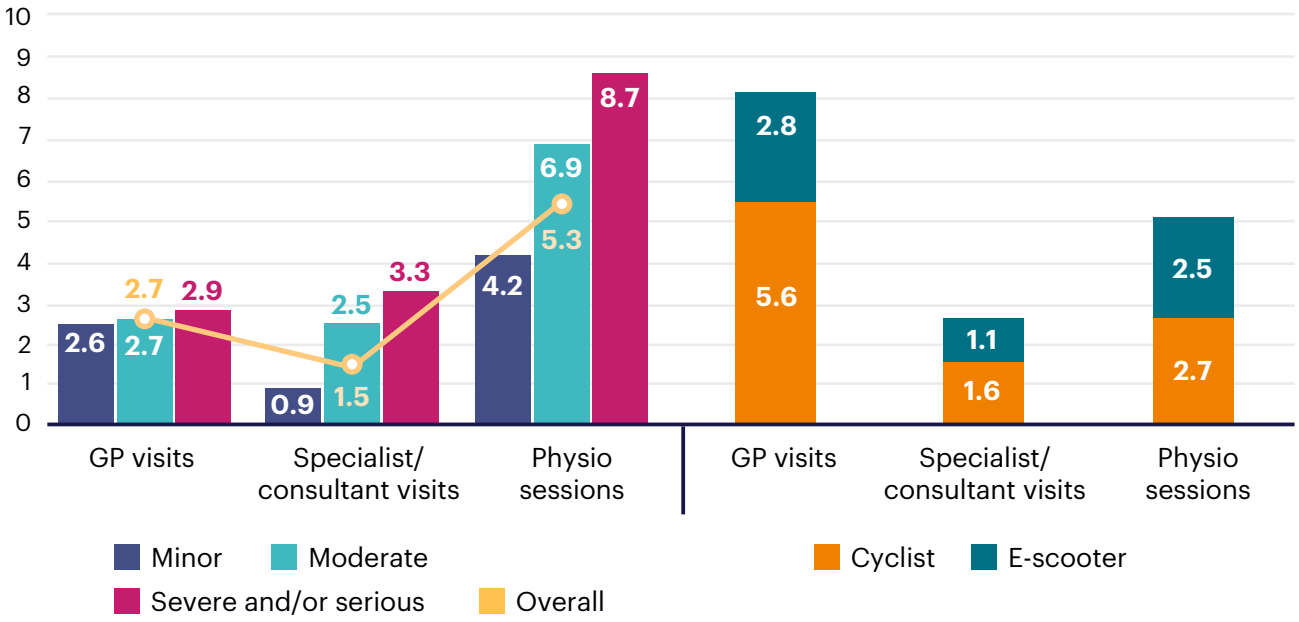
Treatment sessions encompass visits to general practitioners, consultants for more specialised care, and physiotherapy sessions for pain management, physical function and mobility. The study shows that, on average, injured cyclists and e-scooter users attended 2.7 general practitioner (GP) visits, 1.5 specialist consultations, and 5.3 physiotherapy sessions.

As expected, the number of visits increased with the severity of the injury. More severe and complex cases required longer recovery times, necessitating more frequent medical consultations.

When analysed by the type of vulnerable road user, cyclists had slightly more treatment sessions across all three categories compared to e-scooter users. This aligns with the observation that cyclists are more likely to suffer moderate to serious injuries than e-scooter users, requiring more extensive medical care.

Figure 20

Average treatment sessions by injury severity and VRU



Prognosis

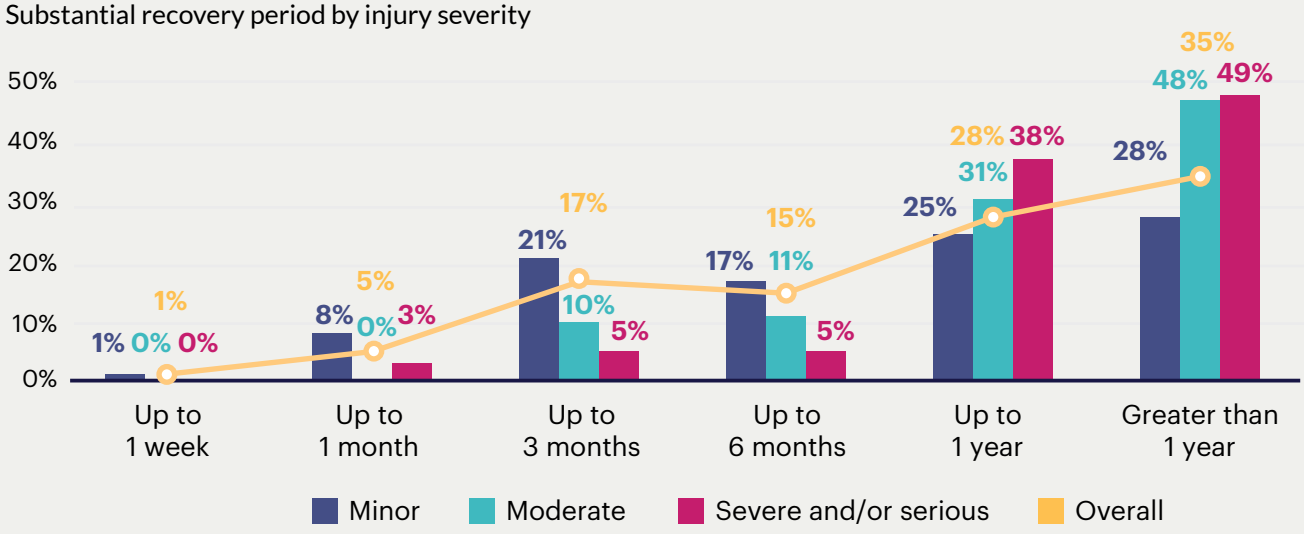
Prognosis refers to the expected course of recovery, specifically duration of time taken or expected to take for the injured cyclist or e-scooter user to substantially recover from the injuries sustained. This section offers insight into how quickly individuals return to their pre-accident condition and the likelihood of requiring ongoing medical care. Understanding prognosis is crucial for assessing the overall impact of the injuries on injured cyclists and e-scooter users' lives and the potential for lingering physical or psychological effects that may influence their quality of life and future well-being.

Recovery period

In this study, prognosis is described based on the substantial recovery period, as per the Personal Injuries Guidelines, which refers to the length of time taken for an injured personal to recover from a majority of their injury's effects, but which may include some ongoing symptoms and interference with their ability to carry out daily activities. Substantial recovery was reported by 65% of injured cyclists and e-scooter users within one year of the accident, with 37% reaching this marker within the first six months.

Figure 21

Substantial recovery period by injury severity

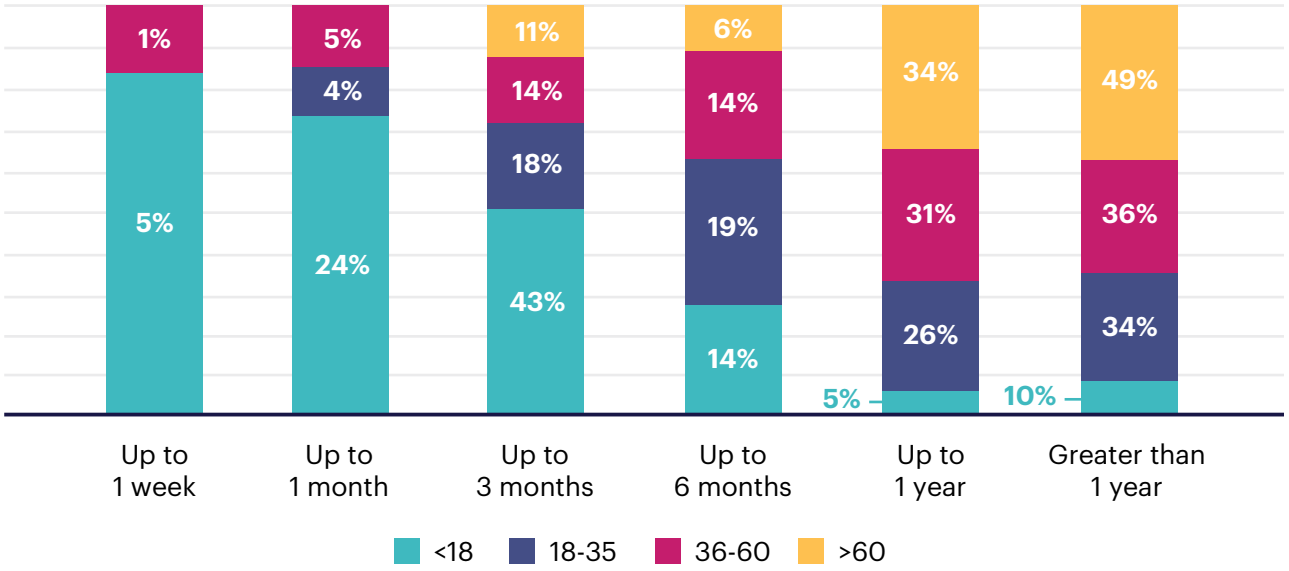


The data indicates a direct correlation between injury severity and recovery time, with a higher proportion of moderate and serious injury cases needing more than six months to achieve substantial recovery.

Age at the time of accident was also identified as a factor influencing the substantial recovery period, with younger individuals generally recovering more quickly than older ones. The data shows that just 15% of injured cyclists and e-scooter users aged under 18 years old required more than six months for substantial recovery, compared to 60% in the 18-35 age group, 67% in the 36-60 age group, and 83% of those over 60.

Figure 22

Substantial recovery period by age categories



Future treatment

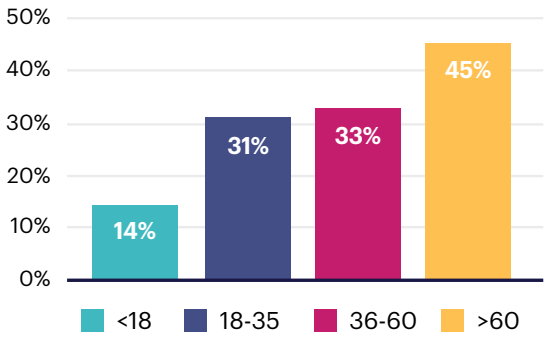
At the time of the medical assessment, on average 1.6 years post-accident, 32% of injured cyclists and e-scooter users required some form of future treatment, with an additional 5% under review, awaiting further medical reports.

Injury severity did not show a strong correlation with the need for future treatment: 30% of minor injury cases, 39% of moderate injury cases, and 33% of serious injury cases were projected to require future treatments to aid their recovery. Age, however, was a more significant factor: 14% of cases under 18, 31% of those aged 18-35, 33% of the 36-60 age group, and 45% of those over 60 were expected to require future treatment.

The most common types of future treatment identified were related to physiotherapy and pain management (82%), followed by counselling and mental health support (18%), and orthopaedic or dental procedures (8%).

Figure 23

Future treatment by age categories



Chapter 8:

Compensation for Accidents affecting Cyclists and E-scooter Users

Personal injury awards consist of two distinct components: General Damages, which provide compensation for pain and suffering, and Special Damages, which cover financial losses. Special Damages reflect direct costs to claimants, including current and future loss of earnings, vehicle repair costs, treatment costs, and other vouched expenses incurred by the claimant as a result of an accident.

Compensation Value

In 2023, €9.84 million in total compensation was awarded by the Injuries Resolution Board for accidents involving cyclists and e-scooter users. This comprised of €8.4 million awarded under General Damages (compensation for pain and suffering) and €1.4 million awarded for Special Damages (financial loss/ expenditure incurred).

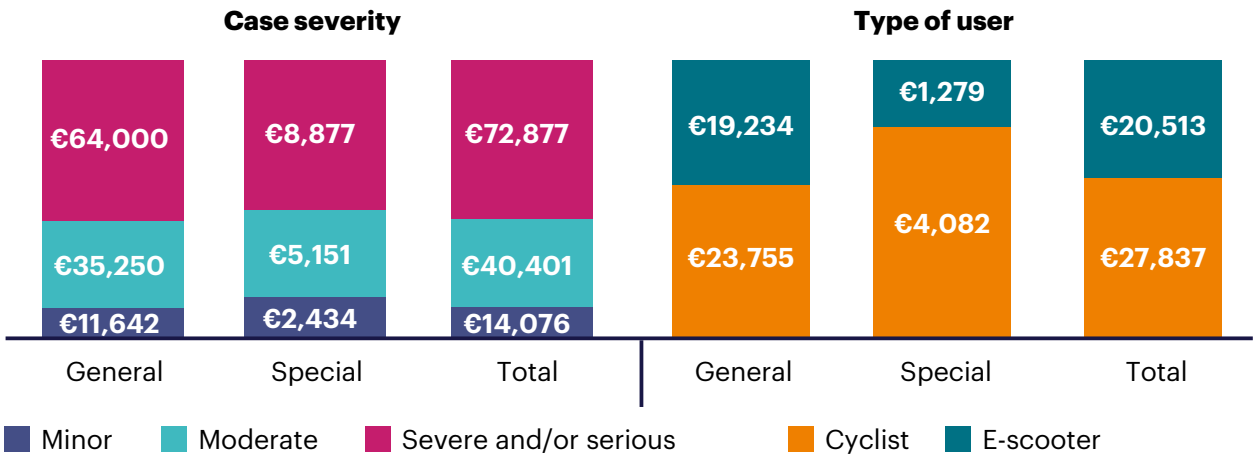
To better understand the relationship between the assessment amount and various factors, the average compensation amount offers a better metric for clearer comparison across different groups. The average compensation amount for injured cyclists and e-scooter users in 2023 was €27,047, with €23,333 awarded under general damages and €3,814 under special damages.

Case severity: The award amounts varied significantly with case severity. Claimants with minor severity injuries were awarded an average of €14,076 (€11,642 in general damages and €2,434 in special damages). Those with moderate severity injuries were awarded on average, €40,401, while claimants with severe or serious injuries were awarded on average, €72,877.

Type of vulnerable road user: Cyclists received approximately 36% higher average award values than e-scooter users, with an average of €27,837 in total damages compared to €20,513 for e-scooter users. Under special damages, cyclists were awarded significantly more (€4,082) compared to e-scooter users (€1,279). This disparity is primarily due to differences in the demographics of the user groups; a substantial proportion of e-scooter users are students or unemployed/retired individuals, leading to fewer claims for loss of income compared to cyclists.

Figure 24

Average award value by injury severity and VRU



In 2023, €9.84 million in total compensation was awarded by the Injuries Resolution Board for accidents involving cyclists and e-scooter users.

Chapter 9:

Discussion and Conclusion

Ireland's Government Road Safety Strategy 2021-2030 aims to "prioritise the safety of those who are most vulnerable, ensuring their right to travel the roads safely is protected." Vulnerable road users are defined as individuals whose mode of transport offers little to no protection in the event of a road traffic collision.

This report focuses on cyclists and e-scooter users, two key groups of vulnerable road users. The study utilises claims data and medical records from nearly 400 cyclists and e-scooter users who were awarded compensation in 2023 for injuries sustained in road traffic accidents, totalling over €9 million in compensation. The findings identify significantly higher rates of serious injury among cyclists and e-scooter users compared to motor vehicle drivers, underscoring their classification as vulnerable road users. Additionally, the study identifies distinct injury patterns, specific risk factors, and the long-term impacts of road traffic accidents on these groups.

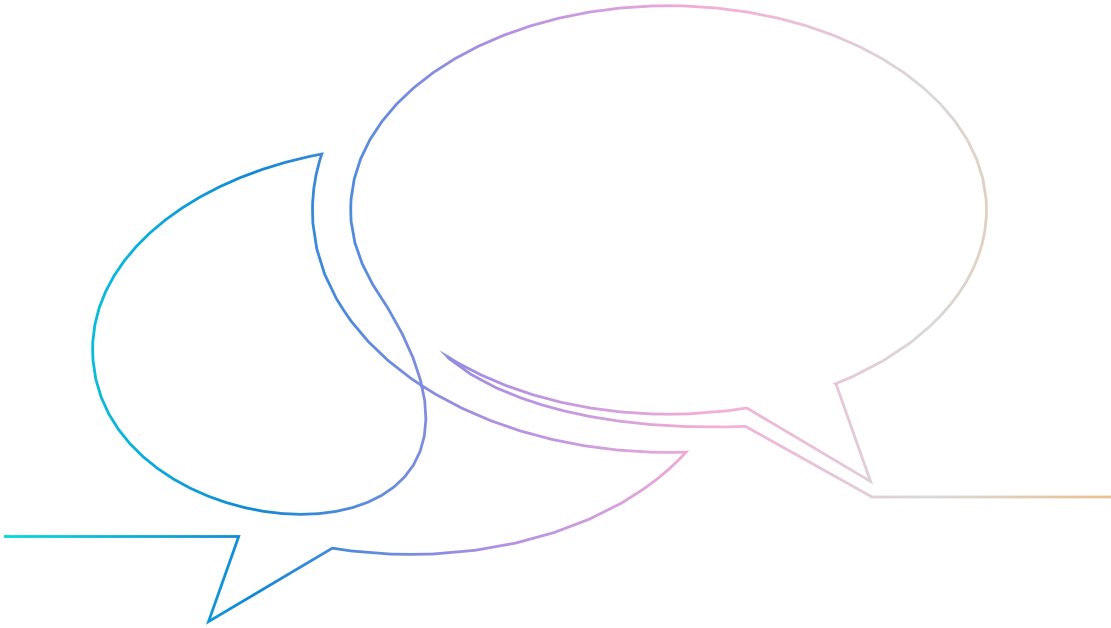
To develop effective interventions aimed at reducing the incidence of road traffic accidents among cyclists and e-scooter users, it is important to understand the unique profiles of each group. The findings show that injured e-scooter users are significantly younger than injured cyclists, with 13% aged under 18 years old. E-scooter users are more likely to be students, report not wearing helmets, and be involved in night-time accidents and incidents at roundabout junctions than cyclists. In contrast, the majority of injured cyclists are aged between 36-60 years, are more likely to be employed, and sustain greater severity injuries, often requiring extended recovery periods. The findings underline the need to develop interventions around safety measures and educational campaigns specifically tailored to the risks and demographics of each group to effectively reduce road traffic accidents among vulnerable road users.

An analysis of all assessments of compensation made by the Injuries Resolution Board in 2023 found that cyclists and e-scooter users were 11 times more likely to sustain serious or severe injuries in road traffic accidents compared to motor vehicle users. Specifically, 11% of cyclists and e-scooter users who were awarded compensation in 2023 suffered serious or severe injuries, in contrast to just 1% of motor vehicle users. Additionally, one in five injured cyclists and e-scooter users required in-patient hospital treatment for their injuries. On average, cyclists, who generally sustained more severe injuries, spent 4.5 days in the hospital, whereas e-scooter users spent an average of 1.5 days. This data underscores the significant physical impact of road traffic accidents on these vulnerable road users.

This report highlights the significant impact of road traffic accidents on vulnerable road users beyond physical injuries alone. Close to half of all injured cyclists and e-scooter users aged under 18 years sustained psychological injuries as a result of road traffic accidents. Additionally, qualitative data extracted from medical reports identified fear and anxiety around cycling as common themes. Many injured cyclists and e-scooter users reported a generalised fear of roads and vehicles, which influenced their daily activities and travel habits. Feelings of guilt and shame were also prevalent, with individuals expressing embarrassment and self-blame about their accidents. Injured cyclists and e-scooter users reported feeling stigmatised or judged by others, which intensified their emotional distress and significantly impacted their overall mental health following the accident.

The findings of this study underscore the need for targeted interventions to enhance the safety of vulnerable road users, particularly cyclists and e-scooter users. The high rates of serious injuries, combined with significant psychological impacts, highlight the necessity for comprehensive safety measures and educational campaigns tailored to the specific risks and needs of these groups. Preventive actions, such as promoting helmet use, improving night visibility, and educating road users on the physical and emotional effects of accidents, are recommended.

Further research capturing details such as trip purpose and distance, types of junctions and roundabouts encountered, and the quality of cycle lane infrastructure could provide valuable insights for targeted safety improvements. By addressing the distinct risks and challenges faced by cyclists and e-scooter users, policymakers can work toward a safer and more supportive environment for all road users in Ireland, guided by evidence-based interventions and public awareness efforts.



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Appendix 1

Table 2

List of quantitative indicators used in the study

Theme	Indicator
Demographic	% of cases by gender
	% of cases by age
	% of cases by occupation/current working status
Value of assessment of compensation	Total amount (general, special and total)
	Avg. amount (general, special and total)
Accident details	% of cases by day of the week, month, year of accident
	% of cases by cause, place, time of accident
	% of cases by type of cyclist
	% of cases wearing helmet
Injury details	% of different types of injuries
	% of cases by severity
	% of cases sustaining multiple injuries
	% of cases reporting psych as secondary injury
	% of cases with reported change in weight
	% of cases reported aggravation of pre-existing condition
	Avg. VAS for pain
	Avg. of count of various symptoms (mental health, learning, balance, etc.)
	% of cases reporting various proportions of symptoms attributed to accident
	% of cases reporting different WAD grades
	Avg. Neck Disability Index (in %)

Theme	Indicator
Treatment details	Avg. duration between date of accident and date of examination
	% of cases hospitalised
	Avg. days of hospitalisation
	Avg. duration between date of accident and date of first treatment
	Avg. number of GP visits
	Avg. number of specialists/consultants visits
	Avg. number of physio sessions required
Impact of accident	% of cases reporting impact on employment
	Avg. days absent from work
	% of cases with ongoing absence from work due to accident
	% of cases reporting impact on quality of life
	% of cases reporting impact on personal relationship
Prognosis	Avg. duration of substantial recovery period
	Avg. duration of estimated substantial recovery period
	% of cases requiring future treatment
	% of cases with different types of future treatments

Notes

Notes

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