Public Services Delivery
Scotland

NHS SCOTLAND

National Services Directorate

Scottish Trauma Network

E-bike and e-scooter related injuries: Survey of emergency departments (ED) and minor injury units (MIU) in Scotland

October 2026

NSD608-026.01

Thomson K, Khan A, Strickland A, Kerr D, Gough E, Montgomery J, Lilley M, McKeirnan M, Campbell P, Cant S, McDowall V, Bridgman S 2026. Electric assisted pedal bicycle (e-bike) and electric assisted scooter (e-scooter) injuries in Scotland; a survey of emergency departments (ED) and minor injury units (MIU). Public Services Delivery Scotland. https://doi.org/10.57064/2164/28000

Acknowledgements

This report was produced on behalf of the Scottish Trauma Network, a strategic network within National Services Directorate, part of Public Services Delivery Scotland. The network is a collaboration of all National Health Service (NHS) Scotland bodies with involvement in the management of traumatic injuries.

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1. Executive summary

Background

The popularity of electric assisted pedal cycles (e-bikes) and electric scooters (e-scooters) has increased rapidly across Scotland in recent years. Clinicians within the Scottish Trauma Network (STN), part of National Services Directorate in Public Services Delivery Scotland, have reported increasing numbers of injuries associated with these vehicles presenting to Emergency Departments (EDs) and Minor Injury Units (MIUs). Current routine NHS recording systems are unable to reliably distinguish e-bike and e-scooter injuries from other transport-related incidents, resulting in a lack of national data to inform prevention, service planning and policy development.

To address this gap, the STN coordinated a national survey across NHS Scotland to collect information on the frequency, circumstances and outcomes of e-bike and e-scooter related injuries presenting to emergency department (ED) and minor injury units (MIU) for an eight- week period between 1 June and 26 July 2026.

Key findings

A total of 446 presentations relating to e-bike and e-scooter injuries were recorded across 11 of Scotland's 14 territorial health boards during the eight-week survey period. E-scooter incidents accounted for 257 presentations (57.6%), while 189 presentations (42.4%) related to e-bikes.

Children and young people were disproportionately represented within the survey findings. Over one-third (36.1%) of all presentations occurred among those aged 10 to 14 years, while almost two-thirds of e-scooter injuries involved patients aged under 14 years. Males accounted for 73.3% of all presentations.

A high proportion of injuries involved people living in the most deprived areas, with 65.2% of presentations among residents of the two most deprived quintiles, using the Scottish Index of Multiple Deprivation (SIMD). Most incidents occurred during leisure activities, with 83.6% of injuries sustained while riding for recreation rather than commuting. Most riders (76.9%) reported wearing no personal protective equipment (PPE) at the time of injury, including helmets.

The most commonly injured body parts were the upper limbs, lower limbs and head. For e-scooter incidents, children and young people accounted for most injuries affecting each of these body parts.

Although many patients were discharged following assessment, the survey identified a significant requirement for ongoing treatment and specialist care:

- 16.4% of patients required hospital admission, either at presenting hospital or following inter-hospital transfer.
- Of all reported presentations, 2.9% of cases were admitted to critical care.
- Orthopaedic surgery accounted for 37.0% of all admissions.
- Neurosurgery and critical care admissions were also recorded, indicating that some injuries were severe and required substantial healthcare resources.

Survey findings also highlighted that 95.3% of reported e-scooter injuries occurred while the vehicle was not being used legally (i.e. not ridden on private land).

Impact on NHS Scotland

The survey demonstrates that e-bike and e-scooter related injuries are generating demand across multiple areas of NHS Scotland, including emergency care, the Scottish Ambulance Service (SAS), outpatient clinics, inpatient wards, specialist surgical services and critical care.

Using indicative costing methodology based on published Scottish health service costs, the estimated cost to NHS Scotland during the eight-week survey period was £655,124. This comprised:

- £108,320 for ED and MIU attendances
- £2,992 for inter-hospital transfers
- £30,100 for outpatient follow-up
- £513,712 for inpatient admissions

The 446 incidents recorded over the 8-week survey period, if extrapolated across a full year and ignoring possible seasonal variations would suggest that approximately 2,900 incidents could occur annually across Scotland. These injuries are estimated to cost NHS Scotland approximately £4.26 million annually. While this represents a broad estimate, these figures demonstrate the potential healthcare resource implications associated with e-bike and e-scooter related injuries.

Conclusions

This survey provides the first national ED and MIU survey of e-bike and e-scooter related injuries presenting to healthcare services in Scotland. The findings demonstrate that these incidents are occurring across the country and are generating a measurable burden for NHS Scotland.

Children and young people, particularly those involved in e-scooter incidents, represent a key at-risk population. Low levels of PPE use, high proportions of injuries occurring in more deprived communities, and the number of patients requiring specialist inpatient care highlight important opportunities for injury prevention and public awareness.

While this survey establishes a valuable baseline for future monitoring, continued data collection and surveillance will be required to understand seasonal and longer-term trends and determine the effectiveness of future interventions.

Recommendations

Recommendation 1: NHS Scotland should submit a proposal to the World Health Organisation for the International Classification of Diseases to feature codes specifically relating to e-bike and e-scooter related injuries for all hospital attendances. This would enhance routine surveillance and enable ongoing monitoring of trends and outcomes. In the meantime, the NHS Scotland should consider the feasibility of introducing its own e-bike and e-scooter external cause codes to enhance surveillance.

Recommendation 2: Enhance future STN e-bike and e-scooter surveys by considering capturing additional information on injury severity, patient pathways and mode of arrival to hospital.

Recommendation 3: National and local partners should consider how existing road safety messaging can be strengthened to improve awareness of legislation relating to e-bike and e-scooter use.

Recommendation 4: The report, and opportunities for prevention, are considered by Transport Scotland's Road Safety Operational and Strategic Partnership Groups, in the light of a recent publication, effective road safety interventions for public health: an umbrella review (Public Health Scotland, 2026).

Recommendation 5: Existing road safety education programmes should be expanded to include safety messaging on e-bike and e-scooters, with an aim to reduce preventable injuries and raise awareness of the safe and legal use amongst school-aged children and their parents/guardians.

Recommendation 6: Public health and road safety partners should promote the use of helmets and other appropriate protective equipment through targeted awareness campaigns.

2. Introduction

Electric assisted pedal cycles (EAPC) (Kenny and Raja 2025) and electric scooters (e-scooters) (Trimble 2026) are increasing in popularity across Scotland. This growth has coincided with an apparent marked rise in injuries, particularly among children and young people. Clinicians across the Scottish Trauma Network (STN) have reported seeing a significant increase in EAPC and e-scooter-related incidents presenting to EDs and MIUs. For the purposes of this report, the term e-bike refers to either road legal EAPCs or non-road legal motor-assisted or motorised cycles with pedals, as defined under UK legislation. The term e-scooter refers to an electrically powered standing scooter.

Current healthcare recording systems cannot reliably capture instances of e-bike and e-scooter injuries, as existing International Classification of Diseases (ICD) codes do not distinguish between the vehicles. A lack of accurate, system-wide data prevents Scotland's ability to support injury prevention, inform service planning, or shape national policy.

Background

Electric pedestrian powered transport, specifically e-bikes and e-scooters, are viewed as both convenient and eco-friendly. However, their hybrid nature presents difficulties in where they can be ridden safely as they can reach speeds of 15 to 30mph, although in the UK EAPC are limited to electric motor assistance at speeds of 15.5 miles per hour and lower, with higher assistance speeds meaning the vehicles need to have a licence (Department of Transport 2024). Furthermore, it is illegal to ride e-scooters in public spaces (e.g. on pavements, roads or in parks); they should only be ridden on private land with the landowner's permission (UK Government, 2025).

With relatively high speeds and minimal safety standards, this specific group of vehicles present a real and significant safety risk. Riders are at particular risk when sharing a road with motor vehicles, and pedestrians are at risk when sharing pavements and paths with vehicles e-bikes and e-scooters, which can travel at speed. If a rider of an e-scooter caused serious harm to another individual, this incident would be investigated in the same way it would if they were riding a motorcycle or driving a car (Police UK, 2026).

Over the last year, clinicians within the STN have reported a perceived increase in presentations to Scottish EDs involving injuries sustained while riding e-bikes or e-scooters. However, there is currently no national dataset to quantify this trend, except for patients with the most severe injuries that are recorded by the Scottish Trauma Audit Group (STAG).

In NHS Greater Glasgow and Clyde specifically, clinicians recorded a 600% increase in the number children and young people attending the ED due to e-bike and e-scooter incidents between May and October 2025 (NHS Greater Glasgow and Clyde, 2025). Over 30 children required emergency care at the Royal Hospital for Children (RHC) compared to only four cases in the same period in 2024. Injuries included severe head trauma, fractured femurs,

chest injuries, and severe lacerations, with some young patients admitted to intensive care.

At the British Trauma Society conference in November 2025, colleagues from East London presented a study describing 125 patients with 155 confirmed e-bike-related injuries recorded over a six-month period. This finding demonstrates that several patients sustained multiple injuries. The clinicians emphasised the economic burden and the need for ED documentation codes for recording this type of injury mechanism.

Despite the increase in popularity, patient recording systems remain unable to capture the detail of these particular types of vehicle. Obtaining accurate data is also challenging, because e-bike and e-scooter injuries cannot yet be classified separately using the ICD standards. 'Pedestrian injured' codes are advised for e-scooters and 'pedal cyclist' codes for e-bikes. When these are used, there is no way to identify or distinguish between a code used for an e-scooter and pedestrian, or an e-bike and bicycles or motorbikes.

Project purpose

The purpose of this project was to develop a national survey with an aim to collect data on the frequency and circumstances of e-bike and e-scooter related injuries in Scotland, for patients presenting at an ED or MIU.

The survey was designed collaboratively with clinicians, public health experts, Transport Scotland and Police Scotland, to identify demographics, injury mechanisms, injury locations, vehicle type, PPE, journey purpose, and early clinical pathway.

A Short Life Working Group (SLWG) was established to manage the project and oversee implementation, data quality, and analysis. Membership of the group included representation from all regional trauma networks of the STN, along with the Scottish Ambulance Service (SAS), Public Health Scotland (PHS), and the Scottish Trauma Audit Group (STAG) (Appendix 1).

3. Methodology

Survey design

Approval for collection of non-identifiable data (except for patient postcode) was sought from the NHS National Services Scotland, now known as Public Services Delivery Scotland (PSDS), Caldicott Guardian and the National Services Directorate (NSD) Information Governance lead, with a data protection impact assessment carried out. This was then issued to all health board Caldicott Guardians and Data Protection leads to seek their approval for participation in this project, while addressing how it abided by the Caldicott principles.

Front-line clinicians in EDs and MIUs across Scotland were pivotal in gathering data during admission. To ensure this process was minimally intrusive, a digital survey was constructed using Microsoft Forms which would be easily accessible and straightforward to complete.

Clear and concise communications were issued to all EDs and MIUs in the run-up to the survey going live to ensure good engagement and address any questions ahead of time. Posters were created with a QR code linking directly to the survey, and guidance on how to complete it. Clinicians were asked to complete a form whenever a patient presented with an e-bike or e-scooter related injury.

The data collection period ran for eight weeks, from Monday 1 June to Sunday 26 July 2026. This allowed data capture during school term time and the summer holidays, as well as avoiding the busy national clinical staff changeover day on Wednesday 5 August.

Data collected

Survey questions (Appendix 2) were developed by the SLWG, in order to collect data on attendances following an injury involving an e-bike or e-scooter. The survey was developed with a mixture of multiple-choice answers and open text fields to aid capturing of detailed information about each incidence.

The SLWG group sought guidance on the phrasing of the questions from the clinical coding team in PHS, along with Andrew Patterson, Statistician at Transport Scotland and Stephen Reid, Criminal Intelligence Analyst at Police Scotland.

Scope

All patients presenting at EDs or MIUs in Scotland with injuries relating to use of or being struck by the following vehicles:

In scope

- Electric assisted pedal cycles (EAPC)
- Electric bicycles with pedals which have been modified to include a throttle
- Electric standing scooters (‘powered transporters’)

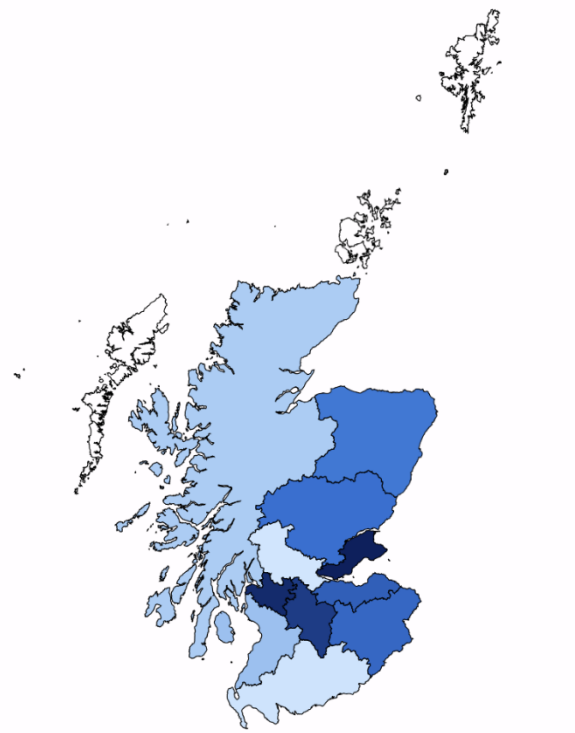
Out of scope

- Electric motorbikes (i.e. no pedals)
- Mopeds
- Motor tricycles
- Electric mobility scooters
- Standard non-electric scooters (foot propelled)

4. Results

Survey participation

All fourteen territorial health boards were asked to participate in the project. Presentations of e-bike and e-scooter related injuries were recorded in eleven of the health boards (Figure 1), with three reporting no injuries in the eight-week reporting period.



Health Board	Patients per 100k Population
Fife	12.30
Greater Glasgow & Clyde	11.56
Lanarkshire	10.47
Lothian	8.23
Borders	7.71
Tayside	7.18
Grampian	6.78
Ayrshire & Arran	3.54
Highland	3.08
Dumfries & Galloway	2.06
Forth Valley	1.96
Total	**8.15**

Figure 1 Health board e-bike and e-scooter injury presentations per 100,000 of the crude population

Overall injury numbers

During the two-month reporting period a total of 446 instances of e-bike or e-scooter related presentations were reported. Of these, 257 were related to e-scooters, and 189 related to e-bikes.

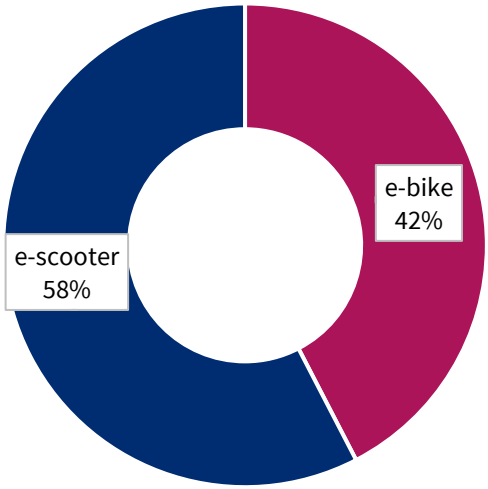


Figure 2 Percentage of e-bike versus e-scooter injuries (n=446)

Demographic characteristics

Generally, children and young people were more likely to be injured by e-bikes and e-scooters, with a clear peak in the 10-14-year age group where 36.1% (n=161) of all reported incidents occurred.

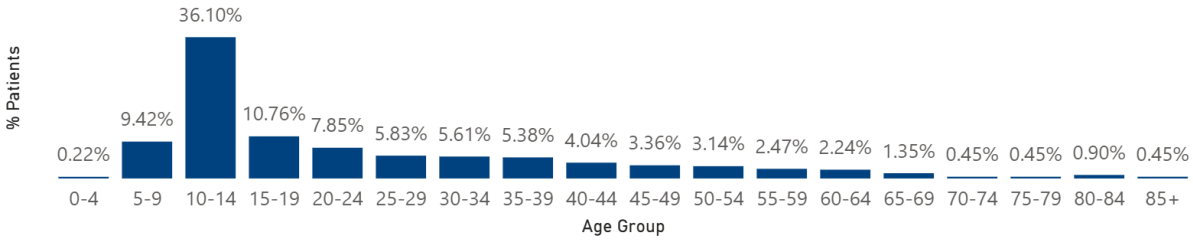


Figure 3 Percentage of all e-bike and e-scooter injury presentations by age group.

Patterns differed by vehicle type. E-scooter injuries were more common among those aged under 14 years who accounted for 65% of reported e-scooter presentations (Figure 4). While e-bike injuries were more evenly distributed across age groups (Figure 5).

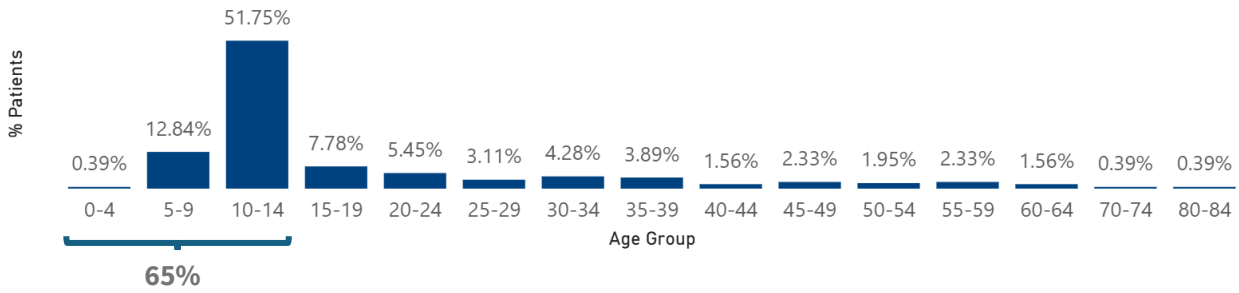


Figure 4 Percentage of e-scooter injuries by age group

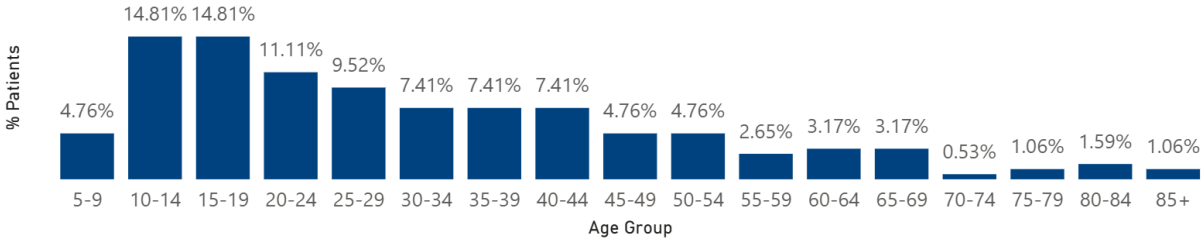


Figure 5 Percentage of e-bike injuries by age group

The legal age for riding an e-bike in the UK is 14 years (UK Government, 2026), however 13.5% of all e-bike-related presentations in the survey were children under 14 years old.

Males were more likely to be injured by e-bikes or e-scooters (Figure 6), representing 73.3% of all presentations reported. This was also observed when comparing e-bike and e-scooter-related injuries separately.

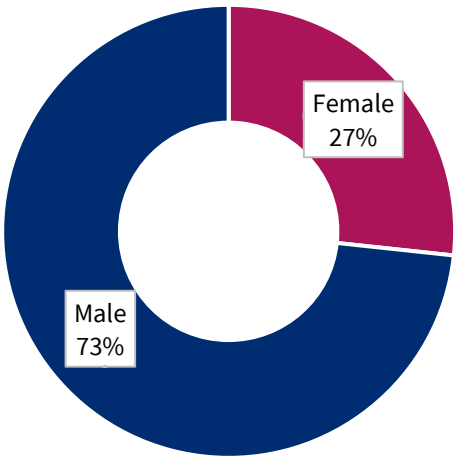


Figure 6 Incidence of injuries by sex

Data was analysed using the Scottish Index of Multiple Deprivation (SIMD) which is derived using the patient's home postcode. Quintile 1 represents the most deprived 20% of the

Scottish population, and quintile 5 the least deprived 20%. The highest proportion of e-bike and e-scooter related injuries occurred in the two most deprived SIMD quintiles (59.9%). This was most stark in e-scooters, where 46.3% of all e-scooter injuries occurred in quintile 1, compared to 30.7% of all e-bike related injuries (Figure 7).

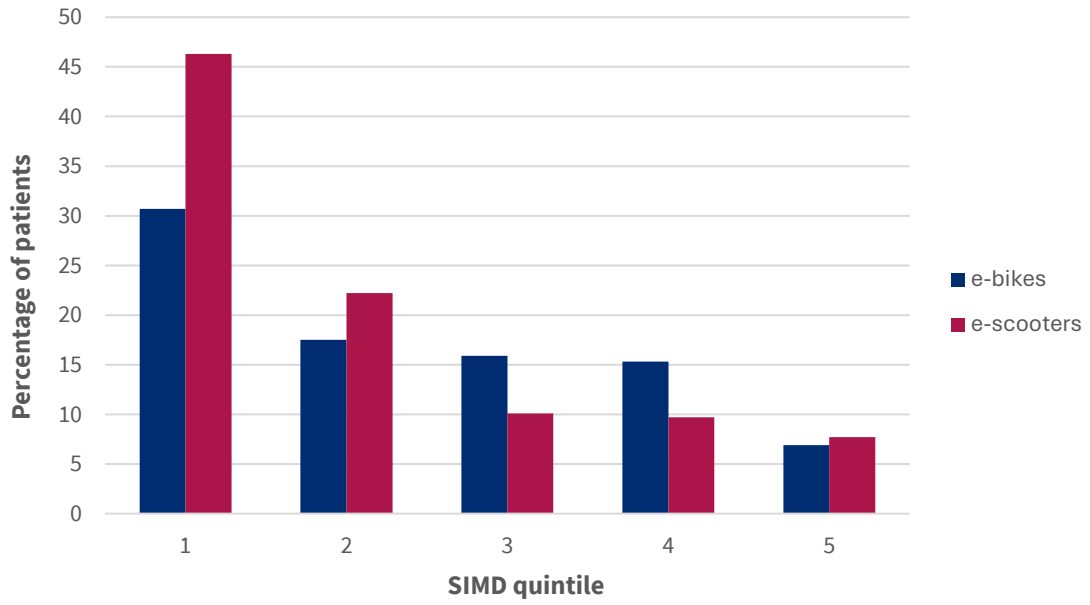


Figure 7 e-bike and e-scooter related injuries based on home postcode SIMD quintile (no postcode was provided in 18.2% of all submissions).

Crude rate of injury by health board were calculated with National Records of Scotland population estimates as denominators (National Records of Scotland, 2026). The health board regions with the highest proportion of e-bike and e-scooter related injuries per 100,000 of the crude population were NHS Fife (12.30 patients/100k), NHS Greater Glasgow and Clyde (11.56 patients/100k) and NHS Lanarkshire (10.47 patients/100k). However, the health board area with the highest total reported presentations was NHS Greater Glasgow and Clyde with 141 patients presenting in the eight-week survey period.

When analysed by Scottish Local Authority area, Glasgow City saw the highest incidence of patients presenting to hospital with e-bike or e-scooter related injuries (n=95), followed jointly by City of Edinburgh, Fife and North Lanarkshire (n=46 per location).

Injury circumstances

The data collection period spanned the months of June and July, which included the final few weeks of Scottish school term time and the start of the summer holidays. In June there were 230 presentations recorded, versus 216 in July.

Late afternoon and evening were the most common times recorded (Figure 8), with Thursday being the most common day for presentation. Cell colours represent the relative number of incidents recorded within each day and time period, with darker shading indicating greater activity.

Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	%
00:00-5:59	<5	<5	<5	<5	5	8	<5	6.95%
6:00-8:59	<5	<5	0	<5	5	<5	0	3.14%
9:00-11:59	<5	<5	<5	<5	6	<5	5	6.05%
12:00-14:59	10	6	7	11	10	12	6	13.90%
15:00-17:59	17	20	15	17	9	12	22	25.11%
18:00-20:59	22	18	20	25	20	15	20	31.39%
21:00-23:59	5	6	6	9	11	18	5	13.45%
	14.57%	12.78%	12.11%	16.59%	14.80%	15.25%	13.90%	

Figure 8 Day and time of injury

Analysis of data on the purpose of the journey identified that most incidents occurred when the vehicle was being ridden for leisure/fun (83.6%), with 8.3% of patients injured while commuting.

The patient was the primary rider of the vehicle in 91% of cases (n=406) however 21 presentations were pedestrians who had been hit by the vehicle (4.7%) and 19 were passengers on the vehicle (4.3%).

For each presentation, data was recorded on whether personal protective equipment (PPE) was worn from a choice of none, helmet, body armour (eg gloves, pads) or other (Figure 9). Most patients (76.9%) were not wearing any PPE at the time of the injury, with similar values specifically for e-bike incidents (73.5%) and e-scooter incidents (79.4%).

When analysed by patients' home postcode SIMD quintile (Figure 10), it appears there is no clear association between deprivation and PPE use. Most patients in each quintile reported wearing no PPE at the time of injury, ranging from 63.0% in quintile 4 to 84.8% in

SIMD quintile 1. Helmet use was most common among patients residing in SIMD quintile 4 (35.2%) and least common among those residing in SIMD quintile 1 (14.7%).

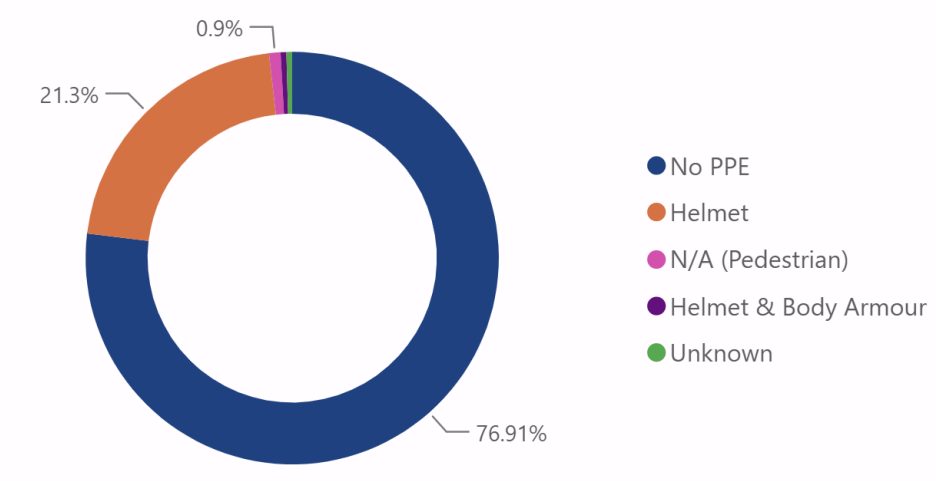


Figure 9 Percentage of cases where PPE was worn

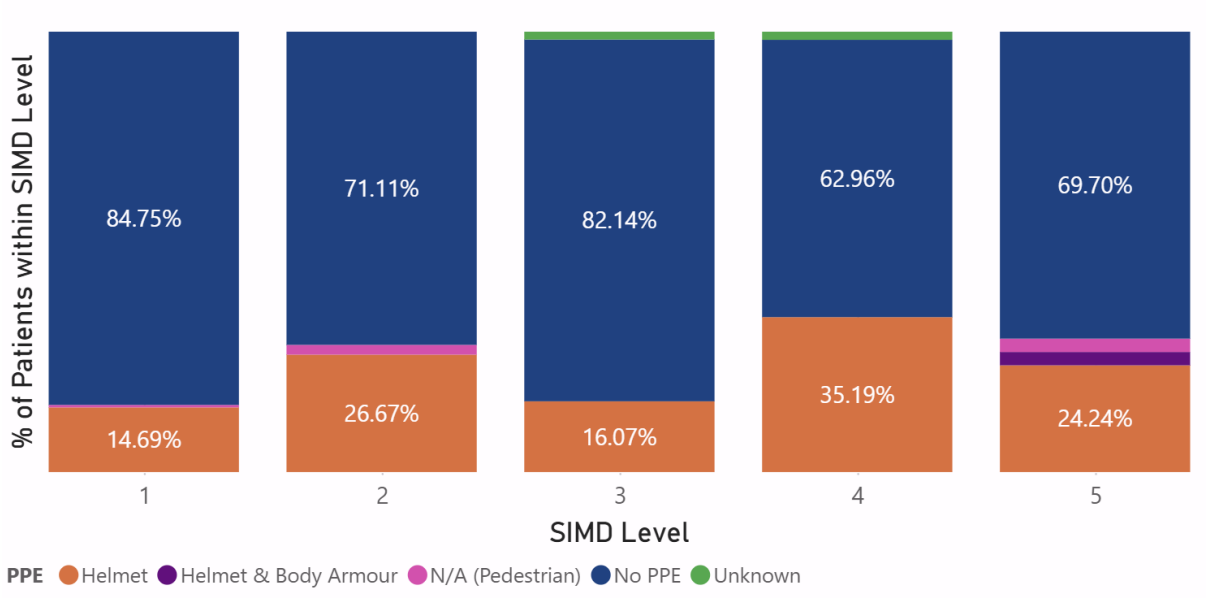


Figure 10 Percentage of PPE worn, by SIMD quintile

The survey findings on the location of the incident, demonstrate that injuries involving an e-bike are most likely to occur on roads, streets or transport areas (44.4%), whereas e-scooter incidents resulting in injury are more likely to happen on pedestrian walkways (48.6%) (Figure 11).

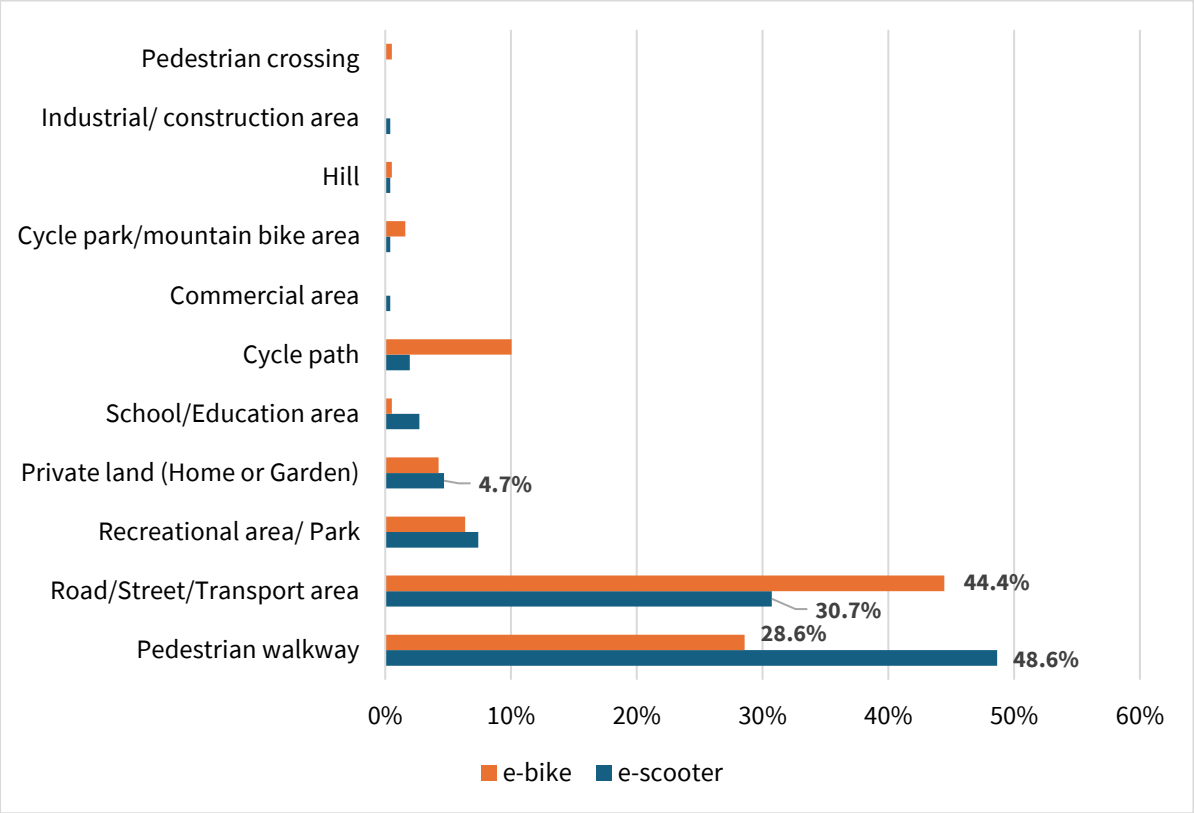


Figure 11 Location of incident causing e-bike or e-scooter injury

Private e-scooters are classified as motor vehicles and therefore require a licence and insurance to legally ride the vehicle. As it is currently not possible to insure e-scooters, it is therefore illegal to ride these in public areas. Of all the e-scooter incidents resulting in injury, 95.3% of these occurred when ridden illegally (i.e. not on private land).

According to Police UK, if a person causes serious harm to another person whilst riding an e-scooter, the incident will be investigated in the same way should the person have been driving a car. During the survey, 16.4% of all reported presentations related to an e-scooter involved another party such as a car, an inanimate object (such as a wall or lamppost) or a passenger on the vehicle.

Injury and outcomes

Clinicians were asked to record which body part was injured on presentation, selecting from a list of options (Appendix 2, Question 16). When patients sustained injuries to multiple body parts, which applies to 47.8% of all presentations, each injured body part is counted separately.

Injuries relating to e-bikes (Figure 12) most frequently involved the upper (26.8%) and lower limbs (22.7%). Adults aged 16 years and over accounted for 79.4% of all upper limb injuries, 70.7% of all lower limb injuries and 72.4% of all head injuries.

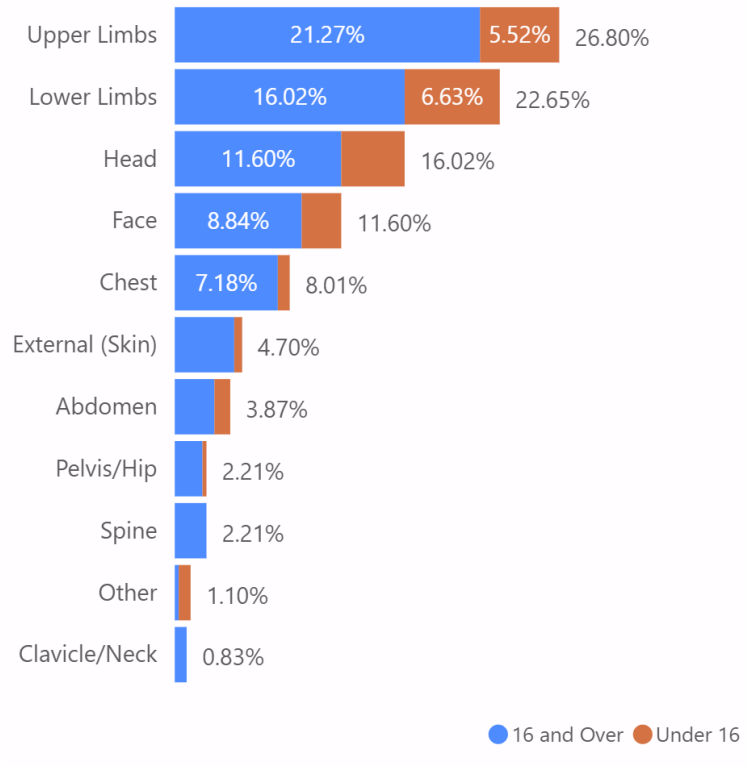


Figure 12 Percentage of injuries by body part of all e-bike incidents reported

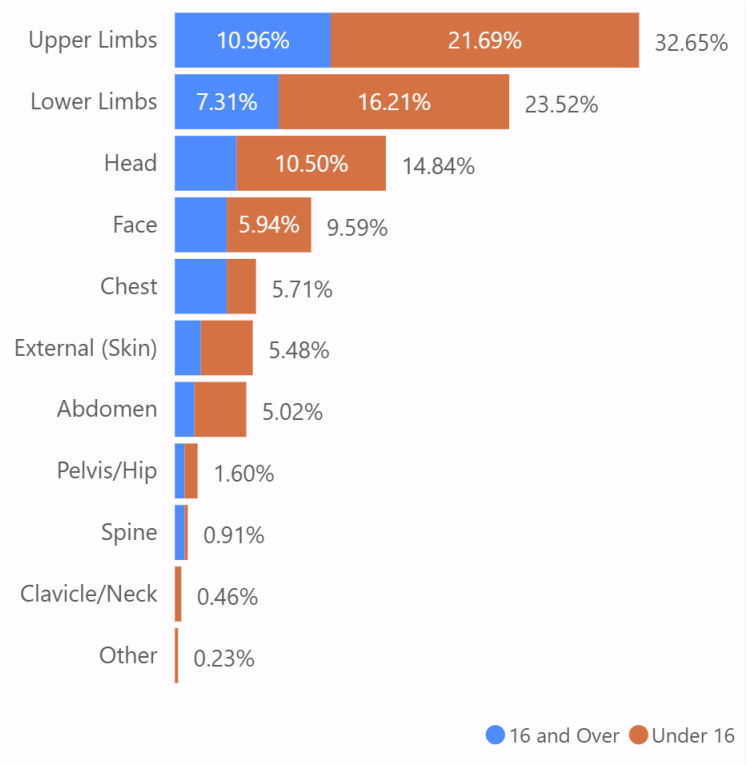


Figure 13 Percentage of injuries by body part of all e-scooter incidents reported

E-scooter-related injuries most commonly affected the upper limbs (32.7%), followed by the lower limbs (23.5%) and head (14.8%) (Figure 13). Most injuries to each of these body regions occurred in patients aged under 16 years.

In these e-scooter incidents, children and young people accounted for 70.8% of all head injuries, 68.9% of lower limb injuries and 66.4% of upper limb injuries.

Following presentation and assessment, patient departure details were collected to determine what proportion of the survey sample were admitted, transferred or discharged (Figure 14).

Patient destination	Site of presentation		
	Emergency Department	Minor Injury Unit	Other
Admitted to critical care	13	0	0
Admitted to general ward	43	<5	<5
Discharged (no further treatment)	193	53	<5
Discharged (outpatient follow-up)	91	32	<5
Theatre or Interventional Radiology (direct from ED)	<5	0	0
Transferred to hospital in the same health board	<5	<5	<5
Transferred to hospital in another health board	<5	<5	0

Figure 14 Patient destination versus site of presentation

Overall, 16.4% (n=73) of all presentations resulted in admission to a general ward or critical care, including those following inter-hospital transfer. In total, 2.9% of all cases (n=13) were admitted to critical care. Excluding transfers, the patient admission rate to the same hospital they presented at was 13.2%.

When considering the admitting speciality of all admissions, including patients who were transferred and admitted to another hospital, 37.0% were to Trauma and Orthopaedic surgery, 16.4% to General surgery, 8.2% to Neurosurgery and 8.2% to Paediatric surgery (Figure 15).

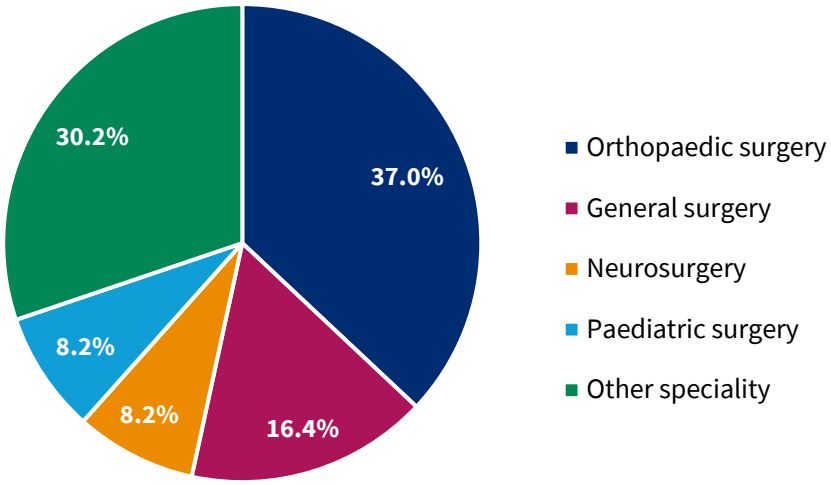


Figure 15 Percentage of patient's admitted by speciality (n=73)

Financial impact

Operational colleagues in SAS advised that the cost for an inter-hospital transfer would be calculated using an hourly rate of £92.05 (2026/27 costs) for a double ED crew and an estimated average transfer duration of 2.5 hours (including collection, transport and handover). For all transfers within and out with the presenting health board, the estimated costs during the eight-week survey period were £2,992.

Costs per attendance at ED were calculated using published Scottish health services costs (PHS, 2025a). The estimated cost over the eight-week period was £108,320, when combining all attendances at EDs and MIUs during the survey period. For patients who were discharged with outpatient follow-up, the cost of appointments was calculated using the average cost for attendance at outpatient clinics with the total value of these calculated as £30,100 for the survey period.

Clinicians were asked to indicate which specialty patients were admitted to from a list of options (Appendix 2, Question 19). Costs for these were then mapped to the PHS specialty categories (PHS, 2025b), with inpatient costs per case applied accordingly. The total cost for all admissions during the survey collection period was estimated at £513,712.

Based on the survey data collected over the eight-week period, the total estimated cost to NHS Scotland from e-bike and e-scooter related injuries was **£655,124** (Figure 16). By calculating the average weekly cost from the eight-week survey period and extrapolating this over 52 weeks, the broad estimate of annual costs is approximately **£4.26 million**. These figures should be interpreted as analytic estimates and may vary due to seasonal fluctuations, patient population, and differences in patient management, with some costs, such as GP appointments or community prescriptions not captured in the estimates.

Cost	Estimated cost to NHS Scotland for June and July 2026	Estimated annual cost to NHS Scotland
Presenting at ED	£108,320	£704,080
Inter-hospital transfer by the Scottish Ambulance Service	£2,992	£19,448
Discharge with outpatient follow-up	£30,100	£195,650
Admitted to specialty as inpatient	£513,712	£3,339,128
Total	**£655,124**	**£4,258,306**

Figure 16 Cost table outlining estimated costs to NHS Scotland from e-bike and e-scooter related injuries.

Clinician observations

In addition to structured survey data, several clinicians provided free-text descriptions of incidents in response to Question 20 in the survey. These comments highlighted additional factors relating to the circumstances of the injury/s, patients' intoxication through drugs or alcohol, multiple riders using a single e-scooter and whether vehicles were modified. Selected examples are presented below to provide context to the quantitative findings.

> *"Pedestrian hit by possibly multiple e-bikes when crossing road. Individuals on e-bikes fled scene and are presumably uninjured."*

> *"Patient had phone in right hand prior to losing control of vehicle." [e-bike]*

> *"[Patient] stole brother's modified scooter. Has nil memory of events."*

> *"He was an e-bike user hit in the leg by another e bike user [travelling] at what he estimates as 45mph."*

> *"Bystanders thought he was travelling at 40mph." [e-scooter]*

5. Discussion

Summary of findings

This survey is the first coordinated national effort to capture all e-bike and e-scooter related injuries presenting to EDs and MIUs across Scotland. During June and July 2026, 446 presentations were recorded across 11 territorial health boards, showing that these injuries are occurring in communities throughout the country. E-scooter incidents accounted for a greater proportion of presentations than e-bike incidents, despite private e-scooters being legally restricted to be use on private land.

Children and young people were disproportionately represented within the survey findings, particularly in relation to e-scooter injuries, where almost two-thirds of presentations involved this group. Males accounted for most presentations, and a high proportion of injuries occurred among residents from the most deprived areas.

Most patients were not wearing any form of PPE at the time of the incident. Injuries most commonly involved the upper limbs, lower limbs and head, reflecting the vulnerability of riders during falls and collisions. Although many patients were discharged following assessment, a notable minority required hospital admission, most commonly under Trauma and Orthopaedic surgery, highlighting the potential severity of injuries sustained.

Interpretation

The findings show that e-bikes and e-scooters are contributing to a growing and preventable source of injury presenting to NHS Scotland services. While these vehicles offer ease of mobility and environmental and public health benefits, the survey shows that their use can result in injuries requiring healthcare intervention, including specialist inpatient care and, in some cases, critical care admission.

The predominance of children and young people among e-scooter-related presentations is of note. Private e-scooters should only be used legally on private land, yet the finding that relatively few injuries occurred in locations where e-scooter use would be lawful, raises wider questions about awareness of current legislation, supervision of younger riders, the accessibility of these vehicles and law enforcement.

Minimal reported use of PPE is another important finding. The high proportion of riders not wearing protective equipment suggests there remains opportunity to improve safety behaviours. Similarly, the high proportion of presentations within more deprived populations highlights the need for further investigation to fully understand all contributing factors.

A key finding from an NHS perspective is the number of patients requiring hospital admission and specialist care. More than one in six presentations (16.4%) ultimately

resulted in admission to a ward or critical care setting, with Trauma and Orthopaedic surgery accounting for over one-third of all admissions. This reflects the burden that these presentations place not only on emergency care services but also on inpatient wards, operating theatres, clinicians and rehabilitation resources.

Implications

The survey findings have important implications for healthcare services, public health policy and injury prevention activity across Scotland. Although collected over a short period, the volume of presentations recorded indicates that e-bike and e-scooter related injuries are generating considerable demand on NHS Scotland services. This demand extends beyond emergency assessment and includes ambulance transfers, outpatient appointments, inpatient admissions and specialist interventions.

The estimated healthcare cost of £655,124 during the eight-week survey period, equivalent to an indicative annual cost of approximately £4.26 million, illustrates the potential scale of resources associated with e-bike and e-scooter related injuries. While these costs are estimates based on published unit costs, they demonstrate that even modest reductions in the incidence or severity of injuries could reduce pressure on healthcare services.

The necessity of this survey highlights a further important point. Existing clinical recording and coding systems cannot distinguish between e-bike and e-scooter injuries, nor from other transport-related incidents, limiting opportunities for routine surveillance and trend analysis. The successful implementation of this survey suggests there may be value in exploring more sustainable approaches to monitoring these injuries in future. Having access to national data on these vehicle-related injuries would support public health prevention initiatives, allow monitoring of emerging trends, and provide policymakers with robust information to inform future transport and safety policies.

6. Limitations

The nature of this national survey, while valuable in providing the first national dataset of its kind, has certain factors which should be considered when interpreting the findings. The data presented is a national collation of self-reported data by NHS Scotland health boards and is management data only. It has not been quality assured and therefore may not provide a complete picture; however, it does provide a useful indication of the frequency and circumstances of e-bike and e-scooter related injuries.

The necessity for this project came about due to the lack of formal recording of data on e-bike and e-scooters incidents in national NHS systems. While the survey demonstrates that e-bike and e-scooter related injuries are generating demand on NHS Scotland services, the absence of previous national surveillance data means it is not possible to establish whether this burden has changed over time.

While extensive stakeholder engagement and detailed communications were issued to all health boards in the run-up to the collection period, there may have been instances where staff were unaware of the project; therefore, a degree of underreporting should be acknowledged. The lack of presentations recorded from NHS Western Isles, NHS Orkney and NHS Shetland suggests that some incidents may not have been captured by the survey. In addition, pressures on clinical staff and busy EDs may have limited opportunities for data collection in addition to routine clinical duties.

The survey was conducted over an eight-week period in the summer and therefore captures only a snapshot of e-bike and e-scooter related incidents throughout the country. The lower rates in July, could be linked to the commencement of the school summer holiday period, when Scottish residents make take advantage of lower cost airfares and holidays prior to schools breaking up south of the border. Additionally, the data collection period ran over 8 weeks, concluding on Sunday 26 July to avoid the busy national changeover day on Wednesday 5 August. Not including the final five days of July may have contributed to the lower reported presentations in this month. Further, the survey was limited to summer months when incident of injury may be higher (Safe e-bike.com, 2026).

Responses to the survey were reliant on information provided by patients, accompanying relatives, or attending SAS staff. Consequently, some information relating to the circumstances of the incident, such as vehicle type, may have been inaccurately reported. For a small proportion of records, certain data items were recorded as unknown or based on estimates, for example the speed at which the patient was travelling.

The data collected were not age-standardised, and this should be considered when interpreting the proportion of incidents involving patients aged under 16 years. The survey did not record whether patients were Scottish residents but instead requested a home postcode. Where no postcode was provided, it is possible that patients were visitors to the area, including tourists. If patients were unfamiliar with the local environment or road network, this may have contributed to the incident.

Clinicians were asked to record the timeframe of the injury as reported by the patient or attending SAS crew. However, it should be noted that in some cases this may have reflected the time of presentation to the ED or MIU rather than the time of the incident itself. Where there was a delay between the incident and attendance, this may have affected the accuracy of the timeframe analysis.

Results show the proportion of all injuries involving each body part; however, individuals may have sustained multiple injuries within a single body part (e.g. multiple leg fractures). As the survey recorded only the body part affected, and not the number or severity of injuries within that region, these data do not provide a measure of injury severity or injury complexity.

The survey did not collect data on the mode of transport, from point-of-injury to hospital presentation (i.e. by ambulance or self-presentation). As a result, the additional cost of

initial transport by ambulance cannot be accounted for and therefore the total cost will be underestimated.

When calculating the cost to NHS Scotland of e-bike and e-scooter related incidents, costs were derived using published average unit costs and are provided for illustrative purposes only. Data were not collected on length of stay, severity of injury, or rehabilitation requirements, and therefore actual costs may differ substantially between patients. Accordingly, the estimated costs should be interpreted as broad estimates of the potential healthcare resource implications rather than precise measures of expenditure.

7. Conclusions

This survey provides the first national overview of e-bike and e-scooter related injuries presenting to EDs and MIUs across Scotland. The findings demonstrate that these incidents are generating a notable burden for NHS Scotland, with presentations recorded across most participating health boards and a high proportion requiring inpatient care.

Children and young people, particularly those involved in e-scooter incidents, represented a substantial proportion of presentations. Injuries most commonly involved the upper and lower limbs and head, while the low reported use of PPE highlights an important area for future injury prevention activity. The survey also identified socioeconomic inequalities in the distribution of incidents and variation in where incidents occurred.

Although many patients were discharged following assessment, the number requiring admission, transfer and specialist treatment demonstrates that these injuries can have significant consequences for patients and consume considerable NHS resources. Using indicative costing methodology, the healthcare costs associated with injuries recorded during the eight-week survey period exceeded £655,000, equating to an estimated annual cost of over £4 million if activity remained consistent throughout the year.

Taken together, the findings suggest that e-bike and e-scooter related injuries should be considered an emerging public health issue within Scotland. Continued surveillance, improved data collection, targeted injury prevention measures and cross-sector collaboration will be important in reducing harm and informing future policy and legislation.

8. Recommendations

Surveillance

Recommendation 1: NHS Scotland should submit a proposal to the World Health Organisation for the International Classification of Diseases to feature codes specifically relating to e-bike and e-scooter related injuries for all hospital attendances. This would enhance routine surveillance and enable ongoing monitoring of trends and outcomes.

Recommendation 2: Enhance future STN e-bike and e-scooter surveys by considering capturing additional information on injury severity, patient pathways and mode of arrival to hospital.

Policy

Recommendation 3: National and local partners should consider how existing road safety messaging can be strengthened to improve awareness of legislation relating to e-bike and e-scooter use.

Recommendation 4: The report, and opportunities for prevention, are considered by Transport Scotland's Road Safety Operational and Strategic Partnership Groups, in the light of a recent publication, effective road safety interventions for public health: an umbrella review (Public Health Scotland, 2026).

Prevention and education

Recommendation 5: Existing road safety education programmes should be expanded to include safety messaging on e-bike and e-scooters, with an aim to reduce preventable injuries and raise awareness of the safe and legal use amongst school-aged children and their parents/guardians.

Recommendation 6: Public health and road safety partners should promote the use of helmets and other appropriate protective equipment through targeted awareness campaigns.

9. References

Department of Transport (2024) *EAPC standards and legal requirements*. Available at: https://www.gov.uk/government/publications/electrically-assisted-pedal-cycles-eapcs/electrically-assisted-pedal-cycles-eapcs-in-great-britain-information-sheet, (Accessed October 2026)

Kenny M, Raja A (2025) *SRP10: The potential for E-bikes in Scotland* Available at: https://www.walkwheelcycletrust.org.uk/media/kcvabtff/the-potential-for-e-bikes-in-scotland-report.pdf (Accessed October 2026)

McMillan G, Scobie G, Rennick L, Greci S, Hamilton S, Buckton C, Harding O, Douglas M, Davis A, Gale A, & Bridgman S (2026). *Effective road safety interventions for public health: an umbrella review.* Available at: https://doi.org/10.57064/2164/26292 (Accessed October 2026)

National Records of Scotland (2026) *Mid-2025 population estimates.* Available at: https://www.nrscotland.gov.uk/publications/mid-2025-population-estimates/ (Accessed October 2026).

NHS Greater Glasgow and Clyde (2025) *Warning as children's escooter and ebike incidents spike.* Available at: https://www.nhsggc.scot/warning-as-childrens-escooter-and-ebike-incidents-spike/ (Accessed August 2026)

Police UK (2026) *E-scooters and electric bikes.* Available at: https://www.police.uk/advice/advice-and-information/rs/road-safety/advice-escooters/ (Accessed September 2026)

Public Health Scotland (2026) *Effective road safety interventions for public health: an umbrella review.* Available at: https://publichealthscotland.scot/publications/effective-road-safety-interventions-for-public-health-an-umbrella-review/ (Accessed October 2026)

Public Health Scotland (2025a) *R100T: Expenditure and activity figures for the last 5 years, for Scotland and each board).* Available at: https://publichealthscotland.scot/publications/scottish-health-service-costs/scottish-health-service-costs-summary-for-financial-year-2023-to-2024/files-listing-for-2023-to-2024/ (Accessed September 2026)

Public Health Scotland (2025b) *R04X: Specialty summary- all specialties (excluding long stage), by patient type, by board.* Available at: https://publichealthscotland.scot/publications/scottish-health-service-costs/scottish-health-service-costs-summary-for-financial-year-2023-to-2024/files-listing-for-2023-to-2024/ (Accessed September 2026)

Safe e-bike.com (2026) *Too many accidents happen each year.* Available at: https://safe-ebike.com/statistics-ebike-accident-statistics (Accessed October 2026)

Scottish Government (2026) *Scottish Index of Multiple Deprivation: data and resources*. Available at: https://www.gov.scot/collections/scottish-index-of-multiple-deprivation-2020/ (Accessed August 2026)

Trimble J (2026) 'Police Scotland Issue Electric Scooter and 'e-bikes' Warning and Guidelines to Falkirk Parents, *Falkirk Herald*, 6 May. Available at: https://www.falkirkherald.co.uk/news/crime/police-scotland-issue-electric-scooter-and-e-bikes-warning-and-guidelines-to-falkirk-parents-8505567 (Accessed October 2026)

UK Government (2024) Guidance: EAPC standards and legal requirements. Available at: https://www.gov.uk/government/publications/electrically-assisted-pedal-cycles-eapcs/electrically-assisted-pedal-cycles-eapcs-in-great-britain-information-sheet (Accessed September 2026)

UK Government (2025) Riding an electric bike: the rules. Available at: https://www.gov.uk/electric-bike-rules (Accessed June 2026)

World Health Organisation (2025) *ICD-11 International Classification of Diseases 11th Revision.* Available at: https://icd.who.int/en/ (Accessed August 2026)

10. Appendices

Appendix 1 Short Life Working Group membership

Name	Role	Organisation
Angela Khan	National Clinical Audit Manager	Scottish Trauma Audit Group, PHS
Ashley Strickland	Data Analyst, Information Management Service (IMS)	Public Services Delivery (PSD) Scotland
Danny Kerr	Clinical Effectiveness Lead: Major Trauma	Scottish Ambulance Service
Emma Gough	Paediatric Trauma Coordinator	North of Scotland Trauma Network
Judith Montgomery	Major Trauma Rehab Coordinator	South East Scotland Trauma Network
Kirstin Thomson	Programme Manager	Scottish Trauma Network
Mark Lilley	Paediatric Major Trauma Coordinator	West of Scotland Trauma Network
Mark McKeirnan	Programme Support Officer	Scottish Trauma Network
Paul Campbell	Emergency Medicine Trainee (ST3)	South East Scotland Trauma Network
Sarah Cant	Advanced Trauma Nurse Practitioner	East Scotland Trauma Network
Stephen Bridgman	Consultant in Public Health	Public Health Scotland
Val McDowall	Advanced Nurse Practitioner, Adult Major Trauma Centre	South East Scotland Trauma Network

Appendix 2 Survey question set

Scottish Trauma Network: e-bike and e-scooter injury survey

Please complete when any patient presents with an injury sustained through an e-bike (with pedals) or an e-scooter. Vehicles **NOT** in scope include: electric motorbikes, mopeds, mobility scooters and electric trikes.

It should take no longer than 5 minutes.

1. **Month of injury** *(dropdown with 12 months)*
2. **Day the injury occurred** *(dropdown with 7 days)*
3. **Time when the injury occurred**
    a. 00:00-05:59
    b. 6:00-8:59
    c. 9:00-11:59
    d. 12:00-14:59
    e. 15:00-17:59
    f. 18:00-20:59
    g. 21:00-23:59
4. **Where did the patient present?**
    a. Emergency department
    b. Minor injury unit
    c. Other
5. **What health board are you reporting from?** *(dropdown with 14 territorial health boards)*
6. **Patient's sex?**
    a. Male
    b. Female
7. **Patient's age (at last birthday)** *(freetext box restricted to numerical value)*
8. **Patient's home postcode (in full)** (Please DO NOT include any patient identifiable information. Any submissions containing patient identifiable data will not be used in the survey and will be deleted) *(freetext box)*
9. **Was the patient wearing any personal protective equipment? Select all that apply**
    a. No PPE was worn
    b. Helmet
    c. Body armour (eg gloves, pads)
    d. Other
10. **Where did the injury take place?**

- Pedestrian walkway (e.g. path, pavement)
    a. Cycle path
- Road or transport area (e.g. car park)
    b. Place of residence/ home or garden
    c. School/ education area

    d. Recreational area/ park
    e. Industrial/ construction
- Private land (e.g. farmland)
- Commercial area (e.g. shopping centre)
    f. Other

11. What type of e-vehicle was involved? (electric motorbikes and mopeds are NOT in scope)
    a. e-Scooter (standing)
    b. e-Bike (electrically assisted bicycle with pedals)

12. What speed does the patient think they were travelling (in miles per hour)? (*Optional freetext box restricted to numerical value)*

13. Was the patient:
    a. the primary rider of the vehicle
    b. a passenger on the vehicle and not the primary rider
    c. not travelling on the vehicle/ a pedestrian

14. Purpose of the journey?
    a. Leisure/ for fun
    b. Business/ commuting
    c. Unknown

15. Was another party involved in the incident?
    a. No
    b. Pedestrian
    c. Bicycle
    d. Motorbike
    e. Car
    f. Bus
    g. Lorry/ van
    h. Stationary vehicle (parked)
    i. e-bike
    j. e-scooter
    k. Inanimate object (eg wall, gate)
    l. Other

16. Injured body part? Select all that apply
    a. Head
    b. Face
    c. Spine
    d. Chest
    e. Abdomen
    f. Upper limb/s
    g. Lower limb/s
    h. Pelvis
    i. External (skin)
    j. Other

17. Patient departure?
    a. Discharge with no further treatment

b. Discharged with out-patient follow-up
c. Transfer to other hospital in **same** health board for ongoing management
d. Transfer to other hospital in a **different** health board for ongoing management
e. Admitted to general ward (select the speciality in the following question) *Branching to Qu20.*
f. Admitted to critical care (select the speciality in the following question) *Branching to Qu20.*
g. Taken straight to theatre or interventional radiology from ED
h. Died (RIP)

18. **Please provide the name of the hospital the patient was transferred to**. (Please **DO NOT** include any patient identifiable information. Any submissions containing patient identifiable data will not be used in the survey and will be deleted) *(branching freetext box from Qu18 c and d)*
19. **Under which speciality was the patient admitted?**
    a. Cardiothoracic
    b. Emergency medicine
    c. ENT
    d. General medicine
    e. General surgery
    f. Intensive care medicine
    g. Maxillofacial surgery
    h. Major Trauma Service
    i. Medicine of the elderly
    j. Neurosurgery
    k. Orthopaedic surgery
    l. Ophthalmology
    m. Paediatric HDU
    n. Paediatric surgical ward
    o. Plastic surgery
    p. Spinal injuries
    q. Vascular surgery
    r. Urology
    s. Other

- **Please note any other information you wish to add (e.g. was the vehicle modified to make it go faster)** (Please **DO NOT** include any patient identifiable information. Any submissions containing patient identifiable data will not be used in the survey and will be deleted) (*optional freetext box*)

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