



RSA

Serious injuries among car users and motorcyclists on Irish roads

2nd RSA Seminar on serious injuries

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Dr Stefania Castelló






Public health researcher / Analyst

scastello@rsa.ie

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Content

Serious injuries among motor vehicle users on Irish roads

-  Background and sources of data on serious injuries: hospital and An Garda Síochána records
-  Serious injuries over 2014-2024
-  Characteristics of hospitalised car users
-  Characteristics of hospitalised motorcyclists
-  Key messages and conclusions

Serious injury reporting

The European context

- Reporting on serious injuries is complex
- The international evidence highlight limitations of reporting on serious injuries based only on police data
 - **Lack of harmonised definition** of a serious injury between countries, making international comparisons difficult
 - **Police record what is reported to them:** potential underreporting of crashes if they are not alerted
 - **Assessment of injury severity** is done by police member without medical training



Serious injury reporting

The European context

- To overcome limitations of current reporting, the European Commission requested Member States to report on serious injuries following a medical definition, the '**MAIS3+**' definition
 - Based on a validated trauma scoring scale (the Abbreviated Injury Scale, AIS)
 - Require access to hospital data

“The transport ministers will undertake to continue ... with the work towards:

*(i) reducing the number of serious injuries in road traffic collisions, and (ii) **reporting reliable and comparable data using a common definition based on the MAIS3+ trauma scale**”*

Valletta Declaration on Road Safety, 29 March 2017, Valletta



The MAIS3+ serious injuries project

Overview



- The current **Road Safety Strategy 2021-2030** includes specific actions to expand serious road injury reporting with hospital data, to better understand the incidence, cause, management, and outcomes of traumatic road injuries at a national level.

The MAIS3+ serious injuries project

- **Primary goal** of reporting on MAIS3+ serious injuries to the EC
- **Greater understanding** of serious injury trends and characteristics in hospital discharge records
- **Partnership** with the HSE National Health Intelligence Unit and Trinity College Dublin Department of Public Health & Primary Care
- **Comparison** of injury trends and characteristics in hospital data with AGS records, where possible.
- **Exploration** of other sources of data on serious injuries

Sources of data on serious injuries

An Garda Síochána (AGS) data and hospital discharge records from HIPE

- AGS and hospital data are complementary.
- Some pieces of information can be found in both AGS and hospital data.



AGS DATA

- ✓ Exact location of the collision
- ✓ Date and time of collision
- ✓ Road type and characteristics
- ✓ Number and characteristics of vehicles involved
- ✓ Casualties' contributory actions
- ✓ Broad injury description (fatal, serious, minor)

HOSPITAL DATA

- ✓ Age
- ✓ Gender
- ✓ Road user type
- ✓ Other vehicle involved
- ✓ If it was a traffic collision (i.e. on a public road)
- ✓ Date/time of hospital admission
- ✓ Casualty comorbidities
- ✓ County of residence
- ✓ Injury assessment: single or multiple, body part, type, severity
- ✓ Number of days at hospital
- ✓ Number of days at ICU
- ✓ Discharge destination



- Data cleaning and deduplication of HIPE records in consultation with NHIU
- Specified inclusion / exclusion criteria



Definitions of serious injury

AGS and hospital data

■ AGS data:

- Person **detained in hospital as an in-patient**, or
- Person with **any of the following injuries** whether or not detained in hospital: fractures, concussions, internal injuries, crushing, severe cuts and lacerations, or severe general shock requiring medical treatment.

■ Hospital data:

- Casualties are assigned a maximum injury severity score (from 1 to 6) based on the **Abbreviated Injury Scale (AIS)***.
- As a result, we obtain two sub-groups of casualties in terms of injury severity:
 - **Casualties with clinically moderate injuries** are those with a maximum AIS score of 2 or less (MAIS2-).
 - **Casualties with clinically serious injuries** are those with at least one injury with a maximum AIS score of 3 or more (MAIS3+).
 - **All hospitalised casualties = (MAIS2-) + (MAIS3+).**
- **All casualties in the hospital sample are in-patients.**

*Association for the Advancement of Automotive Medicine (2016). Abbreviated Injury Scale (c) 2005 Update 2008. (T. Gennarelli, & e. Woodzin, Eds.) Chicago, Illinois.



Total and trends in serious injuries in Ireland

2014-2024

Total

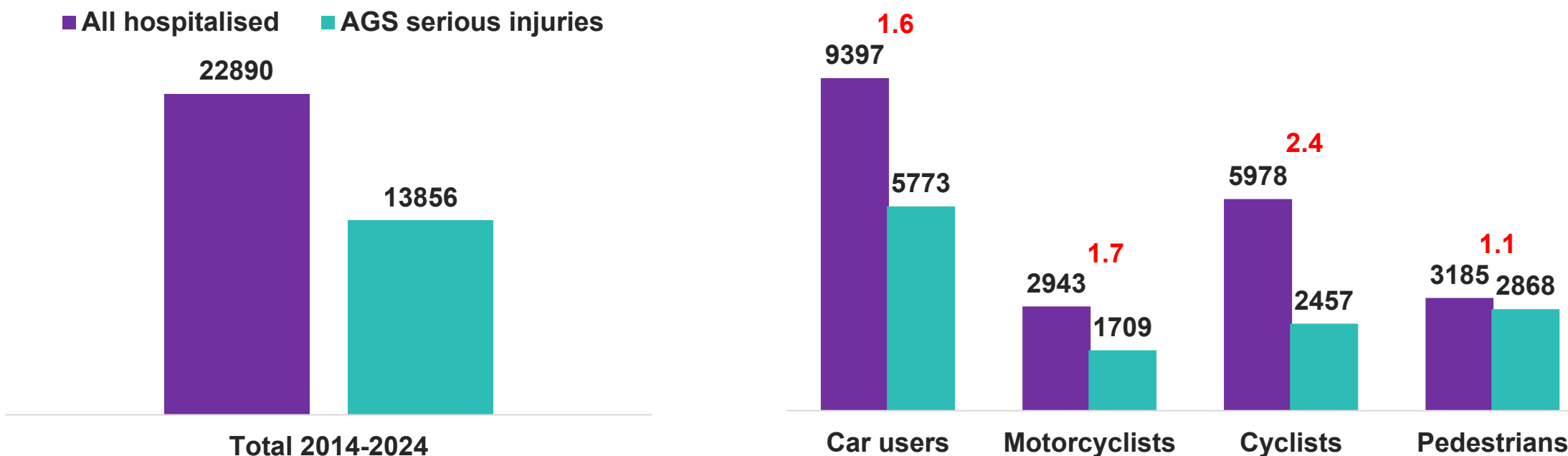


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Hospital and AGS data – 2014-2024

- There is a difference in the number of casualties recorded in each data source: overall, there were 1.7 hospitalised casualties for each serious injury recorded by AGS.
- The difference between the two data sources is observed for all road users.
 - The ratio hospitalised to AGS varies by road user.



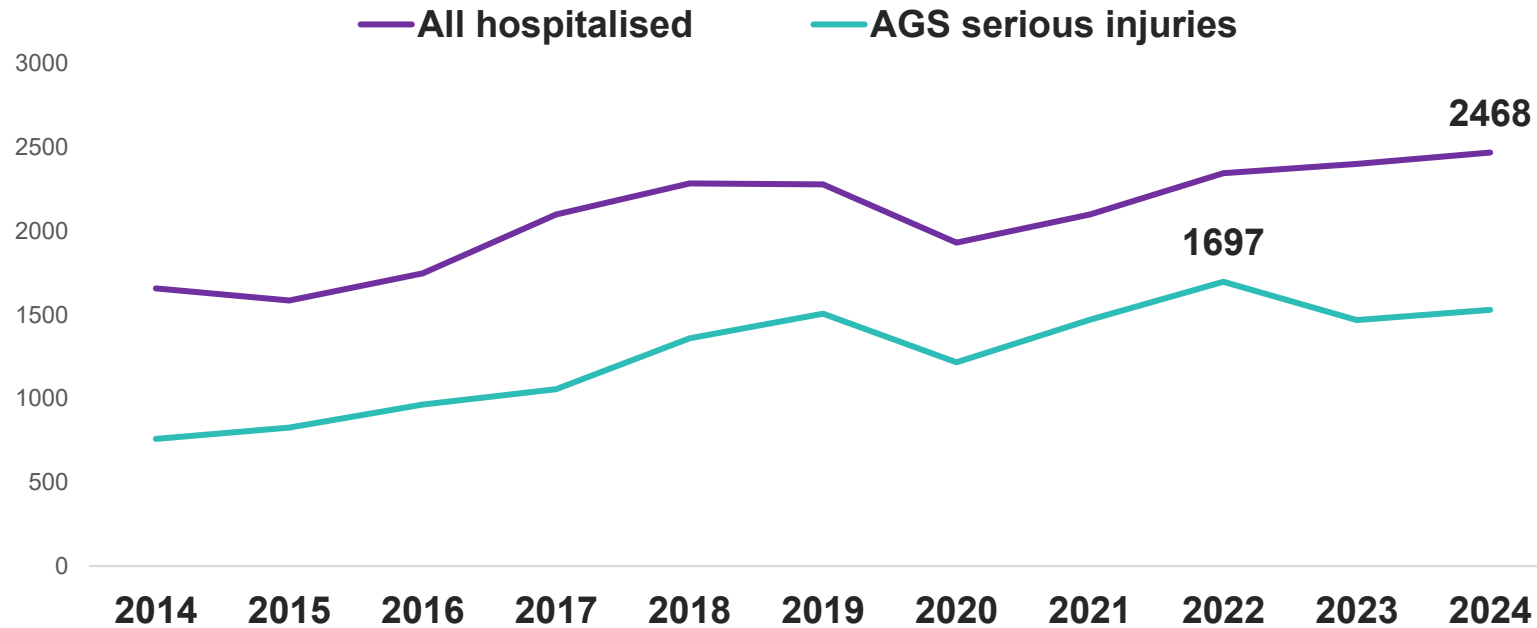
AGS data is current as of September 2025. AGS data for 2021 onwards is provisional and subject to change.

Trends



Hospital and AGS data – 2014-2024

- The number of serious injuries is increasing – highest annual total of hospitalised casualties was recorded in 2024.



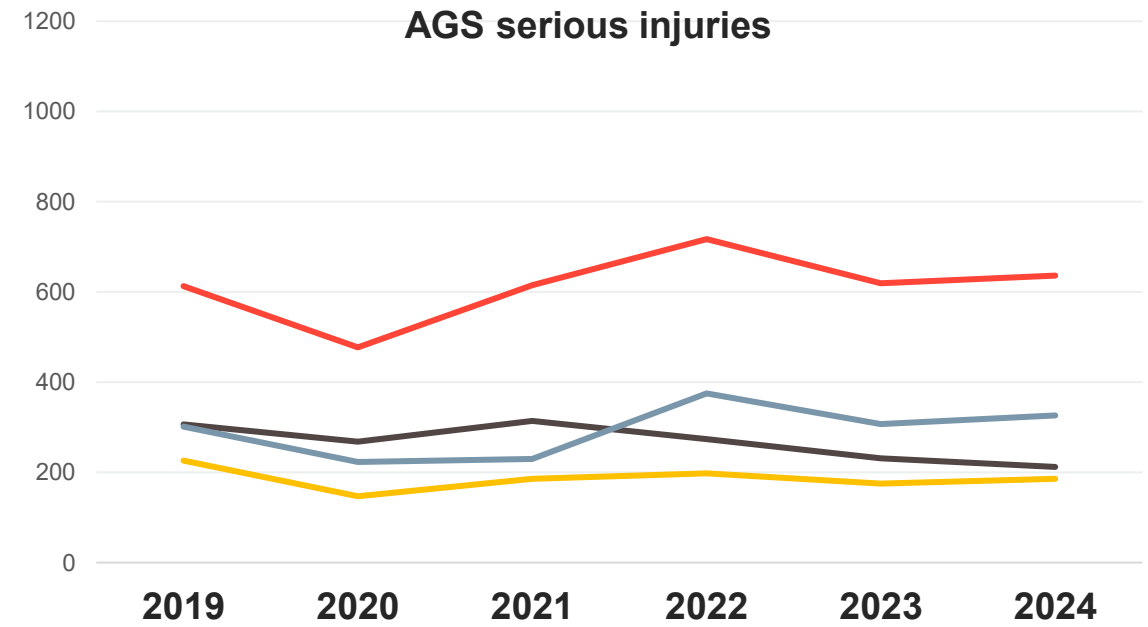
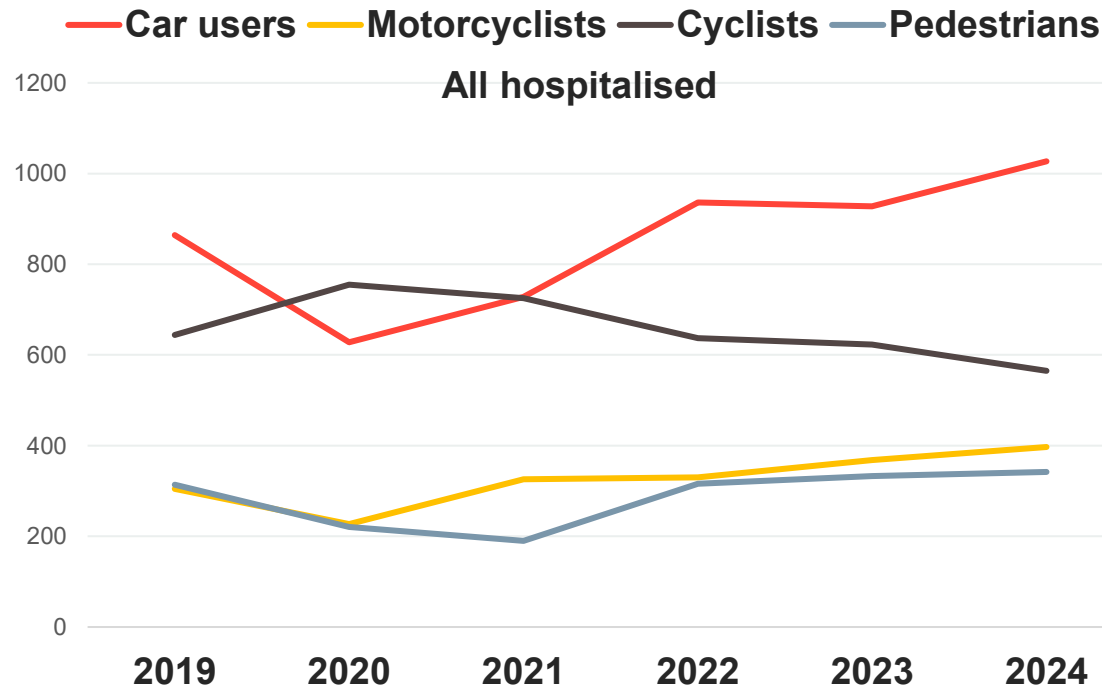
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Trends by road user

Hospital and AGS data – 2014-2024

- Trends vary by road user and are different in each data source.



AGS data is current as of September 2025. AGS data for 2021 onwards is provisional and subject to change.

Characteristics of hospitalised car users

2014-2024

Source: hospital data

Totals

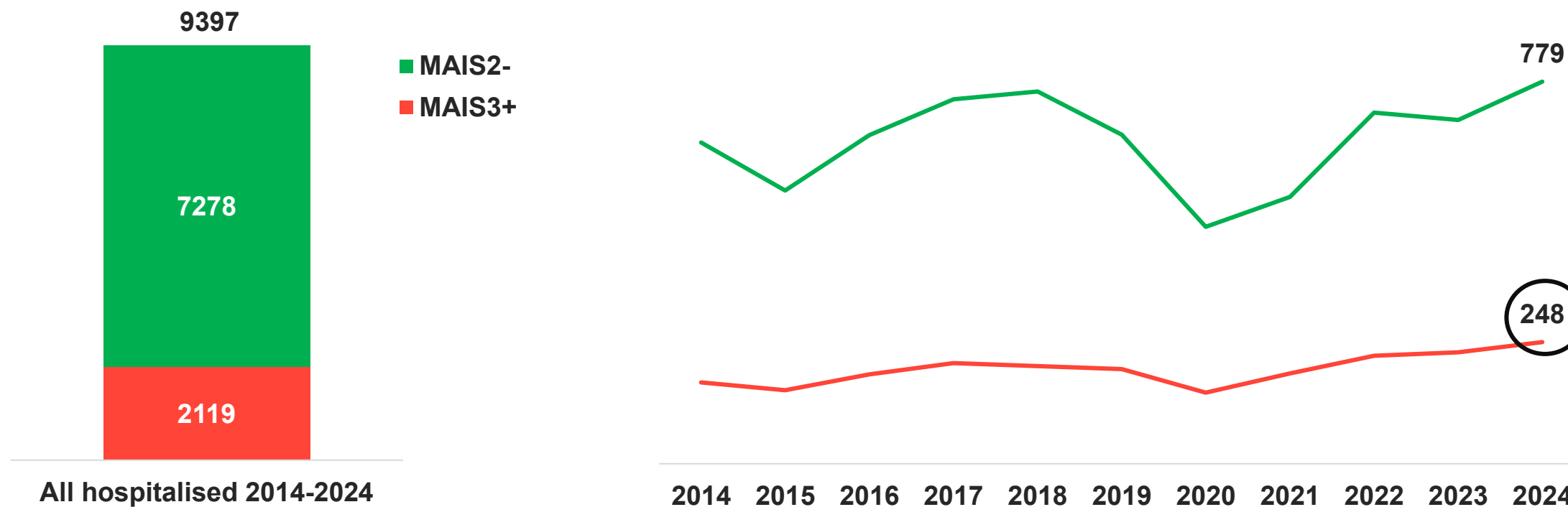


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All hospitalised car users – 2014-2024

- 23% of hospitalised car users sustained clinically serious injuries (MAIS3+).
- The highest annual total of MAIS3+ injuries among car users was recorded in 2024 (248).

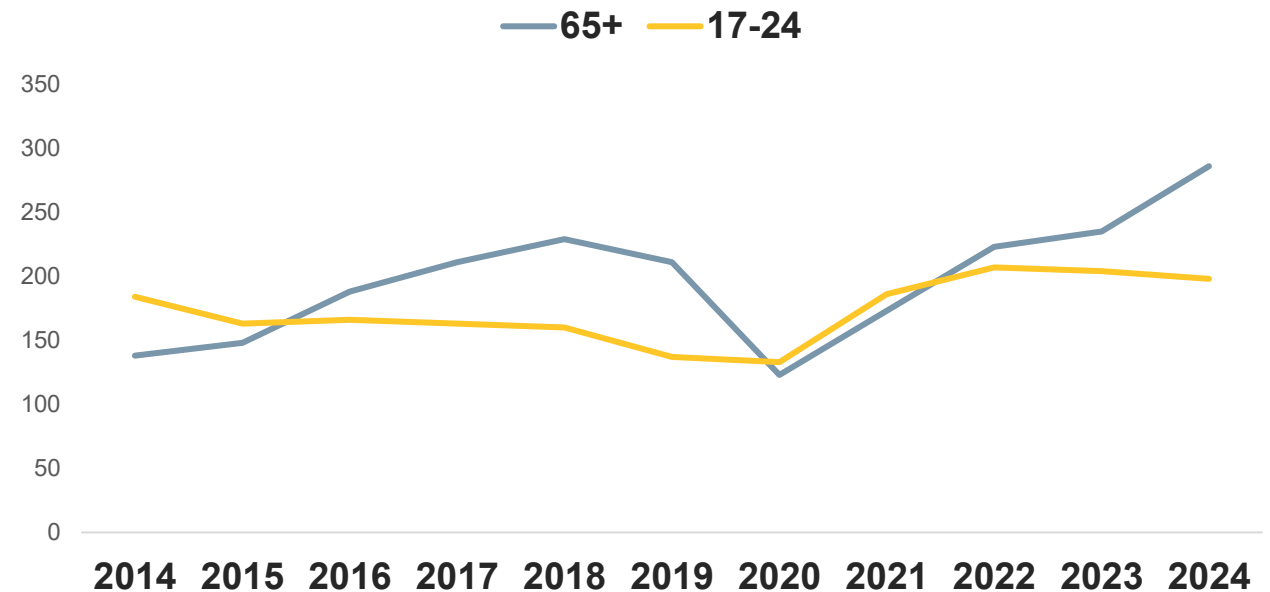
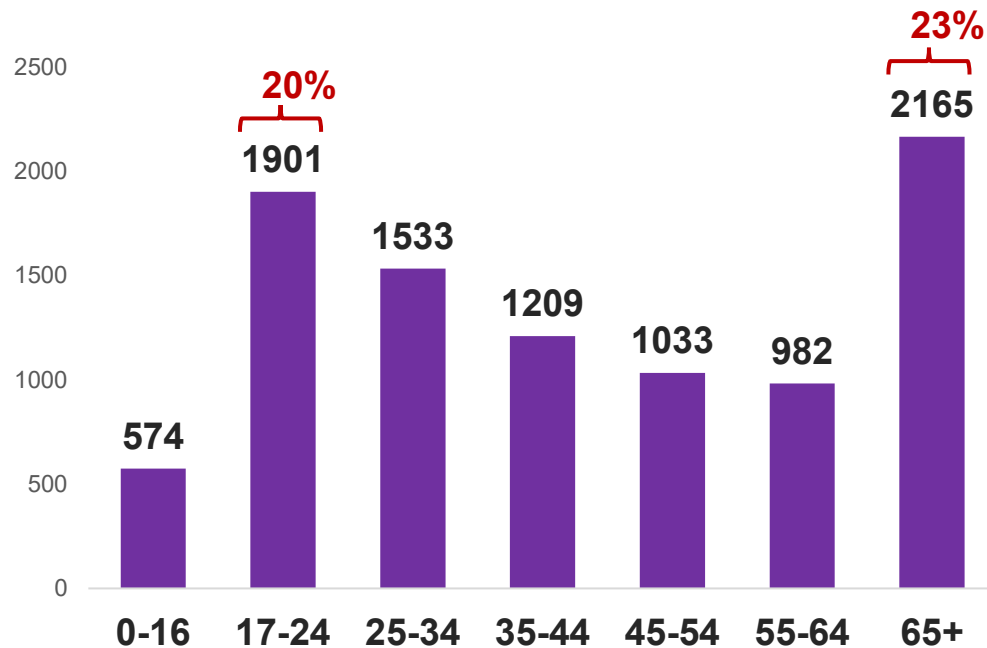


Age



All hospitalised car users – 2014-2024

- 23% of hospitalised car users were aged 65 years or older.
- 20% were aged 17-24 years
- MAIS3+ car users: 23% 17-24 years; 24% 65+.

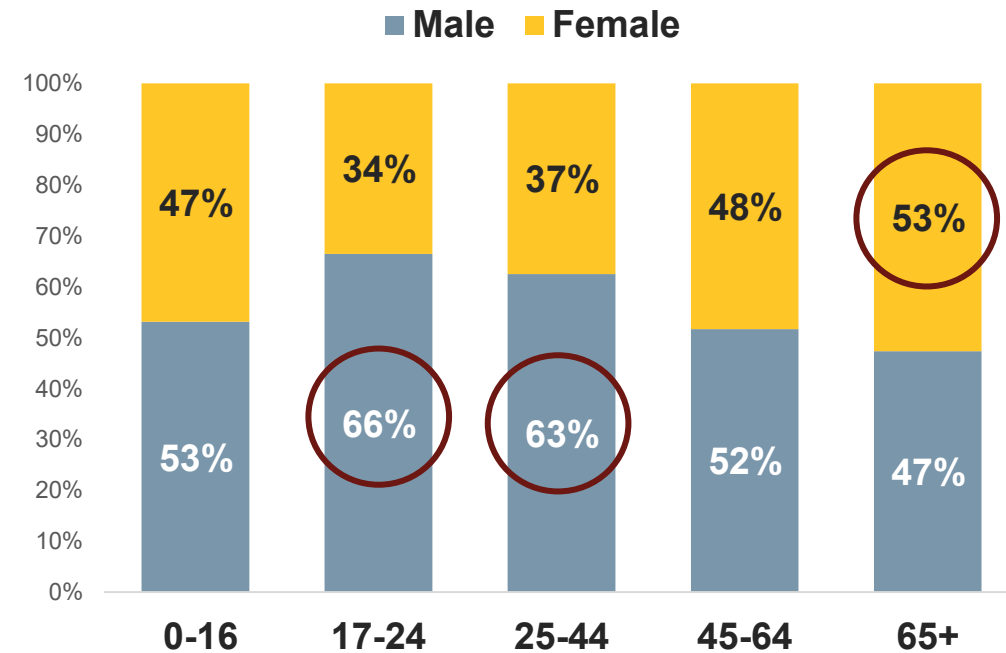
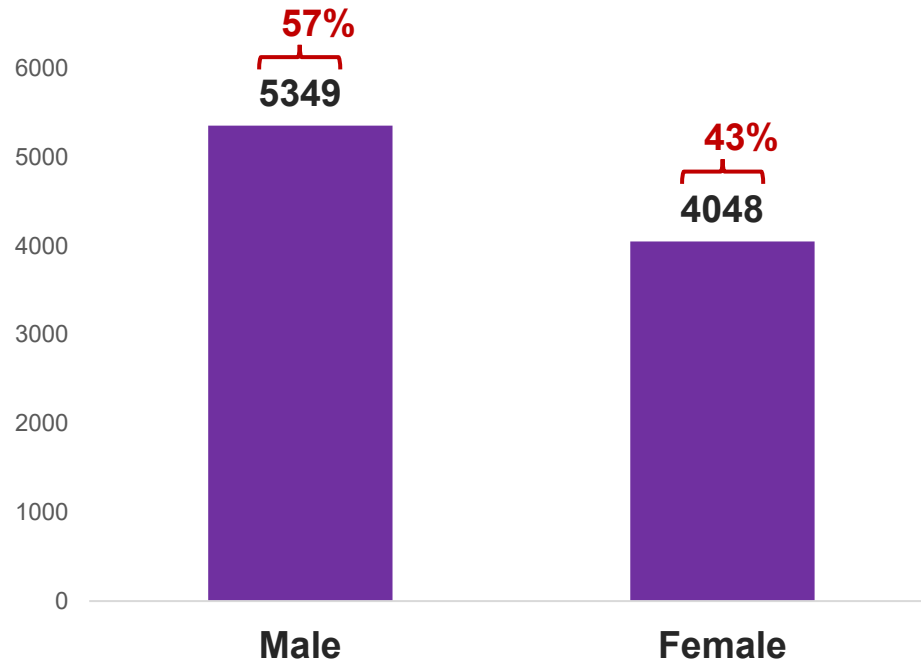


Gender



All hospitalised car users – 2014-2024

- 57% hospitalised car users were male – although share varies by age.
- MAIS3+ car users: 64% male.

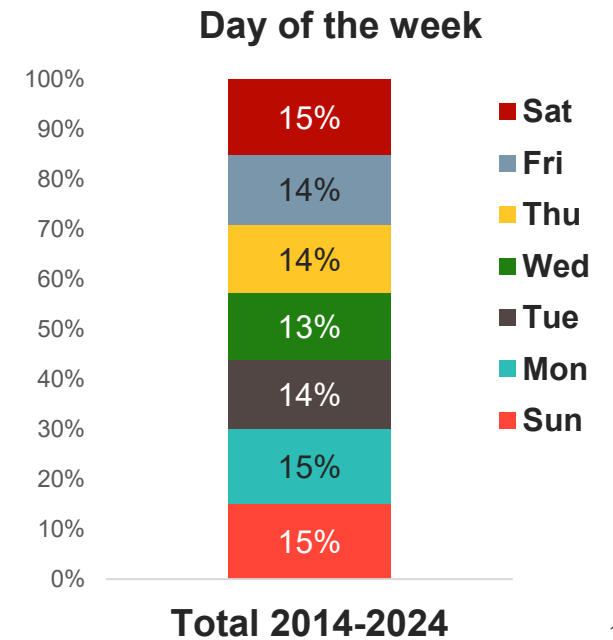
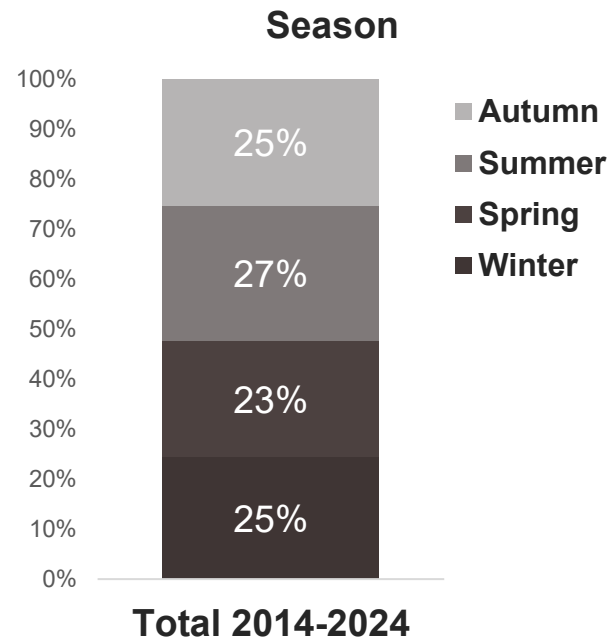
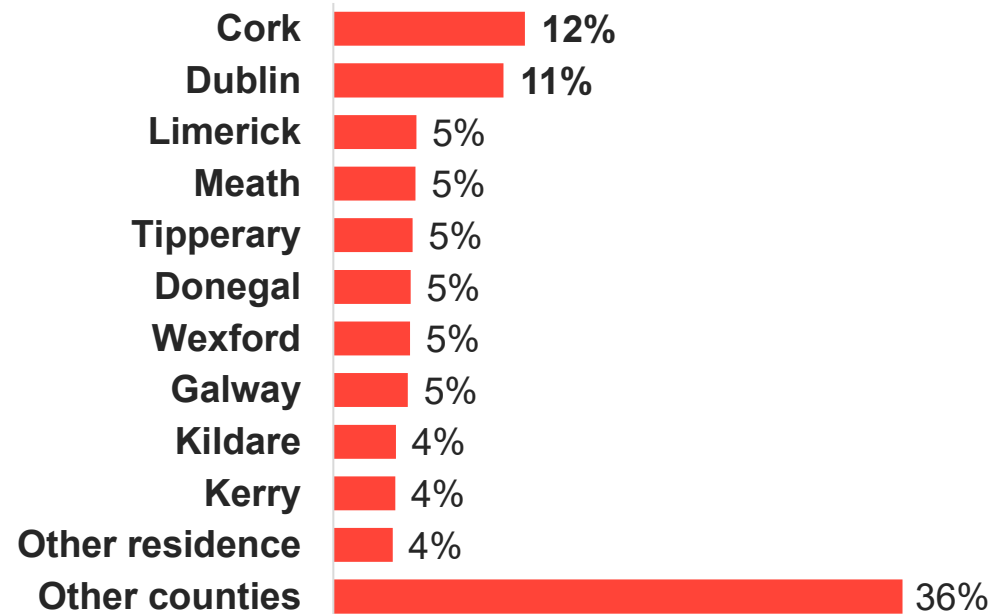


County of residence and date of hospital admission

All hospitalised car users – 2014-2024



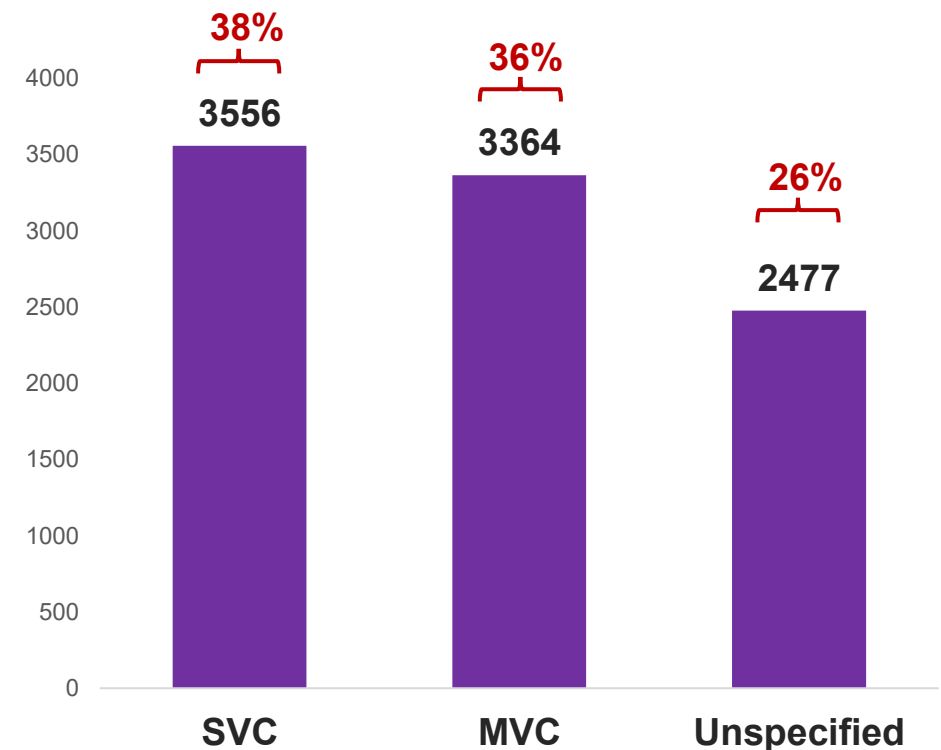
- Cork and Dublin accounted for the highest share of hospitalised car users, of all ages.
- Admission to hospital was almost equally distributed across the four seasons and the days of the week.
 - 17-24 years: Summer, Sat/Sun/Mon
 - 65+ years: Summer



Collision type

All hospitalised car users – 2014-2024

- 38% of hospitalised car users were injured in single-vehicle collisions (SVCs).
 - SVCs among 17-24: 46%
 - SVCs among 65+: 38%
 - SVCs among MAIS3+: 41%
- Of those in multi-vehicle collisions (MVCs), most were injured in collisions with a car, truck, or van (87%).





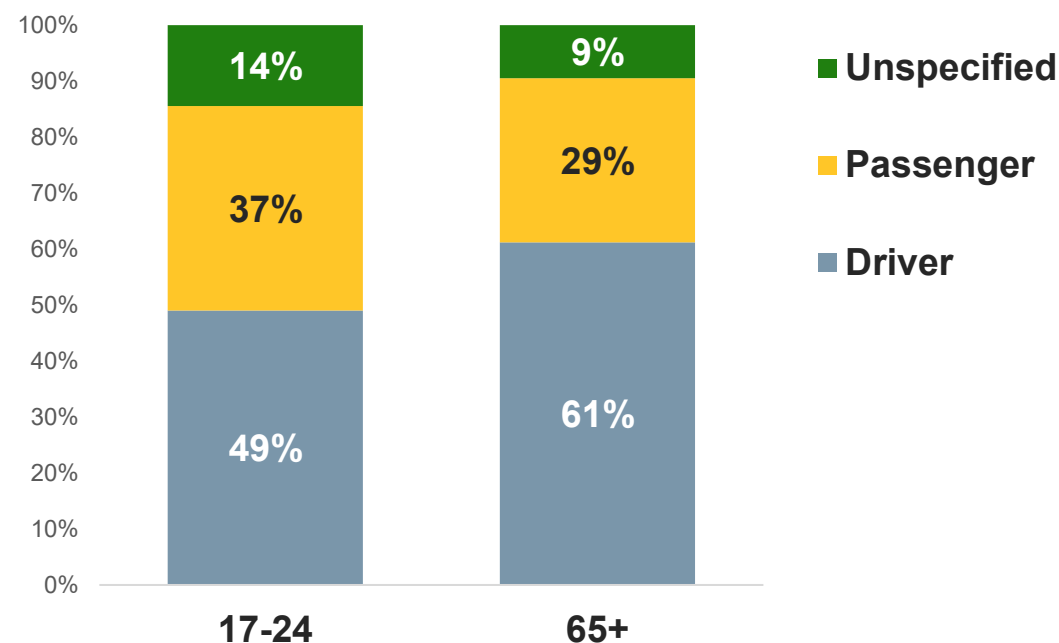
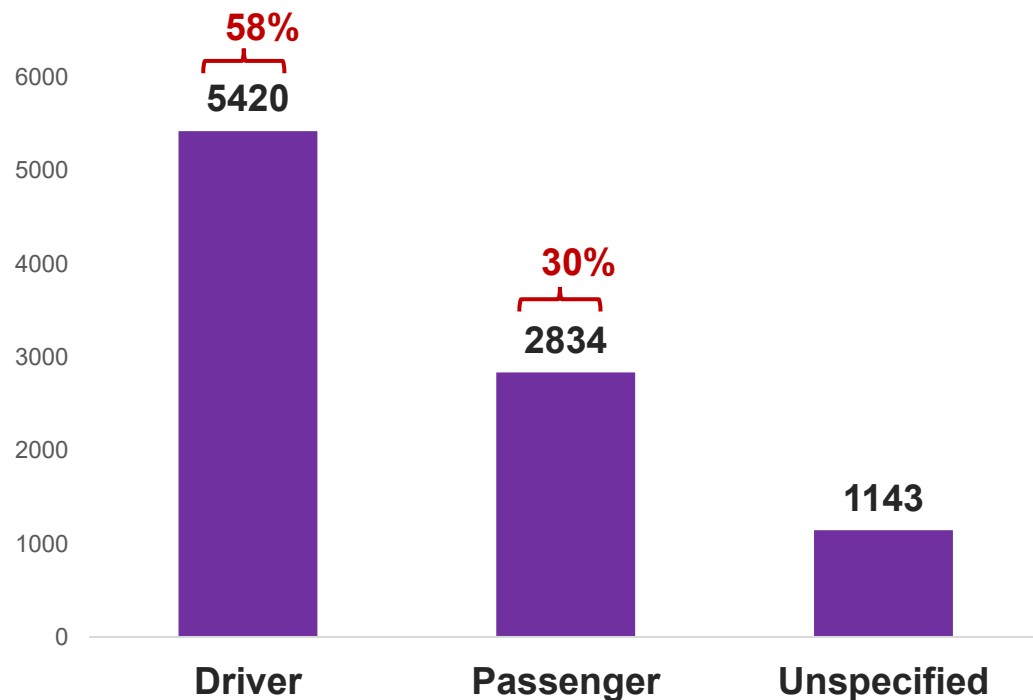
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Position in the car

All hospitalised car users – 2014-2024

- Hospitalised car drivers were mostly male (61%).
- Half of hospitalised car passengers were female (52%).





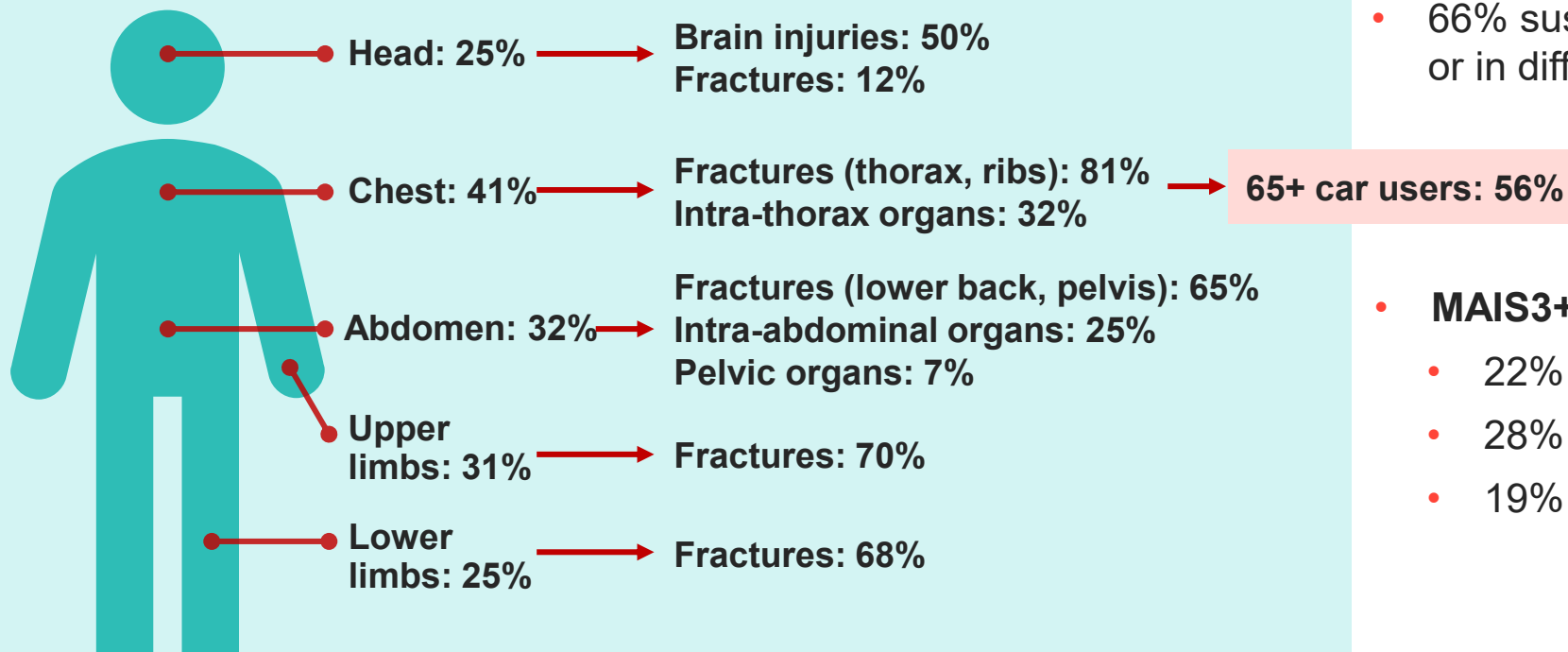
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Injuries sustained*

All hospitalised car users – 2014-2024

Share of car users with at least one injury in each body area (% Yes)



- Hospitalised car users may have sustained one or more injuries (any severity).
- 66% sustained multiple injuries in the same or in different body areas (mean= 4, max 23).

- **MAIS3+ car users:**
 - 22% multiple serious injuries,
 - 28% serious chest injuries (internal),
 - 19% serious head injuries (brain).

* Based on information from the ICD-10-AM injury codes recorded for each casualty in HIPE. Percentages represent the proportion of casualties with an injury or injury type in each body part.



Length of stay at hospital

All hospitalised car users – 2014-2024

- MAIS3+ car users were on average 17 days in hospital as in-patients.

Number of days in hospital	All hospitalised (9397)	MAIS3+ (2119)
1 day or less	2969 (32%)	302 (14%)
2 days	1225 (13%)	195 (9%)
3 to 4 days	1550 (17%)	257 (12%)
5 days or more	3653 (39%)	1365 (64%)
Mean (SD)	7.98 (19.00)	16.66 (32.39)
ICU stay (% yes)	14%	36%
Mean ICU stay (SD)	8.41 (13.63)	9.72 (13.62)

Average n days in hospital:

- **MAIS3+ 65+ car users: 23 days**
- **MAIS3+ 17-24 car users: 13 days.**





Destination at discharge

All hospitalised car users – 2014-2024

- 30% of MAIS3+ car users were sent to another hospital at discharge.

Destination at discharge	All hospitalised (9397)	MAIS3+ (2119)
Home	7336 (78%)	1312 (62%)
Nursing home or other long-term accommodation	377 (4%)	120 (6%)
Transfer to hospital	1476 (16%)	629 (30%)
Other	208 (2%)	58 (3%)

- **MAIS3+ 65+ car users:** 48% went to nursing home or other hospital at discharge (vs 33% of **MAIS3+ 17-24**).

Characteristics of hospitalised motorcyclists

2020-2024

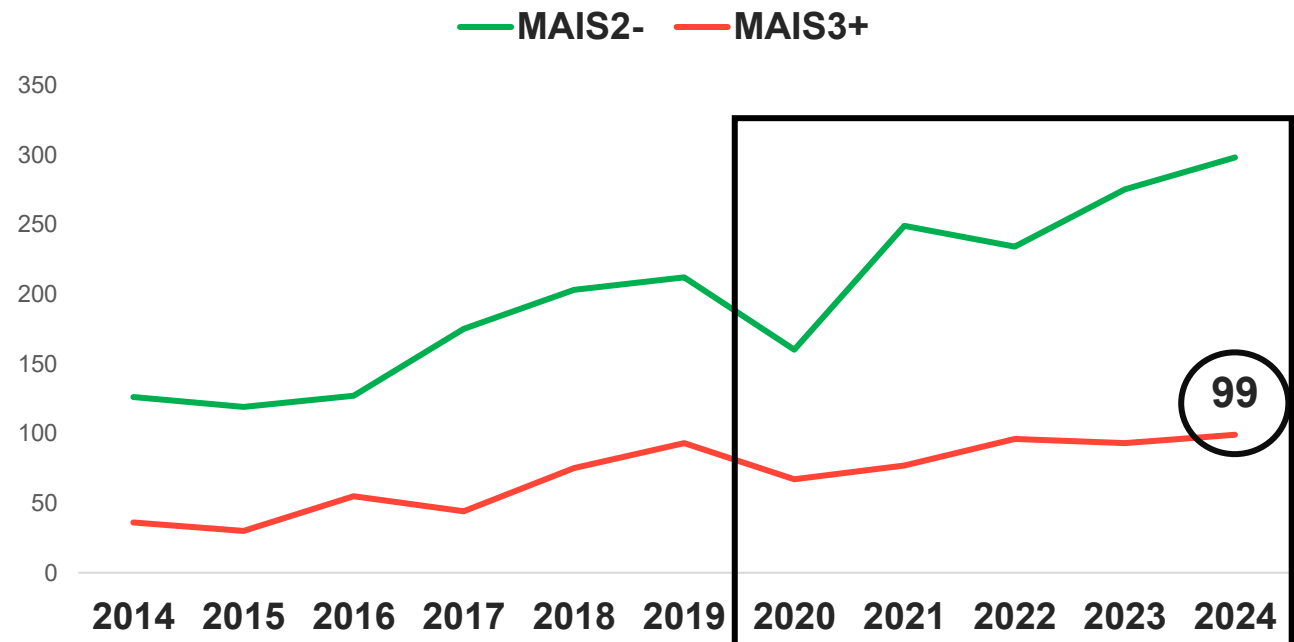
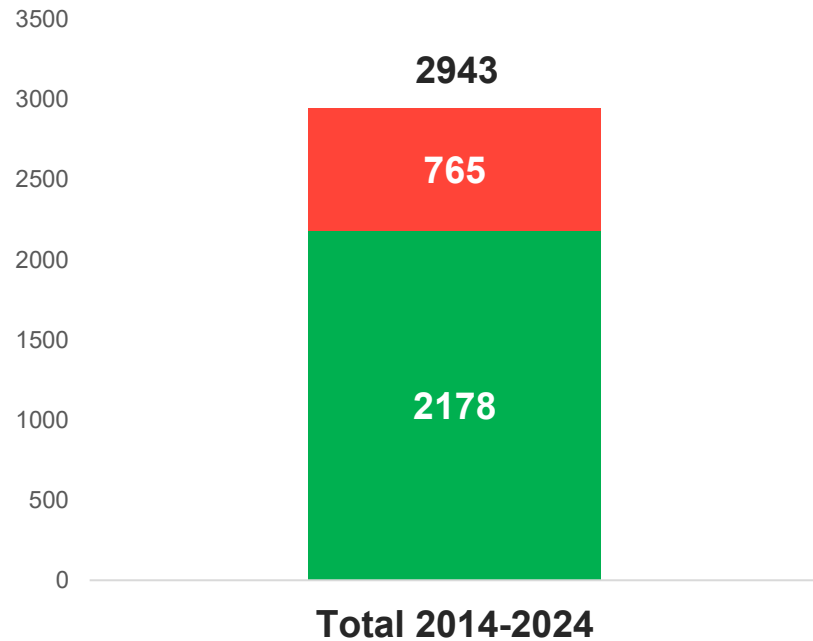
Source: hospital data

Totals



All hospitalised motorcyclists – 2014-2024

- 26% of hospitalised motorcyclists sustained clinically serious injuries (MAIS3+).
- The highest annual total of MAIS3+ injuries among motorcyclists was recorded in 2024 (99).



Characteristics

Hospitalised motorcyclists – 2020-2024



Gender

89% were male



Age

2 in 5 were aged **25-44** years.

0-14	3%
15-24	22%
25-44	42%
45-64	28%
65+	5%

Season

34% were admitted to hospital over **summer**, peaking in **June** (13%).

26% over **spring**.



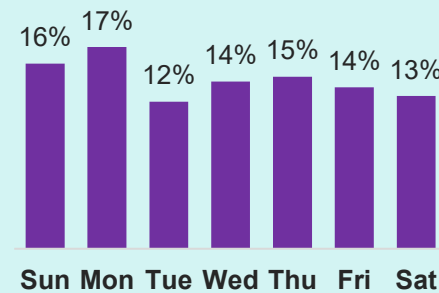
County

40% were **County Dublin** residents.



Day of the week

17% were admitted to hospital on a **Monday**, 16% on a **Sunday**.



Collision type

50% **single-vehicle collisions**.

35% **multi-vehicle collisions** (mostly with a car, truck, or van)



Injuries sustained*

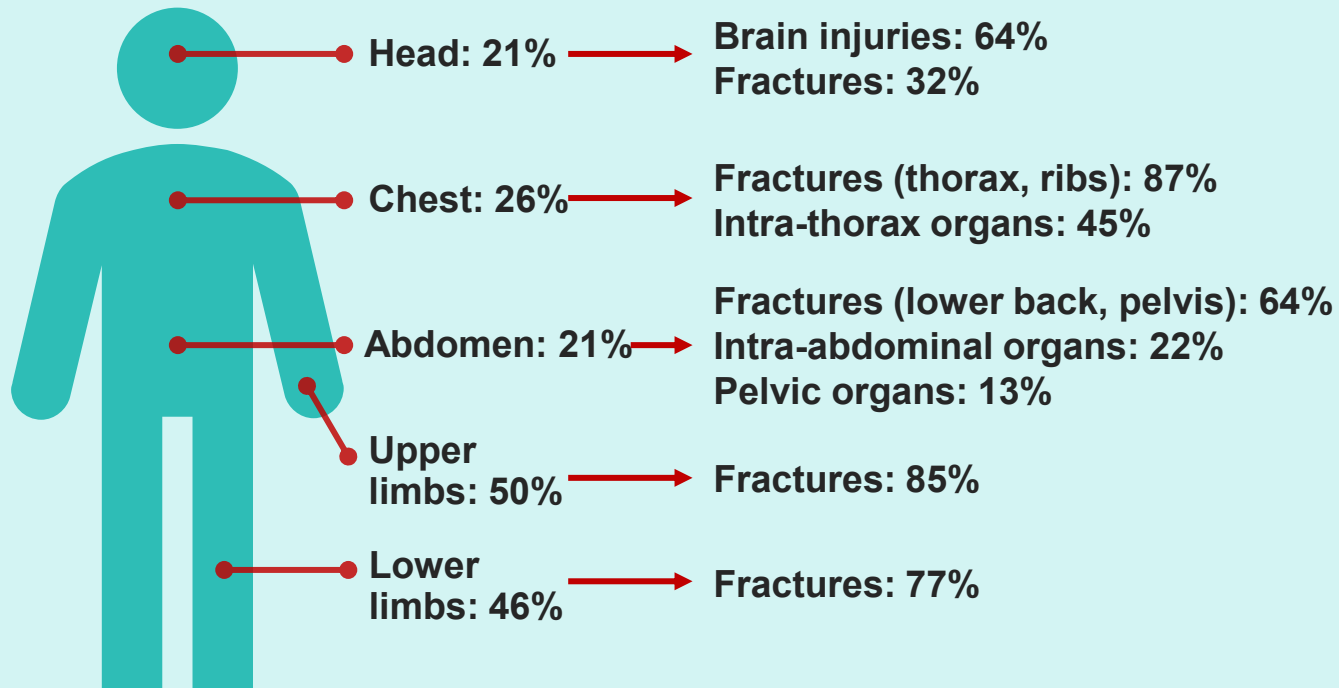
All hospitalised motorcyclists – 2020-2024



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Share of motorcyclists with at least one injury in each body area (% Yes)



- Hospitalised motorcyclists may have sustained one or more injuries (of any severity).
- 71% sustained multiple injuries in the same or in different body parts (mean= 4, max 23).
- **MAIS3+ motorcyclists:**
 - 31% multiple serious injuries,
 - 29% serious lower limb injuries (fractures),
 - 19% serious head injuries (brain).

* Based on information from the ICD-10-AM injury codes recorded for each casualty in HIPE. Percentages represent the proportion of casualties with an injury or injury type in each body part.

Outcomes



All hospitalised motorcyclists – 2020-2024

- MAIS3+ motorcyclists were on average 14 days in hospital as in-patients. 25% of them were sent to another hospital at discharge.

Number of days in hospital	All hospitalised (1648)	MAIS3+ (432)
1 day or less	30%	13%
2 days	15%	7%
3 to 4 days	17%	17%
5 days or more	38%	62%
Mean (SD)	7.32 (15.94)	13.85 (25.08)
ICU stay (% yes)	12%	30%
Mean ICU stay (SD)	8.92 (11.03)	10.36 (12.65)

Destination at discharge	All hospitalised (1648)	MAIS3+ (432)
Home	84%	71%
Nursing home or other long-term accommodation	1%	2%
Transfer to hospital	13%	25%
Other	2%	3%

Key messages and conclusions

Key messages



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- The number of hospitalised casualties over 2014-2024 is 1.5 times higher than the number of AGS serious injuries.
- The number of serious injuries has increased over most recent years. The trend varies in each data source and by road user.
- Car user and motorcyclist hospitalisations recorded in 2024 were the highest of the last 5 years.
- Car users were most frequently male. Young (17-24) and 65+ car users accounted for just under half of all car user hospitalisations.
- Motorcyclists were frequently middle-aged, male, or Dublin residents.
- Frequently recorded injuries among car users were to the chest area- fractures or internal (the most serious).
- Frequently recorded injuries among motorcyclists were fractures to the limbs, or injuries to the chest area.
- MAIS3+ casualties had poor clinical outcomes – more days in hospital, more likely to be transferred to another hospital at discharge.
 - This vulnerability is more marked among casualties aged 65+ years.

Acknowledgements

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Thank you!

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