Serious injuries among pedestrians on Irish roads

RSA Seminar on serious injuries

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Content

Serious injuries among pedestrians on Irish roads

- Background and sources of data on serious injuries: hospital and An Garda Síochána records
- Serious injuries over 2014-2023
- Characteristics of hospitalised pedestrians and AGS serious injuries
- Characteristics of pedestrians with clinically serious injuries
- Key messages and next steps

Serious injuries' 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 injuries' reporting

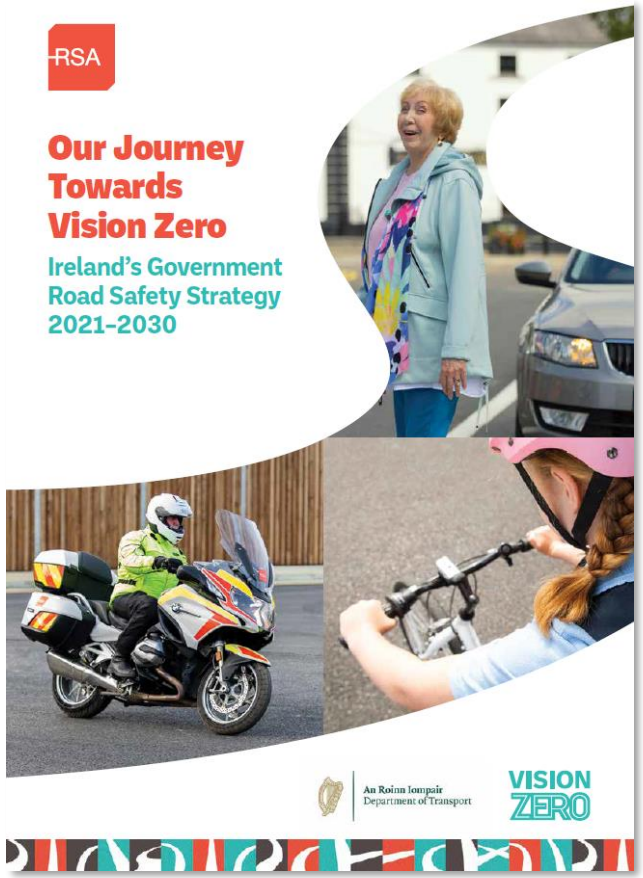
The European context

- 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.

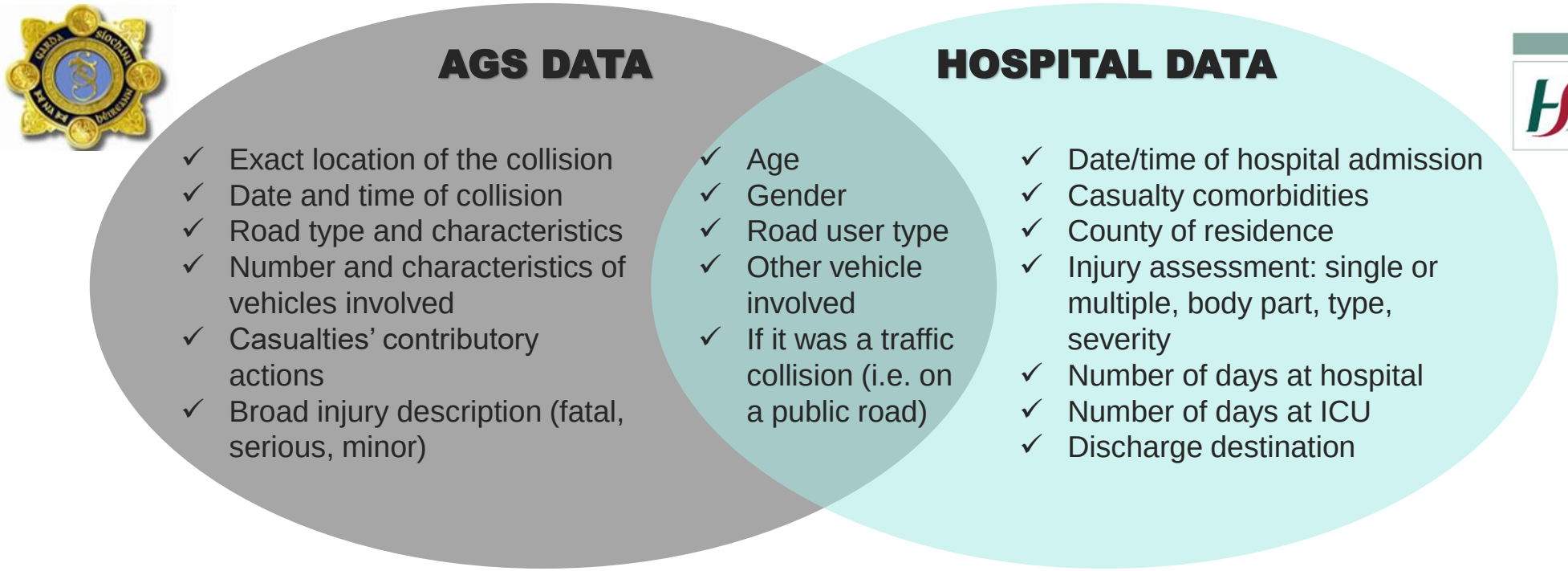
The MAIS3+ serious injuries project

- **Primary goal** of reporting on MAIS3+ serious injuries to the EC
- **Greater understanding** of serious injury trends and characteristics in hospital discharge records (2014-2023)
- **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) and hospital-based records

- Both data sources are complementary
- Some information can be found in both AGS and hospital data



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

Definitions of serious injury

AGS and hospital data

- In **AGS data**, a serious injury is one for which the person is **detained in hospital as an in-patient**, or **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.

- In **hospital data**, we follow a medical definition of a serious injury, based on an international validated injury severity scoring scale, the **Abbreviated Injury Scale (AIS)***.
  - ICD injury codes are converted to AIS using a translation algorithm
  - **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+).
  - We add the number of casualties having MAIS3+ and MAIS2- scores to obtain the total number of **hospitalised casualties**.
    - All hospitalised casualties fall into the definition of a serious injury followed by AGS, as they are all in-patients.

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

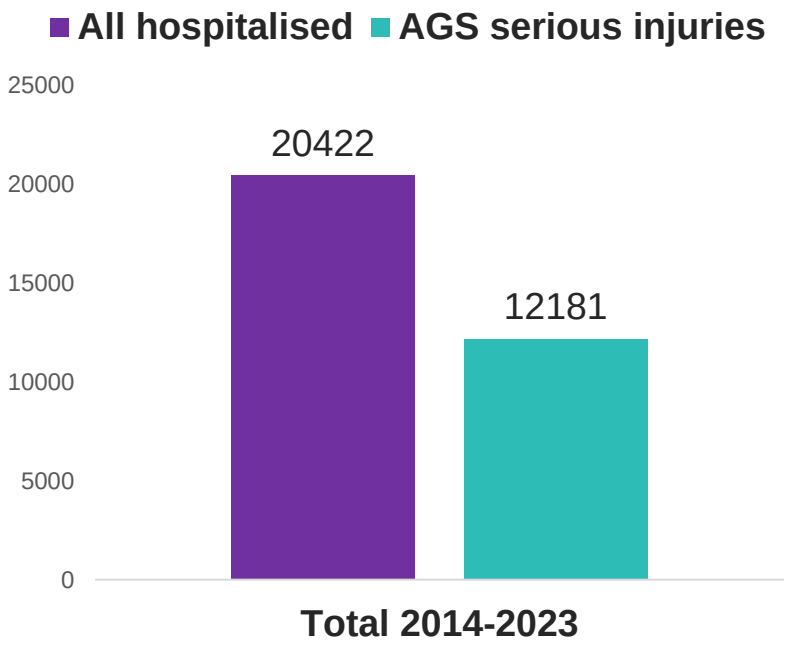
All hospitalised and AGS serious injuries

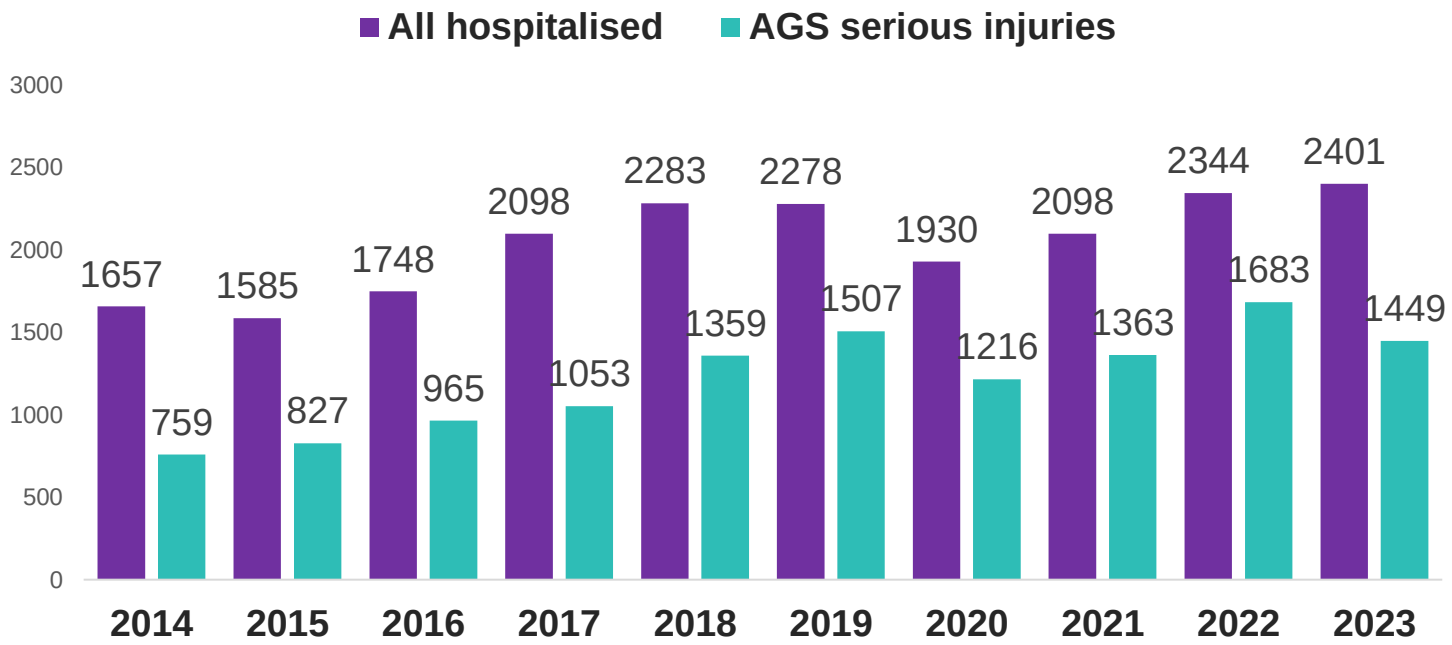
2014-2023

All road user types

All hospitalised and AGS serious injuries – 2014-2023

- Over 2014-2023, there were 1.7 hospitalised casualties by each serious injury recorded by AGS.
- The annual number of casualties in both data sources increased since 2014.





AGS data is current as of 15 September 2024. AGS data for 2020 onwards is provisional and subject to change.

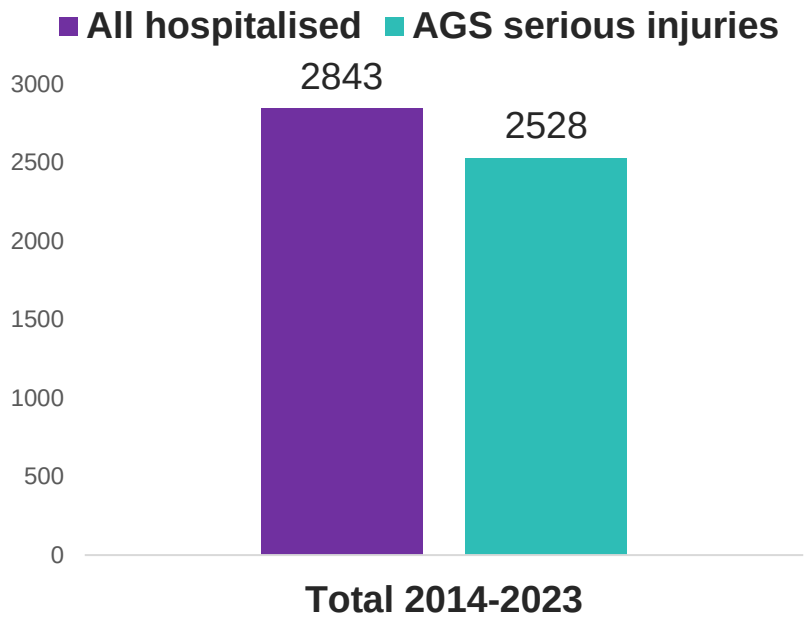
Pedestrians: All hospitalised and AGS serious injuries

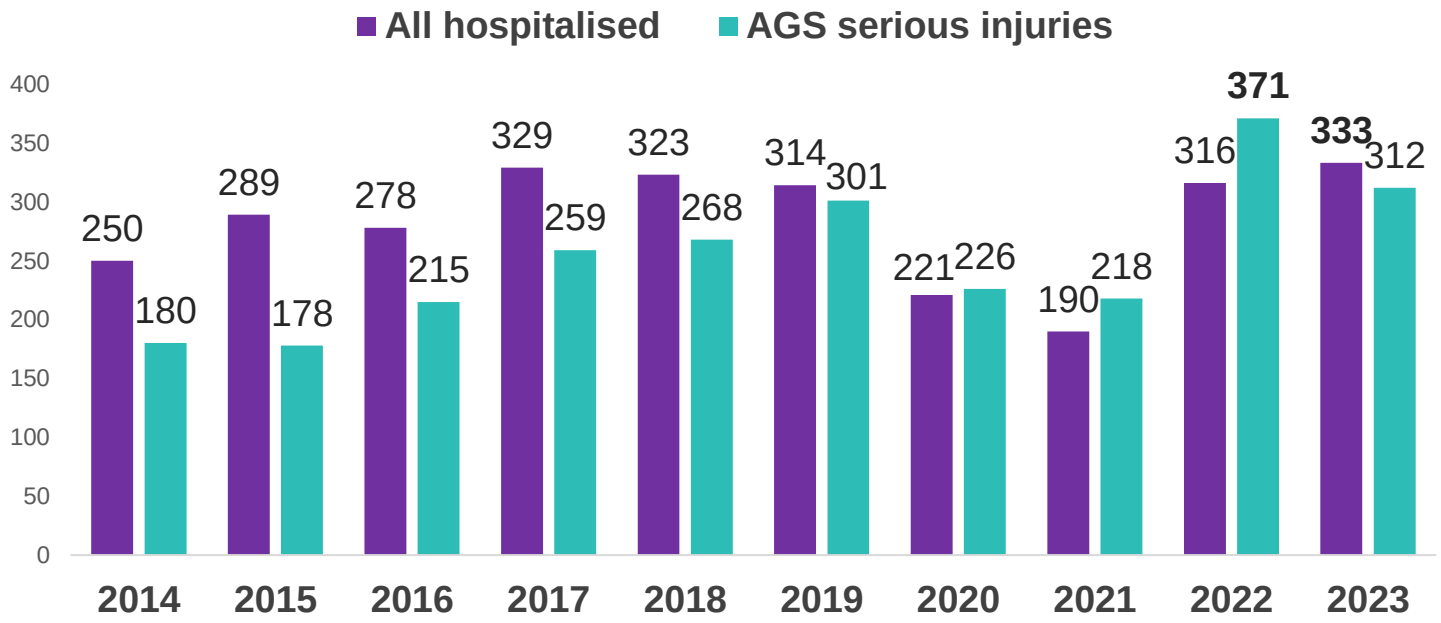
2014-2023

Trends

All hospitalised and AGS serious injuries – 2014-2023

- The discrepancy in the number of records in hospital and AGS statistics became smaller over the years.
- There was a decline in the number of injured pedestrians in both hospital and AGS records in 2020-2021.



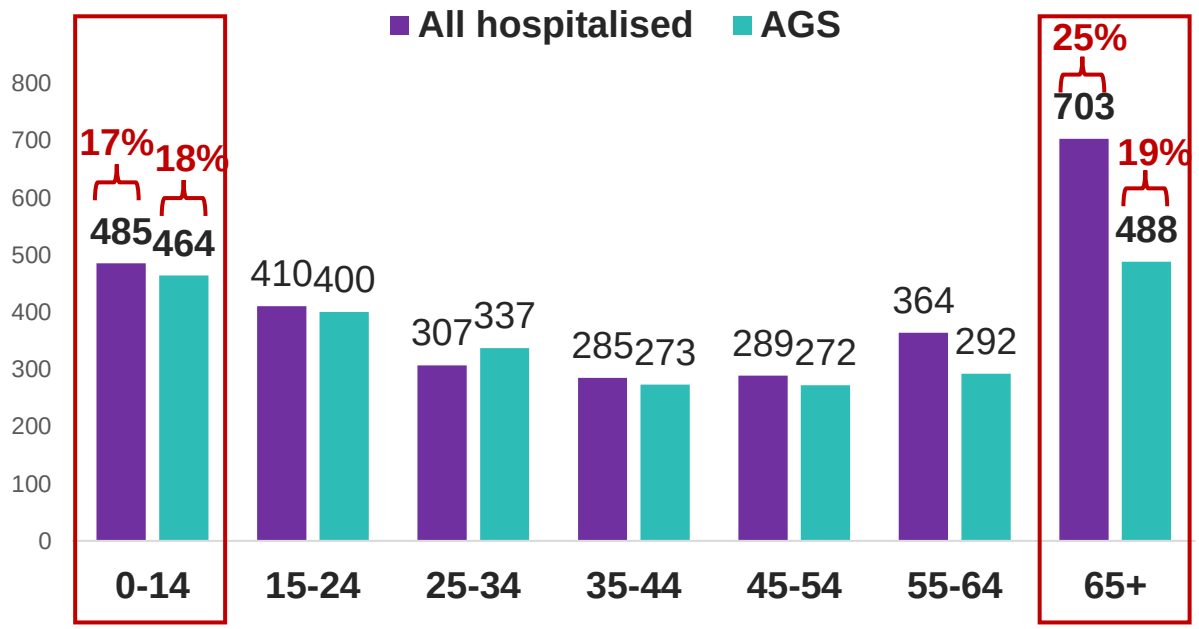


AGS data is current as of 26 August 2024. Data for 2020 onwards is provisional and subject to change.

Age

All hospitalised and AGS serious injuries – 2014-2023

- A quarter of hospitalised pedestrians and almost 1 in 5 AGS serious injuries were aged 65+ years.
- The number and share of pedestrians aged 14 years or less was the second highest in both data sources.

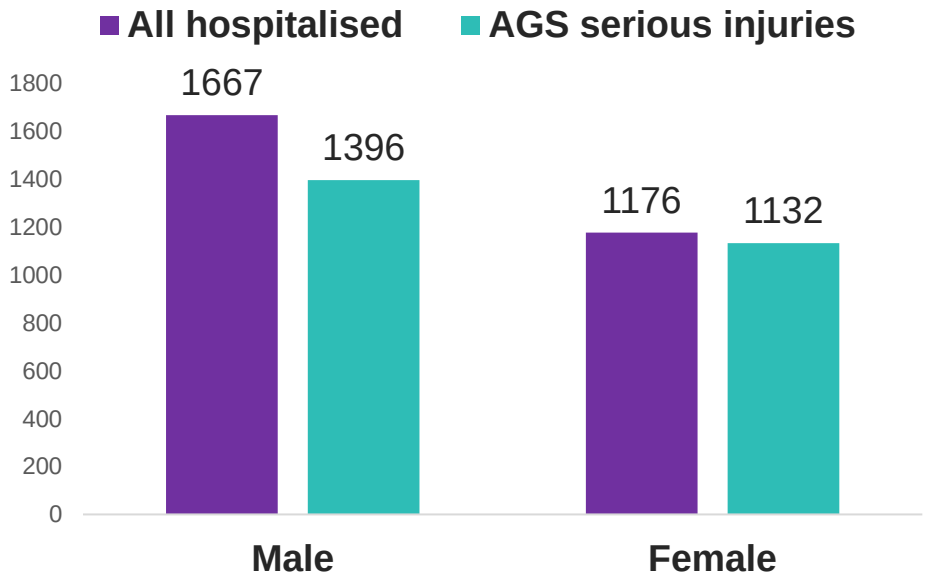


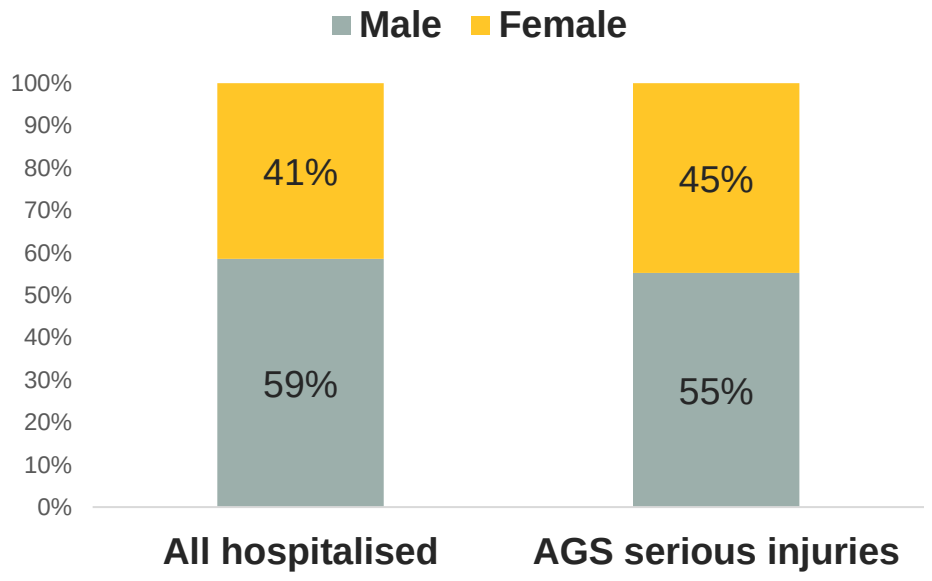
AGS data is current as of 26 August 2024. Data for 2020 onwards is provisional and subject to change.

Gender

All hospitalised and AGS serious injuries – 2014-2023

- Most hospitalised and AGS seriously injured pedestrians were males.
  - 68% of hospitalised pedestrians aged 0-14 years were males.
  - 53% of hospitalised pedestrians aged 65+ years were females.



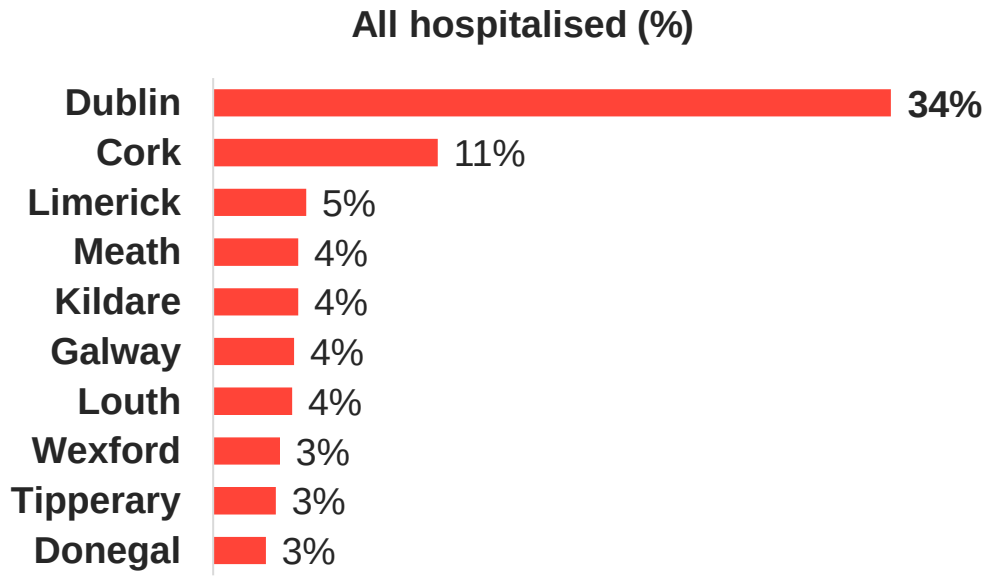


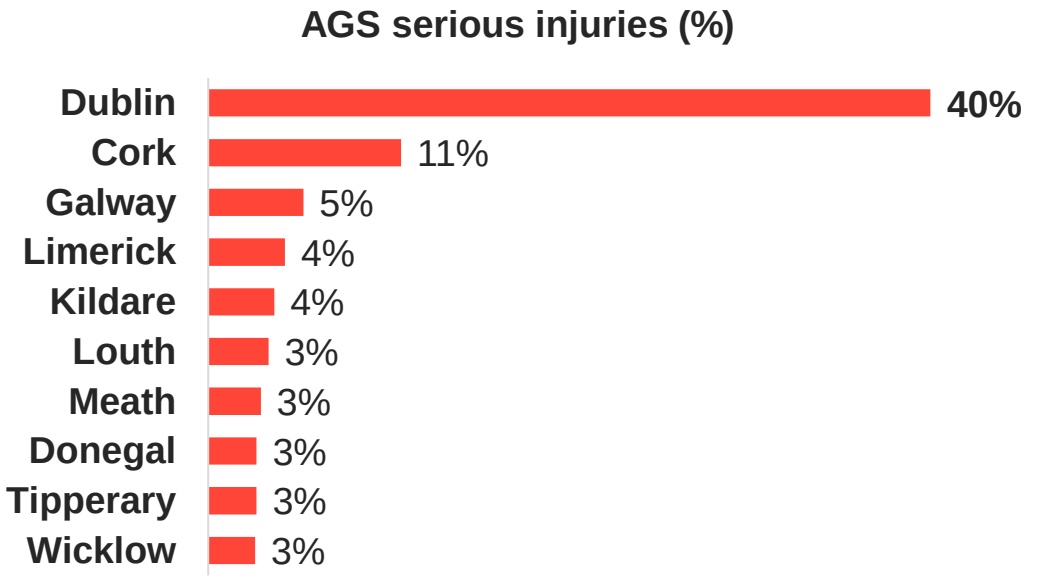
AGS data is current as of 26 August 2024. Data for 2020 onwards is provisional and subject to change.

County

All hospitalised and AGS serious injuries – 2014-2023

- Dublin was the county with the highest number of hospitalised pedestrians (951) and serious injuries recorded by AGS (1,015), followed by County Cork.
- In hospital data, the county indicates the residence of the casualty, whereas in AGS records it refers to the location of the collision.



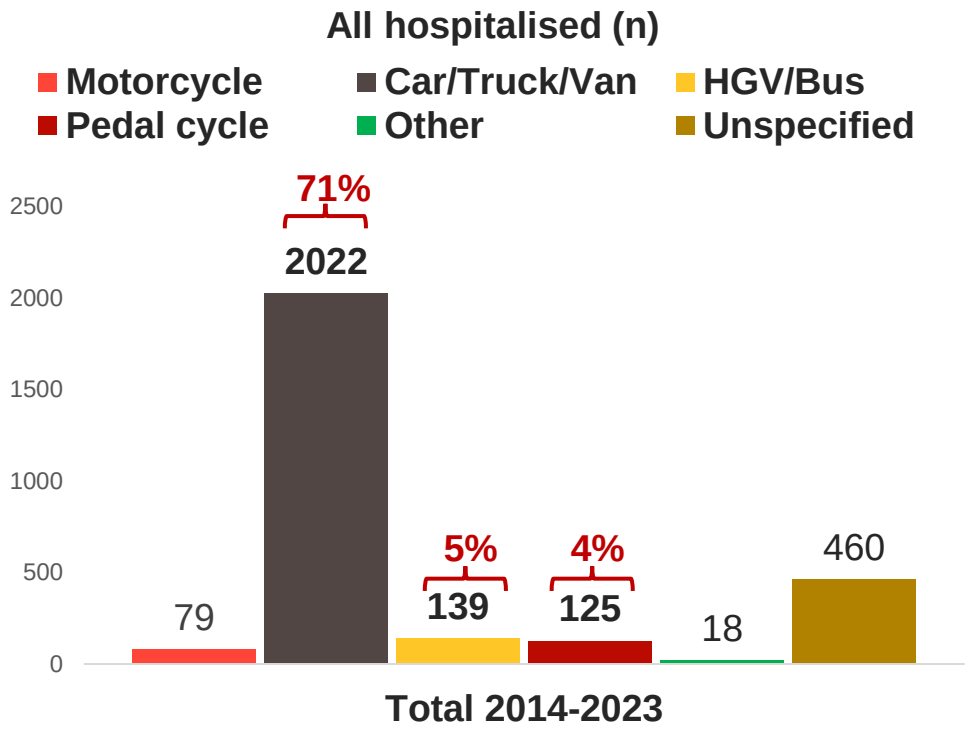


AGS data is current as of 26 August 2024. Data for 2020 onwards is provisional and subject to change.

Collision type

All hospitalised and AGS serious injuries – 2014-2023

- 71% (2,022) of hospitalised pedestrians were injured in a collision with a car, truck, or van.

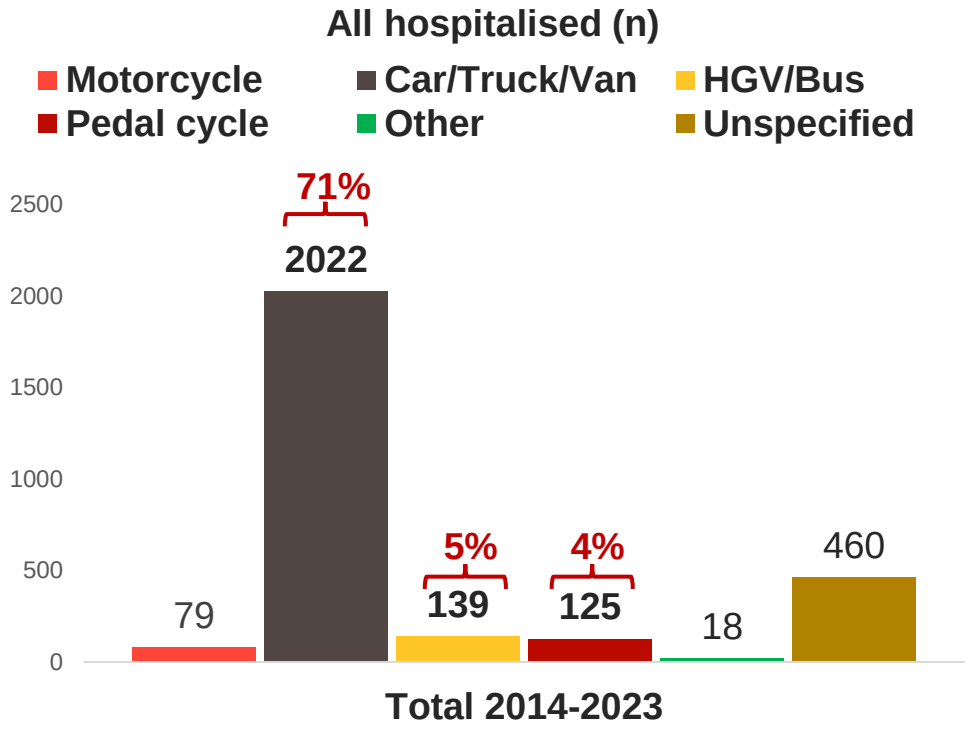


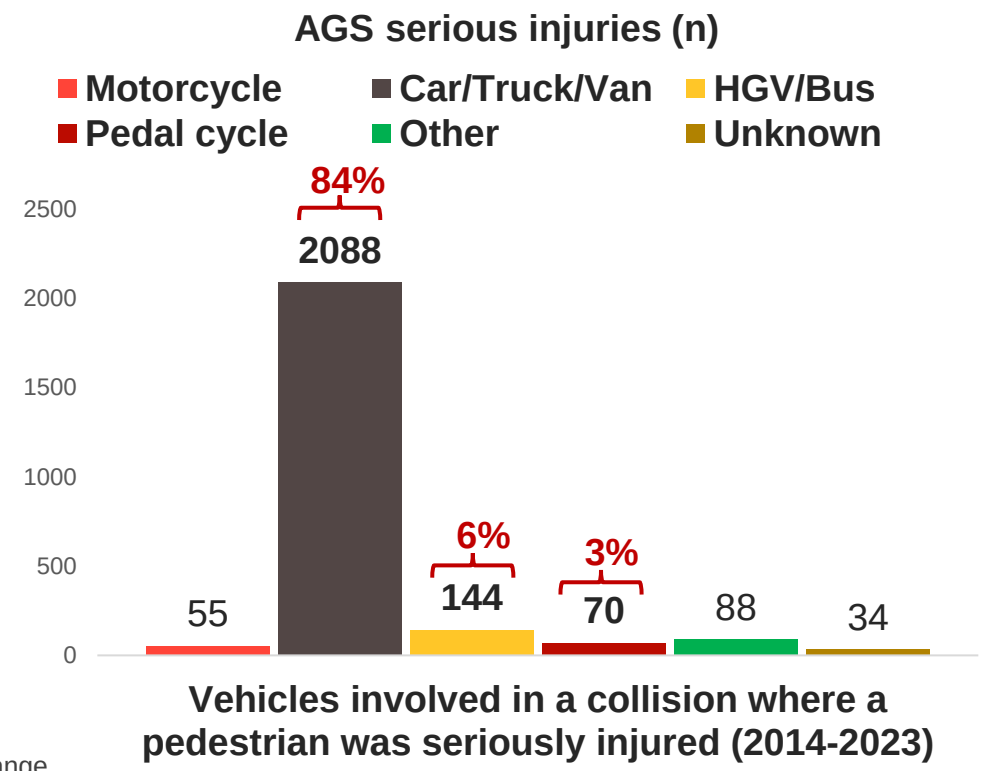
- Collisions with a car, truck, or van were the most frequent among hospitalised pedestrians of all age groups.
- 28% of pedestrians injured in collisions with an HGV/Bus were aged 25-44 years, and 71% were males.
- 43% of hospitalised pedestrians injured in collisions with a pedal cycle were aged 65+ years, 5% 14 years or less; and 62% were females.

Collision type

All hospitalised and AGS serious injuries – 2014-2023

- 71% (2,022) of hospitalised pedestrians were injured in a collision with a car, truck, or van.
- In AGS records, 84% (2,088) of vehicles involved in a collision where a pedestrian was seriously injured were a car, truck, or van.





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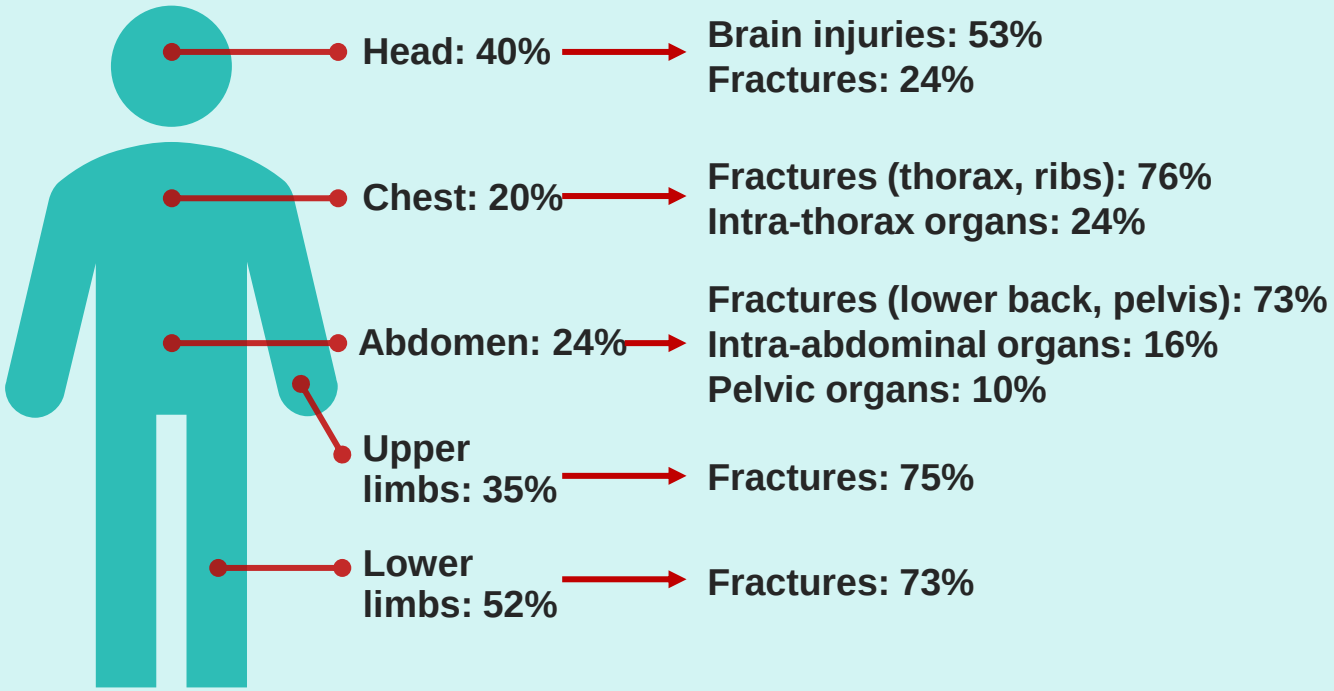
Injuries sustained*

All hospitalised – 2014-2023

Share of pedestrians with at least one injury in each body part (% Yes)



- Hospitalised pedestrians may have sustained one or more injuries (of any severity).
- 72% sustained multiple injuries in the same or in different body parts (mean= 4, max 23).

* 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 – 2014-2023

- When compared to other VRUs or all the road users, hospitalised pedestrians spent more time in hospital, had the lowest share of sent home and the highest share of sent to nursing home at discharge.

Number of days at hospital	All (2843)	%
1 day or less	781	27%
2 days	352	12%
3 to 4 days	391	14%
5 days or more	1319	46%
Mean (SD)	10.28 (22.41)	
Stayed at ICU 1+ days (% yes)	12%	
Mean LOS at ICU (SD)	8.5 (9.75)	

Destination at discharge	All (2843)	%
Home	2096	74%
Nursing home or other long-term accommodation	215	8%
Transfer to hospital	448	16%
Other	84	3%

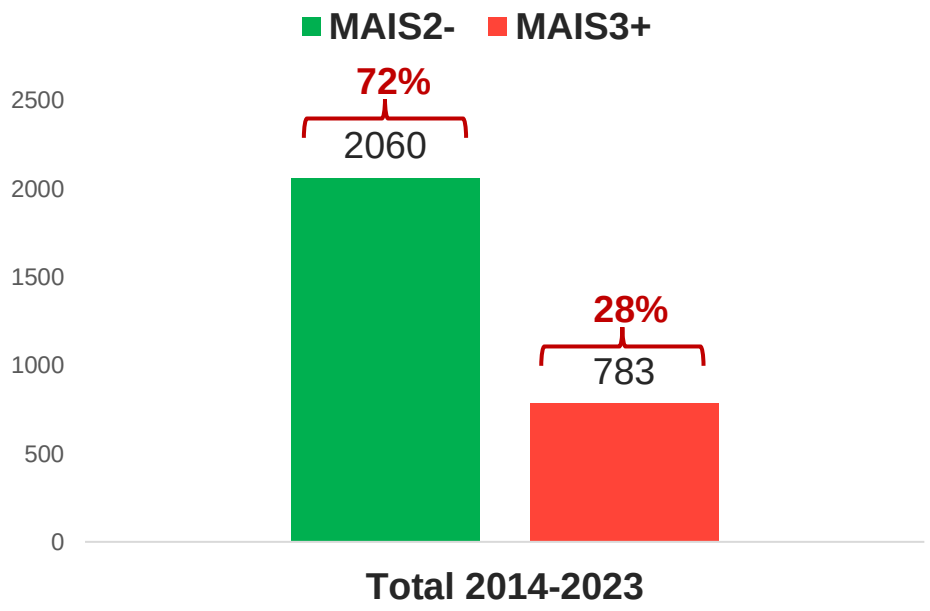
Injury severity

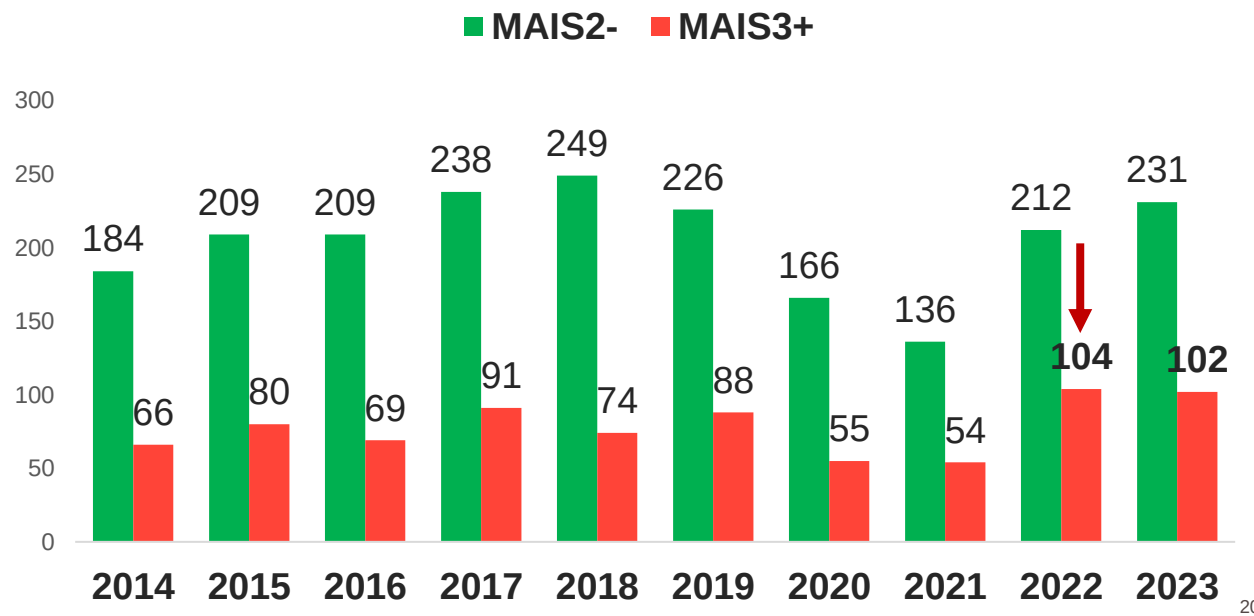
2014-2023 – Hospital data

Total and trend

MAIS2- and MAIS3+ pedestrians – 2014-2023

- We assigned the maximum AIS score to all hospitalised casualties to determine the severity of their injuries.
- Highest annual numbers of MAIS3+ injuries were recorded in 2022 and 2023.

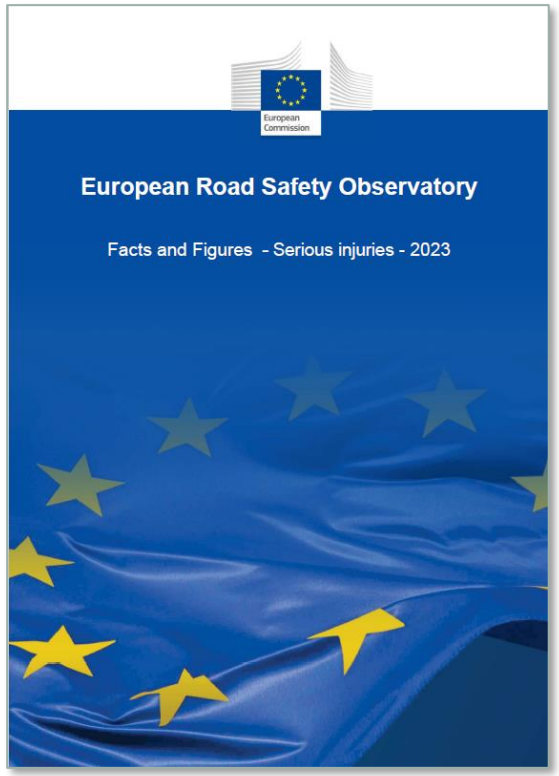




MAIS3+ in Europe

Comparison with other countries

- 11 of 27 countries in the EU still do not collect MAIS3+ data.
- Data coverage varies between countries.



MAIS3+ serious injuries period 2018-2020

Country*	Average MAIS3+	MAIS3+ by 100,000 Pop#
Netherlands	6,733	39
Belgium	3,508	31
Estonia	374	28
Italy	16,772	28
France	15,230	23
Portugal	2,217	22
Germany	14,605	18
Ireland	468	10
Lithuania	120	4

*Countries included are those that provided MAIS3+ figures for the period 2018-2020. Source: ERSO, 2023.
#Based on the average population per country for the period 2018-2020. Source: Eurostat.

Characteristics of MAIS3+ pedestrians

2014-2023

Characteristics

MAIS3+ pedestrians – 2014-2023

Gender

61% were **males.**

Those aged **65+ years were equally distributed.**

Age

3 in 10 were aged **65+ years.**

0-14	14%
15-24	14%
25-44	**20%**
45-64	**21%**
65+	**29%**

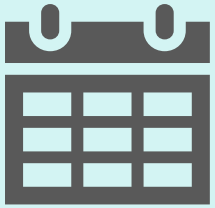
County

36% were **County Dublin** residents.

Season and day of week

34% were admitted to hospital over **Autumn,** 31% over **Winter.**

18% were admitted to hospital on **Fridays.**



Time of day

Admission to hospital was more frequent **after 4pm**

8am-4pm	22%
4pm-12am	**44%**
12am-8am	**33%**

Collision type

71% **car, truck, or van**.

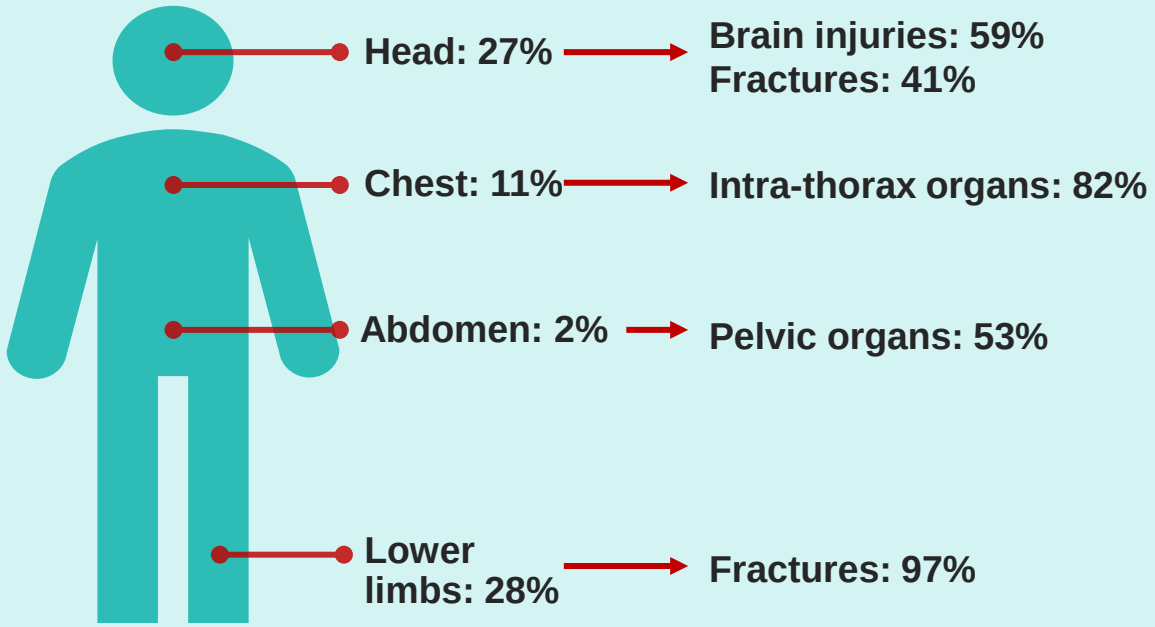
7% **HGV/Bus.**

6% **pedal cycle** (over half of them were 65+)

Injuries sustained*

MAIS3+ pedestrians – 2014-2023

- **69%** sustained a **single serious injury:**



- **31%** of MAIS3+ pedestrians sustained **multiple serious injuries** in the same or different body parts (mean: 2.4, max 6).

* 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

MAIS3+ pedestrians – 2014-2023

MAIS3+ pedestrians (n)			Age (n)				
Number of days	**All (783)**	**%**	**0-14 (112)**	**15-24 (110)**	**25-44 (161)**	**45-64 (170)**	**65+ (230)**
1 day or less	86	11%	13%	16%	17%	8%	5%
2 days	60	8%	18%	13%	6%	4%	4%
3 to 4 days	91	12%	21%	16%	14%	9%	5%
5 days or more	546	70%	48%	55%	63%	79%	86%
Mean (SD)	19.38 (34.15)		10.86 (18.70)	12.01 (18.14)	20.74 (44.30)	21.01 (30.12)	24.89 (39.00)
ICU (% yes)	242	31%	33%	31%	41%	35%	20%
Mean LOS ICU (SD)	9.67 (10.09)		4.95 (5.57)	8.65 (6.95)	10.77 (11.15)	11.00 (9.70)	10.96 (12.69)

- The share of MAIS3+ pedestrians staying 5+ days increased with age.

Destination at discharge

MAIS3+ pedestrians – 2014-2023

MAIS3+ pedestrians (n)			Age (n)				
Destination	**All (783)**	**%**	**0-14 (112)**	**15-24 (110)**	**25-44 (161)**	**45-64 (170)**	**65+ (230)**
Home	462	59%	84%	76%	60%	56%	40%
Nursing home or other long-term accommodation	75	10%	-	*	*	8%	26%
Transfer to hospital	222	28%	~	21%	32%	35%	31%
Other	24	3%	*	*	~	*	3%

* Denotes a cell with less than 5 cases. – Indicates absence of cases in a cell. ~ Indicates that further suppression was needed to avoid disclosure of a cell with less than 5 cases.

- The share of MAIS3+ pedestrians sent home at discharge declined with age.

Summary and next steps

Key messages

Pedestrians – 2014-2023

- Number of pedestrians in hospital records has not declined in recent years.
- Most pedestrians sustained multiple (serious) injuries.
- Almost half of hospitalised pedestrians and 70% of MAIS3+ pedestrians spent 5+ days in hospital.
- Hospitalised pedestrians spent more time in hospital, had the lowest share of casualties being sent home and the highest share of those sent to nursing home at discharge when compared to other vulnerable road users, and to all road users in general.
- 65+ pedestrians accounted for the highest share of casualties in hospital records. They had poor outcomes when compared to younger pedestrians.
- The study of hospital data complements AGS based reporting on serious injuries and provides a more holistic understanding of the human impact of road traffic collisions.

Next steps

- Full report on serious injuries among pedestrians will be published this week.
- Publish other road user full reports on serious injuries using hospital and AGS data
- Explore alternative data sources on serious injuries:
  - Study major trauma from road collisions from NOCA record-level data 2019-2021
  - Pre-hospital records
- Academic paper on cyclist serious injury research in collaboration with TCD
- Continue participating in EC working group on serious injuries (MAIS3+)

Acknowledgements

- RSA Research Department
- MAIS3+ serious injury project Board members
  - Dr Fionnuala Donohue, National Health Intelligence Unit, HSE
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