

MUARC ECIS Fact Sheet 5: Injuries sustained by ECIS drivers and associated financial costs and impacts^{1 2}

400 drivers (48.9% male; 51.1% female) aged 18 – 93 years were enrolled to the ECIS program following admission to either The Alfred Hospital or the Royal Melbourne Hospital for the treatment of injuries sustained in a crash.

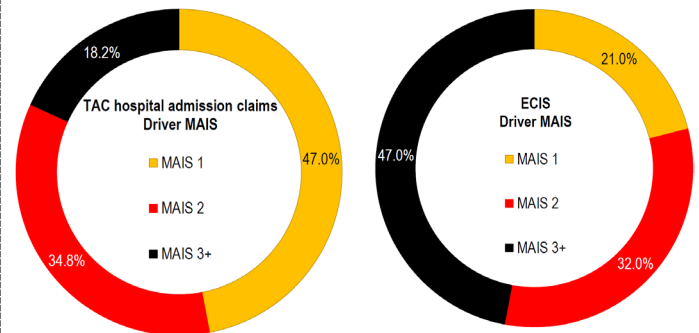
Using medical records, all validated driver injuries were classified according to the Association for the Advancement of Automotive Medicine (AAAM) Abbreviated Injury Scale (AIS) scoring system³, per best practice.

The AIS dictionary classifies all possible injuries by body region, rating each using a severity scale ranging from 1 (minor) to 6 (maximal). The highest severity injury is referred to as the maximum AIS (MAIS) severity level for the person. ECIS defined 'serious injury' as any injury having an AIS severity rating of 3 (serious) or higher (i.e., MAIS 3+).

Other injury metrics were also assessed and calculated, including the estimated financial cost to the Transport Accident Commission (TAC) to support the injured driver and wider financial costs to the community.

A high proportion of hospitalised drivers sustained serious (MAIS 3+) injuries, with many drivers sustaining multiple injuries across different parts of their body.

47% of drivers enrolled to the ECIS program in hospital sustained MAIS 3+ injuries. ECIS crashes were more severe than was the case for all hospitalised driver TAC clients (MAIS 3+: 18.2%). The findings of the ECIS program, for the main, reflect the more seriously injured part of the road trauma spectrum.



Key injury facts

Types and severity of injuries sustained (examples)

Drivers sustained multiple, serious injuries, for instance:

- 6.8% of drivers sustained MAIS 3+ injuries to the head (e.g., loss of consciousness > 1 hour, skull fracture).
- 27.8% of drivers sustained MAIS 3+ injuries to the chest (e.g., multiple rib fractures, lung injury, laceration of artery).
- 15.8% sustained MAIS 3+ injuries to the lower extremity (e.g., fractured femur, fractured pelvis).

Drivers required extended time in hospital, ranging from 1 to 43 days (mean: 8.6 days), with 16% in hospital for more than 14 days.

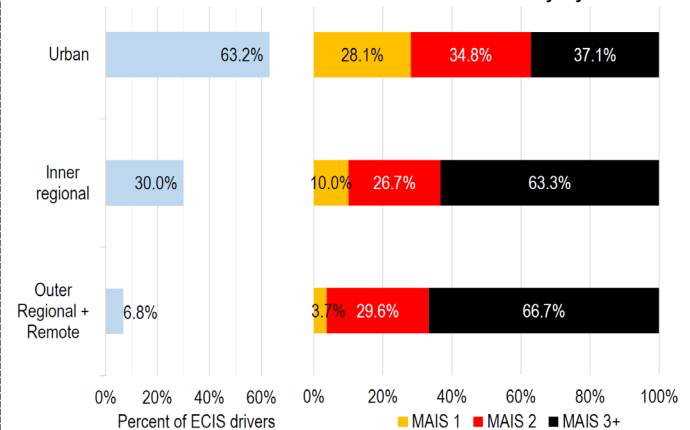
Extended care at a rehabilitation centre was needed by 41.5% of drivers following their acute care stay. Two-thirds of drivers with an MAIS 3+ injury required rehabilitation care.

Injury severity differed by crash type, with Lane Departure crashes being especially severe (MAIS 3+: 57%), followed by Across Path (MAIS 3+: 44%) and Rear Impact crashes (19%).

Crashes in regional Victoria were especially severe

Two-thirds of drivers involved in crashes in inner regional (63.3%) and outer regional (66.7%) locations in Victoria sustained MAIS 3+ severity injuries.

These drivers represented 36.8% of the ECIS driver sample but accounted for half of all drivers with an MAIS 3+ injury.



Crashes represent an immense financial burden to the community

Financial costs differ by crash type and reflect the level of injury suffered by drivers, with costs associated with Lane Departure crashes being especially high (\$945,600, mean value).

Calculation of costs account for head injury severity and spinal cord injury. Costs reflect medical costs, on-going care, vehicle costs, broader health, and loss of productivity costs.

ECIS DRIVER MAIS SEVERITY	PERCENT DRIVERS (OF 400)	COST FOR ECIS DRIVER (\$AUD, MILLION)	PERCENT COST	MEAN COST FOR ECIS DRIVER (\$AUD)
MAIS 1	21.0%	\$16.5	5.8%	\$196,538
MAIS 2	32.0%	\$47.7	16.7%	\$372,609
MAIS 3+	47.0%	\$220.9	77.5%	\$1,175,094
All	100%	\$285.1	100%	\$712,802

Implications

Drivers enrolled to the ECIS program sustained numerous injuries, many classified as 'serious' and more severe according to the widely used AIS injury severity scoring system. Many drivers required urgent and extensive surgical intervention and on-going care in a rehabilitation centre.

The financial costs associated with these crashes, both from an individual perspective and a community perspective, were high. Injured persons also face extensive recovery time, both physically and mentally.

The findings of the ECIS program highlight the severe nature of road crashes. The prevention of these crashes and the elimination of serious injury is urgent. Using the extensive data collected, the ECIS program identified key risk factors and countermeasures by which this goal can be achieved.

1 Fitzharris, M, Lenné, MG, Corben, B, Pok Arundell, T, Peiris, S, Liu, S, Stephens, A, Fitzgerald, M, Judson, R, Bowman, D, Gabler, C, Morris, A & Tingvall. Enhanced Crash Investigation Study (ECIS): Report 1: Overview and Analysis of Crash Types, Injury Outcomes and Contributing Factors. Melbourne Vic Australia: Monash University, 2020. <https://www.monash.edu/muarc/ecis>

2 Fitzharris, M, Corben, B, Lenné, MG, Liu, S, Peiris, S, Pok Arundell, T, Bowman, D, Morris, A & Tingvall. Enhanced Crash Investigation Study (ECIS): Report 3: Understanding contributing factors for serious injury using crash chain analysis. Melbourne Vic Australia: Monash University, 2022. <https://www.monash.edu/muarc/ecis>

3 Association for the Advancement of Automotive Medicine (AAAM). Abbreviated Injury Scale (AIS) 2005 – Update 2008. Chicago: AAAM; 2015.