

## Characteristics of Single Cyclist Injury Crashes in South Australia

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### Abstract

One of the targets in the South Australian Government's State Strategic Plan is to double cycling participation by 2020 from the 2011 baseline of 299,000 residents riding a bike in a typical week. A potential consequence of increasing cyclist participation is an increased number of cyclist crashes. To address the safety of cyclists on public roadways a number of strategies to reduce vehicle and cyclist conflicts have been implemented. These include minimum passing distance laws (when overtaking cyclists) as well as segregated or dedicated cycling infrastructure. However, risk remains even in the absence of vehicles, with single cyclist crashes representing approximately half of all cyclist casualty crashes. This paper explores some of the characteristics of single cyclist injury crashes occurring on public roadways in South Australia.

### Background and Method

Between July 2014 and December 2017, all injury records for road crash casualties presenting to the Royal Adelaide Hospital were examined. Of the 2,068 cases, cyclists accounted for 20 per cent of injuries, about half of which were single cyclists. Hospital records were examined in detail and where possible, matched to police crash records in the SA Traffic Accident Reporting System (TARS). The injuries for all the cyclists were coded using the Abbreviated Injury Scale (AIS; Association for the Advancement of Automotive Medicine, 2005).

### Results

Around half of the hospital records examined did not have a corresponding report in TARS. Males aged 30 to 69 years accounted for 73 per cent of the injured sample and 41 per cent of the injured sample were aged between 40 and 60 years of age. According to maximum AIS injury coding, 60 per cent of the injured cyclists sustained an MAIS 2 injury and 23 per cent of injured cyclists a MAIS 3 (or greater) injury. Alcohol intoxication as a contributing factor in single cyclist crashes was noted in about seven per cent of cases, with 71 per cent of these recorded a BAC of 0.2 or higher.

Loss of consciousness was observed among 36 per cent of all injured cyclists, and this was also reflected in the cyclist head and neck body regions being one of the most injured in the sample. Thirty-nine per cent of all injured cyclists sustained an MAIS2+ injury and six per cent an MAIS3+ injury for this body region (head and neck). Extremities and chest body regions were also commonly injured body regions, with 46 per cent and 22 per cent of injured cyclists, sustaining an MAIS2+ injury for these body regions, respectively. While in 36 per cent of crashes cyclists spent less than a day in hospital, 12 per cent remained in hospital for at least a day, 36 per cent for two to seven days, with the remainder spending between 8 and 28 days in hospital.

The most frequent crash type involved a cyclist 'rollover' (79 per cent). Almost half of these occurred on steep descents in the Adelaide Hills. The distribution of crash types in the sample and the maximum injury severity for those crash types is shown in Table 1.

*Table 1. Crash Type and Injury Severity*

Crash Type	Maximum Abbreviated Injury Scale					Total
	0	1	2	3	4	
Roll over	2	31	96	34	3	166
Hit fixed object	1	1	18	7	1	28
Hit pedestrian			3			3
Rear end			3			3
Hit animal			2	2		4
Hit object on road		1				1
Hit parked vehicle			1			1
Other			1			1
Right turn			1			1
Side swipe				2		2
Unknown				1		1

Cyclists were deemed solely responsible for their crash in 90 per cent of crashes, however, in several crashes, potholes and road debris were found to have caused the crash. Types of crashes in which the injured cyclists were not considered at fault included crashes in which they tried to avoid a collision with a motorized vehicle, crashes with kangaroos, crashes with pedestrians on a trafficable road and crashes with other cyclists. In 92 per cent of crashes a helmet was worn.

## Conclusion

This study summarises some of the characteristics of a sample of single bicycle crashes that resulted in an injury and hospital presentation. It was found that single cyclist crashes generally led to quite serious injuries, and these crashes and injuries are under reported in official road crash data. However, in a holistic approach to road safety, all injury crashes occurring on the public road transport network need to be considered, particularly when developing strategies and methods to reduce road crash serious injuries. Efforts to increase cycling participation need to be balanced by measures to prevent or mitigate single bicycle crashes. While safety measures might be complex for bicycles due to their inherent instability under many riding conditions, simple actions such regular road maintenance (including clearance of debris and timely repair of potholes) can reduce crash risk for single-cyclists.

## References

Association for the Advancement of Automotive Medicine (2005) Abbreviated Injury Scale (AIS).  
Barrington: Association for the Advancement of Automotive Medicine.