

Single-bicycle crashes behind increases in serious injury rates in cyclists

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Abstract

Increases in rates of single-bicycle fatalities have been reported in Australia and the Netherlands. However, little is known about whether crash counterparts in cyclist crashes are changing over time. This study aimed to investigate temporal trends in serious injury rates in cyclists, with a focus on crash counterparts. Data were extracted from the Victorian State Trauma Registry (VSTR) over the period of 1 July 2006 to 30 June 2018. Increases were observed in the incidence of single-bicycle crashes and collisions with other pedal cyclists. An increased emphasis on these crash types is required to reduce cycling injury rates.

Background

Cyclist injury rates are on the rise (Beck et al., 2017), however, little is known about the causes of these crashes and how these characteristics are changing over time. Increases in rates of single-bicycle fatalities have been reported in Australia and the Netherlands (Boufous & Olivier, 2016; Schepers, Stipdonk, Methorst, & Olivier, 2017). However, little is known about rates of non-fatal single-bicycle crashes. Therefore, this study aimed to investigate temporal trends in serious injury rates in cyclists, with a focus on understanding changes in crash counterparts.

Methods

We performed a retrospective review of data from the Victorian State Trauma Registry (VSTR) on hospitalised pedal cyclist major trauma patients injured in on-road traffic-related events over the period of 1 July 2006 to 30 June 2018. Crash counterparts were characterised using International Classification of Diseases 10th Revision – Australian Modification (ICD-10-AM) codes. Population-based incidence rates and 95% confidence intervals (CIs) were calculated for each financial year, based on the total population at June 30 of each financial year. Individual Poisson regression models determined whether the incidence rates increased or decreased over the 12-year period.

Results

Over the study period, there were 1,389 hospitalised pedal cyclist major trauma patients. The overall crude incidence rate increased 5% per year (incidence rate ratio (IRR) = 1.05; 95% CI: 1.03, 1.06) with the number of patients increasing from 68 in 2006/07 to 158 in 2017/18.

Crashes predominantly occurred as single-bicycle crashes (44%), collisions with a car, pick-up truck or van (35%) or collisions with other pedal cyclists (9%). The incidence rate of collisions with a car, pick-up truck or van did not change over the study period (IRR = 1.02; 95% CI: 0.99, 1.05). However, there was an 8% per year increase in the incidence of single-bicycle crashes (IRR = 1.08; 95% CI: 1.05, 1.10) and a 9% per year increase in the incidence of collisions with other pedal cyclists (IRR = 1.09; 95% CI: 1.04, 1.15).

Conclusions

Substantial increases were observed in the incidence of hospitalised pedal cyclist major trauma. This increase was largely explained by increases in single-bicycle crashes and collisions with other pedal cyclists. An increased understanding of the crash characteristics and increased emphasis on

single-bicycle crashes and crashes with other pedal cyclists is required to reduce cycling injury rates.

References

- Beck, B., Cameron, P., Fitzgerald, M. C., Judson, R., Teague, W. J., Lyons, R. A., & Gabbe, B. (2017). Road safety: serious injuries remain a major unsolved problem. *Medical Journal of Australia*, 207(6), 244-249. doi:10.5694/mja17.00015
- Boufous, S., & Olivier, J. (2016). Recent trends in cyclist fatalities in Australia. *Injury Prevention*, 22(4), 284-287.
- Schepers, P., Stipdonk, H., Methorst, R., & Olivier, J. (2017). Bicycle Fatalities: Trends in Crashes with and Without Motor Vehicles in the Netherlands. *Transportation research part F: traffic psychology and behaviour*, 46.