

The power of linked data in understanding differences between serious injury measures

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Abstract

A linked dataset comprising TAC Claims, Road Crash Information System (RCIS) and Victoria Police Traffic Incident System (TIS) from 2012-2017 was established to analyse the differences in reported serious injuries. The comparative analysis reveals the extent of injury level miscoding within the current TIS, and scoping differences between the two databases. Analysis continues to uncover further insight into the differences between the reported series’.

Background

The Victorian Road Safety partners are increasingly relying on the power of linked datasets to inform targeted prevention and education. Effort continues to resolve data quality issues to better understand road trauma; particularly serious injuries. Inconsistency in datasets and reporting, including differences between TAC Claims and Victoria Police reported data has been cause for confusion. This analysis closes knowledge gaps and provides insight into discrepancies. It focuses on hospital admissions within 7 days of an accident as a serious injury measure.

TAC, Victoria Police and VicRoads are collaborating to provide consistency in reporting of road trauma levels and trends where possible. A major project, The TIS Serious Injury Automation Project (TIS SIA Project), is currently underway which aims to automatically validate and correct existing hospital admission status within Victoria Police TIS using client hospital stay information held by the TAC. A new and improved measure of injury level will emerge from this project; the TAC validated TIS injury level. Once the TIS SIA Project is implemented this measure of injury level will be available within TIS and subsequently within VicRoads RCIS. The new series will be superior to the previously used RCIS and TAC validated RCIS series’, given that TIS incidents with an existing incident severity of both minor and non-injury levels are available for validation and correction.

The TAC has also invested significant effort into improving the linkage process between TIS and TAC. The new process integrates the existing manual linkage process undertaken by TAC claims intake teams, with a sophisticated and automated probabilistic data linkage process using full name, date of birth and accident date fields in both systems. The TIS SIA Project will utilize this new improved linkage table.

Whilst formal project plans continue within the relevant technical and business areas across the agencies, the TAC Road Safety Research, Insights and Evaluation team have been able to build and analyse a TIS/RCIS “future state” dataset by using the improved linkage table established by TAC and mimicking the business rules agreed for the TIS SIA Project.

Method

An analysis of Victoria Police TIS data linked to TAC claims data (where possible) was conducted to better understand the differences in their reported serious injury series’. The agreed business rules for the TIS SIA Project were applied to establish the TAC validated TIS injury level. These rules are as follows:

- Maintain TIS personal injury level code if coded as a fatality or if a link to TAC could not be established.

- Where a link to TAC could be established; records where an inpatient hospital stay had been billed to the TAC and the first inpatient stay was within 7 days, were marked as major or “serious” injury. The remaining linked cases were marked as minor injury.

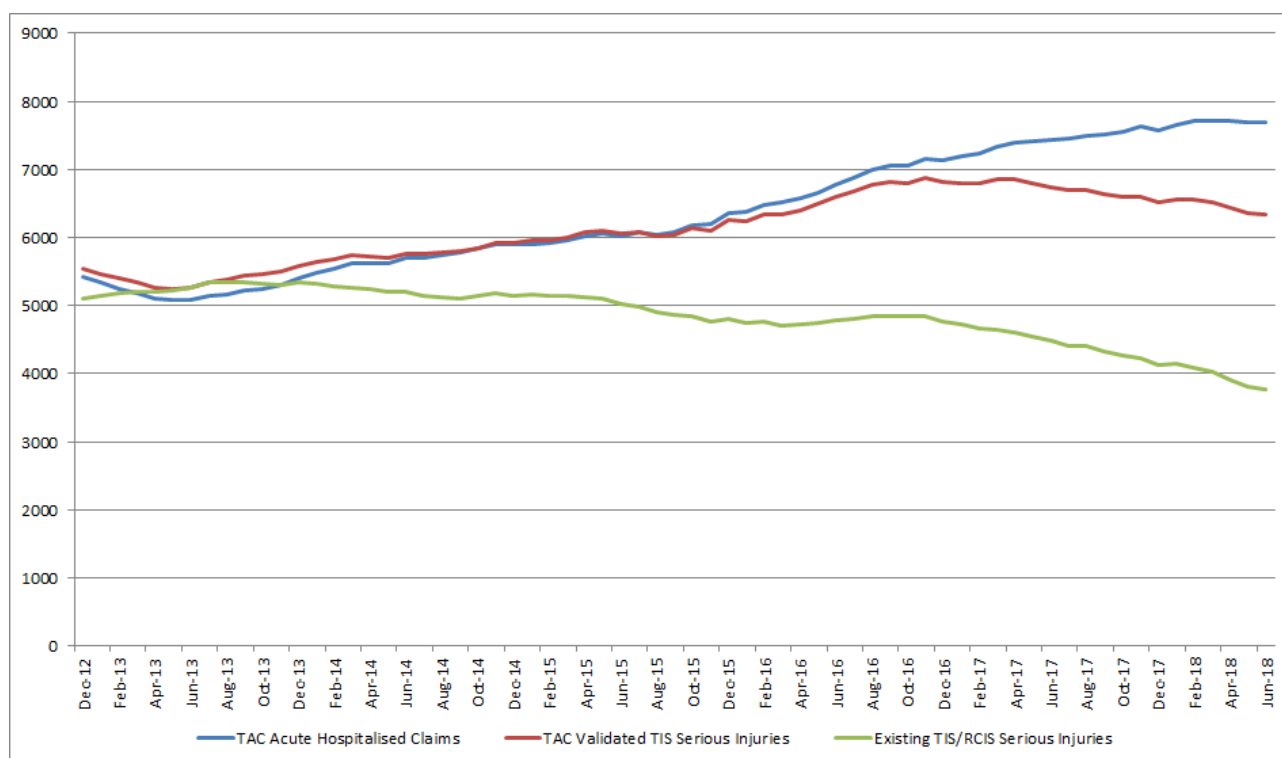
There were 465,844 cases existing in either TIS or TAC for accident dates between 2012-2017¹. Of the 114,906 TAC claims, 76.4% linked to a record within TIS. Of the 38,171 TAC claims with an inpatient hospital stay within 7 days of accident, 91.8% linked to a record within TIS. Known differences and data quality issues across the two datasets were first explored and are available as the preliminary results below. This includes the exploration of miscoded injury level within the existing Victoria Police TIS and the incidence of off road cases within TAC acute hospitalised claims data. Further analysis will continue to uncover and identify differences between the two series and will be available by September 2019.

Results

Chart 1 compares:

1. TAC Acute Hospitalised Claims; which denotes a hospital admission within 7 days of accident and includes both on and off road incidents.
2. Existing TIS/RCIS Serious Injuries for police reported incidents. This definition involves a hospitalisation and includes on road cases only.
3. TAC Validated TIS Serious Injuries: 2 above, validated and corrected by 1 above where a link can be established.

Chart 1. Serious Injury Comparison



¹ 2018 results will also be available ahead of the September conference.

Table 1. Serious Injury Comparison

Measure		Accident Year						
		2012	2013	2014	2015	2016	2017	
	TAC Acute Hospitalised Claims (1+2+3+4+5)	5414	5400	5905	6362	7138	7581	
	Police Reported Serious Injuries (TIS Current State) (3+6+7)	5104	5333	5151	4810	4766	4134	
	TAC Validated Police Reported Serious Injuries (TIS Future State) (3+4+5+7)	5524	5585	5917	6260	6821	6520	
TAC and TIS Comparison								
	TAC Claim Status	Victoria Police Current TIS Status						
1	TAC Acute Hospitalised Claim	Not on TIS	294	257	284	342	548	1389
2	TAC Acute Hospitalised Claim	On TIS but outside scope for TIS SI*	361	338	367	359	336	306
3	TAC Acute Hospitalised Claim	On TIS - Major/Serious Injury	3499	3567	3486	3551	3671	3174
4	TAC Acute Hospitalised Claim	On TIS - Minor Injury	1033	1013	1470	1763	2201	2279
5	TAC Acute Hospitalised Claim	On TIS - No Injury or Unknown Injury	227	225	298	347	382	433
6	TAC Claim but TAC says no hospital or not within 7 days	On TIS - Major/Serious Injury	840	986	1002	660	528	326
7	Not on TAC	On TIS - Major/Serious Injury	765	780	663	599	567	634

*Scope differences could include: ABS code (e.g. on road, off road etc.), Incident status code (e.g. final, draft etc.), accident year recorded etc.

Analysis of the linked file highlights the extent of miscoding in the current TIS (lines 4, 5 and 6 in Table 1). Once implemented, the TIS SIA Project will significantly improve the data quality of the reported injury level within TIS. Despite data quality improvement arising from this project, it is clear that the gap between TAC Hospitalised claims data and TAC Validated TIS data continues to grow. Some of these differences can be explained from scoping differences, but others still need to be explored.

Conclusions

The linked provides valuable insights into differences in reported serious injury series across the Road Safety partners. Known and valid differences will always exist between the databases and work continues to learn more about further differences.