

## **Linking hospital admissions and Police motorcycle crash reports in New Zealand: Can we improve our Midland Region evidence base?**

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### **Abstract**

Motorcyclists are vulnerable road users and are over represented in trauma statistics. This study linked Police crash data (held by the NZ Transport Agency) and hospital trauma admissions (held by the Midland Trauma System). We investigated possible under-reporting by Police, as well as analysing the demography of those casualties requiring hospital admission but not recorded by Police. Linkage rates and reporting biases are of interest from a policy perspective as information on motorcyclists admitted to hospital, but not recorded by Police, do not contribute to the policy evidence base.

### **Background, Method, Results and Conclusions**

Consultation is currently underway on an updated New Zealand Road Safety Strategy. The safety of motorcyclists as vulnerable road users is rightly high on the agenda. Motorcycle deaths and injuries reported by Police have increased since the early 2000s (Ministry of Transport, 2017). Motorcycle casualties are also an area of concern to the Midland Trauma System (MTS) as the regional hospital based trauma service. Motorcyclists represent about 32 percent of all on-road transport related hospital trauma admissions.

### **Methods**

A retrospective review of anonymised, prospectively-collected trauma registry data from 1 January 2012 to 31 December 2016 was conducted. Patients admitted to a Midland hospital within seven days of an on-road motorcycle or moped-related event occurring within the region were included. Variables examined included: patient demographic characteristics, injury event information, in-hospital management, severity of injuries, length of stay and rurality of injury and patient residence. Police records and MTS registry data were linked using probabilistic methods.

### **Results**

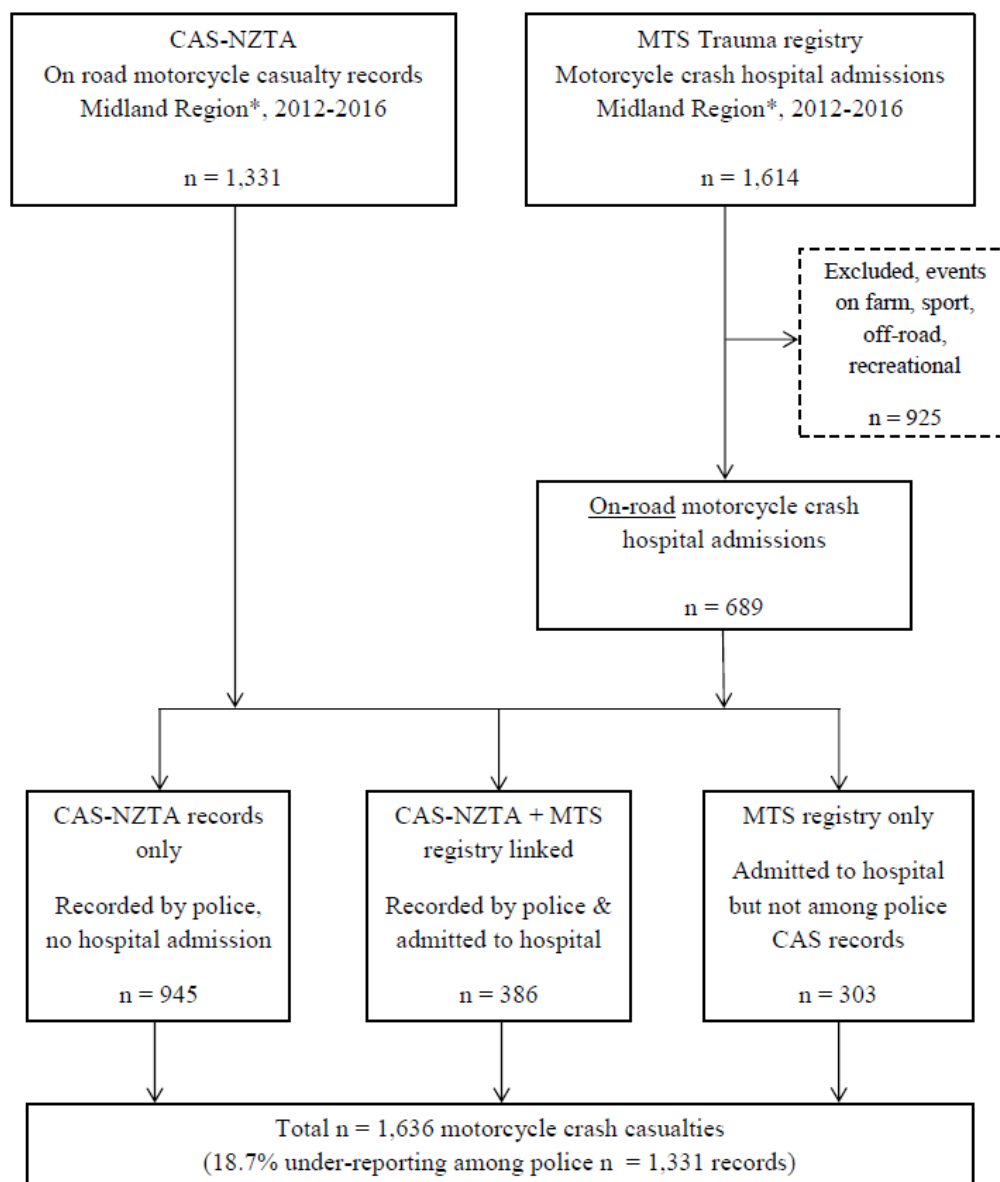
A total of 1,331 on-road crash casualties were recorded by Police while 689 on-road crash casualties were admitted to hospital (Figure 1). Linkage revealed under-reporting by Police of crash casualties resulting in hospitalisation. Approximately 56 percent (386) of hospital admission records were linked with Police records with an additional 303 (46 percent) patient admission records which could not be linked to any Police records. Higher linkage rates were significantly associated with crash severity as recorded by Police, patient injury severity recorded in the trauma registry, age and an urban crash location. Motorcyclists aged less than 45 years were significantly more likely to self-present. The odds of linkage for patients who self-presented to hospital were also significantly lower than those who did not self-present.

### **Conclusions**

The 303 'missing' motorcyclists are important, not only because their injuries were significant enough to require hospital admission, but because undercounting can impact investment in road safety. Comparison with the group recorded by Police showed that the populations differ in terms of their demography, but not in terms of when they crashed or where. However, the reasons why these crashes were not known to Police are harder to ascertain. There could be a relationship between the

conditions of a crash (question of guilt, extent of material damage, severity of the injuries, wished avoidance of Police etc.) as well as the attitude of any attending member of the public towards informing Police (Lujic, Finch, Boufous, Hayen & Dunsmuir, 2008; National Safety Council, 2017).

While the increase in casualties aged over 45 years reported by Police appears to be reflected in hospital trauma admission volumes, the merging of these datasets highlight several sources of bias underlying reporting of motorcycle crashes to Police. An understanding of these biases and including knowledge gained from linked Police-hospital datasets could assist with developing an evidence base that has considered complementary cross-sector crash information. Therefore, consideration should be given to more regular data linkage, to improve the evidence base on which key policy and funding decisions rely.



**Figure 1. Flow diagram of data selection and linkage between Police and trauma registry dataset (\*excluding Tairawhiti DHB) and occurring during 2012-2016.**

**References**

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