Linking Police motorcycle casualty records and hospital trauma admissions in Midland Region

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Motorcycle injury

Road traffic crashes, especially those involving motorcycles, are a significant cause of injury

Study Aim

› Link motorcycle casualty Police records and hospital trauma admissions to gain wider view of motorcycle injury

Data sources

CAS Crash Analysis System

› NZ Transport Agency's tool to map and analyse traffic crash data

› Over 1 million Police Traffic Crash Reports

› Coded causes, crash site, vehicles, persons, speeds, objects struck…..
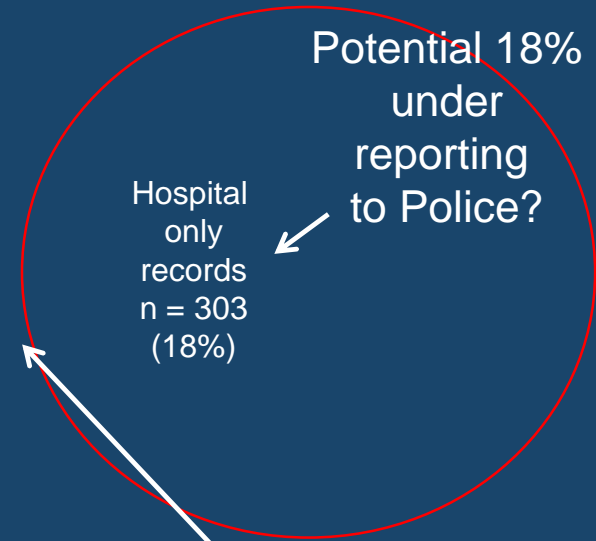
MTS Midland Trauma System

› Estab 2010 to support trauma clinical service development and research

› Hub team based in Waikato Hospital

› MTS hosts the NZ National Minimum dataset for Major Trauma

Linkage of Police motorcycle casualty records and hospital trauma admissions (2012-2016, Midland Health Region, NZ)

Police records CAS
n = 1,331
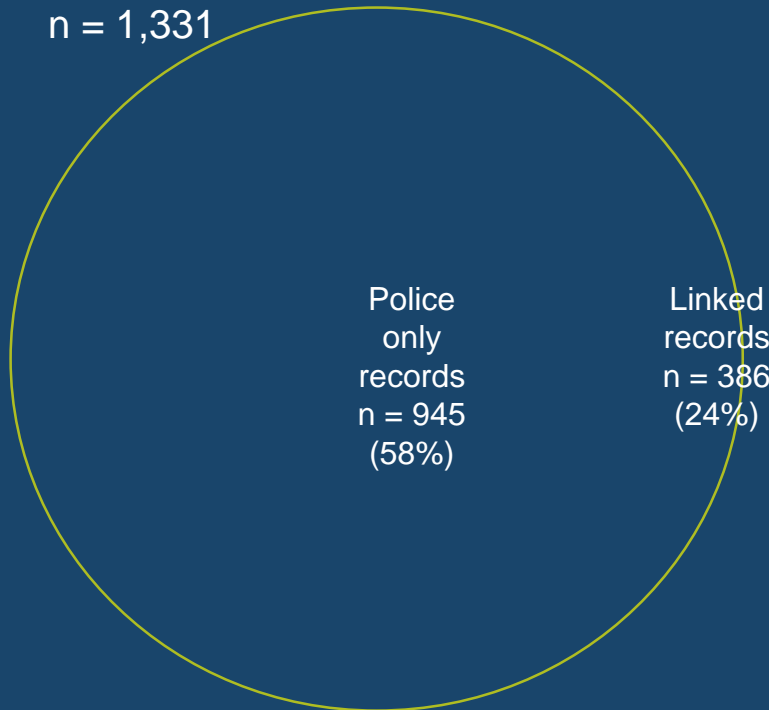
Hospital records
n = 689

Potential 18% under reporting to Police?

Police only records
n = 945
(58%)

Linked records
n = 386
(24%)

Hospital only records
n = 303
(18%)

Only 56% of patient records linked to Police records!

What factors affect linkage rates?

Logistic regression analysis used to assess odds of linkage for hospital admitted patients by:

› Injury severity

› Gender

› Age

› Ethnicity

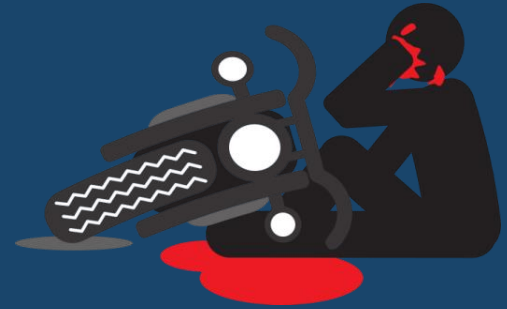› Rurality of crash occurrence

› Self-presenting behaviour

Help identify areas of under-reporting among Police records and potential causes of bias in Police reports

Injury severity affects linkage rates

Major trauma (ISS* > 12) patient records were

2.3 × more

likely to be linked with Police casualty records
compared to minor trauma (ISS < 13) patients

(Odds Ratio linkage: Minor trauma patient = Ref, Major trauma patient = 2.3, P < 0.001)

Significant bias, but perhaps not surprising!

*ISS – Injury Severity Score

Injury severity affects linkage rates

45 Major trauma patients

could **NOT** be linked with Police casualty records
(= 29% of all Major trauma admissions: 45/157)

Under reporting to Police is not confined to minor crashes!

Age affects linkage rates

Younger patient (Aged < 45 Yrs) records were

40% less

likely to be linked with Police casualty records compared to older patients aged ≥ 45 Years

(Odds Ratio linkage: Older patient ≥ 45Yrs = Ref, Younger patient < 45Yrs = 0.601, P < 0.001)

Police records appear to significantly under-report younger (< 45 Yrs) motorcycle casualties

Rurality of crash affects linkage rates

Patients whose crash occurred in a rural area were

39% less

likely to be linked with Police casualty records compared to those who crashed in an urban area

(Odds Ratio linkage: Urban crash = Ref, Semi rural crash = 0.88 (ns), Rural crash = 0.61 P < 0.03)

Self presenting patients have lower linkage rates

Patient records for those who self-presented were

94% less

likely to be linked with Police casualty records

(Odds Ratio linkage: Not self-presenting = Ref, Self-presenting patient = 0.058, P < 0.001)

145 patients self-presented to hospital

Low linkage perhaps not surprising – but who and why?

Self presenting patients and age

Patients younger than 45 Years of age were

1.6 x more

likely to self present to hospital than those aged
45 years or more

(Odds Ratio linkage: Older ≥ 45 Yrs + self-presenting patient = Ref, Younger < 45 Yrs + Self-presenting patient = 1.57, P < 0.02)

Younger patients are far more likely to self present to hospital, and far less likely to be linked to Police records

Other observations

› Gender did not affect linkage rates

› Pillion passengers appear under-represented in Police records

› Patients who lived rurally, especially younger patients, were less likely to be linked to Police records

Conclusions

› Only 56% of motorcycle casualty hospital admitted patient records could be linked to Police motorcycle casualty records

› Key factors affecting linkage rates include: injury severity, age, rurality of crash, and self-presenting behaviour

› Police reports possibly underestimated motorcycle casualties in Midland by ~18%

› Data linkage provides a wider picture of motorcycle trauma and where potential biases in reporting of motorcycle casualties to Police may require further study

Questions?