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Enhanced road safety data in NSW – serious injuries experience

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Access to relevant, timely and reliable data on road traffic crashes is essential for road safety improvement and effectively reducing road trauma on roads. The quality and completeness of the data and information available to decision makers is critical for success in achieving road safety outcomes. While, in most jurisdictions, the primary source of road crash information is police reports, often they don't have the required dimensions and depth to cover all aspects of road safety management. Research into best practice in road safety data management systems suggests that additional data is required to provide context for crashes [1] [2]. A data management manual for road safety data managers recommends the following attributes for a good road safety data system:

- It must capture all crashes that result in death and a significant proportion of those that result in serious injuries;
- Must provide adequate detail on the vehicle, the road user (and vehicle controllers) and the road/environment to assist with identification of causes, and selection of countermeasures;
- Accurate crash location information is essential;
- A responsive Business Intelligence (BI) system that provides information and reports in a timely manner to facilitate evidence-based decisions [1].

In NSW, a robust system is in place through Centre for Road Safety (CRS) at Transport for NSW to extract road safety data and information from police reports. For many years this process has provided a reliable and solid foundation for identifying road safety risk factors and developing strategies and policies to address them.

Like any other data system, an effective road safety data structure should follow and support the road safety business model. Road safety practice in NSW is structured on the Safe Systems approach, so the information landscape to support this must have adequate coverage of the main aspects of the system (with data sources providing specific data on roads, vehicles and road users).

Recognising the need to invest effort and time into improvement and enhancement of existing data systems, CRS developed an information capability road map in 2013 to enhance and better integrate road safety data in line with Safe System components and requirements. A series of relevant data sources were identified to provide context, complement and enhance NSW crash data, among which hospital records were targeted as a priority. The information capability road map implementation, so far, has resulted in a transformed road safety data system as depicted in figure 1.

This figure represents the data sources currently being linked with crash data to complement and enhance road safety data structures in NSW. Each one of those data sources either addresses a gap in crash data or supplements and verifies existing crash information from police reports.

There are still a few data sources which will be investigated for data linkage in the future. Among those are Ambulance Service of NSW (to address the gap in data in terms of post-crash response), WorkCover NSW (to cover employment related road trauma), and Health data from Queensland, Victoria and South Australia (for crashes occurring in NSW where casualties are treated in interstate hospitals).

Identifying serious injuries in NSW

Serious injuries are a key focus in the NSW Road Safety Strategy 2012-21. A main goal of the strategy is 30% reduction in the number of serious injuries resulting from road crashes by 2021.

Until very recently NSW was not collecting serious injury data as part of the road safety data collection. In late 2011, Transport and Road Safety (TARS) Research at UNSW

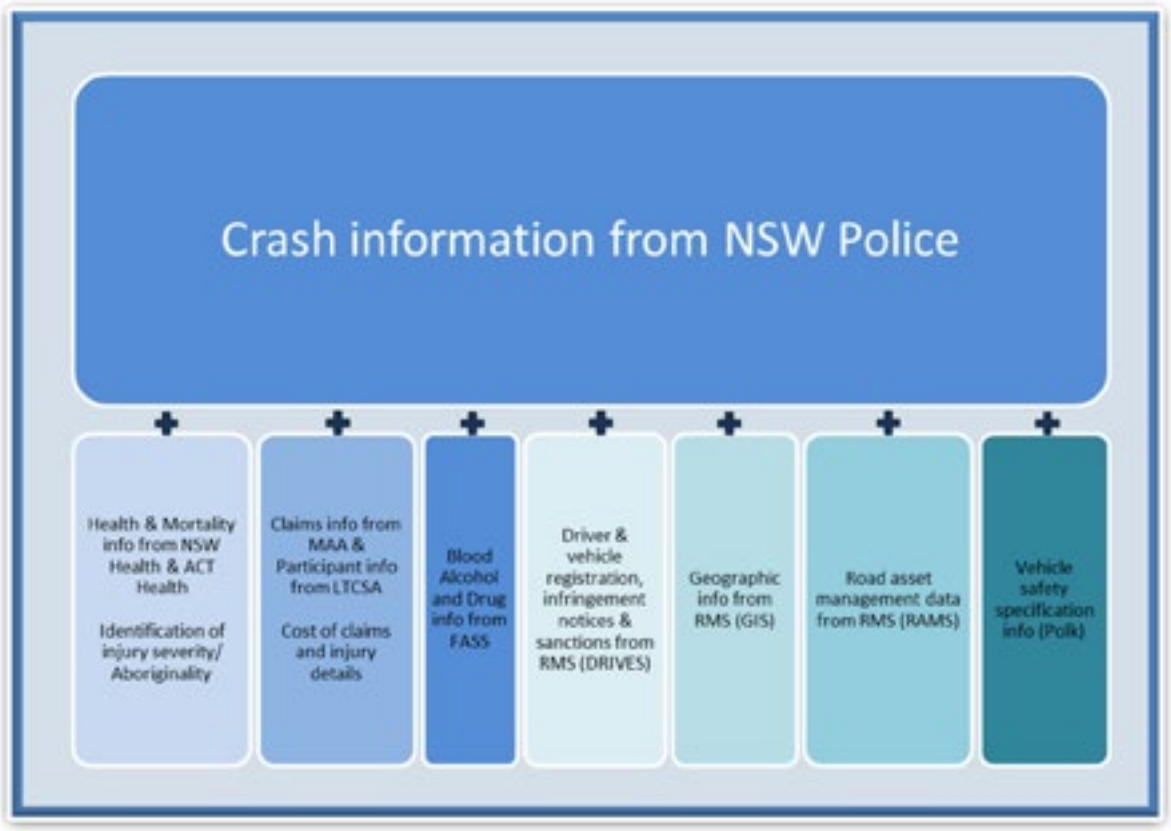

Figure 1. NSW road safety information landscape, current state

MAA - Motor Accidents Authority of NSW

LTCSA – Lifetime Care and Support Authority

FASS - NSW Forensic & Analytical Science Service

RMS – Roads and Maritime Services

was commissioned by CRS to investigate methodologies to define, identify and analyse serious injuries through linking road crash casualty data with the hospital admissions dataset from NSW Health. From this exercise, a methodology and definition of serious injuries were adopted by CRS to use as a starting point in establishing ongoing data linkage with hospital records in support of serious injury prevention strategies and countermeasures. Serious injuries were defined as a person who was hospitalised as a result of a crash (on the same day or next), and did not die as a result of those injuries within 30 days of the crash. Based on emergency department admission data, a second degree of injury severity (moderate injuries) was defined as those people who are admitted into a hospital emergency department as a result of a road crash and not admitted to the hospital as a patient.

Based on the above, a research framework was developed for ongoing monitoring, analysis and research into serious and moderate injuries at CRS. Under the provisions of the Health Records and Information Privacy Act, to access health related records several approvals had to be obtained before the project could commence. To do so, in mid-2013, a formal application was made to NSW and ACT Health Data Custodians and relevant ethics committees (NSW Population and Health Services Research Ethics Committee, Aboriginal Health and Medical Research Council Ethics Committee, ACT Health – Human Research Ethics Committee) to request approval for ongoing quarterly data linkage of crash data with the following datasets:

- NSW Admitted Patient Data Collection (APDC)
- NSW Emergency Department Data Collection (EDDC)
- Mortality data –
  - NSW Registry of Births, Deaths and Marriages - Death registrations (RBDM)
  - Australian Bureau of Statistics – NSW Deaths (ABS)
- ACT Admitted Patient Care (ACT APC) data
- ACT Emergency Department Information System (ACT ED)

The application approval process was completed in early 2014 and included historic data linkage from 2005 to 2014 and then a regular quarterly data linkage process.

The initial data linkage was conducted by the Centre for Health Record Linkage (CHeReL) and then the de-identified (all identifying fields removed), matched and unmatched records were released to the Centre for Road Safety for conducting the research. The process of data preparation, finding and addressing data quality issues and data derivations took a year to complete. During this time the methodology had to be refined and modified a few times and because of this the entire data linkage process had to be repeated. One of the key changes which resulted in an improved match rate between crash records and hospital admissions was the inclusion of traffic unit controllers who were not identified as "injured" in the NSW Police reports but were matched to an APDC or EDDC record through the linkage process. In addition to identifying a few hundred more serious injuries every year, this change resulted in a few thousand more injuries being identified each year which either were not reported to police or CRS did not receive them through weekly data loads from NSW Police. Researchers consider this to be a value-add from data linkage process through making the gaps in the collection of road crash data more evident [3].

Another important outcome of data linkage with hospital records was quantifying the proportion of road crash injuries that are not reported to NSW Police or reported with incorrect or inadequate level of details. Like in most other jurisdictions, the CRS study found that each year there are around 4000 cases of hospitalisations resulting from road transport crashes (based hospital admission classification) which are not included in crash data from Police. A separate study into the reasons for this commenced later in 2014 which found a range of possible scenarios to explain why they could not be linked to police reported crashes. An in-depth research framework has been developed for implementation in 2015 to examine this further and be able to quantify the proportion of real unlinked hospital records which are missing from the NSW serious injury dataset. This should provide more clarity around circumstances under which a linkage can or cannot be expected and a more accurate picture of serious injuries in NSW. It is also anticipated that the data linkage with Motor Accidents Authority of NSW and Lifetime Care and Support Authority will help identify more linked serious injuries as well as moderate and minor injuries especially for passengers in a crash. The centre also aims (as part of their information capability road map) to obtain data from hospitals on borders with Victoria, Queensland and South Australia to uncover the serious injuries resulting from crashes in NSW in which the injured people are transported to hospitals outside NSW. This should also help to further narrow the gap between linked and unlinked serious injuries.

In the meantime, there is a wealth of data on confirmed cases of serious injuries from the data linkage process. This will be used by the Centre for Road Safety, road safety stakeholders and business partners in NSW to guide strategies and programs aiming to reduce serious injuries by 30% by 2021.

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Time for a new public debate about the state of road safety

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Every time a politician cuts a ribbon at a road upgrade or opens a road safety conference we are told of our wonderful progress in reducing deaths from road crashes. But let's not blame the politicians - we write the speeches for them!

And the claims are, in a narrow sense, accurate, albeit misleading. In Australia, in 1970, almost 50 persons were killed in road crashes for every billion kilometres driven. Forty years later the rate was below six; an almost 90%