The average length of each of the lane states D_i can be estimated. The values of these D_i can be used to determine the probability that the current lane ends within Δt and therefore if it will continue for another time step:

$$P\{L(S(t), t + \Delta t) = i | L(S(t), t) = i\} = 1 - \frac{S(t) \cdot \Delta t}{D_i}$$

(A10)

The probability of transitioning to a state that is different in a single time step is given by the following equation:

$$P\{L(S(t), t + \Delta t) = i | L(S(t), t) = j\} = \frac{S(t) \cdot \Delta t}{D_i} \cdot Le_{i,j}$$

(A11)

In particular, some values needed to be set for this paper. The average distances for each lane type used in the lane state model were:

$$D_1 = 2\ km$$
$$D_2 = 2\ km$$
$$D_3 = 1\ km$$

And the transitions between each state in the lane type model were:

$$Le_{1,2} = 0.8,\quad Le_{1,3} = 0.2$$
$$Le_{2,1} = 1.0,\quad Le_{2,3} = 0.0$$
$$Le_{3,1} = 1.0,\quad Le_{3,2} = 0.0$$

Using these transitions, the lane will only transition to a passing lane from a 'no overtaking' lane and not from a 'overtaking possible' lane and the only state that can follow either a 'passing lane' or a 'passing possible' lane is a 'no passing possible' state.

Using these known transitions between states, it is possible to determine the average time spent in each state. The average distance spent in the lane where no passing is allowed is 52.63%, the average distance in a passing is possible lane is 42.11% and the average distance in a passing lane is 5.26%. The transitions, $Le_{i,j}$ and D_i, could be changed to adjust these average lane states if desired.

Overtaking

Overtaking is allowed by considering all three models together. Overtaking will occur if one of the following two conditions are met in conjunction with $S(t) < S_O$:

1. The modelled vehicle is in a passing lane
2. The modelled vehicle is in a passing-possible lane and the safe overtaking zone of the modelled vehicle is clear.

If either of these conditions is satisfied then the modelled car resumes its desired speed, S_O and maintains its current lane state and safe overtaking zone state until such time as they change. No time is considered for the acceleration required to reach maximum speed. A safety margin for overtaking can be built into the safe overtaking zone model, through the distance, *OTD*, required to pass around a slower moving vehicle.

Time step

The time step chosen for the model needs to be sufficiently small such that two events have a negligible opportunity to occur in one time step. Examples of two events occurring simultaneously include two vehicles filling the safe overtaking zone in one time step, or the lane state changing from passing possible, to passing not possible to a passing lane.

Parameters used in the simulations

Particular parameters were used throughout this paper during the simulations. These are itemised here:

$$\Delta t = 1\ second$$
$$OTD = 0.04\ km$$
$$B = 10\ kph$$

Databases for Road Traffic Injury Surveillance in New South Wales

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Abstract

Road traffic injuries are a significant public health problem around the world. Efforts to prevent road traffic injuries are likely to benefit from the collection of consistent and comparable injury information. This study evaluated data item availability across different road traffic injury surveillance data collections in New South Wales in relation to the World Health Organization's recommended core minimum, optimal and supplementary data sets that outline the necessary data items for injury surveillance. The data collections reviewed are suitable for road traffic injury surveillance in different contexts. However, none of the data collections examined sufficiently categorized two common data items required in road safety research: occupant protection devices and injury outcomes. Further improvement of current routine road traffic crash data

collections is warranted to build the required data infrastructure to overcome challenges for etiologically based analyses.

Keywords

Road Traffic Injury, Surveillance

Introduction

Road traffic injuries represent one of the leading causes of injury-related death worldwide [1]. In Australia, road crashes result in around 1,600 deaths [2] and 31,200 serious hospitalised injuries [3] each year, at a conservative annual cost of $18 billion to the community [2]. Importantly, road traffic injuries result from preventable events that have many causes [1]. Injury surveillance data, which describe crashes and their causal factors, are crucial to road traffic injury prevention efforts, such as problem identification and the evaluation of interventions at the broad population level [4].

In New South Wales (NSW), as in other Australian states and territories, different agencies collect a range of data items that are potentially useful for road traffic injury surveillance. However, because the data items are collected for each agency's particular purposes, which do not often include injury surveillance, the recorded data items generally differ across agencies and may not be well suited to answer every road traffic-related research question. In addition, the data collections have varying case inclusion criteria. This means that the individual data collections are neither necessarily comparable nor complementary. For example, routinely collected hospital separation records describe the nature of injuries well (e.g., fractures and abrasions), but are limited in terms of the information they contain about circumstances or factors associated with the cause of the injury (e.g. information regarding restraint use for injured motor vehicle occupants is not recorded) [5]. In contrast, police collected crash records provide detailed information about the circumstances of the crash and its causal factors, but they do not include injury details (e.g., nature of injuries such as fractures) [5].

The aims of this paper are to summarise a number of characteristics of data collections in NSW that are relevant to unintentional road traffic injuries and indicate differences among the data collections in the recording of injury outcome data items. In addition, because of the multifactoral nature (i.e., involving factors related to the environment, vehicles, drivers, and occupants) of road traffic injuries, the paper also aims to report on data item availability within each data collection, including whether information about occupant protection devices is recorded as an active injury countermeasure. This is used to highlight the availability of data items in different data collections in NSW to answer research questions regarding road traffic injuries.

Method

Eight large-scale routinely-collected data collections that are used frequently by various government agencies or research institutions to direct and evaluate road safety prevention efforts in NSW were reviewed. These data collections consisted of: the Australian Bureau of Statistics (ABS) mortality data file (MDF), the National Coronial Information System (NCIS), the Fatal Road Crash Database (FRCD), the NSW Admitted Patient Data Collection (APDC), the NSW Hospital Emergency Department Surveillance System (HEDSS), the Traffic Accident Database System (TADS), the Motor Accidents Authority Claims Register (MAACR), and the NSW WorkCover Data Collection (WCDC). Sample survey data collections and ad-hoc road traffic injury investigations were not examined. Information on the reviewed data collections was obtained from the coding manuals and from the data custodian of each collection.

Results

Characteristics of study data collections

A description of each data collection, collected injury outcomes, case inclusion criteria, type of classification system and timeframe of data collection are presented in Table 1. (See page 58)

Availability of core data items for injury surveillance

Core data item availability was evaluated against both the Minimum Data Set (MDS) and Optional Data Set (ODS) recommendations in the World Health Organization (WHO) injury surveillance guidelines [6], using a three-level scale (definite inclusion, possible inclusion, definite exclusion). Because this study focused on unintentional road traffic injuries, the WHO recommended item, "intent" was not recorded. Other WHO recommended items, "mechanism" and "external cause", were not considered as either the mechanism or external cause were the means of case identification (i.e. road traffic injury).

Table 2 shows the WHO recommended data item availability for each data collection. None of the data collections comprised a complete list of WHO recommended MDS and ODS data items, except for the NCIS. (See page 59)

Availability of supplementary data items for injury surveillance

There are many casual factors leading to road traffic injuries and these are usually attributed to various aspects of the crash scene (e.g., where and when), traffic units involved (e.g., vehicle type and impact point), traffic unit controllers (e.g., on road driving experience) and/or causalities (e.g., use of vehicle restraints). Therefore, the availability of supplementary road traffic injury data items describing exposures to various risk factors across these four categories was also assessed. These supplementary road traffic injury data items were also suggested in the WHO's guidelines for injury surveillance [6]. In addition, the availability of a "medical cause of death" data item was examined for relevant data collections because it can be used to identify injury-specific fatal cases in which a specific injury is the underlying cause of death, so as to calculate injury-specific fatality rates (e.g., rates of death attributable to fractured skulls versus multiple injuries).

Table 1 Data collections relevant to road traffic injury data collections in New South Wales, Australia

Data collection	Administrative agency	Injury outcome	Case criteria	Type of classification system used	Time frame
ABS Mortality Data File (MDF)	Australian Bureau of Statistics www.abs.gov.au	Fatal	Information on fatalities obtained from the NSW Registry of Births Deaths and Marriages. Includes all road traffic deaths of NSW residents.	Structured coding system, such as application of International Classification of Disease	1964 onwards
National Coronial Information System (NCIS)	Victorian Institute of Forensic Medicine www.ncis.org.au	Fatal	Information on fatalities obtained from police investigation reports, autopsy and toxicology reports, other relevant reports, and coroners' findings. Includes all road traffic deaths of NSW residents including those injured in other jurisdictions.	A mixture of structured coding and narrative description of crash scenes	1 July 2000 onwards
Fatal Road Crash Database (FRCD)	Australian Transport Safety Bureau www.atsb.gov.au	Fatal	Information on fatalities obtained from an aggregation of datasets supplied by the relevant State or Territory road authority, eg NSW data is a subset of the TADS data from the RTA (web-based and open to public access).	Structured coding using agency-developed system	1989 onwards
Admitted Patient Data Collection (APDC)	NSW Health Department www.health.nsw.gov.au	Fatal and nonfatal	Information on NSW residents admitted to all public, private, repatriation hospitals, private day procedure centres, public psychiatric hospitals and public nursing homes in NSW or interstate. Includes all road traffic-related hospitalisations of NSW residents in Australia.	Structured coding system, such as application of International Classification of Disease	1993 onwards
Hospital Emergency Department Surveillance System (HEDSS)	NSW Health Department www.health.nsw.gov.au	Fatal and nonfatal	Information on NSW residents presenting to an Emergency Department from 50 selected major hospitals across NSW. Includes all road traffic-related Emergency Department Presentations of NSW residents to selected hospitals.	A mixture of structured coding and narrative description	1996 onwards
Traffic Accident Database System (TADS)	NSW Road Traffic Authority www.rta.nsw.gov.au	Fatal and nonfatal	Information on unintentional road crashes that occurred on a public roadway in NSW and were reported to NSW police. Includes road crashes resulting in death or injury or where a vehicle was towed away. May or may not be a NSW resident.	Structured coding using agency developed system and applying National Traffic Crash Guidelines	1986 onwards
Motor Accidents Authority Claims Register (MAACR)	NSW Motor Accident Authority www.maa.nsw.gov.au	Fatal and nonfatal	Information on persons either fatally or non-fatally injured in an vehicle crash as a driver, passenger, pedestrian, pedal cyclist, or motor cyclist, where the driver of the other motor vehicle was considered partially or completely at fault and the vehicle at fault was registered in NSW. From October 2006, includes all road traffic-related injuries of children, regardless of fault.	Structured coding using agency-developed system	1989 onwards
WorkCover Data Collection (WCDC)	NSW WorkCover www.workcover.nsw.gov.au	Fatal and nonfatal	Information on work-related deaths, injury and disease (excluding dust diseases) claims of workers employed in NSW.	Structured coding system, such as Type of Occurrence Classification System (TOOCS)	1991 onwards

Table 2 Availability[a] of WHO-recommended data items[b] included in the road traffic injury surveillance data collections in NSW[b]

Data items	Categorisation examples	MDF	NCIS	FRCD	APDC	HEDSS	TADS	MAACR	WCDC
WHO Minimum Data Set components									
identifier	a unique identifier for each injury case;	+	+	N/A	-	-	+	+	+
Age-group	0-4, 5-9, etc (in years);	+	+	+	+	+	+	+	+
sex	male, female, unknown;	+	+	+	+	+	+	+	+
place	home, street, sports area, etc;	+	+	-	+	-	+	+	+
activity [c]	working, boarding vehicles, etc;	-	+	-	+	-	-	-	?
nature	fracture, burns, bruise, etc;	+	+	-	+	+	-	+	+
WHO Optional Data Set components									
ethnicity	an indication of race or country of birth;	+	+	-	+	+	-	-	+
injury date	date an injury event occurred ;	-	+	+	-	-	+	+	+
injury time	time an injury event occurred (in 24 hour);	-	+	+	-	-	+	-	+
Residence [d]	usual place of residence;	+	+	-	+	-	+	+	+
alcohol use [d]	yes, no, unknown, etc;	-	+	-	-	-	+	-	-
other substance (e.g., marijuana)	yes, no, unknown, etc;	-	+	-	-	-	-	-	-
Severity of injury [e]	no, minor or superficial, moderate, severe;	N/A	N/A	N/A	-	-	-	+	?
disposition [f]	discharged, admitted, died, etc;	N/A	N/A	N/A	+	+	-	+	?
narrative incident summary	a description of injury-event circumstances;	-	+	-	-	+	?	-	?

[a] A "+" sign indicates a definite inclusion; A "?" sign indicates an inclusion with uncertainty, for example, the access to a data item is restricted, or information could be extracted from texts but not guaranteed; A "-" sign indicates a definite exclusion; "N/A" refers to not applicable, such as a fatality itself of "fatal" severity.

[b] All selected datasets were exempted from present consideration for examination on WHO recommended items, "intent" (e.g., intentional, unintentional), "activity" (e.g., sport, travelling), "mechanism"/"external cause" (e.g., traffic, poisoning), because of the focus on road traffic injuries that were defined as unintentional in this study.

c WCDC collects activity information that only 'at work' or 'commuting' incidents can be determined.

[d] These items were recorded in TADS datasets only for traffic unit controllers.

[e] Datasets (APDC, HEDSS, TADS) collect information from both fatalities and non fatal injuries. However, the APDC only records deaths that occurred in hospital. WCDC datasets may not have identical levels of categories as described in the Categorisation examples.

[f] TADS datasets have not recorded disposition information since 1997.

Discrepancy in data item availability (especially with respect to crash information) was observed between the data collections [Table 3]. The TADS included the highest number of data items relating to supplementary road traffic data items. Because the NCIS contained narrative data of a crash event, it also offers the possibility (although not the guarantee) of identifying these supplementary road traffic injury data items.

Information on occupant protection devices

As widely-accepted injury countermeasures, occupant protection devices are designed to mitigate injury risks in a crash and proper use or deployment of these devices have saved lives and prevented injuries worldwide [1]. Nonetheless, data collections seldom include adequate information about occupant protection devices. To examine the ability of each reviewed data collection to record information on occupant protection devices, two common devices were selected: occupant restraints (i.e. seat belts) and airbags. For both of these devices, the categorisation available in each collection to accurately record the use of these devices was identified.

Table 4 (See page 64) demonstrates that no data collection recorded comprehensive information regarding the use or deployment of the two occupant protection devices examined, and several recorded no information at all. Data coding practices [see Table 1] for each data collection may also have an impact on the level of detail recorded. For example, structured coding schemes are easy to use and allow for the recording of pre-defined coding categories. However, the pre-defined categories may not reflect important information about use of these protection devices, such as the correctness of use of restraint. In contrast, narrative text, as used in the NCIS, could allow possible identification of different forms of safety device-use [7]. A limitation of this is that searching the narrative text for these details, or indeed for data items of interest, requires increased resource investment (e.g., software and time).

Information on injury outcomes

The capacity of each collection to record injury severity, nature of injury, multiple injury counts, and injured body region(s) was also examined. The MDF and the NSW APDC recorded multiple injury outcomes based on the structured International Classification of Disease (ICD) codes [8], whereas the other data collections examined did not provide complete information of selected measurable dimensions to describe potential injury outcomes [Table 4].

Discussion

Roles for epidemiological analyses

Descriptive analyses of the data items present in each of the data collections examined are appropriate to assess the prevalence of protective/hazardous exposures or the incidence of injury outcomes. The TADS and NCIS are the only two data collections that collect both crash and injury information, which highlights their applicability in etiological analyses.

Because each data collection captures casualties from a different but potentially overlapping injured population (except for the MDF and the NCIS which represent the same population – i.e., all road traffic fatalities of NSW residents), these data collections are suitable for road traffic injury analyses in different contexts [see Table 1]. For example, the APDC is suitable for profiling serious road traffic injuries that require hospitalisation, while the TADS additionally incorporates road traffic injuries of a less serious nature. Discrepant findings may result from different case inclusion criteria for different agencies [see Table 1]. For example, using police collected crash data to estimate crash fatality and non-fatality burden may produce different findings from using hospitalisation data. For example, in July 2007-June2008, TADS comprised 435 fatalities and 25,845 non-fatalities, whereas APDC comprised 119 fatalities and 10,711 non-fatalities..

Further, the relevance of a particular data collection to a given research question depends on the availability of the data items specific to that question [see Tables 2- 4]. The different datasets address important variables somewhat differently, with implications for usability, interpretation, and matching. For example, the APDC addresses crash location in terms of general place of occurrence (such as “street and highway” without further information), whereas the TADS addresses crash location with more detailed information (such as GPS co-ordinates).

Privacy and confidentiality issues may limit the accessibility or usability of data for researchers. In the U.S. the National Highway Traffic Safety Administration makes available to the public two major crash datasets with de-identifiable information: the Fatality Analysis Reporting System and National Automotive Sampling System. These datasets are widely used in road traffic injury epidemiological studies. Whether or not the U.S. experience is translatable in Australia requires further investigation

Opportunities for road traffic injury surveillance in NSW

All of the data collections in this study have different case inclusion criteria, use different classification systems for recording data items, and collect different combinations of data items from the WHO’s MDS, ODS and supplementary recommended data items. In addition, the majority of data collections insufficiently categorise data items related to safety devices to reflect complex crash-injury situations, if they collect information on these devices at all. Because of the multifactorial nature of road traffic injuries, it is important to shift the focus of injury epidemiology from descriptively-based to etiologically-based research, emphasised by Haddon [9].

A systematic overhaul of current road traffic injury data collections would be required to ensure that the WHO recommended minimum, optional and supplementary road traffic injury data items are recorded in each data collection.

Table 3 Availability[a] of supplementary data items at various exposure levels in the road traffic injury surveillance data collections in NSW

Data items	Categorisation examples	MDF	NCIS	FRCD	APDC	HEDSS	TADS	MAACR	WCDC
Casualty level									
road user type	pedestrian, driver, passenger, etc;	+	+	+	+	?	+	+	?
restraint use	unrestrained, seat belt, child restraint, etc;	-	?	-	-	?	+	-	-
seating position	front left, centre, third row left, etc;	-	?	-	-	?	+	-	-
airbag [b]	deployed, not deployed, not fitted, unknown;	-	?	-	-	-	+	-	-
Driver level									
licence compliance	learner, standard, expired;	-	?	-	-	-	+	-	-
alcohol	a quantitative blood alcohol concentration;	-	?	-	-	-	+	-	-
restraint use	unrestrained, seat belt, unknown;	-	?	-	-	?	+	-	-
airbag	deployed, not deployed, not fitted, unknown;	-	?	-	-	-	+	-	-
Vehicle level									
vehicle type	car, utility, motorcycle, bicycle, etc;	+	+	?	?	?	+	?	?
travelling speed	a quantitative description of the travelling speed;	-	?	-	-	-	+	-	-
impact direction	an indication of 12-hour clockwise direction	-	?	-	-	-	+	-	-
counterpart colliding with	fixed object, motorised vehicle, etc;	?	+	-	?	-	+	?	?
Environmental level									
road condition	wet, dry, snow, ice, unknown;	-	?	-	-	-	+	-	-
natural light	dawn, dusk, daylight, darkness, unknown;	-	?	-	-	-	+	-	-
weather condition	fine, rain, fog, etc;	-	?	-	-	-	+	-	-
Other exposure factors [c]		-	?	?	-	-	+	?	?
Specific data item									
medical cause of death	underlying and contributing causes (e.g., brain damage)	+	+	-	-	-	-	-	-

[a] A "+" sign indicates a definite inclusion; A "?" sign indicates an inclusion with uncertainty; A"-" sign indicates a definite exclusion.

[b] The "air bag" data item on casualty level was available since 2000, however this item was recoded on vehicle level and may not be specific to each casualty in the vehicle.

[c] "Other exposure factors" referred to data items that reflected other exposures on casualty, driver, vehicle, or environmental level, such as casualty ejection, driver fatigue, vehicle weight, speed limit, and etc.

Table 4 Coding practices[a] for occupant protection device uses and injury outcomes in the road traffic injury surveillance data collections in NSW

Data items	Possible categories observed in use	Coding categories or coding standards							
		MDF	NCIS	FRCD	APDC	HEDSS	TADS	MAACR	WCDC
restraint use	unrestrained, lap belt only, shoulder belt only, lap shoulder belt, infant seat, child restraint, booster, improper use of adult belt, improper use of safety seat;	-	?	-	-	-	adult belt worn, belt fitted (but not worn), no restraint fitted to this position, child restraint, Unknown/ not stated [b]	-	-
airbag presence	fully-deployed, half-deployed, not-deployed, first or second generation airbag, frontal/side airbag to either driver or specific passenger seat, rear side airbag;	-	?	-	-	-	deployed, not deployed, not fitted, unknown	-	-
injury severity	died, hospitalised, treated, no injury, Abbreviate Injury Scale (AIS), Injury Severity Score (ISS), International Classification of Disease (ICD) codes - based Injury Severity Score (ICISS);	Died	Died	Died	ICISS [c]	ICISS[c]	Died, injured	AIS, New ISS	Death, permanent total disability, permanent partial disability, temporary disability
injury nature	fractures, abrasions, dislocation, open wound, burns, traumatic rupture;	International Classification of Disease (ICD) codes	free-form narrative description	-	ICD codes	ICD codes	-	fractures, cut, burns, etc	Australia's Type of Occurrence Classification System (TOOCS)
injury counts	number of injuries;	Multiple cause fields	free-form narrative description	-	55 Multiple diagnosis fields	?	-	Up to 5 multiple counts of injuries	Only the most serious injury
injured body region	head, neck, abdomen, spine, extremities, brain, internal organs, eye, skin;	ICD codes	free-form narrative description	-	ICD codes	?	-	head, abdomen, spine, etc	TOOCS

[a] A "?" sign refers to possible inclusion with uncertainty. For example, the NCIS may have description of different restraint use, but such inclusion is not guaranteed. A "-" sign refers to a definite exclusion.

[b] The TADS also records information about helmet usage (open face helmet worn, full face helmet worn and no helmet worn) in the "restraint use" data items.

[c] ICISS is not recorded in the APDC datasets, but can be subsequently calculated based on ICD codes. APDC also records "died" as a separate outcome.

However, this would consume substantial resources and it is questionable whether it is necessary for all agencies to have a "complete" collection of all WHO recommended road traffic injury surveillance data items.

Alternatively, it would be possible to employ data linkage processes to provide more complete road traffic injury surveillance at a reasonable cost [5]. Data linkage links records from two different data collections on a common unique identifier [10] or using common data items (such as name and date of birth) recorded in both collections [11]. For example, linkage of the MDF and APDC data collections has been conducted, to combine mortality information from the MDF and hospitalisation details from the APDC [10]. Linkage of the TADS and APDC data collections has added details of crash circumstance from TADS to details of injury outcomes from the APDC [11]. By reviewing the 10-year experience of linking population health data from various data collections in Western Australia, Holman et al [12] have demonstrated that data linkage can provide more complete information and increase the scope of available data items to facilitate and enhance population health research. The same is likely to apply to the epidemiological analyses of road traffic injuries in NSW. An example of the value of NSW linked data for undertaking risk factors for road crashes in older people has recently been published [13].

Nonetheless, data linkage can be resource-consuming, and can involve records not being matched on many occasions, in part because the populations sampled by different data collections overlap only incompletely [11]. Further, linkage rates (i.e., the proportion of records that are matched) can vary among different subgroups, introducing biases. These biases involve some known factors (such as age, gender or injury severity) and are also likely to involve some undetected factors (such as educational background or insurance status) that may influence the likelihood of a case of interest being captured by different data collections. For example, a data linkage between hospital and police data from July 2000 to June 2001 recruited 92 injured child passengers aged 0-8 years [14], whereas individually using hospital separation data for the same period and same study subjects recruited 150 cases [15]. Therefore, the feasibility of matching records and the usefulness of the resulting data needs further investigation.

While it may be possible to develop a classification system to take into account all information regarding a vehicle crash, in practice this is not realistic because of operational difficulties, such as need for collection of information at different stages of the injured person's injury journey, limited data collection resources or the data collectors' lack of expertise. Nevertheless, it would be valuable for road traffic injury surveillance to include consistent information on particular data items, such as occupant protection devices.

Even when particular data items are present in the specific road traffic injury data collections examined, data quality (e.g., data completeness, sensitivity, specificity) may influence their usefulness in road traffic injury studies. For example, many values are "missing" for in-crash delta-speed due to the practical difficulty of collecting data after the occurrence of a crash, the use of "unspecified" codes affects the completeness of case inclusion [16], and misclassification of the use of seat belts may bias estimates of the effectiveness of their use [17]. Because data quality issues are a challenge for all data collections, continuing commitments are required from each agency to make vigilant efforts for quality assurance [16,18].

Conclusion

This paper describes the characteristics of road traffic injury in eight data collections commonly used in NSW with a focus on data item availability and the ability of each collection to record different information. It describes the availability of information on two common occupant protection devices and on injury outcomes in each data collection. It also identifies some issues associated with data item availability for road traffic injury identification and prevention. In conclusion, the selection of the most appropriate data collection to examine for information regarding road traffic injuries in NSW will depend upon the nature of the research question and the data items that are required to fulfil the research objectives. Overcoming the challenges for etiologically-based analyses warrants further efforts to record the information on road traffic injuries that is recommended by the WHO, or by protocols that have been developed specifically for the road traffic injury context such as the protocol for the Australian National Crash In-depth Study (administered by Monash University Accident Research Centre, Victoria) that collects in-depth information for both crash scenes and injurious outcomes [19]. An exploration of conducting routine data linkage between road traffic injury data collections should be considered in NSW, as has previously been recommended based on a time-limited data linkage project conducted in NSW [11,13,20].

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Road Safety Literature

New to the College Library

Level Crossing Safety – an update to the 2004 Train Illumination Report, published by the House of Representatives Standing Committee on Infrastructure, Transport, Regional Development and Local Government, June 2009.

Recent Publications

Centre for Automotive Safety Research (CASR) University of Adelaide

The following report has been published and is now available on the Internet:

CASR072 Headform impact test performance of vehicles under the GTR on pedestrian safety

http://casr.adelaide.edu.au/publications/researchreports/CASR072.pdf