Report to Little Blue Dinosaur Foundation

Analysis of patterns of child pedestrian fatalities recorded in the National Coronial Information System from 2001 to 2019

Authors: S. Boufous, F. Koch, J. Olivier, A. Williamson

Deliverable 1 for Project:

Improving strategies for prevention of serious road traffic injury involving children through enhanced analysis of the causes of crashes

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Little Blue Dinosaur Preliminary Report

Table of Contents

Executive Summary

Land transport accidents are a leading cause of deaths and serious injury in children aged 0 to 14 years. Prevention of these tragedies is based mainly on strategies developed for all road traffic crashes even though the causes of crashes involving children may well be different to those involving adults. Physical, cognitive and social developmental characteristics and their overall smaller stature make children more vulnerable in road traffic areas. We need to understand more about the specific causes of land transport accidents involving children to improve prevention. The overall aim of this project is to conduct analysis to help understand more about the trends, causes and factors that lead to road trauma in children and to use this analysis to direct the design of trial programs to reduce child road trauma. The project uses the comprehensive data available in the National Coroners Information System (NCIS). We obtained permission and ethical approval to access all closed coronial cases relating to transport injury for children aged 0 to 14 years in all jurisdictions in Australia except Western Australia for the period: January 2001 and December 2019. This first section of the project involves analysis of the pre-coded summary variables in the NCIS.

Results

Overall numbers and trends

Over 1,000 fatal traffic injury incidents involving under 15 year olds were reported to coroners over the 19 year study period across all states included in the analysis. There was a decreasing trend in the overall numbers of cases across the period, although this occurred in two sections: a large drop between 2001 and 2008 and, after an increase, another drop between 2012 and 2019. This overall drop in cases occurred almost exclusively in major cities and inner regional areas, with no change in outer regional and remote and very remote areas. Trends in child pedestrian fatalities also showed a drop for a short period (2001 to 2005) but have remained about the same level in the last 14 years.

Local Government Areas (LGA's)

Around one-third of incidents occurred in NSW and Queensland followed by Victoria (20%). Around 85% of incidents occurred in these three states.

Analysis of the location of fatal incidents by LGA showed different patterns for the number and rates of incidents. Based on number of incidents, the LGA's with the largest numbers were high population areas in Queensland and to a lesser extent in NSW and most involved pedestrians and the youngest children. Based on incident rates, LGA's with highest rates were mainly rural areas, involved a light vehicle and older children (10 to 14 years). The LGA's with high numbers and rates included: Mackay (QLD), Mid-Coast (NSW), Katherine (NT), Isaac (QLD), and Whitsunday (QLD).

For NSW, the highest numbers and rates included almost the same group of LGA's, but again, those with the highest rates were in more remote areas and involved light vehicles. LGA's with both high numbers and rates were: Mid-Coast, Wentworth, Richmond Valley, Wollondilly, Hawkesbury and Shoalhaven.

For pedestrian incidents, LGA's with highest numbers and rates were Cairns (QLD), Mackay (QLD), Georges River (NSW), Logan (QLD), Cumberland (NSW) and Parramatta (NSW).

Age and gender characteristics of child

The largest percentage of incidents involved the youngest children (36,1% for 0-4 years), followed by the oldest group (35,1% for 10-14 years). Over all incidents, most children were male, except for the youngest group where the gender difference was much smaller.

Characteristics of crash

The pre-coded variables in NCIS provide only limited information about the characteristics of the fatal crash, including the mode of travel, activity and the vehicle or object involved in the crash. This analysis showed that in nearly half of incidents the child was a passenger in a light vehicle and in a further one-third they were a pedestrian. Younger children were more likely to be a pedestrian at the time of the incident.

By far, most children in these incidents were travelling at the time, but it is notable that about one-quarter of under five children were engaged in a range of other activities such as leisure and play or vital personal activities. Older children were more likely to be involved in sports and exercise activities.

Not surprisingly, for most incidents the child was located near transport areas at the time, but again, the youngest children differed with one-quarter at home or a farm when the incident occurred.

Remoteness of area

There were differences between city, regional and remote areas on some characteristics. In major cities, the child involved was a pedestrian but in all other areas the child was more likely to be a passenger in a light vehicle. Pedal cycle incidents were also more likely in cities, whereas All-terrain vehicle incidents were more likely in regional areas. In major cities, the incident was most likely to involve a light vehicle, but in regional areas incidents were also likely to include colliding with a fixed or stationary object and in remote areas, many incidents involved no counterpart, usually a rollover of a vehicle. The activity of the child at the time of the incident was travelling for all areas, regardless of remoteness.

Next steps

This preliminary analysis will assist in identifying the cases to be investigated further in the in-depth analysis. This analysis will focus mainly on incidents where the child played an active role in the crash. This takes the focus to the 351 pedestrian incidents and especially those in the younger, under 10 age group (n=269).

The analysis has also identified the LGA's where most incidents occurred and those with the highest rates. This will assist in identifying the LGA's where new strategic interventions that will be developed based on the in-depth analysis can be trialed and evaluated.

Overview

Land transport accidents were the leading cause of death in children aged 0-14 between 2015-17, contributing to 29% of all deaths within this age group (AIHW, 2021). Globally, road traffic crashes are a leading cause of death and serious injury in children from high- and middle-income countries globally. It is estimated that every four minutes a child is prematurely lost on the roads of this world (WHO, 2015). Many more are injured, often severely. These traumatic events cause immeasurable suffering and grief, and at times economic hardship for families and friends.

Children are particularly vulnerable for various reasons. Younger children are limited by their physical, cognitive, and social development, making them more vulnerable in road traffic than adults. Because of their small stature, it can be difficult for children to see surrounding traffic and for drivers and others to see them. Furthermore, children are more susceptible to serious head injury than adults (WHO, 2015).

Effective road safety programs aimed at preventing road trauma rely on good quality data regarding when, why, and how road safety risk occurs. Analyses of data on causes of road crash fatalities have provided the evidence on which national and jurisdictional road safety strategies have been based for many decades. These analyses have identified specific, commonly occurring features to target interventions to improve road safety. On this basis it has been deduced that crashes are most commonly caused by factors such as driver errors like speeding, distraction, alcohol and fatigue. They occur on regional roads and involve single vehicles. It has therefore been concluded that the development of strategies to reduce fatal crashes should focus on these issues. In addition to these factors, serious injury and death are often associated with the lack or incorrect use of seatbelts, particularly in children, lack of use of helmets and vehicle type.

While this approach has been useful, it has limitations. Many countermeasures adopted rely on secondary solutions such as helmets, seatbelts, vehicle airbags and roadside barriers which help to limit the damage that occurs in a crash but do nothing for crash prevention. Most obviously, the data analysis on which road safety solutions are based only look at single factors in crashes, yet as most road safety professionals are aware, crashes, like all types of accidents, are a result of a combinations of factors. Only focusing on one specific factor may mean that we miss out on understanding why that crash occurred. This can also mean that we may fail to identify the most important causal factor(s). Our current approach also assumes that crashes involving children occur for similar reasons to all crashes. This may not be justified due to the characteristics of children described earlier that likely increase their vulnerability and may change the way crashes occur.

The overall aim of this project is to conduct analysis to help understand more about the trends, causes and factors that lead to road trauma in children and to use this analysis to direct the design of trial programs to reduce child road trauma. This analysis needs in-depth information on the causes of crashes. The National Coroners Information System (NCIS) provides the most comprehensive collection of information about accidental deaths in Australia. It includes coded information summarising the main characteristics of the fatality and detailed Coronial, Police and other reports relating to the circumstances of the

incident. This project is using NCIS data to conduct an in-depth analysis of the causes of fatal road traffic and motor vehicle accidents involving 0 to 14 year olds.

The current report describes the results of a preliminary analysis of the pre-coded information available in the NCIS database. This preliminary analysis will help to inform our planned investigation of the deeper causal and contributing factors to child crash fatalities. We will detail which Local Government Areas have the largest number and rates of transport related incidents both nationwide and within New South Wales. Furthermore, we will provide descriptive summaries of the past 19 years of transport related incidents in Australia by cross tabulating the pre-coded information.

Methods

Data were obtained from the NCIS for all transport related deaths in Australian states and territories during the 19 year period spanning January 2001 and December 2019 where the deceased was under 15 years of age. Information for all deaths referred to Australian coroners since July 2000 have been captured in the NCIS in both coded and narrative text format. Information from Queensland coroners is only available from January 2001 onward, and information for Western Australia is not available as ethics was not requested for this state due to time constraints on this project.

We queried the NCIS database for closed-case deaths where the incident occurred between January 2001 and December 2019, the mechanism of injury was deemed to be blunt force associated with a transport injury event either on or off-road, and the deceased was under 15 years of age. Results were further filtered to exclude incidents involving: watercraft, aircraft, animals, or rail vehicles. The variables contained in this query are described in Table 1.

In order to calculate population rates, residential population estimates for Local Government Areas (LGA) and Australian Remoteness Areas (RA) were obtained from the Australian Bureau of Statistics (ABS). In this report, we adopted the age groupings employed by the ABS: 0-4, 5-9, and 10-14. Annual population estimates were available for each LGA. Population rates derived from these estimates were obtained by dividing the cumulative number of incidents by the cumulative population size over the 19 year period under study and reported as the number of incidents per 100,000 individuals. Explicit population estimates by age were not available for Australian Remoteness Areas from the ABS. To mediate this, an estimate was obtained by combining age distribution information from 2001 with total residential population estimates from 2016. Population rates were derived by dividing the cumulative number of incidents over the 19 year period by 19 times this population estimate. Again, rates are reported as the number of incidents per 100,000 individuals.

Cross-tabulated, descriptive statistics were generated from the pre-coded information described in Table 1. Cell counts of less than 5 have been replaced with "< 5" to maintain privacy of the deceased.

Table 1*: Summary of pre-coded variables available in the NCIS database*

Variable	Description
Age	The age in years of the deceased at the time of the incident.
Sex	The biological sex of the deceased at the time of the incident.
Fatal incident state	The State or territory where the incident occurred.
Fatal incident postcode	The Postcode where the incident occurred (e.g Home/Dwelling, Transport Area, Farm, ...).
Fatal incident LGA	The Local Government Area where the incident occurred.
Fatal incident RA	The Remoteness Area where the incident occurred.
Fatal incident location	The location where the incident occurred.
Mode of Transport	The mode of transport (i.e light vehicle, such as a car or van; pedestrian; ...) of the deceased at the time of the incident.
Counterpart involved in the fatal incident	The vehicle or object (if any) with which the deceased, or vehicle in which the deceased was travelling, collided.
Activity during fatal incident	The type of activity being undertaken by the deceased at the time of the incident (e.g travel, leisure/play, sports).

Results

Annual Trends

Figures 1 and 2 show the number of incidents in the included jurisdictions for all incidents and pedestrian incidents respectively. There has been a notable decline in the total number of annual incidents over the period 2001-2019. This can largely be attributed to declines in major cities and inner regional areas. When considering only pedestrian fatalities, the number of annual incidents has been largely constant since 2005. There was a notable decline, however, in pedestrian incidents in major cities between 2001 and 2005.

Figure 1: Annual number of fatal incidents between 2001 and 2019 in the included jurisdictions. Annual incidents are given for each remoteness area (total/all, red; major cities, gold; inner regional, green; outer regional, blue; remote, dark blue; and very remote, purple.
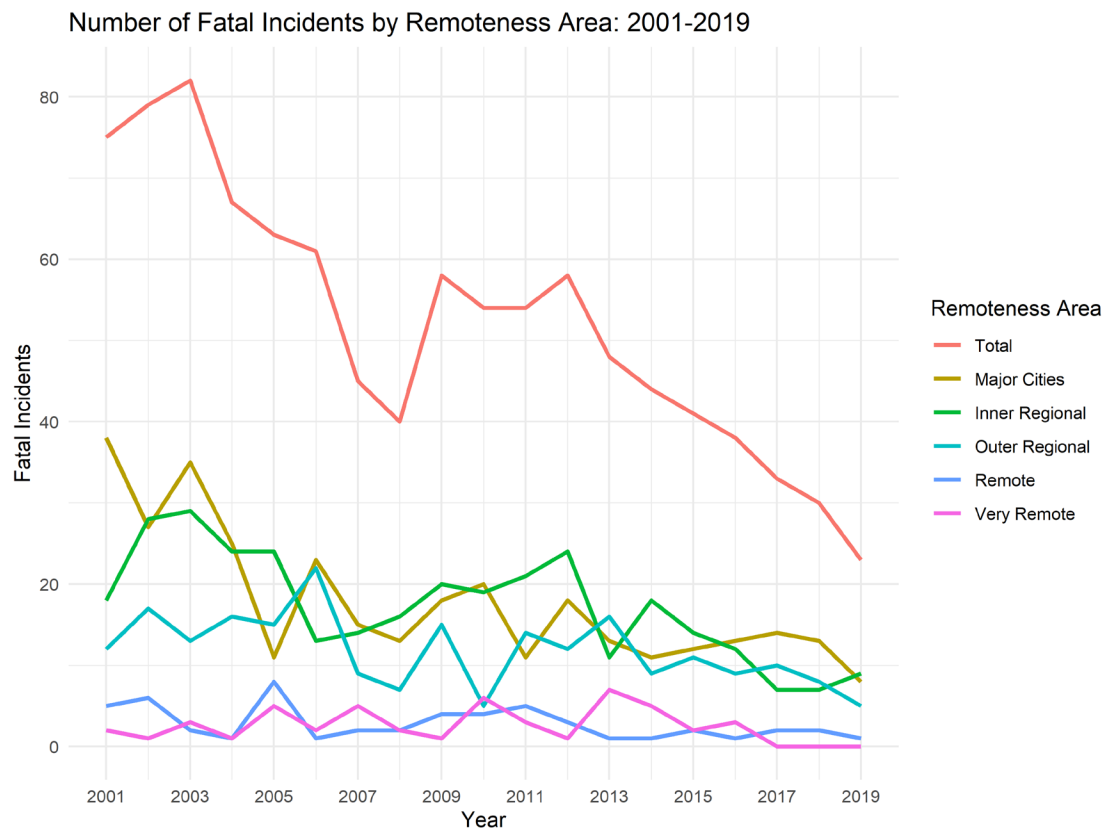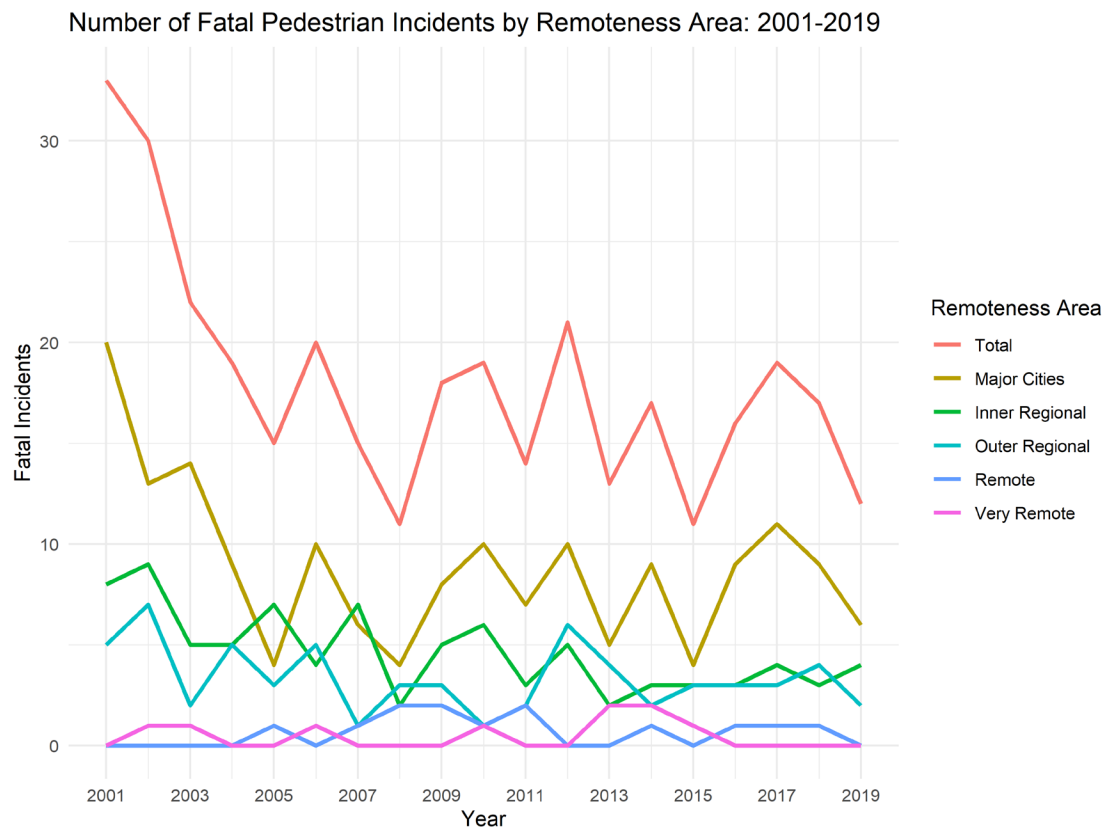
Figure 2: Annual number of fatal pedestrian incidents between 2001 and 2019 in the included jurisdictions. Annual incidents are given for each remoteness area (total/all, red; major cities, gold; inner regional, green; outer regional, blue; remote, dark blue; and very remote, purple.

By LGA

The total number of incidents and rate per 100,000 children aged 0-14 were tabulated for each LGA (Tables 2-6). Only LGAs with more than 5 incidents over the 19 year period were considered in order to allow for more accurate estimates and comparisons of population rates.

Table 2 summarizes the 20 Local Government Areas with the highest number of fatal transport incidents across the jurisdictions included. Of the top 10 LGAs, 6 where in Queensland, 3 in New South Wales, and 1 in Victoria. These top 10 LGAs accounted for 153 incidents, and each jurisdiction experienced more than 11 incidents during the 19 year period. Pedestrian incidents were the most common type in the majority of these LGAs, accounting for 105 incidents. Those aged 4 and under were the commonly affected age group, accounting for 115 incidents. These large case numbers appear to be primarily driven by large populations, with Mackay (QLD) and Mid-Coast (NSW) being the only LGAs with abnormally high incidence (4.3 and 5.3 cases annually per 100,000 individuals).

Table 3 shows LGAs with the highest fatality rates. These LGAs were predominantly rural areas. Light vehicle (involving cars, minivans, etc.) incidents were the most common type in 9 of the top 10 LGAs with those aged 10 to 14 being the most commonly affected age group. There were 5 LGAs which are in the top 20 for both rate and total: Mackay (QLD), Mid-Coast (NSW), Katherine (NT), Isaac (QLD), and Whitsunday (QLD).

Focusing on NSW, the LGAs with the highest total number of fatalities were Mid-Coast, Parramatta, and Central Coast were with 16, 11, and 11 fatal incidents respectively (Table 4). Wentworth, Richmond Valley, and Mid-Coast experienced the highest rate with 17.5, 6.4, and 5.3 incidents annually per 100,000 individuals respectively (Table 5). There was almost perfect agreement between the top 20 rankings in NSW by both rate and total with Canterbury-Bankstown being the only LGA in the top 20 by total to not appear in the top 20 by rate. In NSW, LGAs with the higher rates tended to be more remote with light vehicles being the most common mode of transport of the deceased. Pedestrian incidents were most common in Parramatta, Central Coast, Cumberland, Blacktown, Campbelltown, Canterbury-Bankstown, Wentworth, and Georges River while most of the other top 20 LGAs by total incidents had light vehicles as the most common mode of transport.

In Table 6, only fatal pedestrian incidents were considered. Only 15 LGAs nationwide (except for Western Australia) had more than 5 fatal pedestrian incidents over the 19 year period under study. NSW accounted for 6 of these LGAs: Cumberland (7), Parramatta (6), Central Coast (6), Canterbury-Bankstown (6), Georges River (5), and Campbelltown (5). Brisbane (QLD) had the largest number of incidents over this time period at 16 in total. However, Brisbane also had one of the lowest rates at 0.4 per year per 100,000 children. Cairns (QLD), Mackay (QLD), and Georges River (NSW) had the highest rate of incidents at 1.0-1.1 per year per 100,000 children.

Top 20 LGAs by Total Incidents

Table 2: *The 20 LGAs with the largest number of fatal incidents. The most common age group and mode of transport is also provided for each LGA. LGAs have been orderd by decreasing total number of incidents. Where LGAs have the same number of incidents, they are further ordered by decreasing rate per 100,000 children.*

LGA	State	Total	Per 100k	Most Common Age	Most Common Mode of Transport
Brisbane (C)	QLD	24	0.6	0-4	Pedestrian
Mackay (R)	QLD	20	4.3	0-4	Light Vehicle
Logan (C)	QLD	17	1.3	0-4	Pedestrian
Gold Coast (C)	QLD	17	0.9	0-4	Pedestrian
Mid-Coast (A)	NSW	16	5.3	10-14	Light Vehicle
Moreton Bay (R)	QLD	14	0.8	0-4	Pedestrian
Casey (C)	VIC	12	1.0	0-4	Light Vehicle
Cairns (R)	QLD	11	1.8	0-4	Pedestrian
Parramatta (C)	NSW	11	1.5	5-9	Pedestrian
Central Coast (C) (NSW)	NSW	11	0.9	5-9	Pedestrian
Ipswich (C)	QLD	10	1.2	10-14	Pedestrian
Sunshine Coast (R)	QLD	10	1.0	5-9	Light Vehicle
Katherine (T)	NT	9	18.0	0-4	Light Vehicle
Fraser Coast (R)	QLD	9	2.6	10-14	Light Vehicle
Melton (C)	VIC	9	1.7	10-14	Pedestrian
Cumberland (A)	NSW	9	1.1	0-4	Pedestrian
Liverpool (C)	NSW	9	1.0	10-14	Light Vehicle
Blacktown (C)	NSW	9	0.6	0-4	Pedestrian
Isaac (R)	QLD	8	7.5	10-14	Light Vehicle
Whitsunday (R)	QLD	8	6.7	10-14	Light Vehicle

Top 20 LGAs by Incident Rate

Table 3: *The 20 LGAs with the highest rates of fatal incidents. The most common age group and mode of transport is also provided for each LGA. The ABS annotation for official LGA status are: (C), Cities; (A), Areas; (R), Regional Council; (T), Town; (DC), District Council; (S), Shire.*

LGA	State	Total	Per 100k	Most Common Age	Most Common Mode of Transport
Unincorporated SA	SA	6	40.6	10-14	Light Vehicle
Wakefield (DC)	SA	6	22.1	10-14	Light Vehicle
Katherine (T)	NT	9	18.0	0-4	Light Vehicle
Wentworth (A)	NSW	5	17.5	5-9	Pedestrian
Barkly (R)	NT	7	16.7	10-14	Light Vehicle
Isaac (R)	QLD	8	7.5	10-14	Light Vehicle
Tablelands (R)	QLD	7	7.2	0-4	Light Vehicle
Whitsunday (R)	QLD	8	6.7	10-14	Light Vehicle
Somerset (R)	QLD	6	6.5	0-4	Light Vehicle
Richmond Valley (A)	NSW	6	6.4	5-9	Light Vehicle
Alexandrina (DC)	SA	5	6.3	0-4	Light Vehicle
Southern Downs (R)	QLD	8	5.8	10-14	Light Vehicle
Western Downs (R)	QLD	8	5.5	0-4	Light Vehicle
South Burnett (R)	QLD	7	5.4	0-4	Pedestrian
Mid-Coast (A)	NSW	16	5.3	10-14	Light Vehicle
Lockyer Valley (R)	QLD	8	5.3	5-9	Light Vehicle
East Gippsland (S)	VIC	7	4.7	5-9	Light Vehicle
Scenic Rim (R)	QLD	7	4.6	5-9	Light Vehicle
Mackay (R)	QLD	20	4.3	0-4	Light Vehicle
Gympie (R)	QLD	8	4.3	10-14	Light Vehicle

Top 20 LGAs in NSW by Total Incidents

Table 4: *The 20 LGAs with the highest rates of fatal incidents. The most common age group and mode of transport is also provided for each LGA. The ABS annotation for official LGA status are: (C), Cities; (A), Areas; (R), Regional Council; (T), Town; (DC), District Council; (S), Shire.*

LGA	State	Total	Per 100k	Most Common Age	Most Common Mode of Transport
Mid-Coast (A)	NSW	16	5.3	10-14	Light Vehicle
Parramatta (C)	NSW	11	1.5	5-9	Pedestrian
Central Coast (C) (NSW)	NSW	11	0.9	5-9	Pedestrian
Cumberland (A)	NSW	9	1.1	0-4	Pedestrian
Liverpool (C)	NSW	9	1.0	10-14	Light Vehicle
Blacktown (C)	NSW	9	0.6	0-4	Pedestrian
Hawkesbury (C)	NSW	8	2.9	0-4	Light Vehicle
Shoalhaven (C)	NSW	8	2.3	10-14	Light Vehicle
Wollongong (C)	NSW	8	1.1	0-4	Light Vehicle
Fairfield (C)	NSW	8	1.0	0-4	Light Vehicle
Penrith (C)	NSW	8	1.0	10-14	Light Vehicle
Wollondilly (A)	NSW	7	3.4	0-4	Light Vehicle
Port Stephens (A)	NSW	7	2.7	5-9	Light Vehicle
Campbelltown (C) (NSW)	NSW	7	1.0	0-4	Pedestrian
Canterbury-Bankstown (A)	NSW	7	0.5	0-4	Pedestrian
Richmond Valley (A)	NSW	6	6.4	5-9	Light Vehicle
Wentworth (A)	NSW	5	17.5	5-9	Pedestrian
Tweed (A)	NSW	5	1.6	5-9	Quad/4x4
Newcastle (C)	NSW	5	1.0	10-14	Light Vehicle
Georges River (A)	NSW	5	1.0	5-9	Pedestrian

Top 20 LGAs in NSW by Incident Rate

Table 5: *The 20 LGAs with the highest rates of fatal incidents. The most common age group and mode of transport is also provided for each LGA. The ABS annotation for official LGA status are: (C), Cities; (A), Areas; (R), Regional Council; (T), Town; (DC), District Council; (S), Shire.*

LGA	State	Total	Per 100k	Most Common Age	Most Common Mode of Transport
Wentworth (A)	NSW	5	17.5	5-9	Pedestrian
Richmond Valley (A)	NSW	6	6.4	5-9	Light Vehicle
Mid-Coast (A)	NSW	16	5.3	10-14	Light Vehicle
Wollondilly (A)	NSW	7	3.4	0-4	Light Vehicle
Hawkesbury (C)	NSW	8	2.9	0-4	Light Vehicle
Port Stephens (A)	NSW	7	2.7	5-9	Light Vehicle
Shoalhaven (C)	NSW	8	2.3	10-14	Light Vehicle
Tweed (A)	NSW	5	1.6	5-9	Quad/4x4
Parramatta (C)	NSW	11	1.5	5-9	Pedestrian
Cumberland (A)	NSW	9	1.1	0-4	Pedestrian
Wollongong (C)	NSW	8	1.1	0-4	Light Vehicle
Liverpool (C)	NSW	9	1.0	10-14	Light Vehicle
Fairfield (C)	NSW	8	1.0	0-4	Light Vehicle
Penrith (C)	NSW	8	1.0	10-14	Light Vehicle
Campbelltown (C) (NSW)	NSW	7	1.0	0-4	Pedestrian
Newcastle (C)	NSW	5	1.0	10-14	Light Vehicle
Georges River (A)	NSW	5	1.0	5-9	Pedestrian
Central Coast (C) (NSW)	NSW	11	0.9	5-9	Pedestrian
Lake Macquarie (C)	NSW	5	0.7	0-4	Light Vehicle
Blacktown (C)	NSW	9	0.6	0-4	Pedestrian

Top 20 LGAs by Total Pedestrian Incidents

Table 6: *The 20 LGAs with the largest number of fatal pedestrian incidents. The most common age group and mode of transport is also provided for each LGA. The ABS annotation for official LGA status are: (C), Cities; (A), Areas; (R), Regional Council; (T), Town; (DC), District Council; (S), Shire.*

LGA	State	Total	Per 100k	Most Common Age
Brisbane (C)	QLD	16	0.4	0-4
Logan (C)	QLD	11	0.8	0-4
Cairns (R)	QLD	7	1.1	0-4
Cumberland (A)	NSW	7	0.8	0-4
Gold Coast (C)	QLD	7	0.4	0-4
Moreton Bay (R)	QLD	7	0.4	0-4
Parramatta (C)	NSW	6	0.8	5-9
Central Coast (C) (NSW)	NSW	6	0.5	0-4
Casey (C)	VIC	6	0.5	0-4
Canterbury-Bankstown (A)	NSW	6	0.4	5-9
Mackay (R)	QLD	5	1.1	0-4
Georges River (A)	NSW	5	1.0	5-9
Campbelltown (C) (NSW)	NSW	5	0.7	10-14
Whittlesea (C)	VIC	5	0.7	0-4
Ipswich (C)	QLD	5	0.6	10-14

Stratified by Age

There was a notable imbalance in the number of fatal incidents involving males versus females which increases with age (Table 7). Overall, males accounted for 62% of all incidents, but only 55% of the 0-4 year old age group. New South Wales accounted for more incidents than any other state under study (34%, Table 8) followed by Queensland (30%) and Victoria (20%). The majority of incidents either took place when the deceased was in a light vehicle (i.e car, minivan, etc.) at the time of the incident (44%, Table 9) or was a pedestrian (34%). Unlike the other two age groups, pedestrian incidents were the most common type in those 4 years of age and under, and nearly half of all pedestrian incidents occurred in this age group. Most incidents involved a collision of either a light vehicle (41%, Table 10) or a stationary object (21%) with the child. There was no counterpart (e.g. vehicle rolled over) in 12% of cases. Furthermore, those aged 4 and under were disproportionately affected by collisions involving special all-terrain or off-road vehicles.

Travelling was overwhelmingly the most common activity being undertaken during an incident accounting for 79% of cases (Table 11). "Leisure or play" and "Vital Personal Activity" were also common activities in the 0-4 age group, but much less so for the older age groups. These common activites are also reflected in the locations at which an incident took place with around 78% of all incidents taking place in a "transport area". While there were relatively few incidents at a "home or dwelling" for those aged 5 and over, this location represented 25% of cases in those aged 4 and under.

Sex

Table 7: *Number of fatal incidents for each gender stratified by age.*

Sex	0-4		5-9		10-14		Total	
Female	168	(45%)	116	(39%)	112	(31%)	396	(38%)
Male	205	(55%)	182	(61%)	251	(69%)	638	(62%)
Total	373	(100%)	298	(100%)	363	(100%)	1,034	(100%)

Incident State

Table 8: *Number of fatal incidents for each state stratified by age. Counts less than 5 have been replaced with "<5". Row and column totals have been calculated by treating cells with counts less than 5 as zero.*

State	0-4		5-9		10-14		Total	
NSW	121	(32%)	106	(36%)	119	(33%)	346	(34%)
QLD	125	(34%)	84	(28%)	103	(28%)	312	(30%)
VIC	62	(17%)	67	(22%)	79	(22%)	208	(20%)
SA	37	(10%)	28	(9%)	40	(11%)	105	(10%)
NT	25	(7%)	11	(4%)	20	(6%)	56	(5%)
ACT	<5	(1%)	<5	(1%)	<5	(1%)	7	(1%)
Total	≥ 370	(100%)	≥ 296	(100%)	≥ 361	(100%)	1,034	(100%)

Mode of Transport

Table 9: *Number of fatal incidents for the 5 most frequent modes of transport stratified by age. Percentages have been calculated with respect to all incidents within that age group, and not just for the 5 most frequent modes of transport shown. The last row therefore summarises the percentage of all incidents that are accounted for by the 5 most frequent modes of transport.*

Mode of Transport	0-4		5-9		10-14		Total	
Light transport vehicle with four or more wheels	168	(45%)	135	(45%)	156	(43%)	459	(44%)
Pedestrian	172	(46%)	97	(33%)	82	(23%)	351	(34%)
Special all-terrain or off-road vehicle	24	(6%)	33	(11%)	42	(12%)	99	(10%)
Pedal cycle	<5		18	(6%)	36	(10%)	≥ 54	(5%)
Two-wheeled motor vehicle	<5		9	(3%)	39	(11%)	≥ 48	(5%)
Total	≥ 369	(99%)	292	(98%)	355	(98%)	1,016	(98%)

Counterpart to Incident

Table 10: *Number of fatal incidents for the 5 most frequent counterparts to incident stratified by age. Counts less than 5 have been replaced with "<5". Percentages have been calculated with respect to all incidents within that age group, and not just for the 5 most frequent counterparts to incident shown. The last row therefore summarises the percentage of all incidents that are accounted for by the 5 most frequent counterparts to incident.*

Counterpart to Incident	0-4		5-9		10-14		Total	
Light transport vehicle with four or more wheels	166	(45%)	132	(44%)	122	(34%)	420	(41%)
Fixed or stationary object	63	(17%)	50	(17%)	102	(28%)	215	(21%)
Heavy transport vehicle	34	(9%)	49	(16%)	53	(15%)	136	(13%)
No counterpart	36	(10%)	32	(11%)	52	(14%)	120	(12%)
Special all-terrain or off-road vehicle	58	(16%)	24	(8%)	25	(7%)	107	(10%)
Total	357	(96%)	287	(96%)	354	(98%)	998	(97%)

Activity of the child at the time of the Incident

Table 11: *Number of fatal incidents for the 5 most frequent activities during fatal incident stratified by age. Counts less than 5 have been replaced with "<5". Row and column totals have been calculated by treating cells with counts less than 5 as zero. Percentages have been calculated with respect to all incidents within that age group, and not just for the 5 most frequent activities during incident shown. The last row therefore summarises the percentage of all incidents that are accounted for by the 5 most frequent activities during incident.*

Activity During Incident	0-4		5-9		10-14		Total	
Travelling not elsewhere classified	280	(75%)	256	(86%)	286	(79%)	822	(79%)
Leisure or play	36	(10%)	11	(4%)	11	(3%)	58	(6%)
Sports and exercise during leisure time	5	(1%)	13	(4%)	36	(10%)	54	(5%)
Vital personal activity	34	(9%)	6	(2%)	<5		≥ 40	(4%)
Being taken care of	12	(3%)	<5		<5		≥ 12	(1%)
Total	367	(98%)	≥ 287	(96%)	≥ 338	(93%)	≥ 992	(96%)

Location of Incident

Table 12: *The 5 most frequent locations of incident stratified by age and sex. Counts less than 5 have been replaced with "<5". Row and column totals have been calculated by treating cells with counts less than 5 as zero. Percentages have been calculated with respect to all incidents within that age group, and not just for the 5 most frequent locations of incident shown. The last row therefore summarises the percentage of all incidents that are accounted for by the 5 most frequent locations of incident.*

Location of Incident	0-4		5-9		10-14		Total	
Transport area: public highway, freeway, street or road	246	(66%)	263	(88%)	298	(82%)	807	(78%)
Home or dwelling	95	(25%)	12	(4%)	23	(6%)	130	(13%)
Farm	11	(3%)	12	(4%)	19	(5%)	42	(4%)
Countryside	<5		<5		11	(3%)	≥ 11	(1%)
Sports and athletics area	<5		<5		7	(2%)	≥ 7	(1%)
Total	≥ 356	(95%)	≥ 293	(98%)	≥ 358	(99%)	≥ 1,007	(97%)

Stratified By Remoteness Area

Pedestrian incidents account for nearly half of all incidents in Major Cities, whereas in all other Remoteness Areas, incidents where the deceased was travelling in a light vehicle accounted for the majority of incidents (Table 13). However, rates of all types of incidents generally increased with increasing remoteness (Tables 14, 16, and 18). Collisions with light vehicles were the most common counterpart in major cities, inner regional, and outer regional areas (59%, 34% and 34% respectively, Table 15). Incidents with no counterpart were relatively uncommon in these areas (3%, 9%, and 10% respectively). This is reversed in remote and very remote areas where there is no counterpart in 36% and 53% of incidents respectively.

Mode of Transport

Number of Incidents

Table 13: *Number of fatal incidents for the 5 most frequent modes of transport stratified by Remoteness Area. Counts less than 5 have been replaced with "<5". Row and column totals have been calculated by treating cells with counts less than 5 as zero. Percentages have been calculated with respect to all incidents within that remoteness area, and not just for the 5 most frequent modes of transport shown. The last row therefore summarises the percentage of all incidents that are accounted for by the 5 most frequent modes of transport.*

Mode of Transport	Remoteness Area											Total	
	Major Cities		Inner Regional		Outer Regional		Remote		Very Remote				
Light transport vehicle with four or more wheels	120	(36%)	173	(53%)	99	(44%)	22	(42%)	25	(51%)		439	(42%)
Pedestrian	168	(50%)	88	(27%)	64	(28%)	13	(25%)	9	(18%)		342	(33%)
Special all-terrain or off-road vehicle	8	(2%)	38	(12%)	25	(11%)	11	(21%)	12	(24%)		94	(9%)
Pedal cycle	26	(8%)	14	(4%)	9	(4%)	<5		<5			≥ 49	(5%)
Two-wheeled motor vehicle	12	(4%)	13	(4%)	19	(8%)	<5		<5			≥ 44	(4%)
Total	334	(99%)	326	(99%)	216	(96%)	≥ 50	(94%)	≥ 49	(100%)		≥ 975	(94%)

Annual Incidents Per 100,000 Children (using 2016 population as standard)

Table 14*: Number of fatal incidents per 100,000 individuals for the 5 most frequent modes of transport stratified by Remoteness Area.*

Mode of Transport	Remoteness Area				
	Major Cities	**Inner Regional**	**Outer Regional**	**Remote**	**Very Remote**
Light transport vehicle with four or more wheels	0.23	1.06	1.29	2.32	4.20
Pedestrian	0.32	0.54	0.83	1.37	1.51
Special all-terrain or off-road vehicle	0.02	0.23	0.33	1.16	2.02
Pedal cycle	0.05	0.09	0.12	0.00	0.34
Two-wheeled motor vehicle	0.02	0.08	0.25	0.42	0.17
Total	0.64	2.00	2.82	5.27	8.24

Counterpart to Incident

Number of Incidents

Table 15*: Number of fatal incidents for the 5 most frequent counterparts to incident stratified by Remoteness Area. Counts less than 5 have been replaced with "<5". Row and column totals have been calculated by treating cells with counts less than 5 as zero. Percentages have been calculated with respect to all incidents within that remoteness area, and not just for the 5 most frequent counterparts to incident shown. The last row therefore summarises the percentage of all incidents that are accounted for by the 5 most frequent counterparts to incident.*

Counterpart to Incident	Remoteness Area											Total	
	Major Cities		**Inner Regional**		**Outer Regional**		**Remote**		**Very Remote**				
Light transport vehicle with four or more wheels	200	(59%)	110	(34%)	77	(34%)	13	(25%)	<5			≥ 400	(39%)
Fixed or stationary object	42	(12%)	80	(24%)	65	(29%)	11	(21%)	10	(20%)		208	(20%)
Heavy transport vehicle	38	(11%)	54	(16%)	35	(16%)	<5		<5			≥ 127	(12%)
No counterpart	10	(3%)	31	(9%)	23	(10%)	19	(36%)	26	(53%)		109	(11%)
Special all-terrain or off-road vehicle	36	(11%)	38	(12%)	20	(9%)	<5		5	(10%)		≥ 99	(10%)
Total	326	(96%)	313	(95%)	220	(98%)	≥ 51	(96%)	≥ 47	(96%)		≥ 957	(93%)

Annual Incidents Per 100,000 Children (using 2016 population as standard)

Table 16*: Number of fatal incidents per 100,000 individuals for the 5 most frequent counterparts to incident stratified by Remoteness Area.*

Counterpart to Incident	Remoteness Area				
	Major Cities	Inner Regional	Outer Regional	Remote	Very Remote
Light transport vehicle with four or more wheels	0.38	0.67	1.00	1.37	0.67
Fixed or stationary object	0.08	0.49	0.85	1.16	1.68
Heavy transport vehicle	0.07	0.33	0.46	0.42	0.34
No counterpart	0.02	0.19	0.30	2.01	4.37
Special all-terrain or off-road vehicle	0.07	0.23	0.26	0.42	0.84
Total	0.62	1.91	2.87	5.38	7.90

Activity During Incident

Number of Incidents

Table 17*: Number of fatal incidents for the 5 most frequent activities during incident stratified by Remoteness Area. Counts less than 5 have been replaced with "<5". Row and column totals have been calculated by treating cells with counts less than 5 as zero. Percentages have been calculated with respect to all incidents within that remoteness area, and not just for the 5 most frequent activities during incident shown. The last row therefore summarises the percentage of all incidents that are accounted for by the 5 most frequent activities during incident.*

Activity During Incident	Remoteness Area										Total	
	Major Cities		Inner Regional		Outer Regional		Remote		Very Remote			
Travelling not elsewhere classified	251	(74%)	270	(82%)	185	(82%)	41	(77%)	40	(82%)	787	(76%)
Leisure or play	18	(5%)	17	(5%)	15	(7%)	<5		<5		≥ 50	(5%)
Sports and exercise during leisure time	21	(6%)	17	(5%)	9	(4%)	<5		<5		≥ 47	(5%)
Vital personal activity	21	(6%)	12	(4%)	7	(3%)	<5		<5		≥ 40	(4%)
Being taken care of	5	(1%)	5	(2%)	<5		<5		<5		≥ 10	(1%)
Total	316	(93%)	321	(98%)	≥ 218	(97%)	≥ 51	(96%)	≥ 46	(94%)	≥ 952	(92%)

Table 18*: Number of fatal incidents per 100,000 individuals for the 5 most frequent activities during incident stratified by Remoteness Area.*

Activity During Incident	Remoteness Area				
	Major Cities	Inner Regional	Outer Regional	Remote	Very Remote
Travelling not elsewhere classified	0.48	1.65	2.41	4.33	6.72
Leisure or play	0.03	0.10	0.20	0.42	0.34
Sports and exercise during leisure time	0.04	0.10	0.12	0.32	0.34
Vital personal activity	0.04	0.07	0.09	0.32	0.00
Being taken care of	0.01	0.03	0.03	0.00	0.34
Total	0.60	1.95	2.85	5.39	7.74

Stratified By Counterpart

Collisions of light vehicles with a pedestrian represented just over a fifth of all incidents (Table 19). Collisions between two light vehicles or collisions of a light vehicle with a stationary object were the next most common types of incident (15% each). Most pedestrians were travelling at the time of the incident (64%). Most pedestrians who were travelling were hit by a light vehicle (67%, Table 21). Light vehicles and off-road vehicles such as quad bikes and 4x4's were responsible for the majority of collisions in all other activities.

Mode of Transport

Table 19: *Number of fatal incidents stratified by the most frequent modes of transport and counterparts to incident. Counts less than 5 have been replaced with "<5". Row and column totals have been calculated by treating cells with counts less than 5 as zero. Percentages have been calculated with respect to all incidents with the same mode of transport, and not just for the 5 most frequent counterparts to incident shown of transport shown. The last row summarises the percentage of incidents associated with a mode of transport that are accounted for by the 5 most frequent counterparts to incident. The last column summarises the percentage of all incidents that are accounted for by the 5 most frequent modes of transport for each of the 5 most frequent counterparts to incident.*

Counterpart to Incident	Mode of Transport										Total	
	Light transport vehicle with four or more wheels		Pedestrian		Special all-terrain or off-road vehicle		Pedal cycle		Two-wheeled motor vehicle			
Light transport vehicle with four or more wheels	151	(33%)	224	(64%)	8	(8%)	25	(45%)	12	(24%)	420	(41%)
Fixed or stationary object	154	(34%)	<5		25	(25%)	<5		24	(47%)	≥ 203	(20%)
Heavy transport vehicle	76	(17%)	30	(9%)	9	(9%)	17	(30%)	<5		132	(13%)
No counterpart	48	(10%)	<5		56	(57%)	<5		6	(12%)	≥ 110	(11%)
Special all-terrain or off-road vehicle	22	(5%)	77	(22%)	<5		6	(11%)	<5		≥ 105	(10%)
Total	451	(98%)	≥ 331	(94%)	≥ 99	(100%)	≥ 54	(96%)	≥ 45	(88%)	≥ 980	(96%)

24

Activity During Incident

Table 20*: Number of fatal incidents stratified by the most frequent activities during incident and counterparts to incident. Counts less than 5 have been replaced with "<5". Row and column totals have been calculated by treating cells with counts less than 5 as zero. Percentages have been calculated with respect to all incidents with the same mode of transport, and not just for the 5 most frequent counterparts to incident shown of transport shown. The last row summarises the percentage of incidents associated with a mode of transport that are accounted for by the 5 most frequent counterparts to incident. The last column summarises the percentage of all incidents that are accounted for by the 5 most frequent activities during incident for each of the 5 most frequent counterparts to incident.*

Counterpart to Incident	Activity During Transport										Total	
	Travelling not elsewhere classified		Leisure or play		Sports and exercise during leisure time		Vital personal activity		Being taken care of			
Light transport vehicle with four or more wheels	322	(39%)	35	(60%)	14	(26%)	25	(57%)	6	(43%)	402	(41%)
Fixed or stationary object	195	(24%)	<5		12	(22%)	<5		<5		≥ 207	(21%)
Heavy transport vehicle	117	(14%)	<5		<5		<5		<5		≥ 117	(12%)
No counterpart	91	(11%)	6	(10%)	16	(30%)	<5		<5		≥ 113	(11%)
Special all-terrain or off-road vehicle	73	(9%)	10	(17%)	<5		15	(34%)	<5		≥ 98	(10%)
Total	798	(97%)	≥ 56	(97%)	≥ 49	(91%)	≥ 42	(95%)	≥ 12	(86%)	≥ 957	(96%)

Pedestrian Activity During Incident

Table 21: *Number of fatal pedestrian incidents stratified by the most frequent activities during incident and counterparts to incident. Counts less than 5 have been replaced with "<5". Row and column totals have been calculated by treating cells with counts less than 5 as zero. Percentages have been calculated with respect to all incidents with the same mode of transport, and not just for the 5 most frequent counterparts to incident shown of transport shown. The last row summarises the percentage of incidents associated with a mode of transport that are accounted for by the 5 most frequent counterparts to incident. The last column summarises the percentage of all incidents that are accounted for by the 5 most frequent activities during incident for each of the 5 most frequent counterparts to incident.*

Counterpart to Incident	Pedestrian Activity During Transport											Total	
	Travelling not elsewhere classified		Leisure or play		Vital personal activity		Being taken care of		Education				
Light transport vehicle with four or more wheels	142	(65%)	34	(69%)	21	(52%)	6	(60%)	6	(67%)		209	(64%)
Special all-terrain or off-road vehicle	44	(20%)	10	(20%)	15	(38%)	<5		<5			≥ 69	(21%)
Heavy transport vehicle	20	(9%)	<5		<5		<5		<5			≥ 20	(6%)
Special industrial, agricultural or construction vehicle	6	(3%)	<5		<5		<5		<5			≥ 6	(2%)
Other non-motorised transport device	<5		<5		<5		<5		<5			≥ 0	(0%)
Total	≥ 216	(99%)	≥ 49	(100%)	≥ 40	(100%)	≥ 10	(100%)	≥ 9	(100%)		≥ 324	(99%)