NSW GOVERNMENT Transport for NSW

Centre for Road Safety

TOWARDS ZERO

Vehicle and technology - trauma trends

Report

March 2017 | Version: 1

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Division:	Freight, Strategy and Planning, Transport for NSW

Contents

1 Fatal and serious injury crashes since 2008

The following overview of NSW road trauma is limited to the most recent available data. For fatal crashes this covers the calendar years 2008 to 2016p, where the 2016 data are preliminary and subject to change. For serious injury crashes this covers the calendar years 2008 to 2015 – data for the calendar year 2016 data were incomplete at the time of this report and therefore not included.

A fatal crash is a road traffic crash which results in at least one person dying within 30 days of the crash as a result of injuries from the crash. A serious injury crash is a road traffic crash which involved at least one person admitted to hospital (and matched to a person in a Police crash report), but there were no fatalities from the crash.

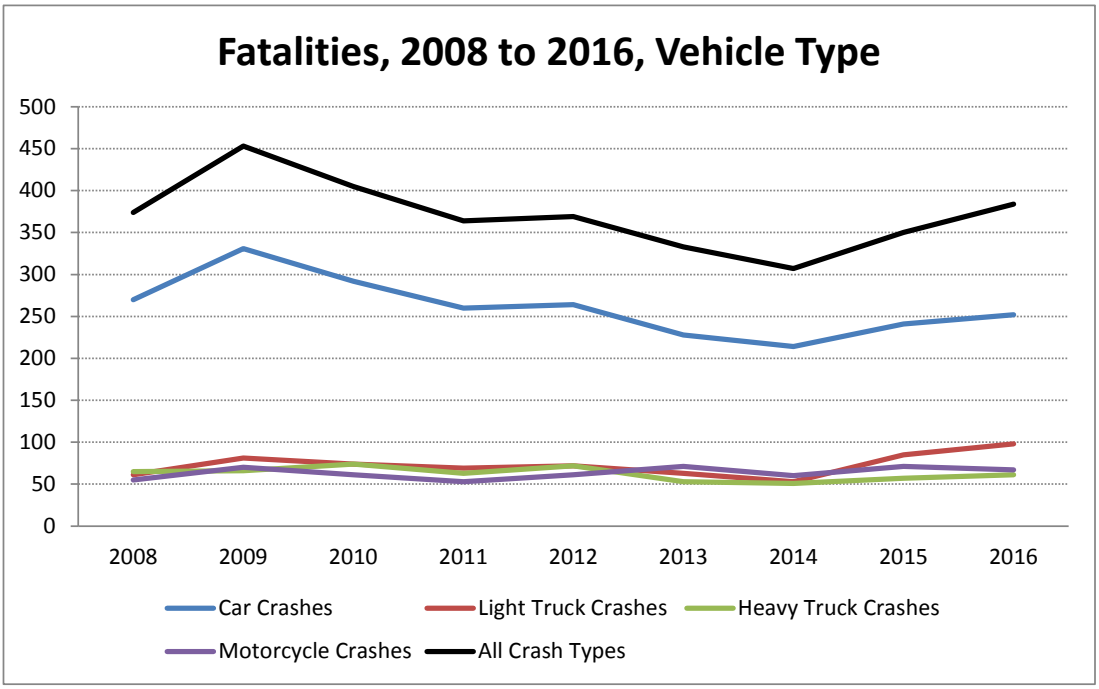
This report discusses the recent trends for trauma associated with vehicle and crash types, especially with respect to safety performance of vehicles and the protection of their occupants.

1.1 Trends for trauma associated with vehicle and crash types

1.1.1 Fatalities, vehicle type

From 2009 to 2014 there was significant reduction in overall fatalities on NSW roads, down by 32 per cent. Over the same period there were decreased fatalities from car crashes (down by 35 per cent), light truck crashes (down by 35 per cent), heavy truck crashes (down by 23 per cent) and motorcycle crashes (down by 14 per cent).

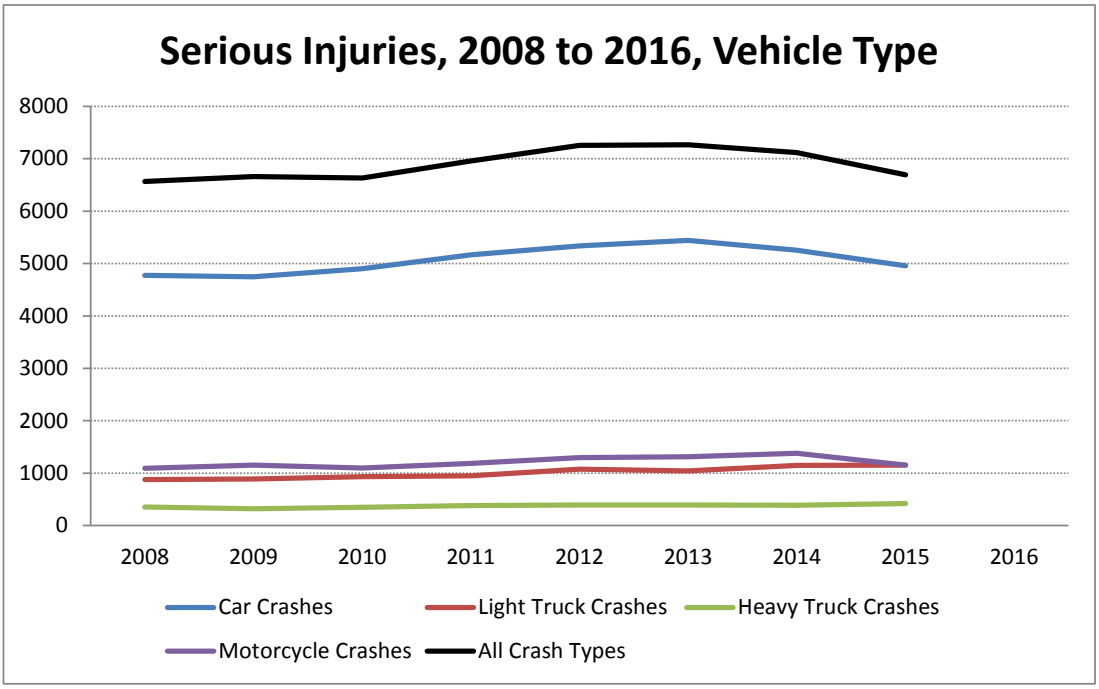
However since 2014 there have been increases in fatalities, in particular from car crashes (up by 18 per cent) and light truck crashes (up by 85 per cent).



1.1.2 Serious injuries, vehicle type

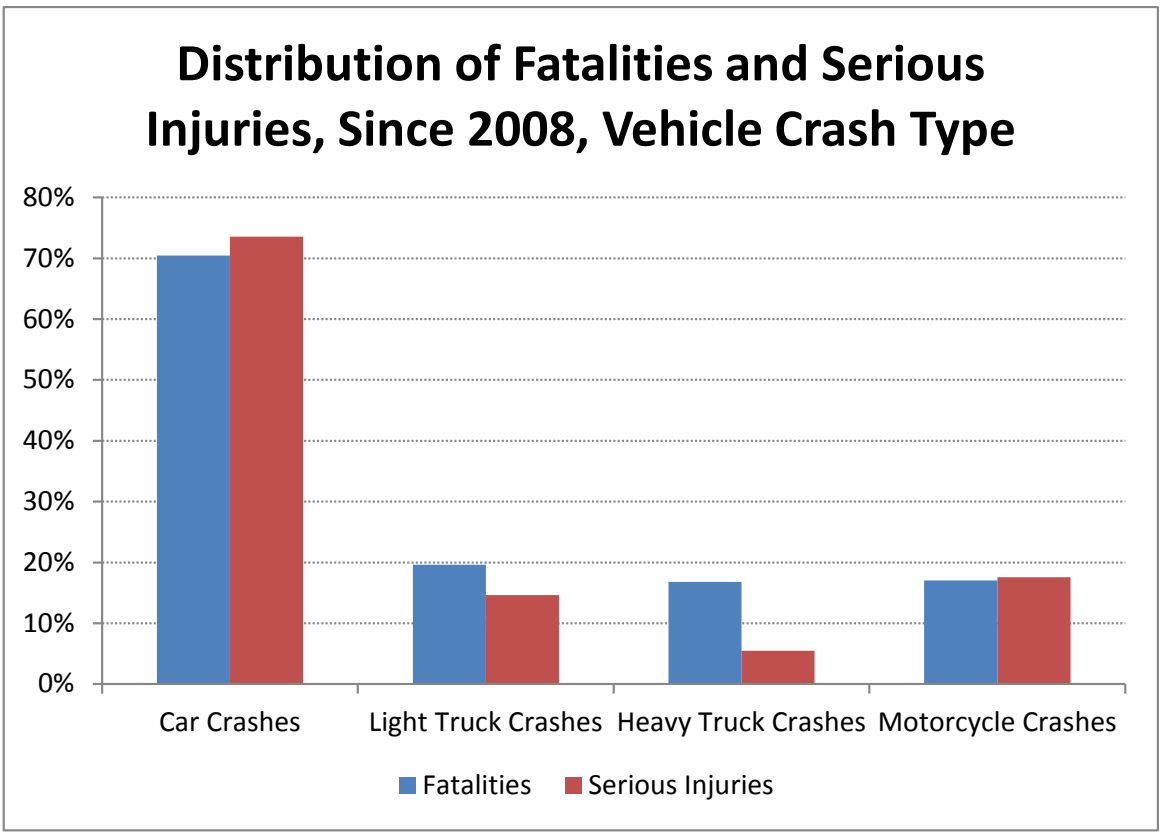
In contrast, overall serious injuries increased between 2010 and 2013 but have decreased slightly since 2013. Whilst serious injuries from car crashes decreased by 9 per cent between 2013 and 2015 serious injuries from light truck crashes increased by 10 per cent over the same period.

Pedal cyclist fatalities were 3% of total fatalities over the years 2008 to 2016, with little variation from that average.



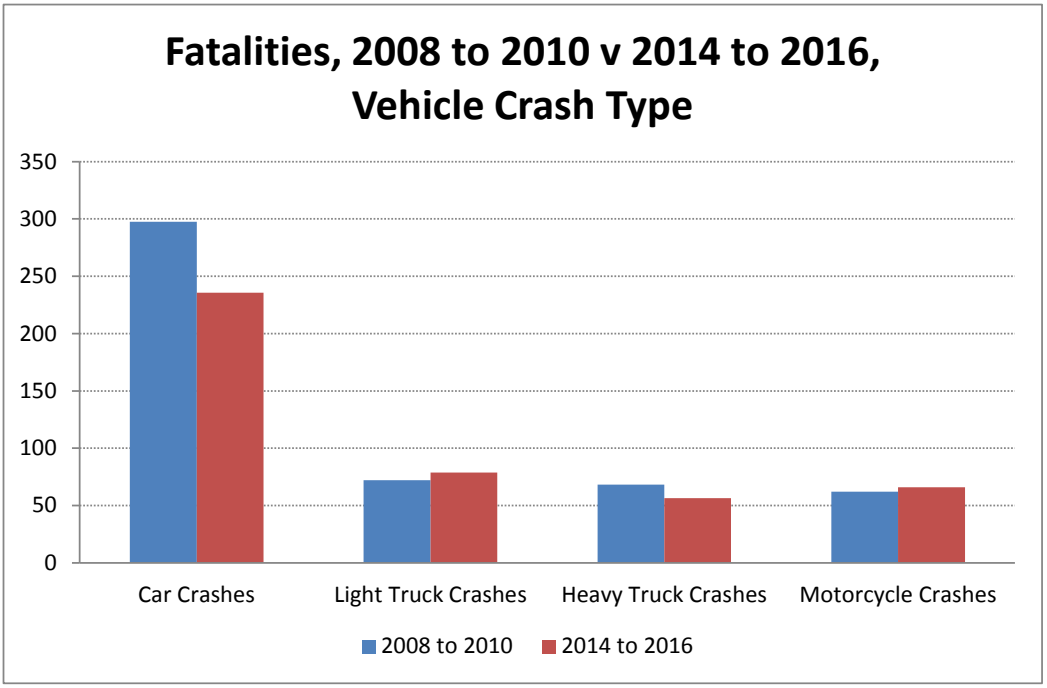
1.1.3 Distribution of fatalities and serious injuries, since 2008, vehicle crash type

The following chart shows the distribution of fatalities by crash type – car crashes account for the majority of fatalities and serious injuries. However fatalities from light truck and heavy truck crashes appear to be over-represented when compared with the levels of serious injuries from these crashes. Vehicle size and mass would contribute to this particular result.



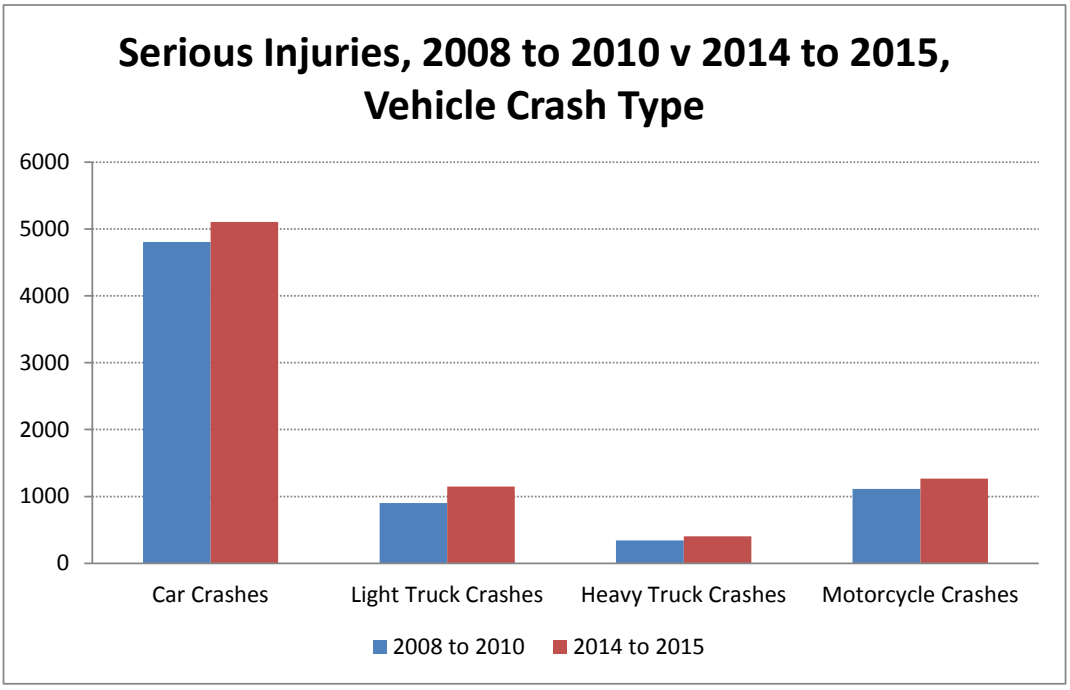
1.1.4 Fatalities, 2008 to 2010 v 2014 to 2016, vehicle crash type

Fatalities for the 2014 to 2016 period versus 2008 to 2010 baseline, car and heavy truck crashes have improved but light truck crashes have deteriorated.



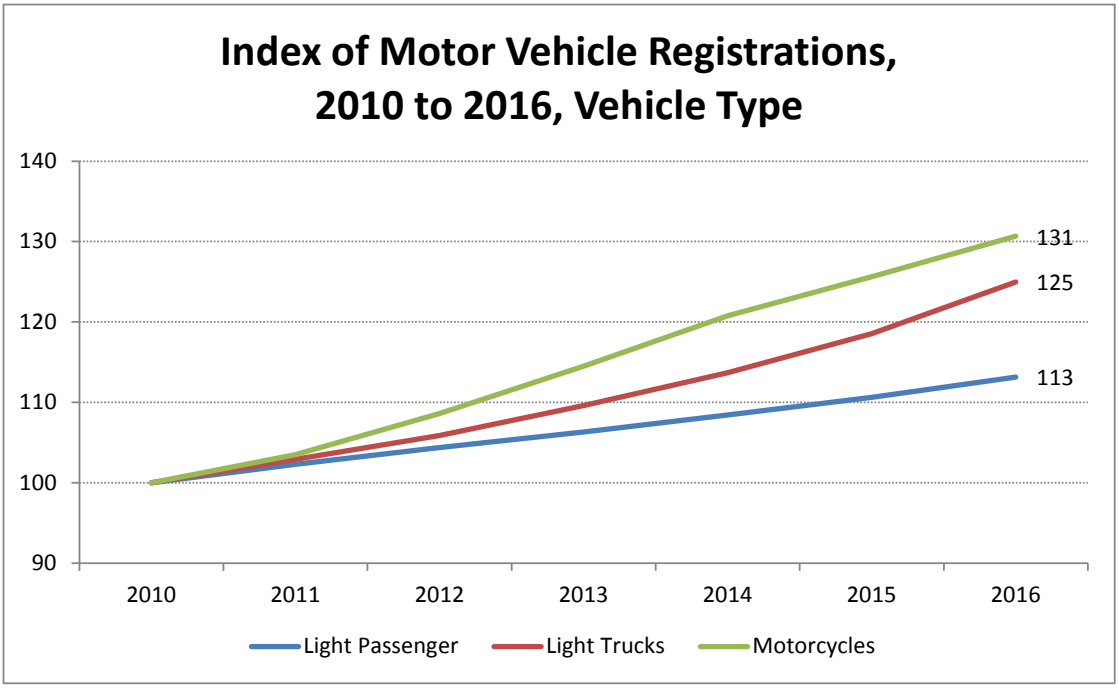
1.1.5 Serious injuries, 2008 to 2010 v 2014 to 2015, vehicle crash type

However, for serious injuries there have been increases for all of the above crash types.



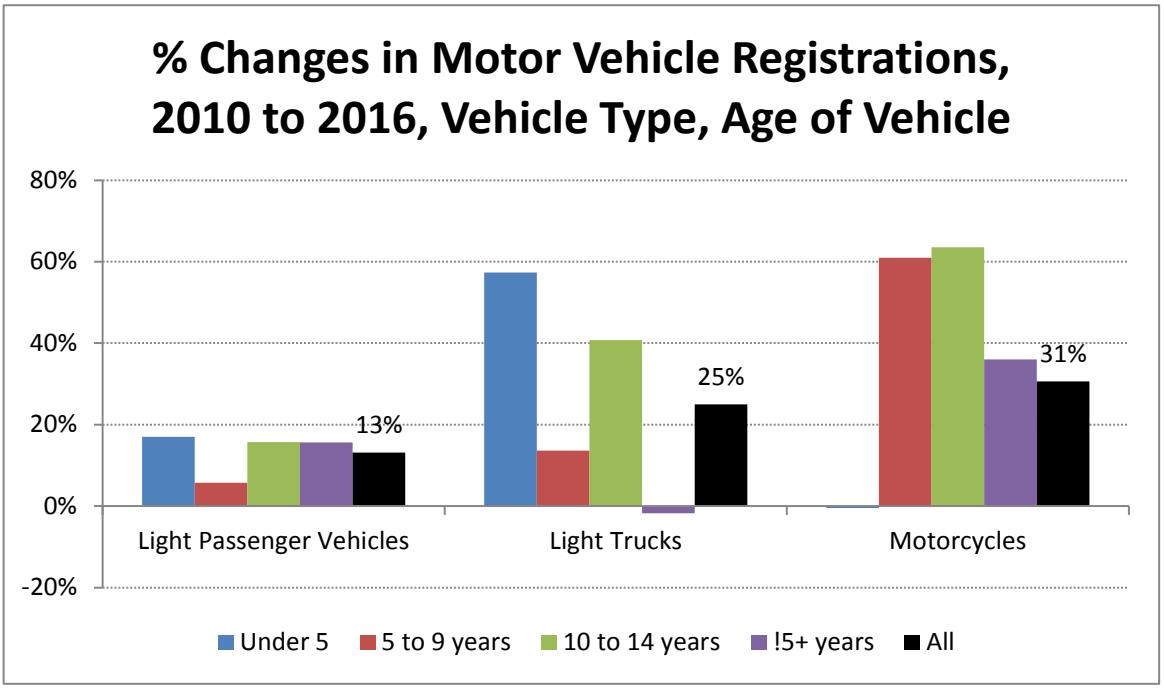
1.1.6 Index of Motor Vehicle Registrations, 2010 to 2016, vehicle type

The changes in motor vehicle registrations since 2010 by vehicle type partly explains some of the fatality and serious injury increases with registrations of light trucks and motorcycles both well above the level of increases for light passenger vehicles.



1.1.7 Percentage changes in motor vehicle registrations, 2010 to 2016, vehicle type, age of vehicle

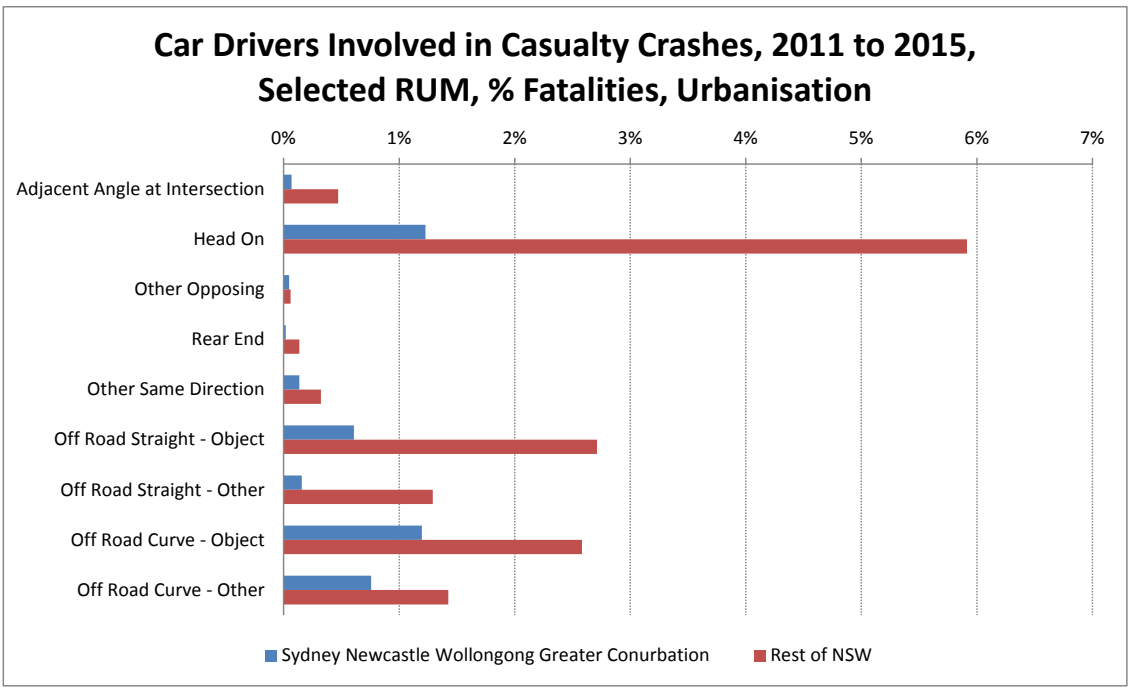
It has also been interesting to see dramatic changes in the age of the vehicle fleet since 2010, by type of vehicle. Total light passenger vehicle registrations increased by around 13 per cent and this was fairly consistent by age group. However, the greatest growth in light trucks has been amongst those aged under 5 years, whilst for motorcycles it has been amongst those aged 5 to 14 years.



1.1.8 Car drivers involved in casualty crashes, 2011 to 2015, selected RUM, % fatalities, urbanisation

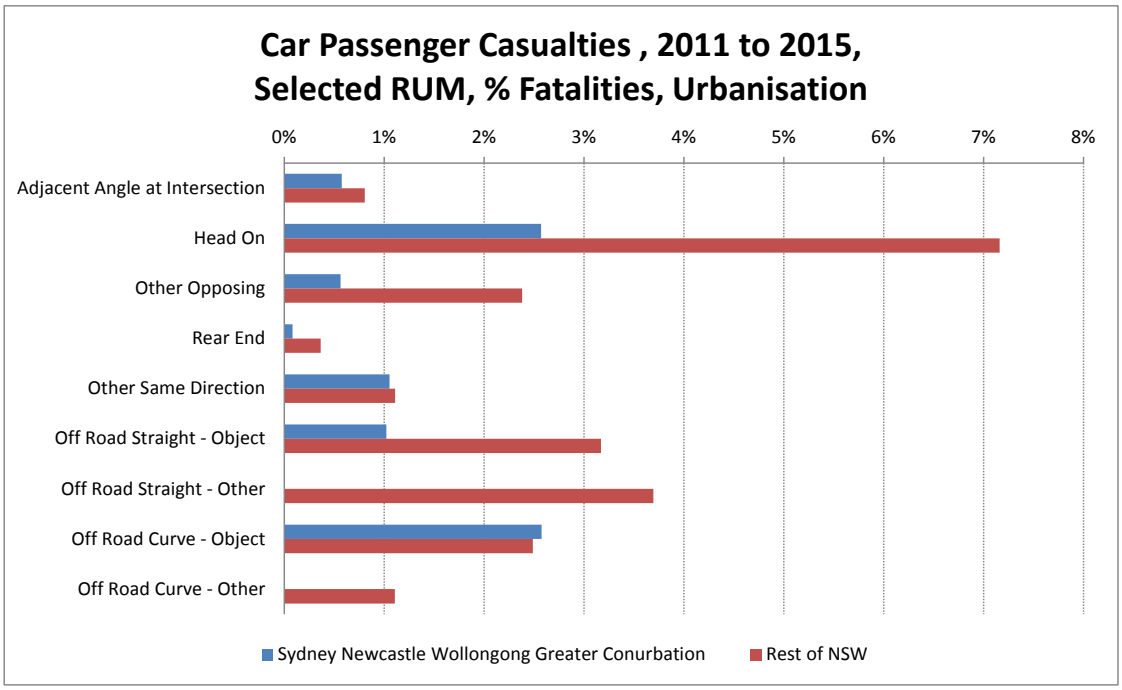
Focusing on car crash types and how well the occupants are protected, the following charts show the likelihood of serious trauma for drivers and passengers when involved in a casualty crash for crash type (Road User Movements) and urbanisation.

For a car driver the highest risk of death arises from head on and off road crashes into objects on country roads. The same crash types are prevalent for the Sydney, Newcastle, Wollongong Greater Conurbation but overall risks are much lower.



1.1.9 Car passenger casualties, 2011 to 2015, selected RUM, % fatalities, urbanisation

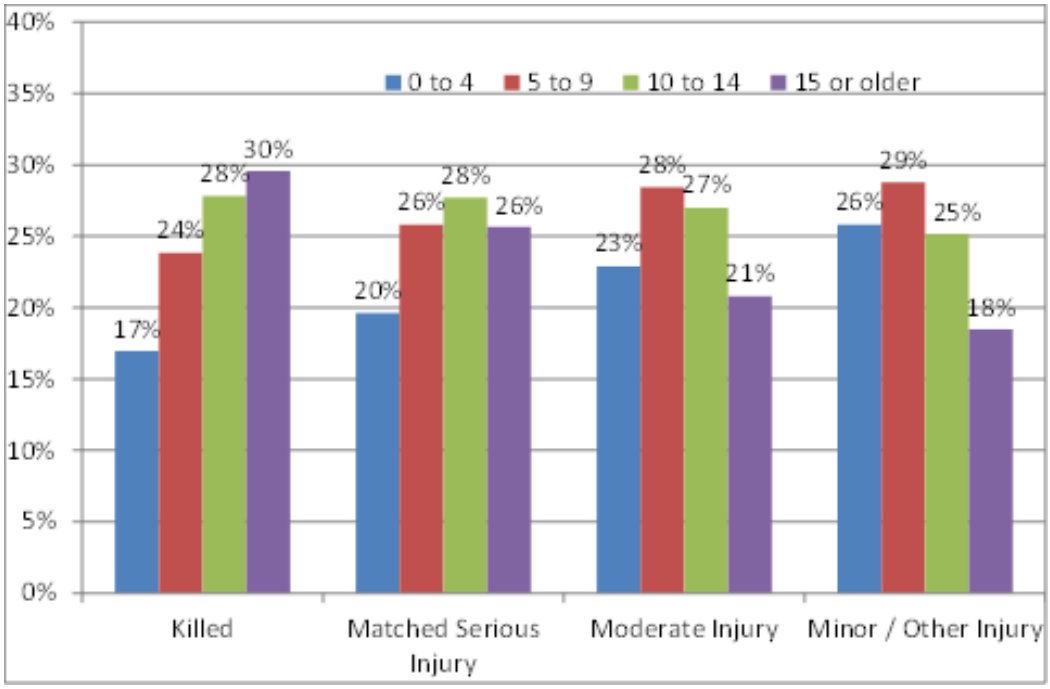
Similar likelihood outcomes are experienced for car passenger fatalities.



1.2 Effect of car age and severity of occupant injuries

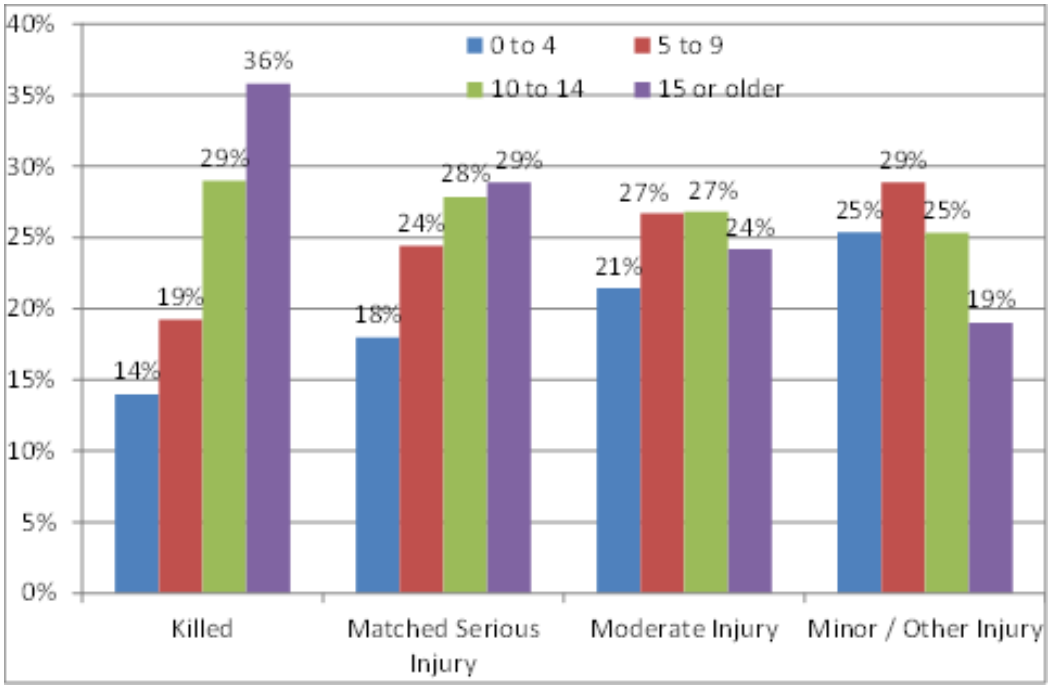
The following chart shows this relationship for the five years ending 2010/11. For the more severe injuries, older cars are more heavily represented. For the less severe injuries, newer cars are more heavily represented.

1.2.1 Relationship between car age and severity of occupant injury for five financial years 2006/07 to 2010/11



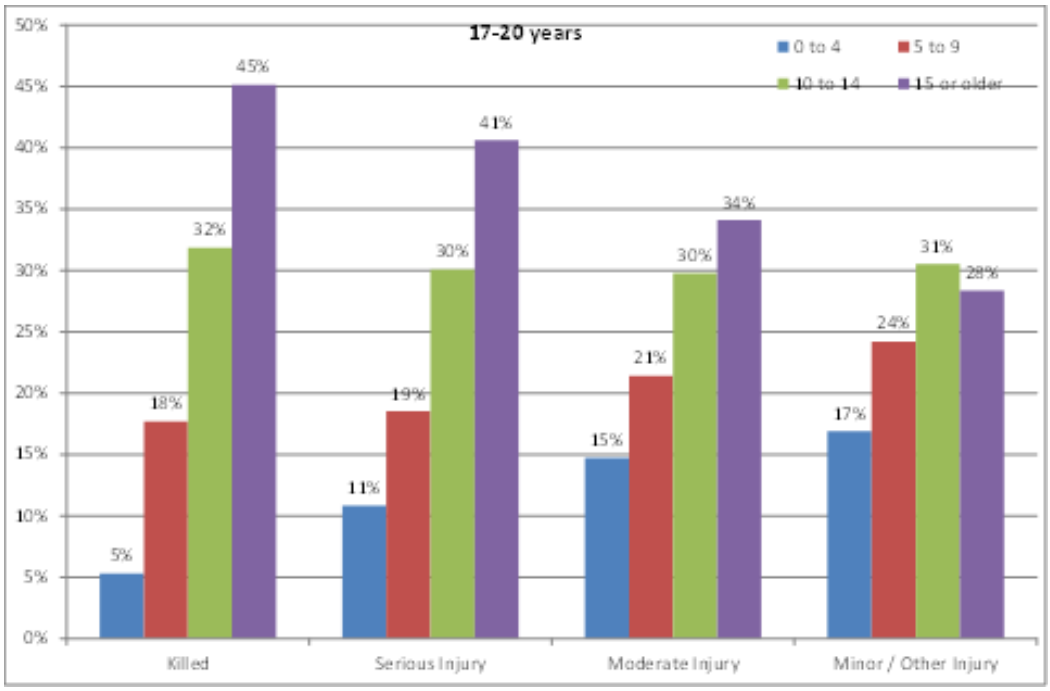
1.2.2 Relationship between car age and severity of occupant injury for five financial years 2011/12 to 2015/16

This effect is clearer and stronger in the most recent five-year period.



1.2.3 Relationship between car age and severity of injury to occupants, aged 17 to 20 years, for five financial years 2011/12 to 2015/16

There are some variations between the age groups of occupants, for example the young adult group aged 17 to 20 years has the highest proportion of fatalities from vehicles aged more than 15 years old.



This trend is reasonably consistent for all age groups, except the 70+. For other age groups, as injury severity decreases:

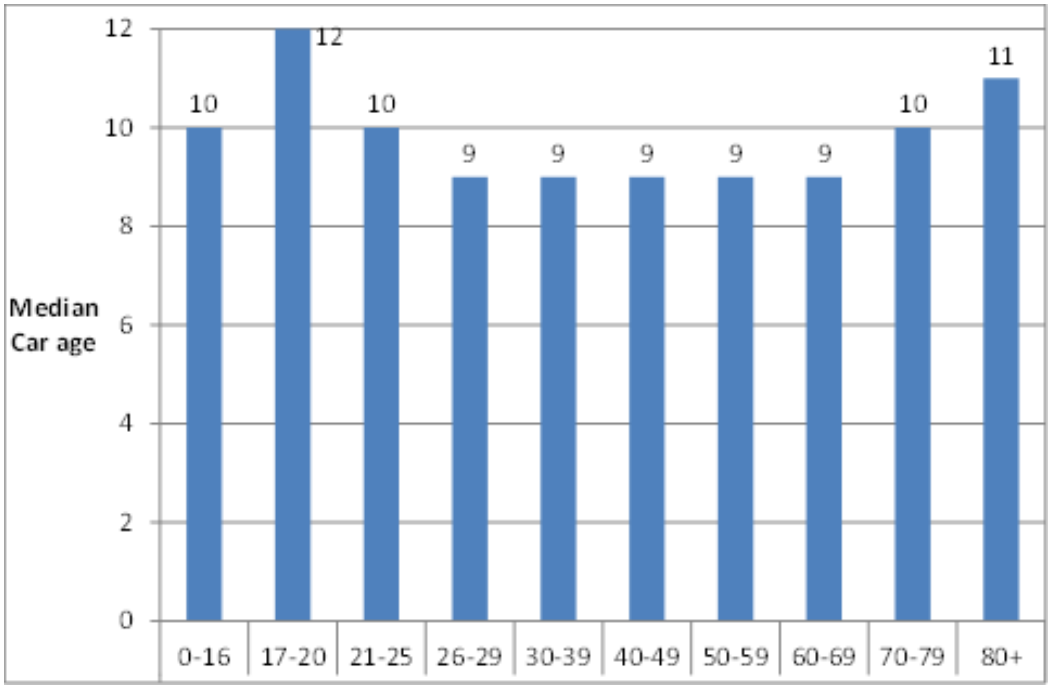
- the 0 to 4 years car age is an increasing proportion,
- the 15+ years car age is a decreasing proportion.

For the 70+ age group, the effect of car age on injury severity is not clear from these data. The numbers in the older age groups are small. The 80 or older group is only 3% of occupant casualties. The 70 or older groups is 8%.

1.3 Ages of Cars and Ages of Injured Occupants

Older occupants and young adult occupants were injured in older cars.

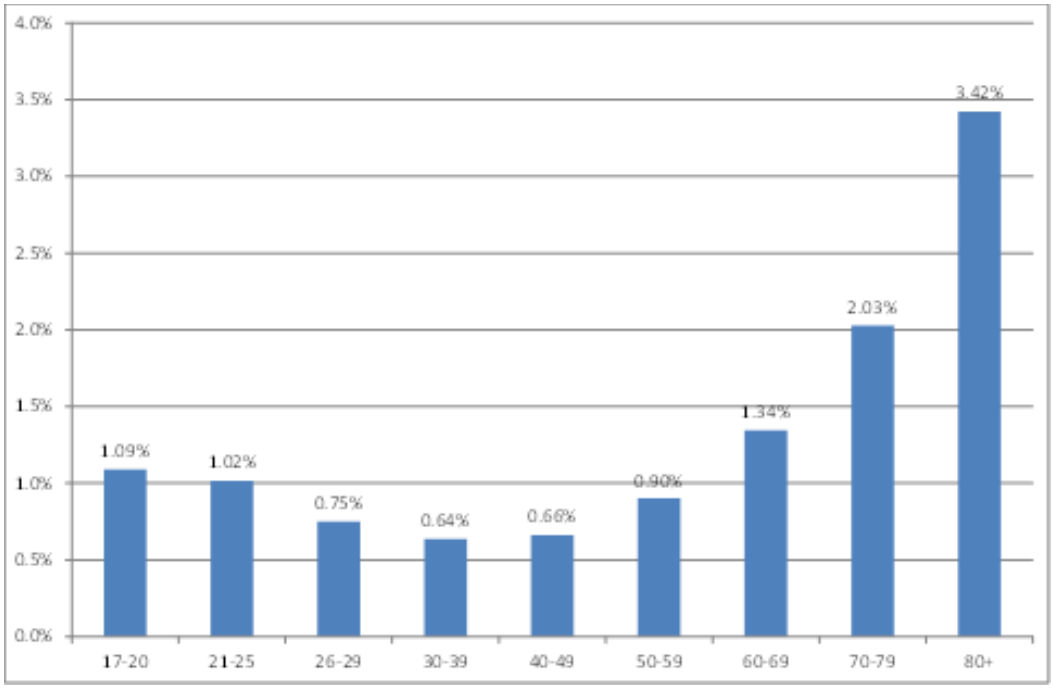
1.3.1 Median ages of cars, by age group of injured occupants, for five financial years 2011/12 to 2015/16



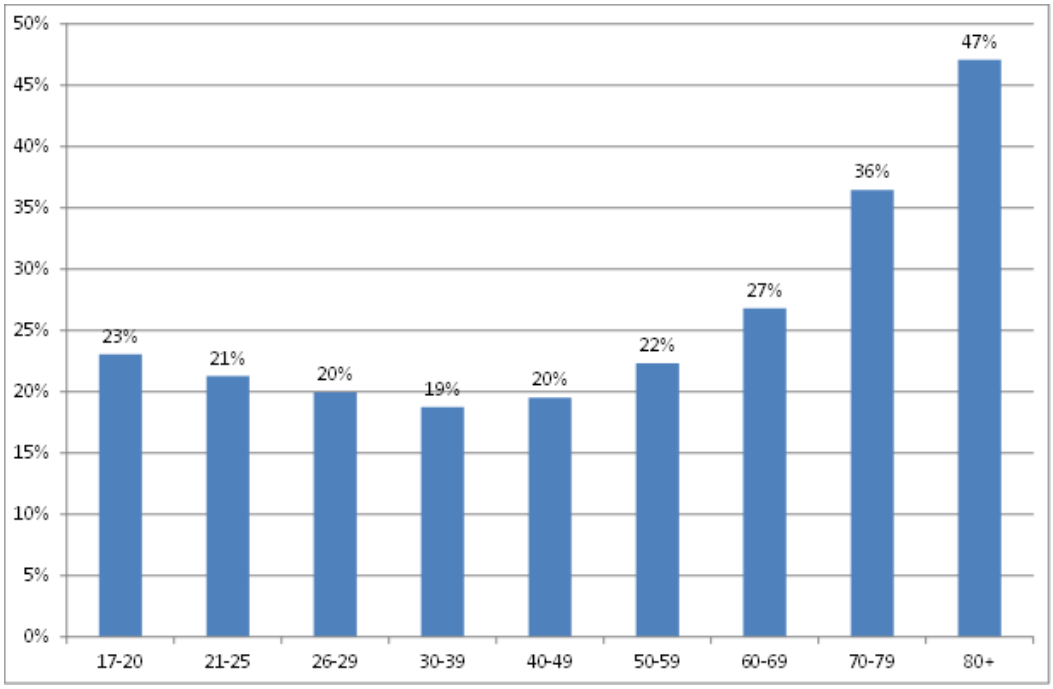
The following charts measure likely severity of injury for different occupant age groups by looking at the proportion of a particular severity among reported car occupant casualties in that age group. It is restricted to occupants aged 17 years or older.

Both these charts show that there is an elevation in severity for younger occupants, and particularly for older occupants

1.3.2 Proportion of fatalities in reported casualties, by age group of injured car occupants, for five financial years 2011/12 to 2015/16



1.3.3 Proportion of fatalities or matched serious injuries in reported casualties, by age group of injured car occupants, for five financial years 2011/12 to 2015/16

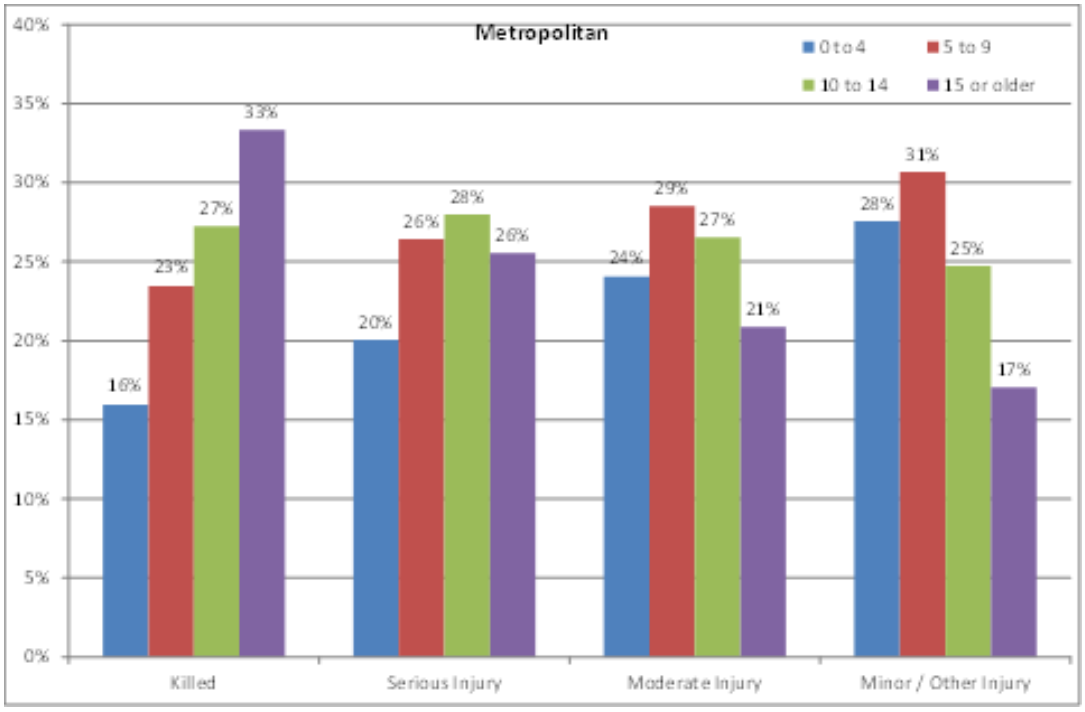


1.3.4 Relationship between car age and severity of injury to occupants, on metropolitan roads, for five financial years 2011/12 to 2015/16

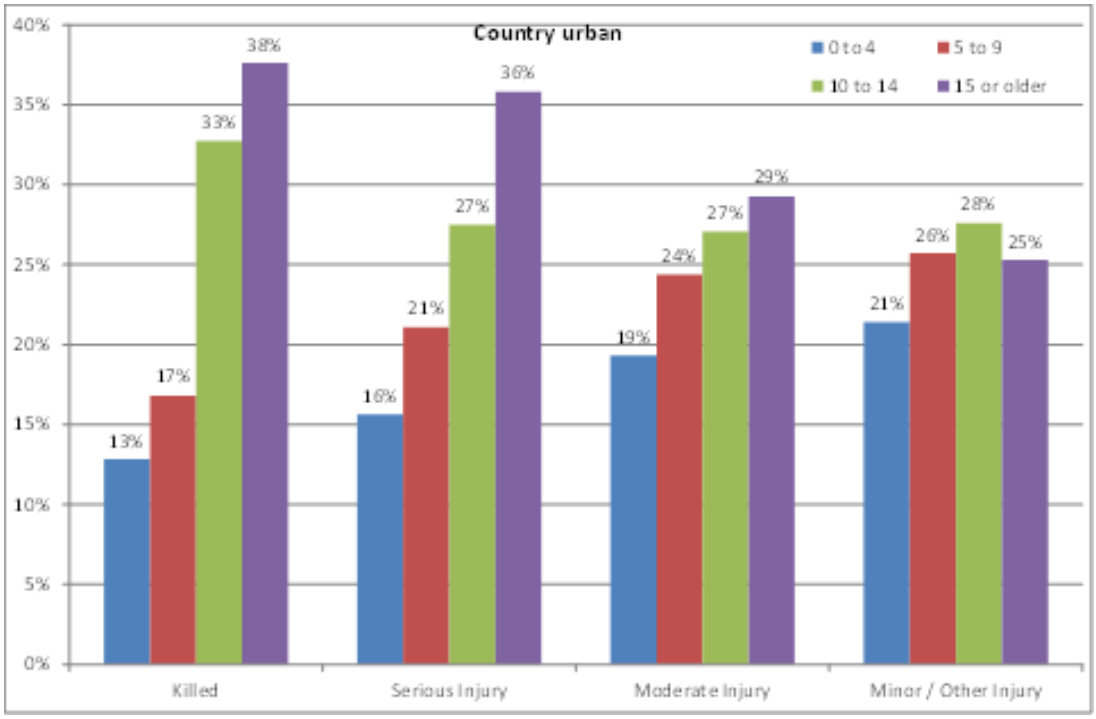
Severities related to car age, for separate urbanisation groups are also very consistent.

For each urbanisation group, as injury severity decreases:

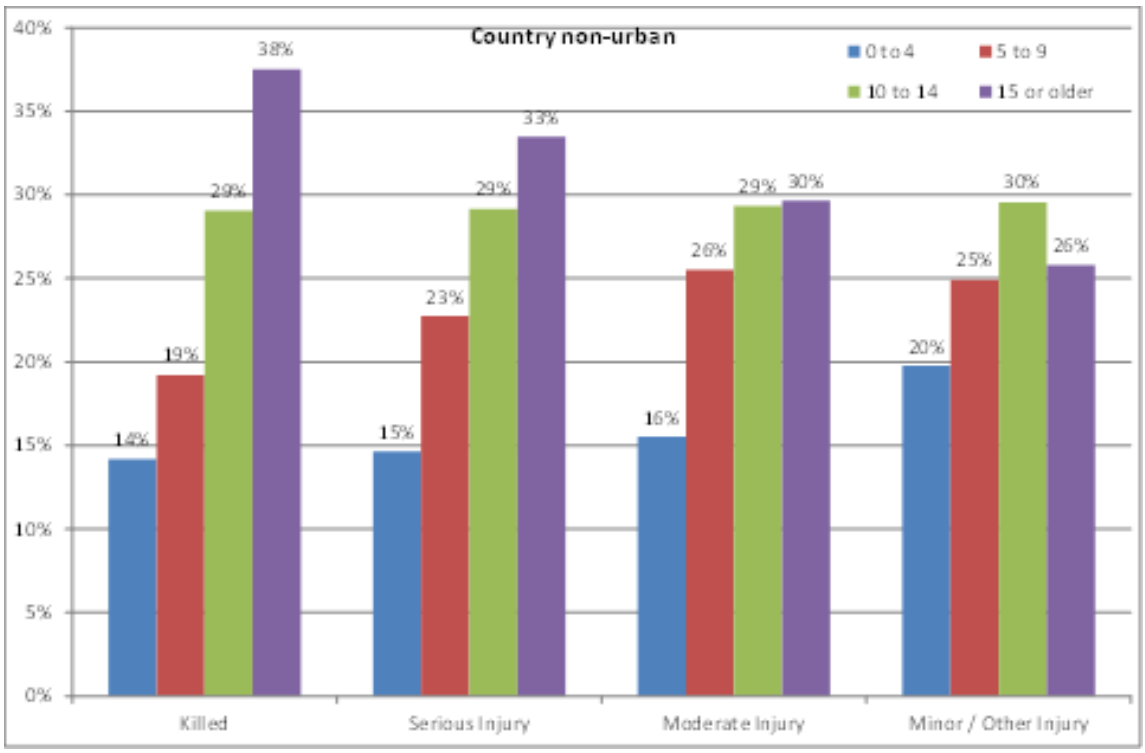
- the 0 to 4 years car age is an increasing proportion
- the 15+ years car age is a decreasing proportion.



1.3.5 Relationship between car age and severity of injury to occupants, on country urban roads, for five financial years 2011/12 to 2015/16



1.3.6 Relationship between car age and severity of injury to occupants, on country non-urban roads, for five financial years 2011/12 to 2015/16



1.4 Injury Characteristics of Occupants by Age of Vehicle

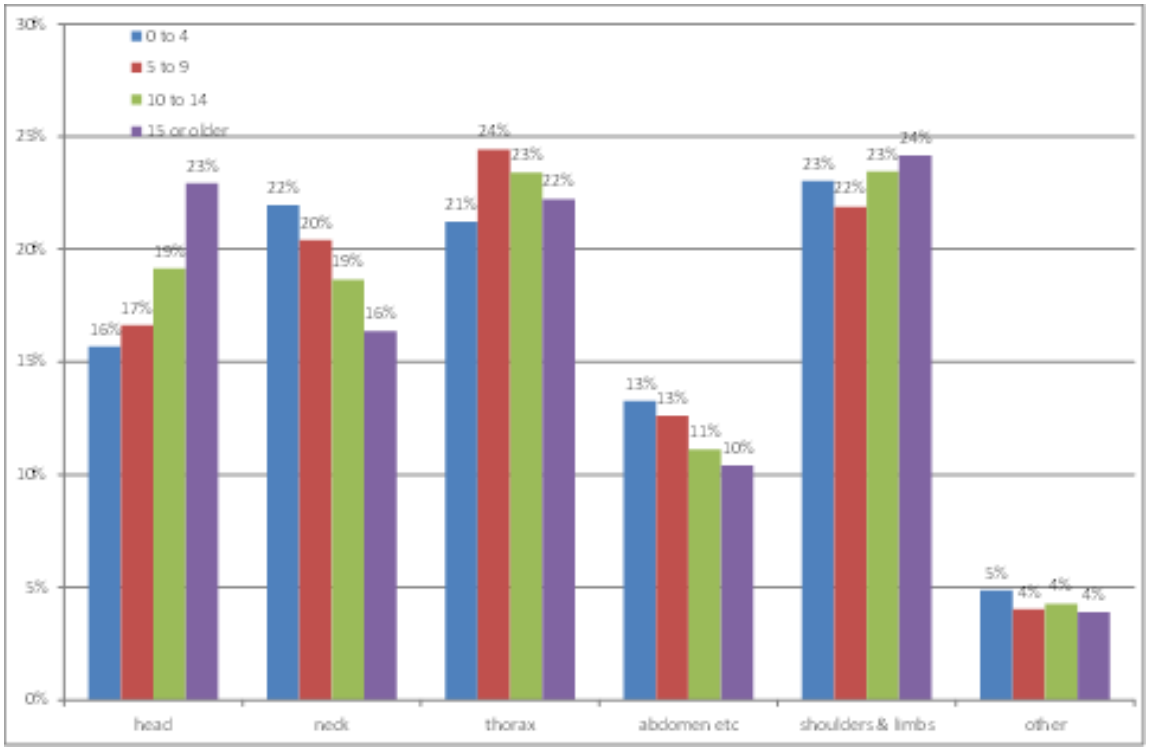
1.4.1 Region of Body

The body region injured per the principal diagnosis is identified in the data. In the case of multiple specified injuries, the condition which presents the most serious threat to life would be selected as the principal diagnosis in the hospital data. That is, each injured person has one body region for the principal diagnosis, but can have injuries in other body regions as well.

The following chart shows the proportions in each body region of principal diagnosis for each car age group. For example, head injury was the principal diagnosis for 16% of occupants of cars aged 4 years or less. Thorax injury was the principal diagnosis for 21% of occupants of cars aged 4 years or less.

The area called “abdomen etc” is coded in the hospital data as “abdomen, lower back, lumbar spine and pelvis.” “Limbs” includes arms, wrists, legs, ankles, hands, feet.

1.4.2 Principal diagnosis, matched serious injuries to car occupants, for five financial years 2011/12 to 2015/16



1.4.3 Severity

Serious injuries are defined as those that result in admission to hospital. But not all injuries that meet the definition are equally severe. Two main ways of measuring severity (of serious injuries) have been used in the Centre for Road Safety. One depends on an assessment of average survivability associated with injuries of a type experienced by the victim. The other measures the length of stay in hospital.

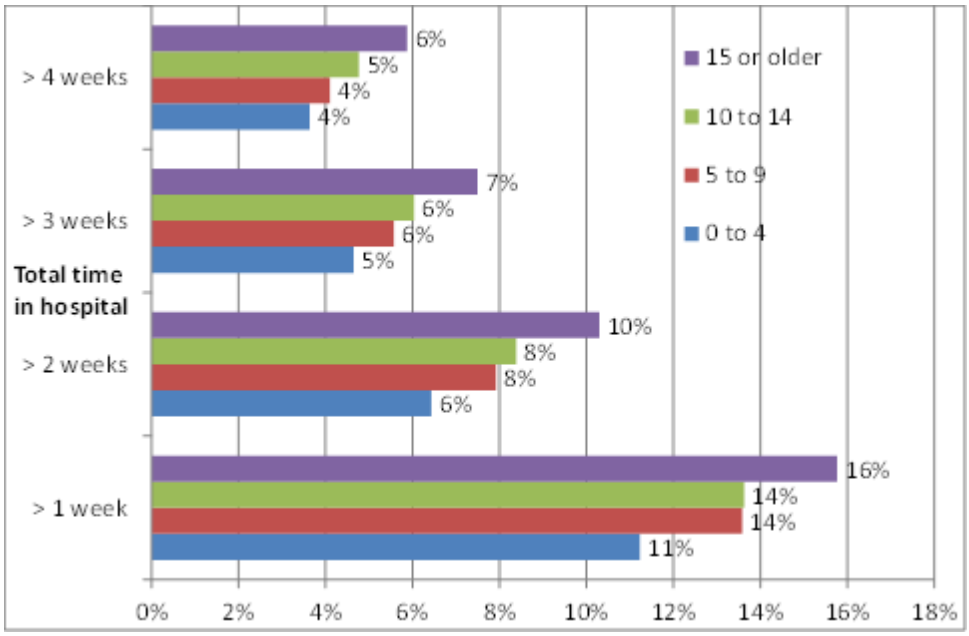
The survivability analysis here uses a high threat to life (HTTL) criterion, based on the worst injury, assessed over the total time in hospital, even if the person moves from hospital to hospital.

Proportions that were high threat to life in each body region of principal diagnosis of matched serious injuries who were car occupants, five years ended 30 June 2016.

Principal injury	% HTTL
thorax	48%
head	42%
abdomen etc	32%
neck	25%
shoulders and limbs	20%

Those seriously injured in older cars stay longer in hospital on average. It can be seen from Figure 24 that those injured in older cars tend to have the longer hospital stays. Both length of stay in hospital and car age are related to occupant age.

1.4.4 Proportion of car occupant matched serious injuries, who stayed in hospital more than one week, the proportion who stayed more than two weeks, the proportion who stayed more than three weeks and the proportion who stayed more than four weeks, by car age range, 2011/12 to 2015/16



Both length of stay in hospital and car age are also related to occupant age, with length of stay increasing by vehicle age and age of occupant.