Risk on the Road

Pedestrians, Cyclists and Motorcyclists

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Ministry of Transport
TE MANATŪ WAKA
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Contents

Additional information

For more information about the background to the survey see the Ministry of Transport website at **www.transport.govt.nz/research/TravelSurvey/**

More travel information is available in the Walking fact sheet, Cycling fact sheet and Motorcycling fact sheet, linked off **www.transport.govt.nz/research/travelsurvey/reportsandfactsheets/**

More information on risk is available in the risk fact sheets, linked off **www.transport.govt.nz/research/travelsurvey/reportsandfactsheets/**
These include:

- Introduction and mode comparison
- Drivers and their passengers

For further information on crash statistics see **www.transport.govt.nz/research/roadcrashstatistics/**. This includes links to publications such as *Motor Vehicle Crashes in New Zealand*, the annual statistical statement produced by the Ministry of Transport. Enquires relating to crash statistics may be directed to the Ministry of Transport, PO Box 3175, Wellington, or by email on **info@transport.govt.nz**.

A selection of fact sheets is available via the research section of the Ministry of Transport website. These include:

Crash facts:

- Alcohol and drugs
- Speed
- Cyclists
- Diverted attention
- Fatigue
- Motorcyclists
- Overseas drivers
- Pedestrians
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Travel survey:

- Comparing travel modes
- Driver travel
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For more information about road safety, visit the Ministry of Transport website at **www.transport.govt.nz**.

Risk on the road: Pedestrians, cyclists and motorcyclists

Key Facts

- Road crash statistics by themselves don't necessarily tell us who is most at risk on the road because they don't take into account the amount of travel. The amount of travel can be combined with crash statistics to compare the **risk** of death and injury for different age groups or different modes of travel.

- For pedestrians, 5–9 year olds and people over 80 have the highest risk of death or injury in a motor vehicle crash, but these are fragile age groups who are more likely to be injured or die when hit.

- Cyclist risk varies depending on whether you consider deaths/injuries per 100 million km travelled (248 per 100 million km travelled) or per million hours spent travelling (31 per million hours travelled). The risk is much higher relative to other modes per distance travelled than by time travelled, due to the slower speeds involved.

- Motorcycling is the riskiest of all travel modes. Young motorcyclists have a much higher risk of death or injury than older ones.

This fact sheet looks at the risk of death and injury for pedestrians, cyclists and motorcyclists. The focus is on the risk associated with road travel. Off road walking, cycling and motorcycle travel and crashes are not included. The death and injury data are from police reported crashes involving motor vehicles from the Crash Analysis System (CAS). This analysis does not include pedestrian and cyclist falls or incidents not involving a motor vehicle. Measures of exposure to risk (distance travelled, time spent travelling and trip numbers) are from the New Zealand Household Travel Survey (NZHTS).

Pedestrians

In the four years July 2010 – June 2014, an average of 34 pedestrians died and 892 pedestrians were injured in motor vehicle crashes each year.

Table 1 summarises pedestrian travel times and distances, and the number of deaths and injuries by age.

Table 1: Pedestrian deaths or injuries in motor vehicle crashes and the associated travel time, distance and risk

Age (years)	*Total number of pedestrian trip legs sampled in 4 years*	Hours spent walking per year (million hours)	Distance walked per year (million km)	Number of deaths or injuries in motor vehicle crashes per year	Deaths / injuries per million hours walked	Deaths / injuries per million km walked
0–4	*2,072*	9.7	34	44	4.5	1.28
5–9	*2,577*	11.0	39	88	8.0	2.24
10–14	*4,190*	20.4	85	112	5.5	1.31
15–19	*4,135*	23.0	105	118	5.1	1.12
20–24	*2,487*	16.7	68	99	5.9	1.45
25–29	*1,808*	11.2	47	57	5.1	1.21
30–34	*2,208*	10.7	45	49	4.5	1.07
35–39	*2,774*	11.7	49	31	2.6	0.63
40–44	*2,798*	12.2	50	40	3.3	0.81
45–49	*2,872*	14.9	61	36	2.4	0.59
50–54	*2,601*	13.7	52	48	3.5	0.91
55–59	*2,401*	11.3	41	38	3.4	0.92
60–64	*2,293*	10.8	39	33	3.0	0.83
65–69	*1,859*	9.5	33	29	3.1	0.88
70–74	*1,453*	7.2	25	32	4.5	1.28
75–79	*1,066*	4.7	14	25	5.2	1.76
80+	*986*	4.7	15	50	10.8	3.36
All ages	*40,580*	203.4	803	927	4.6	1.15

Figure 1 shows pedestrian deaths and injuries per year by age group. The largest number of deaths and injuries occurred for those between ages 5 and 24. Up to age 35, males have a higher death/injury rate than females but there is no large difference for older pedestrians.

Figure 2 shows the time spent walking by age and gender. The greatest amount of walking is done by those aged between 10 and 24 years. Among adults, females tend to spend more time walking than males.

Figure 1: Pedestrian deaths or injuries in motor vehicle crashes (annual average) by age and gender

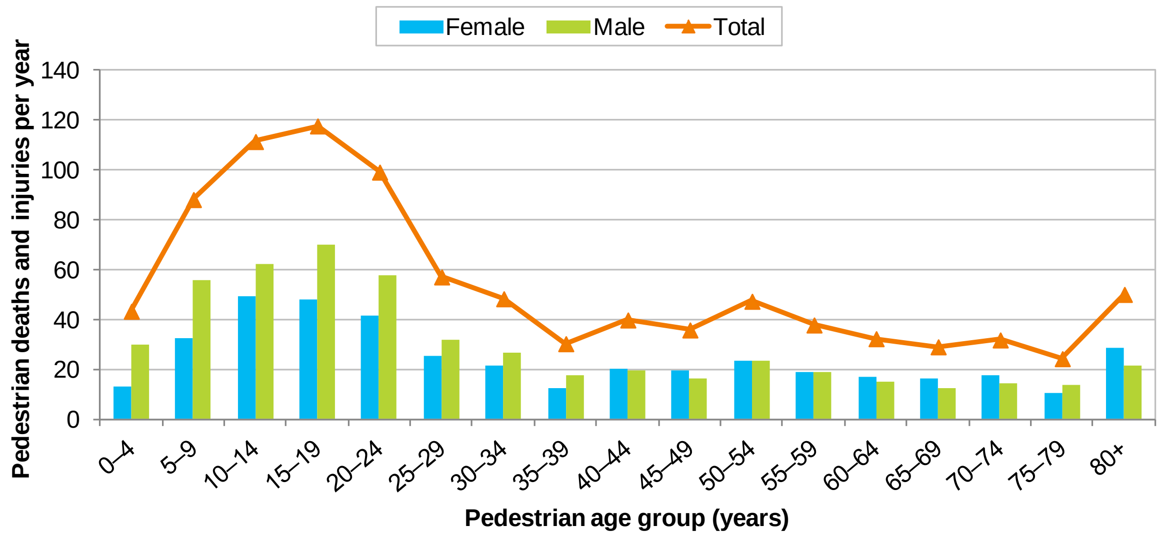
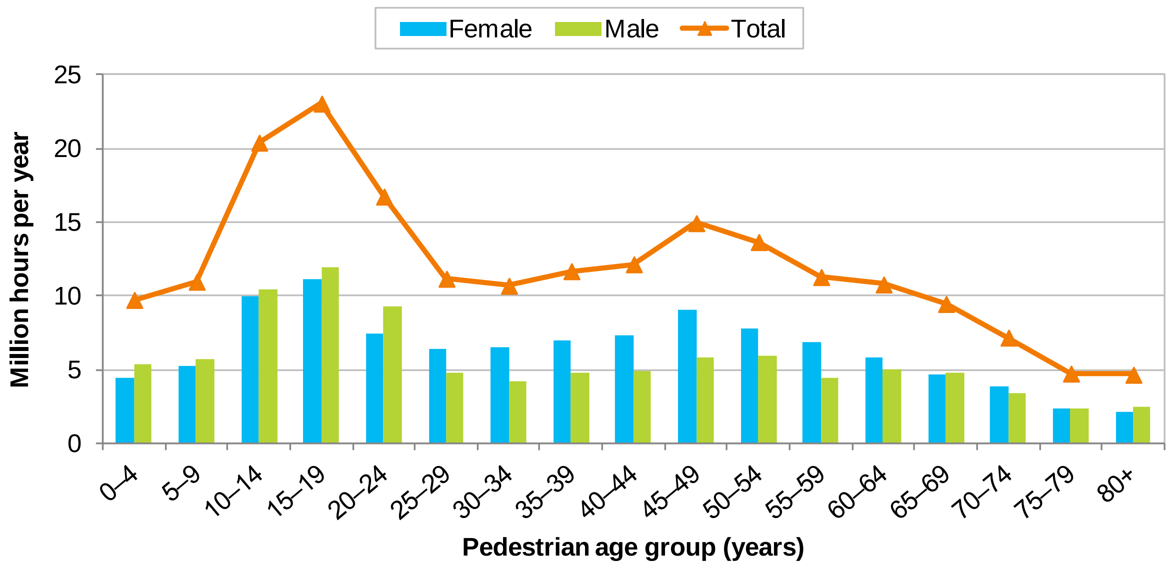


Figure 2: Time spent walking per year by age and gender



Combining these, we find the risk of pedestrian death or injury per million hours spent travelling by age and gender (Figure 3). The highest risk is for those aged 5–9 years and over 80 years old, however these are fragile age groups who are more likely to be injured or die when in a crash. There is a similar trend for the risk by distance walked (Figure 4).

Figure 3: Pedestrian deaths or injuries in motor vehicle crashes per time spent walking by age and gender (not fragility adjusted, annual average)

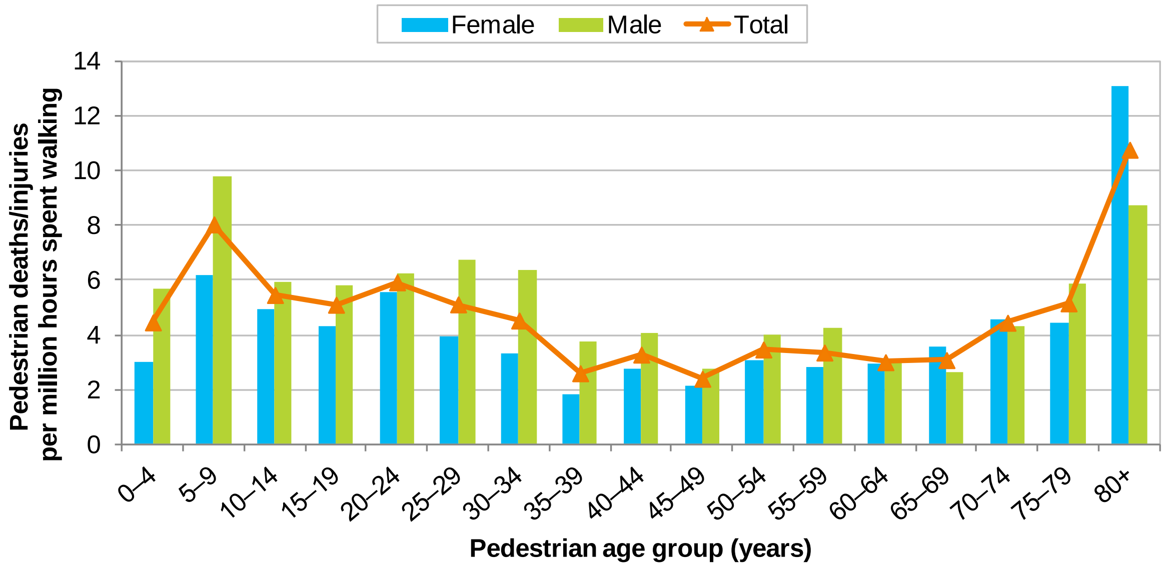
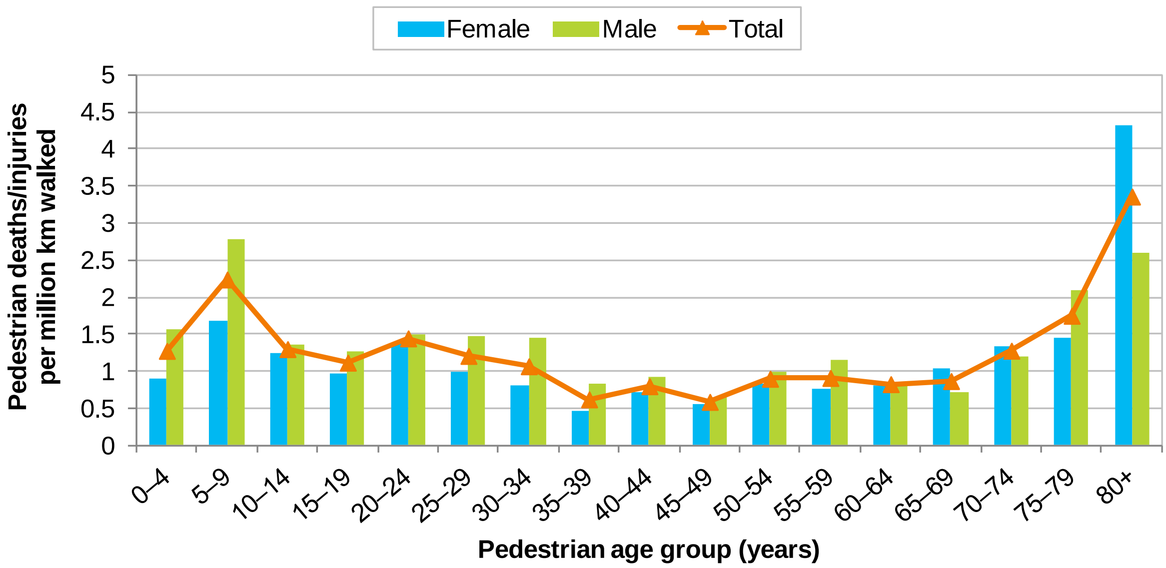


Figure 4: Pedestrian deaths or injuries in motor vehicle crashes per distance walked by age and gender (not fragility adjusted, annual average)



Pedestrian risk by time of day and age

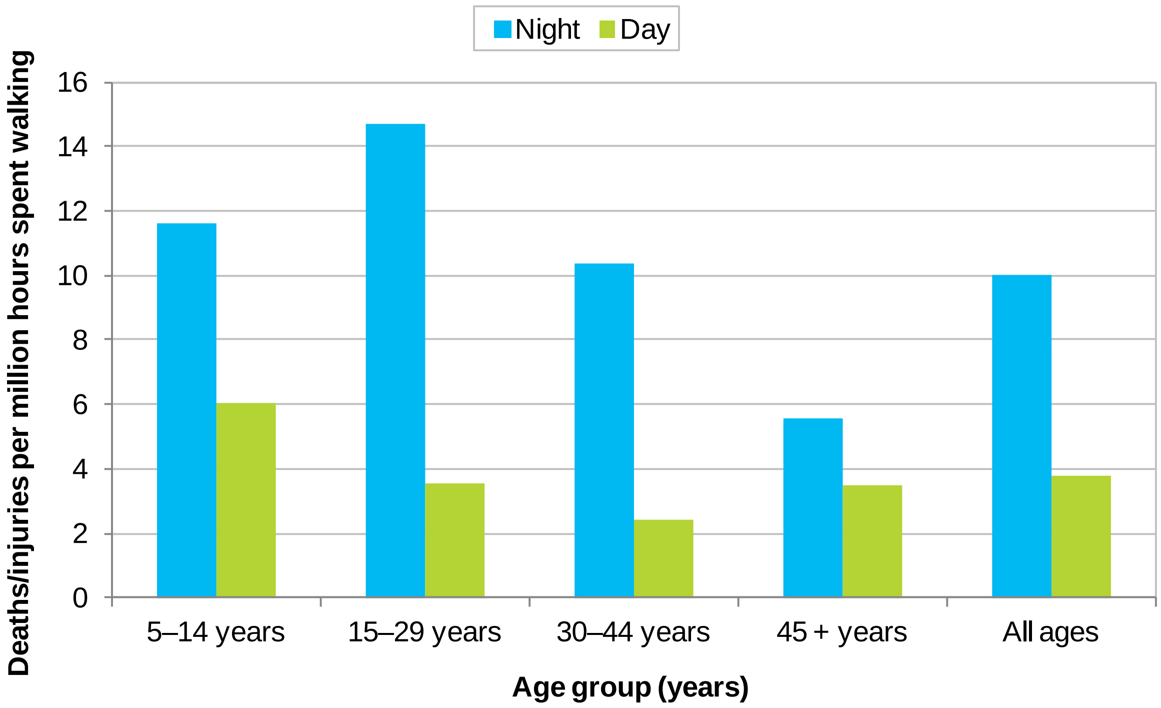
We can also look at pedestrian risk by time of day to see when is the riskiest time of day to be out walking.

Table 2 and Figure 5 below compare walking during daylight hours with walking during night time hours (defined using sunrise and sunset time by location) by various age groups.

Table 2: Pedestrian deaths or injuries in motor vehicle crashes and time spent walking by daylight and night time for different age groups

Age group (years)	*Sample trips legs*	Time spent walking (Million hours per year)				Pedestrian deaths and injuries per year			
		Any time	At night	During the day	(% at night)	Any time	At night	During the day	(% at night)
5–14	*6,767*	31.4	1.3	30.0	4%	197	15.5	182	8%
15–29	*8,430*	51.0	7.9	43.0	16%	271	117	154	43%
30–44	*7,780*	34.5	4.2	30.3	12%	117	44	73	38%
45 +	*15,531*	76.8	9.2	67.3	12%	285	51	234	18%
All ages	*38,508*	193.7	22.7	170.7	12%	869	227	642	26%

Figure 5: Pedestrian deaths or injuries in motor vehicle crashes per million hours spent walking by day time/night time and age (annual average)



Night time walking is far riskier than daytime walking for all age groups. The biggest contrast in risk between day and night is for 15–29 year olds and 30–44 year olds. 15–29 year olds are more likely to walk at night than the other age groups. For this age group, night time accounts for 16 percent of total walking time (see Table 2) but 43 percent of the pedestrian deaths and injuries. For 30–44 year olds, night time accounts for 12 percent of total walking time but 38 percent of the pedestrian deaths and injuries.

Figure 6 shows a more detailed breakdown by hour of day for adults (18+) and children. The patterns are quite different for children and adults.

For children, most deaths and injuries occur between 3 and 4pm, followed by 8am and 9am and 4pm to 6pm. This coincides with the times they walk the most (Figure 7), most likely going to and from school.

Adult pedestrian deaths and injuries are spread out relatively evenly between 8am and 6pm.

Figure 6: Pedestrian deaths or injuries in motor vehicle crashes per year by hour of day and age (annual average)

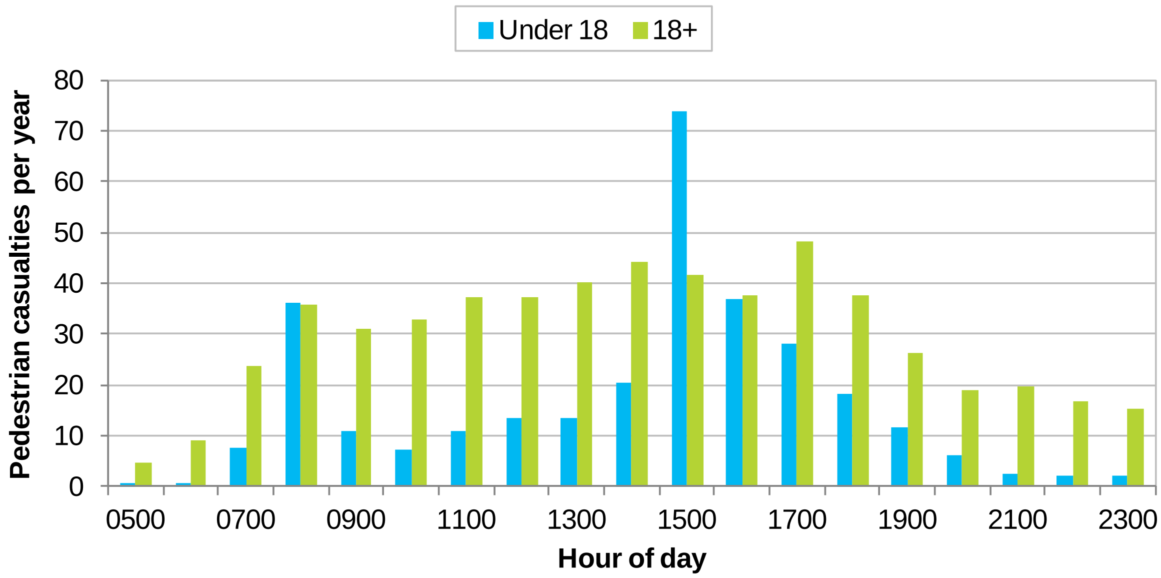
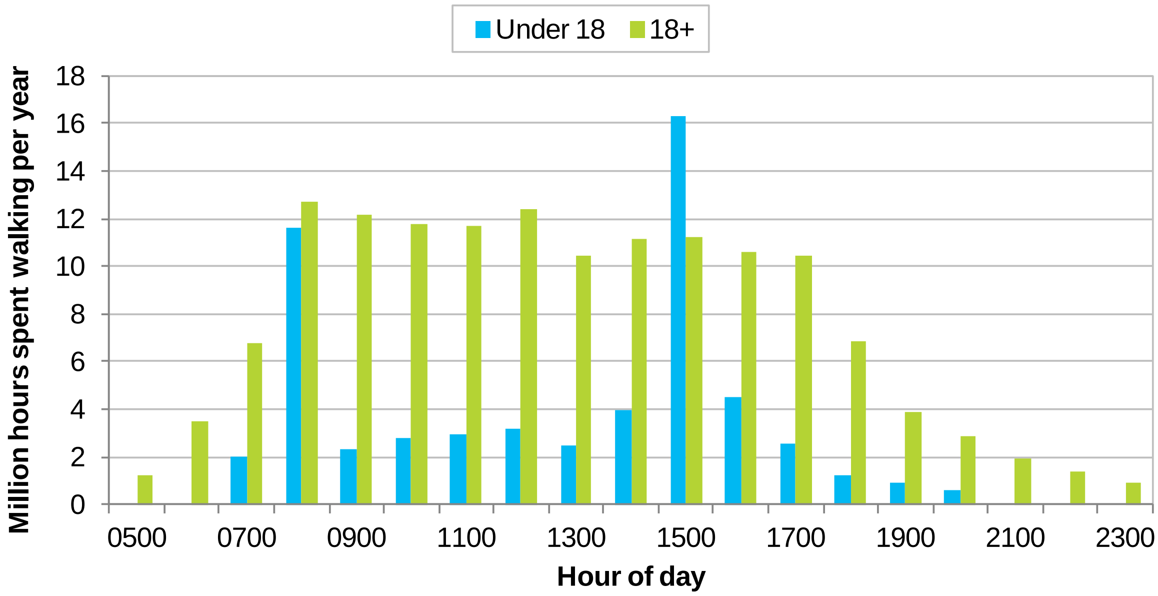


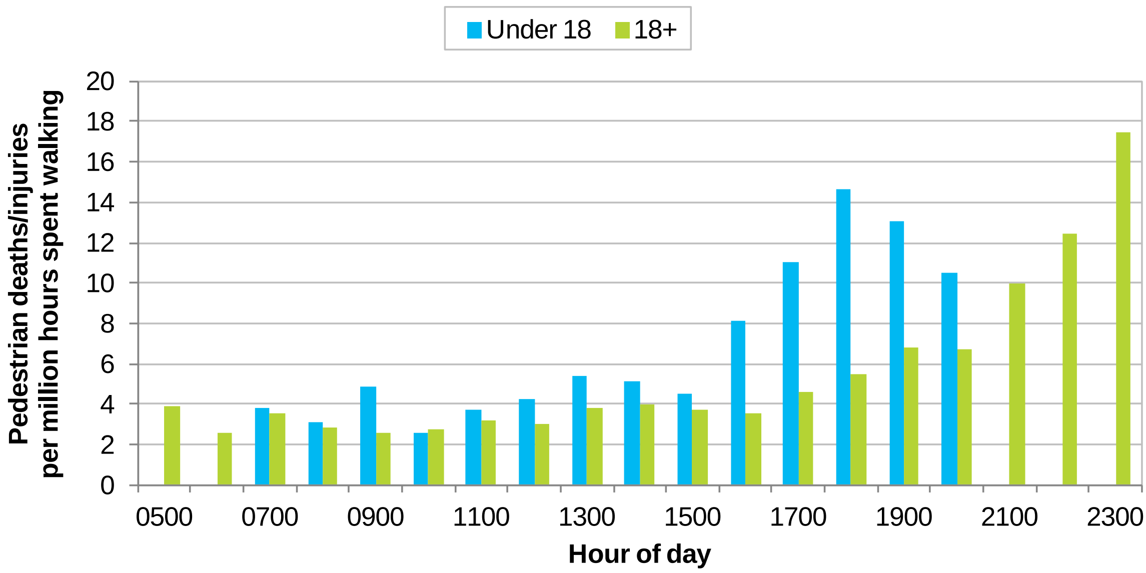
Figure 7: Average time spent walking per year by hour of day and age



Note: Values have not been calculated for adults between 0000 and 0400 and for children between 2100 and 0600 as the number of trips was too small to provide reliable estimates.

Figure 8 shows the risk in terms of number of casualties per time spent walking. The most risky time of day for children to be out walking is between 5 and 8pm. For adults the injury risk slowly increases into the evening. Risk per hour could not be calculated outside the hours shown as there are too few trips in the sample to provide reliable estimates of walking time.

Figure 8: Pedestrian deaths or injuries in motor vehicle crashes per million hours spent walking per year by hour of day and age (annual average)



Note: Values have not been calculated for adults between 0000 and 0400 and for children between 2100 and 0600 as the number of trips was too small to provide reliable estimates.

Cyclists

In the four years July 2010 – June 2014, on average 9 cyclists each year died and 757 cyclists each year were injured in motor vehicle crashes.

Table 3 shows cyclist deaths or injuries in motor vehicle crashes, the time spent travelling, and the distance travelled. Because there are a smaller number of cycle trips in the sample, we use much broader age groups than previously.

Table 3: Cyclist deaths or injuries in motor vehicle crashes and the time spent travelling and the distances travelled

Age group	Total number of cycled trip legs in 4 years	Number of hours spent cycling per year (million hours)	Distance cycled per year (100 million km)	Average number of deaths or injuries in motor vehicle crashes per year
5–12 years	*500*	1.7	0.1	63
13–17 years	*424*	2.6	0.2	101
18–44 years	*1,360*	9.2	1.3	348
45 + years	*1,431*	11.2	1.5	252
All ages	*3,767*	24.9	3.1	766

Figure 9 shows the number of cyclist deaths or injuries in motor vehicle crashes per year.

Figure 9: Cyclist deaths or injuries in motor vehicle crashes per year, by age group (annual average)

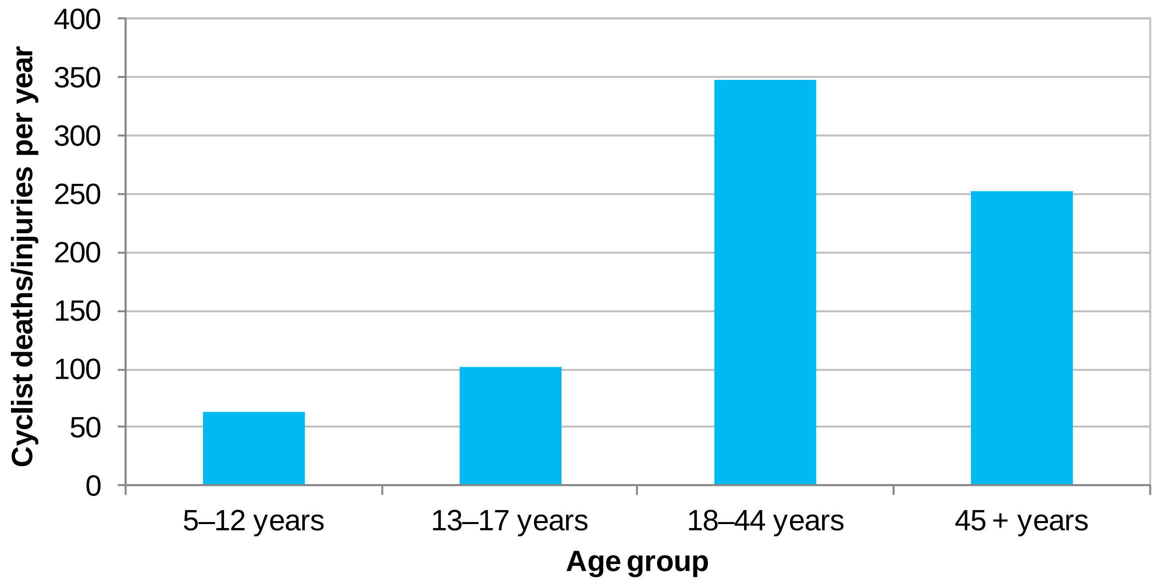


Figure 10: Average number of hours spent cycling per year by age group

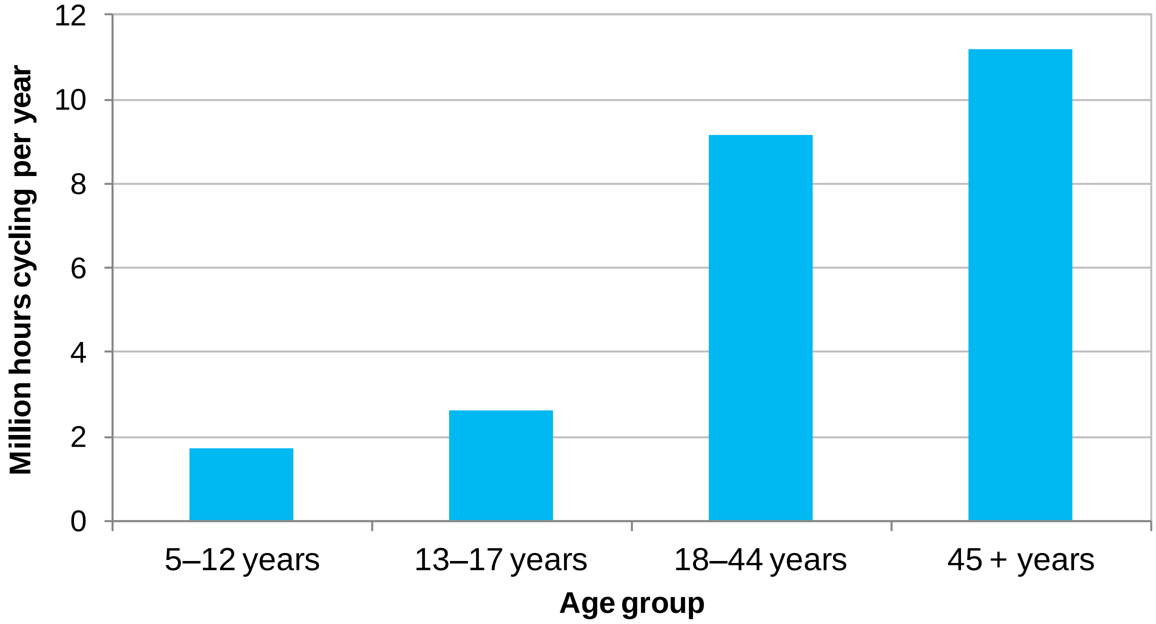


Figure 11: Average distance cycled per year by age group

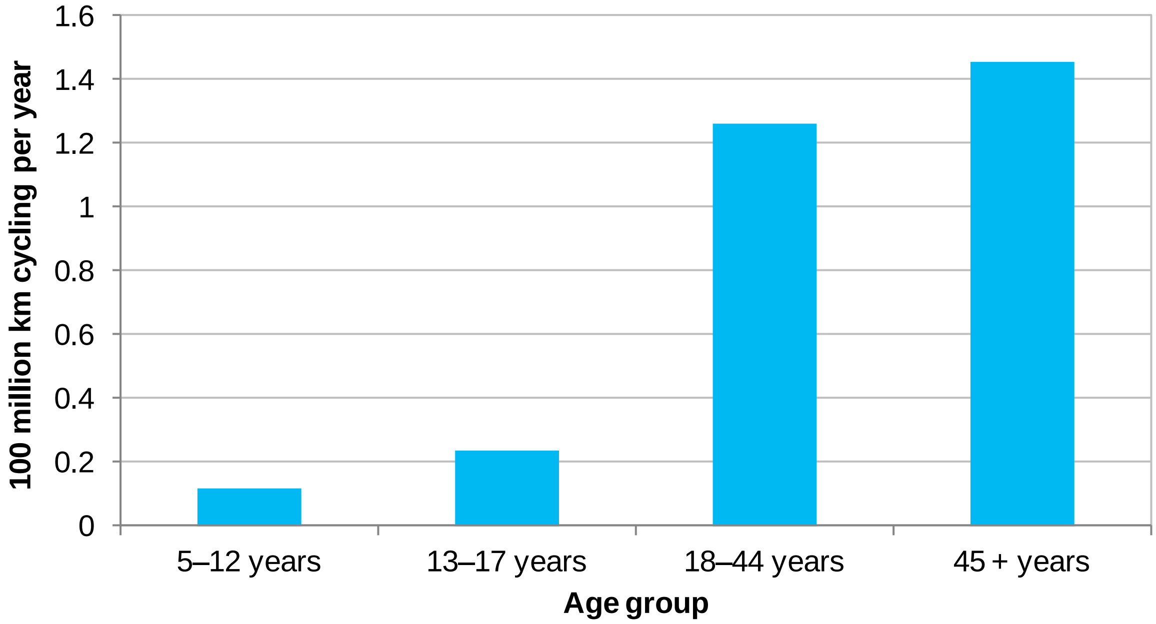


Figure 10 shows average time spent cycling by age group and Figure 11 shows the average distance cycled by age group.

Figure 12 shows the deaths and injuries per distance cycled and Figure 13 shows the risk per time spent cycling. Cyclists aged 5–17 years have a higher risk than adults (18 years and older) per distance travelled. This is related to the time spent in the road environment; children cycle more slowly so take longer to cover the same distance.

Figure 12: Average number of cyclist deaths or injuries in motor vehicle crashes per distance cycled, by age

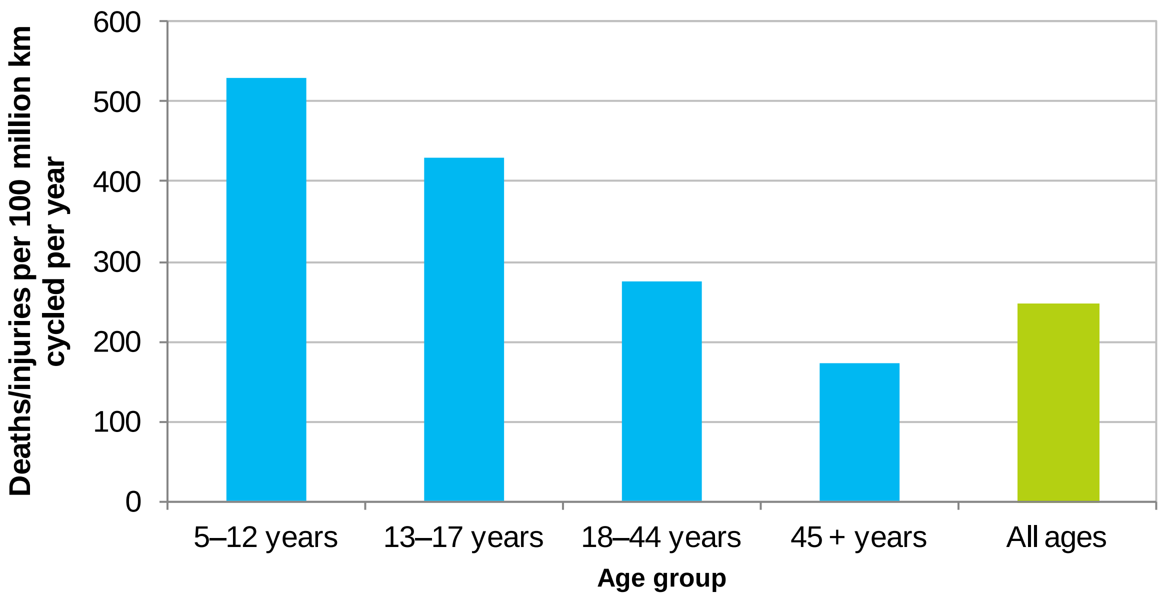
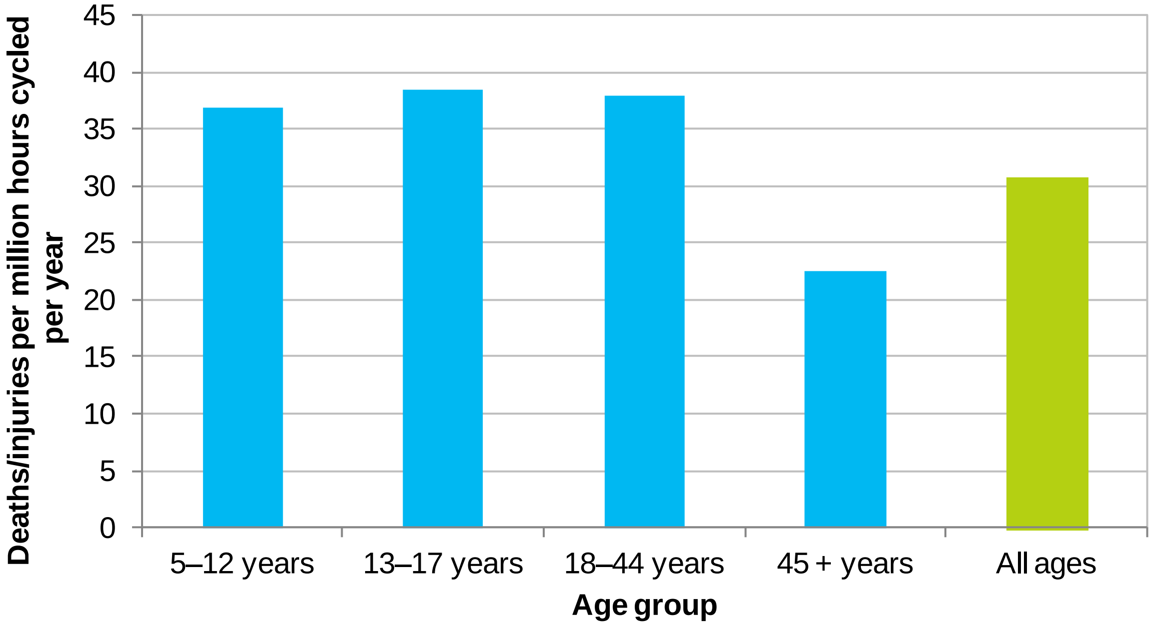


Figure 13: Average number of cyclist deaths or injuries in motor vehicle crashes per time spent cycling, by age



Motorcyclists

There are far fewer motorcyclist trips in the Travel Survey so we have grouped 5 years of travel data to provide a big enough sample for analysis. Table 4 shows the cyclist deaths and injuries and the travel data for the 5 years July 2009 to June2014.

Table 4: Motorcyclist deaths or injuries in motor vehicle crashes and the time spent travelling and the distances travelled (2009–2014)

Age group	*Total trip legs in sample*	Average million hours per year	Average 100 million km per year	Average deaths/ injuries per year
0–29 years	*205*	1.2	0.4	465
30–44 years	*338*	1.7	0.7	330
45+ years	*546*	3.4	1.6	443
All ages	*1,089*	6.4	2.7	1,237

Figure 14 shows the deaths and injuries per distance motorcycled, and Figure 15 shows the risk per time spent motorcycling. Younger motorcyclists have a much higher risk than older ones.

Figure 14: Average number of motorcyclist deaths or injuries in crashes per distance motorcycled, by age (2009–2014)

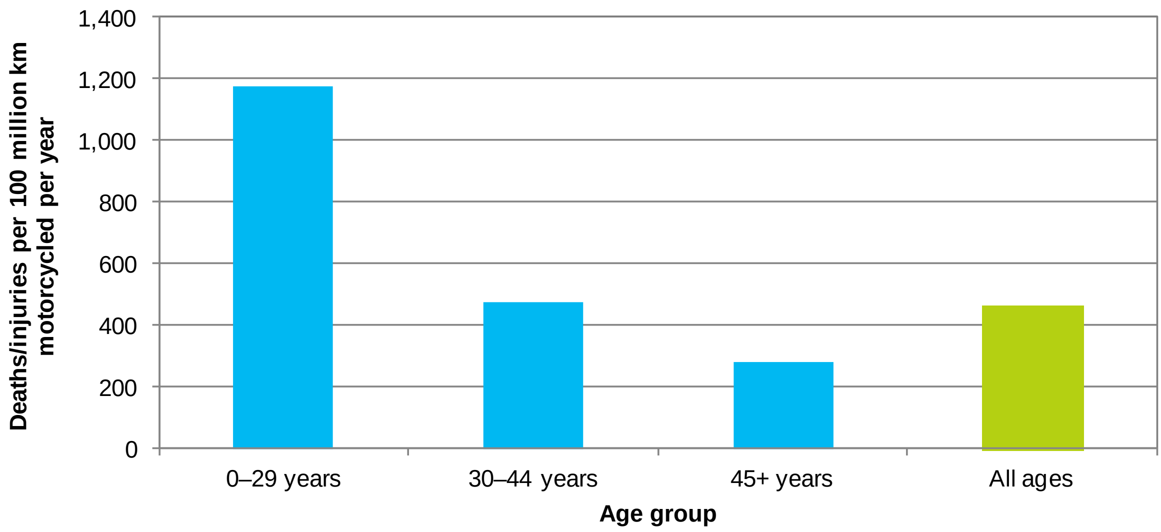
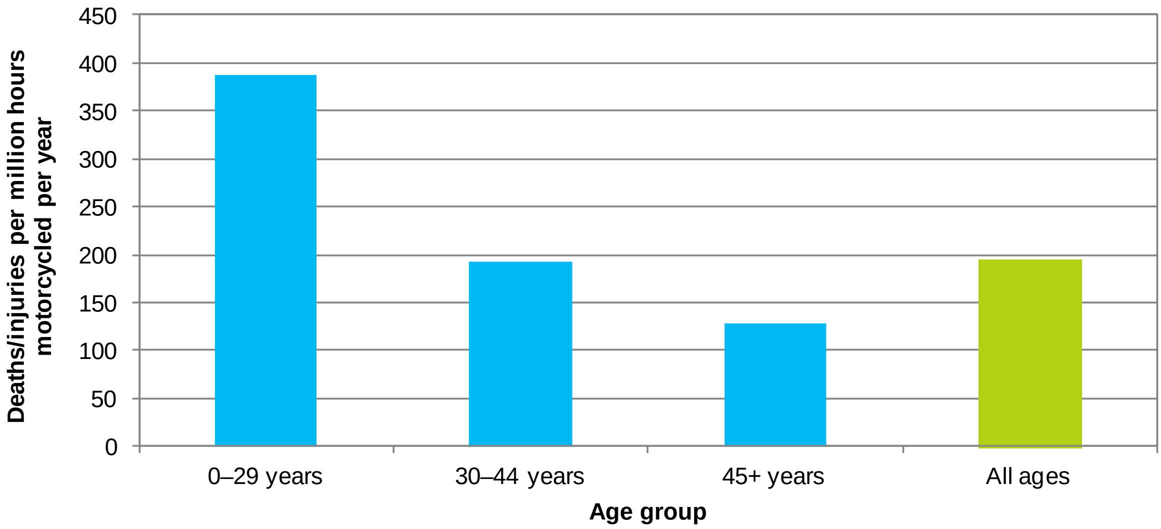


Figure 15: Average number of motorcyclist deaths or injuries in crashes per time spent motorcycling, by age (2009–2014)



There is also enough information to be able to compare risks for riding on urban roads and the open road (speed limit over 70km/h). Table 5 shows the travel and crash data for the five years July 2009–June 2014.

Table 5: Motorcyclist travel, deaths and injuries and associated risks by road type

(2009–2014)	Open road	Urban road	Overall
Trip legs in sample[1]			*1,089*
Million km per year[2]	187.5	63.8	263.5
Deaths per year	32	12	44
Deaths/injuries per year	475	762	1,237
Deaths per 100 million km	17	18	17
Deaths/injuries per million km	2.5	11.9	4.7

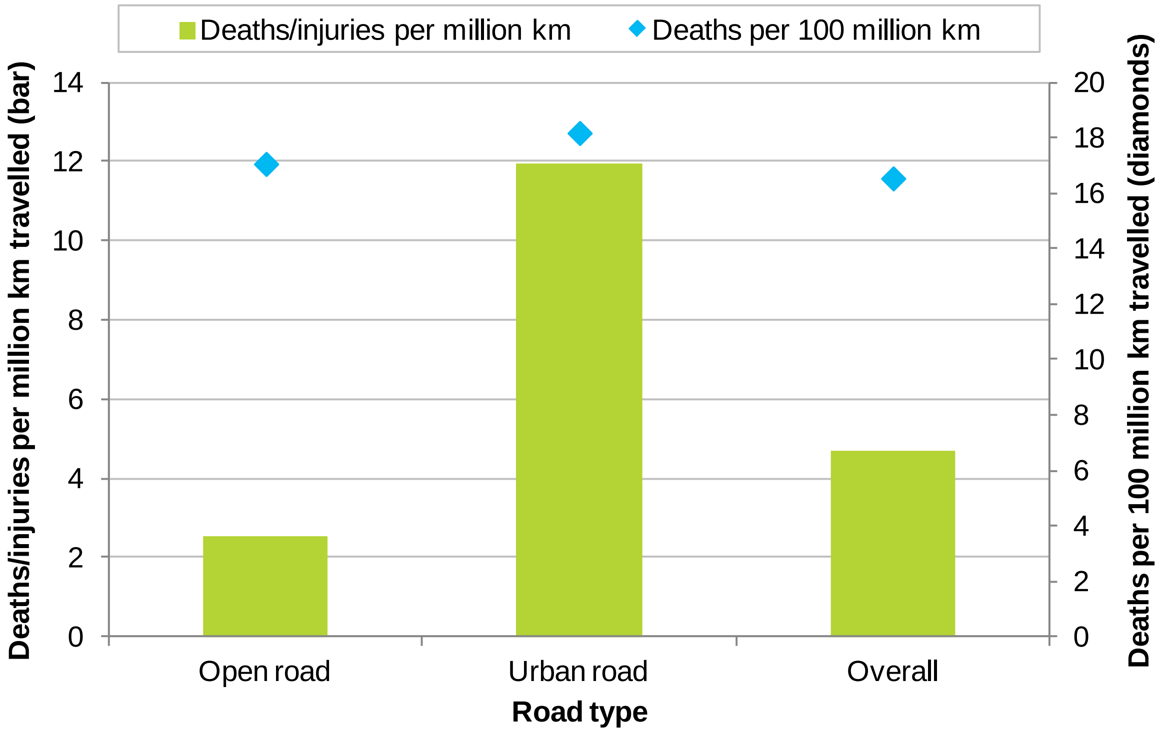
Nearly three quarters of motorcyclist deaths in New Zealand occurred on the open road but less than forty percent of all deaths and injuries occurred there. About three-quarters of the distance travelled was on the open road.

For the same distance travelled, risk of death is very similar on the open road and in urban areas. For injuries the risk is much higher for urban areas than on the open road (Figure 16). This difference reflects the fact that the higher speeds at which crashes occur on the open road are more likely to result in death than the lower speed crashes on urban roads.

[1] A single trip leg may include travel on both urban and open roads.

[2] Overall may not be exactly the sum of Open road and Urban road because a small amount of travel is on roads of unknown type.

Figure 16: Motorcyclist death and death/injury risk per distance travelled by road type (2009–2014)



Glossary

Cycle	Excludes off-road activities such as mountain biking.
Driver	In this fact sheet refers to all drivers of light 4 wheeled vehicles (cars, vans, utes, and SUVs).
Injuries	This includes more serious injuries such as fractures, concussions, internal injuries, crushings, severe cuts and lacerations, severe general shock necessitating medical treatment and any other injury involving removal to and detention in hospital, and injuries of a minor nature such as sprains and bruises.
Light 4 wheeled vehicles	Cars, station wagons, vans, utes, or SUVs.
Motorcyclist	Includes scooters.
SUV	Sports utility vehicle. Used in this report to refer to light passenger vehicle with high wheel base and distinctive body shape. Normally, but not always, four wheel drive.
Travel	Includes all on-road travel by any mode; any walk which involves crossing a road or walking for 100 metres or more along a public footpath or road; cycling on a public road or footpath; some air and sea travel. Excludes off-road activities such as tramping, mountain biking, walking around the mall or around the farm.
Travel mode	The method of travel. Includes vehicle driver, vehicle passenger, pedestrian, cyclist, motorcycle rider or passenger, bus or train passenger, ferry or aeroplane passenger, and other modes (eg horse riding).
Trip distance	For road-based trips, distances are calculated by measuring the distance from the start address along the roads to the finish address by the quickest (not necessarily the shortest) route. If the respondent states that the quickest route was not used, the interviewer records an intermediate point which is then used in mapping the route.
Trip leg	A single leg of a journey, with no stops or changes in travel mode. For example, driving from home to work with a stop at a shop, is two trip legs; one ending at the shop and one ending at work. This does not include trips where people walk less than 100 metres without crossing a road, trips on private property that start and end at the same place without

	crossing a road, and off-road round trips.
Walk	Includes walkers, joggers, skateboarders and children on tricycles.