Australian Government
Department of Infrastructure and Regional Development
Bureau of Infrastructure, Transport and Regional Economics

Road safety of older Australians: recent statistics

Summary

Demographic and economic changes in Australia are disproportionately impacting road safety fatality outcomes for older people. While the growth in population and numbers of licence-holders exceeds the growth in fatalities for all ages, there have been consistent reductions in deaths of younger people but flat trends and recent increases in deaths of older people. These recent increases appear mainly in driver and motorcyclist fatalities. Hospitalisation statistics (to 2009) show increasing trends for all age groups.

The types of fatal crashes involving an older operator differ from fatal crashes which do not. The aggregated data presented here confirm previous findings that intersections are over-represented, as are multiple vehicle crashes. Run-off-the-road (often high-speed) crashes are under-represented. These and other related results are explored in greater depth in the list of references provided.

Introduction

This BITRE Information Sheet collates the latest available national data on casualty road crashes involving older Australians. Each year in Australia 250 people aged 65 and over die from road crashes and approximately 4,000 more are hospitalised. There is evidence of recent increasing annual trends in these age groups.

The structure of the paper is as follows: firstly an overview of fatality and hospitalisation data over the last decade is given. This is followed by recent exposure statistics and standardised rates, including population changes, driver licensing statistics and estimated vehicle-kilometres-travelled. A number of tables are then presented that compare characteristics of fatal crashes on the basis of the age of the vehicle operators. A *Suggested Reading* section is also included as a guide to previous research in the area.

The tables presented include an overview of the problem in Australia and overseas, as well as more detailed analysis of crashes involving older operators. The results corroborate those from recent literature, but provide an Australia-wide compilation of data.

The age groups used to compare 'older' road users with others vary depending on the availability of data. Australian fatality data is available with any age groups, and in this report, the main age groups used are 65-74 years, 65+ and 75+. Rakotonirainy et al. (2012), using crash data from Queensland, included age groups of 60-69, 70-79 and 80+, and Koppel et al. (2012), studying Victorian crash data, used 65+ years. The *National Road Safety Strategy 2011–2020* defines an 'older driver' as aged 65+ years (ATC 2011).

The crash data used has been extracted firstly from the Australian Road Deaths Database (ARDD)—a basic fatality resource based on the states and territories' road safety databases (Sections 2 and 3), and secondly, the National Crash database (NCD)— a database containing a greater depth of data but current to 2012, also from the states and territories (Section 4). Non-fatal (hospitalisation) data has been sourced from the Australian Institute of Health and Welfare (AIHW) National Injury Surveillance Unit.

An overview of recent fatality and hospitalisation data

This section presents raw fatality and hospitalisation counts for the last ten years. The trends in annual deaths over time are compared between age groups. Of particular note are the differences between the trends in road crash fatalities and those in road crash hospitalisation data.

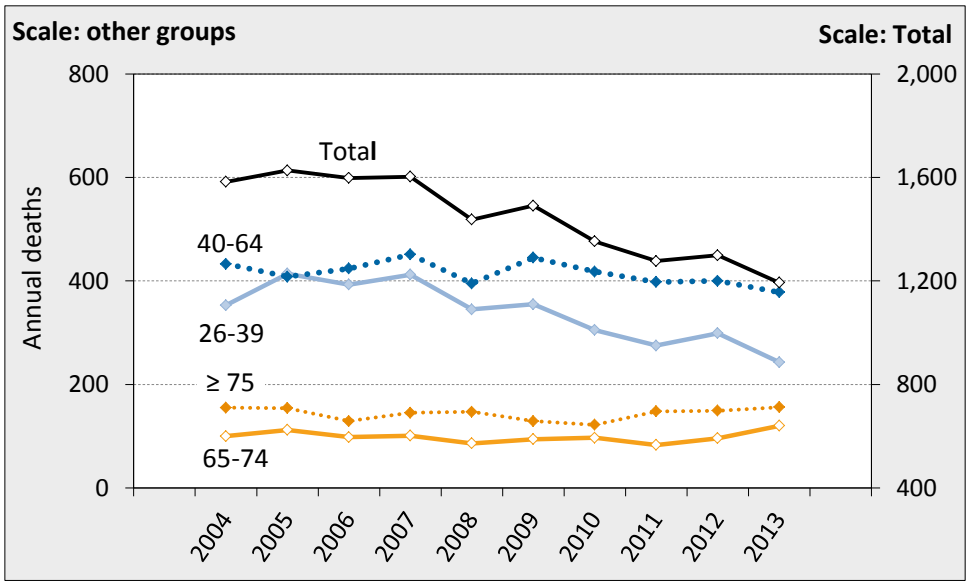
2.1 Data

Table 1: Annual fatalities by age group

Calendar	0–16	17–25	26–39	40–64	65–74	75–84	≥ 85	Total
2004	112	429	353	433	100	120	35	1,583
2005	110	426	414	408	112	107	47	1,627
2006	118	435	393	424	98	87	42	1,598
2007	101	392	412	451	101	101	44	1,603
2008	87	377	345	395	86	101	46	1,437
2009	106	362	355	445	94	82	47	1,491
2010	74	336	305	418	97	81	41	1,353
2011	93	280	275	398	83	98	50	1,277
2012	70	284	299	400	96	93	56	1,299
2013	66	229	243	378	120	102	54	1,193
Total change	-41%	-47%	-31%	-13%	20%	-15%	54%	-24.6%

Source: ARDD (2014a)

Figure 1: Annual fatalities for selected age groups

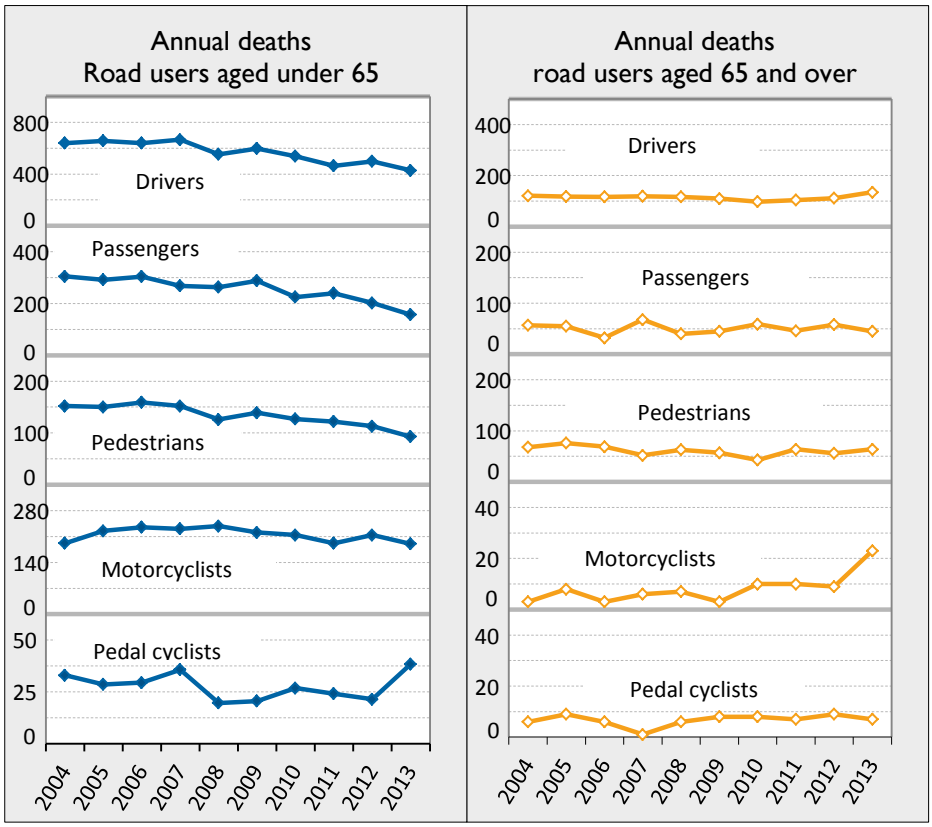


Source: ARDD (2014a)

Over the ten years, total annual deaths declined by 24.6 per cent, including a reduction of 11.8 per cent during the last three years. In contrast, deaths in the 65+ age group increased during the decade and especially so during the last three years.

Fatalities by road user type follow, with a comparison of two age groups: ages under 65 years and 65+ years. The following chart shows annual deaths for each road user group. Of the increases in the 65+ age group, most were drivers or motorcyclists, and occurred during the last three years. Motorcyclist deaths for people aged 65+ have climbed from 5 per year to 25 per year.

Figure 2: Annual fatalities: road user type within age groups



Source: ARDD (2014a)

The patterns above in fatalities over time and by road user group differ between older people and younger people. Such differences are not evident however in the available national hospitalisation data. The following table and chart present High Threat to Life (HTTL)[1] hospitalisations.

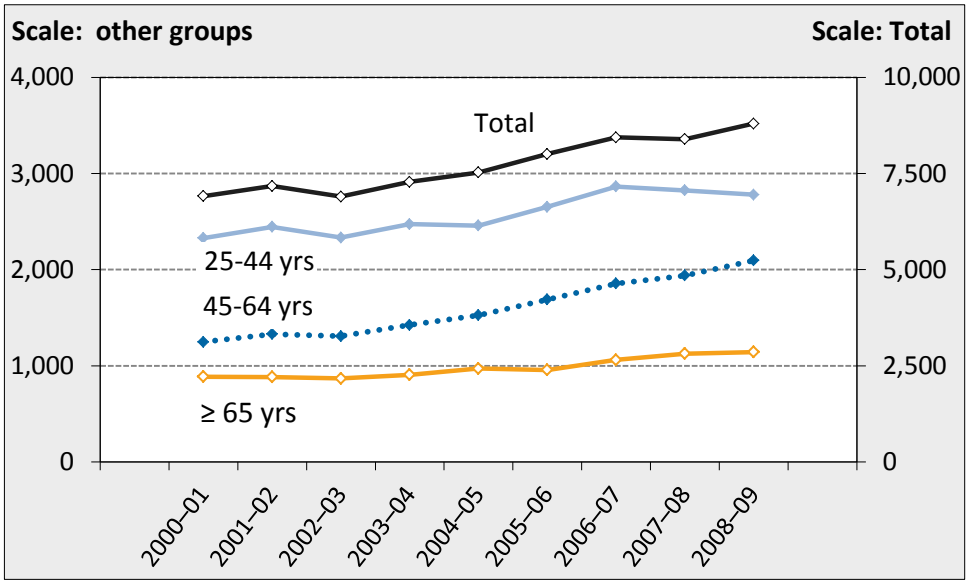
Table 2: Annual road crash HTTL hospitalizations by age group

	0–24	25–44	45–64	≥ 65	Total
2000-01	2,448	2,329	1,247	887	6,911
2001-02	2,517	2,445	1,330	883	7,175
2002-03	2,390	2,333	1,308	868	6,899
2003-04	2,479	2,473	1,424	907	7,283
2004-05	2,574	2,458	1,525	971	7,528
2005-06	2,708	2,654	1,689	956	8,007
2006-07	2,659	2,865	1,855	1,062	8,441
2007-08	2,501	2,825	1,939	1,126	8,392
2008-09	2,779	2,780	2,096	1,143	8,798
Total change	13.5%	19.4%	68.1%	28.9%	27.3%

Source: Henley et al (2012)

All age groups show increases in annual HTTL counts, with the largest increase occurring in the 45-64 years age group.

Figure 3: Annual HTTL hospitalisations for selected age groups

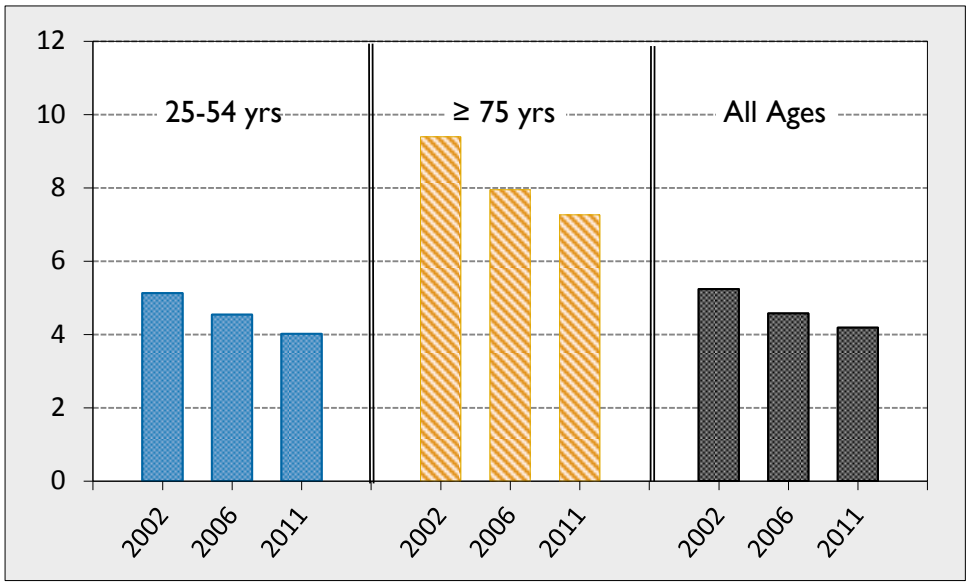


Source: Henley et al (2012)

[1] High threat to life (HTTL) hospitalisations are a subset comprised of the most severely injured persons. See (Henley et al.] for a definition.

The next chart shows patient days from all road crash injuries by age group.

Figure 4: Patient-days from road crash hospitalizations by age group

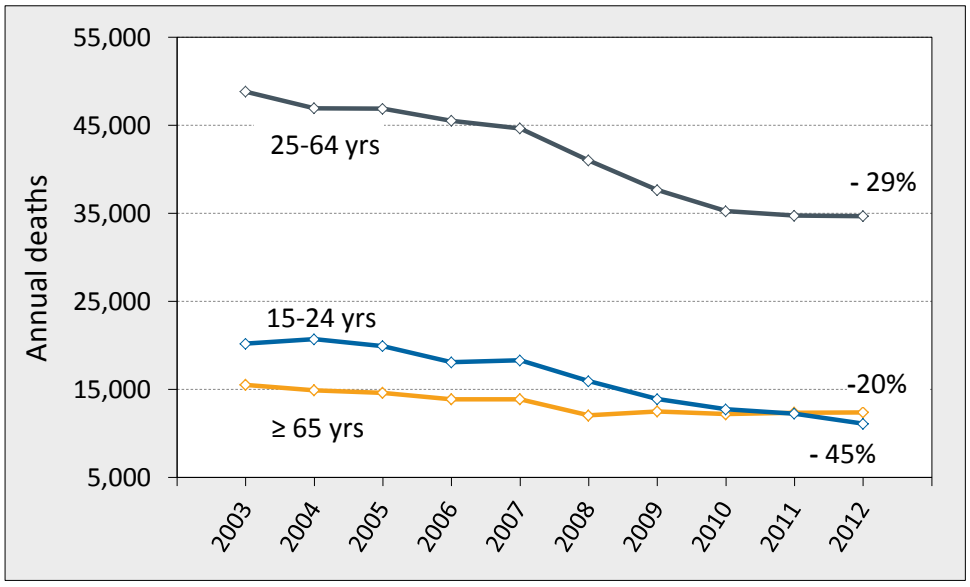


Source: National Injury Surveillance Unit, AIHW data supplied to BITRE

Figure 4 highlights the disproportionate impact of road crash injuries on older people. A person aged 75+ injured and hospitalised in a road crash spends on average seven days in hospital, whereas for ages between 25 and 54, the average is (a still substantial) four days. Between 2002 and 2011, average patient-days declined by around 20 per cent for all age groups.

The final data in Section 2 concerns recent international fatalities across OECD countries. As before, key comparisons are between the trends over time for different age groups.

Figure 5: Annual deaths across OECD countries[2] by age group



Source: IRTAD (2014)

[2] The data presented comprises approximately 80 per cent of all fatalities occurring in the OECD.

For OECD countries, the total reduction during the decade in the older age groups (20 per cent) is significantly less than the reduction in younger age group deaths. The years included in Figure 5 are slightly different to Australia's data in Table 1, however this OECD reduction of 20 per cent appears stronger than the corresponding reduction for Australia. In the OECD, the 65+ age group now accounts for 20.7 per cent of total deaths, up from 17.5 per cent ten years earlier.

2.2 Summary

Over the decade to 2013 road crash fatalities have declined by 24.6 per cent. Fatalities of persons aged 65+ however have *increased* by 8 per cent. Most people who are killed in road crashes are vehicle occupants: this proportion is similar for older and younger people. There are comparatively fewer motorcyclist and pedal cyclist deaths in the older ages and more pedestrians.

The Australian fatality trends by age group are similar to the bulk of OECD countries: deaths of younger road users have fallen more quickly than those aged 65+.

Hospitalisation HTTL statistics (to 2009) show different trends to fatalities: *increases* are evident for all age groups, with the total 27 per cent higher in 2009 than in 2001. On average older patients spend a lot longer in hospital than younger patients.

Exposure and rates

Firstly, this section presents exposure data. Included here are population counts, driver licence counts and vehicle-kilometres-travelled (VKT). Where available, national data is used. Following the exposure data, rates of annual deaths per population and annual HTTL hospitalisation per population are presented.

3.1 Data

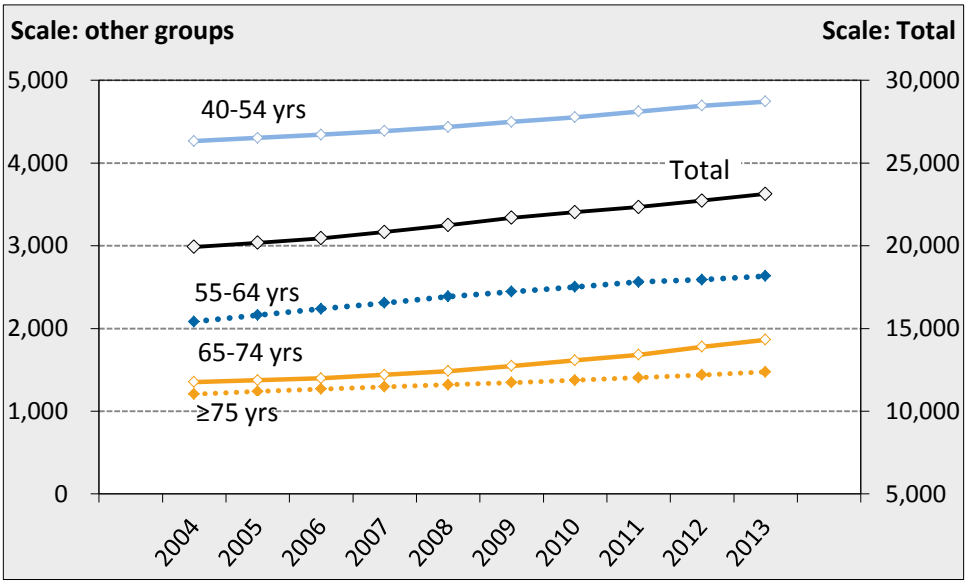
Table 3: Population (000s) by age group

	0–25	26-39	40–54	55–64	65–74	75–84	≥ 85	Total
June 2004	6,990	4,040	4,270	2,080	1,350	920	1,210	19,930
June 2013	7,820	4,600	4,740	2,630	1,860	1,040	1,480	23,140
Total change	11.9%	13.8%	11.2%	26.5%	37.7%	12.6%	53.6%	16.1%

Source: ABS (2013a)

Table 3 and Figure 6 show Australian Bureau of Statistics' population data over the last decade by age group. The population of people aged 75+ has grown by 22.4 per cent. In comparison, the total Australian population has grown by 16.1 per cent. People aged less than 65 years account for 86 per cent of the total, down from 87 per cent ten years ago.

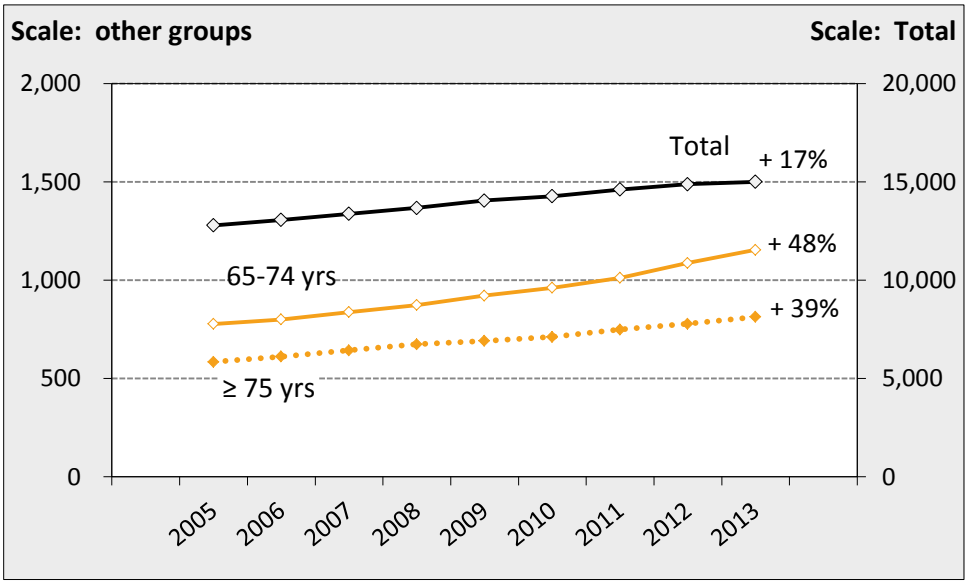
Figure 6: Population (000s) for selected age groups



Source: Source: ABS (2013a)

The next two figures present licence count data by age group over time[3]. The raw counts are shown in Figure 7 and are standardised by adult population in Figure 8.

Figure 7: Licences (thousands) by age group

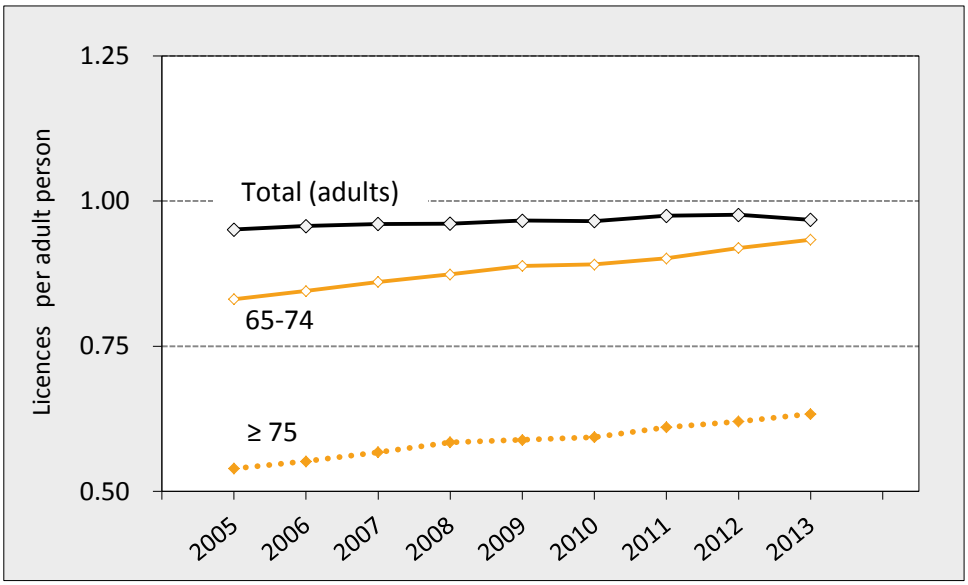


Source: State and Territory registration and licencing agencies

[3] The data shown compiled available state/territory data. Not all jurisdictions are included.

Total licence counts have increased by 17 per cent over the last decade, and for the 65+ age group, the increase was 44 per cent. There has been an acceleration over the last two years in the 65-74 age group, an effect which is also seen in the population counts.

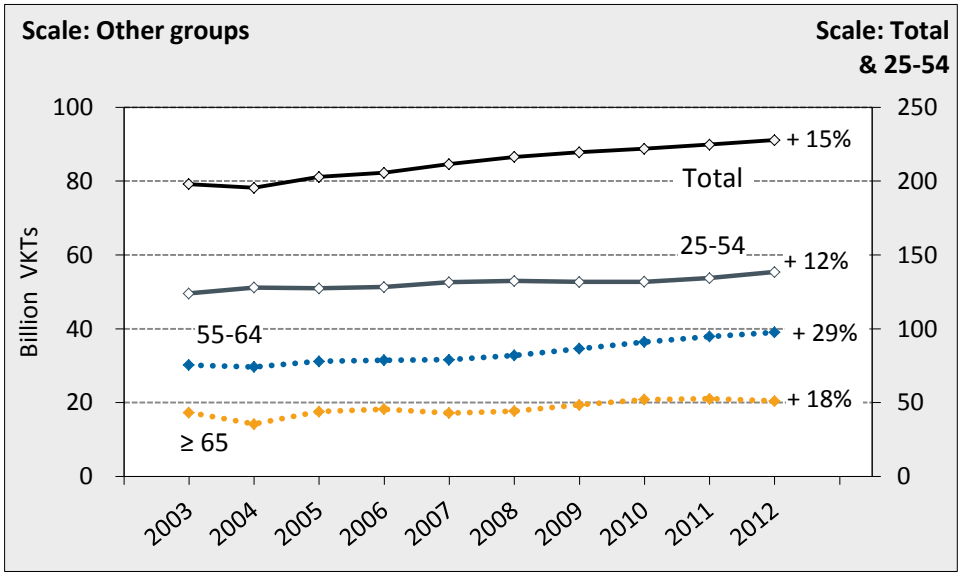
Figure 8: Licences[4] per person by age group



Sources: based on ABS (2013a) and state/territory driver licensing authorities

Licence counts per person are higher in the ages under 65, but this rate is increasing quickly for the age group 65+. The final two collations of exposure data show estimates of VKT by age group.

Figure 9: Annual VKT (billions) by age group

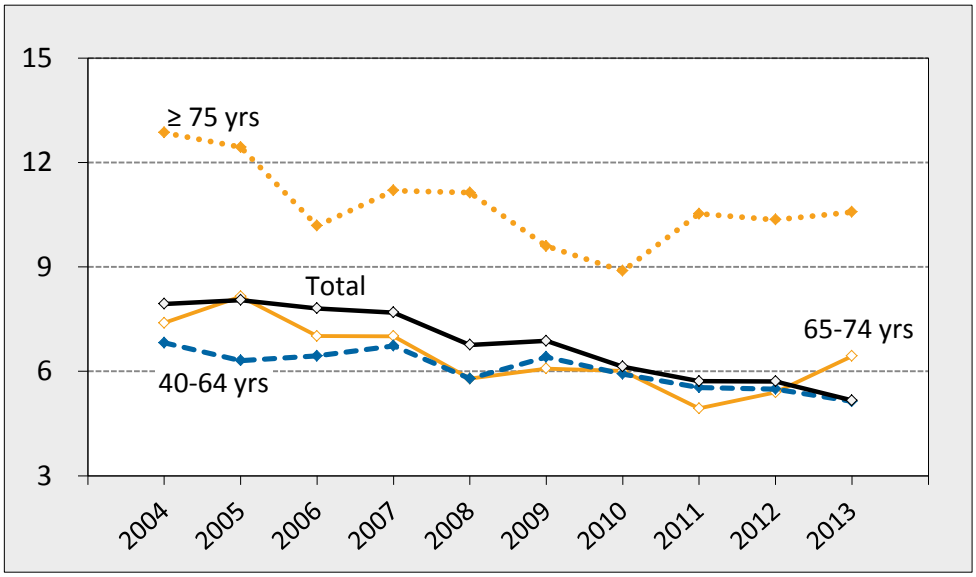


Source: based on ABS (2013b)

[4] Includes all active licences

Estimated VKT in the older age group (65+ years) has increased, but not as much as licence counts or population. Next, the road crash fatality rates and HTTL injury rates per 100,000 population are shown.

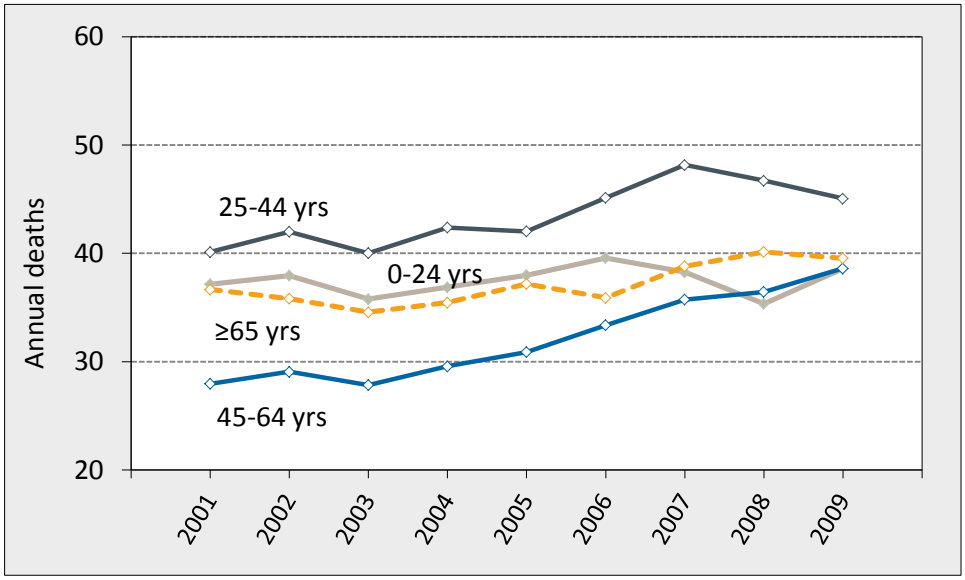
Figure 10: Annual fatality rate per 100,000 population for selected age groups



Source: ARDD (2014) and ABS (2013a)

The fatality rate per population for the 75+ age group is much higher than both the middle aged groups and the total. The rate for the 65-74 group remains largely in line with 40-64 age group, except for the last two years during which it increased.

Figure 11: Annual HTTL hospitalisation rate per 100,000 population for selected age groups



Source: Henley et al. (2012) and ABS (2013a)

As seen in Figure 11, the trend in HTTL hospitalisations per population increases most strongly in the 45-64 years age group.

3.2 Summary

The population for groups 65–74 years and 85+ are growing faster than that of other age groups. Counts of drivers' licences in the 65+ age group are growing more strongly than population growth. Over 60 per cent of people aged 75+ years and over have a drivers licence, up from 54 per cent ten years ago.

Over the decade, the rates of annual fatalities per population have fallen for all age groups. More recently for older people however they have increased. For HTTL injuries the rates per population have increased for all age groups above 24 years.

Older-driver-involved fatal crashes

The following tables compare crashes that involve an older operator[5] with those that do not. This differs from the data in Section 2 which tabulated data by age of the person killed or injured. Fault or contributing factors in the crash are not necessarily allocated to the older driver. Shown first is counts of fatalities, and then this is followed by comparisons of crash characteristics[6]. The source for this section is the National Crash Database (BITRE).

4.1 Data

Table 4. Fatal crashes and fatalities

Crashes with at least one operator aged ≥ 65 yrs

	Crashes	Fatalities
2008	191	218
2009	184	211
2010	191	207
2011	190	202
2012	207	233

All other crashes

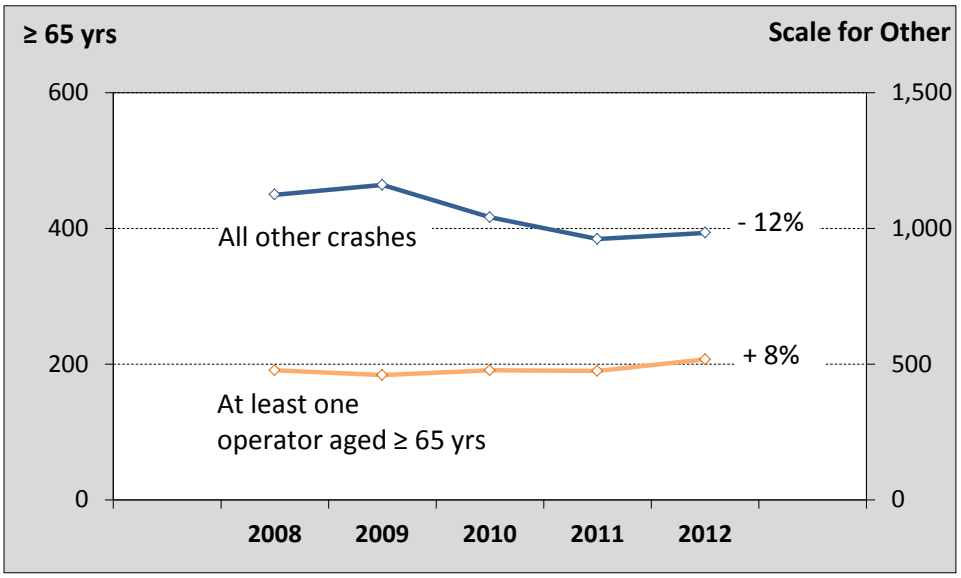
	Crashes	Fatalities
2008	1,124	1,219
2009	1,160	1,277
2010	1,041	1,145
2011	961	1,076
2012	984	1,068

Source: BITRE (2014b)

[5] 'Operator' comprises drivers, motorcycle riders and pedal cyclists

[6] A number of tables quote a χ^2 statistic to test row-equivalence or column-equivalence: the year dimension is collapsed, resulting in a two dimensional table comparing fatal crashes involving older-operators with those that do not. The statistic is calculated on this summarised table. A value much larger than its degrees of freedom indicates significance.

Figure 12. Annual numbers of fatal crashes : involvement of older operators



Source: BITRE (2014b)

Of all fatal crashes, 17 per cent involve an older operator (up from 15 per cent five years ago). This proportion is similar to that quoted for the 60+ age group for all serious crashes in a recent study in Queensland, Rakotonirainy (2012).

Table 5. Road user type of killed person

At least one operator ≥ 65 yrs

	Driver	Passenger	Pedestrian	Motorcyclist	Pedal cyclist	Total
2008	62%	22%	6%	7%	3%	**100%**
2009	62%	23%	5%	6%	4%	**100%**
2010	53%	22%	11%	10%	4%	**100%**
2011	60%	18%	7%	10%	4%	**100%**
2012	59%	21%	6%	9%	5%	**100%**
Average	**59%**	**21%**	**7%**	**8%**	**4%**	**100%**

All other crashes

	Driver	Passenger	Pedestrian	Motorcyclist	Pedal cyclist	Total
2008	43%	21%	15%	19%	2%	**100%**
2009	45%	22%	14%	17%	2%	**100%**
2010	46%	21%	13%	18%	3%	**100%**
2011	42%	23%	16%	17%	3%	**100%**
2012	44%	20%	15%	19%	2%	**100%**
Average	**44%**	**22%**	**15%**	**18%**	**2%**	**100%**

χ^2 = 152, (df = 4)

Source: BITRE (2014b)

In crashes involving an older driver, 80 per cent involve the death of a motor vehicle occupant (driver or passenger). This compares with 66 per cent for other fatal crashes. The differences between the two collapsed tables are statistically significant.

Table 6. Number of vehicles involved in crash

At least one operator ≥ 65 yrs

	Number of vehicles involved			
	1	2	> 2	Total
2008	29%	53%	18%	100%
2009	32%	55%	13%	100%
2010	31%	54%	14%	100%
2011	31%	58%	12%	100%
2012	31%	50%	19%	100%
Average	31%	54%	15%	100%

All other crashes

	Number of vehicles involved			
	1	2	> 2	Total
2008	61%	33%	5%	100%
2009	60%	34%	6%	100%
2010	56%	37%	7%	100%
2011	58%	35%	7%	100%
2012	56%	38%	6%	100%
Average	58%	35%	6%	100%

$\chi^2 = 270$, (df = 2)

Source: BITRE (2014b)

A fatal crash involving an older operator is much more likely to be a multi-vehicle crash. This confirms the results of previously published findings, including OECD (2001).

Table 7. Location at intersection

At least one operator ≥ 65 yrs

	Intersection Crash		
	Yes	No	Total
2008	39%	61%	100%
2009	28%	72%	100%
2010	34%	66%	100%
2011	30%	70%	100%
2012	30%	70%	100%
Average	32%	68%	100%

No operator ≥ 65 yrs

	Intersection Crash		
	Yes	No	Total
22%	78%	100%	
18%	82%	100%	
19%	81%	100%	
21%	79%	100%	
21%	79%	100%	
20%	80%	100%	

$\chi^2 = 67.9$ (df=1)

Source: BITRE (2014b)

Fatal crashes involving an older operator are more likely to occur at an intersection.

Table 8. Crash type[7] (excludes South Australia)

At least one operator ≥ 65 yrs

Crash type	2008	2009	2010	2011	2012	Average
Pedestrian	6%	4%	10%	7%	5%	6%
Adjacent-Intersection	20%	10%	17%	12%	13%	15%
Opposing	30%	27%	26%	30%	25%	28%
Same Direction	5%	10%	8%	9%	10%	8%
Manoueuvring	3%	7%	6%	6%	5%	5%
Overtaking	3%	4%	3%	4%	1%	3%
On Path	3%	4%	2%	1%	2%	2%
Off Path -Straight	15%	15%	13%	10%	16%	14%
Off Path - Curve	7%	10%	7%	11%	7%	8%
Other/Unknown	7%	9%	8%	11%	16%	10%
Total	100%	100%	100%	100%	100%	100%

No operator ≥ 65 yrs

Crash type	2008	2009	2010	2011	2012	Average
Pedestrian	14%	14%	12%	15%	15%	14%
Adjacent-Intersection	5%	4%	5%	6%	5%	5%
Opposing	15%	17%	19%	17%	18%	17%
Same Direction	4%	4%	4%	4%	5%	4%
Manoueuvring	2%	2%	2%	1%	2%	2%
Overtaking	2%	3%	3%	3%	3%	3%
On Path	2%	2%	3%	3%	1%	2%
Off Path -Straight	25%	21%	22%	21%	23%	22%
Off Path - Curve	22%	24%	21%	21%	21%	22%
Other/Unknown	9%	9%	9%	10%	7%	9%
Total	100%	100%	100%	100%	100%	100%

χ^2 = 393 (df= 10)

Source: BITRE (2014b)

As shown in Table 8, a fatal crash where there is no older driver involved is more likely to be a single-vehicle off-path crash. Older operator involvement tends to be at intersections, and with two involved vehicles either head-on or adjacent. A more detailed analysis of crash type is provided in Koppel et al. (2011).

[7] Crash type is based on jurisdiction DCA or RUM codes

4.2 Summary

There are qualitative differences between crashes involving older operators with those that do not: a greater proportion of the former occur at intersections and also, on average, involve more than one vehicle. In older operator-involved crashes, 80 per cent of the killed people are vehicle occupants, which is a significantly higher proportion than found in other crashes. This could however be explained by there being fewer motorcyclists and pedal cyclists in the older age groups.

References and suggested reading

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