



Australian Government

Department of Infrastructure, Transport, Regional Development and Communications

Bureau of Infrastructure and Transport Research Economics

STATISTICAL REPORT



bitre

Safety

**International road safety comparisons
2018**

© Commonwealth of Australia 2020

ISSN: 1447-8218

Ownership of intellectual property rights in this publication

Unless otherwise noted, copyright (and any other intellectual property rights, if any) in this publication is owned by the Commonwealth of Australia (referred to below as the Commonwealth).

Disclaimer

The material contained in this publication is made available on the understanding that the Commonwealth is not providing professional advice, and that users exercise their own skill and care with respect to its use, and seek independent advice if necessary.

The Commonwealth makes no representations or warranties as to the contents or accuracy of the information contained in this publication. To the extent permitted by law, the Commonwealth disclaims liability to any person or organisation in respect of anything done, or omitted to be done, in reliance upon information contained in this publication.

Creative Commons licence

With the exception of (a) the Coat of Arms; and (b) the Department of Infrastructure's photos and graphics, copyright in this publication is licensed under a Creative Commons Attribution 3.0 Australia Licence.

Creative Commons Attribution 3.0 Australia Licence is a standard form licence agreement that allows you to copy, communicate and adapt this publication provided that you attribute the work to the Commonwealth and abide by the other licence terms. A summary of the licence terms is available from <http://creativecommons.org/licenses/by/3.0/au/deed.en>. The full licence terms are available from <http://creativecommons.org/licenses/by/3.0/au/legalcode>.

Use of the Coat of Arms

The Department of the Prime Minister and Cabinet sets the terms under which the Coat of Arms is used. Please refer to the Department's Commonwealth Coat of Arms and Government branding web page <http://www.dpmc.gov.au/guidelines/index.cfm#brand> and, in particular, the Guidelines on the use of the Commonwealth Coat of Arms publication.

An appropriate citation for this report is:

Bureau of Infrastructure and Transport Research Economics (BITRE), 2020, *International road safety comparisons 2018* BITRE, Canberra ACT.

Contact us

This publication is available in PDF format. All other rights are reserved, including in relation to any Departmental logos or trade marks which may exist. For enquiries regarding the licence and any use of this publication, please contact:

Bureau of Infrastructure and Transport Research Economics (BITRE)
Department of Infrastructure, Transport, Regional Development and Communications
GPO Box 501, Canberra ACT 2601, Australia
Telephone: (international) +61 2 6274 7210
Fax: (international) +61 2 6274 6855
Email: roadsafety@infrastructure.gov.au
Website: www.bitre.gov.au

Bureau of Infrastructure and Transport Research Economics

International road safety comparisons 2018

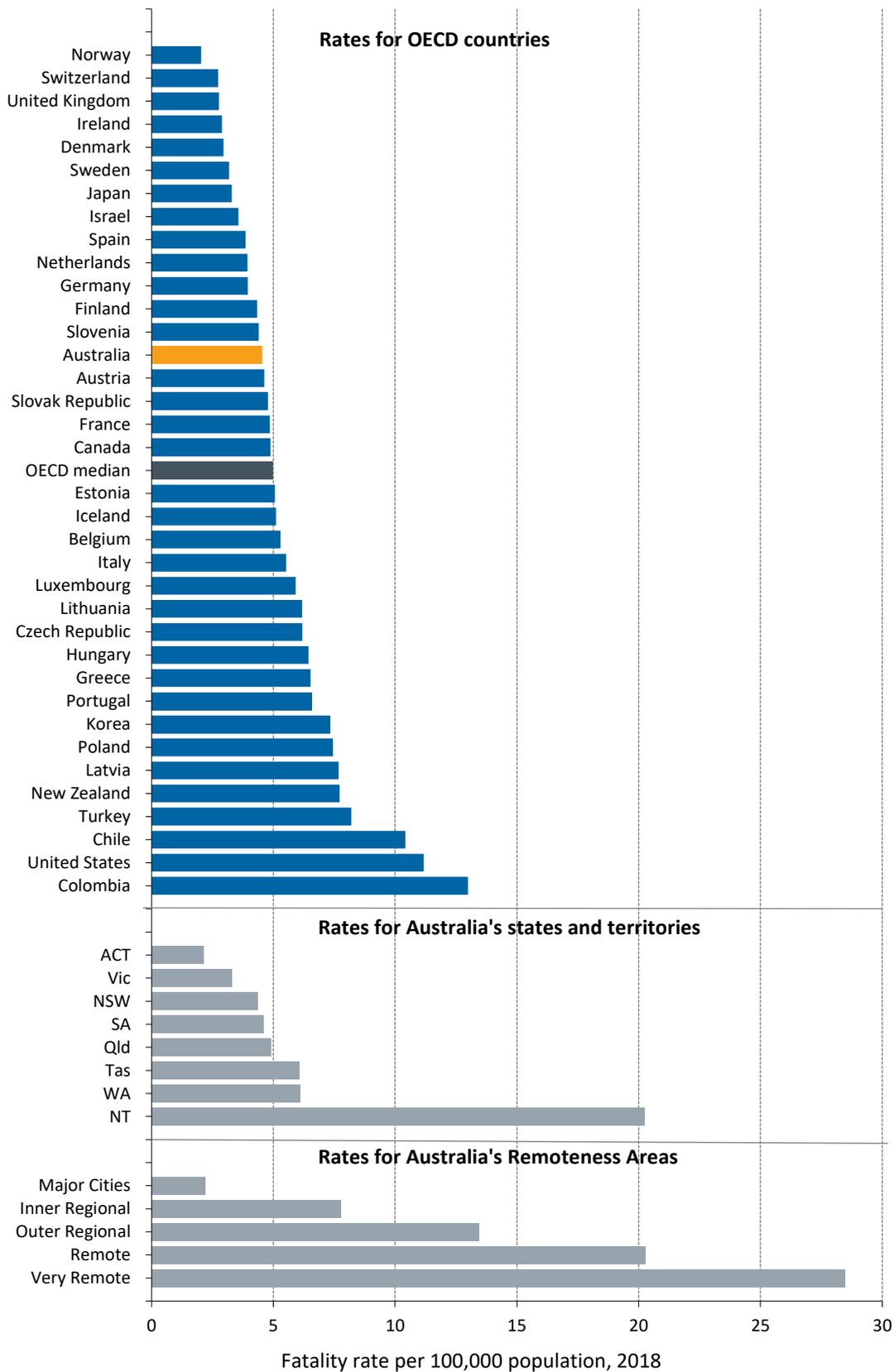
Department of Infrastructure, Transport, Regional Development and Communications
Canberra, Australia

At a glance

This report presents road deaths and road death rates for Organisation for Economic Co-operation and Development (OECD) nations and Australian states and territories. The rates allow for a comparison of Australia's road safety performance with that of other OECD nations by accounting for the differing levels of population, motorisation and distances travelled. The latest available international data is for 2018.

- In terms of the fatality rate per 100,000 population in 2018:
 - Australia's rate of 4.54 was the 14th lowest rate out of the 36 nations. The nations with the three lowest rates were Norway (2.03), Switzerland (2.74) and the United Kingdom (2.77) (Table 1.1).
 - Between 2009 and 2018 Australia's fatality rate declined by 34.0 per cent. Over the same period, the OECD median rate declined by 29.2 per cent (Figure 1.2).
 - The age groups with the highest fatality rates per population are 65 plus years (in 17 of 28 countries this age group had the highest rate) and 15-24 years (in 11 of 28 countries, this age group had the highest rate) (Table 1.4).
 - In Australia, rates vary significantly across Remoteness Areas classifications. Major City rates are consistently the lowest (2.20 in 2018) and Very Remote areas are consistently the highest (28.46 in 2018) (Figure 1.1).
- In terms of the fatality rate per 10,000 registered vehicles in 2018:
 - Australia's rate of 0.59 was the 11th lowest rate out of the 32 nations with available data. The nations with the three lowest rates were Norway (0.27), Switzerland (0.37) and Japan (0.46) (Table 2.1).
 - Between 2009 and 2018 Australia's fatality rate declined by 37.8 per cent. Over the same period, the OECD median rate declined by 30.4 per cent (Figure 2.2).
- In terms of the fatality rate per 100 million vehicle kilometres travelled (VKT) in 2018:
 - Australia's rate of 0.43 was the 7th lowest rate out of 19 nations with available data. The nations with the three lowest rates were Norway (0.23), Ireland (0.29) and Denmark (0.31) (Table 3.1).
 - Between 2009 and 2018 Australia's fatality rate declined by 34.9 per cent. Over the same period, the OECD median rate declined by 32.1 per cent (Figure 3.2).
- The three rates are highly correlated (approximately $r = 0.8$).
- In Australia in 2018 vulnerable road users (motorcyclist, pedestrian or pedal cyclist) accounted for 36 per cent of total road deaths, which is low compared to most other OECD countries. Across countries there is marked difference in this proportion: in New Zealand, Finland and Norway, it is under 34 per cent, whereas in Japan and Korea, vulnerable road users accounted for over 58 per cent of the total deaths (Table 1.3).

Figure 1.1 Fatality rate per 100,000 population – 36 OECD countries, Australian states/territories and Australia’s Remoteness Areas, 2018



Data sources

International data

The International Road Traffic Accident Database (IRTAD 2020) is the main source of fatality and exposure data in this report. IRTAD is maintained by the Joint Transport Research Centre of the OECD and the International Transport Forum. Each year member nations supply IRTAD with their most recent data, which may include revisions to historical data. Further information on IRTAD is available at <http://internationaltransportforum.org/irtadpublic/about.html>. In cases of particular countries where required data was not held by IRTAD, data was retrieved from the country's relevant government agency.

Australian data

Australian road fatality data in this report are based on two Bureau of Infrastructure and Transport Research Economics (BITRE) databases: the Australian Road Deaths Database (ARDD) and the National Crash Database (NCD). There are minor data differences between the two databases due to the timing differences in data receipt and ongoing validation by data providers. ARDD data are available at http://www.bitre.gov.au/statistics/safety/fatal_road_crash_database.aspx. ARDD data used in this report was current to July 2020.

Acknowledgements

The Department of Infrastructure, Transport, Regional Development and Communications acknowledges the provision of data from the following agencies:

Transport for New South Wales;
Department of Transport, Victoria;
Department of Transport and Main Roads, Queensland;
Department of Planning, Transport and Infrastructure, South Australia;
Western Australian Police;
Main Roads Western Australia;
Department of State Growth, Tasmania;
Department of Infrastructure, Planning and Logistics, Northern Territory;
Territory and Municipal Services Directorate, ACT.

Contents

At a glance	iii
Data sources	v
Acknowledgements	v
SECTION 1 Fatality rate per 100,000 population	1
SECTION 2 Fatality rate per 10,000 registered vehicles	9
SECTION 3 Fatality rate per 100 million vehicle kilometres travelled (VKT)	15
SECTION 4 Comparing the three measures	21
References	24

Tables

Table 1.1	Fatality rate per 100,000 population – 36 OECD countries and Australian states/territories, 2018	2
Table 1.2	Fatality rate per 100,000 population – OECD countries and Australian states/territories, 1990, 2000 and 2009 to 2018	4
Table 1.3	Distribution of deaths by road user group – 28 OECD countries and Australian states/territories, 2018.....	6
Table 1.4	Fatality rate per 100,000 population for age groups – 28 OECD countries and Australian states/territories, 2018.....	8
Table 2.1	Fatality rate per 10,000 registered vehicles – 32 OECD countries and Australian states/territories, 2018.....	10
Table 2.2	Fatality rate per 10,000 registered vehicles – OECD countries and Australian states/territories, 1990, 2000 and 2009 to 2018	12
Table 3.1	Fatality rate per 100 million vehicle kilometres travelled (VKT) – 19 OECD countries and Australian states/territories, 2018	16
Table 3.2	Fatality rate per 100 million vehicle kilometres travelled (VKT) – OECD countries and Australian states/territories, 1990, 2000 and 2009 to 2018..	18
Table 4.1	Correlation between exposure measures.....	22
Table 4.2	Correlation between rates.....	22

Figures

Figure 1.1	Fatality rate per 100,000 population – 36 OECD countries, Australian states/territories and Australian Remoteness Areas, 2018	3
Figure 1.2	Fatality rate per 100,000 population – OECD quartiles and Australia, 2009 to 2018	5
Figure 1.3	Distribution of deaths by road user group – 28 OECD countries and Australian states/territories, 2018.....	7
Figure 2.1	Fatality rate per 10,000 registered vehicles – 32 OECD countries and Australian states/territories, 2018.....	11
Figure 2.2	Fatality rate per 10,000 registered vehicles – OECD quartiles and Australia, 2009 to 2018	13
Figure 3.1	Fatality rate per 100 million vehicle kilometres travelled (VKT) – 19 OECD countries and Australian states/territories, 2018	17
Figure 3.2	Fatality rate per 100 million vehicle kilometres travelled (VKT) – OECD quartiles and Australia, 2009 to 2018.....	19
Figure 4.1	Population rates vs vehicle registration rates, 2018.....	22
Figure 4.2	Population rates vs vehicle kilometres travelled rates, 2018	23
Figure 4.3	Vehicle registration rates vs vehicle kilometres travelled rates, 2018.....	23

This page is intentionally left blank.

SECTION I

Fatality rate per 100,000 population

The fatality rate per population is a measure of the public health risk associated with road crashes.

Fatality rate per 100,000 population – OECD countries, 2018

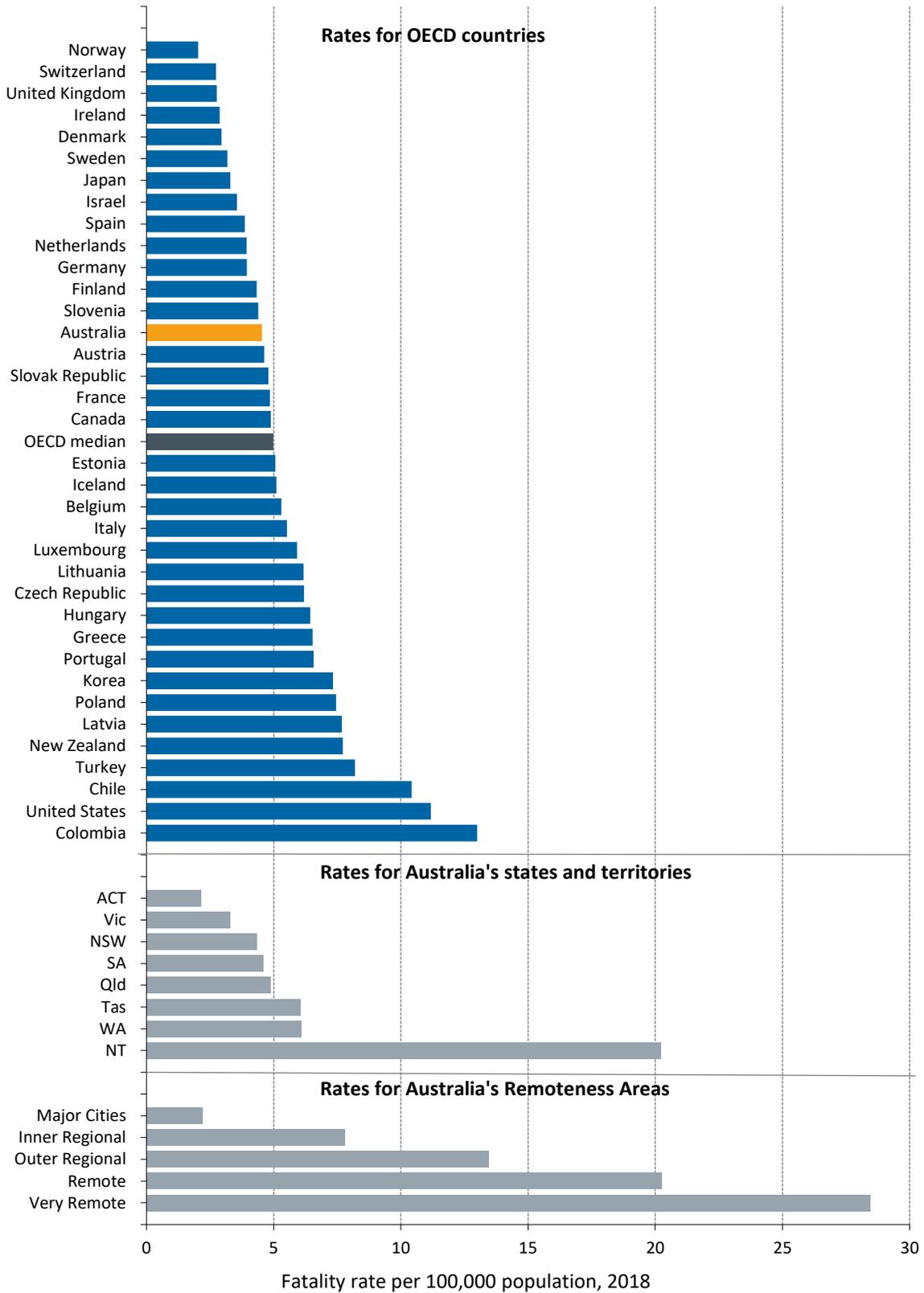
Table I.1 Fatality rate per 100,000 population – 36 OECD countries and Australian states/territories, 2018

<i>Nation</i>	<i>Road deaths</i>	<i>Population (000s)</i>	<i>Fatality rate per 100,000 population</i>
Norway	108	5,312	2.03
Switzerland	233	8,513	2.74
United Kingdom	1,839	66,436	2.77
Ireland	140	4,857	2.88
Denmark	171	5,790	2.95
Sweden	324	10,175	3.18
Japan	4,166	126,443	3.29
Israel	316	8,873	3.56
Spain	1,806	46,733	3.86
Netherlands	678	17,232	3.93
Germany	3,275	82,914	3.95
Finland	239	5,516	4.33
Slovenia	91	2,070	4.40
Australia	1,134	24,983	4.54
Austria	409	8,838	4.63
Slovak Republic	260	5,447	4.77
France	3,248	66,942	4.85
Canada	1,804	37,059	4.87
OECD median			4.97
Estonia	67	1,322	5.07
Iceland	18	353	5.10
Belgium	604	11,404	5.30
Italy	3,334	60,422	5.52
Luxembourg	36	608	5.92
Lithuania	173	2,802	6.18
Czech Republic	658	10,626	6.19
Hungary	629	9,768	6.44
Greece	700	10,726	6.53
Portugal	675	10,284	6.56
Korea	3,781	51,635	7.32
Poland	2,862	38,413	7.45
Latvia	148	1,927	7.68
New Zealand	377	4,886	7.72
Turkey	6,675	81,407	8.20
Chile	1,955	18,751	10.43
United States	36,560	327,167	11.17
Colombia	6,476	49,834	13.00
ACT	9	420	2.14
Vic	213	6,462	3.30
NSW	347	7,980	4.35
SA	80	1,737	4.61
Qld	245	5,009	4.89
Tas	32	528	6.06
WA	158	2,594	6.09
NT	50	247	20.24

Sources

ABS 2020a, Australian Road Deaths Database and IRTAD 2020

Figure I.1 Fatality rate per 100,000 population – 36 OECD countries, Australian states/territories and Australia's Remoteness Areas, 2018



Sources ABS 2020a, ABS 2020c, Australian Road Deaths Database and IRTAD 2020

OECD countries, 1990, 2000 and 2009 to 2018

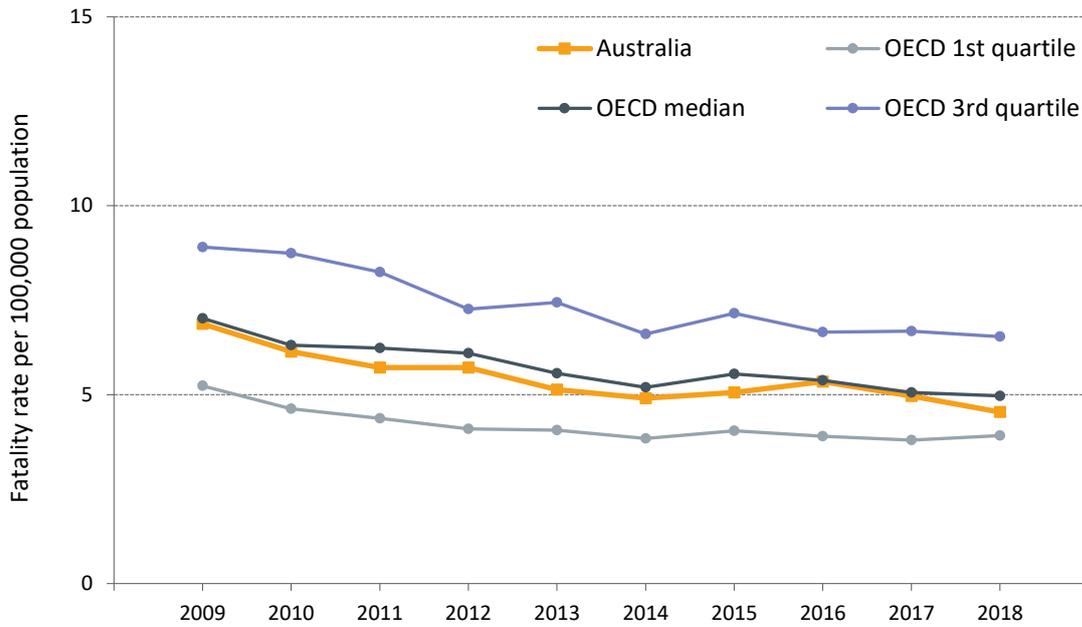
Table I.2 Fatality rate per 100,000 population – OECD countries and Australian states/territories, 1990, 2000 and 2009 to 2018

<i>Nation</i>	1990	2000	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Norway	7.8	7.6	4.4	4.3	3.4	2.9	3.7	2.9	2.3	2.6	2.0	2.03
Switzerland	13.8	8.2	4.5	4.2	4.0	4.2	3.3	3.0	3.1	2.6	2.7	2.74
United Kingdom	9.4	6.1	3.8	3.0	3.1	2.8	2.8	2.9	2.8	2.8	2.8	2.77
Ireland	13.6	11.0	5.2	4.7	4.1	3.5	4.1	4.1	3.5	3.8	3.3	2.88
Denmark	12.3	9.3	5.5	4.6	4.0	3.0	3.4	3.2	3.1	3.7	3.0	2.95
Sweden	9.0	6.7	3.9	2.8	3.4	3.0	2.7	2.8	2.6	2.7	2.5	3.18
Japan	11.8	8.2	4.6	4.6	4.3	4.1	4.1	3.8	3.8	3.7	3.5	3.29
Israel	9.0	8.0	4.6	4.9	4.9	3.7	3.8	3.9	4.2	4.4	4.2	3.56
Spain	23.2	14.2	5.9	5.3	4.4	4.1	3.6	3.6	3.6	3.9	3.9	3.86
Netherlands	9.2	6.8	3.9	3.2	3.3	3.4	2.8	2.8	3.1	3.1	3.1	3.93
Germany	-	9.1	5.1	4.5	5.0	4.5	4.1	4.2	4.2	3.9	3.8	3.95
Finland	13.0	7.7	5.2	5.1	5.4	4.7	4.7	4.2	4.9	4.7	4.3	4.33
Slovenia	25.9	15.8	8.4	6.7	6.9	6.3	6.1	5.2	5.8	6.3	5.0	4.40
Australia	13.7	9.5	6.9	6.1	5.7	5.7	5.1	4.9	5.1	5.3	5.0	4.54
Austria	20.3	12.2	7.6	6.6	6.2	6.3	5.4	5.0	5.6	4.9	4.7	4.63
Slovak Republic	-	-	-	-	-	-	-	-	-	5.1	5.1	4.77
France	19.8	13.7	6.6	6.2	6.1	5.6	5.0	5.1	5.2	5.2	5.2	4.85
Canada	14.3	9.5	6.6	6.6	5.9	6.0	5.6	5.2	5.3	5.3	5.1	4.87
Estonia	27.8	14.8	7.5	5.9	7.6	6.6	6.1	5.9	5.1	5.4	3.6	5.07
Iceland	9.4	11.4	5.3	2.5	3.8	2.8	4.6	1.2	4.8	5.4	4.7	5.10
Belgium	19.8	14.3	8.9	7.8	8.0	7.5	6.9	6.7	6.8	5.9	5.4	5.30
Italy	12.6	12.4	7.2	6.9	6.5	6.3	5.6	5.6	5.6	5.4	5.6	5.52
Luxembourg	18.6	17.4	9.6	6.3	6.4	6.4	8.3	6.3	6.3	5.5	4.2	5.92
Lithuania	-	-	11.7	9.7	9.8	10.1	8.7	9.1	8.2	6.6	6.6	6.18
Czech Republic	12.5	14.5	8.6	7.6	7.4	7.1	6.2	6.5	7.0	5.8	5.4	6.19
Hungary	23.4	11.8	8.2	7.4	6.4	6.1	6.0	6.3	6.5	6.2	6.4	6.44
Greece	20.2	18.7	13.1	11.3	10.3	8.9	8.0	7.3	7.3	7.6	6.8	6.53
Portugal	29.3	20.0	8.8	8.9	8.4	6.8	6.1	6.1	5.7	5.5	5.8	6.56
Korea	33.1	21.8	11.8	11.1	10.5	10.7	10.1	9.4	9.1	8.4	8.1	7.32
Poland	19.3	16.5	12.0	10.1	10.9	9.3	8.7	8.3	7.6	7.9	7.4	7.45
Latvia	-	-	-	10.4	8.7	8.7	8.9	10.6	9.5	8.1	7.0	7.68
New Zealand	21.5	12.0	8.9	8.6	6.5	7.0	5.7	6.5	6.9	7.0	7.9	7.72
Turkey	-	-	6.0	5.5	5.2	5.0	4.8	4.6	9.6	9.2	9.2	8.20
Chile	15.7	14.3	11.6	12.1	11.8	11.3	11.9	11.9	11.9	12.0	10.5	10.43
United States	17.9	14.9	11.0	10.7	10.4	10.8	10.4	10.3	11.1	11.7	11.5	11.17
Colombia	-	-	12.5	11.4	12.1	12.7	13.2	13.3	14.2	14.7	13.63	13.00
ACT	9.2	5.7	3.4	5.3	1.6	3.2	1.8	2.6	3.8	2.5	1.2	2.14
Vic	12.5	8.7	5.4	5.3	5.2	5.0	4.2	4.2	4.2	4.7	4.1	3.30
NSW	13.7	9.4	6.4	5.7	5.0	5.1	4.5	4.1	4.6	4.9	4.9	4.35
SA	15.8	11.1	7.4	7.3	6.3	5.7	5.9	6.4	6.0	5.0	5.8	4.61
Qld	13.8	9.0	7.6	5.7	6.0	6.1	5.8	4.7	5.1	5.2	5.0	4.89
Tas	15.4	9.1	12.5	6.1	4.7	6.1	7.0	6.4	6.6	7.1	6.1	6.06
WA	12.2	11.3	8.5	8.4	7.6	7.5	6.5	7.3	6.3	7.6	6.2	6.09
NT	41.5	25.6	13.7	21.8	19.5	20.8	15.3	16.1	20.0	18.3	12.5	20.24

Sources

ABS 2020a, Australian Road Deaths Database and IRTAD 2020

Figure I.2 Fatality rate per 100,000 population – OECD quartiles and Australia, 2009 to 2018



Sources

ABS 2020a, Australian Road Deaths Database and IRTAD 2020

Proportion of road deaths by road user group – OECD countries, 2018

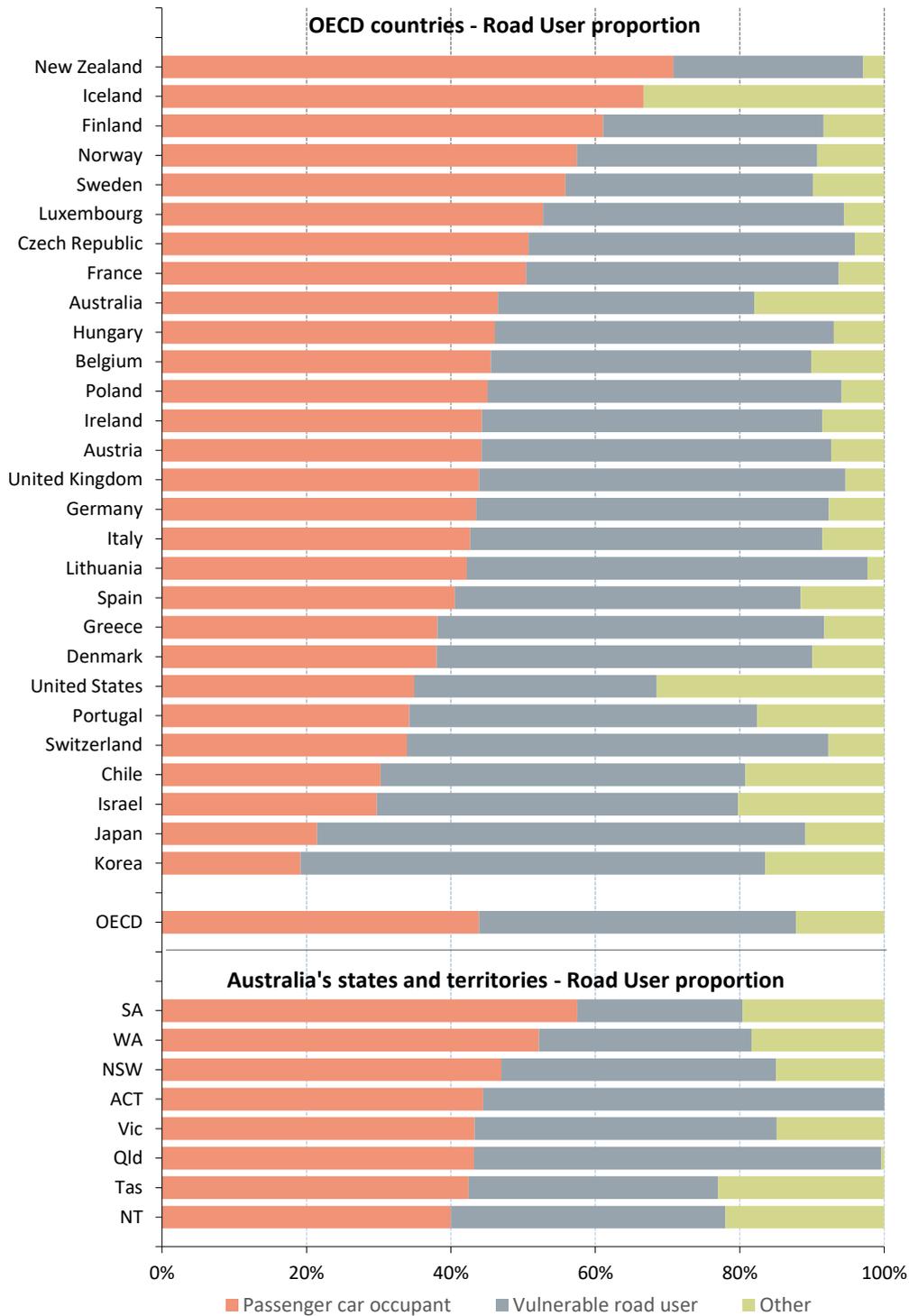
Table I.3 Distribution of deaths by road user group – 28 OECD countries and Australian states/territories, 2018

<i>Nation</i>	<i>Road User</i>				
	<i>Passenger car occupant</i>	<i>Pedestrian</i>	<i>Motorcyclist</i>	<i>Pedal cyclist</i>	<i>Other</i>
New Zealand	71%	11%	14%	1%	3%
Iceland	67%	0%	0%	0%	33%
Finland	61%	10%	11%	9%	8%
Norway	57%	12%	15%	6%	9%
Sweden	56%	10%	17%	7%	10%
Luxembourg	53%	8%	25%	8%	6%
Czech Republic	51%	22%	15%	9%	4%
France	50%	15%	23%	5%	6%
Australia	46%	16%	17%	3%	18%
Hungary	46%	26%	10%	11%	7%
Belgium	46%	12%	18%	15%	10%
Poland	45%	28%	11%	10%	6%
Ireland	44%	30%	11%	6%	9%
Austria	44%	11%	27%	10%	7%
United Kingdom	44%	26%	20%	5%	5%
Germany	43%	14%	21%	14%	8%
Italy	43%	18%	24%	7%	9%
Lithuania	42%	41%	9%	5%	2%
Spain	41%	21%	23%	3%	12%
Greece	38%	21%	31%	2%	8%
Denmark	38%	18%	18%	16%	10%
United States	35%	18%	14%	2%	31%
Portugal	34%	23%	21%	4%	18%
Switzerland	34%	21%	21%	16%	8%
Chile	30%	35%	9%	6%	19%
Israel	30%	31%	14%	5%	20%
Japan	21%	36%	17%	15%	11%
Korea	19%	39%	20%	5%	16%
OECD	44%	21%	17%	6%	12%
SA	58%	8%	13%	3%	20%
WA	52%	9%	18%	2%	18%
NSW	47%	20%	16%	3%	15%
ACT	44%	22%	22%	11%	0%
Vic	43%	14%	18%	10%	15%
Qld	43%	17%	18%	21%	0%
Tas	42%	9%	24%	1%	23%
NT	40%	22%	16%	0%	22%

Sources

ABS 2020a, IRTAD 2020 and National Crash Database

Figure I.3 Distribution of deaths by road user group – 28 OECD countries and Australian states/territories, 2018



Sources: ABS 2020a, IRTAD 2020 and National Crash Database

Fatality rate per 100,000 population by age groups – OECD countries, 2018

Table I.4 Fatality rate per 100,000 population for age groups – 28 OECD countries and Australian states/territories, 2018

<i>Nation</i>	<i>Age group</i>			
	<i>0-14</i>	<i>15-24</i>	<i>25-64</i>	<i>65 +</i>
Norway	0.11	2.41	2.15	3.46
Switzerland	0.87	2.61	2.21	6.00
United Kingdom	0.34	3.99	2.89	4.00
Ireland	0.30	4.51	3.13	4.49
Denmark	0.62	3.12	3.07	4.48
Sweden	0.39	3.36	3.06	5.98
Japan	0.50	2.60	2.19	6.71
Israel	1.28	5.16	3.42	7.52
Spain	0.36	4.57	4.08	5.54
Germany	0.71	5.14	3.75	5.90
Finland	0.56	6.89	3.97	6.70
Australia	0.72	6.78	4.82	6.21
Austria	0.24	5.15	4.76	7.35
France	0.74	8.05	5.23	6.54
Iceland	1.48	8.40	5.42	6.12
Belgium	0.72	5.68	5.60	7.93
Italy	0.42	7.04	5.19	7.78
Luxembourg	1.03	14.09	6.33	3.48
Lithuania	1.19	9.37	6.36	7.43
Czech Republic	1.32	8.61	6.48	8.19
Hungary	0.42	5.24	7.08	10.04
Greece	0.65	8.54	6.24	9.57
Portugal	0.42	6.68	6.65	10.21
Korea	0.62	3.47	5.87	22.82
Poland	0.97	10.85	7.66	10.76
New Zealand	1.48	12.49	7.73	10.98
Chile	1.98	10.76	12.22	13.97
United States	1.70	14.53	13.01	13.17
ACT	2.49	1.68	2.64	0.00
Vic	0.67	2.80	3.67	5.56
NSW	0.47	7.63	4.11	7.00
SA	0.98	8.24	4.26	6.57
Qld	0.92	7.46	5.45	5.84
Tas	0.00	14.19	6.37	5.77
WA	0.99	9.64	6.97	5.61
NT	0.00	27.75	25.24	26.65

Sources

ABS 2020a, Australian Road Deaths Database and IRTAD 2020

SECTION 2

Fatality rate per 10,000 registered vehicles

The fatality rate per registered vehicle is a means of comparing road deaths between countries by taking account of their different levels of motorisation.

Fatality rate per 10,000 registered vehicles – OECD countries, 2018

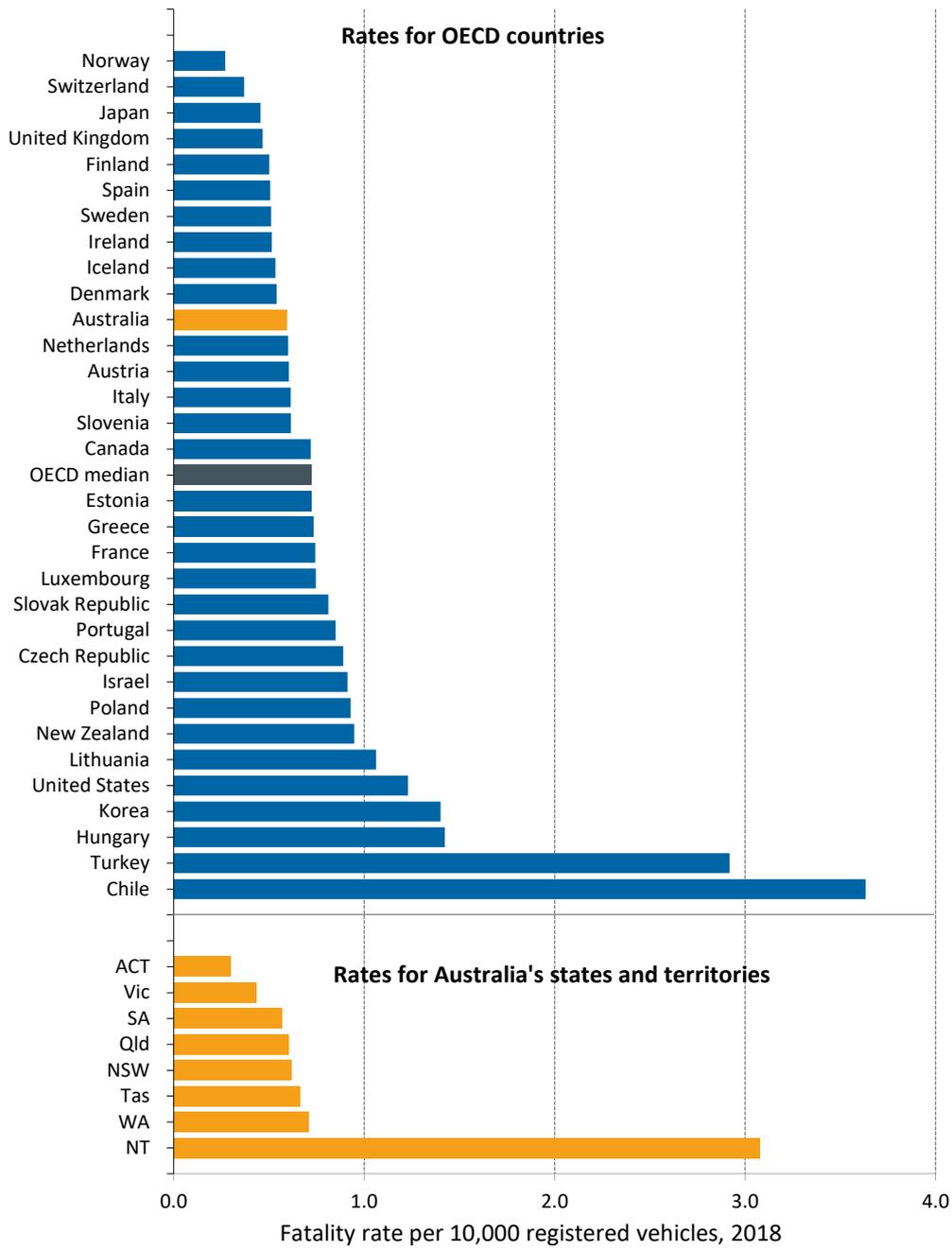
Table 2.1 Fatality rate per 10,000 registered vehicles – 32 OECD countries and Australian states/territories, 2018

<i>Nation</i>	<i>Road deaths</i>	<i>Total registered motor vehicles (000s)</i>	<i>Fatality rate per 10,000 registered vehicles</i>
Norway	108	3,981	0.27
Switzerland	233	6,315	0.37
Japan	4,166	91,468	0.46
United Kingdom	1,839	39,365	0.47
Finland	239	4,766	0.50
Spain	1,806	35,663	0.51
Sweden	324	6,331	0.51
Ireland	140	2,718	0.52
Iceland	18	337	0.53
Denmark	171	3,168	0.54
Australia	1,134	19,173	0.59
Netherlands	678	11,287	0.60
Austria	409	6,771	0.60
Italy	3,334	54,256	0.61
Slovenia	91	1,476	0.62
Canada	1,804	25,060	0.72
OECD median			0.72
Estonia	67	928	0.72
Greece	700	9,522	0.74
France	3,248	43,653	0.74
Luxembourg	36	482	0.75
Slovak Republic	260	3,203	0.81
Portugal	675	7,941	0.85
Czech Republic	658	7,386	0.89
Israel	316	3,465	0.91
Poland	2,862	30,801	0.93
New Zealand	377	3,975	0.95
Lithuania	173	1,628	1.06
United States	36,560	297,043	1.23
Korea	3,781	26,990	1.40
Hungary	629	4,418	1.42
Turkey	6,675	22,866	2.92
Chile	1,955	5,383	3.63
ACT	9	303	0.30
Vic	213	4,923	0.43
SA	80	1,409	0.57
Qld	245	4,045	0.61
NSW	347	5,618	0.62
Tas	32	481	0.67
WA	158	2,232	0.71
NT	50	163	3.08

Sources

ABS 2020b, Australian Road Deaths Database and IRTAD 2020

Figure 2.1 Fatality rate per 10,000 registered vehicles – 32 OECD countries and Australian states/territories, 2018



OECD countries, 1990, 2000 and 2009 to 2018

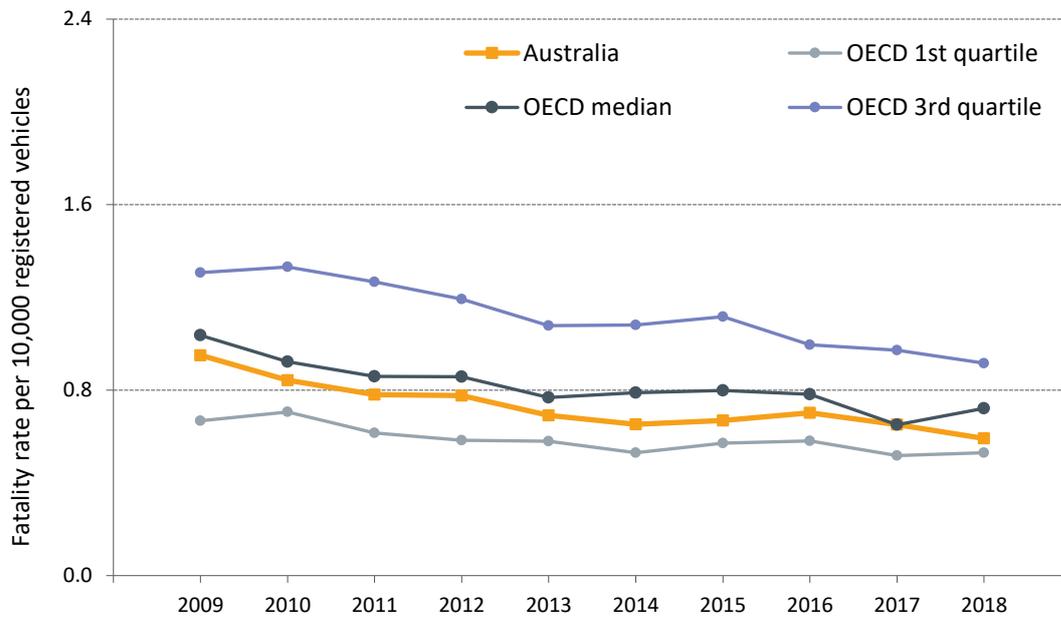
Table 2.2 Fatality rate per 10,000 registered vehicles – OECD countries and Australian states/territories, 1990, 2000 and 2009 to 2018

<i>Nation</i>	1990	2000	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Norway	1.4	1.2	0.6	0.6	0.5	0.4	0.5	0.4	0.3	0.3	0.3	0.27
Switzerland	2.2	1.2	0.6	0.6	0.6	0.6	0.5	0.4	0.4	0.4	0.4	0.37
Japan	1.9	1.2	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.46
United Kingdom	2.1	1.2	0.7	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.47
Finland	2.8	1.5	0.8	0.7	0.7	0.6	0.6	0.5	0.6	0.6	0.5	0.50
Spain	5.1	2.2	0.8	0.7	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.51
Sweden	1.7	1.2	0.6	0.5	0.6	0.5	0.4	0.5	0.4	0.4	0.4	0.51
Ireland	4.5	2.5	1.0	0.9	0.8	0.7	0.8	0.8	0.6	0.7	0.6	0.52
Iceland	1.7	1.8	0.7	0.3	0.5	0.3	0.6	0.1	0.6	0.6	0.5	0.53
Denmark	-	-	-	0.9	0.8	0.6	0.7	0.6	0.6	0.7	0.6	0.54
Australia	2.3	1.5	1.0	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.59
Netherlands	2.2	1.3	0.7	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.5	0.60
Austria	3.7	1.8	1.1	0.9	0.9	0.9	0.7	0.7	0.7	0.7	0.6	0.60
Italy	2.1	1.6	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.6	0.6	0.61
Slovenia	-	-	1.3	1.0	1.1	1.0	0.9	0.8	0.9	0.9	0.7	0.62
Canada	2.3	1.6	1.0	1.0	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.72
Estonia	-	-	-	1.2	1.5	1.2	1.1	1.0	0.8	0.8	0.5	0.72
Greece	7.4	3.1	1.5	1.3	1.2	1.0	0.9	0.8	0.8	0.9	0.8	0.74
France	3.6	2.3	1.1	1.0	1.0	0.9	0.8	0.8	0.8	0.8	0.8	0.74
Luxembourg	3.3	2.4	1.2	0.8	0.8	0.8	1.0	0.8	0.8	0.7	0.5	0.75
Slovak Republic	-	-	-	-	-	-	-	-	-	0.9	0.9	0.81
Portugal	-	-	-	-	-	-	-	-	-	-	-	0.85
Czech Republic	3.3	3.2	1.5	1.3	1.3	1.2	1.0	1.1	1.1	0.9	0.8	0.89
Israel	4.1	2.5	1.3	1.5	1.4	1.1	1.1	1.1	1.2	1.2	1.1	0.91
Poland	-	-	2.1	1.7	1.7	1.4	1.3	1.2	1.1	1.1	1.0	0.93
New Zealand	3.3	1.8	1	1	1	1	1	0.9	0.9	0.9	1.0	0.95
Lithuania	12.7	5.0	1.7	1.4	1.4	1.3	1.1	1.8	1.5	1.2	1.2	1.06
United States	2.4	1.9	1.3	1.3	1.2	1.3	1.2	1.2	1.3	1.3	1.3	1.23
Korea	-	-	-	-	-	-	2.3	2.1	1.9	1.7	1.6	1.40
Hungary	-	-	-	2.1	1.8	1.7	1.6	1.7	1.7	1.5	1.5	1.42
Turkey	-	-	-	2.7	2.4	2.2	2.1	1.9	3.8	3.5	3.3	2.92
Chile	-	10.6	6.4	6.3	5.7	5.1	5.0	4.7	4.6	4.5	3.8	3.63
ACT	1.6	0.9	0.5	0.7	0.2	0.4	0.3	0.4	0.5	0.3	0.2	0.30
Vic	2.1	1.2	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.5	0.43
SA	2.6	1.6	1.0	1.0	0.8	0.7	0.8	0.8	0.8	0.6	0.7	0.57
Qld	2.3	1.4	1.0	0.7	0.8	0.8	0.8	0.6	0.6	0.7	0.6	0.61
NSW	2.5	1.6	1.0	0.9	0.8	0.8	0.7	0.6	0.7	0.7	0.7	0.62
Tas	2.4	1.3	1.6	0.8	0.6	0.7	0.8	0.7	0.8	0.8	0.7	0.67
WA	1.9	1.6	1.0	1.0	0.9	0.9	0.8	0.9	0.7	0.9	0.7	0.71
NT	8.6	5.0	2.4	3.7	3.3	3.5	2.5	2.6	3.2	2.9	2.0	3.08

Note ABS vehicle registration data was not available for the year 2000. The average of 1999 and 2001 is used as an estimate for that year.

Sources ABS 2020b, Australian Road Deaths Database and IRTAD 2020

Figure 2.2 Fatality rate per 10,000 registered vehicles – OECD quartiles and Australia, 2009 to 2018



Sources ABS 2020b, Australian Road Deaths Database and IRTAD 2020

This page is intentionally left blank.

SECTION 3

Fatality rate per 100 million vehicle kilometres travelled (VKT)

The fatality rate per vehicle kilometres travelled (VKT) is a risk measure which takes account of the estimated amount of vehicle travel.

Fatality rate per 100 million vehicle kilometres travelled (VKT) – OECD countries, 2018

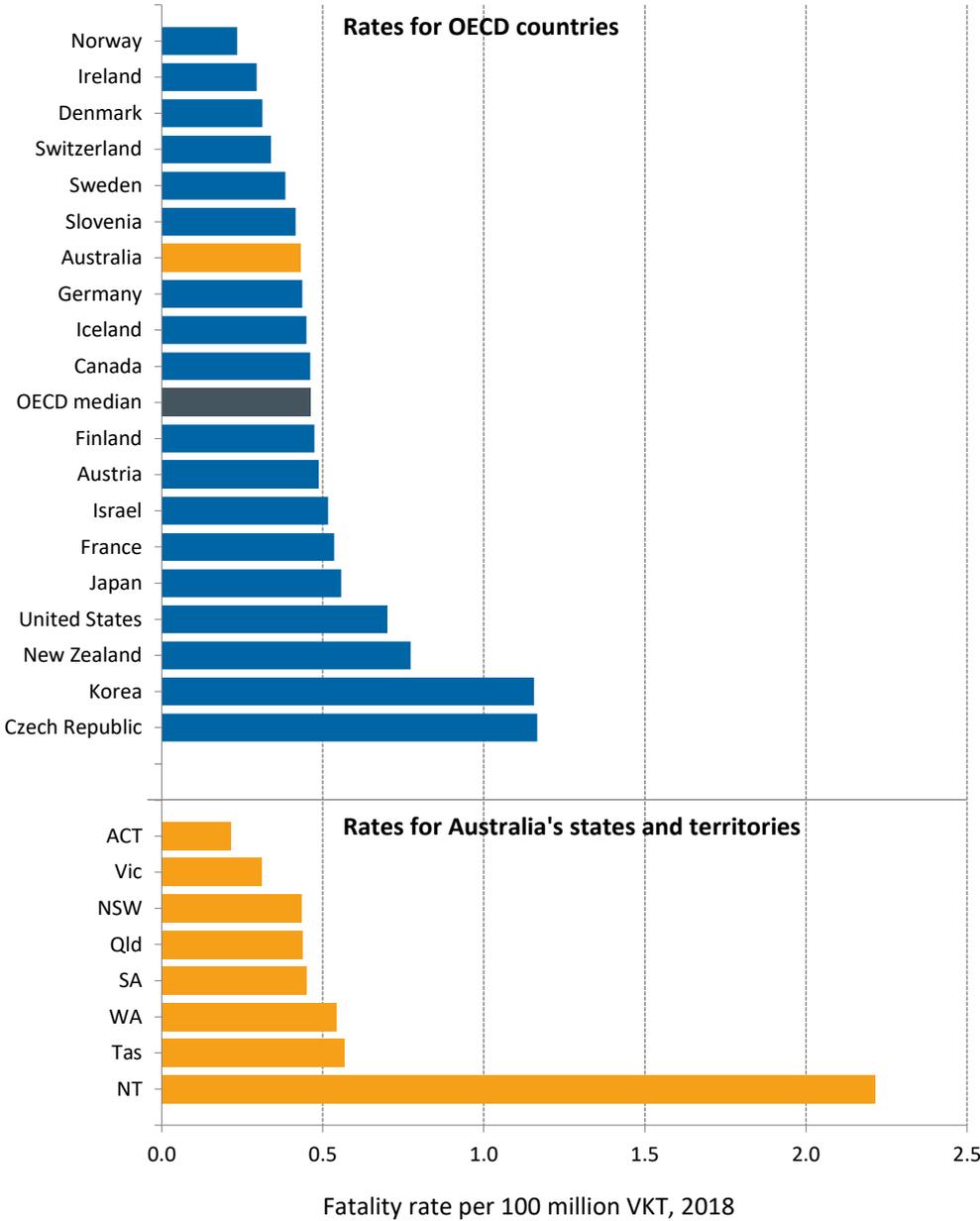
Table 3.1 Fatality rate per 100 million vehicle kilometres travelled (VKT)
– 19 OECD countries and Australian states/territories, 2018

<i>Nation</i>	<i>Road deaths</i>	<i>Total VKT (millions)</i>	<i>Fatality rate per 100 million VKT</i>
Norway	108	46,000	0.23
Ireland	140	47,545	0.29
Denmark	171	54,613	0.31
Switzerland	233	68,650	0.34
Sweden	324	84,433	0.38
Slovenia	91	21,886	0.42
Australia	1,134	263,408	0.43
Germany	3,275	751,100	0.44
Iceland	18	4,008	0.45
Canada	1,804	390,859	0.46
OECD median			0.46
Finland	239	50,436	0.47
Austria	409	84,157	0.49
Israel	316	61,196	0.52
France	3,248	606,297	0.54
Japan	4,166	747,930	0.56
United States	36,560	5,214,801	0.70
New Zealand	377	48,791	0.77
Korea	3,781	327,073	1.16
Czech Republic	658	56,450	1.17
ACT	9	4,177	0.22
Vic	213	68,773	0.31
NSW	347	79,644	0.44
Qld	245	56,088	0.44
SA	80	17,771	0.45
WA	158	29,074	0.54
Tas	32	5,625	0.57
NT	50	2,256	2.22

Sources

Australian Road Deaths Database, BITRE 2020 and IRTAD 2020

Figure 3.1 Fatality rate per 100 million vehicle kilometres travelled (VKT) – 19 OECD countries and Australian states/territories, 2018



Sources Australian Road Deaths Database, BITRE 2020 and IRTAD 2020

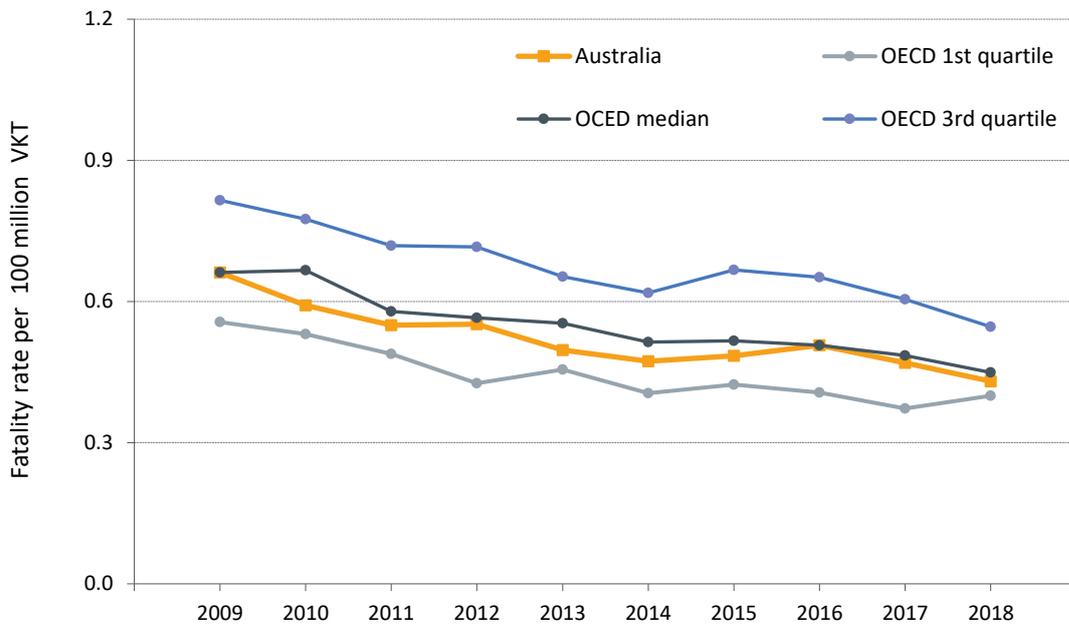
OECD countries, 1990, 2000 and 2009 to 2018

Table 3.2 Fatality rate per 100 million vehicle kilometres travelled (VKT) – OECD countries and Australian states/territories, 1990, 2000 and 2009 to 2018

<i>Nation</i>	1990	2000	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Norway	1.2	1.0	0.5	0.5	0.4	0.3	0.4	0.3	0.3	0.3	0.2	0.23
Ireland	1.9	1.2	0.5	0.5	0.4	0.4	0.5	0.4	0.4	0.4	0.3	0.29
Denmark	1.7	1.1	0.7	0.6	0.5	0.3	0.4	0.4	0.3	0.4	0.3	0.31
Switzerland	1.9	1.1	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.34
Sweden	1.2	0.9	0.5	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.38
Slovenia	6.5	2.7	1.0	0.8	-	-	0.7	0.6	0.7	0.6	0.5	0.42
Australia	1.4	0.9	0.7	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.43
Germany	-	1.1	0.6	0.5	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.44
Iceland	1.5	1.4	0.5	0.3	0.4	0.3	0.5	0.1	0.5	0.5	0.4	0.45
Canada	-	0.9	0.7	0.7	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.46
Finland	1.6	0.8	0.5	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.47
Austria	3.2	1.5	0.8	0.8	0.7	0.7	0.6	0.6	0.6	0.5	0.5	0.49
Israel	-	1.2	0.6	0.8	0.8	0.6	0.6	0.6	0.6	0.7	0.6	0.52
France	2.6	1.6	0.8	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.54
Japan	2.3	1.3	0.8	0.8	0.8	0.7	0.7	0.6	0.7	0.6	0.6	0.56
United States	1.3	0.9	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.70
New Zealand	-	1.4	1.0	0.9	0.7	0.8	0.6	0.7	0.7	0.7	0.8	0.77
Korea	-	4.9	2.0	1.9	2.0	1.9	1.8	1.6	1.5	1.4	1.3	1.16
Czech Republic	4.8	3.7	1.6	1.6	1.6	1.6	1.4	1.4	1.4	1.2	1.1	1.17
ACT	1.0	0.6	0.3	0.5	0.2	0.3	0.2	0.3	0.4	0.2	0.1	0.22
Vic	1.2	0.8	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.31
NSW	1.5	1.0	0.7	0.6	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.44
Qld	1.4	0.8	0.7	0.5	0.5	0.6	0.5	0.4	0.5	0.5	0.4	0.44
SA	1.7	1.1	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.5	0.6	0.45
WA	1.2	1.0	0.8	0.8	0.7	0.7	0.6	0.7	0.6	0.7	0.5	0.54
Tas	1.7	0.9	1.2	0.6	0.5	0.6	0.7	0.6	0.6	0.7	0.6	0.57
NT	4.7	2.8	1.5	2.4	2.2	2.4	1.8	1.8	2.3	2.1	1.4	2.22

Sources Australian Road Deaths Database, BITRE 2020 and IRTAD 2020

Figure 3.2 Fatality rate per 100 million vehicle kilometres travelled (VKT) – OECD quartiles and Australia, 2009 to 2018



Sources

Australian Road Deaths Database, BITRE 2020 and IRTAD 2020

This page is intentionally left blank.

SECTION 4

Comparing the three measures:

- Fatality rate per 100,000 population;
- Fatality rate per 10,000 registered vehicles;
- Fatality rate per 100 million vehicle kilometres travelled (VKT)

Comparing the three measures:

Population, registered vehicles and vehicle kilometres travelled are highly correlated. The ranking of countries according to the rates will be similar for each of these exposure measures.

The following tables present the correlation between firstly the exposure measures, and then between the fatality rates.

Table 4.1 Correlation between exposure measures

<i>Measures</i>	<i>Population</i>	<i>Veh. Registration</i>	<i>VKT</i>
Population	1.00	0.98	0.97
Veh. Registration		1.00	0.99
VKT			1.00

Table 4.2 Correlation between rates

<i>Measures</i>	<i>Population</i>	<i>Veh. Registration</i>	<i>VKT</i>
Population	1.00	0.73	0.67
Veh. Registration		1.00	0.80
VKT			1.00

The charts following illustrate the similarity of the three measures presented in sections 1,2 and 3.

Particular countries/jurisdictions have rates that can be classified as outliers. These outliers are removed from the following charts.

Figure 4.1 Population rates vs vehicle registration rates, 2018

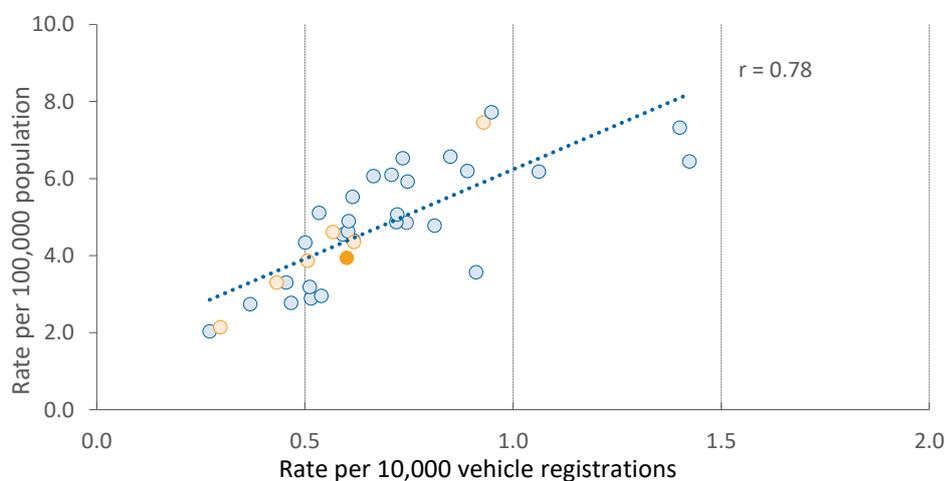


Figure 4.2 Population rates vs vehicle kilometres travelled rates, 2018

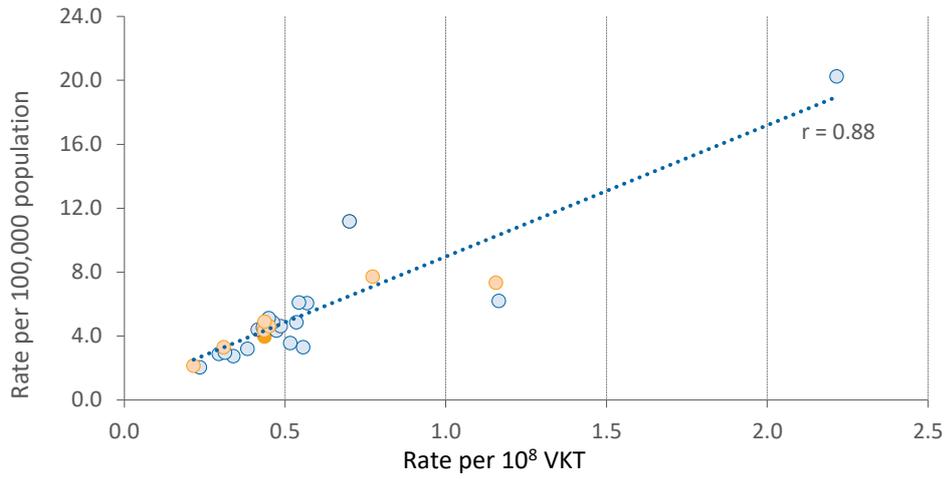
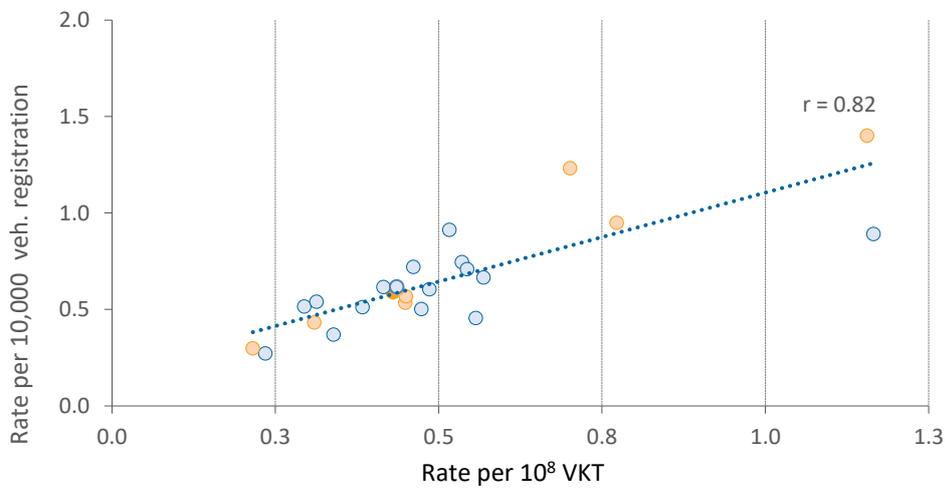


Figure 4.3 Vehicle registration rates vs vehicle kilometres travelled rates, 2018



References

- ABS 2020a Australian Bureau of Statistics, *Australian Demographic Statistics, December 2019*, Cat No 3101.0, June 2020.
- ABS 2020b Australian Bureau of Statistics, *Motor Vehicle Census*, Cat No 9309.0, January 2020.
- ABS 2020c Australian Bureau of Statistics, *Regional Population Growth, Australia, 2018-19*, Cat No 3218.0, March 2020.
- ABS 2018 Australian Bureau of Statistics 2018, *Australian Statistical Geography Standard (ASGS): Volume 5 – Remoteness Structure*, Cat No 1270.0.55.005 March 2018.
- BITRE 2020 Bureau of Infrastructure and Transport Research Economics (BITRE) unpublished VKT estimates, State and capital city vehicle kilometres travelled.
- IRTAD 2020 International Road Traffic Accident Database (IRTAD), (member site) <<http://stats.oecd.org/>>. accessed - August 2020.