

Work-related Traumatic Injury Fatalities, Australia

2016

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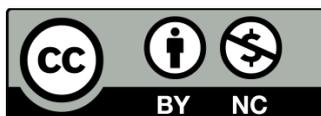
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Forward

The aim of this report is to provide statistics about people who die each year from injuries that arose through work-related activity. This includes fatalities resulting from an injury sustained in the course of a work activity (worker fatalities) and as a result of someone else's work activity (bystander fatalities).

Earlier reports have included fatalities that occurred while the worker was commuting to or from work (commuter fatalities), however, these fatalities have always been difficult to distinguish from other road fatalities and this report relies heavily on workers' compensation data. As fewer jurisdictions are now providing compensation coverage for commuting, the integrity of the commuter fatality collection has diminished and has therefore been ceased.

Injury is defined as a condition coded to 'External causes of morbidity and mortality' and 'Injury, poisoning and certain other consequences of external causes' in the International Statistical Classification of Diseases and Related Health Problems, Tenth Revision, Australian Modification (ICD-10-AM).

The scope of this collection includes all persons:

- who were fatally injured, and
- whose injuries resulted from work activity or exposures, and
- whose injuries occurred in an incident that took place in Australian territories or territorial waters.

The report includes all persons who died:

- while working including unpaid volunteers and family workers, persons undertaking work experience and defence force personnel killed within Australian territories or territorial waters or travelling for work (worker fatalities), or
- as a result of someone else's work activity (bystander fatalities).

The collection specifically excludes those who died:

- of iatrogenic injuries — those where the worker died due to medical intervention
- due to natural causes such as heart attacks and strokes, except where a work-related injury was the direct cause of the heart attack or stroke
- as a result of diseases, such as cancers, and
- by self-inflicted injuries (suicide).

Changes from previous publications may also be evident due to the availability of additional information from finalised coroners reports and additional workers' compensation claims.

For explanatory notes on the data for this publication, refer to <https://www.safeworkaustralia.gov.au/doc/explanatory-notes-safe-work-australia-datasets>

Work-related Traumatic Injury Fatalities

Key findings

In the 14 years from 2003 to 2016



3414  **workers**
have lost their lives in
work-related incidents



On average
each year
workers
die per month
at work

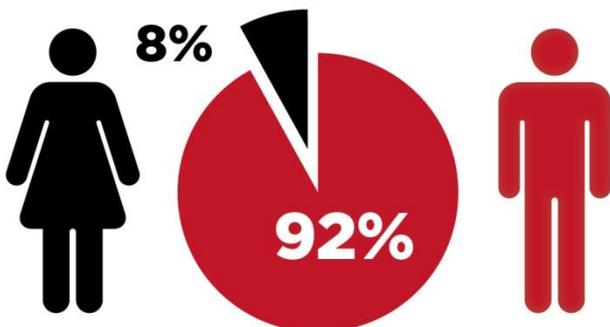
Worker fatalities in 2016



182
workers
were fatally
injured at work



Worker deaths
41% lower
than highest number of
worker deaths recorded
in 2007



168 of the 182 fatalities
involved
male
workers

Fatality rate per 100 000 workers



2016 =
1.5 fatalities
lowest fatality rate in
14 years from 2003 -2016



The fatality rate has
decreased by
49% from 3.0 in 2007
to 1.5 in 2016

Work-related Traumatic Injury Fatalities

Key findings

In the 14 years from 2003 to 2016

2/3 of worker fatalities
involved vehicles



59%

of bystander fatalities
were due to a vehicle collision

Causes of worker fatalities in 2016



42%

(76 workers)
vehicle collision



14%

(25 workers)
falling from height



9%

(17 workers)
hit by moving objects

Worker fatalities in 2016

50% were in two
of fatalities industries

47 

transport, postal
and warehousing

44 

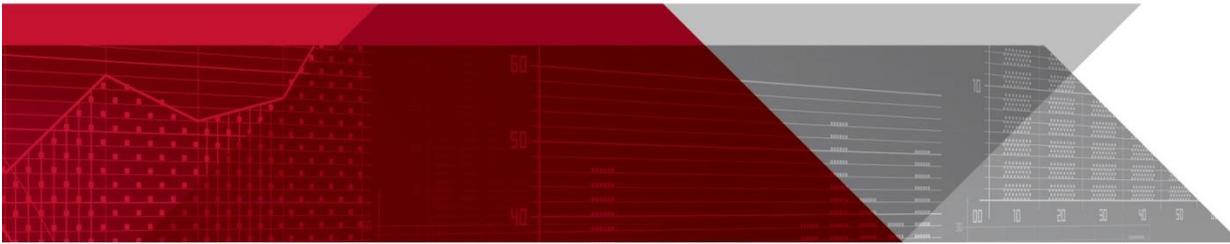
agriculture, forestry
and fishing



**99 of 182
fatalities**



54% involved
a vehicle



Section 1

Worker fatalities

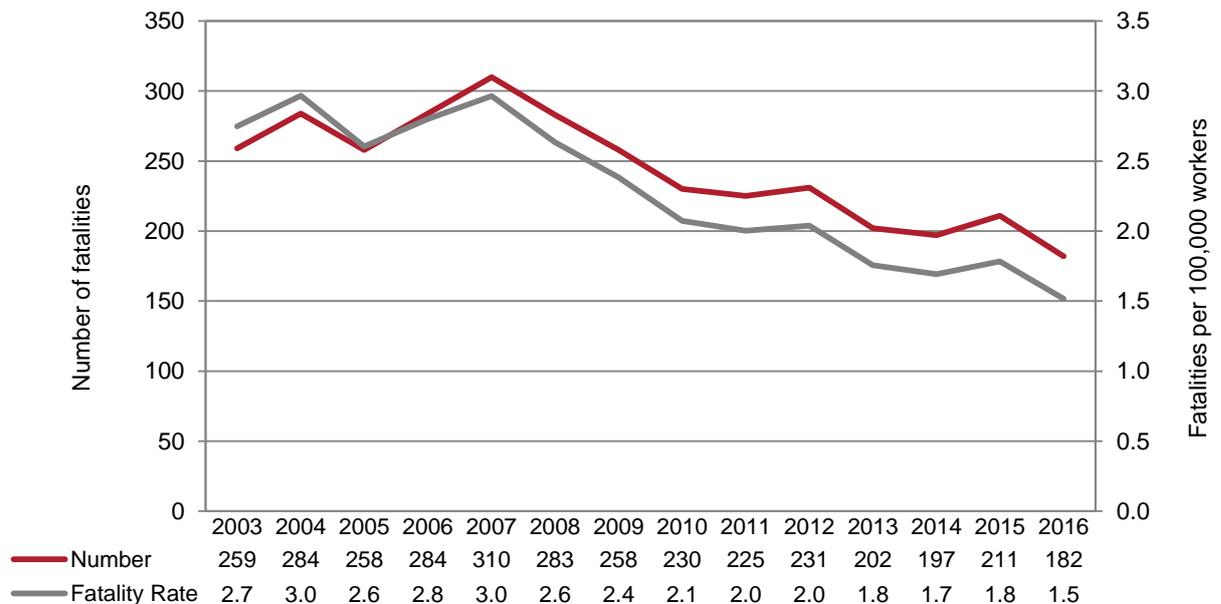


1. Worker fatalities

Figure 1 shows that both the number of fatalities and the fatality rate have been trending downward since 2007. Injuries at work resulted in the deaths of 182 workers in 2016, 29 less than in 2015, and the lowest number since the full collection of data began in 2003. The highest number of work-related injury fatalities was recorded in 2007 when there were 310 deaths.

Similarly, the fatality rate was 1.5 fatalities per 100,000 workers in 2016, which is also the lowest since the series began and is around half the rate recorded at the peak in 2007 when there were 3.0 fatalities per 100,000 workers.

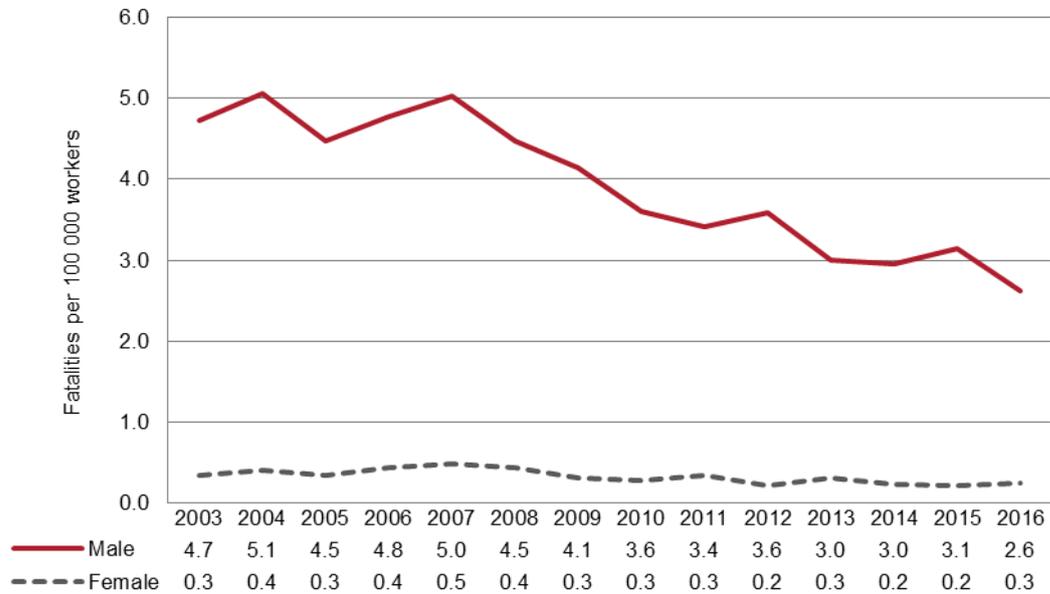
Figure 1 Worker fatalities: number of fatalities and fatality rate, 2003 to 2016



2. Worker fatalities by sex

In 2016, 92 per cent (168 of the 182 fatalities) of workers killed were men. Figure 2 shows, however, that the fatality rate for male workers has been declining over the last 10 years, down from 5.0 fatalities per 100,000 workers in 2007 to 2.6 in 2016. Over the same period the fatality rate for female workers has remained relatively constant at or around 0.3 fatalities per 100,000 workers.

Figure 2 Worker fatalities: fatality rate by sex, 2003 to 2016



3. Age

Table 1 shows the distribution of fatalities by age group. This distribution shows that there were fewer fatalities in the youngest and oldest age groups, which reflects the lower workforce participation of these age groups compared with other age groups.

While the number of fatalities in 2016 is the lowest in the series, the age profile was broadly similar to previous years. The exception was the 65 years and over age group, which accounted for a slightly lower proportion of fatalities than other years.

Despite this, while only accounting for 40 per cent of the workforce in 2016, older workers aged 45 and over accounted for the majority (61 per cent) of worker fatalities.

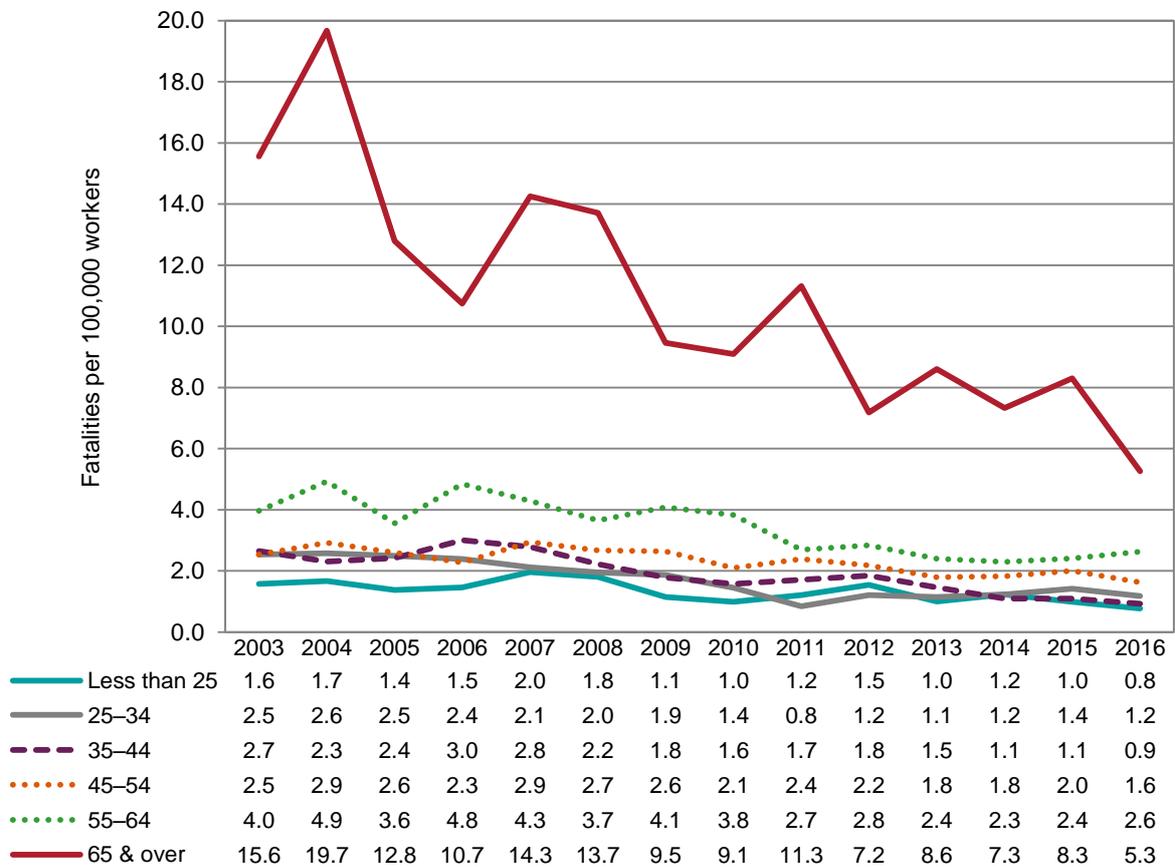
Table 1 Worker fatalities: number by age group, 2003 to 2016

Year	Less than 25	25–34	35–44	45–54	55–64	65 and over	Total
2003	26	55	61	53	40	24	259
2004	28	56	53	62	53	32	284
2005	24	55	57	57	41	24	258
2006	26	53	72	51	60	22	284
2007	36	48	68	68	56	34	310
2008	34	46	55	63	50	35	283
2009	21	44	44	63	59	27	258
2010	18	35	39	51	58	29	230
2011	23	21	43	58	42	38	225
2012	28	31	47	53	45	27	231
2013	18	30	37	44	39	34	202
2014	22	33	28	45	38	31	197
2015	17	39	28	50	41	36	211
2016	14	33	24	41	46	24	182
Total	335	579	656	759	668	417	3414

Figure 3 shows fatality rates have fallen over the past 14 years for all age groups. While the gap between the oldest age group and the younger age groups has narrowed, the fatality rate of the oldest age group remains four to 10 times higher than the younger age groups.

In 2016, fatality rates generally increased with age from 0.8 fatalities per 100,000 workers in those aged under 25 years to 5.3 in workers aged 65 years and over.

Figure 3 Worker fatalities: fatality rate by age group, 2003 to 2016



4. Industry

Figure 4 shows in 2016, the vast majority (69 per cent) of fatalities occurred in three industries. Transport, postal and warehousing (47 fatalities) accounted for more than a quarter of fatalities in 2016, followed closely by Agriculture, forestry and fishing (44 fatalities) and Construction (35 fatalities).

Figure 4 Worker fatalities: proportion by industry of employer, average of last 10 years (2007 to 2016) and 2016

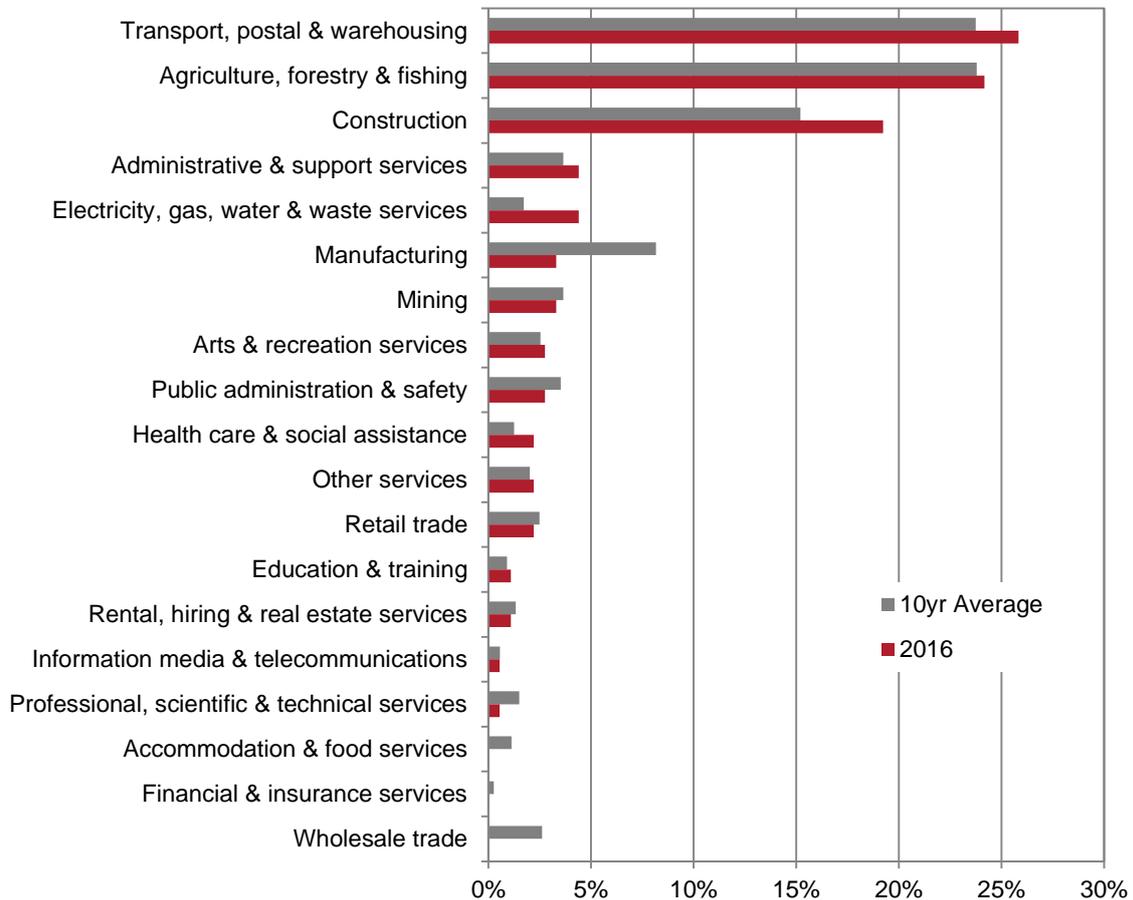


Table 2 below shows that despite accounting for the vast majority of fatalities, the top three industries have recorded relatively substantial falls in the number of fatalities over the last 14 years – Transport, postal and warehousing down 31 per cent, Agriculture, forestry and fishing down 27 per cent and Construction down 19 per cent.

For the complete time series see Appendix A3.

Table 2 Worker fatalities: number by industry of employer, 2003 and 2012 to 2016 (sorted by 2016 fatalities)

Industry of employer	2003	2012	2013	2014	2015	2016	% of 2016	10yr average (2007-2016)
Transport, postal & warehousing	68	61	43	47	45	47	26%	24%
Agriculture, forestry & fishing	60	56	55	45	56	44	24%	24%
Construction	43	30	22	32	34	35	19%	15%
Administrative & support services	4	6	5	4	8	8	4%	4%
Electricity, gas, water & waste services	5	3	4	5	4	8	4%	2%
Manufacturing	20	18	12	17	16	6	3%	8%
Mining	11	8	9	11	11	6	3%	4%
Arts & recreation services	3	5	7	10	7	5	3%	3%
Public administration & safety	9	8	11	6	6	5	3%	4%
Health care & social assistance	3	2	4	2	3	4	2%	1%
Other services	4	3	7	4	8	4	2%	2%
Retail trade	7	5	8	0	4	4	2%	2%
Education & training	2	4	..	1	2	2	1%	1%
Rental, hiring & real estate services	4	3	3	1	..	2	1%	1%
Information media & telecommunications	1	2	..	..	..	1	1%	1%
Professional, scientific & technical services	2	8	2	..	2	1	1%	2%
Accommodation & food services	5	1	2	6	3	..	..	1%
Financial & insurance services	1	..	..	..	..	..	..	0%
Wholesale trade	7	9	8	6	2	..	..	3%
Total	259	232	202	197	211	182	100%	100%

Fatality rates, expressed as the number of fatalities per 100,000 workers, are best used when comparing risk across industries. Table 3 shows that in 2016 the Agriculture, forestry and fishing industry recorded the highest fatality rate with 14.0 fatalities per 100,000 workers. While the fatality rate for this industry fell in 2016, down from 18.0 in 2015, it remains almost 10 times the all industries average of 1.5 fatalities per 100,000 workers.

The Transport, postal and warehousing industry recorded the second highest fatality rate in 2016 with 7.5 fatalities per 100,000 workers, followed by the Electricity, gas, water and waste services industry (5.8 fatalities per 100,000 workers).

It should be noted, however, that fatality rates are sensitive to the number of workers employed in each industry, and therefore are liable to show volatility in those industries which employ the fewest workers (such as the Electricity, gas, water and waste services industry), even when small variations in the number of fatalities are recorded. Therefore, the actual number of fatalities should also be considered when interpreting the fatality rates for smaller industries.

For the complete time series see Appendix A4.

Table 3 Worker fatalities: fatality rate (fatalities per 100,000 workers) by industry of employer, 2003 and 2012 to 2016 (sorted by 2016 rate)

Industry of employer	2003	2012	2013	2014	2015	2016	10yr average (2007-2016)
Agriculture, forestry & fishing	16.4	17.7	18.3	13.9	18.0	14.0	16.9
Transport, postal & warehousing	14.6	10.9	7.2	7.9	7.4	7.5	9.5
Electricity, gas, water & waste services	5.5	2.0	2.7	3.4	2.8	5.8	2.9
Construction	5.8	3.1	2.2	3.1	3.3	3.3	3.5
Mining	12.4	3.0	3.4	4.4	4.8	2.7	4.0
Arts & recreation services	2.1	2.4	3.4	4.8	3.1	2.2	2.9
Administrative & support services	1.2	1.5	1.3	1.0	1.9	1.8	2.2
Rental, hiring & real estate services	2.4	1.4	1.5	0.5	0.0	0.9	1.5
Other Services	0.9	0.7	1.5	0.8	1.7	0.8	1.0
Manufacturing	1.9	1.9	1.3	1.8	1.8	0.7	2.0
Public administration & safety	1.6	1.1	1.5	0.8	0.8	0.7	1.2
Information media & telecommunications	0.4	0.9	0.0	0.0	0.0	0.5	0.6
Retail trade	0.6	0.4	0.7	0.0	0.3	0.3	0.5
Health care & social assistance	0.3	0.1	0.3	0.1	0.2	0.3	0.2
Education & training	0.3	0.5	0.0	0.1	0.2	0.2	0.2
Professional, scientific & technical services	0.3	0.9	0.2	0.0	0.2	0.1	0.4
Wholesale trade	1.9	2.2	1.9	1.5	0.5	0.0	0.3
Accommodation & food services	0.8	0.1	0.3	0.8	0.4	0.0	0.1
Financial & insurance services	0.3	0.0	0.0	0.0	0.0	0.0	1.5
Total	2.7	2.0	1.8	1.7	1.8	1.5	2.1

5. Priority industries

The *Australian Work Health and Safety Strategy 2012–2022* (Australian Strategy) provides a framework to drive improvements in work health and safety (WHS) in Australia. It promotes a collaborative approach between the Commonwealth, state and territory governments, industry and unions and other organisations to achieve the vision of healthy, safe and productive working lives. The Australian Strategy identifies national priority industries and disorders to help direct prevention activities to where they are needed the most.

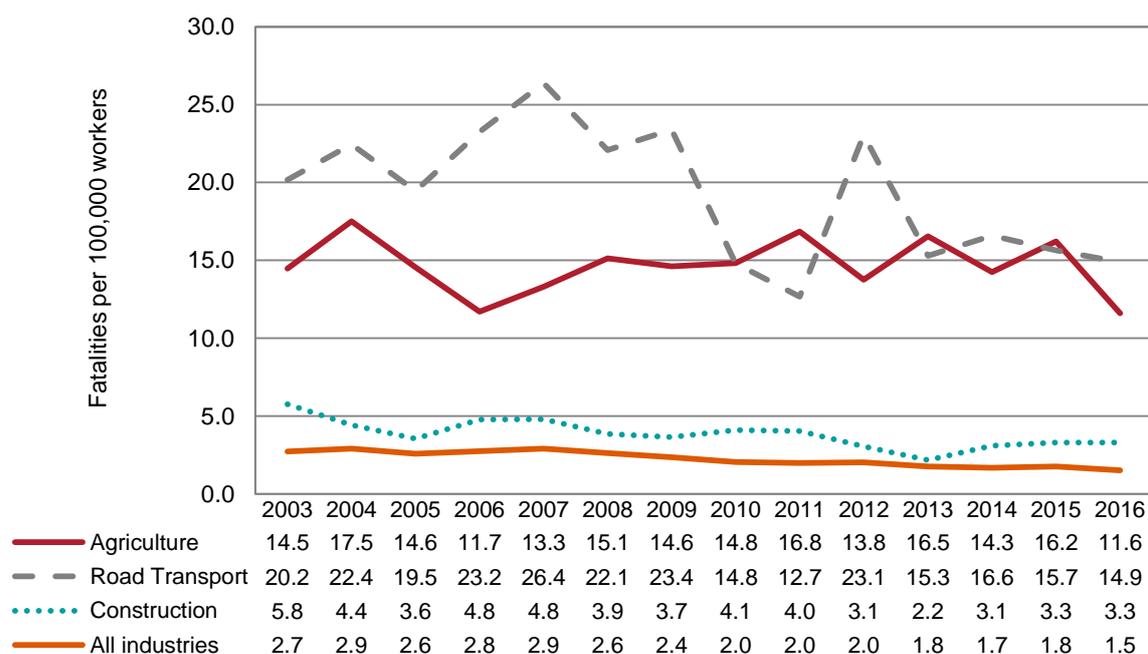
The following priority industries have high numbers and rates of fatalities and/or injuries or are by their nature hazardous:

- Agriculture
- Road transport
- Manufacturing
- Construction
- Accommodation and food services
- Public administration and safety, and
- Health care and social assistance.

Industries such as Accommodation and food services, Health care and social assistance and Public administration and safety have low fatality rates but are included as priority industries due to high injury rates. For information on serious claims in these industries, refer to the latest *Australian Workers' Compensation Statistics* report.

For the purposes of this report, only those priority industries with fatality rates above the all industry rate will be examined in further detail – that is Agriculture, Road transport and Construction. Figure 5 shows that while fatality rates can be volatile over time, they have generally been decreasing for the selected priority industries over the last 14 years, apart from Agriculture where, despite a relatively substantial fall in 2016, the rate has remained at or around 15 fatalities per 100,000 workers for much of the period. Although the Road transport fatality rate has decreased over the period it is still 10 times the all industry rate (14.9 compared with 1.5).

Figure 5 Worker fatalities: fatality rate (fatalities per 100,000 workers) by industry of employer, 2003 to 2016



6. Agriculture

Table 4 shows the number of worker fatalities in the Agriculture industry sub-divisions by age group for the 10 years to 2016. Older workers account for a much greater proportion of fatalities in the Agriculture industry. Over the 10 year period, workers aged 55 and over accounted for the majority (55 per cent) of fatalities in the Agriculture industry. This compares with only a third of fatalities over the same period across all industries.

Within the Agriculture industry, the sheep, beef cattle and grain farming industry accounted for two-thirds (67 per cent) of fatalities over the 10 year period (279 out of 418). Of these, only 18 per cent were younger workers aged under 35.

Table 4 Worker fatalities: Agriculture industry sub-divisions by age group, 2007 to 2016 (combined)

Industry sub-division	Under 25	25–34	35–44	45–54	55–64	65 & over	Total
Sheep, beef cattle & grain farming	27	22	24	46	53	107	279
Other crop growing	2	3	4	8	2	14	33
Other livestock farming	2	5	2	5	8	6	28
Fruit & tree nut growing	1	8	2	6	4	6	27
Dairy cattle farming	6	2	5	2	6	4	25
Mushroom & vegetable growing	3	2	..	1	5	6	17
Nursery & floriculture production	1	..	..	..	4	..	5
Poultry farming	..	..	1	..	..	3	4
Agriculture – Total	42	42	38	68	82	146	418

As shown in Table 5 below, more than a quarter (112 or 27 per cent) of the fatalities in the Agriculture industry were due to vehicle collisions over the 10 years to 2016. This was followed by the rollover of non-road vehicles (65 fatalities or 16 per cent) and being hit by moving objects (60 fatalities or 14 per cent).

Table 5 Worker fatalities: Agriculture by mechanism of incident, 2007 to 2016 (combined)

Mechanism of incident	No. of fatalities	% of fatalities
Vehicle collision	112	27%
Rollover of non-road vehicle	65	16%
Being hit by moving objects	60	14%
Being hit by falling objects	35	8%
Falls from a height	30	7%
Being trapped by moving machinery	26	6%
Contact with electricity	19	5%
Being hit by an animal	18	4%
Being trapped between stationary and moving objects	16	4%
Other mechanisms	37	9%
Total	418	100%

Over the 10 years to 2016, the majority (71 per cent) of fatalities in the Agriculture industry involved a vehicle. Of these fatalities, 78 involved a tractor, 61 involved a quad bike and 42 involved a ute, car or van. For a further 28 of the fatalities, the deceased worker was killed by a vehicle while on foot.

Table 6 Worker fatalities: Agriculture by vehicle involvement and type of vehicle, 2007 to 2016 (combined)

Vehicle involvement and type of vehicle	No. of fatalities	% of fatalities
Vehicle involved	297	71%
Tractor	78	19%
Quad bike	61	15%
Ute, Car or Van	42	10%
Worker on foot	28	7%
Aircraft	24	6%
Truck	17	4%
Motorbike	15	4%
Other vehicles	32	8%
No vehicle involved	121	29%
Total	418	100%

7. Road transport

Over the period from 2007 to 2016, there were 439 worker fatalities in the Road transport industry. Of these, the vast majority (92 per cent) occurred in the road freight transport sub-division. The remaining 36 fatalities occurred in the road passenger transport industry, with the majority of these in the taxi and other road transport segment of the industry.

In terms of age breakdown, Table 7 shows that workers aged between 45 and 54 accounted for the largest proportion of fatalities in this industry (123 out of 439), closely followed by workers aged 55 to 64 (114 fatalities) and workers aged 35 to 44 (108 fatalities).

Table 7 Worker fatalities: Road transport industry sub-divisions by age group, 2007 to 2016 (combined)

Industry sub-divisions	Under 25	25-34	35-44	45-54	55-64	65 & over	Total
Road freight transport	19	45	104	119	98	18	403
Road passenger transport	1	4	4	4	16	7	36
Taxi and other road transport	..	3	3	1	8	6	21
Urban bus transport (including tramway)	..	1	1	2	5	..	9
Interurban and rural bus transport	1	..	..	1	3	1	6
Road transport – Total	20	49	108	123	114	25	439

As shown in Table 8 below, the vast majority of fatalities in the Road transport industry over the 10 years to 2016 were due to vehicle collisions – 314 in the road freight transport industry and 24 in the road passenger transport industry. Being hit by moving objects (27 fatalities) was the next highest mechanism for the road freight transport industry, compared with being trapped by moving machinery (5 fatalities) for the road passenger transport industry.

Table 8 Worker fatalities: Road transport industry sub-divisions by mechanism of incident, 2007 to 2016 (combined)

Industry sub-division Mechanism	No. of fatalities	% of fatalities
Road freight transport	403	92%
Vehicle collision	314	72%
Being hit by moving objects	27	6%
Being hit by falling objects	17	4%
Falls from a height	11	3%
Being trapped between stationary and moving objects	10	2%
Other mechanisms	24	5%
Road passenger transport	36	8%
Vehicle collision	24	5%
Being trapped by moving machinery	5	1%
Being hit by moving objects	4	1%
Being assaulted by a person or persons	3	1%
Road Transport - Total	439	100%

As expected, Table 9 shows that 419 work fatalities (or 95 per cent) in the Road transport industry involved a vehicle, and of these, the majority (338 fatalities) occurred while the victim was driving. A further 45 fatalities occurred while the worker was loading or unloading a vehicles and 14 occurred while the worker was conducting repairs or maintenance on the vehicle.

Table 9 Worker fatalities: Road transport by vehicle involvement and activity of the deceased, 2007 to 2016 (combined)

Vehicle involvement – Deceased activity	No. of fatalities	% of fatalities
Vehicle Involved	419	95%
Driving/moving freight/people	338	77%
Loading/unloading	45	10%
Repair/maintenance	14	3%
Entering/exiting vehicle	3	1%
Other	19	4%
No vehicle involved	20	5%
Total	439	100%

8. Construction

Over the period from 2007 to 2016, there were 354 worker fatalities in the Construction industry in Australia. Of these fatalities, Table 10 below shows that almost two-thirds (229 fatalities or 65 per cent) occurred in the construction services industry sub-division, of which 56 fatalities occurred in land development and site preparation services, 54 occurred in building installation services and 50 occurred in building structure services. The building construction industry sub-division accounted for 56 worker fatalities over the 10 year period, split relatively evenly between residential and non-residential building construction. The heavy and civil engineering construction industry sub-division accounted for the remaining 56 worker fatalities.

In terms of age breakdown, worker fatalities in the Construction industry were much more evenly spread across the different age groups. Over the period, younger workers aged under 35 accounted for almost a third of fatalities, compared with only around a quarter of fatalities across all industries. Older workers, however, still accounted for the majority of fatalities, with 55 per cent of workers killed in the industry being aged 45 or over.

Table 10 Worker fatalities: Construction industry sub-divisions by age group, 2007 to 2016 (combined)

Industry sub-divisions	Under 25	25-34	35-44	45-54	55-64	65 & over	Total
Building construction	8	11	8	12	16	14	69
Residential building construction	5	5	4	8	6	8	36
Non-residential building construction	3	6	4	4	10	6	33
Construction services	37	40	25	54	45	28	229
Land development & site preparation services	6	4	7	14	17	8	56
Building installation services	14	15	6	5	10	4	54
Building structure services	7	9	5	16	11	2	50
Building completion services	4	4	5	12	5	9	39
Other construction services	6	8	2	7	2	5	30
Heavy & civil engineering construction	8	10	11	11	10	6	56
Construction – Total	53	61	44	77	71	48	354

In terms of mechanism of the fatalities, Table 11 shows that between 2007 and 2016, falls from a height were the main cause of fatalities in both the building construction and construction services industry sub-divisions. By contrast, being hit by moving objects caused the most fatalities in the heavy and civil engineering construction industry sub-division.

Across the three industry sub-divisions, a relatively substantial number of fatalities were also caused by vehicle collisions (57 fatalities or 16 per cent), being hit with falling objects (45 fatalities or 13 per cent) and contact with electricity (39 fatalities or 11 per cent).

Table 11 Worker fatalities: Construction industry sub-divisions by mechanism of incident, 2007 to 2016 (combined)

Industry sub-division Mechanism	No. of fatalities	% of fatalities
Building construction	69	19%
Falls from a height	29	8%
Being hit by falling objects	13	4%
Vehicle collision	9	3%
Contact with electricity	4	1%
Being hit by moving objects	4	1%
Other mechanisms	10	3%
Construction services	229	65%
Falls from a height	63	18%
Vehicle collision	38	11%
Contact with electricity	35	10%
Being hit by falling objects	26	7%
Being hit by moving objects	16	5%
Being trapped between stationary and moving objects	14	4%
Being trapped by moving machinery	12	3%
Other mechanisms	25	7%
Heavy & civil engineering construction	56	16%
Being hit by moving objects	20	6%
Vehicle collision	10	3%
Being hit by falling objects	6	2%
Falls from a height	4	1%
Being trapped between stationary and moving objects	4	1%
Other mechanisms	12	3%
Construction – Total	354	100%

Across the whole Construction industry, falls from a height caused 96 fatalities (or 27 per cent) over the 10 years to 2016. As shown in Table 12 below, over a third (38 per cent) of these involved falls from a building or other type of structure, and a quarter involved a fall from a ladder.

Table 12 Worker fatalities: Construction industry, falls from a height fatalities by breakdown agency, 2007 to 2016 (combined)

Breakdown agency	No. of fatalities	% of fatalities
Buildings and other structures	36	38%
Ladders	24	25%
Scaffolding and elevated work platforms	15	16%
Openings in floors, walls or ceilings	4	4%
Other agencies	17	18%
Falls from a height – Total	96	100%

9. Occupation

In 2016, 34 per cent (62 fatalities) of the workers killed were employed as machinery operators and drivers. Labourers accounted for a further 22 per cent (40 fatalities) of fatalities followed by technicians and trades workers (14 per cent – 26 fatalities) and managers (13 per cent – 24 fatalities).

Table 13 below shows, that since both 2003 and over the last five years, all occupations have generally recorded a fall in the number of worker fatalities.

For the complete time series see Appendix A5.

Table 13 Worker fatalities: number by occupation and sub-group, 2003 and 2012 to 2016 (sorted by 2016 fatalities)

Occupation	2003	2012	2013	2014	2015	2016	% of 2016	10yr average (2007-2016)
Machinery operators and drivers	86	77	62	67	71	62	34%	33%
Road and rail drivers	65	61	47	49	46	50	27%	24%
Mobile plant operators	11	8	6	6	17	8	4%	4%
Machine and stationary plant operators	7	5	8	12	8	3	2%	4%
Labourers	61	48	41	50	38	40	22%	20%
Farm, forestry and garden workers	22	16	11	23	17	15	8%	8%
Construction and mining labourers	24	14	8	9	9	11	6%	5%
Technicians and trades workers	31	28	29	29	35	26	14%	16%
Construction trades workers	10	11	3	10	11	12	7%	5%
Automotive and engineering trades workers	10	4	11	8	9	2	1%	4%
Electro-technology and telecommunications trades workers	9	6	9	7	8	6	3%	4%
Managers	40	39	35	19	35	24	13%	15%
Farmers and farm managers	31	27	30	16	24	19	10%	11%
Professionals	19	22	12	12	12	14	8%	8%
Design, engineering, science and transport professionals	17	15	9	10	6	8	4%	5%
Community and personal service workers	11	9	14	11	10	3	2%	4%
Protective service workers	7	7	4	3	..	3	2%	2%
Sales workers	7	3	6	2	2	3	2%	2%
Clerical and administrative workers	4	5	1	3	1	1	1%	1%
Total*	259	231	202	197	211	182	100%	100%

*Total includes fatalities where occupation is unknown.

In line with the number of fatalities, Table 14 below shows that in 2016, machinery operators and drivers also recorded the highest fatality rate of 8.2 fatalities per 100,000 workers, followed by labourers (3.4 fatalities per 100,000 workers) and managers (1.6 fatalities per 100,000 workers).

For the complete time series see Appendix A6.

Table 14 Worker fatalities: fatality rate by occupation, 2003 and 2012 to 2016 (sorted by rate in 2016)

Occupation	2003	2012	2013	2014	2015	2016	10yr average (2007-2016)
Machinery operators and drivers	13.7	10.4	8.0	8.9	9.5	8.2	10.4
Labourers	5.6	4.2	3.6	4.4	3.4	3.4	4.1
Managers	3.5	2.7	2.4	1.3	2.3	1.6	2.4
Technicians and trades workers	2.2	1.7	1.7	1.7	2.0	1.5	2.2
Professionals	1.0	0.9	0.5	0.5	0.4	0.5	0.8
Sales workers	0.7	0.3	0.6	0.2	0.2	0.3	0.4
Community and personal service workers	1.4	0.8	1.2	1.0	0.8	0.2	0.9
Clerical and administrative workers	0.3	0.3	0.1	0.2	0.1	0.1	0.2
Total	2.7	2.0	1.8	1.7	1.8	1.5	2.1

10. Mechanism of incident

Table 15 below shows that 76 worker fatalities were due to a vehicle collision in 2016. This includes incidents where an occupant of a vehicle is killed following a collision with another vehicle or a stationary object. While the number of fatalities due to this mechanism has fallen substantially over the last 10 years, the proportion of total fatalities (42 per cent) is slightly higher than the 10 year average of 38 per cent.

Falls from a height accounted for the next highest proportion of worker fatalities (14 per cent) in 2016, followed by being hit by moving objects and being hit by falling objects, each accounting for 9 per cent of fatalities.

These top four mechanisms accounted for almost three-quarters of worker fatalities in 2016 (74 per cent).

For the complete time series see Appendix A1.

Table 15 Worker fatalities: number by mechanism of incident, 2003 and 2012 to 2016 (sorted by 2016 fatalities)

Mechanism of incident	2003	2012	2013	2014	2015	2016	% of 2016	10yr average (2007-2016)
Vehicle collision	108	91	68	74	60	76	42%	38%
Falls from a height	27	30	26	22	29	25	14%	12%
Being hit by moving objects	40	28	24	22	28	17	9%	11%
Being hit by falling objects	15	27	25	17	21	17	9%	10%
Being trapped by moving machinery	6	10	10	11	9	8	4%	5%
Contact with electricity	13	6	8	5	8	7	4%	4%
Drowning	4	3	4	1	5	7	4%	2%
Being trapped between stationary and moving objects	9	5	7	12	11	4	2%	4%
Being assaulted by a person or persons	12	6	6	4	5	4	2%	2%
Rollover of non-road vehicle	9	6	15	7	14	3	2%	4%
Contact with hot objects	1	1	1	4	6	3	2%	1%
Explosion	3	2	1	6	5	2	1%	1%
Being hit by an animal	1	4	2	1	1	2	1%	1%
Other mechanisms	11	12	5	11	9	7	4%	5%
Grand Total	259	231	202	197	211	182	100%	100%

* The percentages shown in this table have been rounded to the nearest whole number; therefore the sum of percentage figures for each column may not equal the total.

Table 16 shows that over the 10 years to 2016, vehicle collisions were by far the most common mechanism of fatality for the younger age groups. While vehicle collisions also accounted for the most fatalities for the older age groups as well, older workers were relatively more likely to be killed from being hit by moving objects and falls from a height than younger workers.

Table 16 Worker fatalities: percentage by mechanism of incident and age group, 2007 to 2016 combined

Mechanism of incident	Under 25	25-34	35-44	45-54	55-64	65 and over	Total
Vehicle collision	40%	41%	46%	41%	36%	22%	38%
Falls from a height	7%	9%	8%	13%	15%	17%	12%
Being hit by moving objects	10%	8%	9%	12%	13%	15%	11%
Being hit by falling objects	9%	9%	13%	7%	10%	11%	10%
Being trapped by moving machinery	7%	4%	5%	4%	4%	3%	5%
Rollover of non-road vehicle	4%	2%	2%	3%	5%	12%	4%
Contact with electricity	9%	6%	4%	4%	1%	2%	4%
Being trapped between stationary and moving objects	3%	4%	2%	3%	5%	4%	4%
Other mechanisms	10%	16%	10%	14%	11%	13%	12%
Total	100%	100%	100%	100%	100%	100%	100%

* The percentages shown in this table have been rounded to the nearest whole number; therefore the sum of percentage figures for each column may not equal the total.

11. Worker fatalities due to vehicle collisions

Table 17 shows in 2016, of the 76 workers who died in a vehicle collision, over half (59 per cent) involved single vehicle incidents and just under half of these involved heavy vehicles (20 fatalities). A further 14 fatalities were as a result of single light vehicle incidents and 9 involved aircraft.

The remaining 31 fatalities in 2016 due to a vehicle collision, involved a multi-vehicle incident. One third of these involved two heavy vehicles and another third involved two light vehicles.

Table 17 Worker fatalities due to vehicle collision: number by breakdown agency, 2003 and 2012 to 2016

Type of collision	2003	2012	2013	2014	2015	2016	% of 2016	10yr average (2007- 2016)
Single vehicle incident	66	54	42	51	35	45	59%	64%
Heavy vehicle	27	27	18	24	17	20	26%	30%
Aircraft	22	14	10	9	5	7	9%	13%
Light vehicle	9	7	5	9	6	14	18%	13%
Motorbike	1	1	2	3	..	..	..	2%
Quad bike	..	2	4	5	5	..	..	3%
Agriculture vehicle	4		2			2	3%	1%
Watercraft	1	2	..	1	..	..	..	1%
Other single vehicle	2	1	1	..	2	2	3%	1%
Multi vehicle incident	42	37	26	23	25	31	41%	36%
Occupant in light vehicle killed in collision with a heavy vehicle	10	13	7	4	7	5	7%	9%
Two heavy vehicles	16	11	7	8	6	10	13%	11%
Two light vehicles	9	8	3	4	7	9	12%	7%
Occupant in a heavy vehicle killed in collision with light vehicle	1	3	4	3	2	4	5%	4%
Other multi-vehicle collision	6	2	5	4	3	3	4%	6%
Total – Vehicle collision	108	91	68	74	60	76	100%	100%

* The percentages shown in this table have been rounded to the nearest whole number; therefore the sum of percentage figures for each column may not equal the total.

12. Worker fatalities due to being hit by moving objects

In 2016, 17 workers were killed as a result of being hit by moving objects. This number has more than halved since 2003.

As shown in Table 18, while 59 per cent of fatalities were caused by mobile plant and transport, this proportion is considerably lower than the average over the last 10 years of 73 per cent. In contrast to previous years where being hit by a heavy or light vehicle was the most common cause of death, in 2016 being hit by self-propelled plant and tractors or other agricultural vehicles accounted for the most fatalities.

Table 18 Worker fatalities due to being hit by moving objects: number by breakdown agency, 2003 and 2012 to 2016 (sorted by 2016 fatalities)

Breakdown agency	2003	2012	2013	2014	2015	2016	% of 2016	10yr average (2007-2016)
Mobile plant and transport	26	25	16	17	18	10	59%	73%
Trucks, semi-trailers, lorries	6	7	5	5	3	2	12%	21%
Cars, station wagons, vans, utilities	7	2	5	2	3	..	..	15%
Self-propelled plant	6	5	3	2	6	4	24%	13%
Tractors, agricultural or otherwise	4	4	1	5	3	3	18%	10%
Other mobile plant or transport	3	7	2	3	3	1	6%	12%
Machinery and (mainly) fixed plant	4	2	5	1	3	2	12%	8%
Powered equipment, tools and appliances	5	1	..	..	3	2	12%	6%
Materials and substances	2	..	..	..	..	1	6%	1%
Animal, human and biological agencies	..	..	..	1	1	1	6%	1%
Non-powered hand tools, appliances and equipment	2	..	2	2	1	..	..	6%
Environmental agencies	1	..	..	1	2	..	..	3%
Chemicals and chemical products	..	..	1	..	..	..	..	1%
Total – Being hit by moving objects	40	28	24	22	28	17	100%	100%

13. Worker fatalities due to falls from a height

In 2016, 25 workers died as a result of a fall from a height. As shown in Table 19, the number of workers dying as a result of this mechanism has not improved to any great extent over the last 14 years.

Over the 10 years to 2016, falls from a height most commonly involved falls from a ladder (17 per cent), roof (15 per cent of fatalities), horses, donkeys and mules (8 per cent), trucks, semi-trailers and lorries (7 per cent) and elevated work platforms (6 per cent).

Table 19 Worker fatalities due to falls from a height: number by breakdown agency, 2003 and 2012 to 2016 (sorted by 2016 fatalities)

Breakdown agency	2003	2012	2013	2014	2015	2016	% of 2016	10yr average (2007-2016)
Non-powered hand tools, appliances and equipment	5	3	4	4	7	10	40%	27%
Ladders	3	1	3	2	3	6	24%	17%
Scaffolding	1	1	..	..	2	2	8%	6%
Environmental agencies	14	18	7	10	12	9	36%	37%
Roof	9	8	2	5	6	4	16%	15%
Buildings under construction or demolition	3	2	..	..	1	..	..	3%
Internal building structures	..	2	..	1	..	..	..	2%
Openings in floors, walls or ceilings	..	1	..	1	1	2	8%	3%
Mobile plant and transport	2	5	7	2	5	3	12%	15%
Trucks, semi-trailers, lorries	2	2	3	..	3	1	4%	7%
Motorised water craft	..	..	1	..	..	..	..	2%
Machinery and (mainly) fixed plant	3	4	3	3	2	1	4%	11%
Elevating work platforms	1	1	1	..	2	..	..	6%
Animal, human and biological agencies	3	..	5	3	3	1	4%	9%
Horses, donkeys, mules	3	..	4	3	3	1	4%	8%
Total – Falls from a height	27	30	26	22	29	25	100%	100%

* The sum of the number of fatalities and percentage figures for each column may not equal the total due to rounding and the inclusion of selected subcategories in some breakdown agencies. The total also includes fatalities where the breakdown agency was unknown.

14. Worker fatalities due to being hit by falling objects

In 2016, 17 workers died due to being hit by falling objects, which amounted to 9 per cent of all worker fatalities.

Table 20 provides more detail on the object (agency) which hit the worker. Over the last 10 years, 16 per cent of fatalities occurred as a result of a worker being hit by falling vegetation. This was followed by trucks, semi-trailers and lorries and forklift trucks which each accounted for 7 per cent worker fatalities due to this mechanism.

Table 20 Worker fatalities due to being hit by falling objects: number by breakdown agency, 2003 and 2012 to 2016 (sorted by 2016 fatalities)

Breakdown agency	2003	2012	2013	2014	2015	2016	% of 2016	10yr average (2007-2016)
Environmental agencies	6	7	8	6	3	6	35%	26%
Vegetation	3	5	6	2	2	3	18%	16%
Buildings and other structures	3	1	2	3	..	1	6%	6%
Materials and substances	3	3	5	3	5	5	29%	15%
Ferrous and non-ferrous metal	..	2	3	3	..	2	12%	6%
Sawn or dressed timber	..	..	..	..	2	1	6%	4%
Mobile plant and transport	3	8	6	4	10	3	18%	25%
Tractors, agricultural or otherwise	2	..	1	..	1	1	6%	3%
Trucks, semi-trailers, lorries	..	2	4	3	1	2	12%	7%
Machinery and (mainly) fixed plant	1	6	2	2	1	3	18%	19%
Forklift trucks	..	1	..	1	..	1	6%	7%
Cranes	1	3	1	..	..	1	6%	5%
Non-powered hand tools, appliances and equipment	1	3	3	2	2	..	..	13%
Storage equipment	..	1	2	..	1	..	..	4%
Total – Being hit by falling objects	15	27	25	17	21	17	100%	100%

Note: Only selected agency subgroups are included. Therefore the number of fatalities in the selected subcategories will not add to the category total. The percentage figures are also rounded to the nearest whole number.

15. Worker fatalities by breakdown agency

The breakdown agency identifies the object, substance or circumstance principally involved at the point at which things started to go wrong.

Table 21 shows that the breakdown agency of mobile plant and transport accounted for 55 per cent of fatalities in 2016, and 58 per cent of fatalities over the 10 years to 2016. Within this group, trucks, semi-trailers or lorries was the biggest contributor accounting for 23 per cent of all worker fatalities in 2016. This was followed by cars, station wagons, vans or utilities at 12 per cent.

For the complete time series see Appendix A2.

Table 21 Worker fatalities: number and proportion by selected breakdown agencies*, 2003 and 2012 to 2016 (selected years, sorted by 2016 fatalities)

Breakdown agency	2003	2012	2013	2014	2015	2016	% of 2016	10yr average (2007-2016)
Mobile plant and transport	161	143	121	115	113	101	55%	58%
Road transport	99	91	70	72	65	67	37%	36%
Trucks, semi-trailers, lorries	58	54	41	50	43	42	23%	22%
Cars, station wagons, vans, utilities	38	36	22	20	22	21	12%	12%
Other mobile plant	20	12	17	14	14	12	7%	7%
Tractors, agricultural or otherwise	13	6	13	10	6	10	5%	4%
Air transport	24	14	10	9	4	6	3%	4%
Self-propelled plant	8	13	6	10	14	9	5%	5%
Other transport	3	4	12	6	7	2	1%	3%
Water transport	4	4	4	1	5	1	1%	1%
Environmental agencies	29	32	18	27	34	31	17%	14%
Machinery and (mainly) fixed plant	23	23	24	21	18	14	8%	10%
Conveyors and lifting plant	13	12	17	12	9	6	3%	5%
Electrical installation	6	3	6	2	5	5	3%	2%
Non-powered hand tools, appliances and equipment	13	8	14	13	18	12	7%	6%
Ladders, mobile ramps and stairways, and scaffolding	4	2	4	4	6	8	4%	2%
Animal, human and biological agencies	15	10	12	9	12	10	5%	5%
Live four-legged animals	4	5	7	5	4	6	3%	3%
Human agencies	10	3	4	3	8	3	2%	2%
Materials and substances	7	7	7	7	9	7	4%	4%
Powered equipment, tools and appliances	8	6	4	2	6	3	2%	2%
Chemicals and chemical products	2	2	2	3	1	1	1%	1%
Total	259	231	202	197	211	182	100%	100%

Note: Only selected breakdown agency subgroups and classes are included. Therefore the number of fatalities in the selected subcategories will not add to the category total. The percentage figures are also rounded to the nearest whole number.

16. Worker fatalities and the involvement of vehicles

Over the 10 year period from 2007 to 2016, 1484 (64 per cent) worker fatalities involved vehicles. Of these, just over a half (748 fatalities) occurred on a public road.

Table 22 Worker fatalities by vehicle involvement: number by public road status and mechanism of incident, 2007 to 2016 combined (sorted by vehicle involved fatalities)

Mechanism of fatality	Vehicle involved: On a public road	Vehicle involved: Not on a public road	Vehicle involved: Total	No vehicle involved	Total
Vehicle collision	661	229	890	..	890
Being hit by moving objects	61	133	194	73	267
Rollover of non- road vehicle	8	94	102	..	102
Being hit by falling objects	2	74	76	149	225
Being trapped by moving machinery	3	53	56	52	108
Being trapped between stationary and moving objects	6	48	54	32	86
Falls from a height	2	46	48	224	272
Other mechanisms	5	59	64	315	379
Total	748	736	1484	845	2329

Table 23 shows that the vast majority (88 per cent) of worker fatalities involving vehicles on public roads were the result of a vehicle collision. This was followed by being hit by moving objects which accounted for a further 8 per cent of fatalities.

By contrast, less than a third (31 per cent) of fatalities involving a vehicle not on a public road were due to a vehicle collision. A further 18 per cent were caused by being hit by a moving object and 13 per cent due to the rollover of a non-road vehicle.

Table 23 Worker fatalities by vehicle involvement: percentage by public road status and mechanism of incident, 2007 to 2016 combined (sorted by vehicle involved fatalities)

Mechanism of fatality	Vehicle involved: On a public road	Vehicle involved: Not on a public road	Vehicle involved: Total	No vehicle involved	Total
Vehicle collision	88%	31%	60%	..	38%
Being hit by moving objects	8%	18%	13%	9%	11%
Rollover of non-road vehicle	1%	13%	7%	..	4%
Being hit by falling objects	0%	10%	5%	18%	10%
Being trapped by moving machinery	0%	7%	4%	6%	5%
Being trapped between stationary and moving objects	1%	7%	4%	4%	4%
Falls from a height	0%	6%	3%	27%	12%
Other mechanisms	1%	8%	4%	37%	16%
Total	100%	100%	100%	100%	100%

17. Worker fatalities by State/Territory

Table 24 shows that in 2016, 53 workers were killed in New South Wales, 45 in Queensland, 31 in Victoria, 21 in South Australia and 20 in Western Australia.

The most populous states have accounted for the majority of fatalities over the last 10 years. New South Wales accounted for 29 per cent of the worker fatalities over the period, followed by Queensland (25 per cent) and Victoria (19 per cent).

Table 24 Worker fatalities: number by State/Territory of death, 2003 and 2012 to 2016 (sorted by 2016 fatalities)

State/Territory	2003	2012	2013	2014	2015	2016	% of 2016	10yr average (2007-2016)
New South Wales	85	83	54	58	62	53	29%	29%
Queensland	57	57	54	50	51	45	25%	25%
Victoria	54	35	33	42	38	31	17%	19%
South Australia	13	13	15	10	10	21	12%	6%
Western Australia	28	25	33	25	43	20	11%	14%
Tasmania	17	6	8	8	6	6	3%	4%
Northern Territory	4	9	4	4	1	5	3%	3%
Australian Capital Territory	1	3	1	..	..	1	1%	0%
Total	259	231	202	197	211	182	100%	100%

Table 25 shows that for the majority of the states and territories, the fatality rate was lower in 2016 than the average of the last 10 years. The South Australia fatality rate was higher than its 10 year average, while the Australian Capital Territory fatality rate was in line with its 10 year average.

Similar to industries, fatality rates are sensitive to the number of workers employed in each state or territory, and therefore are liable to show volatility in the smaller jurisdictions which employ the fewest workers, even when small variations in the number of fatalities are recorded. Accordingly, the actual number of fatalities should also be considered when interpreting the fatality rates for smaller jurisdictions.

Table 25 Worker fatalities: fatality rate by State/Territory of death, 2003 and 2012 to 2016

State/Territory	2003	2012	2013	2014	2015	2016	10yr average (2007-2016)
New South Wales	2.7	2.4	1.5	1.6	1.7	1.4	1.9
Queensland	3.2	2.5	2.4	2.2	2.2	1.9	2.6
Victoria	2.3	1.3	1.2	1.5	1.3	1.0	1.6
South Australia	1.8	1.6	1.9	1.2	1.2	2.6	1.9
Western Australia	2.9	1.9	2.5	1.9	3.2	1.5	2.6
Tasmania	8.2	2.6	3.5	3.4	2.5	2.5	3.6
Northern Territory	4.1	7.1	3.1	3.0	0.8	3.8	4.9
Australian Capital Territory	0.6	1.4	0.5	0.0	0.0	0.5	0.5
Total	2.7	2.0	1.8	1.7	1.8	1.5	2.1

18. Worker fatalities by State/Territory and industry

Table 26 and Table 27 show the industries which had the highest numbers of fatalities in each state or territory over the 10 years from 2007 to 2016. In line with the national average, Transport, postal and warehousing and Agriculture, forestry and fishing account for most worker fatalities across all the states and territories.

Tasmania and the Northern Territory had a considerably higher proportion of fatalities in the Agriculture, forestry and fishing industry (40 per cent and 38 per cent respectively).

Table 26 Worker fatalities: number by State/Territory of death and the industries with the highest number of fatalities, 2007 to 2016 combined

Industry	New South Wales	Queens land	Victoria	Western Australia	South Australia	Tasmania	Northern Territory	Total* (2007-2016)
Agriculture, forestry and fishing	141	143	113	60	40	34	23	554
Transport, postal and warehousing	169	146	105	75	32	11	14	553
Construction	100	99	70	40	26	11	5	354
Manufacturing	62	42	34	38	7	6	1	190
Administrative and support services	23	21	20	12	6	1	2	85
Mining	15	19	7	32	8	3	1	85
Public administration and safety	22	20	17	8	6	6	2	82
Wholesale trade	24	15	10	6	5	..	1	61
Arts and recreation services	20	23	4	6	3	..	2	59
Retail trade	23	10	10	6	3	4	2	58
Other industries	68	53	52	39	15	9	8	248
Total	667	591	442	322	151	85	61	2329

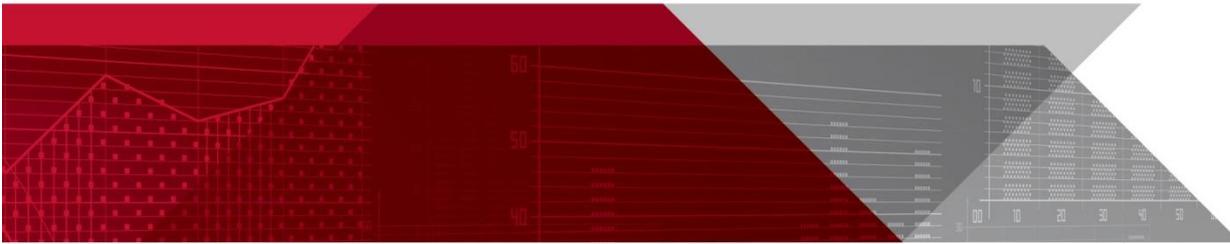
* The Australian Capital Territory was not included separately due to the low numbers involved, however, the total includes the Australian Capital Territory.

Table 27 Worker fatalities: proportion by State/Territory of death and the industries with the highest number of fatalities, 2007 to 2016 combined

Industry	New South Wales	Queens land	Victoria	Western Australia	South Australia	Tasmania	Northern Territory	Total* (2007-2016)
Agriculture, forestry and fishing	21%	24%	26%	19%	26%	40%	38%	24%
Transport, postal and warehousing	25%	25%	24%	23%	21%	13%	23%	24%
Construction	15%	17%	16%	12%	17%	13%	8%	15%
Manufacturing	9%	7%	8%	12%	5%	7%	2%	8%
Administrative and support services	3%	4%	5%	4%	4%	1%	3%	4%
Mining	2%	3%	2%	10%	5%	4%	2%	4%
Public administration and safety	3%	3%	4%	2%	4%	7%	3%	4%
Wholesale trade	4%	3%	2%	2%	3%	0%	2%	3%
Arts and recreation services	3%	4%	1%	2%	2%	0%	3%	3%
Retail trade	3%	2%	2%	2%	2%	5%	3%	2%
Other industries	10%	9%	12%	12%	10%	11%	13%	11%
Total	100%	100%	100%	100%	100%	100%	100%	100%

* The Australian Capital Territory was not included separately due to the low numbers involved, however, the total includes the Australian Capital Territory.

Note: The percentages shown in this table have been rounded to the nearest whole number, therefore the sum of percentage figures for each column may not equal the total.



Section 2

Bystander fatalities



19. Bystander fatalities by age group

The actions of a worker or a fault in a workplace resulted in the deaths of 52 members of the public in 2016, including seven children aged 14 and under. This total number of bystander fatalities in 2016 is the equal lowest number over the 14 years of the series.

Table 28 shows over the last 10 years, the oldest (65 years and over) and youngest (14 and under) age groups accounted for the highest proportion of bystander fatalities, 23 per cent and 16 per cent respectively.

Table 28 Bystander fatalities: number and proportion by age group, 2003 and 2012 to 2016

Age group	2003	2012	2013	2014	2015	2016	% of 2016	10yr average (2007-2016)
14 & under	8	6	11	12	7	7	13%	16%
15-24	8	4	7	12	3	4	8%	12%
25-34	9	8	12	7	7	6	12%	13%
35-44	4	7	6	6	6	10	19%	12%
45-54	10	8	9	7	8	5	10%	12%
55-64	10	7	10	10	10	7	13%	12%
65 & over	8	22	11	18	11	13	25%	23%
Total	57	62	66	72	52	52	100%	100%

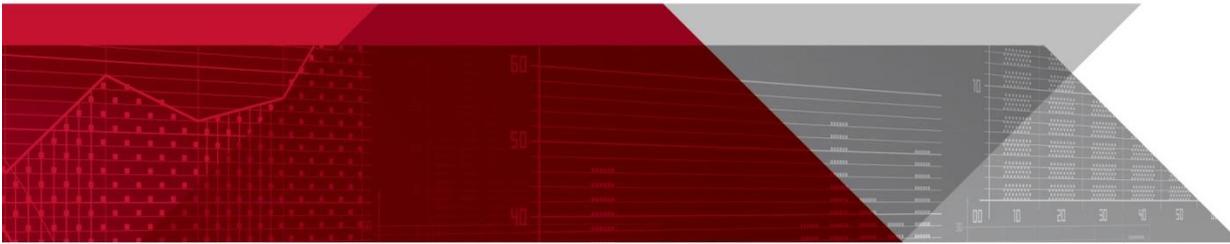
20. Bystander fatalities by mechanism of incident

Table 29 shows over the 10 year period from 2007 to 2016, 59 per cent of the bystander fatalities were due to a vehicle collision, with being hit by moving objects accounting for a further 16 per cent.

Falls from a height accounted for 6 per cent of bystander fatalities over the period, and drowning 5 per cent. The majority of the deaths from drowning were of children aged 14 years and under.

Table 29 Bystander fatalities: number by mechanism of incident, 2003 and 2012 to 2016 (sorted by 2016 fatalities)

Mechanism of fatality	2003	2012	2013	2014	2015	2016	% of 2016	10yr average (2007-2016)
Vehicle incident	38	41	42	42	30	24	46%	59%
Being hit by moving objects	7	12	8	10	9	12	23%	16%
Drowning	1	..	..	5	5	7	13%	5%
Being trapped by moving machinery	1	..	1	..	..	4	8%	1%
Being hit by falling objects	2	3	6	3	2	3	6%	5%
Falls from a height	2	5	4	6	3	1	2%	6%
Other mechanisms	6	1	5	6	3	1	2%	8%
Grand Total	57	62	66	72	52	52	100%	100%



Section 3 Glossary



21. Glossary

Being hit by moving objects

Part of the Mechanism classification used to describe the action of an object hitting a person. This includes pedestrians hit by vehicles as well as being hit by other moving equipment or objects.

Breakdown agency

A part of the TOOCS classification which identified the object, substance or circumstance principally involved at the point at which things started to go wrong.

Bystander fatality

The death of a person who dies from injuries sustained as a result of another person's work activity and who was not engaged in a work activity of their own at the time of the injury. A traffic incident death is only classified as a bystander fatality when attributable to someone else's work activity. Typically, this means the driver of a work vehicle is at fault. Cases where fault could not be determined with sufficient confidence are excluded.

Contributing family workers

A person who works without pay in an economic enterprise operated by a relative.

Employed person

The denominators used in calculating fatality rates in this report are based on ABS estimates of Employed persons, as defined in Labour force, Australia (ABS cat no 6202.0). This population includes Employees (who work for an employer); self-employed persons (regardless of whether they employ others or not); and those who work without pay for a family business or farm. It excludes persons whose only work is voluntary.

Employee

A person who works for a public or private employer and receives remuneration in wages, salary, a retainer fee from their employer while working on a commission basis, tips, piece-rates, or payment in kind; or a person who operates his or her own incorporated enterprise with or without hiring employees.

Fatality rate

The number killed as a result of work-related injury expressed as a per-capita rate against the population at risk of work-related injury. In this report the rate is expressed as the number of fatalities per 100,000 Employed persons: for brevity this is usually expressed as 'fatalities per 100,000 workers'. See Paragraph 4 of the Explanatory notes for further details.

Industry

A grouping of businesses that carry out similar economic activities. Fatalities data in this publication have been coded to the Australian and New Zealand Standard Industrial Classification (ANZSIC) 2006 (ABS cat. no. 1292.0) and unless specified are shown at the industry division level.

Injury

A condition coded to 'External causes of morbidity and mortality' and 'Injury, poisoning and certain other consequences of external causes' in the International Statistical Classification of Diseases and Related Health Problems, Tenth Revision, Australian Modification (ICD-10-AM).

Job

A set of tasks designed to be performed by one person for an employer (including self-employment) in return for payment or profit.

Mechanism of incident

The action, exposure or event that best describes the circumstances that resulted in the most serious injury.

Non-public road incident

An incident involving a vehicle that occurred at a worksite, on a private road or a public area that is not a public road. These incidents include plane crashes and incidents involving watercraft as well as vehicle crashes on farming properties.

Occupation

A set of jobs with similar sets of tasks. Fatalities data in this publication have been coded to the Australian and New Zealand Standard Classification of Occupations (ANZSCO) (ABS cat. no. 1220.0) First edition and unless specified are shown at the major group level.

Public road incident

A collision on a public road between any vehicle or self-propelled plant and anything else including a pedestrian. Incidents involving vehicles at worksites or on private roads are excluded. Public road incidents can be due to a Vehicle collision or being hit by a vehicle (which is included in the Mechanism of Being hit by moving objects). Vehicles that are caught in bush fires or hit by falling trees while on public roads are not classed as public road incidents as they do not involve a collision.

Rollover of non-road vehicle

Part of the Mechanism classification used to identify when a vehicle that is not normally a road vehicle overturns. This includes tractors and quad bikes being used on farm properties.

Self-employed

Includes both owner managers and employers. An owner manager is a person who works in his/her own business, with or without employees, whether or not the business is of limited liability. An employer is a person who operates his/her own unincorporated economic enterprise or engages independently in a profession or trade, and hires one or more employees.

Type of occurrence classification system (TOOCS)

A suite of four classifications to code the way an injury occurred, comprising the Nature of injury/disease classification, the Bodily location of injury/disease classification, Mechanism of incident classification, and the Agency of injury/disease classification. Version 3.1 is used for coding the data presented in this report. Fatalities are only coded by Mechanism and Agency.

Vehicle collision

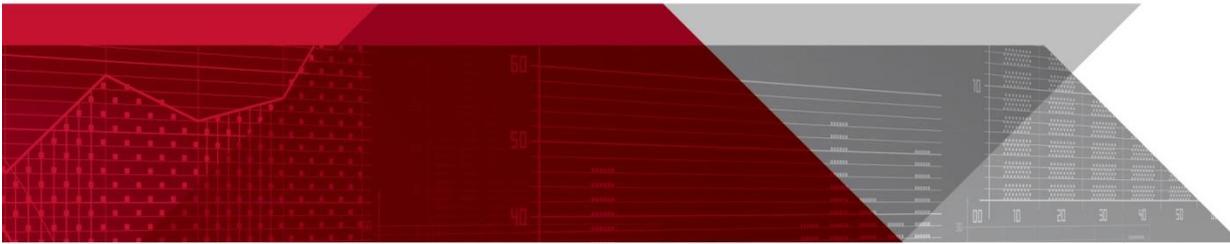
Part of the Mechanism of incident classification that identifies fatalities that occurred due to a vehicle crash and where the occupant of the vehicle was killed. In the classification, this category is called Vehicle Incident but has been renamed to assist with reader understanding. Vehicle collisions that occur on public roads are further classified as a public road incidents and do not include people hit by a vehicle, which are coded to Being hit by moving objects. Vehicles not only include cars and trucks but also include other motorised equipment such as aircraft, boats, loaders, tractors and quad bikes.

Volunteer

Persons who undertake voluntary work through or for an organisation or group are included in the worker counts where that organisation or group is a business enterprise. It does not include sporting organisations or caring activities.

Worker fatality

The death of a person who dies from injuries sustained while at work, including those workers whose injury was caused by another's work activity. Workers include employees, self-employed persons, volunteers and contributing family workers.



Section 4 Appendices



Appendix A1: Worker fatalities: number by mechanism of incident, 2003 to 2016 (sorted by total fatalities)

Mechanism of incident	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Total
Vehicle incident	108	121	103	124	129	121	112	80	79	91	68	74	60	76	1346
Being hit by moving objects	40	37	29	32	38	32	31	28	19	28	24	22	28	17	405
Falls from a height	27	25	26	39	32	30	29	27	22	30	26	22	29	25	389
Being hit by falling objects	15	21	25	25	24	23	15	29	27	27	25	17	21	17	311
Contact with electricity	13	16	13	18	13	9	13	10	10	6	8	5	8	7	149
Being trapped by moving machinery	6	9	11	7	11	13	11	12	13	10	10	11	9	8	141
Rollover of non-road vehicle	9	13	11	6	12	11	12	11	11	6	15	7	14	3	141
Being trapped between stationary and moving objects	9	13	12	12	11	8	7	8	13	5	7	12	11	4	132
Being assaulted by a person or persons	12	9	7	5	8	3	4	4	3	6	6	4	5	4	80
Drowning	4	3	2	2	5	9	8	2	3	3	4	1	5	7	58
Explosion	3	1	2	1	1	7	1	3	5	2	1	6	5	2	40
Being hit by an animal	1	3	2	1	2	3	2	3	6	4	2	1	1	2	33
Contact with hot objects	1		2	1	7	3	..	1	3	1	1	4	6	3	33
Falls on the same level	3	5	1	1	4	4	2	2	..	4	..	1	1	..	28
Slide or cave-in	1	2	4	3	1	..	1	1	2	1	..	5	1	1	23
Exposure to environmental heat	1	1	..	1	3	..	2	1	2	1	2	1	3	1	19
Single contact with chemical or substance	3	..	..	1	3	1	1	2	2	2	..	2	..	..	17
Being bitten by an animal	1	1	3	2	..	..	..	1	2	2	..	1	..	1	14
Hitting stationary objects	..	1	1	..	1	..	1	2	1	2	2	..	2	..	13
Hitting moving objects	..	1	3	..	3	3	1	..	..	..	..	..	..	1	12
Insect and spider bites and stings	..	1	..	..	2	3	1	1	..	..	1	..	..	..	9
Being hit by a person accidentally	..	..	..	..	..	..	2	2	2	..	..	..	..	..	6
Exposure to other & unspecified environmental factors	..	..	..	..	..	..	1	..	..	..	..	1	2	1	5
Other and multiple mechanisms of injury	1	..	1	..	..	..	1	..	..	..	..	..	..	1	4

Mechanism of incident	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Total
Other variations in pressure	..	1	..	2	..	..	..	..	..	..	..	..	..	..	3
Unspecified mechanisms of injury	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Contact with poisonous parts of plant or marine life	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1
Exposure to environmental cold	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1
Total	259	284	258	284	310	283	258	230	225	231	202	197	211	182	3414

Appendix A2: Worker fatalities: number by breakdown agency, 2003 to 2016 (sorted by total fatalities)

Breakdown agency	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Total
Mobile plant & transport	161	180	151	172	192	184	167	135	133	143	121	115	113	101	2068
Road transport	99	114	100	112	139	115	110	86	72	91	70	72	65	67	1312
Trucks, semi-trailers, lorries	58	72	50	66	76	67	65	49	47	54	41	50	43	42	780
Cars, station wagons etc.	38	36	42	43	54	36	41	35	22	36	22	20	22	21	468
Air transport	24	12	15	21	11	19	11	14	21	14	10	9	4	6	191
Industrial aircraft	9	7	4	11	7	13	11	13	10	12	9	3	4	4	117
Passenger aircraft	15	4	11	10	4	6	..	1	10	2	1	6	..	2	72
Self-propelled plant	8	12	10	10	11	14	11	8	9	13	6	10	14	9	145
Front-end loaders, log handling plant etc.		5	5	4	5	4	1	1	2	6	2	3	4	3	45
Excavators, backhoes, other plant	3	3	1	2	2	1	3	3	4	3	1	2	4	4	36
Graders, dozers, snowploughs etc.	3	1	2	2	1	5	1	2	1	..	1	2	3	..	24
Other mobile plant	20	23	16	15	14	15	15	16	13	12	17	14	14	12	216
Tractors, agricultural or otherwise	13	22	13	13	7	11	13	13	9	6	13	10	6	10	159
Water transport	4	9	6	4	4	11	9	4	4	4	4	1	5	1	70
Other transport	3	4	3	3	4	8	7	1	11	4	12	6	7	2	75
All terrain vehicle (atv)	3	4	3	2	4	8	6	1	11	4	12	6	7	2	73
Machinery & (mainly) fixed plant	23	27	32	30	29	29	31	25	32	23	24	21	18	14	358
Conveyors and lifting plant	13	10	20	18	18	17	16	14	22	12	17	12	9	6	204
Forklift trucks	4	4	6	9	5	8	3	8	4	2	6	5	4	1	69
Power hoists	2	3	3	1	9	6	6	4	8	3	4	3	2	2	56
Cranes	5	1	7	4	3	2	5	..	7	4	6	2	1	1	48
Electrical installation	6	6	6	5	4	5	11	5	4	3	6	2	5	5	73
Environmental agencies	29	28	27	29	28	20	25	20	21	32	18	27	34	31	369
Buildings and other structures	16	12	9	14	7	8	10	6	4	12	5	8	8	7	126
Vegetation	3	6	11	5	6	3	3	6	6	6	7	2	5	7	76

Breakdown agency	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Total
Non-powered hand tools, appliances & equipment	13	17	11	20	24	22	13	23	8	8	14	13	18	12	216
Ladders, mobile ramps and scaffolding	4	3	5	7	13	9	7	11	7	2	4	4	6	8	90
Ladders	3	3	3	5	10	4	4	9	6	1	3	3	3	6	63
Scaffolding	1	..	2	..	3	5	3	2	1	1	1	..	2	2	23
Animal, human & biological agencies	15	15	14	14	14	12	9	11	13	10	12	9	12	10	170
Live four-legged animals	4	6	6	6	6	5	4	7	7	5	7	5	4	6	78
Horses, donkeys, mules	3	3	4	5	4	3	3	3	3	1	4	5	3	2	46
Cows, steers, cattle, buffalo	1	2	..	1	1	2	1	3	3	3	2	..	..	2	21
Human agencies	10	7	6	5	6	4	4	2	4	3	4	3	8	3	69
Other person	8	6	5	5	6	3	4	2	4	3	4	3	4	3	60
Powered equipment, tools & appliances	8	7	6	12	10	8	8	10	7	6	4	2	6	3	97
Materials & substances	7	10	13	4	8	6	5	2	8	7	7	7	9	7	100
Chemicals & chemical products	2	..	4	3	3	2	..	4	3	2	2	3	1	1	30
Total	259	284	258	284	310	283	258	230	225	231	202	197	211	182	3414

Appendix A3: Worker fatalities: number by industry of employer, 2003 to 2016 (sorted by total fatalities)

Industry of employer	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Total
Transport, postal & warehousing	68	66	55	62	83	71	64	45	48	60	43	47	45	47	804
Road transport	45	50	41	52	62	52	56	33	29	51	36	40	40	40	627
Road freight transport	40	47	37	47	58	50	51	32	25	44	33	37	39	34	574
Agriculture, forestry & fishing	60	77	62	46	52	69	62	55	60	56	55	45	56	44	799
Agriculture	46	54	44	35	40	45	45	46	46	38	43	40	44	31	597
Construction	43	35	30	43	45	38	36	41	41	30	22	32	34	35	505
Manufacturing	20	23	23	29	25	30	23	21	22	18	12	17	16	6	285
Mining^a	11	11	9	15	7	12	10	5	6	8	9	11	11	6	131
Public administration & safety	9	11	14	13	13	4	11	7	11	8	11	6	6	5	129
Administrative & support services	4	9	12	8	12	10	12	12	8	6	5	4	8	8	118
Wholesale trade	7	10	11	8	8	11	4	10	3	9	8	6	2	..	97
Retail trade	7	5	7	10	17	6	5	7	2	5	8	..	4	4	87
Arts & recreation services	3	5	6	5	10	3	1	5	6	5	7	10	7	5	78
Other services	4	7	10	7	4	7	4	2	4	3	7	4	8	4	75
Electricity, gas, water & waste services	5	8	6	8	4	4	5	1	2	3	4	5	4	8	67
Professional, scientific & technical services	2	6	2	6	7	5	4	4	2	8	2	..	2	1	51
Rental, hiring & real estate services	4	2	6	4	10	4	2	4	2	3	3	1	..	2	47
Accommodation & food services	5	4	..	8	6	2	3	2	1	1	2	6	3	..	43
Health care & social assistance	3	3	3	2	..	2	6	4	2	2	4	2	3	4	40
Education & training	2	1	2	8	4	2	2	2	2	4	..	1	2	2	34
Information media & telecommunications	1	1	..	1	3	..	1	3	3	2	..	..	..	1	16
Financial & insurance services	1	..	..	1	..	3	3	..	..	..	..	..	..	..	8
Total	259	284	258	284	310	283	258	230	225	231	202	197	211	182	3414

^a Mining fatalities include those that occur in coal and metal ore mining, oil and gas extraction, sand and gravel quarrying, exploration and support services.

Appendix A4: Worker fatalities: fatality rate (fatalities per 100,000 workers) by industry of employer, 2003 to 2016 (sorted by total fatality rates)*

Industry of employer	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Total
Agriculture, forestry & fishing	16.4	21.6	17.6	13.4	15.0	20.0	17.8	15.5	19.0	17.7	18.3	13.9	18.0	14.0	17.0
Agriculture	14.5	17.5	14.6	11.7	13.3	15.1	14.6	14.8	16.8	13.8	16.5	14.3	16.2	11.6	14.7
Transport, postal & warehousing	14.6	13.7	11.1	12.4	15.5	12.5	11.0	7.7	8.3	10.9	7.3	7.9	7.4	7.5	10.4
Road transport	20.2	22.4	19.5	23.2	26.4	22.1	23.4	14.8	12.7	23.1	15.3	16.6	15.7	14.9	19.2
Road freight transport	26.1	32.0	27.3	32.0	38.0	29.1	30.0	19.6	15.6	29.0	20.0	21.6	21.2	18.1	25.4
Mining^a	12.4	11.0	7.6	11.4	5.1	7.3	6.1	2.7	2.7	3.0	3.4	4.3	4.8	2.7	5.1
Electricity, gas, water and waste services	5.5	8.8	6.0	7.6	3.8	3.3	3.8	0.7	1.4	2.0	2.7	3.4	2.8	5.8	3.8
Construction	5.8	4.4	3.6	4.8	4.8	3.9	3.7	4.1	4.0	3.1	2.2	3.1	3.3	3.3	3.8
Arts & recreation services	2.1	3.2	3.5	2.9	5.2	1.6	0.5	2.6	2.9	2.4	3.4	4.9	3.1	2.2	2.9
Administrative & support services	1.2	2.7	3.4	2.3	3.4	2.9	3.4	3.1	2.0	1.5	1.3	1.0	1.9	1.8	2.3
Manufacturing	1.9	2.2	2.3	2.9	2.4	2.9	2.3	2.1	2.3	1.9	1.3	1.8	1.8	0.7	2.1
Wholesale trade	1.9	2.6	3.0	2.0	2.1	2.7	1.0	2.4	0.7	2.2	1.9	1.5	0.5	..	1.8
Rental, hiring & real estate services	2.4	1.1	3.4	2.1	5.0	2.0	1.1	2.1	1.0	1.4	1.5	0.5	..	0.9	1.7
Public administration & safety	1.6	1.9	2.3	2.1	2.0	0.6	1.6	1.0	1.5	1.1	1.5	0.8	0.8	0.7	1.4
Other services	0.9	1.7	2.5	1.7	0.9	1.5	0.9	0.4	0.9	0.7	1.5	0.8	1.7	0.8	1.2
Retail trade	0.6	0.5	0.6	0.9	1.4	0.5	0.4	0.6	0.2	0.4	0.7	..	0.3	0.3	0.5
Information media & telecommunications	0.4	0.5	..	0.4	1.2	..	0.5	1.4	1.5	0.9	..	..	..	0.5	0.5
Professional, scientific & technical services	0.3	1.0	0.3	0.8	0.9	0.6	0.5	0.5	0.2	0.9	0.2	..	0.2	0.1	0.4
Accommodation & food services	0.8	0.6	..	1.2	0.9	0.3	0.4	0.3	0.1	0.1	0.3	0.8	0.4	..	0.4
Education & training	0.3	0.1	0.3	1.1	0.5	0.2	0.2	0.2	0.2	0.5	..	0.1	0.2	0.2	0.3
Health care & Social assistance	0.3	0.3	0.3	0.2	..	0.2	0.5	0.3	0.2	0.1	0.3	0.1	0.2	0.3	0.2
Financial & insurance services	0.3	..	..	0.3	..	0.7	0.8	..	..	..	..	..	..	..	0.1
Total	2.7	2.9	2.6	2.8	2.9	2.6	2.4	2.0	2.0	2.0	1.8	1.7	1.8	1.5	2.2

^a Mining fatalities include those that occur in coal and metal ore mining, oil and gas extraction, sand and gravel quarrying, exploration and support services.

* Movements in fatality rates in industries with 5 or fewer fatalities each year should be viewed with caution.

Appendix A5: Worker fatalities: number by occupation, 2003 to 2016 (sorted by total fatalities)

Occupation	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Total
Machinery operators and drivers	86	91	76	89	112	94	95	65	61	77	62	67	71	62	1108
Road and rail drivers	65	71	55	69	82	67	72	48	46	61	47	49	46	50	828
Mobile plant operators	11	8	8	10	17	9	12	8	7	8	6	6	17	8	135
Machine and stationary plant operators	7	8	11	9	7	15	9	7	8	5	8	12	8	3	117
Labourers	61	60	42	52	56	65	40	51	41	48	41	50	38	40	685
Farm, forestry and garden workers	22	26	15	13	16	33	12	22	16	16	11	23	17	15	257
Other labourers	10	18	9	14	15	13	10	14	7	9	19	17	9	13	177
Construction and mining labourers	24	10	12	14	13	15	11	11	12	14	8	9	9	11	173
Managers	40	48	50	42	38	34	43	34	41	39	35	19	35	24	522
Farmers and farm managers	31	35	35	27	27	24	32	27	35	27	30	16	24	19	389
Technicians and trades workers	31	49	43	53	55	46	37	40	43	28	29	29	35	26	544
Construction trades workers	10	13	6	15	17	11	13	12	8	11	3	10	11	12	152
Automotive and engineering trades workers	10	15	13	12	13	16	10	10	11	4	11	8	9	2	144
Electro-technology and telecommunications trades workers	9	11	13	11	13	9	6	8	14	6	9	7	8	6	130
Skilled animal and horticultural workers	..	4	6	6	7	1	2	3	4	1	3	3	2	5	47
Professionals	19	15	24	25	24	21	20	24	25	22	12	12	12	14	269
Design, engineering, science and transport professionals	17	12	19	17	12	16	13	13	19	15	9	10	6	8	186
Legal, social and welfare professionals	..	1	1	1	..	2	..	2	..	1	2	..	..	3	13
Community and personal service workers	11	16	12	14	10	8	14	9	10	9	14	11	10	3	151
Protective service workers	7	6	8	7	5	3	8	5	3	7	4	3	..	3	69
Sales workers	7	4	5	7	10	7	4	5	1	3	6	2	2	3	66
Clerical and administrative workers	4	1	6	2	5	8	5	2	3	5	1	3	1	1	47
Total	259	284	258	284	310	283	258	230	225	231	202	197	211	182	3414

Note: Only selected occupation sub-major classifications are included. Therefore the number of fatalities in the selected sub-major classifications will not add to the category total.
 *The total number of fatalities and percentage figures for each column shown in this table will not equal the total due to rounding and the inclusion of selected subdivisions and groups within an industry division.

Appendix A6: Worker fatalities: fatality rate by occupation, 2003 to 2016 (sorted by 2016 fatality rates)

Occupation	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Machinery operators and drivers	13.7	14.2	11.9	13.5	15.7	13.1	13.8	9.2	8.2	10.4	8.0	8.9	9.5	8.2
Road and rail drivers	24.9	26.2	20.7	25.2	28.6	23.2	25.0	16.7	14.8	20.4	14.6	15.4	14.3	14.6
Mobile plant operators	9.3	6.5	6.5	8.0	12.2	6.6	9.1	5.6	5.0	5.4	4.4	4.3	13.1	6.5
Machine and stationary plant operators	4.0	4.8	6.9	5.5	4.1	8.5	5.7	4.3	4.7	2.9	4.4	7.3	5.0	1.9
Labourers	5.6	5.5	3.8	4.6	4.9	5.6	3.5	4.5	3.6	4.2	3.6	4.4	3.4	3.4
Farm, forestry and garden workers	15.8	20.6	13.2	10.8	13.8	31.4	11.1	18.3	13.7	14.7	11.0	20.0	14.6	12.4
Other labourers	5.1	9.2	4.3	6.0	6.3	5.3	4.2	6.0	3.1	3.9	8.3	7.8	4.4	5.9
Construction and mining labourers	17.8	7.0	8.4	9.5	7.8	9.0	6.8	7.0	7.1	8.8	5.2	5.7	5.7	6.6
Managers	3.5	4.1	4.0	3.3	2.8	2.5	3.1	2.3	2.9	2.7	2.4	1.3	2.3	1.6
Farmers and farm managers	15.7	18.1	17.7	14.1	13.7	12.3	15.9	13.6	20.8	16.0	19.1	9.1	14.4	12.2
Technicians and trades workers	2.2	3.4	2.9	3.5	3.5	2.8	2.3	2.5	2.6	1.7	1.7	1.7	2.0	1.5
Construction trades workers	3.3	4.1	1.8	4.4	5.0	2.9	3.7	3.3	2.1	3.2	0.8	2.8	3.0	3.2
Automotive and engineering trades workers	3.0	4.4	3.8	3.4	3.7	4.4	2.8	2.8	3.1	1.1	3.0	2.1	2.3	0.6
Electro technology and telecommunications trades workers	4.6	6.2	7.0	5.6	6.1	4.2	2.8	3.4	6.4	2.6	4.0	3.0	3.3	2.5
Skilled animal and Horticultural Workers	0.0	4.0	5.9	5.2	6.1	0.9	1.9	2.8	3.4	0.8	2.5	2.3	1.7	4.1
Professionals	1.0	0.8	1.2	1.2	1.1	0.9	0.9	1.0	1.0	0.9	0.5	0.5	0.4	0.5
Design, Engineering, Science and Transport Professionals	6.9	4.6	6.5	5.6	3.9	4.7	3.8	3.6	5.0	3.9	2.3	2.6	1.6	2.1
Legal, Social and Welfare Professionals	0.0	0.8	0.7	0.7	0.0	1.2	0.0	1.1	0.0	0.5	1.0	0.0	0.0	1.4
Community and Personal Service Workers	1.4	2.0	1.4	1.6	1.1	0.9	1.4	0.9	0.9	0.8	1.2	1.0	0.8	0.2
Protective Service Workers	5.9	5.2	6.5	5.7	4.1	2.4	6.1	3.9	2.2	5.1	2.7	2.0	0.0	2.1
Sales Workers	0.7	0.4	0.5	0.7	1.0	0.7	0.4	0.5	0.1	0.3	0.6	0.2	0.2	0.3
Clerical and Administrative Workers	0.3	0.1	0.4	0.1	0.3	0.5	0.3	0.1	0.2	0.3	0.1	0.2	0.1	0.1
Total	2.8	3.0	2.6	2.8	3.0	2.6	2.4	2.1	2.0	2.0	1.8	1.7	1.8	1.5

Note: Movements in fatality rates in occupations with 5 or fewer fatalities each year should be viewed with caution.

* Occupation not known is included in total.