

Quad bike safety



- Quad bikes are the leading cause of unintentional death on Australian farms.¹
- Based on a 10 year average, 13 people are killed annually in Australia, with 50% of these resulting from roll overs causing crush injuries or asphyxiation.²
- For every quad bike fatality, it is estimated there are an additional 80 hospital and emergency department admissions.³



State of the Road A Fact Sheet of the Centre for Accident Research & Road Safety - Queensland (CARRS-Q)

THE FACTS

- Quad bikes have become a highly utilised item of machinery in recent years, due to their adaptability, low running cost and easy operation. They are widely used by farmers, local governments, search and rescue teams, recreation clubs and for adventure tourism⁴.
- There is increasing concern in the research, medical and community sector, calling for quad bike safety reforms amid high rates of fatality and injury.
- Quad bikes are the leading cause of unintentional death on Australian farms⁵, and account for nearly 50% of all non-fatal on-farm injuries⁶. While farm fatalities have dropped by approximately 65% over the past 20 years, quad bike incidents continue to rise⁷.
- It is difficult to estimate the number of quad bikes currently in use in Australia due to a lack of data on sales, turnover and usage patterns, with recent estimates ranging from 220,000⁸ to over 300,000⁹.

A statistical analysis

In Australia, quad bike fatalities from 2011-2016 amounted to 106¹:

- Males made up the majority: 84%;
- The median age of fatalities was 46 years, with the youngest being 4 years;
- 49% of fatalities were work-related and 51% involved recreational use;
- 26% of fatalities occurred on terrain where an incline was noted by investigators (though there are limited details regarding the slope of the incline);
- Over half (51%) involved a rollover;
- None of the fatalities mentioned any form of rollover protection on the quad bike;

- 17% were attributed to a potential weight imbalance (e.g. through carrying spray tanks, cargo, passengers or towing heavy trailers);
- In 34% of cases, the rider was not wearing a helmet; and
- More than ¾ of fatalities have occurred in three States: Queensland (30%), New South Wales (25%) and Victoria (23%).

In Queensland, quad bike fatalities from 2011-2016 amounted to 33¹:

- 75% were males;
- 15% were children under the age of 16 years;
- 44% of fatalities were work-related and 56% involved recreational use;
- 44% of fatalities involved the quad bike's rollover; and
- In 1 in 3 cases (33%), the rider was not wearing a helmet.

While the number of fatalities related to quad bikes is generally well-reported by a number of agencies across Australia, estimates of the magnitude and patterns of non-fatal injuries are limited.

Approximately 1 in 2 quad bike fatalities result from rollovers, and crush injury/asphyxiation is a common cause of death².

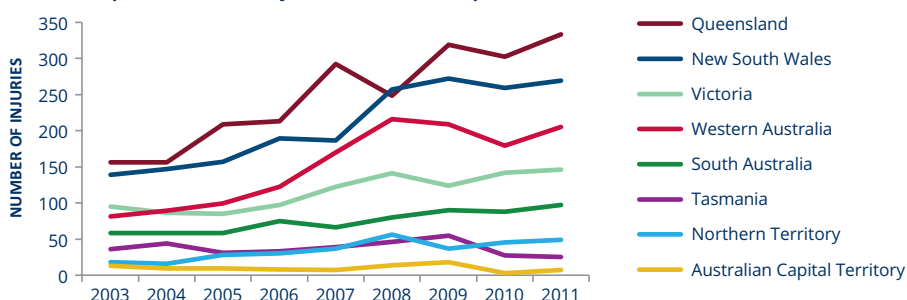
The graph below demonstrates the number of quad bike injuries admitted to hospital in each Australian state from 2003-2011. Almost 8,000 people admitted to hospital across Australia in this time period, and shows that Queensland consistently has the highest number of hospitalised injuries³.

Key risk factors

There is a **lack of consumer and public awareness** of the dangers of quad bikes and requirements to ride them safely:

- Quad bikes are deceptively easy to ride which can lead to **complacency with their use**.
- Maintaining stability while riding a quad bike can be beyond the physical capacity of some riders (especially children and older

Number of quad bike-related injuries admitted to hospital in each Australian State 2003-2011





Fact sheet images courtesy of Workplace Health and Safety Queensland

persons) and can lead to fatigue and an inability to retain control.

- **Few riders are properly trained.** Research shows that 1 in 3 quad bike riders are self-taught¹⁰.
- Quad bikes' **high centre of gravity** increases the risk of rollover.
- There is a popular and **mistaken belief that quad bikes are all-terrain vehicles**, however steep slopes, rough terrain and even flat surfaces (such as asphalt or tarmac) can cause instability.
- **Unsafe riding practices are common**¹⁰. Quad bikes are designed for particular purposes and within particular operating conditions. Using them outside these parameters can significantly increase the risk of severe injury or death.
- **Children under 16 years of age do not have the physical and cognitive abilities** to operate quad bikes safely.
- **Many riders fail to wear protective wear** - 1 in 3 rider fatalities were not wearing a helmet^{1,11}.
- **Overloading** causes instability. Despite most quad bikes being designed to carry one person only, one-quarter of recreational quad bike users had carried passengers¹⁰. In addition, the loading of equipment and fitting of inappropriate attachments or towing apparatus can significantly change the handling, stability and braking conditions, and propensity for rollover.
- Consumption of **alcohol or drugs** impairs rider ability and judgement.
- Operating quad bikes in **remote locations** without access to adequate methods of communication and/or use of personal locator beacons increases delay in retrieval and medical assistance.

Who is most at risk?

- **Male riders**¹;
- **Children** under 16 years of age^{1,10};
- **Farm workers and visitors**¹²;

- **Older persons**¹²; and
- **Riders in rural/remote regions** who are more likely to ride alone and be removed from immediate help¹².

Mechanism and types of injury

- The most common incidents are³:
 - Rollovers;
 - Hitting stationary objects; and
 - Falling from the quad bike.

Do not allow children under 16 years of age to ride or be a passenger on a quad bike of any size.

Precipitating factors

The key precipitating factors for quad bike incidents are³:

- Uneven terrain (e.g. riding on a slope);
- Turning; and
- Speed.

These factors are consistent across all age groups and all types of use with the majority of incidents occurring on private property.

Recreation versus work-related incidents

In Australia, for quad bike fatalities occurring in the period 2000-2012¹²:

- Approximately 50% of fatalities were related to workplace activity and 50% to recreational activity.
- Approximately 75% of the quad bike fatalities occurred on farms.
- Rollover occurred in 85% of the work-related fatal cases compared to 56% of recreational cases.
- Loss of control on a slope and/or driving over an object was a factor in 58% of the farm cases and 33% of recreational cases.
- In work-related fatalities, a higher percentage involved older riders (78% were

50 years or older). In comparison, only 9% of recreational riders killed were over 50.

- The main cause of death for farm workers was chest injury (59%), compared to head injury for recreational riders (49%).
- Around 13% of farm workers died as a result of a head injury. A helmet was found to be worn in only 22% of the fatal cases.

A recent review of recreational quad bike fatalities over the last decade (2004-2014)¹³ showed that that largest proportion of child fatalities occurred in Queensland, whilst the largest proportion of adult fatalities occurred in Western Australia. In both child and adult fatalities, the largest proportion of injuries involved the head (47% and 43% respectively, with injuries to the thorax region (i.e. crushed chest, asphyxiation) accounting for an additional 23.5% of child fatalities).

Current reform

Research

Significant Australian research has been undertaken in recent years resulting in:

- A literature review of quad bike-related injuries and deaths¹⁴;
- A review of quad bike-related injuries in Queensland³ and Victoria⁵;
- A review of recreational quad-bike related injuries and deaths in Australia^{3,8};
- An investigation of quad bike use, crash characteristics and associated injury risks in South Australia¹³;
- Quad bike performance test results, conclusions and recommendations¹²;
- The development of a Quad Safety Guide for farmers⁷;
- A policy paper on preventing death and serious injury caused by rollover of quad bikes on Australian farms¹⁵; and
- The adoption and improved safety impacts of crush protection devices (CPD)^{2,9}.

Inquests

Coronial inquests into deaths caused by quad bikes have been conducted in Tasmania (2016), Queensland (2015), New South Wales (2015), New Zealand (2013) and Victoria (2009). Details of these can be found on Safe Work Australia's Quadwatch website¹.

Recent safety actions and initiatives

- From 1 October 2016, eligible Victorian farmers and their workers could apply for a rebate of up to \$600 to fit operator protection devices on up to two quad bikes, or \$1,200 towards the cost of buying an alternative safer vehicle¹⁶.
- From 19 July 2016, as part of the NSW Quad Bike Safety Improvement Program, eligible NSW farmers and their workers could apply for a rebate of up to \$500 to implement safety measures in the workplace. Rebates are available until 30 June 2017 unless exhausted prior¹⁷.
- On 22 June 2016, WorkSafe Queensland

launched *Ride Ready*, a quad bike safety public awareness campaign¹⁸.

- In March 2016, Queensland announced its State-wide Plan for Improving Quad Bike Safety in Queensland 2016-2019¹⁹.
- Through the Trans-Tasman Quad Bike Working Group, WorkCover NSW helped develop and implement the Australian Work Health and Safety Strategy 2012-2022²⁰. This strategy outlines:
 - improvements to point of sale information to guide farmers when purchasing a vehicle best suited to their needs and farm profile;
 - the mandatory requirement to wearing a helmet;
 - options for farmers to fit safety devices to protect riders in the event of a rollover;
 - a nationally recognised rider training course designed specifically for farmers; and
 - the need to comply with manufacturers' guidelines in relation to passenger-carrying, load requirements and rider age.
- In April 2014, a national safety campaign¹⁰ was launched to raise awareness of the dangers of quad bikes. The campaign involved the Australian Competition and Consumer Commission (ACCC), NSW Fair Trading, and State and Territory consumer protection authorities.
- The Australian Government (via Safe Work Australia) established the Quadwatch¹ website to bring together industry, manufacturers, quad bike users, community organisations, and government to raise awareness of quad bike safety. The webpage provides quad bike safety data, research, coronial and news reports, and information and guidance material.
- In 2012, a \$1 million quad bike crash performance research, testing and design project commenced, run by Heads of Workplace Safety Authorities (HWSA) and University of New South Wales. The results were released in 2015, quantifying the stability and crashworthiness of quad bikes, and assessing their risks and performance. WorkCover NSW is working with stakeholders and the HWSA to develop a nationally agreed position in relation to the research findings and a revised Quad National Bike Safety Strategy. The project¹² produced 24 recommendations including:
 - introducing a consumer safety rating system for new vehicles;
 - retrofitting of operator protective devices for existing on-farm vehicles;
 - increasing helmet wearing;
 - restricting children under 16 from operating an adult quad bike; and
 - increasing education and awareness about the importance of vehicle selection and safe use.
- Training for quad bike operators is now available nationally.



What rules or regulations apply to quad bikes?

- There is limited specific regulation in place for quad bikes.
- Quad bikes used for work are currently regulated under work health and safety laws as 'plant'. A person conducting a business or undertaking must ensure the health, safety and welfare at work of all their employees and visitors. This includes ensuring quad bikes are safe to use for the situation and skill of the rider and to protect riders in the event of an overturn. Proper instruction and training must be provided and understood by the rider⁴.
- Mandatory helmet requirements are in place in Queensland. It is a requirement for quad bike and utility off-road vehicle riders and any passengers carried to wear an approved motorcycle helmet when the vehicle is operating on a road or road-related area²¹.
- In Queensland from 1 February 2017, children under the age of 8 will be prohibited from being carried as passengers on quad bikes and utility off-road vehicles, as well as any child of any age if they are unable to sit with their feet flat on the floor and hands on handholds²¹.
- Additionally from 1 February 2017, the requirement for the operator of a quad bike or utility off-road vehicle and their passenger to wear a motorcycle helmet will be legislated in the Transport Operations (Road Use Management—Road Rules) Regulation 2009. Failing to comply with this requirement will result in a fine of \$365 and the incursion of 3 demerit points. This offence will also be subject to existing motorcycle helmet double demerit point penalties. If two or more motorcycle helmet offences are committed within a 12 month period, the second and subsequent offences will incur double demerit points. There will be no exemptions from wearing an approved motorcycle helmet for quad bike riders and passengers²¹.
- In February 2016, Worksafe Victoria announced new legislation requiring Crush Protection Devices (CPDs) on quad bikes

in workplaces if there is deemed (by the employer) to be a risk of rollover.

- The ACCC governs the supply of quad bikes.

Challenges for quad bike safety improvement in Australia

- Despite manufacturer warnings and educational campaigns to improve quad bike safety, decisions about quad bike use remain an individual choice.
- There is no legislation governing:
 - what age motorised vehicles can be operated on private property despite the high risk of fatalities and injuries in riders aged under 16 years.
 - the wearing of helmets on quad bikes operated on a private property, despite research indicating a reduction to severe injury risk when worn¹².
 - the requirement for rollover protection systems (except in Victoria as described above), despite the high incidence of rollover crashes.
- Data collection varies between States, hospital emergency departments and ambulance services, making it difficult to gain an accurate understanding of the magnitude, injury patterns, trends, and contributory factors relating to quad bike incidents.
- Riders operating a quad bike for work-related purposes can be reluctant to wear protective gear. For example, farmers may choose not to wear a helmet during mustering as they find it limits visibility.

CARRS-Q'S WORK IN THE AREA

- Work and farm associated quad bike-related injuries in Queensland³.
- Recreational quad bike-related injuries in Queensland³ and Australia⁸.
- Understanding serious quad bike-related injuries in Queensland and Northern Territory: Comparing circumstances, patterns, severity, costs and outcomes.
- Quads and kids: Understanding parents' knowledge, attitudes and beliefs about safety and risks (PhD program).

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TIPS FOR STAYING SAFE

- Consider if an alternative vehicle would be safer (e.g. side by side vehicle).
- Consider fitting an operator protection device (OPD).
- Maintain the quad bike in a safe condition – regularly check the brakes, guards, suspension and tyre pressure. Ensure controls can be operated comfortably when seated.
- Read the operator manual and observe the manufacturer's safety warnings and recommended use of the vehicle.
- Ensure you, and any rider preparing to ride a quad bike you own, receive training in its appropriate use and potential hazards.
- Do not carry passengers on quad bikes.
- Do not allow children under the age of 16

to ride or be a passenger on a quad bike of any size.

- Supervise children** at all times near quad bike activity.
- Ride on familiar tracks and **beware of obstacles** (particularly those that may be hidden in grass).
- Avoid rough terrain and steep slopes.**
- Never ride under the influence of alcohol or drugs.**
- Have sufficient strength, weight and agility to operate safely and to react quickly to changing terrain or conditions. Operators should be physically capable to **control the quad bike and to correctly move their body weight to keep the wheels on the ground at all times.**
- Be aware of heat stress, fatigue or other limiting conditions** which may affect concentration while operating a quad bike.
- Tell someone when and where you plan to go** on a quad bike and when you will return, **and carry a radio/mobile phone, personal alarm beacon, or other device** in case of an emergency.
- Always wear a helmet and sturdy footwear.** Goggles, long sleeve shirts, long pants and gloves are also recommended.

Watch the ACCC's video *Would You Risk It?*, which highlights the dangers of unsafe quad bike practices.

FUTURE DIRECTIONS

- Improved data collection** is needed. State variability and coding constraints limit the quality and consistency of data collection relating to injuries and incidents. The pattern of non-fatal versus fatal incidents, and recreational versus work-related quad bike incidents is likely to vary.
- Further **research** will assist understanding of the magnitude, trends and outcomes of quad bike-related injuries in order to inform quad bike safety programs.
- There is a common need for the **improved design** of quad bikes, despite different requirements in the workplace and farms compared with recreational use. A consumer safety rating system is currently being developed for stability, handling and crashworthiness (similar to the ANCAP Star Rating system that already exists for motor vehicles)²².
- There is an increasing call for **legislation change** governing quad bike safety to protect riders and passengers.
- Community and workplace **education programs** are needed to raise awareness regarding the dangers of quad bikes and their appropriate usage.
- Further research to investigate the impact of **training** on rider safety and identify characteristics of effective training programs.

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STATE OF THE ROAD is CARRS-Q's series of Fact Sheets on a range of road safety and injury prevention issues. They are provided as a community service and feature information drawn from CARRS-Q's research and external sources. See the reference list for content authors.

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