Quad bike safety

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 tourism.4

- 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 farms,5 outranking tractors.6 While farm fatalities have dropped by approximately 65% over the past 20 years, quad bike incidents continue to rise.7

- 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 300,000.9

A statistical analysis

In Australia, for quad bike fatalities in 2011-2012:1

- There were 39 quad bike fatalities;
  - 77% were males. Of the 9 females who died, 4 were passengers;
  - 1 in 5 (20%) were children under 16 years;
  - 42% of fatalities were work-related and 58% involved recreational use;
  - 38% of fatalities occurred on terrain where an incline was noted by investigators (though there are limited details regarding the slope of the incline);
  - Almost half (49%) occurred on uneven ground (though there are limited details regarding the uneven ground);
  - Over half (54%) involved the quad bike’s roll over;
  - One-quarter (28%) were attributed to a potential weight imbalance (e.g. through carrying spray tanks, cargo, passengers or towing heavy trailers);
  - In 36% of cases, the rider was not wearing a helmet (46% were unknown); and
  - None of the fatalities mentioned any form of rollover protection on the vehicle.

In Queensland, for quad bike fatalities in 2011 and 2012:1

- There were 9 quad bike fatalities;
  - 66% were males;
  - 1 in 5 (22%) were children under the age of 16 years;
  - 44% of fatalities were work-related and 55% involved recreational use;
  - 44% of fatalities involved the quad bike’s roll over; and
  - In 1 in 3 cases (33%), the rider was not wearing a helmet (33% were unknown).

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 roll overs, and crush injury/asphyxiation is a common cause of death.2

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 injuries.3

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 persons) and can lead to fatigue and an inability to retain control.
• Few riders are properly trained. Research shows that one in three quad bike riders are self-taught.10
• 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 passengers.16 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 roll over.
• Consumption of alcohol or drugs impairs rider ability and judgement.
• Operating quad bikes in remote locations without access to adequate methods of communication or use of personal locator beacons increases delay in retrieval and medical care.

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 remote from immediate help.12

Mechanism and types of injury
• The most common incidents are:2
  ° 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, and supervise children at all times.

Precipitating factors
• The key precipitating factors for quad bike incidents are:3
  ° 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 2000-2012:2,12
• Approximately 50% of fatalities were related to workplace activity and 50% to recreational activity.

A recent review of recreational quad bike fatalities over the last decade (2004-2014)11 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 occurred in quad bike safety in recent years including:
• Literature review of quad bike-related injuries and deaths;14
• A review of quad bike-related injuries in Queensland and Victoria;7
• A review of recreational quad-bike related injuries and deaths in Australia;18
• An investigation of quad bike use, crash characteristics and associated injury risks in South Australia;19
• Quad bike performance test results, conclusions and recommendations;12
• The development of a Quad Safety Guide for farmers;7
• Policy paper on preventing death and serious injury caused by rollover of quad bikes on Australian farms;19 and
• The adoption and improved safety impacts of crush protection devices (CPD).2,19

Inquests
Coronial inquests into deaths caused by quad bikes have occurred in Victoria (2009), Queensland (2015), New South Wales (2015), and New Zealand (2013). An inquest will be held in Tasmania in 2016. Details of these can be found on the Quadwatch website.1

Recent safety actions and initiatives
• In March 2016, Queensland announced its State-wide Plan for Improving Quad Bike Safety in Queensland 2016-2019.16
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.

In April 2014, a national safety campaign 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 Quad Watch Trans-Tasman Working Group was established and comprised quad-bike manufacturers, farmer representatives, road safety and workplace safety authorities, with the support of workplace safety authorities in Australia and New Zealand. Its goal was to contribute to the reduction of fatalities and serious injuries of quad-bike use on farms in a work setting.

The Heads of Workplace Safety Authorities (HWLSA) has established a working party to develop solutions to reduce the incidence of quad bikes fatalities and has developed an industry strategy. The jurisdictions are in the process of implementing the party recommendations, including:

• Improvements to point of sale information to assist farmers purchase a vehicle best suited to their needs and profile;
  ° the mandatory wearing of approved helmets;
  ° children should not operate adult sized quad bikes;
  ° the development of nationally recognised rider training;
  ° information on roll-over protective devices that may reduce the likelihood of the rider being trapped under the quad bike in the event of a roll over; and
  ° guidance materials to assist in providing a better match between quad bike accessories and the host vehicle.

The Australian Government (via Safe Work Australia) has established the Quadwatch website to bring together industry, manufacturers, quad bike users, community organisations, and government to raise awareness of quad bike safety. The webpage provides links to 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 HWLSA 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 HWLSA to develop a nationally agreed position in relation to the research findings and a revised Quad National Bike Safety Strategy. The project produced 24 recommendations including:

° 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.

• PhD program: Quads and kids: Understanding parents’ knowledge, attitudes and beliefs about safety and risks.

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 worn.
° the requirement for rollover protection systems (except in Victoria as described above), despite the high incidence of roll over 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 Queensland.
• Recreational quad bike-related injuries in Queensland and Australia.
• Understanding serious quad bike-related injuries in Queensland and Northern Territory: Comparing circumstances, patterns, severity, costs and outcomes.

° Increasing education and awareness about the importance of vehicle selection and safe use.
TIPS FOR STAYING SAFE

• Consider if an alternative vehicle would be better for the purpose (e.g. side by side vehicle).
• Consider fitting an operator protection (CPD) device.
• Maintain the 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.

The ACCC has launched a YouTube video titled Would You Risk It? highlighting the dangers of unsafe quad bike practices. See www.productsafety.gov.au/quadbikes

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. Safety programs focussing on fatalities alone will miss significant issues contributing to serious injury.
• Further research will assist understanding of the magnitude, trends and outcomes of quad bike-related injuries in order to inform quad bike safety programs.
• Whilst there is a clear need to distinguish and treat differently the safety requirements for quad bikes used in the workplaces and farms compared with those for recreational use due to different usage requirements, there is a common need for the improved design of quad bikes. A consumer safety rating system is currently being developed for quad bikes for stability, handling and crashworthiness (similar to the ANCAP Star Rating system that already exists for motor vehicles). The system aims to empower consumer choice and encourage design change by manufacturers based on safety.
• 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.

REFERENCES


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.

FOR MORE INFORMATION
Marketing & Events Officer, CARRS-Q
Queensland University of Technology
130 Victoria Park Road
Kelvin Grove QLD 4059 Australia

Phone +61 (0)7 3138 4568
Fax +61 (0)7 3138 7532
Email marketing.carrsq@qut.edu.au
Twitter @CARRS_Q
Facebook www.facebook.com/carrsq130

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