

**Title:** Older Motorcycle Rider Safety in Queensland

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### **Abstract**

Previous research has documented an increase in the number of motorcycle registrations and crashes in Australia (including Queensland) in the last decade and an increasing trend of older rider involvement in crashes. The current research was commissioned by the Queensland Department of Transport and Main Roads to better understand these trends and to inform policy designed to improve older rider safety. The research drew on licensing, registration, offence and crash data for all riders in Queensland over two five year periods (financial years 1993–98 and 2003–08); and included two surveys ( $n = 1,592$  and  $1,821$  respectively) targeting active riders. Crash data analysis revealed that while the number of older riders in crashes has increased, the number of active riders has also increased, meaning that the crash rate for older riders has actually decreased. It was also found that older riders ride more, but crash less and commit fewer traffic offences than younger riders. Analysis of survey responses revealed differences in attitudes towards motorcycle safety between younger and older riders, and the use of protective clothing and equipment. Older riders were less likely to be influenced by others during group rides than younger riders, and reported noticing the effect ageing was having on their riding. Participants also acknowledged the challenges of returning to riding and the changing traffic environment. This paper discusses the results of the crash, offence and survey analyses in terms of their implications for future research and motorcycle safety policy development.

### **Introduction**

Motorcyclists are well known to be over-represented in the road toll. Current estimates suggest they are 30 times more likely than car occupants to die in a crash and 41 times more likely to sustain serious injuries (Johnston et al, 2008). Motorcycle registrations are also increasing in Australia faster than any other vehicle type, particularly in Queensland where between 2003 and 2008 there was a 66.3% increase in the number of motorcycle registrations (ABS, 2009).

Recent research shows the rate of motorcycle deaths increased across Australia by 3.6% each year between 1998 and 2007, and that riders aged over 44 years have contributed the most to increases across Australia (Johnston et al, 2008). Data analysis by Transport and Main Roads has also identified an increase in fatalities, licences and registrations for older riders in Queensland. It is unknown whether the recent increases in older rider crashes are related to increased exposure (more riders travelling more kilometres), skill deficits (associated with ageing or from taking long breaks from riding before returning to riding in later life), increased risk taking, or other psychological or environmental factors.

This research was commissioned by Transport and Main Roads to better understand the extent of the older rider problem in Queensland and to inform policy development designed to improve older rider safety. This research involved two phases designed to explore the risk associated with older riders. In Phase 1, an analysis of official licensing, registration, offence and crash data was conducted for two five year time periods (financial years 1993-98 and 2003-08) to determine whether the involvement of older riders in offences and crashes is increasing. In Phase 2, a survey was completed by a large sample of active riders (defined as those with both a motorcycle licence and a motorcycle registered in Queensland in their name) to better understand older rider attitudes and issues affecting older riders.

## Phase 1 – Licensing, registration, offence and crash data analysis

### Method

The Data Analysis Unit at Transport and Main Roads extracted data relating to the number of motorcycle riders involved in crashes in Queensland for financial years 1993-98 and 2003-08, traffic offences of motorcycle riders for financial years 2003-08, and motorcycle licences on record and motorcycle vehicle registrations as at June 30 1998 and June 30 2008.

As the research focus was older active riders, the motorcycle licensing and registration data was combined to identify “active” riders, defined as those who had both a motorcycle licence and a motorcycle registered in their name, as it is possible that individuals may hold a motorcycle licence, but do not currently ride, and perhaps have not ridden for some time.

When the 2008 licensing and registration data was analysed, it was found that there were almost three times as many current motorcycle licences than motorcycle registrations. As Table 1 shows, the number of individuals considered active in this research represented less than one sixth of the motorcycle licences on record. Only data relating to these active riders was analysed in this phase.

Table 1: Motorcycle licences and registrations on record as at June 30, 2003

	<i>N</i>
<i>Motorcycle licences</i>	684,460
Held by individuals with licence only	581,446 (84.9%)
Held by individuals with registered motorcycle – “active riders”	103,014 (15.1%)
<i>Motorcycle registrations</i>	235,386
Held by individuals with registration only	132,372 (56.2%)
Held by individuals with motorcycle licence – “active riders”	103,014 (43.8%)

Having identified active riders, the next task was to define older riders. Traditionally in road safety, “young” road users are those under 25, with all road users aged 25 and over considered “older”. However, the average learner motorcyclist in Queensland is

in their mid-thirties, making 25 years and over an inappropriate definition of the older rider in this context. There is no clear theoretical basis on which to identify older riders. They could be defined as middle-aged riders who are either new to riding, returning to riding or who have been continually riding a motorcycle for some time. Neurological or cognitive ability could also form part of the benchmark. In this research, older riders were defined as riders aged 45 years or older, based on analysis of licensing and crash trends by year of age.

## **Results**

As shown in Table 2, the number of active riders has more than doubled over 10 years. When active riders were divided into two groups based on age, it was found that the number of older active riders increased by more than three and a half times, compared to a 50% increase for younger active riders. The proportion of older active riders also increased over this time period, almost doubling.

The number of riders in crashes also increased between 1993-98 and 2003-08. Again, older riders showed a more marked increase than younger riders, and the proportion of older riders involved in crashes more than doubled.

These data show that there are more active riders (particularly older active riders) and more riders involved in crashes (particularly older riders), which might suggest that there is an increasing older rider problem in Queensland.

However, when crash rates (crashes per year per 1,000 active riders) were calculated for 1998 and 2008, it was found that there has been a reduction in rider involvement in crashes over time, and that this reduction was slightly greater for older riders. The table also shows that in 2008, the crash rate for younger riders was 2.6 times that for older riders.

Table 2: Motorcycle rider and crash trends over time

	<b>1998</b>	<b>2008</b>	<b>Change</b>
<i>Number of active riders</i>	50,714	103,014	103% increase
Under 45	38,306 (76%)	57,540 (56%)	50% increase
45 and over	12,408 (24%)	45,474 (44%)	266% increase
	<b>1993-98</b>	<b>2003-08</b>	<b>Change</b>
<i>Number of riders in crashes</i>	5,789	8,035	39% increase
Under 45	5,129 (89%)	6,138 (76%)	20% increase
45 and over	660 (11%)	1,897 (24%)	187% increase
	<b>1998</b>	<b>2008</b>	<b>Change</b>
<i>Crashes per year per active rider</i>	22.8	15.6	32% reduction
Under 45	26.8	21.3	20% reduction
45 and over	10.6	8.3	22% reduction

We also analysed vehicle kilometres travelled (VKT) to determine whether changes in the amount of riding could account for the trends observed in these data. We used VKT data from the ABS Survey of Motor Vehicle Use (ABS, 2008), which divided rider into three categories (15-24, 25-54 and 55+). When combined with Queensland crash data, we were able to calculate VKT per crash for each age group. We found that young riders travel an average of 14,761km before they crash, compared to 63,862km for riders aged 25-54 and 107,856km for riders aged 55 and over.

As noted above, older riders accounted for 44% of active riders in 2008. However, analyses of traffic infringement data for the five year period 2003-08 presented in Table 3 shows that older riders represented only 30% of offenders, and were responsible for only 24% of motorcycle offences. That is, older riders are under-represented in traffic infringement data.

Table 3: Motorcycle offence trends 2003-08

	<b>2003-08</b>
<i>Number of offenders</i>	32,788
Under 45	22,995 (70%)
45 and over	9,793 (30%)
<i>Number of offences</i>	63,338
Under 45	48,121 (76%)
45 and over	15,217 (24%)

## ***Discussion***

Motorcycle registrations are increasing faster than any other vehicle type in Australia. Phase 1 of this research sought to determine the extent of the increase in motorcycle riders in Queensland by identifying active riders – defined as those with both a motorcycle licence and motorcycle registered in their name. Analysis of Queensland licensing and registration data found that the number of active motorcycle riders more than doubled in Queensland from 1993-98 to 2003-08, and that the increase in active riders was particularly marked for older riders (defined as those aged 45 and over). Over the same period, the number of riders involved in crashes in Queensland also increased, but the proportion of older riders in crashes increased by less than the increase in the number of older active riders. The possibility that older riders ride less cannot explain these differences, as analysis of crashes by VKT also showed that young riders crash more per VKT than older riders. Finally, older riders were less likely to have motorcycle offences than young riders.

Together, these results show that while the number of older riders involved in crashes is increasing, this increase is less than the increase in the overall number of older active riders. Thus it does not appear that older rider involvement in crashes is increasing, as the increase in older rider crash involvement is lower than that for younger riders. In Phase 2 of this research, focus shifted away from official data and towards the self-reported attitudes and motorcycle riding behaviour of older riders.

## Phase 2 – Survey of older riders

### **Method**

A random sample of 6,700 riders was drawn from those riders identified as active in Phase 1. A recruitment letter was sent with a paper copy of the survey, as well as a personalised link to the online survey. A total of 1,609 responses were received (response rate = 24.0%) in time for analysis.

The gender of respondents was similar to that of active riders in Queensland, as 89% were male, compared to 91% for the active rider population. The average age of respondents was 47 years ( $SD = 11.42$ ), slightly older than the average active rider (42 years). This meant that older riders were over-represented in our sample, with 61% being classified as older (45 years or older), compared to 44% of the active rider population. Our sample was also less likely to have committed an offence (66 versus 514 per 1,000 riders) or been involved in a crash (9 versus 47 per 1,000 riders) in the previous five years than the active rider population.

Survey items were developed based on a review of the motorcycle safety literature, with a focus on issues that were considered relevant for older riders. Survey items were piloted with members of the Queensland Motorcycle Safety Advisory Group. The survey measured participant demographics, motorcycle/s ridden, awareness of risks and hazards, speeding, motorcycle preparation and maintenance, risky riding, attentiveness while riding, use of protective clothing, attitudes towards group riding, and issues to do with older riders. A number of analyses were conducted, including younger versus older rider comparisons, a factor analysis of survey items and a cluster analysis to identify groups of older riders. This paper will focus on describing the attitudes of older riders ( $n = 973$ ), and a discussion of the age-related motorcycle riding issues they raised.

### **Results**

The proportion of older riders in the sample that agreed with survey items regarding motorcycle preparation and maintenance are presented in Table 4.

Table 4: Older rider attitudes towards motorcycle preparation and maintenance and use of protective equipment

	<b>% participants who agreed</b>
I get my motorcycle serviced at the recommended intervals	93%
I check my tyre pressure before I ride	88%
I change my tyres when they are down to serviceable wear limits	97%
My helmet is Australian Standards approved	100%
I make sure my helmet is properly fastened when I'm riding	100%

The high proportion of respondents agreeing with these statements, and in particular the helmet items, show that this group of older riders comply with helmet laws.

However, Table 5 shows that older riders were significantly less likely than younger riders to report usually or always (as opposed to never or sometimes) wearing a full face helmet while riding, and more likely to report wearing open face helmets. Similarly, older riders were less likely than younger riders to usually or always wear eye protection or gloves, but significantly more likely to wear motorcycle boots.

Table 5: Comparison of older and younger rider use of protective motorcycle gear

	Younger riders	Older riders
Full face helmet	88%	76% ***
Open face helmet	19%	33% ***
Eye protection (helmet visor, sunglasses etc)	98%	97% ***
Gloves	81%	74% **
Protective motorcycle jacket (leather, textile, Kevlar mesh)	84%	81%
Protective motorcycle pants (leather, textile, Kevlar mesh)	45%	42%
Motorcycle boots	63%	68% **

Age group differences significant at alpha levels of: \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

Older rider agreement with items measuring awareness of risks, hazard perception and attentiveness while riding are presented in Table 6.

Table 6: Older rider attitudes towards awareness of risks, hazard perception and attentiveness while riding

	% participants who agreed
If there's a green light, the intersection is pretty much safe to ride through	54%
When I come to an intersection, I have an escape plan in case another vehicle does something stupid	95%
I keep a space around me when I ride	97%
When I'm riding, my eyes and mind are searching for and evaluating obstacles	98%
Riding a motorcycle is riskier than other types of transport: riding well means being a good risk manager	95%
When I'm riding, I watch the vehicles around me to try and work out what they're going to do	98%
I slow down before corners to the point that I could stop in the distance I can see ahead	89%
Imagining 'what if' scenarios stops me from taking blind corners too fast	90%
To corner properly, you need to look ahead and set up for the corner as much as possible	99%
I know what counter-steering is	88%
It's important to practice emergency manoeuvres like braking or swerving sharply	88%
My headlights are usually on when I'm riding during the day	94%
When I'm riding, I'm in my own little world and I ignore other traffic as much as possible	1%
My motorcycle skills get a bit rusty if I don't ride very often	56%
I acknowledge courteous drivers with a wave or a nod	94%

While the older rider sample generally reported safe attitudes in their responses to these questions, it was concerning that just over half of the sample agreed that an intersection is “pretty much safe to ride through” if there is a green traffic light. Responses to this item were also somewhat dissimilar to the other items regarding awareness of other motorists and hazard perception, where the high proportion of older riders in the sample agreeing with such statements suggested they have a very cautious approach to riding, and emphasise the importance of being aware of other motorists and their potential errors. It was also noted that just over half of the older riders in the sample agreed that their skills “get a bit rusty” if they do not ride regularly, which has implications for returning and infrequent riders.

Table 7 outlines older rider agreement with statements about risky riding, riding while fatigued, drink riding and speeding. Again, responses suggest that older riders hold safe attitudes towards risky riding, and driving while tired. However, it was interesting to note that approximately one fifth of older riders indicated they were tired prior to a near miss or crash, in contrast to the small proportion of respondents whose responses indicated that they ride while tired.

Table 7: Older rider attitudes towards risky riding, riding while fatigued, drink riding and speeding

	<b>% participants who agreed</b>
People pay too much attention to safety: riding a motorcycle is all about having fun	7%
I sometimes like to frighten myself a little when riding	9%
I'm the sort of rider who takes risks at every opportunity	1%
I'm the sort of rider who rides safely at every opportunity	95%
It doesn't matter too much if I get tired when I'm riding a motorcycle because just riding will keep me awake	3%
I often feel tired when riding a motorcycle	9%
Thinking about it now, I often felt a bit tired just before a near miss or crash	19%
My motorcycling skills are not affected by a couple of beers	22%
Motorcyclists should completely separate drinking alcohol from motorcycle riding	75%
I weave in and out of traffic to get ahead of others on the road	14%
In general, speed limits are too low	38%
In some situations, it's necessary to ride over the speed limit to stay safe	53%
Most people don't think speeding is a big deal	55%
Speed cameras are just there to raise revenue	61%

Responses to the drink riding questions were somewhat less safe than those to the risky riding or fatigue questions, with approximately one fifth of respondents indicating that small amounts of alcohol do not affect their riding, and three quarters agreeing alcohol should be completely separated from riding. These results may suggest that this group may be supportive of lowering the legal blood alcohol concentration for motorcyclists. Older riders may also be more supportive of this than younger riders, where only 69% agreed that drinking should be completely separated

from riding. Attitudes towards speeding were fairly positive, with more than half of the older riders in the sample agreeing that speeding was sometimes necessary to remain safe, and that speeding was not an important safety issue, and that speed cameras are a means of revenue raising.

Sixty-five percent of older riders reported belonging to a motorcycle club. Table 8 outlines older rider agreement with statements about group riding. The item with the highest proportion of the sample agreeing was “It’s important to me that the people I ride with respect my motorcycling skills”, which may have implications for the development of interventions targeting this group. For example,

Table 8: Older rider attitudes towards group riding

	<b>% participants who agreed</b>
I am a safer rider when I’m riding with a group	42%
I have strong ties to the people I ride with	67%
The people I ride with wouldn’t ride with me if they were affected by drugs or alcohol	81%
I push myself harder when I’m riding in a group	21%
The people I ride with perform stunts, burn outs or race each other when we ride together	7%
It’s important to me that the people I ride with respect my motorcycling skills	82%
When I ride with a group, I focus on following the bike ahead rather than the road	12%
I’m more likely to commit a traffic offence when I’m riding with a group	13%

Table 9 outlines older rider agreement with statements about how riding has changed as they’ve aged. Some respondents have noticed that riding has become more difficult, and they get tired more easily than they used to. These results may have implications for future research that could objectively measure age differences in skills such as motorcycle control and reaction time, as this would inform training and education programs targeted at older riders, and inform policy development regarding periodic skill testing for motorcyclists.

Table 9: Older rider perceptions of how riding has changed as they’ve aged

	<b>% participants who agreed</b>
I find it more difficult to control a motorcycle now than I did when I was younger	20%
Most of the riders I know who are older than 50 years ride bikes that are too powerful for them	16%
I find it more difficult to scan the road for obstacles now than I did when I was younger	13%
I find it more difficult to react to obstacles on the road now than I did when I was younger	16%
I find that I get tired more easily when riding now than I did when I was younger	33%

While the cluster analysis conducted is beyond the scope of this paper, it is noted that four types of older rider were identified, based on their attitudes towards

motorcycle safety and self-reported riding behaviour. It is therefore important to keep in mind that older riders do not represent a homogenous group.

## ***Discussion***

This phase of the research found that older riders, as a group, generally have quite safe attitudes towards riding. They are aware of the risks and take active steps to protect themselves from being involved in a crash, and to minimise injury in the event of a crash. However, compared to younger riders, older riders were more likely to report wearing open face rather than full face helmets, which offer superior protection. They were also generally less likely to wear protective gear than younger riders.

Analysis of older rider agreement with statements about a variety of motorcycle safety issues in this paper has provided insight into older rider attitudes, and identified potential targets for intervention and future research specifically targeting this group.

These results should be interpreted in light of the limitations of this study. For example, the survey sample may not be representative of the active rider population, as survey respondents were on average older, and were less likely to have committed an offence or been involved in a crash in the previous five years than the active rider population identified in Phase 1 of this research. This may reflect a response bias, such that riders who do not commit offences or crash are more likely to respond to road safety surveys. This may mean that the survey reflects the attitudes and behaviours of riders who are less likely to crash or commit an offence, rather than those of the general riding population. A further limitation is the use of self-report data, which is vulnerable to other biases. However, the attitudes of older riders was of interest in this phase, and such information can only be obtained from the riders themselves.

## **General Discussion**

Older riders are of increasing concern for road safety authorities because of the large increases in both the absolute number of riders of this age on the road, the number of these riders in crashes and the perception that these riders, rather than younger riders, will be involved in any given crash. However, Phase 1 of this research found that older riders are crashing less than they used to, and much less than younger riders, per rider and per VKT. Older riders are also less likely to have offences than younger riders. Taken together, these results suggest that the apparent older rider problem is one of numbers. Rapid increases in the number of active older riders inevitably increases the number of older riders involved in crashes.

Phase 2 found that when there were significant differences between the attitudes of older and younger riders, older riders generally held safer attitudes. However, younger riders were more likely to report wearing safety gear, including wearing full face rather than open face helmets. In general, older riders hold safe attitudes towards motorcycle riding, although some respondents raised issues that affect older

rider safety that were not experienced in their youth that should be explored in future research to inform policy development aimed at improving older rider safety.

### References

- Australian Bureau of Statistics (ABS), (2008). *Survey of Motor Vehicle Use: Data Cubes, Australia, 12 months ended 31 October 2007*. 9210.0.55.001. Australian Bureau of Statistics, Canberra, ACT. Retrieved from:  
<http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/9210.0.55.001Main+Features112%20months%20ended%2031%20October%202007?OpenDocument>
- Australian Bureau of Statistics (ABS), (2009). *Motor Vehicle Census 2009*. Australian Bureau of Statistics, Canberra, ACT. Retrieved from:  
[http://www.ausstats.abs.gov.au/Ausstats/subscriber.nsf/0/DC551064A4316C21CA257670000E2950/\\$File/93090\\_31%20Mar%202009%20\(Reissue\).pdf](http://www.ausstats.abs.gov.au/Ausstats/subscriber.nsf/0/DC551064A4316C21CA257670000E2950/$File/93090_31%20Mar%202009%20(Reissue).pdf)
- Johnston, P., Brooks, C., & Savage, H. (2008). *Road Safety Research and Analysis Report Monograph 20: Fatal and serious road crashes involving motorcyclists*. Department of Infrastructure, Transport, Regional Development and Local Government, Australian Government, Canberra, ACT. Retrieved from:  
<http://www.infrastructure.gov.au/roads/safety/publications/2008/pdf/mono20.pdf>