A Survey of Motorcyclists in NSW, 2006

A report to the Motorcycle Council of NSW

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***Survey of Motorcyclists in NSW*, 2006 (2007)**
Liz de Rome and Thomas Brandon for the Motorcycle Council of NSW

The survey was managed for the Motorcycle Council of NSW by a Project Working Party. The members of the Working Party were:

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Table of contents

Introduction

This is a report on a survey of riders in NSW undertaken in 2006 by the Motorcycle Council of NSW (MCC). The survey was undertaken as a part of the development of the MCC's motorcycle safety strategic plan, named *Positioned for Safety 2010* (de Rome, Stanford & Wood, 2007).

Background

The MCC's first motorcycle safety strategic plan was developed in 2001, in response to a perceived crisis in motorcycle safety policy in Australia (de Rome & Stanford, 2002). At the time Australia was ranked ninth best for road safety amongst the 27 OECD nations, but was ninth worst for motorcycle safety (ATSB, 2004). Australian motorcycle fatalities were almost double the median for OECD nations (6.2 vs 3.6 per 10,000 registered vehicles. Despite such figures, motorcyclists were not identified for targeted road safety programs. At the time, road safety policy was based on the belief that motorcyclists were adequately covered under general road safety campaigns directed at all motorists. There was also a view that it would be difficult to effectively deliver targeted information to motorcyclists because they were a relatively small but divergent group of road users (de Rome et al, 2002).

The MCC Executive felt that there was a need for more research and targeted programs to address motorcycle safety. They obtained the support of the Motor Accidents Authority of NSW (MAA) to fund the development of a motorcycle safety strategic plan. The strategic plan was the product of consultation with the main stakeholders from government and industry. The resulting plan identified key motorcycle safety issues in NSW and listed 91 strategies for addressing them. It was published in 2002 and distributed to all stakeholders identified with responsibilities for road safety and injury prevention (de Rome & Stanford, 2002).

Three years later an independent evaluation, also funded by the MAA, found that 75% of the strategies had achieved outcomes (Riches, 2005). Riches reported an observable increase in the level of activity associated with motorcycle safety in NSW by government agencies, researchers and the community. Initiatives included research projects into motorcycle fatigue and protective clothing, the development of a website to deliver safety information to riders, a State-funded motorcycle safety advertising campaign and a number of community-based projects by local councils.

The 2006 survey of motorcyclists was undertaken as a part of the process to revise and update the motorcycle safety strategic plan. It replicated much of the 2001 survey and sought information about riders' awareness of motorcycle safety messages, participation in rider training, involvement in crashes and perceptions and management of risk. Information was also sought about usage of protective clothing by riders and their pillions. This paper reports on the results of the 2006 survey; other papers will compare the responses of the 2001 and 2006 surveys.

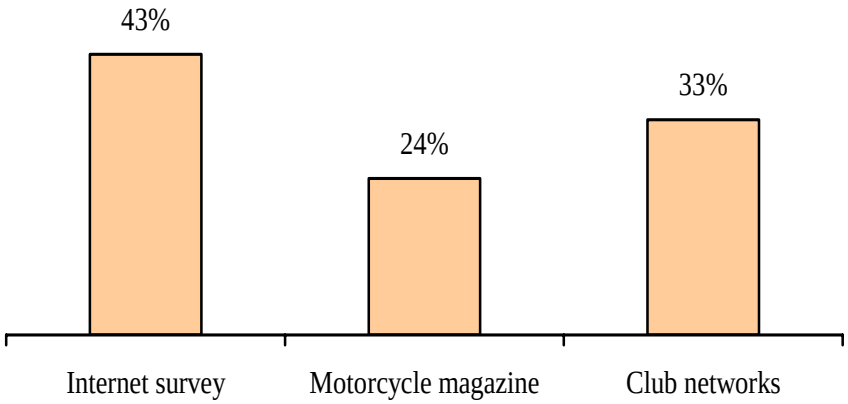
The Survey of Motorcyclists

The survey was distributed through a variety of channels following the process for the 2001 survey (de Rome et al, 2002). These included distribution at motorcycle club meetings through the MCC's member network, attached to handlebars in key motorcycle parking areas, through commercial outlets such as motorcycle shops and as an insert in a motorcycle magazine. All copies were individually numbered so that response rates could be tracked for each distribution point. An interactive version of the survey was also made available for completion on the MCC website. The survey was conducted over a four-week period in May 2006. Completed paper questionnaires were returned by mail or fax to the MCC. There were 1,299 respondents to the survey, including 742 paper copies and 557 from the website.

The magazine inserts (n=12,000) were distributed through all NSW outlets of *Australian Motorcycle News* (AMCN). The response rate for the magazines was 3%. The overall response rate for club and community distribution was 35%.

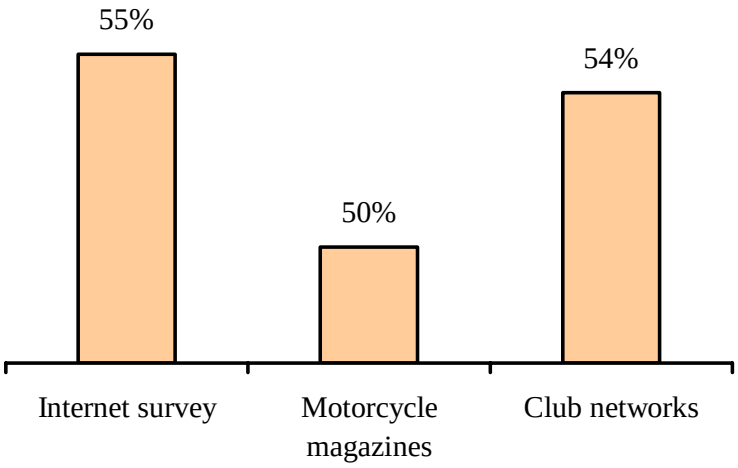
Figure 1 shows the proportion of completed surveys obtained from each type of distribution method. The internet survey produced 43% (n=557) of respondents.

Figure 1: Proportion of respondents by survey distribution method



Overall, 52% of respondents were members of a motorcycle club, with a similar proportion of club members sourced by each type of survey method. Figure 2 shows the proportion of club members within each type of distribution method. Club networks include a range of direct distribution methods such as club meetings and ride days, as well as some distribution by members who worked in motorcycle accessories shops.

Figure 2: Proportion of club members by survey distribution method



The respondents

Demographics

The majority of survey respondents were male (88%, n=1138) with an average age of 39.7 years. Female respondents (12%, n=157), tended to be younger with an average age of 34.8 years. Table 1 gives a breakdown of the number of respondents of each age group and gender.

Table 1: Frequency distribution of survey respondents by age and gender

Age group	Male	Female	All
Under 25	128	20	148
25–39	444	90	535
40–59	508	43	551
60+	54	2	56
Unknown	6	2	9
Total	**1,140 (88%)**	**157 (12%)**	**1,299**

Note: There were 2 respondents of unknown gender.

The sample represents 1.2% of the total number of registered motorcycles (RTA, 2005).[1] Respondents were broadly representative of the population of owners of registered motorcycles in NSW (see Figure 3 and Figure 4).

There were proportionately more women in the sample than amongst registered owners in NSW (12% vs 8%). Middle-aged riders (25–39-year-olds) were also over-represented (41.2% vs 34.2%). Males in the 40–59 age group were slightly under-represented (39.1% vs 42.6%) whereas males aged under 25 were over-represented (9.9% vs 6.7%).

[1] The population of registered owners is based on motorcycle registrations in June of each year in NSW. Registration data for 2005 has been used as the 2006 data was not yet available at the time of writing.

There were fewer owners of smaller capacity motorcycles compared to the population of registered motorcycles. Only 1% of those surveyed rode machines with capacity of 125cc or less, although they represent 8% of registered motorcycles. Those with motorcycles of 126–250cc represented only 13% of the survey, but comprise almost a quarter (23%) of registered motorcycles. Conversely there was an over-representation of 500–660cc (11% of registered, 18% of surveyed) and 750–1000cc (18% of registered, 28% of surveyed) motorcycles. The lower participation of those with smaller capacity motorcycles may also reflect the relatively high proportion (20%) of bikes (125–250cc) that, while registered, are designed for trail or other off-road usage.

Figure 3: Age and gender of survey respondents compared to registered owners of motorcycles

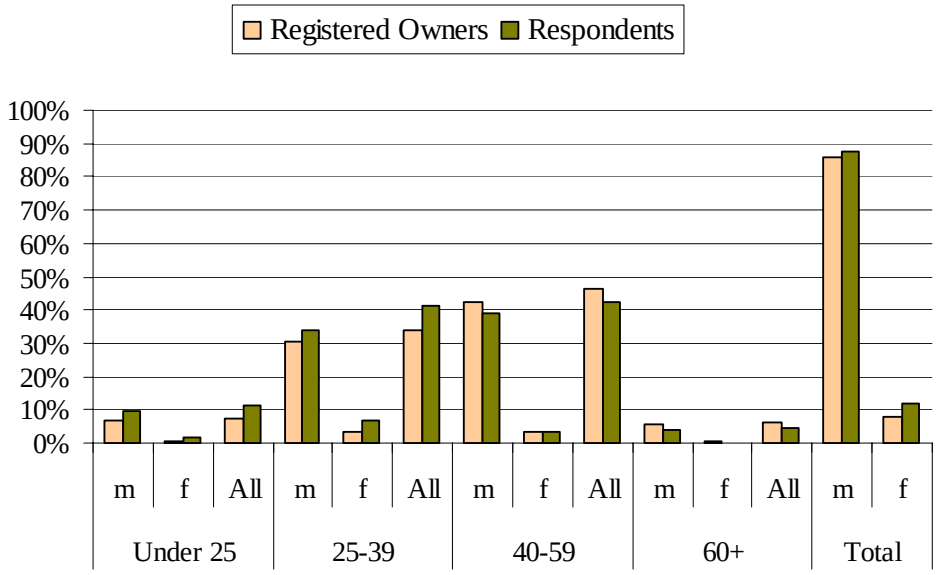
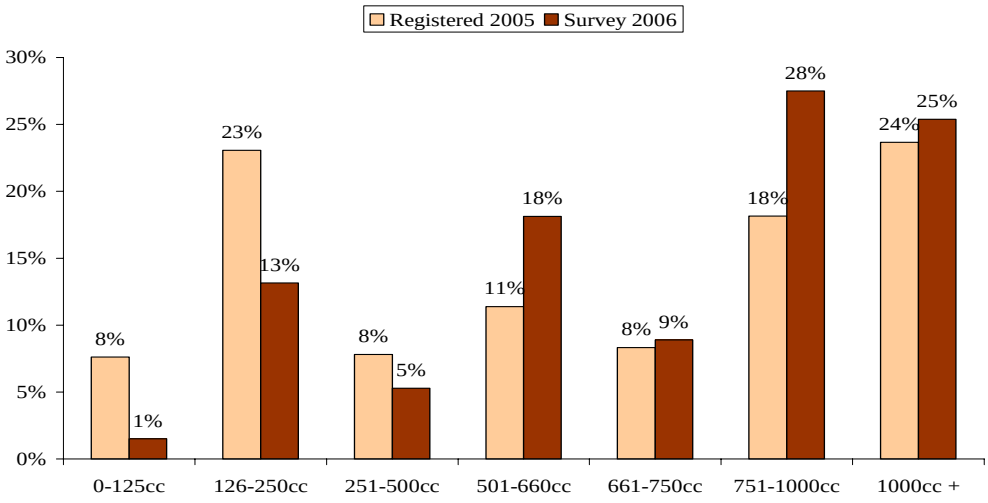


Figure 4: Capacity of motorcycles: survey versus registered motorcycles



NB: Australia Post motorcycles are not included in the registered motorcycle population here.

Table 2 shows the residence of survey respondents. The majority (70%) came from the Sydney statistical division. The Hunter and Illawarra regions bordering Sydney accounted for a further 12%. Seven percent of respondents were from outside of NSW, and almost half of these were from the Australian Capital Territory (n=40/90).

Table 2: Residence of respondents[2]

ABS statistical division	Number	Percentage
Sydney	907	69.8%
Outside NSW	90	6.9%
Hunter	82	6.3%
Illawarra	70	5.4%
Unknown	32	2.5%
South Eastern	24	1.8%
North Western	24	1.8%
Richmond-Tweed	21	1.6%
Mid-North Coast	14	1.1%
Central West	14	1.1%
Murrumbidgee	13	1.0%
Northern	6	0.5%

The majority (86%, n=1108) had a full motorcycle licence, which they had held for an average of 16.1 years. There was a significant gender difference, with male riders having held their licence for on average 17.4 years, compared to 6.7 years for female riders. Eight respondents indicated they did not hold a motorcycle licence as they only ride as a pillion. Another 12 had either never held a licence or held an expired, lapsed or a disqualified/suspended licence. A full car licence was held by 82% (n=1058) of respondents while 4% (n=48) held a provisional or learner's car licence.

Forty-two percent (n=534) of respondents had taken a break of more than six months since obtaining their motorcycle licence. The average rider had returned to riding 5.6 years ago after a break of 7.3 years.

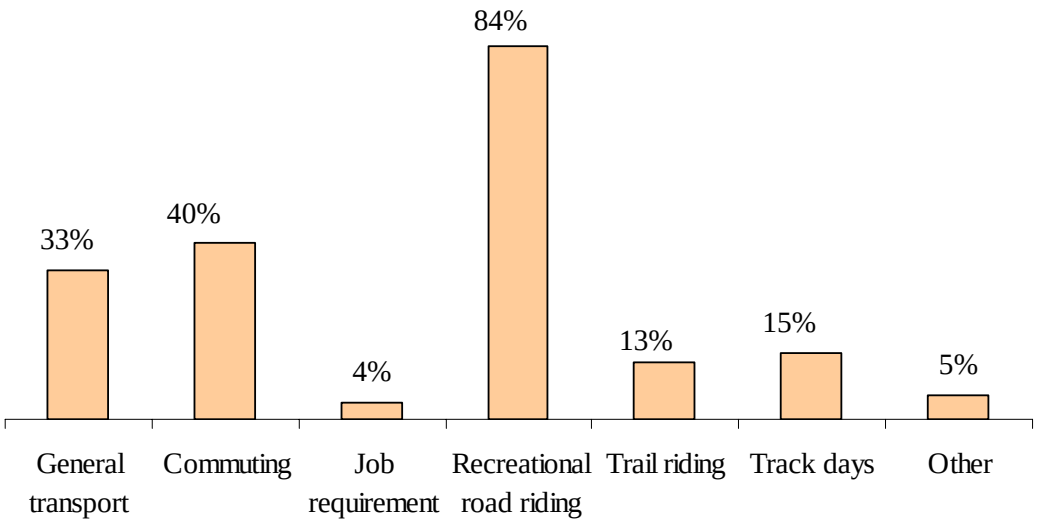
Main reason for riding

For most respondents, their motorcycle was mainly used for recreational riding (84%, n=1073) with commuting (40%, n=508) and general transport (33%, n=427) the next most common reasons (see Figure 5). Very few respondents used their motorcycle only for commuting or general transport (6%, n=77). For most, their motorcycle was either for recreational riding only (31%, n=392) or a combination of recreational riding and commuting or

[2] Based on data from the ABS National Localities Index, 2002.

general transport (30%, n=391). Females were more likely than males to use their motorcycles only for recreational riding (38% vs 29%).

Figure 5: Main reasons for motorcycle riding



On average respondents had ridden on 3.2 of the previous 7 days and estimated that they had ridden 10,757 kilometres in the previous year. See Table 3 for the average number of kilometres ridden by each age group and gender.

Table 3: Average number of kilometres ridden last year by age and gender

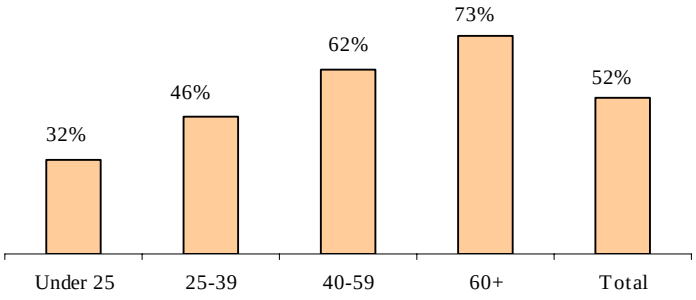
Age	Male (km)	Female (km)	All (km)
Under 25	10,375	6,332	8,353
25–39	10,978	7,613	9,295
40–59	11,559	8,988	10,273
60+	11,280	3,750	7,515
Unknown	6,250	3,875	5,063
Total	**10,088**	**6,111**	**8,100**

Motorcycle-related social activities

Fifty-two percent of respondents belonged to a formal motorcycle club or road riding association (see Figure 6). A high proportion (66%) of the women respondents (n=157) were club members. Overall there was a trend of greater club membership among older respondents.[3]

[3] The very small sample size (n=2) of females over 60 means the lower representation in this age group is not necessarily indicative.

Figure 6: Club membership by age

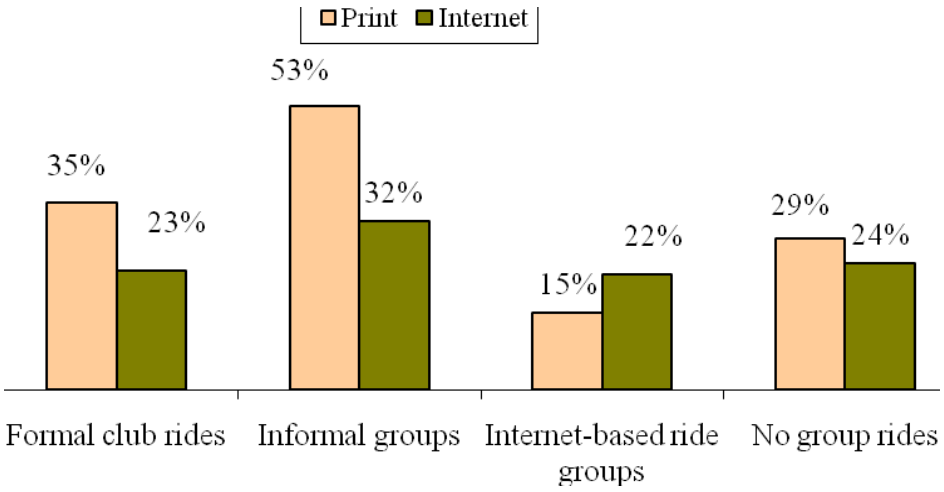


Group rides

The majority of respondents (77%, n=1050) had taken part in some form of group ride more than four times in the previous year (see Figure 7). Informal ride groups were the most common with 44% (n=562) of respondents having participated in such groups.

Those who completed the internet-based survey were more likely to participate in internet-based ride groups (22% vs 18%) and less likely to participate in formal (23% vs 30%) or informal ride groups (32% vs 53%). However, there was little difference in the overall participation in ride groups between those who completed the internet-based and paper-based forms of the survey (76% vs 71%). It was simply a matter of how those rides were organised.

Figure 7: Proportion of respondents who completed internet vs paper surveys by involvement in different types of ride group



Overall ride group participation was slightly higher among females than males (78% vs 71%). Young males aged under 25 years were least likely to participate in ride groups compared to other age groups (see Table 4).

Table 4: Proportion participating in ride groups within age and gender groups

Age group/ Participated in ride group	Male Yes		Female Yes		All Yes	
Under 25 (n=148)	80	63%	15	75%	95	64%
25–39 (n=535)	315	71%	67	74%	382	72%
40–59 (n=551)	372	73%	37	86%	409	74%
60+ (n=56)	42	78%	1	50%	43	77%
Total (n=1,299)	**814**	**71%**	**122**	**78%**	**936**	**72%**

Note: There were 7 respondents of unknown age, 1 respondent of unknown gender and 1 respondent of unknown age or gender.

Only 13% (n=169) of respondents regularly carried a pillion. The majority (55%, n=706) occasionally carried a pillion, while 32% (n=404) reported that they never carried a pillion.

Type of motorcycle

The types of motorcycle most frequently ridden by over one-third of respondents were sports/supersports models (35%, n=450) or sports tourers (26%, n=334). (see Figure 8). Sports models were favoured by younger riders while tourers were favoured by older riders (see Figure 9).

Figure 8: Type of motorcycle

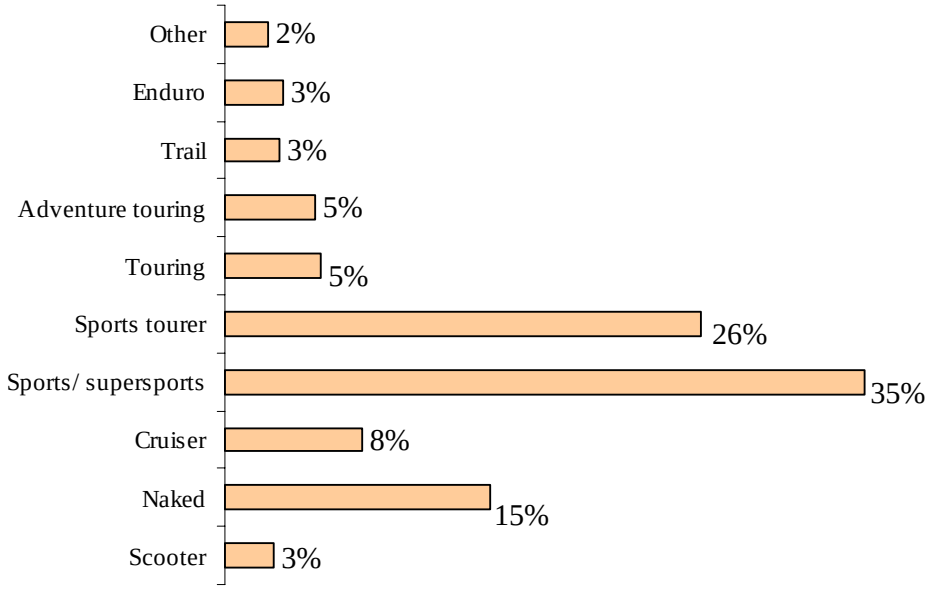
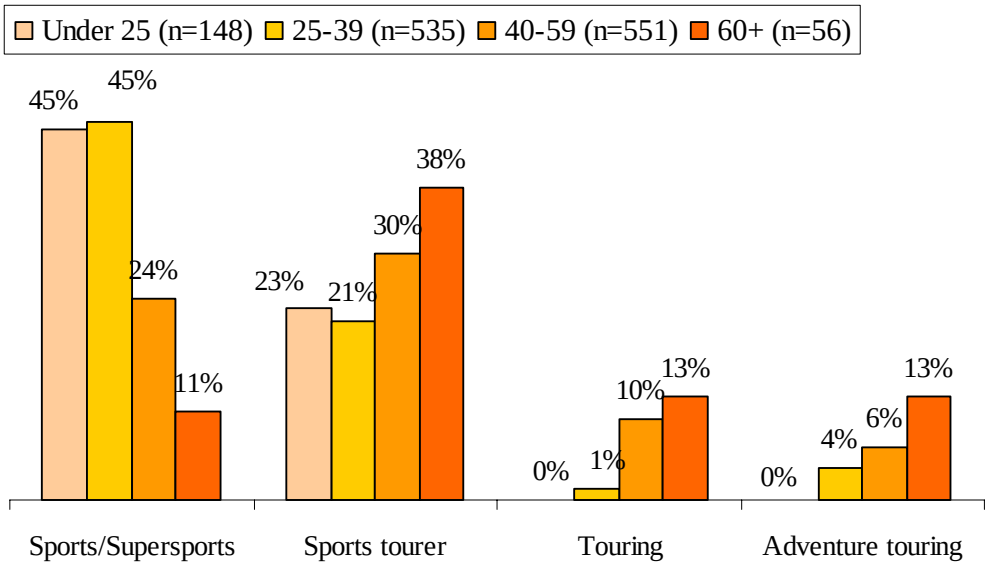
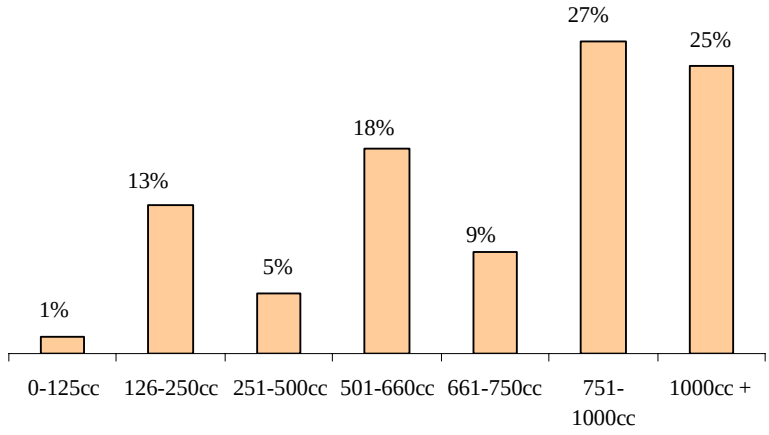


Figure 9: Most popular types of motorcycle by age group



Twenty-seven percent of respondents most frequently rode motorcycles with an engine capacity of between 751–1000cc (27%, n=349); a further 25% were 1000cc or more (n=323). Only 14% rode motorcycles with a capacity of 250 cc or less. (See Figure 10).

Figure 10: Distribution of motorcycles by engine capacity



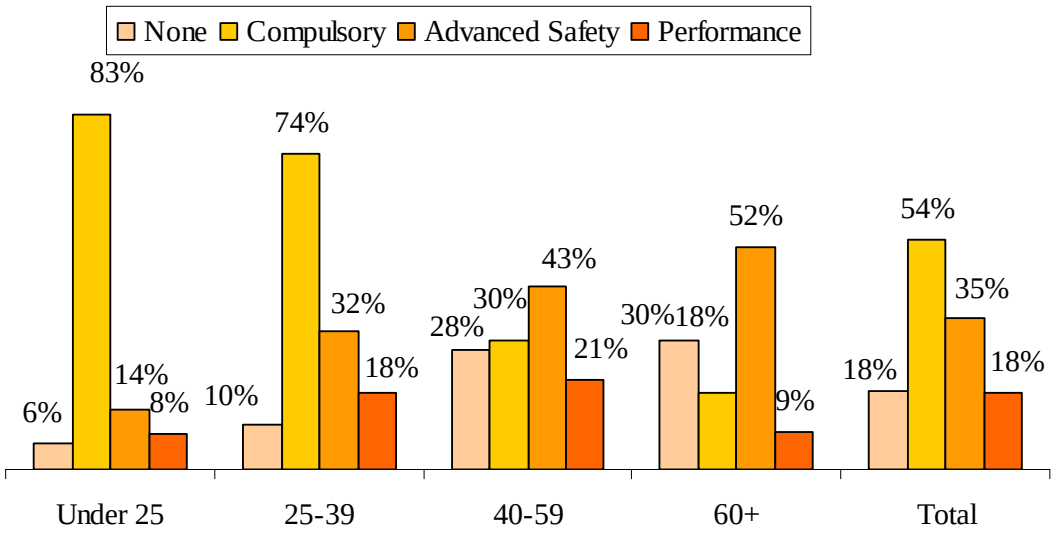
Ten percent of respondents (n=73/742) said they were riding LAMS-approved[4] motorcycles, almost half of which (n=33) were 251–660cc.

[4] This question was only answered by the paper-based survey. In NSW novice riders are restricted to motorcycles of 250cc or less, however the Learner Approved Motorcycle Scheme (LAMS) allows novice riders to ride approved motorcycles up to 660cc assessed on their power-to-weight ratio.

Rider training

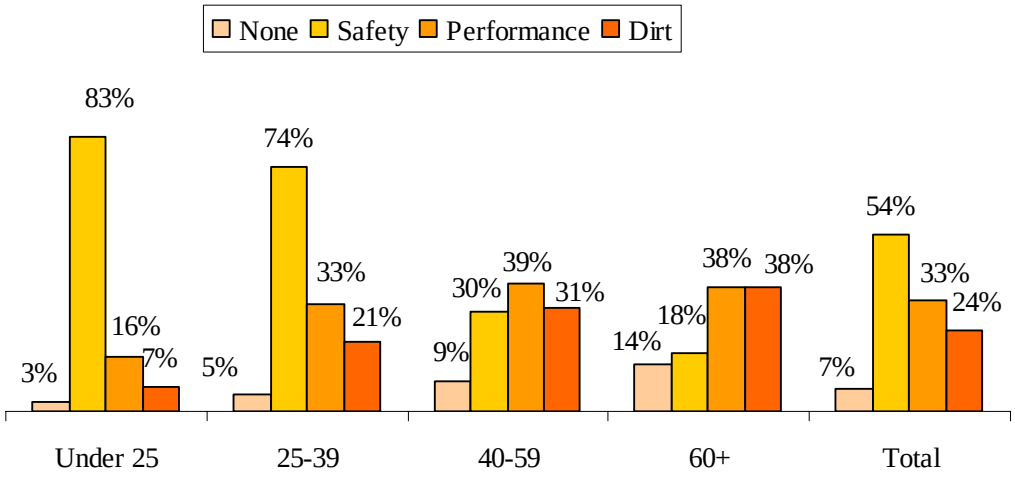
The majority of respondents (81%, n=1,042) had completed some form of training. Over half, 54% (n=697) had completed compulsory licensing training and 35% (n=459) had undertaken post-licence training. Younger riders were less likely to have post-licence rider safety or performance training (see Figure 10).

Figure 10: Proportion of each age group who completed various types of training



Overall, 93% (n=1,210) of respondents indicated they would be interested in some form of further training, if available. Younger riders were more interested in safety training while older riders were more interested in performance training (see Figure 11). The major reasons given for not undergoing further training were cost (41%, n=520) and lack of time (39%, n=490). Only 7% (n=82) of respondents said they felt no need for further training.

Figure 11: Proportion by age group interested in further training



Track days

Over one-third of respondents (35%, n=453) indicated they had taken part in at least one track day. Among those who had participated in track days in the last three years, the average was 5.2 track days over that period with a median of 3. Table 5 shows the proportion of riders by the number of track days undertaken in the previous three years.

Table 5: Distribution of number of track days in the previous three years (n=1279)

Number of track days	Number	Percentage
0	937	73%
1	100	8%
2	66	5%
3	47	4%
4	24	2%
5–9	65	5%
10–14	9	1%
15+	31	2%

Of those who had taken part in track days, the majority (77%, n=235/305) believed they had improved their road riding skills; 28% (n=86/305) believed they had improved their safety; and 14% (n=42/305) believed the track day had made no difference.

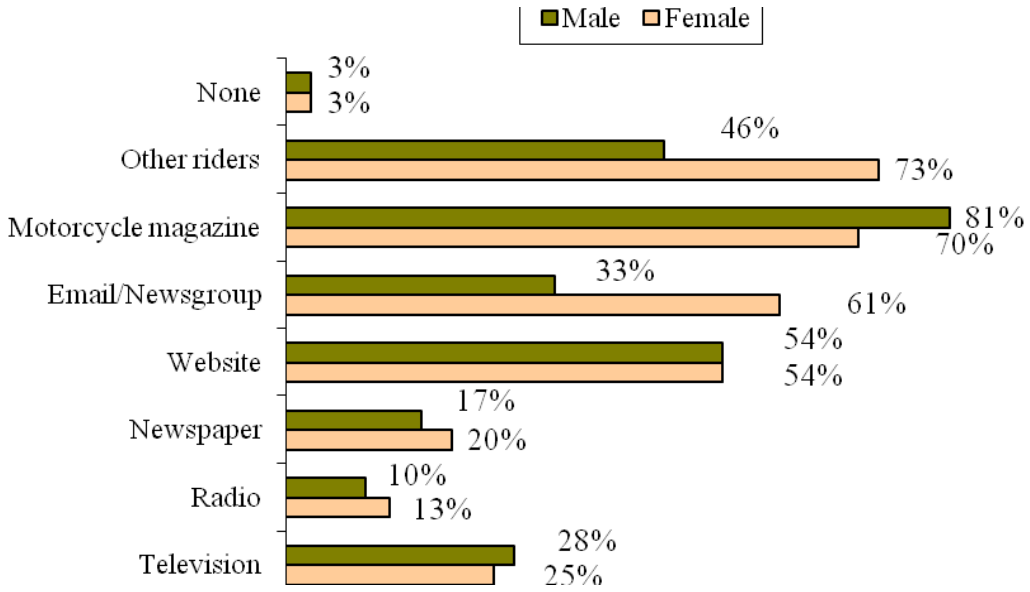
Communicating with motorcyclists

Information sources

The major sources used by respondents to find information on motorcycling were motorcycle magazines (80%), websites (54%), other riders (50%) and email/newsgroups (36%). Only 3% of respondents reported not using any sources of information on motorcycling.

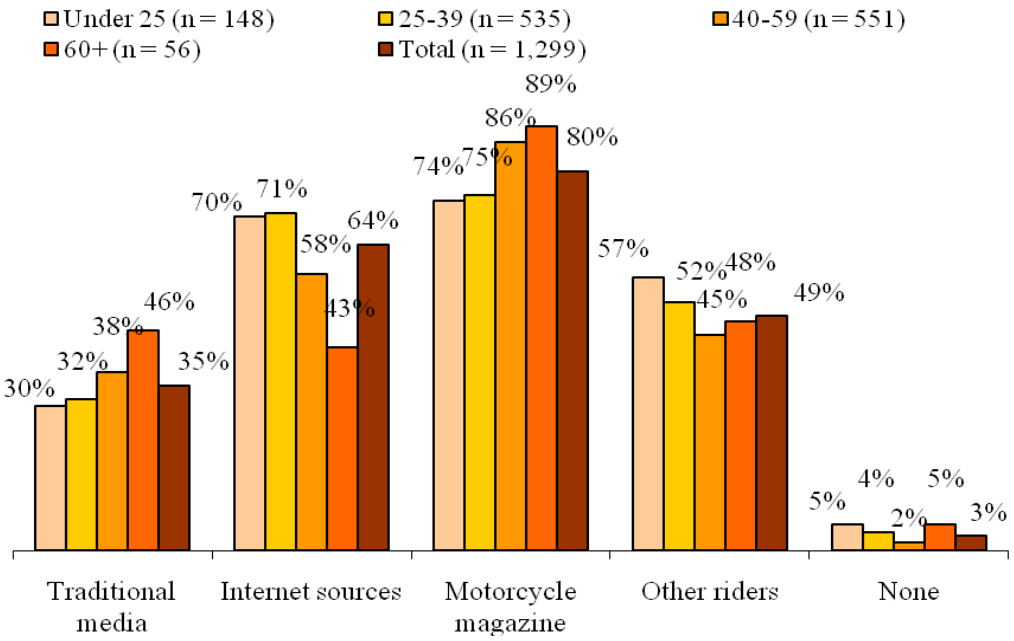
Females were more likely than males to find information on motorcycling from email/newsgroups (61% vs 33%) and other riders (73% vs 46%), but were less likely to use motorcycle magazines (70% vs 81%; see Figure 12).

Figure 12: Proportion of each gender who used each source for motorcycling information



Younger respondents were more likely to get information from internet sources and other riders, while older riders were more likely to get information from traditional media (television, radio, newspapers) and motorcycle magazines (see Figure 13).

Figure 13: Proportion of each age group who used each source of motorcycling information



Note: There were 9 respondents of unknown age.

Safety messages

Respondents were asked about the most memorable motorcycle-related road safety or riding skill message they had seen. The majority of respondents recalled some such message (76%, n=917).

Table 6 lists the sources of messages remembered by respondents. The major sources for such messages were riding trainers (24%, n=218/917) and other riders (20%, n=185/917).

Over half (57%, n=525/997) of respondents found this message valuable and influential on their riding. The primary reason given for remembering the message was the usefulness of the information (54%, n=525/969), although 17% (n=170/969) of respondents said it was memorable because it was humorous.

Table 6: Sources of messages remembered by respondents (n=917)

Type of message	Number	Percentage
From a rider trainer	218	24%
From another motorcyclist	185	20%
A sticker on a car	132	14%
An ad in a motorcycle magazine	131	14%
A poster	123	13%
Internet/email	86	9%
In a motorcycle information booklet or brochure	51	6%
On the radio	38	4%

Respondents were asked to write down the safety message recalled. The text of these messages were classified according to their content in terms of specific or general messages (see Table 7).

Table 7: Content of most memorable motorcycle-related safety messages (n=957)

Type of message	Number	Percentage
Specific safe riding strategies	302	32%
Motorists' awareness of riders	257	27%
Protective gear	115	12%
General road safety	74	8%
Strategies to be seen on the road	80	8%
Maintain crash-avoidance gap	36	4%
Training course—general	27	3%
Excessive speed	19	2%
Conspicuity	14	1%
Drink riding	12	1%
Learning from own or others' crash experience	11	1%
Other safety messages	10	1%

A high proportion of the messages (60%) provided actual safety tips and strategies. These included specific safe riding advice (32%) such as "Stay out of a car's blind spots" or "Steer with your eyes, not your arms". There were specific references to wearing protective gear (12%); to the importance of being seen by other motorists (8%); and to maintaining a crash-avoidance gap (4%). Other specific strategies included references to conspicuity, excessive speed or drink riding. Many of the specific strategies were drawn from a series of government-run motorcycle safety advertisements.

Other messages (8%) made more general references to road safety such as "Don't ride beyond your ability" and "Ride to survive". While these do

express safety consciousness, they are less constructive in terms of influencing behaviour.

Campaigns directed at encouraging other drivers to watch out for motorcyclists appeared to have a particular resonance with the respondents (27%). The campaigns identified were mostly those produced by the MAA/RTA in NSW. A number also referred to a UK government television campaign, copies of which have been circulated among riders via the internet. The interesting aspect is that these campaigns directed at other motorists appeared to also have an effect in reminding riders about their own vulnerability.

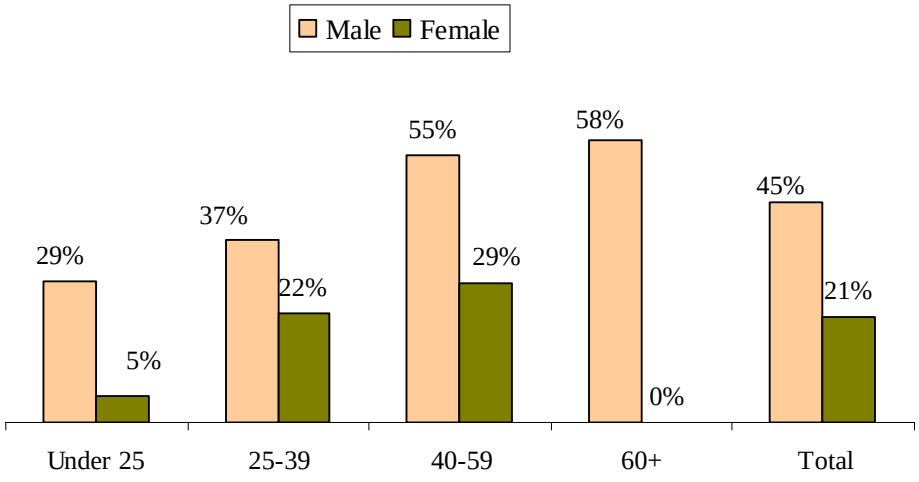
Crash experience

Involvement in crashes

Respondents were asked about their involvement in serious motorcycle crashes, where a "serious crash" was defined as one where someone required medical treatment or at least one vehicle was unrideable or drivable. All questions dealt only with serious crashes. Forty-two percent (n=535) of respondents reported being involved in a total of 828 serious motorcycle road crashes at some time during their years of riding.[5]

While the average across the whole sample was 0.6 crashes, for those who had been involved in at least one crash, the average was 1.5 crashes. Males were more likely to have been involved in a crash than females (45% vs 21%) and were involved in more crashes than females (0.7 vs 0.3 crashes; see Figure 14 and Table 8).

Figure 14: Proportion of each age and gender involved in crashes



[5] Under the Australian Road Rules "serious road crash" is defined as where medical treatment was required or at least one of the vehicles involved had to be towed.

Table 8: Average number of crashes by age and gender

Age group	Male	Female
Under 25	0.4	0.1
25–39	0.5	0.3
40–59	0.9	0.5
60+	0.8	0.0
Total	**0.7**	**0.3**

As might be expected, older respondents were more likely to have been involved in a crash and were generally involved in more crashes than younger respondents.[6] This does not imply a higher crash risk, but reflects their exposure in terms of years of riding. Crash risk by years of exposure and kilometres ridden is discussed below.

Crashes were reported by 5% (n=3/58) of those with learner licences and 12% (n=8/68) of those with provisional licences compared to 48% (n=503/1058) of those with full licences.

The number of years each respondent had held their licence was calculated based on the year in which they obtained their motorcycle licence.[7] This was adjusted for those who reported having had a break by subtracting the length of the break. Their crash rate was calculated in terms of the number of crashes in which they had been involved per 10 years of riding.

Using the number of kilometres respondents reported having ridden in the last 12 months, and extrapolating this to their entire years of riding, their overall crash rate per 100,000 kilometres ridden was calculated. This method rests on the assumption that respondents will have ridden the same number of kilometres each year of their riding life. While this may be unlikely, the error rate is likely to be consistent for all respondents.

Overall respondents had been involved in 0.4 serious crashes per 10 years of riding (see

Table 9). Younger male riders were involved in more crashes per year of riding experience, with those under 25 years being especially over-represented in crashes for their years of riding.[8]

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[6] No females 60 or over were involved in crashes, though due to the small sample size in this group (n=2) this may not be representative.

[7] As the month in which the licence was obtained was not available, this was taken as 2006 minus the year in which their licence was obtained. Those who obtained their licence in 2006 (n=65) were excluded from analysis.

[8] The small number of respondents in the females aged under 25 years (n=20) and females over 60 years (n=2) categories mean these figures may not be representative.

Table 9: Average number of crashes per 10 years of riding by age and gender

Age group	Male	Female	Total
Under 25	1.8	0.4	1.7
25–39	0.6	0.5	0.6
40–59	0.3	0.5	0.3
60+	0.2	0.0	0.2
Total	**0.4**	**0.4**	**0.4**

Riders who had completed compulsory provisional training but no further training were involved in the most crashes for their years of riding (0.6 crashes per 10 years of riding; see Table 10). This was not the case for learner riders; those who had completed only compulsory learner licence training were involved in a lower number of crashes for their years of riding. Riders who had not undertaken any training were involved in the least number of crashes for their years of riding. However this is an artefact of their age because as a group they represent older and more experienced riders who gained their licence before compulsory training was introduced in NSW in 1990.

Table 10: Average number of crashes per 10 years of riding by highest level of training

Highest level of training completed	Crashes per 10 years riding
None	0.3
Learner licence	0.4
Provisional licence	0.6
Advanced safety	0.4
Advanced performance	0.4

Overall respondents had been involved in 0.6 crashes per 100,000 kilometres ridden. Table 11 gives a breakdown of the number of crashes per 100,000 kilometres for each gender and age group.

Female riders were involved in 50% more crashes for the distance ridden than males of the same age. Younger riders were also involved in more crashes for their distance ridden. In particular, males aged 25–39 had around twice the average crash rate, while those aged under 25 had over five times the average rate.

Table 11: Average number of crashes per 100,000 kilometres by age and gender[9]

	Male	Female	Total
Under 25	1.7	—	1.6
25–39	0.6	0.7	0.6
40–59	0.3	0.6	0.3
60+	0.2	—	0.2
Total	**0.4**	**0.6**	**0.4**

One question of interest was whether taking part in training or track days might create unrealistic optimism about riding skills, leading to an increased crash risk. Such an effect has been documented in relation to young drivers (Christie, 2001). Just 2.7% (n=28/1041) of those who had done any training had crashed within three months of completing a rider training course. Similarly, of the 453 who had taken part in one or more track days, 2.4% (n=11) had crashed within three months of a track day.

Characteristics of crashes

Respondents were asked to provide further details of their most recent serious crash. Forty percent of these crashes were single-vehicle and involved only the motorcycle; 53% involved another motor vehicle; and 7% involved a bicycle, pedestrian, animal or other road user (see Table 12).

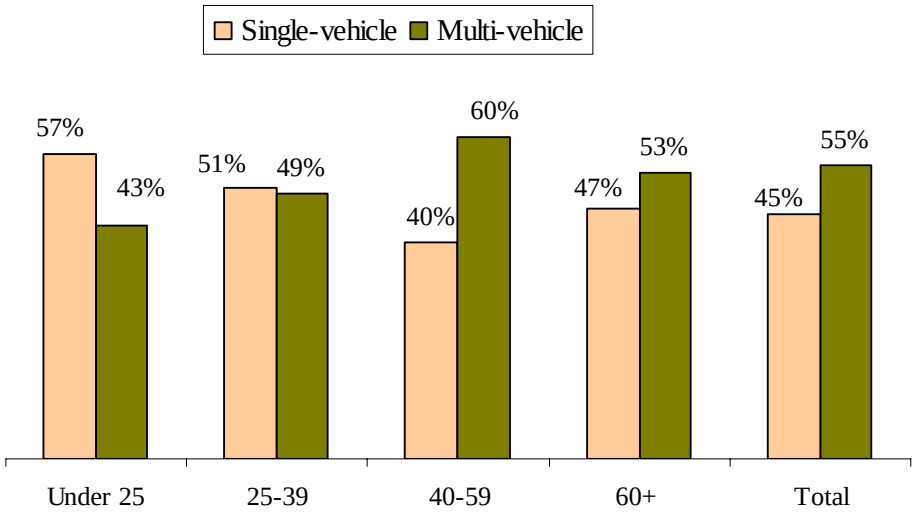
Table 12: Involvement of other road users in crashes (n=559)

Single-vehicle crashes	**Number**	**Percentage**
No other vehicle	224	40%
Multi-vehicle and other road user crashes		
Car	241	43%
Light truck, van or large 4WD	34	6%
Another motorcycle	16	3%
Heavy truck or bus	7	1%
Bicycle	1	0%
Pedestrian	2	0%
Animal	22	4%
Other	19	3%
Total multi-vehicle and other road users	**342**	**60%**

[9] Due to the small number of respondents in the category of females under 25, the rate for this category was not calculated. There was no data for the category of females over 60.

Younger riders were more likely to have been involved in single-vehicle crashes than older riders. Single-vehicle crashes accounted for 57% of crashes involving riders under 25 and 51% involving 25–39-year-old riders. Forty-five percent of all crashes were single-vehicle (see Figure 15).

Figure 15: Proportion of single-vehicle and multi-vehicle crashes for each age group



Fifty-five percent (n=310/560) of these serious crashes were reported to the police. The majority of crashes (91%) occurred on a sealed road (see Table 13).

Table 13: Road type of crashes (n=531)

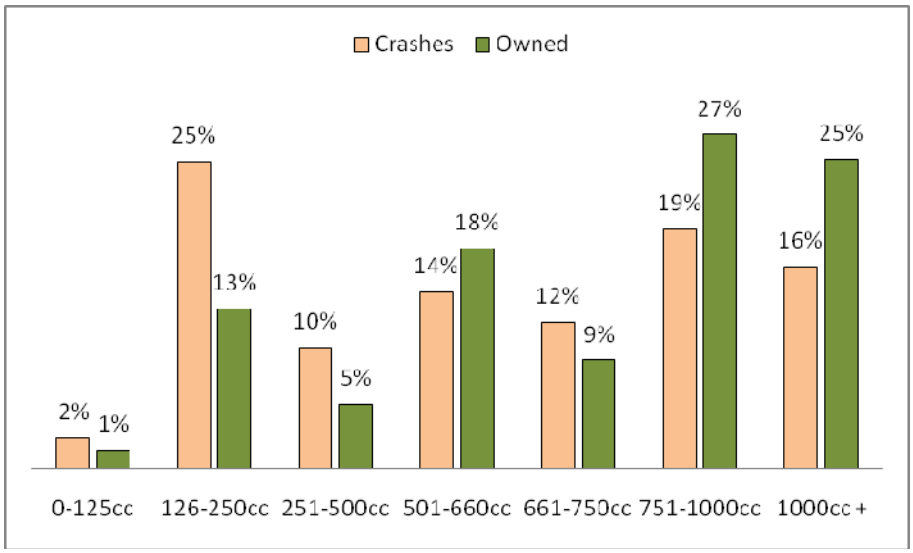
Road surface	Number	Percentage
Sealed	490	92%
Unsealed	20	4%
Off-road/trail	21	4%

Crash involvement by motorcycle size

Those who crashed were more likely to have crashed on a smaller motorcycle relative to the proportion of small motorcycles in the sample (see Figure 16).

Compared to their ownership there was double the representation in crashes of motorcycles of 0–125cc (2% vs 1%), 126–250cc (25% vs 13%) and 251–500cc (10% vs 5%). Representation in crashes was markedly lower among motorcycles of 751–1000cc (19% vs 27%) and over 1000cc (16% vs 25%).

Figure 16: Motorcycle capacity in crashes compared to reported ownership[10]



Injuries in crashes

In 82% (n=266/323) of the injury crashes, someone required medical attention. This was most commonly the rider (79%, n=254); the pillion required medical attention in 6% (n=18) of cases, and someone else in 4% (n=12) of crashes.[11] Table 14 shows the level of injury for riders and pillions involved in crashes.

The most common injuries were sprains and bruises (53% of riders, 50% of pillions) followed by broken bones (48% of riders, 39% of pillions). Riders required hospitalisation in 41% of cases, while pillions were hospitalised in 53% of cases.

Overall the levels of injury to riders were similar in single-vehicle and multi-vehicle crashes. Single-vehicle crashes produced higher levels of broken bones (50% vs 46%) and gravel rash (39% vs 33%) but less hospitalisation (39% vs 42%).

Pillions were injured more often in multi-vehicle crashes, however all three fatalities were in single-vehicle crashes.

[10] Note that registered motorcycles do not include the Australia Post fleet.

[11] Due to technical issues the data from the internet survey was not used for this question.

Table 14: Level of injury of riders and pillions involved in crashes

	Single-vehicle				Multi-vehicle				All crashes			
	Rider (n=204)		Pillion (n=16)		Rider (n=249)		Pillion (n=24)		Rider (n=453)		Pillion (n=48)	
	n	%	n	%	n	%	n	%	n	%	n	%
Fatality	2	1	1	4	0	0	0	0	2	0	1	2
Hospitalised	71	35	6	25	107	43	14	58	178	39	20	42
Broken bones	92	45	3	13	115	46	12	50	207	46	15	31
Gashes, cuts	69	34	5	21	90	36	10	42	159	35	15	31
Gravel rash	76	37	4	17	76	31	6	25	152	34	10	21
Sprains, bruises	93	46	8	33	139	56	11	46	232	51	19	40
No injuries	37	18	1	4	40	16	2	8	77	17	3	6

Behavioural characteristics of crashes

Table 15 lists the circumstances leading to the most recent serious crash experienced by riders. The most common circumstances given were avoiding a situation created by another vehicle (42%) and loss of traction (19%).

Table 15: Circumstances leading to crashes by crash type (n=557)

Circumstances leading to crash	Single-vehicle (n=259)		Multi-vehicle (n=290)		All crashes (n=549)	
	n	%	n	%	n	%
Avoiding a situation created by another vehicle	28	12.6	197	63.5	225	42.2
Avoiding a situation that I created myself	20	9.0	19	6.1	39	7.3
Loss of traction with the road surface	96	43.0	8	2.6	104	19.5
Running out of cornering clearance	13	5.8	1	0.3	14	2.6
Excess speed for the conditions	28	12.6	9	2.9	37	6.9
Affected by fatigue, cold, drugs, alcohol or illness	15	6.7	4	1.3	19	3.6
Unfamiliarity with that motorcycle	6	2.7	4	1.3	10	1.9
Slow speed manoeuvring	2	0.9	1	0.3	3	0.6
I panicked when I made a mistake	15	6.7	4	1.3	19	3.6
I failed to give way to another vehicle/pedestrian	0	0.0	7	2.3	7	1.3

Asked about how they were riding at the time of the crash, two-thirds (67%, n=370/551) of respondents reported riding normally when they crashed. Seventeen percent (n=93) admitted that they were pushing their limits and 14% (n=78) said they were less focused than normal.

When asked about their mental state, 75% (n=410/554) reported they were focused on what they were doing. Only 10% (n=54) reported having

been fatigued or tired, 9% (n=49) were distracted or bored and 3% (n=18) reported they were impaired by alcohol or drugs.

Asked who was most responsible for the crash, 44% of respondents blamed the other driver/rider, while 37% accepted responsibility themselves and 11% blamed the road surface (see Table 16).

Table 16: Person/object most responsible for crashes (n=556)

Who was most responsible for the crash	Number	Percentage
Other driver/rider	245	44%
Myself	204	37%
Road surface hazard/gravel, etc.	59	11%
Other	38	7%
Animal	20	4%
Pedestrian	3	1%
Pedal cyclist	2	0%

When asked to identify from a list what they could have done to avoid the crash, 35% said that there was nothing they could have done. Table 17 lists the possible actions proposed to the respondents. Twenty percent thought better observation skills could have helped them avoid the crash; slowing down earlier (15%) and better braking skills (14%) were the other options most commonly selected from the list provided.

Table 17: Possible actions to avoid the crash

	Single-vehicle (n=152)		Multi-vehicle (n=184)		All crashes (n=336)	
	n	%	n	%	n	%
Nothing	42	28	76	41	118	35
Used better braking skills	22	14	26	14	48	14
Used better cornering skills	12	8	6	3	18	5
Used better observation skills	26	17	40	22	66	20
Had slowed down earlier	30	20	21	11	51	15
Had a better maintained motorcycle	2	1	3	2	5	1
Had a better motorcycle	3	2	4	2	7	2
Had not ridden when fatigued/tired	11	7	5	3	16	5
Had not ridden after taking alcohol or drugs	12	8	1	1	13	4
Used better slow speed manoeuvring skills	4	3	1	1	5	1
Had given way to the other vehicle/pedestrian	23	15	31	17	54	16

Table 18 shows the responses to the question about options for crash avoidance by the level of rider training completed. Those who had no training were most likely to report that there was "nothing they could have done" to avoid the crash.

Those who had completed advanced safety training were also more likely to have selected the "nothing they could have done" option.

Riders with compulsory training only were most likely to nominate braking and observation skills, and slowing down earlier, as the means by which they might have avoided the crash.

As noted earlier, those who had not completed compulsory licensing training tend to be the older riders. This may reflect an accurate assessment of the situation based on their experience, or may indicate lack of acceptance of their contribution to the crash.

Table 18: Possible actions to avoid the crash, by training level

	None		**Compulsory only**		**Compulsory and advanced safety**		**Advanced safety only**	
Nothing	55	39%	17	28%	18	35%	28	35%
Used better braking skills	15	11%	13	21%	8	15%	12	15%
Used better cornering skills	4	3%	3	5%	7	13%	4	5%
Used better observation skills	22	15%	15	25%	11	21%	18	22%
Had slowed down earlier	20	14%	12	20%	5	10%	14	17%
Had a better maintained motorcycle	2	1%	0	0%	1	2%	2	2%
Had a better motorcycle	4	3%	1	2%	2	4%	0	0%
Had not ridden when fatigued/tired	4	3%	6	10%	6	12%	0	0%
Had not ridden after taking alcohol/drugs	7	5%	1	2%	2	4%	3	4%
Used better slow speed manoeuvring skills	2	1%	2	3%	1	2%	0	0%
Had given way to the other vehicle/pedestrian	1	1%	2	3%	0	0%	1	1%

Protective clothing[12]

Protective clothing in crashes

Table 19 shows the protective gear that riders reported wearing when they were involved in their most recent serious crash.

Table 19: Use of protection in crashes (n=338)

Protective clothing	Wearing gear	
Helmet	317	94%
Motorcycle gloves	285	84%
Motorcycle jacket	252	75%
Body armour	72	21%
Back protector	44	13%
Motorcycle pants	127	38%
Motorcycle boots	221	65%

Overall the perceived effectiveness of protective wear was very high, with 88% of respondents believing that protective gear had reduced their injuries in their crash.

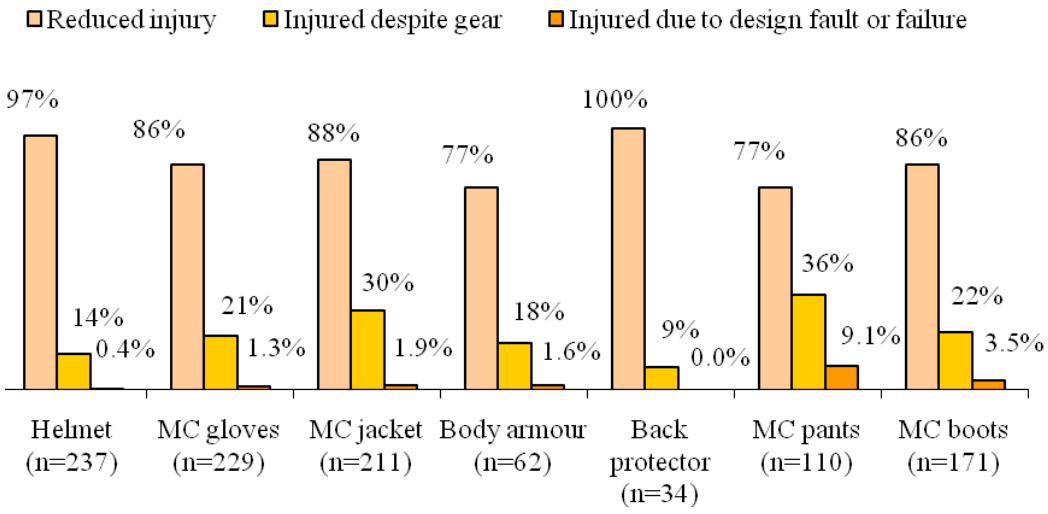
While body armour was only worn by 21% of those involved in crashes, a high proportion (77%) of those riders believed that it had prevented or reduced injuries in crashes. Similarly back protectors were only worn in 13% of crashes but were believed to have prevented or reduced injury in 82% of those crashes.

Injuries in spite of wearing protective gear were reported by 21% of respondents who had crashed. Injuries due to design faults or failures were low (3%), but most common in relation to motorcycle pants (9%).

Figure 17 shows the number wearing each type of protective clothing when they crashed by its effectiveness.

[12] Due to data loss, the responses from the internet survey were not used for this section of the analysis.

Figure 17: Perceived benefits of protective gear



Usage of protective clothing

Respondents were asked about the level of protection worn on three typical types of ride. These were the last time they were: commuting to work or study; riding recreationally; or on a short trip in the local area. They were also asked what was worn by the last pillion they carried.

A system was devised to assign an overall score for protection. Protection on the various body areas was scored, with high protection getting 2 points, low protection 1 point and no protection 0 points to obtain an overall score for a respondent's level of protection. Table 20 shows how the levels of protection are defined.

Table 20: Definitions for levels of protection

Score	2 (High)	1 (Low)	0 (None)
Head	Full-face helmet or open-face helmet and eye protection	Open-face helmet without eye protection	No helmet
Upper body	One-piece leather suit or motorcycle jacket with impact protectors	Motorcycle jacket without impact protectors	Non-motorcycle jacket or no jacket
Legs	One-piece leather suit or motorcycle pants with impact protectors	Motorcycle pants	Non-motorcycle pants or shorts
Feet	Motorcycle boots	Closed shoes	Thongs or open sandals
Hands	Motorcycle gloves	Other gloves	No gloves

Figure 18 shows the level of protection worn by riders on the various types of trips, and by pillions. Levels of protection were similar for commuting and recreational riding, though leather suits or pants with impact

protectors (35% vs 14%) and motorcycle boots (83% vs 64%) were more common for recreational riding than commuting.

Riders typically wore lower levels of protection on short trips than when commuting or riding recreationally. The level of protection worn by pillions was generally lower than for riders, and was comparable with the level worn by riders on short trips.

Figure 18: Level of protection worn by riders

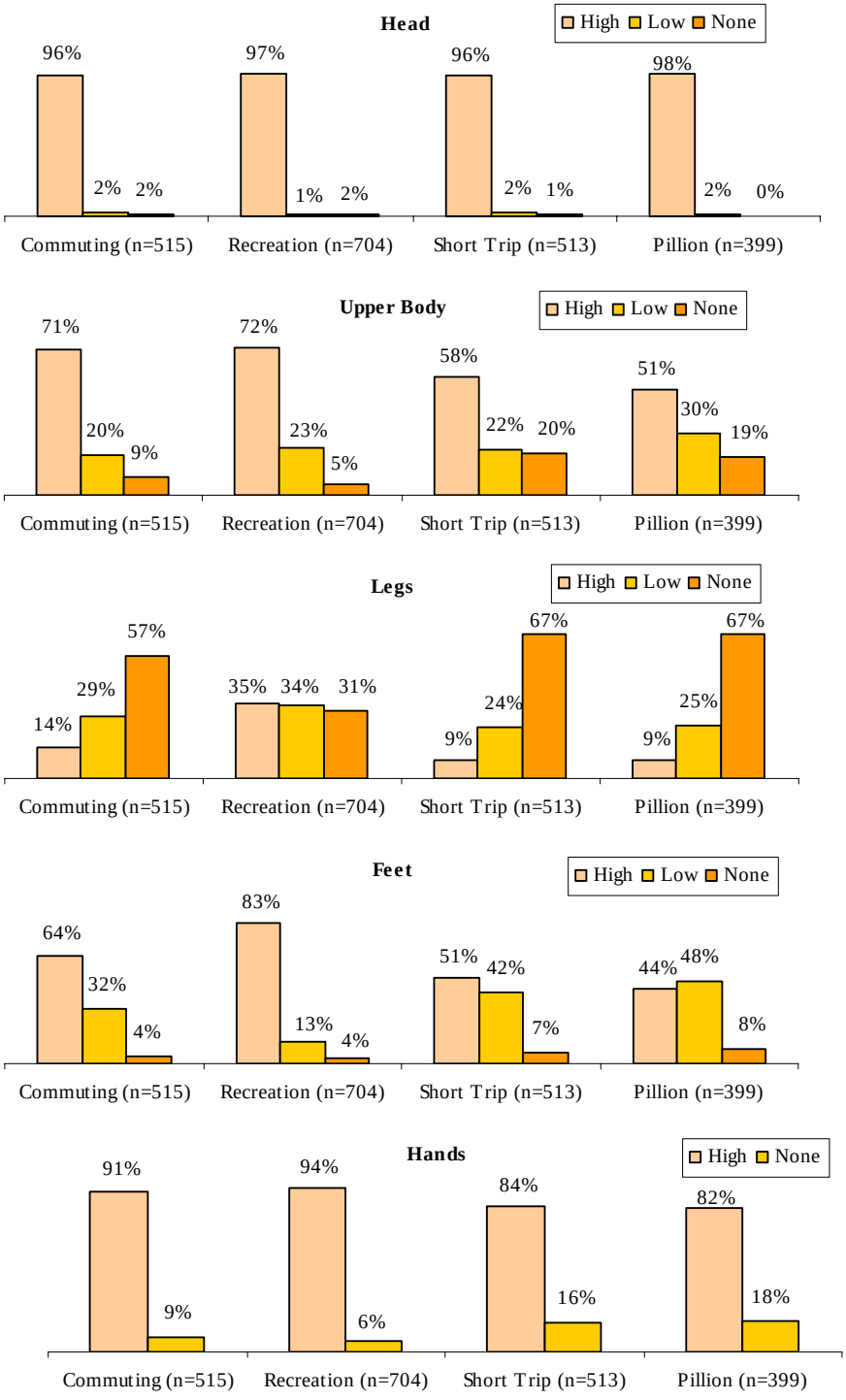


Figure 20 shows the level of protection worn by regular pillions compared to occasional pillions. As might be expected, the regular pillions wore higher levels of protection.

Figure 19: Level of protection for regular vs occasional pillions

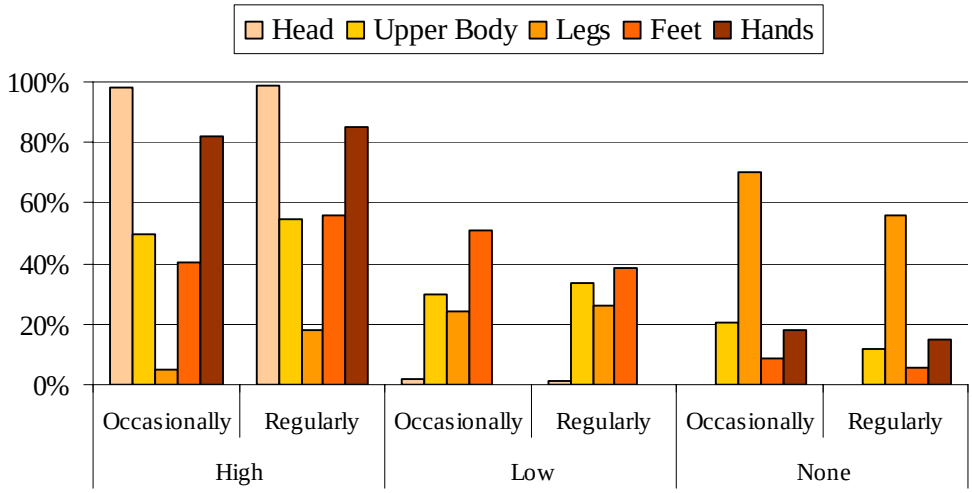


Figure 20 gives the overall level of protection worn by different age groups. Older riders wore lower levels of protection than younger riders. However, riders aged under 25 years wore lower levels of protection than 25–39-year-olds while commuting or on recreational trips. There was a very substantial drop in the level of protection worn by those aged over 60 on all types of trip.

Figure 20: Average overall level of protection by ride types and age

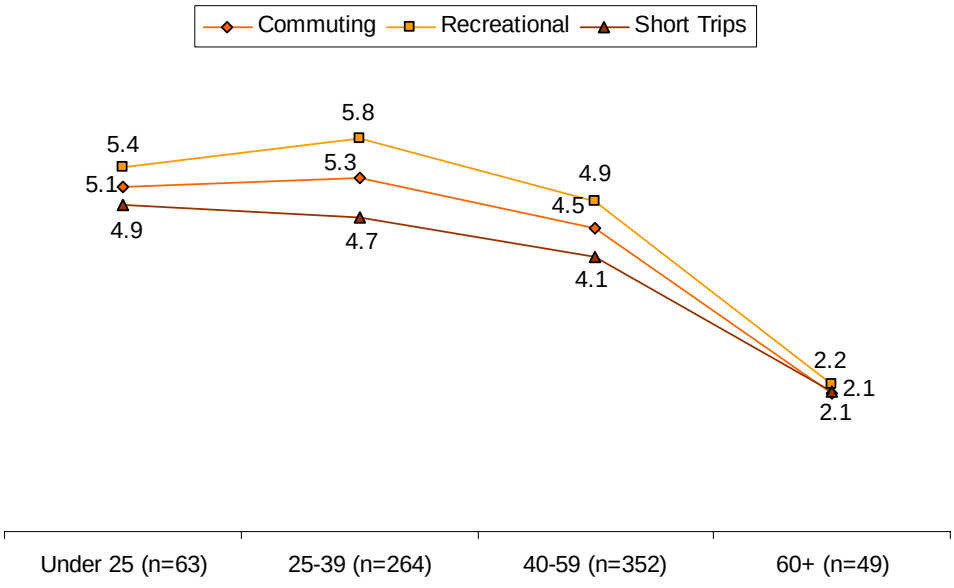
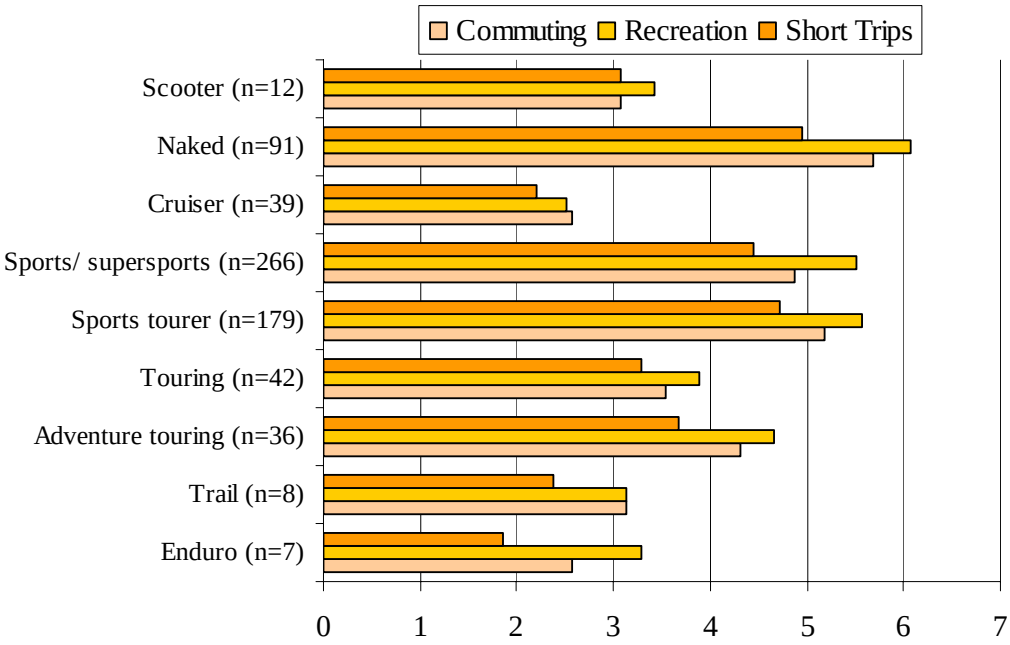


Figure 21 gives the overall level of protection worn on various types of trips according to motorcycle types.

Levels of protection worn were lower for those riding scooters, cruisers, trail and enduro bikes than for other types of motorcycles.[13] The highest levels of protection were worn by those riding naked, sports/supersports and sports tourer bikes. For all types of bikes the lowest level of protection was worn while on short trips. Generally, more protection was worn on recreational trips than while commuting. There was less differential in the level of protection worn on various ride types by those with scooters or cruisers.

Figure 21: Average overall level of protection on various ride types by motorcycle type



Discussion

Demographics

The survey was reasonably representative of registered motorcycle owners in NSW in terms of age and gender. However, there were more younger riders in the survey and more women than in the population of registered owners. The small number of females in the motorcycle population means it is hard to draw conclusions regarding this group. In particular, the number of females under 25 (n=20) and over 60 (n=2) in the sample make it hard to draw any firm conclusions for these groups.

[13] The number (n=23) of riders who said they were riding an enduro motorcycle when they crashed is difficult to interpret. The question clearly asked about the motorcycle they were riding when involved in a serious road crash, but enduro motorcycles are designed for off-road riding and cannot be registered for road riding.

In terms of riding experience, the sample was similar to that found in a survey of a random sampling of NSW motorcycle owners (Harrison & Christie, 2005). On average males had held a licence much longer than females (17.4 vs 6.7 years). Their reported riding exposure was much higher than has been reported in other studies, however. On average respondents estimated they had ridden 10,757 kilometres in the previous year, which is more than double the mean distance of 5,208 kilometres per year for NSW riders based on odometer readings (Harrison & Christie, 2005). The discrepancy between the two studies may reflect the inaccuracy of self-reports for such measures, or a difference in the sample reached.

There were some also discrepancies in the capacities of motorcycles owned by respondents compared to the population of registered motorcycles. Over half of respondents (52%) belonged to a formal motorcycle club or road riding association. This, together with the large average distance travelled by respondents, suggests that the survey sample may be skewed towards the more active or committed motorcyclists. However there is little information available to define the activity levels of the "average" member of the motorcycling population.

The Motorcycle Council of NSW claims to represent over 38,000 motorcyclists through some 41 affiliated motorcycle clubs. There are also some motorcycle clubs not affiliated with the MCC, including major clubs such as the Honda Riders Club, which has an estimated 13,000 members in NSW. Such club membership does not necessarily indicate active involvement, as free membership to some manufacturer-run clubs is automatically provided with the purchase a new motorcycle. The actual number of motorcyclists who are club members is hard to establish as riders may belong to more than one motorcycle club. However, the MCC estimates that motorcycle club members represent at least 46% of the registered owners of motorcycles in NSW.

Communicating with motorcyclists

The majority of respondents appear to use multiple sources for motorcycle-specific information. Forty-three percent (n=557) completed the web version of the survey over the four weeks that it was available on the MCC website.

Club membership was slightly higher among internet (55%) and other distribution sources (54%), including various club-based distribution methods, than from surveys distributed through motorcycle magazines (50%).

Motorcycle magazines were the most commonly used source of information (80%), though as 24% of respondents completed the survey distributed in motorcycle magazines this figure is not indicative of the general population. Fifty-four percent of respondents used websites and 36% used email or newsgroups as a source of motorcycling information. Other riders were a source of information for 49% of respondents. Traditional media (radio, newspaper and television) were the least used sources for motorcycling information.

Females were more likely than males to get motorcycling information from other riders (73% vs 46%) and email/newsgroups (61% vs 33%), and less likely to get information from motorcycle magazines (70% vs 81%).

Specific safety messages regarding motorcycling seem to have been effective in reaching the majority of respondents. More than three quarters (76%) could recall a motorcycle safety message and 57% found that message valuable and influential on their riding. A high proportion (60%) of the messages recalled referred to specific safety tip or strategy. Many of these specific messages were from campaigns run by the MAA and RTA in NSW. Many riders referred to campaigns directed at drivers rather than motorcycle riders, suggesting that such campaigns can attract the attention of motorcyclists as well as the drivers they primarily target.

Crash experience and causal responsibility

Forty-two percent of respondents had been involved in at least one motorcycle crash. While older riders reported a higher involvement in crashes, when estimates of years of riding and distance travelled were taken into account it was younger riders who were seen to have a higher crash involvement (see

Table 9 and Table 11). Of the most recent crashes reported by respondents, 40% were single-vehicle crashes; 53% involved another motor vehicle; and 4% involved a bicycle, pedestrian or animal. This is consistent with RTA data on the proportion of single-vehicle motorcycle crashes (39%) reported in NSW (RTA, 2006).

Rider training

Compulsory rider training was introduced into NSW as part of the licensing process in 1990. Since then, the sheer number of motorcycle casualties has decreased substantially. This is particularly apparent for riders under the age of 26 whose involvement in crashes is 58% lower (reduced from 1,664 in 1990 to 698 in 2005; RTA, 2006). Despite the significant reduction in the number of young riders in crashes, the picture of what is actually happening to their crash rates is not all that clear. This is because the number of motorcycles registered to young people has also decreased from 17% to 9% of registered owners (de Rome, Stanford & Wood, 2007). While the crash involvement of young riders has reduced, it is less clear whether this is due to a reduction in the number of young riders, or a reduction in their crash rate.

It is over 30 years since the Motorcycle Operator Skills Test (MOST) was first developed by McPherson and McKnight (1976) in the US. Despite the increasing experience of riders and rider trainers in the intervening time, we still do not know how best to train riders to reduce their crash risk. Reviews of training and licensing have not been able to demonstrate a conclusive association between rider training and reduced risk of crashes. A recent Australian review of rider training concluded that the injury-reduction benefits apparently associated with compulsory training could be due to their functioning as a deterrent, thus reducing the total number of young riders, rather than reducing their crash risk rate (Haworth & Mulvihill, 2005).

The majority of riders surveyed (81%) had undertaken some form of rider training, with 54% having completed compulsory licence training and 35% having undertaken advanced safety training. As expected, young riders were more likely to have completed compulsory licence training while older riders were more likely to have completed advanced safety training. An overwhelming majority (93%) of respondents were interested in completing further training.

Riders who had completed either compulsory training or advanced safety training were less likely to suggest that there was nothing they could have done to avoid a crash, and more likely to suggest that better riding skills could have helped avoid the crash (see Table 18). This may suggest that training opens up options for a rider that are not recognised by riders without training. However, those who had completed advanced safety training were more likely to believe that no actions or better skills could have helped avoid the crash. This may be because they accurately assessed the situation, but it also may suggest a tendency to overestimate their abilities and underestimate their own contribution to crashes. It should also be noted that these riders tended to be older, and their responses may be related to their age and experience rather than the training they completed.

A majority (64%) of riders had completed track days, with 86% believing track days had improved their road riding skill or their safety.

Personal protection

Overall use of motorcycle-specific protective clothing was high, with the legs the area least likely to be protected by a majority of respondents. The level of protection used was lowest among pillions, who were least likely to wear high levels of leg and foot protection. Riders wore substantially lower levels of protection on short trips and were less likely to protect their feet and legs while commuting than when undertaking recreational rides.

The lower level of leg and foot protection worn while commuting may be related to comfort and convenience factors. Motorcycle protective pants and boots in particular are generally not comfortable or suitable work attire. Riders can more easily remove their jacket and helmet than change pants and boots on arrival at work. This may be the disincentive to wearing such protection when commuting.

The lower level of protection worn by pillions appears to be related to the frequency or infrequency of carrying pillions. Only a small proportion (13%) of respondents regularly carry pillions, but over half (55%) reported carrying a pillion occasionally. Unless a pillion has their own riding gear, they are usually dependent on the rider's spare gear. Protective gear is essentially clothing and needs to fit the wearer. As might be expected, those with regular pillions reported higher levels of pillion protection than those with occasional pillions (see Figure 19).

The perceived effectiveness of protective gear in reducing injury was very high. The vast majority of respondents wearing protective gear during a crash said they thought it reduced or prevented injury (see Figure 18). Actual effectiveness in reducing injury appeared to be correspondingly high, with

relatively few respondents reporting injuries when they were wearing appropriate protective gear.

The relatively low levels of protection to the lower body and feet suggests that riders need to be better informed about the relative merits of different forms of protective clothing.

Conclusion

An earlier report on the 2001 survey indicated that there were well-established and effective communication channels in NSW which could be used to deliver targeted motorcycle safety information to riders (de Rome, Stanford & Wood, 2004). It was also found that a high proportion of the motorcyclists who responded to the survey were actively engaged in strategies to manage and reduce their own crash risk. It was suggested that other road safety stakeholders could use these channels to deliver targeted programs to improve the safety of motorcycling. That survey also noted that while most riders and their pillions used appropriate gear to protect their heads and upper bodies, there was a need to inform motorcyclists about the benefits of protecting their legs and feet.

Since the 2001 survey was conducted, a substantial number of motorcycle safety initiatives have been undertaken by government and community organisations in NSW (de Rome, Stanford & Wood, 2007). These have included a high-profile government advertising campaign on motorcycle safety and a number of community-based projects by local councils. The MCC has also developed a website to deliver motorcycle safety information to riders on a range of topics including protective clothing.

The results of the 2006 survey suggest that these efforts have been successful, at least in gaining the attention of the riders who responded to the survey. A higher proportion of riders could recall a motorcycle safety message, and the majority of these messages provided constructive advice. There appeared to be an increase in the level of safety dialogue amongst the riders with a higher proportion attributing the source safety messages to other riders.

Overall the findings from this survey confirm the value of investing in a targeted approach to motorcycle safety.

List of tables

List of figures

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