# REVIEW

# Injuries in the Victorian thoroughbred racing industry

### S Cowley, B Bowman, M Lawrance

There is increasing concern in Australia about safety in the thoroughbred racing industry, but there has been no reported analysis of injury data. This review analyses injury and workers' compensation data recorded in Victoria. On the basis of the results, it is recommended that the injury and incident data collection systems are improved such that they are not only more complete but also accumulate more detailed information about the location of an incident or injury event, the activity at the time of the incident or injury event, and factors that may have influenced the occurrence.

Thoroughbred racing is one of the largest industries in Victoria, providing over 30 000 full-time-equivalent jobs and contributing over \$A140 million annually in taxes from betting alone.<sup>1</sup>

Three metropolitan race clubs and 80 country clubs operate four metropolitan, 52 country and 12 picnic racecourses in Victoria. During the 2004–2005 racing calendar, there were 581 race meetings, of which 130 were within the metropolitan area and 451 were in regional Victoria, attended by 1.647 million people. In addition, there were 130 race trials. At the race meetings there were 4646 thoroughbred races, of which 155 (2.5%) were jumps races.<sup>1</sup> In the season 2004–2005, 9315 different horses started at least one race, and about 317 horses had at least one start in jumps races.

Racing Victoria Limited (RVL) is the top racing body in the state of Victoria and it oversees and regulates the industry. Horse trainers are licensed by RVL and are the industry's largest employer group, undertaking activities related to the preparation and presentation of a horse for racing. There are about 1200 trainers registered in Victoria employing stable assistants, known as stable hands or strappers, and track riders to undertake track work duties. They also engage jockeys to ride during race meetings and to undertake some track work.

During 2005, there were 277 licensed jockeys in Victoria. Jockeys are regarded as employees of RVL for workers' compensation purposes when they are riding horses at licensed training facilities or race tracks. Track riders and stable hands are generally employees of licensed horse trainers. In Victoria, workers' compensation provides injured workers who have suffered a work-related injury or illness with weekly payments to cover their loss of earning capacity, payment for medical expenses, and other reasonable expenses to assist them to return to work. The first 10 days of earnings are

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paid by the employer, and employers are required to lodge claims with their insurer if: the claim extends to more than 10 days lost time; associated medical and the like expenses exceed \$A531; the injured worker requests that a claim be lodged.

Fleming *et al*<sup>2</sup> reported on horse riding-related injuries in general and pointed out:

"A rider mounted on a horse is completely dependent upon the animal and a person anywhere near a horse is exposed to risk. Horses are unpredictable and emotionally liable. They are large powerful creatures that can weigh an average of 500 kg and reach speeds of up to 60 km/hr. Horse kick strength has been estimated at 400 J, which is fourfold the test impact load of around 80-100 J for most equestrian helmet standards. A kick from a horse can easily cause a skull fracture or intracranial haemorrhage. The rider is elevated (head up to 3 m above the ground) and is in a head forward position with no restraining device, increasing the risk of ejections or falls. These combined factors allow horses to impart tremendous kinetic energy to their riders." (p 210)

Speed,<sup>3</sup> in addressing the welfare of retired Australian jockeys, adds that the thoroughbred jockey is travelling in this way while crouching over a tiny saddle, constantly changing direction and surrounded by others who are attempting to manage the same challenges.

In recent years, the number of races and the number of horses in training has increased, with a direct influence on exposure of employees to risk of injury. The recognition of some risk factors has resulted in a requirement that jockeys use protective headwear and a protective vest while mounted on a horse; track riders must also wear similar protective clothing. However, although there is increasing concern about safety within the industry, influenced to a large extent by several fatal injuries sustained by jockeys during races, there has been no reported analysis of injury data from Victoria or other states in Australia. This is surprising given the value to the economy, the public interest, and the media attention given to the sport.4 5 Where reports are made about occupational safety in this sector, they are almost exclusively focused on injuries among licensed jockeys, generally address the nature of the injury rather than the cause, and refer to racing in 

Abbreviations: RVL, Racing Victoria Limited; VWA, Victorian WorkCover Authority

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Accepted 19 April 2007 Published Online First 14 May 2007 Table 1Nature and location of injuries reported in theVWA workers' compensation claims dataset made byjockeys and non-RVL employees for injuries resulting fromtalls from horses

Injury	Frequency	
	Licensed jockeys (n = 198)	Non-RVL employees (n = 250)
Nature		
Contusion	35 (18)	37 (15)
Dislocation	6 (3)	7 (3)
Fracture	91 (46)	112 (45)
Intracranial	12 (6)	15 (6)
Open wound	8 (4)	2 (1)
Strain	13 (7)	25 (10)
Traumatic joint injury	12 (6)	19 (8)
Other	21 (11)	33 (13)
ocation		
Back	18 (9)	39 (16)
Cranium	12 (5)	12 (5)
Chest and abdomen	19 (10)	17 (7)
Face/head	6 (3)	11 (4)
Lower limb	46 (23)	73 (29)
Neck	18 (9)	17 (7)
Shoulder	36 (18)	32 (13)
Upper limb	29 (15)	43 (17)
Brain	8 (4)	4 (2)
Other	6 (3)	2 (1)

countries other than Australia.<sup>5</sup> Case reports on specific injuries to jockeys in the USA and Europe are not uncommon (see, for example, references<sup>6</sup> <sup>7–11</sup>), and Speed<sup>3</sup> suggests that, in professional riding, the jockey is at great risk of serious injury that often results in long lay-off periods, paralysis or even death.

In the absence of reports of data analysis in Australia, we performed an analysis of data in the Victorian WorkCover Authority's (VWA) workers' compensation claims database and the RVL injury recording system. The analysis was one part of a larger project funded during 2005 by WorkSafe Victoria, the occupational health and safety regulatory body in Victoria, that led to the development of strategies to reduce risk to people who work with thoroughbred horses.

#### DATA ANALYSIS

The objective of the analysis was to estimate the size of the injury problem in the industry and identify occupational groups that featured significantly in the injury data.

Workers' compensation injury claims for the period July 2001 to June 2005 recorded in the VWA database against the industry "Horse Racing" (WIC code L9145C) were reviewed. Injury report forms are generally completed by the injured party or their employer at the time of or shortly after an injury. The RVL injury dataset for the same period was also reviewed. It contains all injuries reported in writing to RVL via an injury report form and is limited to injuries suffered by jockeys and apprentice jockeys when engaged at race events, and barrier attendants and other RVL employees while undertaking activities under the employ of RVL. In general, the injury report forms are completed by the injured party. Some of these injuries became the subject of workers' compensation claims and appear in the VWA dataset. However, RVL did not, for the period under review, identify those injuries that become compensable claims. To enable comparative analysis, RVL granted permission to the VWA to identify those claims in the VWA dataset that were made by RVL employees. Among those data identifiable as claims made by RVL employees, it was

possible to differentiate those made by jockeys and those made by other RVL employees.

Injuries in both datasets were categorised into those that did and those that did not involve interaction with a horse. These categories were in turn categorised into the way in which the injury was sustained to inform discussion about cause and hence prevention. In the VWA dataset, the claimants were categorised as either RVL or non-RVL employees, and, among the RVL employees, jockeys were identified.

A greater degree of separation was possible in the RVL dataset because of the greater amount of detail discernible from many of the reports. All reports were reviewed and, where necessary, interpreted by a research assistant with expert knowledge of thoroughbred racing and occupational health and safety. The data analysis was approved by the University of Ballarat Human Research Ethics Committee.

#### RESULTS

During the period July 2001 to June 2005, 985 claims were recorded in the VWA dataset with an estimated fully developed cost of \$A27 564 338. Of these 985 claims, 289 (29%) were made by RVL employees, of which 257 (89%) were made by licensed jockeys or apprentice jockeys. Of the 257 claims made by licensed jockeys or apprentice jockeys, 198 (77%) resulted from falls from horses, with mean and median fully developed workers' compensation claims costs of \$A41 923 and \$A12 815, respectively. The mean and median fully developed workers' compensation claims costs for horse-related injuries not due to falls were \$A25 044 and \$A10 462, respectively. Only 10 (4%) claims made by jockeys did not result from an interaction with a horse. Insufficient information was available in the accident text fields in the database to analyse these data further.

Non-RVL employees made 696 (71%) claims during the period July 2001 to June 2005, of which 489 (72%) resulted from an interaction with a horse. Of these, 250 (50%) were riding falls as a result of either being unseated (n = 187 or 75%)

Table 2Nature and location of injuries reported in theVWA workers' compensation claims dataset made byjockeys and non-RVL employees for injuries that did notresult from falls from horses

	Frequency	
	Licensed jockeys (n = 59)	Non-RVL employees (n = 248)
Nature		
Contusion	10 (17)	73 (29)
Dislocation	0 (0)	5 (2)
Fracture	21 (36)	69 (28)
Intracranial	0 (0)	0 (0)
Open wound	8 (14)	31 (13)
Strain	6 (10)	25 (10)
Traumatic joint injury	4 (7)	15 (6)
Other	10 (17)	30 (12)
Location		
Back	5 (8)	17 (7)
Cranium	0 (0)	4 (2)
Chest and abdomen	6 (10)	18 (7)
Face/head	12 (20)	41 (17)
Lower limb	18 (31)	92 (37)
Neck	4 (7)	3 (1)
Shoulder	4 (7)	16 (6)
Upper limb	10 (17)	53 (21)
Brain	0 (0)	0 (0)
Other	0 (0)	4 (2)

RVL, Racing Victoria Limited; VWA, Victorian WorkCover Authority. Values are number (%).

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or the horse falling (n = 63 or 25%). These claims had mean and median fully developed workers' compensation claims costs of \$A34 574 and \$A9 466, respectively. The mean and median fully developed workers' compensation claims costs for horse-related injuries not due to a fall were \$A19 650 and \$A5 512, respectively.

The non-fall-related claims resulting from interaction with a horse made by non-RVL employees were associated with: being kicked (n = 79; 32%); being struck or hit by a horse (n = 61; 25%); being crushed or pushed by a horse (n = 56; 23%); sustaining a strain or sprain while manually handling a horse (23; 9%); being pulled by a horse (n = 17; 7%); being bitten by a horse (n = 7; 3%); other injuries that could not be categorised (n = 4; 2%).

Of the claims made by non-RVL employees (n = 696), 198 (28%) were not associated with a horse. Of these, 72 (36%) were manual handling injuries, 36 (18%) were injuries resulting from slips and trips, 12 (6%) were emotional or psychological injuries, three (2%) were associated with vehicles, three (2%) with building structures and three (2%) with plant or machinery, and 30 (15%) could not be categorised.

Tables 1 and 2 show the nature and location of falls and nonfalls injuries in the VWA workers' compensation claims database reported by jockeys and non-RVL employees.

Analysis of the RVL injury records for the period July 2001 to June 2005 found 398 reports, of which 359 (90%) were made by licensed jockeys or apprentice jockeys. Of all injuries reported, 379 (95%) involved a horse, and all injuries except one sustained by a jockey involved a horse. The one injury reported by a jockey that did not involve a horse was dehydration associated with wasting.

Of the 358 horse-related injuries sustained by jockeys, 270 (75%) were associated with falls from a horse, of which 185 (69%) occurred at a race meeting. Most falls at race meetings (n = 172) occurred during the race, but 13 (7%) occurred on the way to the starting barrier or after the finishing line. Of the falls that occurred at race meetings (n = 185), 172 occurred during flat racing and 31 during jumps races. However, the absence of specificity in many reports renders these numbers unreliable.

Jockeys reported injuries sustained as a consequence of 85 falls during track work. This represents 31% of all falls from horses. The non-fall-related injuries to jockeys that resulted from interaction with a horse were associated with: sustaining a strain or sprain while manually handling a horse (n = 28; 32%); being struck or hit by a horse (n = 24; 27%); being crushed or pushed by a horse (n = 24; 27%); being kicked (n = 7; 8%); being pulled by a horse (n = 1; 1%); other events that could not be categorised (n = 4; 5%). There were no reports of a jockey being bitten by a horse.

RVL employees other than jockeys reported no falls from horses. This group reported 21 non-fall-related injuries that resulted from interaction with horses. Of these, 13 (62%) involved starting barriers, the majority being crushings. Five (24%) reports referred to being kicked by a horse, one being struck by a horse's head, one being bitten by a horse, and one being pulled while leading a horse.

Most injuries that were not associated with horses reported by RVL employees other than jockeys were strain or sprain injuries sustained while undertaking grounds maintenance work.

Analysis of the RVL injury data reveals similar injury patterns, with fractures (31%) and contusions (17%) resulting from falls from horses featuring prominently among jockeys. The lower limb (23%), upper limb (17%) and shoulder (16%) were the most common injury location. However, the RVL injury database did not use a standard nomenclature or systematic injury coding process for the period analysed and

therefore there are relatively large numbers of injuries about which details cannot be discerned.

#### DISCUSSION

The data analysis reveals significant numbers of injuries among licensed jockeys, track riders and stable hands representing claims costs in excess of \$A6million per annum. The median claims costs suggest that the injuries are significant given that the earnings of most jockeys is less than \$A50 000 per annum.<sup>1</sup> Details of average earnings of all jockeys and stable assistants are not available. The data are likely to be skewed in as much as under-reporting of injuries is prevalent and many injuries are carried by workers so that they can maintain their occupation and income.<sup>12</sup>

McCrory *et al*<sup>5</sup> compared injuries sustained by jockeys riding races in Great Britain, Ireland and France and concluded that the injury rates differ significantly between the three countries examined. Extrapolation of international data to Australian racing should therefore be undertaken with caution. Differences in racing styles, track design, climate, data collection and other variables influence comparisons. Notwithstanding this, the findings from the Victorian injury data are comparable to surveys of jockeys and reviews of injury data in the USA,<sup>13 14</sup> Great Britain and Ireland<sup>4</sup> that found fractures to be the most common injury, with the leg and shoulder being the most common site. Other common injuries were bruising, sprain, concussion and dislocation.

Intracranial injuries feature in the Victorian data, and concussion was mentioned in the accident text of 20 (10%) claims made by licensed jockeys who reported falls from horses. Turner *et al*<sup>4</sup> reported that concussion was relatively common among jockeys in Great Britain and Ireland, the rate being higher for flat racing, which is attributed to the higher speed and horses being more closely bunched together so that jockeys sustain kicks from other horses, in addition to direct contact with the ground. Interestingly, concussion was mentioned in the accident text of 39 (16%) claims made by non-RVL employees who reported injuries due to falls from horses and four (2%) who reported injuries not related to falls.

Non-RVL employees, mainly track riders and stable assistants (known as stable hands or strappers), made 71% of workers' compensation claims during the period under review. Most claims made by this group were for injuries resulting from interactions with horses (72%). Half of the horse-related injuries were associated with falls from a horse and are therefore likely to be associated with track riding activities; track riders are employees of trainers who undertake riding activities for the purpose of training. Whereas general horse care and race preparation takes place at trainers' premises, most track riding is undertaken at race tracks, predominantly on training tracks, and therefore at the premises of a third party, where the trainer-employer has less influence over risk control.

It is generally recognised that those who handle horses are liable to be kicked, bitten, stepped on, or struck by the animals.<sup>15</sup> <sup>16</sup> Turner *et al*<sup>4</sup> reported that 30% of injuries in the UK and Ireland occur in the paddock and stalls before and after races, and injuries also often occur during track work and travel to the racecourse for training.

Half of the workers' compensation claims recorded in the VWA dataset made by people employed outside RVL that were associated with an interaction with a horse were not associated with falls. This suggests that these injuries were suffered during animal care and race preparation activities. Thus, these claims are likely to have been made predominantly by stable assistants. Most of the claims made for horse-related injuries not caused by a fall followed kicks by horses (32%), being struck or hit by a horse (25%), or being crushed or pushed by a

#### What is already known on this topic

- Jockeys in the thoroughbred racing industry experience a high incidence of injuries.
- Falls from horses are a major cause of injuries, and fractures of the upper and lower limbs prevail.
- This evidence is provided predominantly in reviews of the industry in the USA, UK and Ireland.
- Little is known about injuries to track riders and stable hands.

#### What this study adds

- This is the first study of injuries to Australian jockeys; it supports the evidence from other countries.
- It also documents the injury experience of track riders and stable hands and highlights the significant and largely ignored number of falls experienced by licensed jockeys and track riders during track riding and training activities.

horse (23%). Many of these injuries were reported to be fractures and contusions and have the potential to be serious. Unlike in most other industry sectors, manual handling injuries (ie, sprain and strain type injuries) were not found to predominate. These findings parallel one of the few reports in the literature that address injuries to occupation groups other than jockeys which analysed injury patterns among 581 patients with horse-related injuries visiting clinics of a hospital in Hokkaido in Japan between 1985 and 1991.<sup>17</sup> Most injuries were sustained by workers employed in thoroughbred stabling areas and stud farms. Kicks were the most common mechanism of injury (39.2%), followed by falls from horseback (18.1%) and trampling (15.3%). Common areas of injury were chest (17.7%), shoulder and upper limb (20.4%) and the lower limb (23.7%). Bruises were most common (36.7%), followed by fractures (23.2%) and abrasions and lacerations (21.4%). The authors report that stabling activities produce injury patterns that differ from those of horseback riding.

The analysis of the RVL dataset found that 31% of fall-related injuries reported by jockeys were incurred during track riding. Thus it is clear that track riding is an activity that exposes riders to a significant risk of injury. However, there has to date been little interest in track riding safety in the literature and racing organisations, and most of the interest in terms of injury causation and prevention focuses on jockeys during racing activities. The literature provides evidence that supports this interest, identifying the potential for jockeys to sustain more serious injuries during races as a result of the speed and likelihood of being struck by other horses that are following or adjacent, but clearly the significance of the risk during track riding should not be underestimated, and track riding activities are in need of examination. Similarly, strategies to prevent nonfall, horse-related injuries to employees other than jockeys require examination.

Anecdotal evidence from workers suggests that there is widespread under-reporting of less severe injuries and incidents during which injury was narrowly avoided (near misses). A large number of these less severe injuries were the result of incidents that had the potential to be more serious.

#### CONCLUSIONS

The risk of injury associated with work with horses in the thoroughbred horse racing sector is increasingly recognised to be in need of attention. The size of the occupational health and safety problem in this industry is, however, difficult to determine owing to the limited injury data collected by employers and the limitations on information contained in the workers' compensation claims database. Further, anecdotal evidence from workers suggests that there is widespread underreporting of incidents and injuries, and records of injuries are, to a large extent, limited to those that are more severe and have led to workers' compensation claims. There are many near-miss incidents and incidents in which a minor injury occurs where there is the potential for serious injury. Accurate estimation of risk is therefore difficult at this time.

Most reported injuries are associated with horses, and most of those are due to falls from horses. Although there is a great deal of interest in falls experienced by jockeys during races, about one third of injuries reported by jockeys were sustained during track riding and one half of the claims made by non-RVL employees for injuries involving horses were sustained by track riders during training activities.

Many of the injuries reported by workers in the sector in Victoria were serious and involved fractures, and the patterns are similar to those reported in other countries where fractures to the lower limb, upper limb and shoulder predominate.

It is recommended that the injury and incident data collection systems in the industry sector are improved such that they are not only more complete but also accumulate more detailed information about the location of an incident or injury event, the activity at the time of the incident or injury event, and factors that may have influenced the occurrence. RVL is currently piloting the development of improved injury recording systems, and it is suggested that the success of such reporting systems will be influenced by the ability of RVL to educate club and facility management and users of those premises about their responsibilities with regard to hazard reporting and hazard control. This in turn will require those that have responsibility for hazard control to be seen to be more responsive to hazard reports and proactive in hazard control. Further recommendations for action to control risk in the sector are detailed elsewhere<sup>12 19</sup> and include increasing the focus on the safety of riders during track riding through attention to track design and track work rules and procedures.

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# COMMENTARY

This paper adds to the small body of literature available on horse-related injuries by clearly highlighting the need for adequate prospective data collection. The data analysed represent only a fraction of the injuries and incidents involving horses in Australia, and under-reporting is inevitable in a survey of this sort. The results are very similar to those found in the USA obtained by data collected using a retrospective questionnaire, and the pattern will inevitably change when complete data are available. Nonetheless, the author(s) have confirmed that horse-related injuries are a significant problem in Australian work riders and jockeys.

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