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We've demonstrated the potential to make eventing safer – what will happen next?

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All are writing here in a personal capacity.

Background

Participation in most sport carries inherent risk. Compared to other sports, equestrian sports have the additional dimension of the involvement of animal as well as human athletes. The ethics of risk management are therefore complex: while competing in eventing, the rider makes decisions which affect both themselves and their animal partner, the horse. Ideally, these ethical considerations should be embedded throughout every level of management in the sport – from individual trainers, coaches and riders to the heads of the sport, the governing bodies. Arguably, it is now more important than ever that equestrian sport engages seriously with the ethics of risk management, as discussions about equestrian sports' social licence to operate have become more frequent and prominent in recent years. In order to maintain that social licence, equestrian sports must not only commit to improve equine welfare through monitoring, researching and reporting, they must also be seen to be unmistakably acting on information gained from these processes. This will require honesty and transparency about the areas in which improvements can be made.

Eventing – and specifically the cross-country phase – has had periods of increased focus on safety in recent decades. In response to five high-profile athlete fatalities in the UK in the year 1999, the International Eventing Safety Committee (IESC) was set up. The IESC reported in the year 2000, with their main conclusion stating that:

“A fundamental conclusion which pervades every detailed recommendation is that everything should be done to prevent horses from falling: this single objective should greatly reduce the chances of riders being seriously injured as well as significantly improving the safety of competing horses.” [1]

In 23 years since the IESC report, there have been many rules revisions and developments in the sport. There have also been at least 54 athlete fatalities and at least 171 horse fatalities to date worldwide[2]. In the intervening years to 2020, few academic studies were published that attempted to quantify the risk factors associated with falls during cross-country: all of those were published before 2009 and were based on data from the 2001/2002 season[3–7]. This suggests a potential gap in recent evidence and evidence-based policy informed by academic study in the sport, compared with other equestrian sports such as horse racing, which has seen a much larger volume of published academic literature – and as a result, evidence-based policy change – over the past 20 years. Given this gap, it is actually difficult to conclude with any degree of certainty whether or not eventing has become safer since the IESC review. The FEI publishes annual summary statistics of their competitions, including the number and type of fall (unseated rider, horse fall, rotational fall). These summaries contain data about injuries to athletes only[8]. Furthermore, ‘serious’ and ‘fatal’ injuries to athletes are aggregated together. The 2023 FEI summary reports data covering the period 2011–2022. In 2021, falls of any kind were recorded in 5.59% of starts (n=912). In 2022 the proportion was 5.43% of starts (n=1,165). It should be noted here that better reporting in recent years, along with changing definitions of what is recorded as a ‘fall’, may come into consideration when looking across a 12-year time period.

Much of the focus on improving safety in the cross-country phase has been on reducing the number of rotational falls, which are particularly dangerous due to the risk that the athlete is crushed by their horse. The 2023 FEI summary reports a reduction in the number and proportion of rotational falls between 2011 and 2022. The incidence in 2011 was 0.20% of starts (n = 32), falling to 0.07% of starts (n = 15) in 2022. There may be a general trend of a decrease in the incidence of rotational falls since 2011, however 2022 was the first year in which the decrease was statistically significant. Furthermore, the number and incidence of athlete injuries has not followed suit. For slight injuries, the incidence was 0.23% (n = 37) of starts in 2011 and 0.58% (n = 124) of starts in 2022 – in fact a statistically significant **increase**, although it is likely that improved reporting has had an impact here. For serious and fatal injuries, incidence was 0.17% (n = 27) of starts in 2011 and 0.13% (n = 28) of starts in 2022 (not a statistically significant difference). The proportion of rotational horse falls resulting in a serious or fatal injury to the athlete was 26. 7% (n=4 out of 15 rotational falls recorded in 2022)[8]. In 2011 the proportion was 15.63% (n = 5 out of 32 rotational falls recorded). This observed increase was not statistically significant which is not surprising with such small numbers of rotational falls and serious injury.

Since 2021 we have published three papers in EVJ based on the largest-ever studies of safety in eventing cross-country [9–11]. In those papers we identified risk factors consistent with those reported in prior work, and we also identified new risk factors which are modifiable by sport governing bodies. Here, we summarise the main findings and make distinct, evidence-based recommendations for interventions which governing bodies could implement relatively quickly to improve safety for both athletes and horses.

Paper 1: Horse and athlete related risk factors for cross-country horse falls and unseated athletes in FEI competitions

This study investigated the two outcomes (horse falls and unseated riders) separately with an experimental unit of ‘combination start’ (one combination start was one start made by one horse-athlete combination in one competition). Common associations were found between both outcomes and risk factors such as event level, course length, prior experience of both horse and athlete. Horses and athletes with more individual experience of competition, especially at their current level of

competition, were less likely to have either a horse fall or an unseated rider. Horses were more likely to fall or unseat their rider if they'd competed more recently. In contrast, athletes were more likely to fall or become unseated if they'd had fewer recent competitions. This suggests that there is an aspect of optimal preparation (to avoid falls or unseating) which is different for horses and athletes, perhaps with horses avoiding overwork while athletes need to have enough practice. Finding the appropriate balance could minimise risks to both and would clearly be more readily achievable by those athletes with multiple horses on which they compete. Athletes who did not successfully finish their previous competition, for any reason, were at increased odds of falling or being unseated in their next competition start. For specific combinations of horse and athlete, those who performed poorly in the dressage phase (which is always first in FEI competitions) were at increased odds of a horse fall and unseated athlete in the cross-country phase of the same competition.

Paper 2: Fence and course design related risk factors for cross country horse falls and unseated athletes in FEI competitions

The experimental unit of this study was each individual fence at every FEI competition during the study period. The outcome of interest was whether one or more fall (including horse falls and unseated athletes) occurred at the fence. This study quantified the risks associated with each type of fence, as well as the course design around the fence. For example, fence types such as corner or Trakehner were associated with increased odds of a fall occurring, relative to square spread type fences. The second and subsequent elements of combination fences were at increased odds of a fall occurring compared to the first element. Fences positioned up or downhill, near corners, or with water as an element, were also associated with increased odds of falls compared to fences on the flat, straight, or without water respectively.

These results demonstrate that it may be possible to design courses and fences in a way that minimises the risk of horse falls and unseated athletes, **without compromising on challenge or competitiveness**. It would not be desirable to avoid the use of certain fence or course design elements, but designers can avoid putting too many "risky" elements together. In addition, course designers could strategically position high-risk fences in low-risk areas of the course

Paper 3: Cross-country horse falls in British Eventing one-day competitions

This study investigated risk factors for horse falls from a database of nearly three quarters of a million horse starts in national-level one-day competitions in Great Britain.. Sixteen risk factors were identified; higher levels of competition, riders that had a horse fall in their previous start, older horses and an increased number of dressage penalties were all associated with higher risk of a horse fall. Additionally, horses that had started once, twice or three times during the 30 days prior to their current start were associated with higher risk of a horse fall than those that had not started in this period. This indicates that, in line with the FEI study described above, eventing horses may be vulnerable when competing very frequently. Furthermore, this study supports the findings of the FEI study in that combinations who perform poorly in dressage are associated with higher risk of a horse fall. Notably, the largest effect sizes observed in this study relate to the levels of competition, indicating that careful consideration of qualification requirements for higher levels of competition must be continually reviewed and improved upon.

Specific recommendations of evidence-based policies for governing bodies to adopt

Data-driven rule changes based on peer-reviewed research have already been implemented for other equestrian sports such as horse racing and FEI endurance competition, and we strongly recommend that the same approach is used for Eventing. Here, we outline specific recommendations that we believe eventing governing bodies such as the FEI and National Federations should consider implementing. We make these recommendations in the name of evidence-based policy, aimed at reducing the risk of injury and fatality to horses and athletes. We believe these measures would improve welfare, while also helping to protect the social license to operate for the sport.

1) Commission a full re-evaluation of qualification criteria viewed through the lens of risk management.

Currently, qualification is based around combinations earning Minimum Eligibility Requirements (MER) in competition. To earn an MER a combination must complete a competition with fewer than the specified number of penalty points in each phase. Qualification up through National and International competition levels requires certain numbers of MERs to be earned at each stage of progression. There is scope within this system to alter either the number of MERs required at each level, or to alter the performance level required to earn an MER—or indeed some combination of the two, with variation from level to level. Prior modelling of the impact of different rule changes could be conducted to identify those that are most likely to result in maximal benefit to horse and athlete welfare, without significantly reducing the number of combinations able to make progress through the levels of competition. Consideration should also be given to requiring a certain number of MERs to be achieved once reaching 4* and 5* level, in order to maintain eligibility for those levels – i.e. a ‘demotion threshold’ could be set to ensure horses and athletes compete at a level appropriate for their skill level. By integrating risk management considerations into qualification, a new MER system could also allow for more flexibility for riders to achieve MERs than is currently available in seasons such as the current UK season, which has experienced multiple event cancellations due to inclement weather.

2) Use evidence-based, statistically validated risk profiles to inform athletes, trainers and governing bodies.

Appropriate use of risk profiling analytics, informed by peer-reviewed research could contribute to data-driven decisions about whether individual horses or combinations are ready to step up to the next level of competition without exposing themselves or their horse to unnecessary risk. Significant reductions in risk could be achieved by improved knowledge exchange, ensuring athletes are aware of how the history of their horse (i.e. their risk profile) contributes to the likelihood of a horse fall or unseated athlete. It is imperative that this strategy is driven by fully validated and peer-reviewed scientific literature and methodology, to minimise the risk for error and poor practice, which can ultimately be the difference between life and death of a horse or athlete.

3) Commission a complete review of course design and fence design specifications.

Note that this recommendation is emphatically not about removing certain fence types or challenges from cross-country courses. It would not be desirable to say, for example, that jumps in or out of water, corner and Trakehner fences should no longer be used. Rather, it should be recognised that it is possible to design around these features. An awareness of the risk factors identified in the literature

described here can inform course designs that aim to reduce the risk of athlete and horse falls, while also maintaining the level of challenge that stakeholders expect. The end result of this should be a refreshed set of design documents allowing courses to be constructed which balance considerations of challenge whilst minimising risk to horses and athletes. This initiative would also enable 'risk-profiling' of individual courses within levels so that athletes, when stepping up a level, are able to choose competitions with cross country phases that are slightly more forgiving in nature.

4) Introduce a disqualification limit on dressage score

Given the associations found between poor dressage performance and likelihood of falls during cross-country, a penalty cap rule preventing high-risk combinations from progressing to cross-country after exceptionally poor performance in the dressage should be considered (in line with the current cap on show-jumping penalties). A dressage penalty cap of 70 penalties would have affected 0.1% of competitors in national competition, and less than 2% of competitors in FEI competition, during the periods studied. Dressage scores of 70 or higher are therefore at the extreme end of the scoring system and could indicate a number of risk and welfare concerns such as horse pain, stress or lameness (associated with aversive behaviour which would incur a poor dressage score), or that the partnership are not competing at the appropriate level and thus may not be safe to compete across country. This strategy is strongly recommended in particular for competitions in which the show-jumping occurs **after** the cross-country, thereby no penalty cap is in place prior to a combination starting the cross-country phase.

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