



Scientific Advances Towards The Reduction Of Fractures Related To Racing In The Thoroughbred Racehorse

Chris Riggs

The Hong Kong Jockey Club Equine Welfare Research Foundation

12th February 2026



نادي سباقات الخيل
JOCKEY CLUB OF SAUDI ARABIA

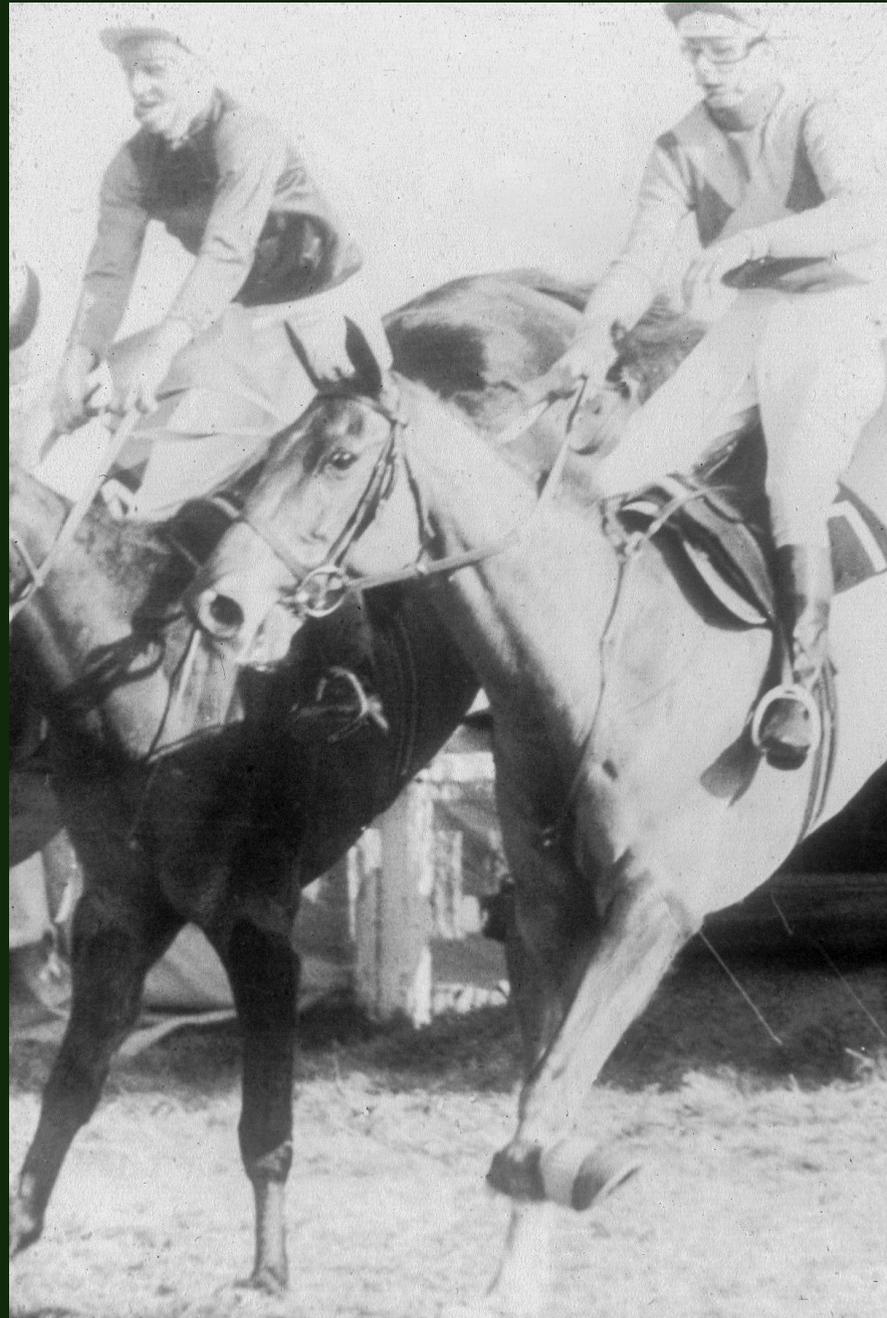


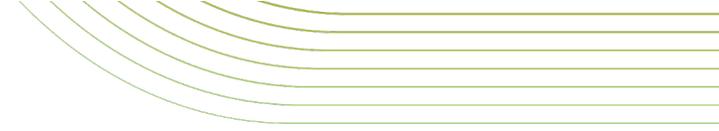
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1986



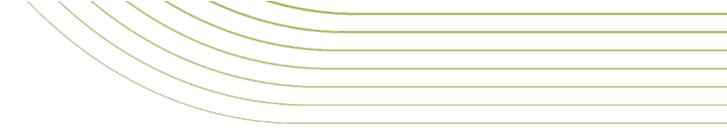


Understand the fatigue-basis for racing fractures

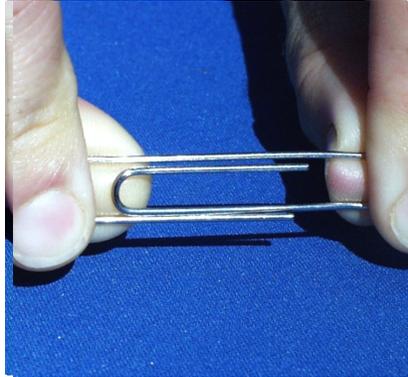
1980s



2026

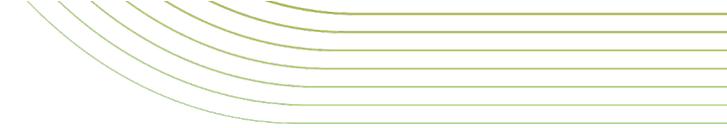


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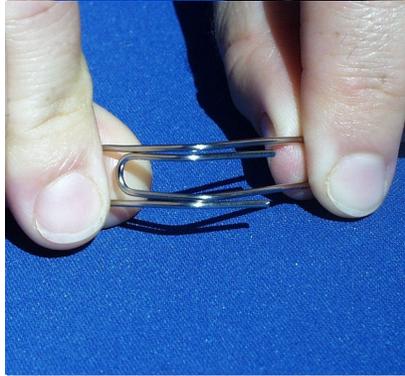


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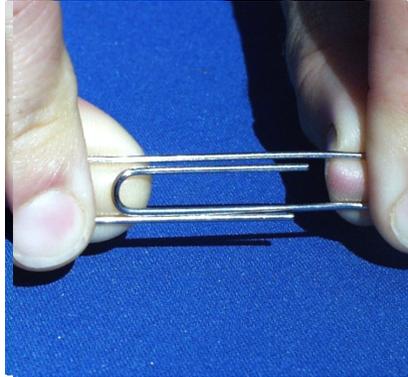


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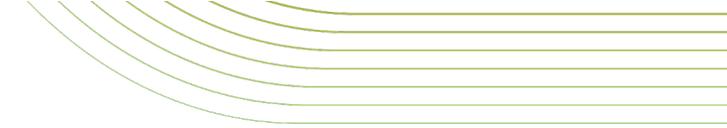


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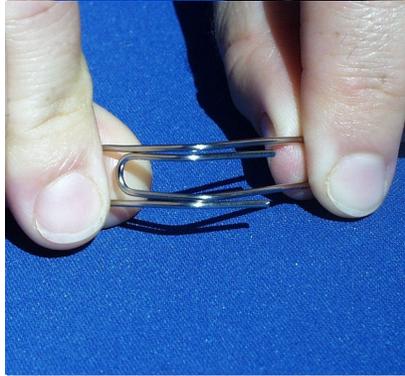


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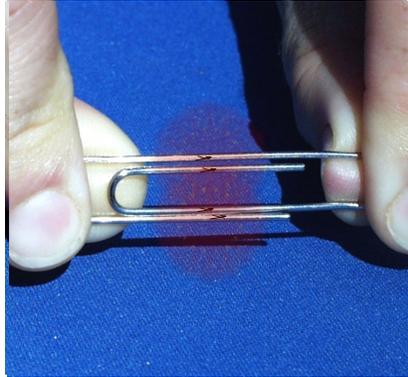


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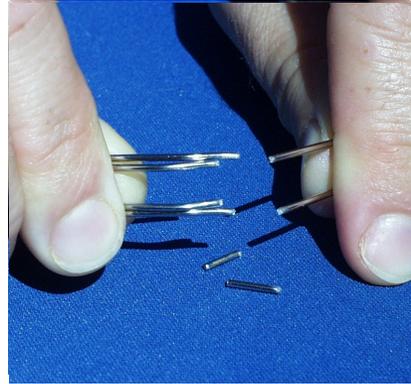


1980s





Understand the fatigue-basis for racing fractures



1980s



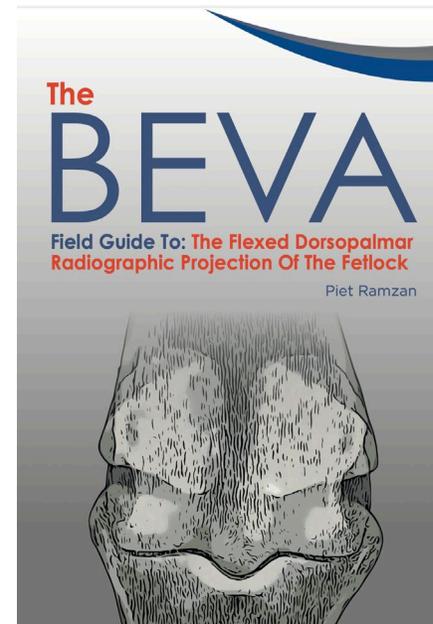
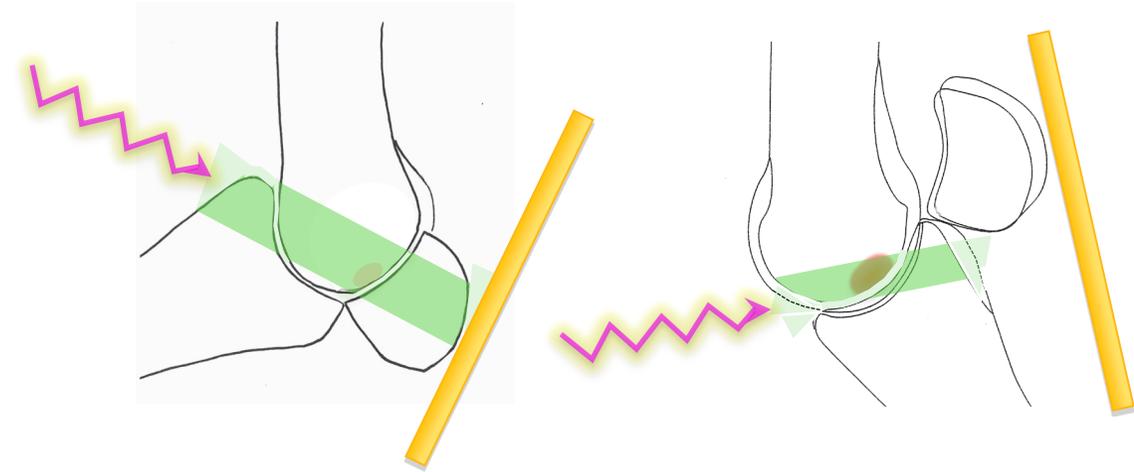
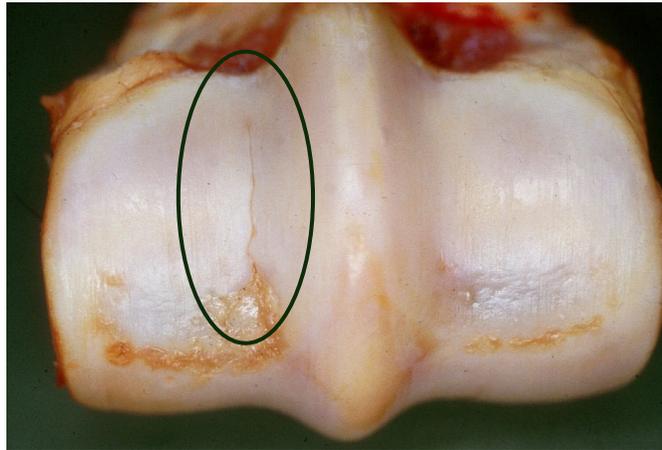
PREVENTING FRACTURES

Understand the fatigue-basis for racing fractures

Characterise pathology that precedes fracture in common racing fractures

1980s

Develop standard x-ray techniques to spot some pre-fracture changes



Understand the fatigue-basis for racing fractures

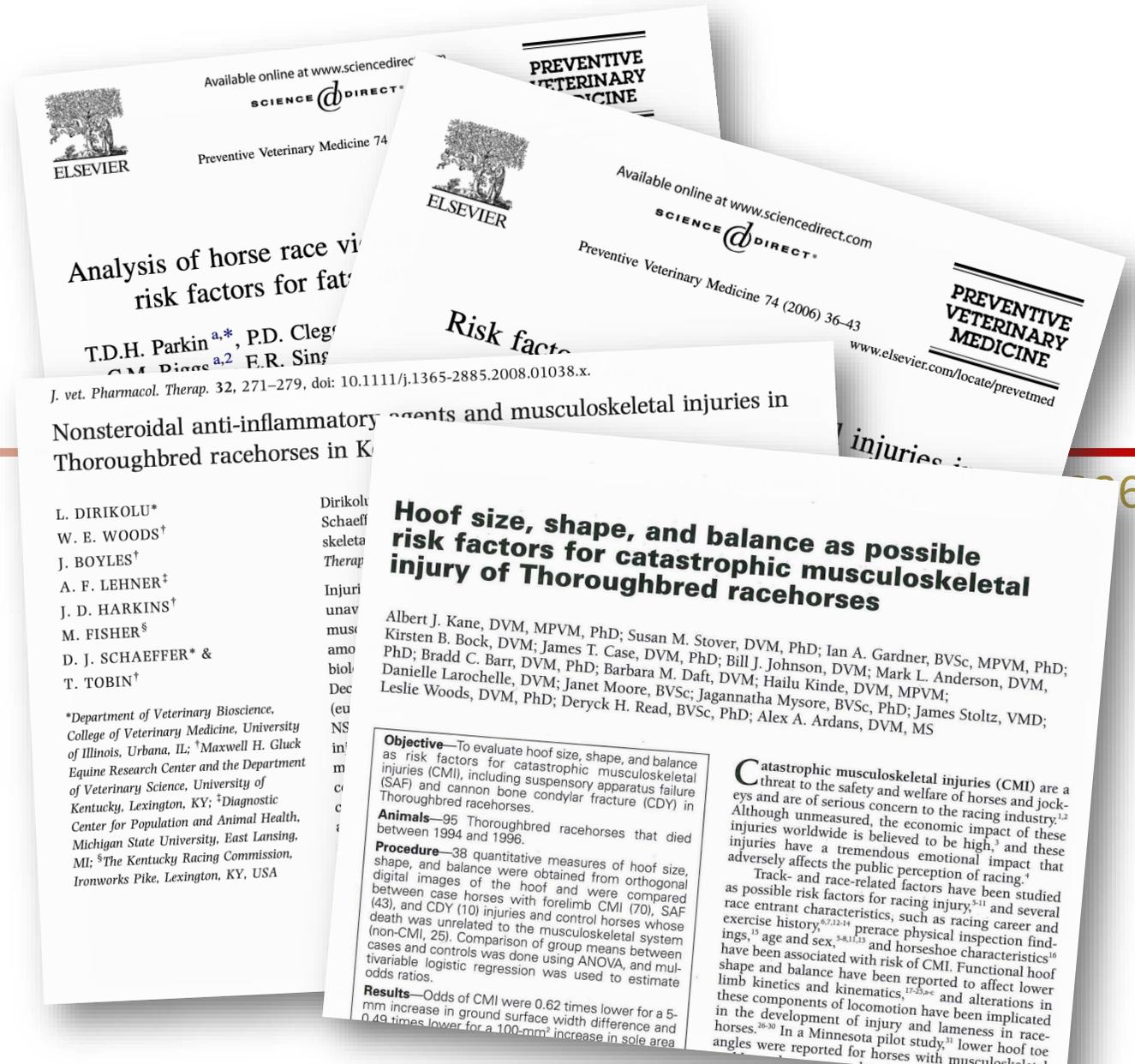
Characterise pathology that precedes fracture in common racing fractures

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Identify epidemiological risk factors for fracture

Develop standard x-ray techniques to spot some pre-fracture changes

Recommend interventions, (e.g. going, field size)



The Veterinary Journal 2002, 163, 19–29

doi: 10.1053/tvj.2001.0610, available online at <http://www.idealibrary.com> on IDEAL®



Review

Fractures – A Preventable Hazard of Racing Thoroughbreds?

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SUMMARY

Fractures are a common cause of loss among Thoroughbred racehorses. A large proportion of these injuries occurs in the absence of a specific traumatic event and show typical characteristics of stress fractures. The fractures show a high degree of consistency in their morphology; they frequently share the same locations as incomplete cracks and they are often associated with pre-existing pathology (periosteal and endosteal new bone formation and intracortical remodelling).

Bone is able to adapt to changes in its mechanical environment. Studies of the Thoroughbred racehorse show modification of the geometric properties of the third metacarpal bone in response to training. These modifications are associated with reduced bone strains. Intense training before the adaptive response is completed and bone strain reduced increases the risk of fatigue damage. Fatigue of bone is associated with progressive microdamage, which is important in the pathogenesis of stress fractures. However, the biological repair mechanism of bone (remodelling) is also instrumental in the development of stress fractures. Horses



PREVENTING FRACTURES

Understand the fatigue-basis for racing fractures

Characterise pathology that precedes fracture in common racing fractures

Identify epidemiological risk factors for fracture

Identify **genotypes** associated with increased risk of fracture

Advanced **diagnostic imaging** of standing horse (MRI, CT, PET)

Application of “omics” to search for **biomarkers**

Wearable devices used to detect changes in gait and heart rate that may pre-empt injury

Monitor and quantify **training load** and its impact on skeletal fatigue

1980s

2026

Develop standard x-ray techniques to spot some pre-fracture changes

Recommend interventions, (e.g. going, field size)

Mechanisms to profile higher risk horses

Polygenic risk scoring

Ability to detect subtle structural changes that pose increased risk of fracture

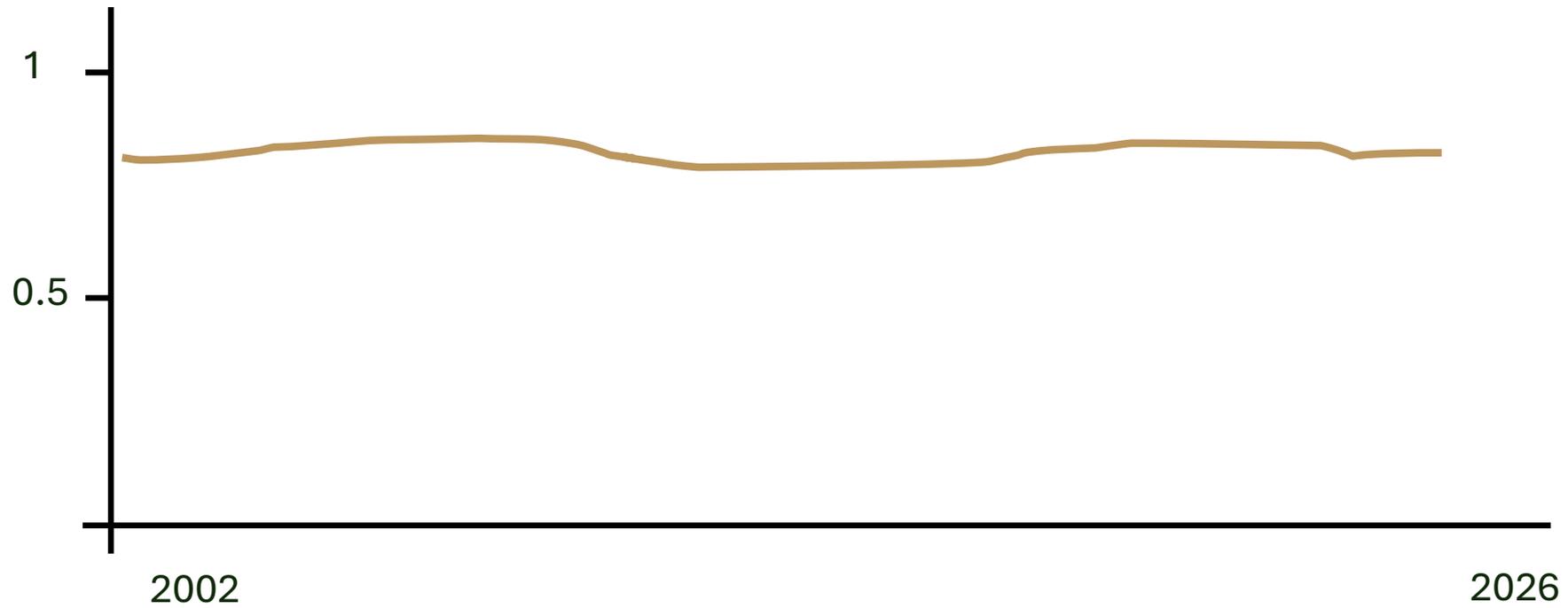
Early warning of horses at increased risk of fracture

Recommend patterns of training that reduce the risk of skeletal disease

Number of fatal fractures per 1,000 race starters



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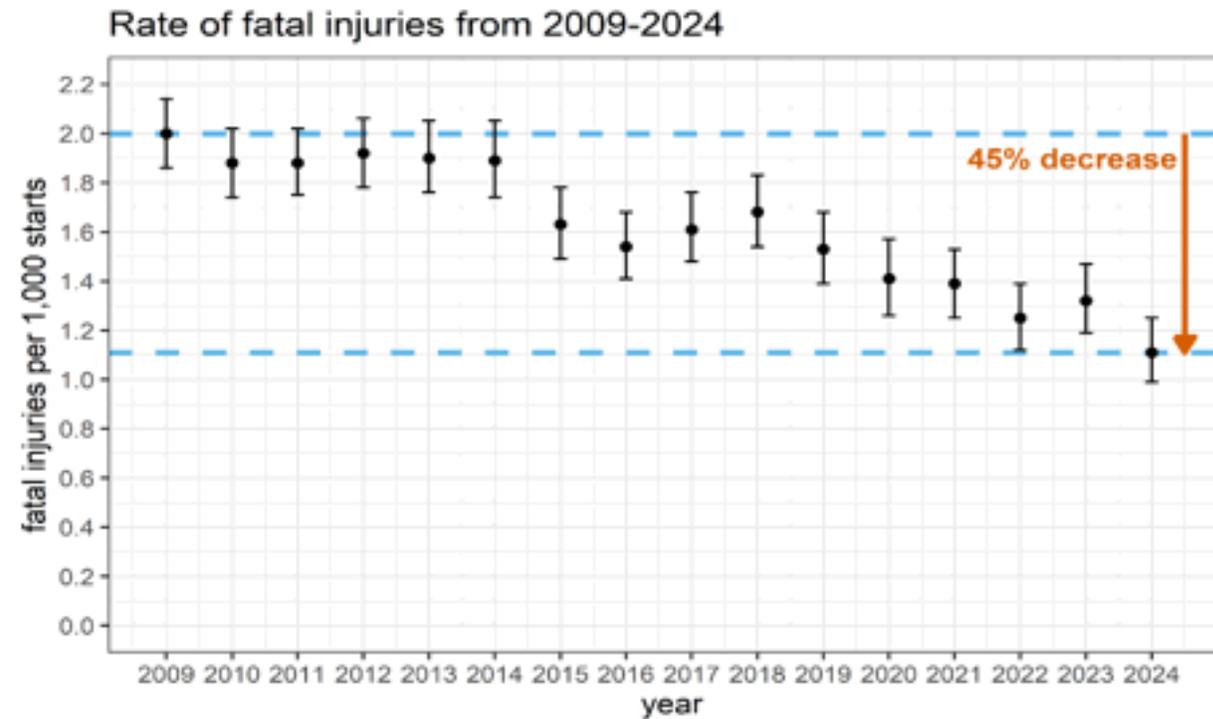
USA

Courtesy Tim Parkin

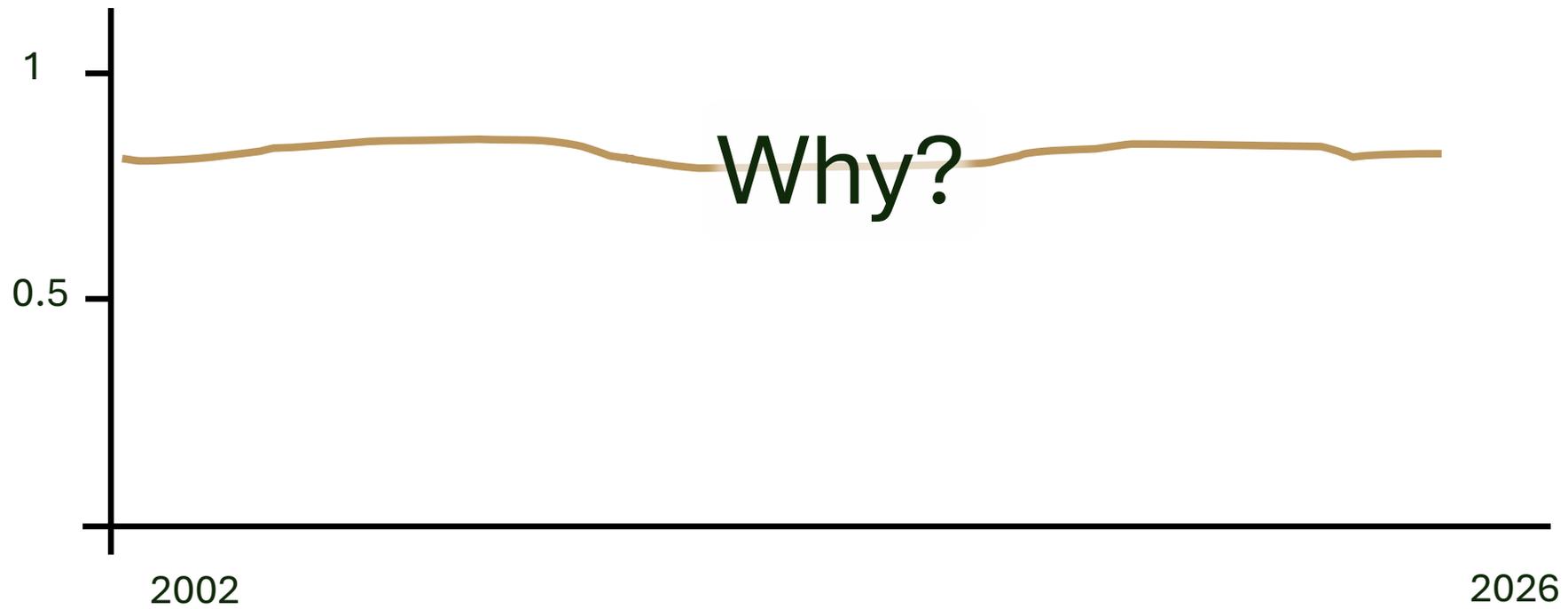
Current status



- How achieved?
- Attitudinal change
 - Social licence to operate
 - Welfare higher up agendas
 - Some important regulatory changes
 - Much of which directly from multitude of reports and evidence from work with the EID



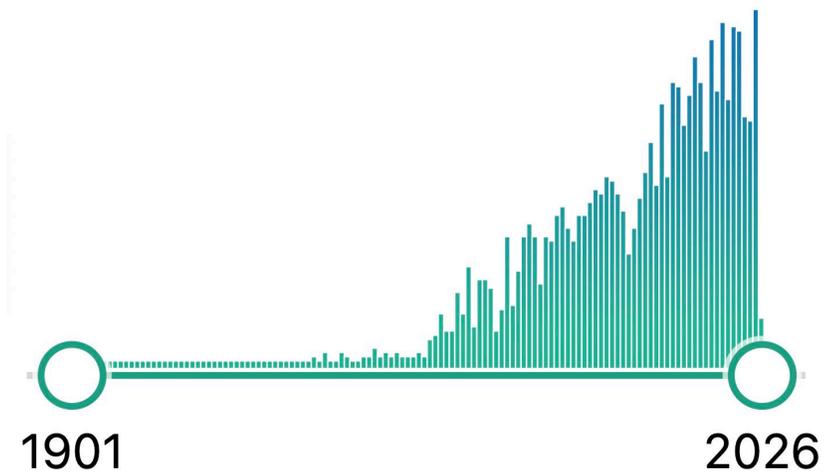
Number of fatal fractures per 1,000 race starters



1. It is a **very** complex problem

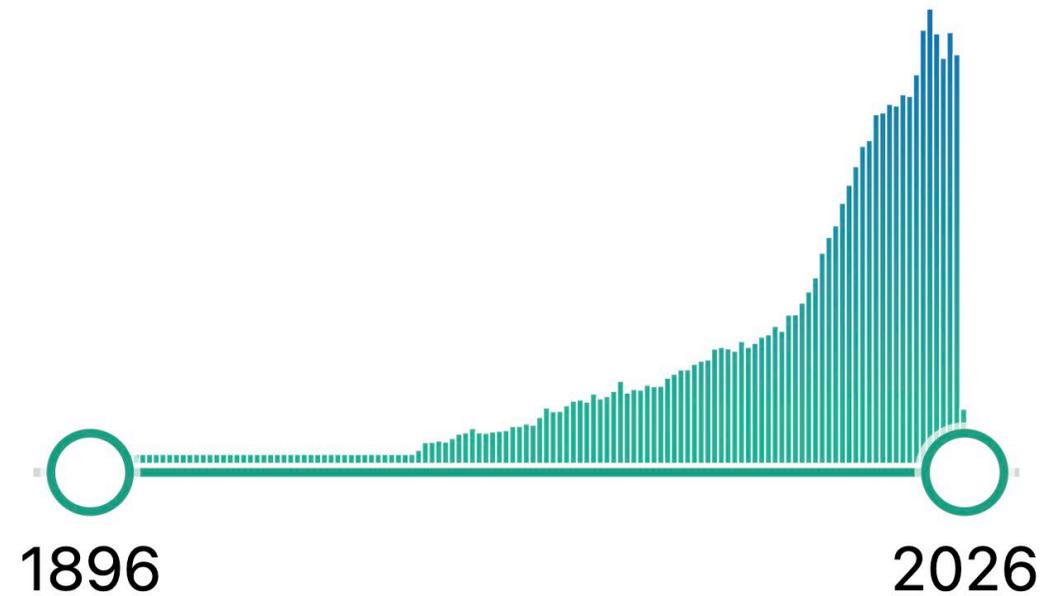
Publication database search:

“Horse and Fracture”



2,085 published papers

“Human and Fracture”



313,018 published papers



2.



2.

Early warning of horses at increased risk of fracture

Polygenic risk scoring

Mechanisms to profile higher risk horses



Ability to detect subtle structural changes that pose increased risk of fracture

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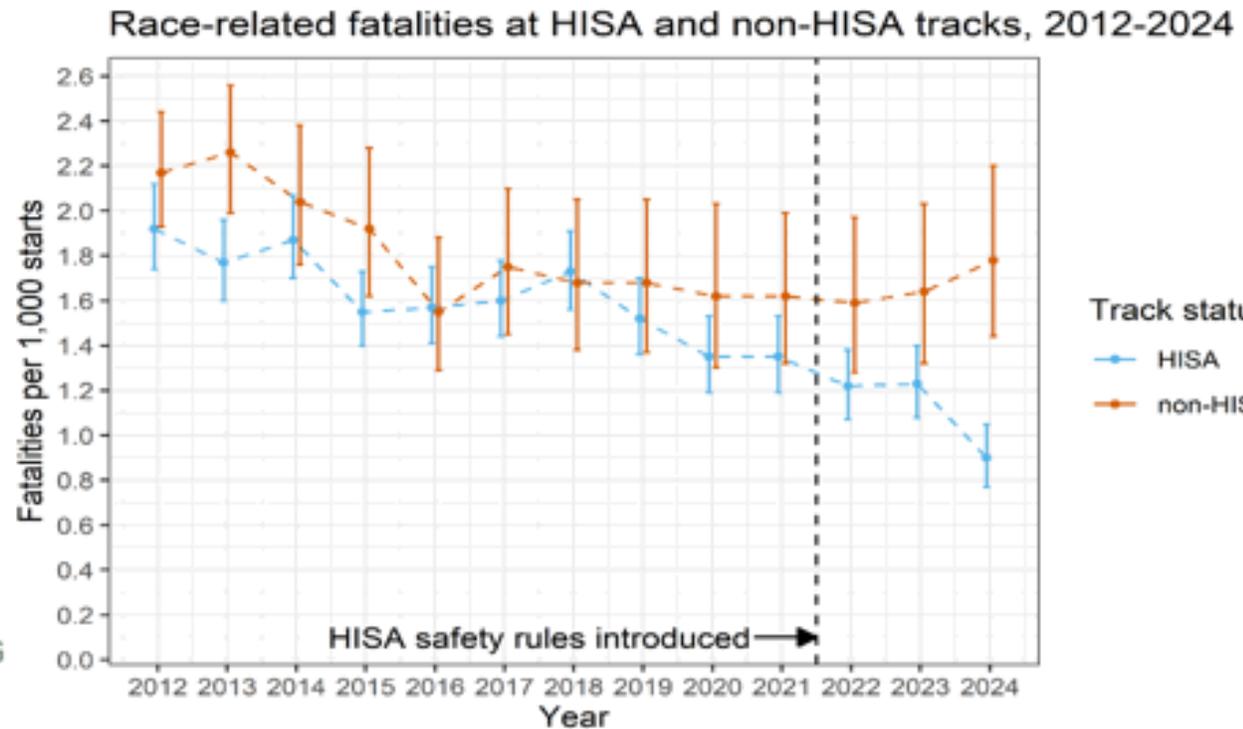
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Current status



The 'impact' of HISA?

- 2024 was the year that difference was greatest
- Clearly not entirely 'causal'
- But difficult to argue that HISA isn't good for the industry



How to unite all stakeholders to work towards the common purpose of welfare?



Horse Welfare vs. Social License



Horse Welfare vs. Social License

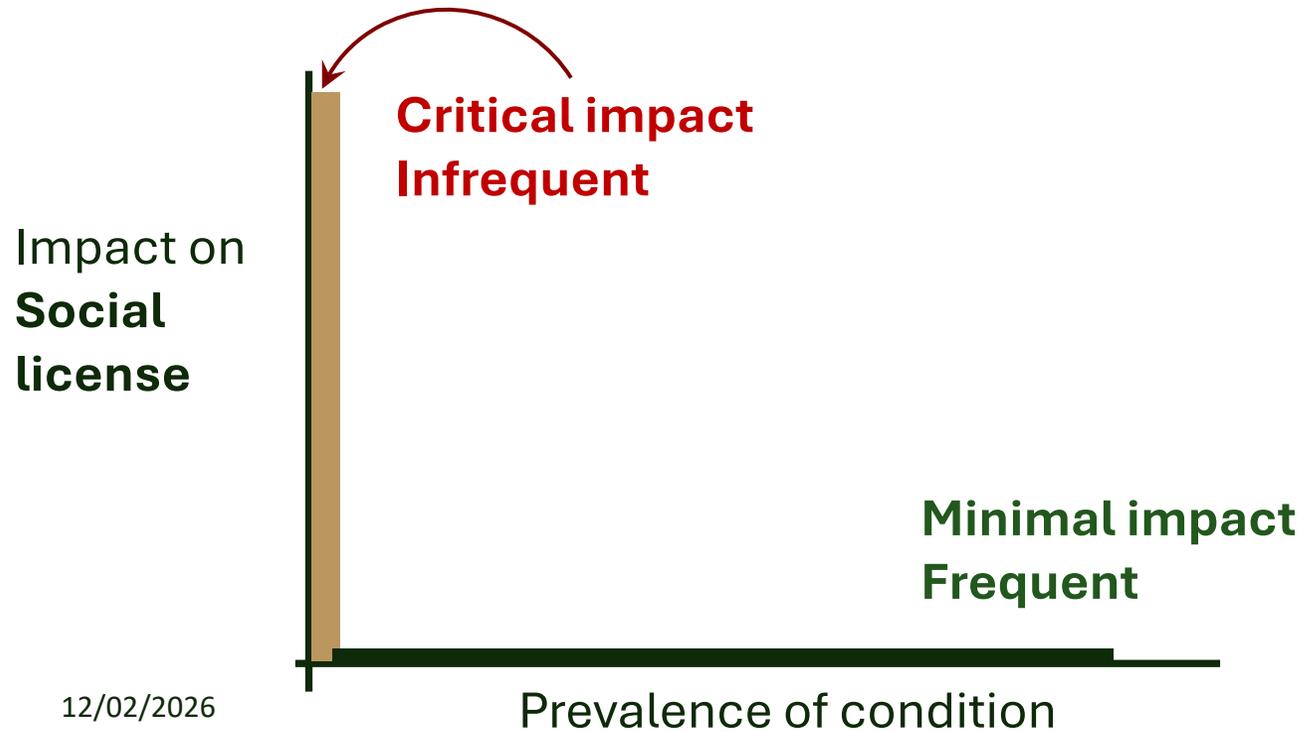
Fractures vs. degenerative disease of the fetlock joint



Horse Welfare vs. Social License

Fractures vs. degenerative disease of the fetlock joint

A major **Social License** issue
an important Welfare issue



Horse Welfare vs. Social License

Fractures vs. degenerative disease of the fetlock joint

A major **Social License** issue
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An important **Social License** issue
a major **Welfare** issue

Impact on
**Social
license**

**Critical impact
Infrequent**

**Minimal impact
Frequent**

Prevalence of condition

Impact on
Welfare

**Critical impact
Infrequent**

**Important impact
Frequent**

Prevalence of condition



THANK YOU



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