Dr. Tim Parkin

EQUINE INJURY DATABASE
A Safety Initiative of The Jockey Club

Initial analyses of the

EQUINE INJURY DATABASE

A Safety Initiative of The Jockey Club

Potential impact of data analysis - examples from Hong Kong and UK

Introduction

- Scratching the surface
- Complex analyses to follow
  - Rely on complete, comprehensive and accurate data
  - Will take time – no quick answers
  - Previous experience with data from Hong Kong, Australia, Japan, UK…
    - Fatality, tendon injury, fracture…
- Today
  - Individual factors potentially associated with fatality during racing
  - Thoroughbreds only

Questions

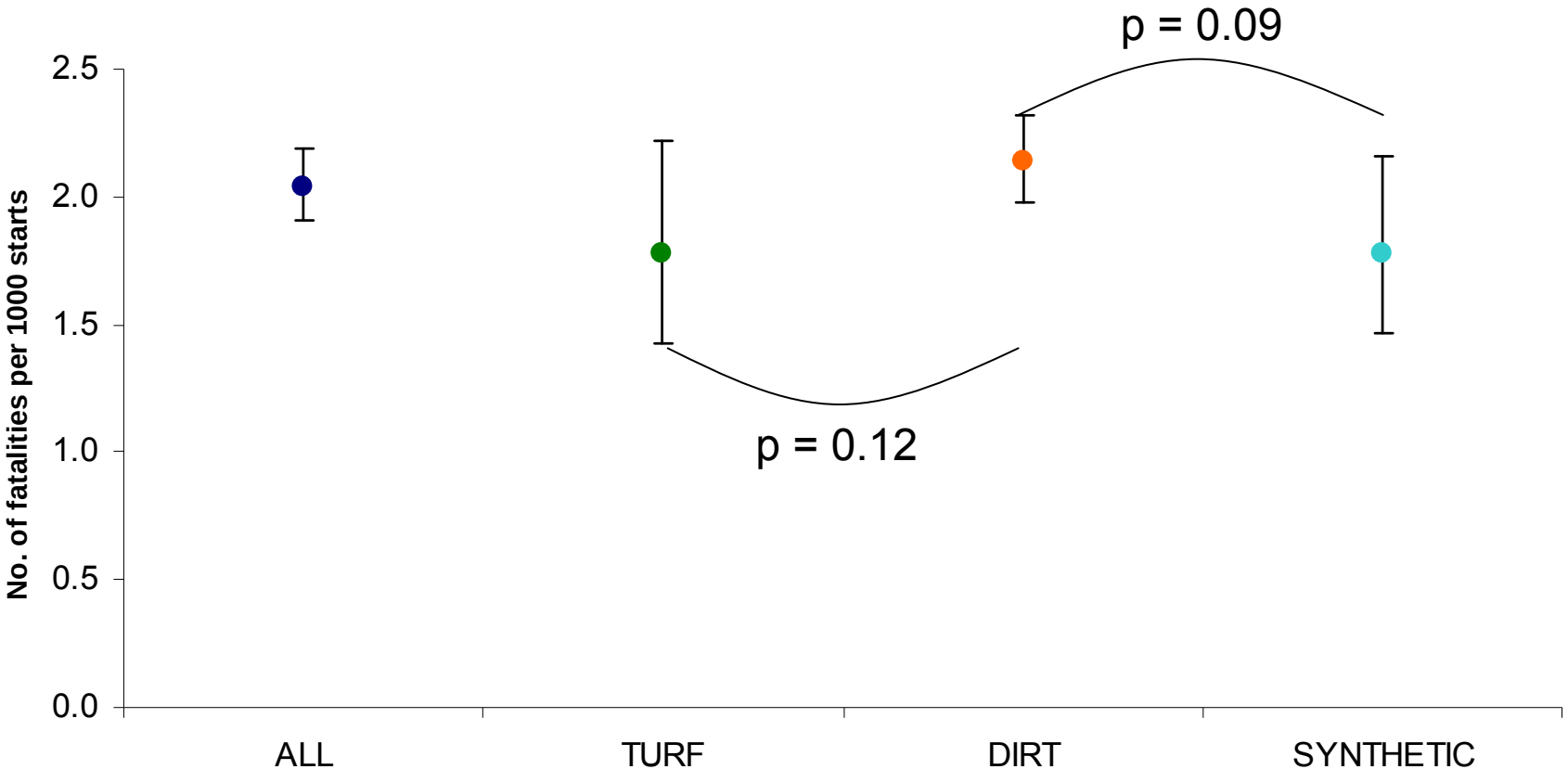
- Surface type
- Mares and fillies in open races
- Age
- Gender
- Change of racing surface
- Surface condition
  - Turf
  - Dirt
- Race distance
- Weight carried

Take Home Messages

- No statistically significant difference in the risk of fatality on different surfaces
- Females were not at increased risk of fatality when racing against males
- 2-year-olds were less likely to sustain a fatal injury than older horses
- Females were less likely to sustain a fatal injury than intact males
- There was no increase in risk when races were moved off the turf

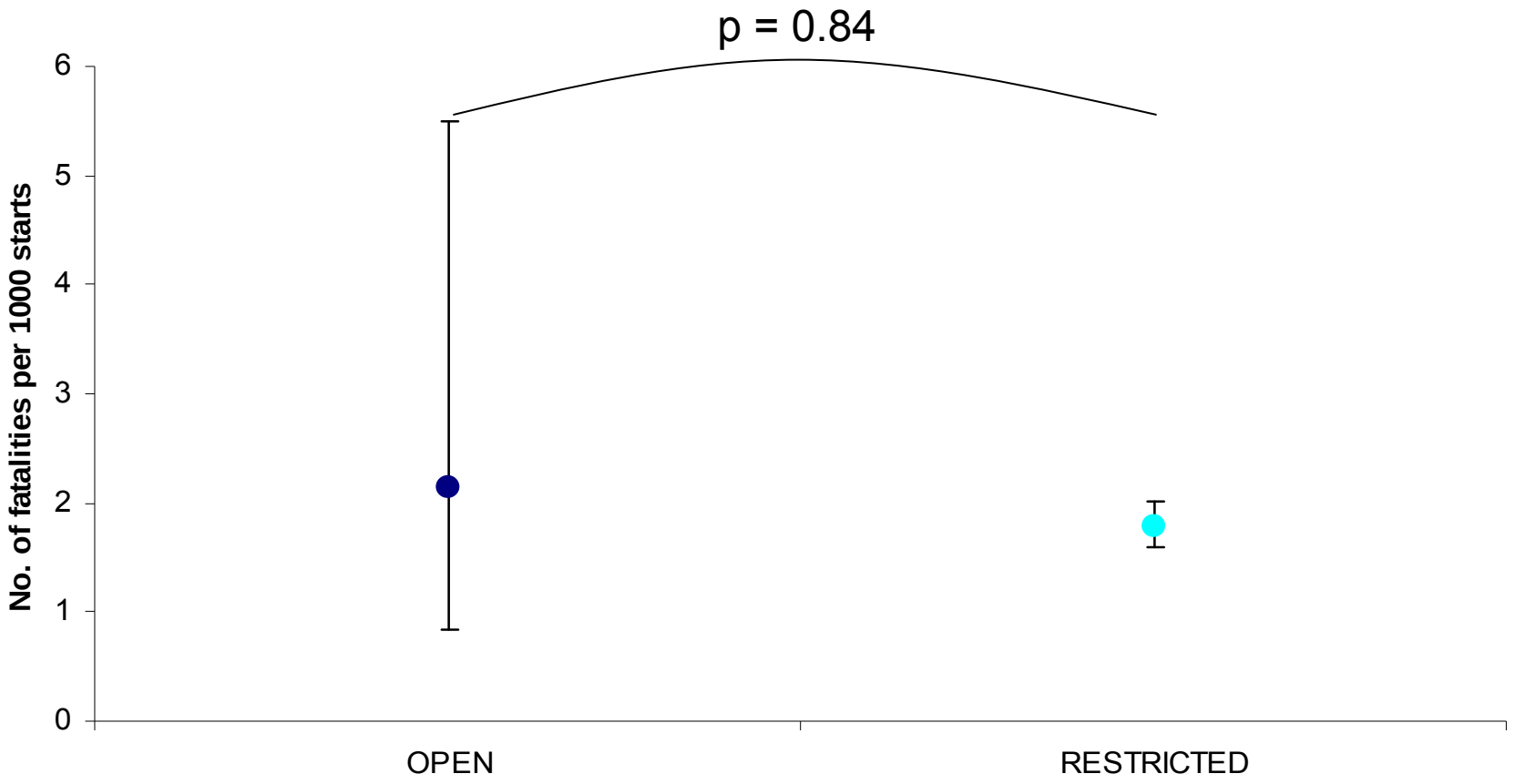
Detail

Surface Type



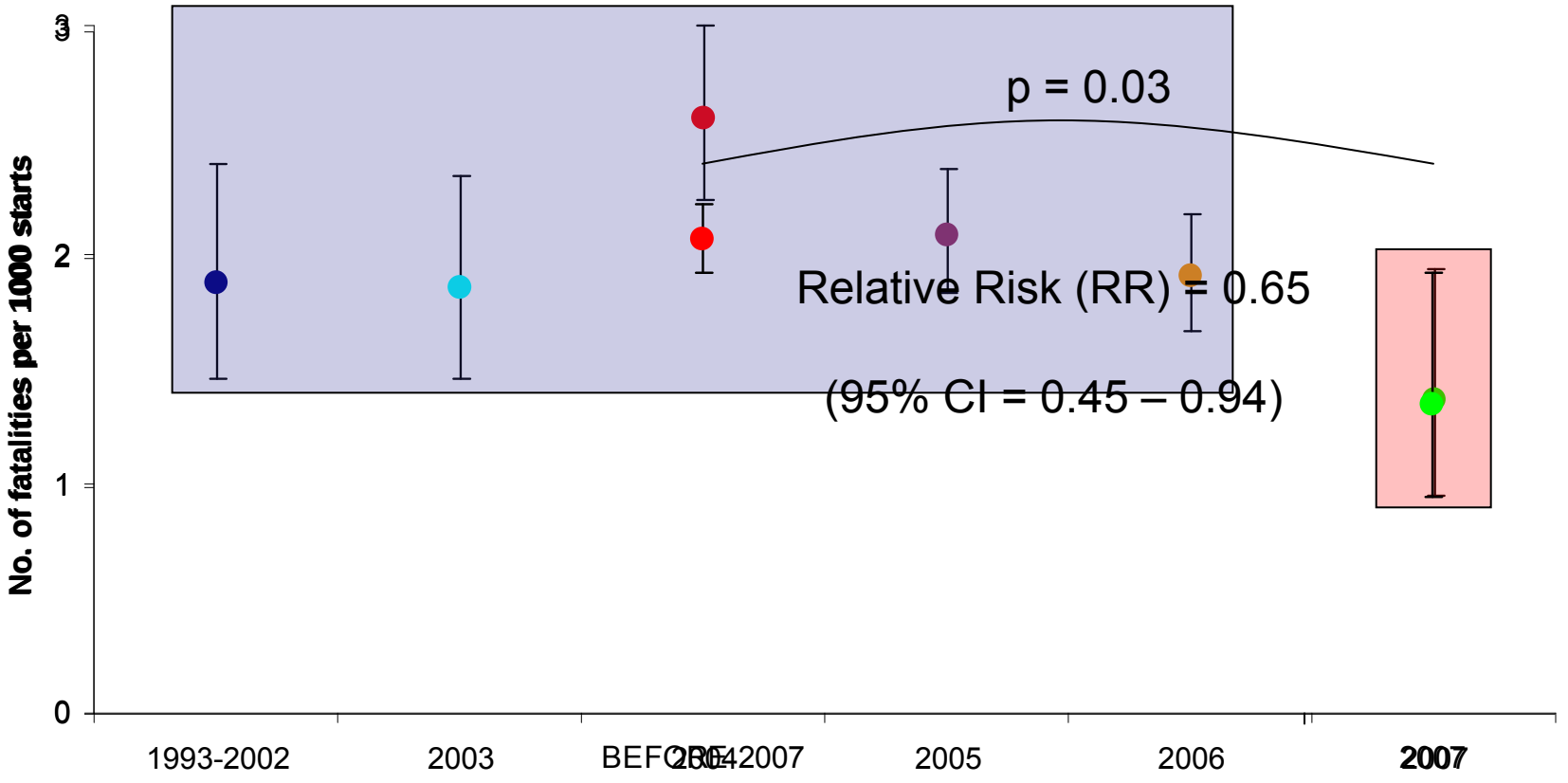
Incidence	2.04	1.78	2.14	1.78
95% CI	1.90 – 2.19	1.43 – 2.21	1.97 – 2.32	1.47 – 2.16

Mares & Fillies in Open Races – All Surfaces Combined



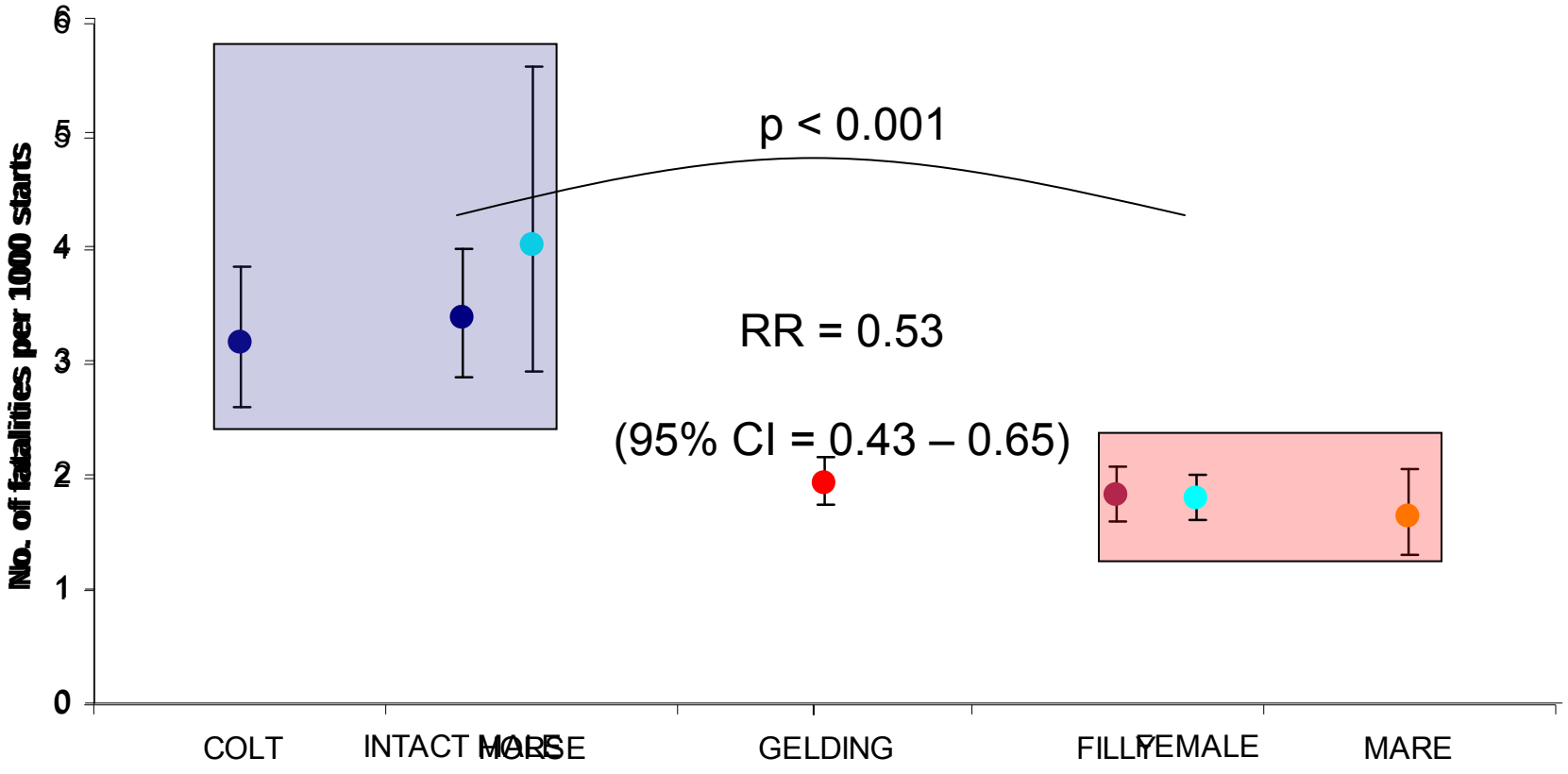
Incidence	2.14	1.79
95% CI	0.83 – 5.49	1.59 – 2.0

Age (Year of Birth) – All Surfaces Combined



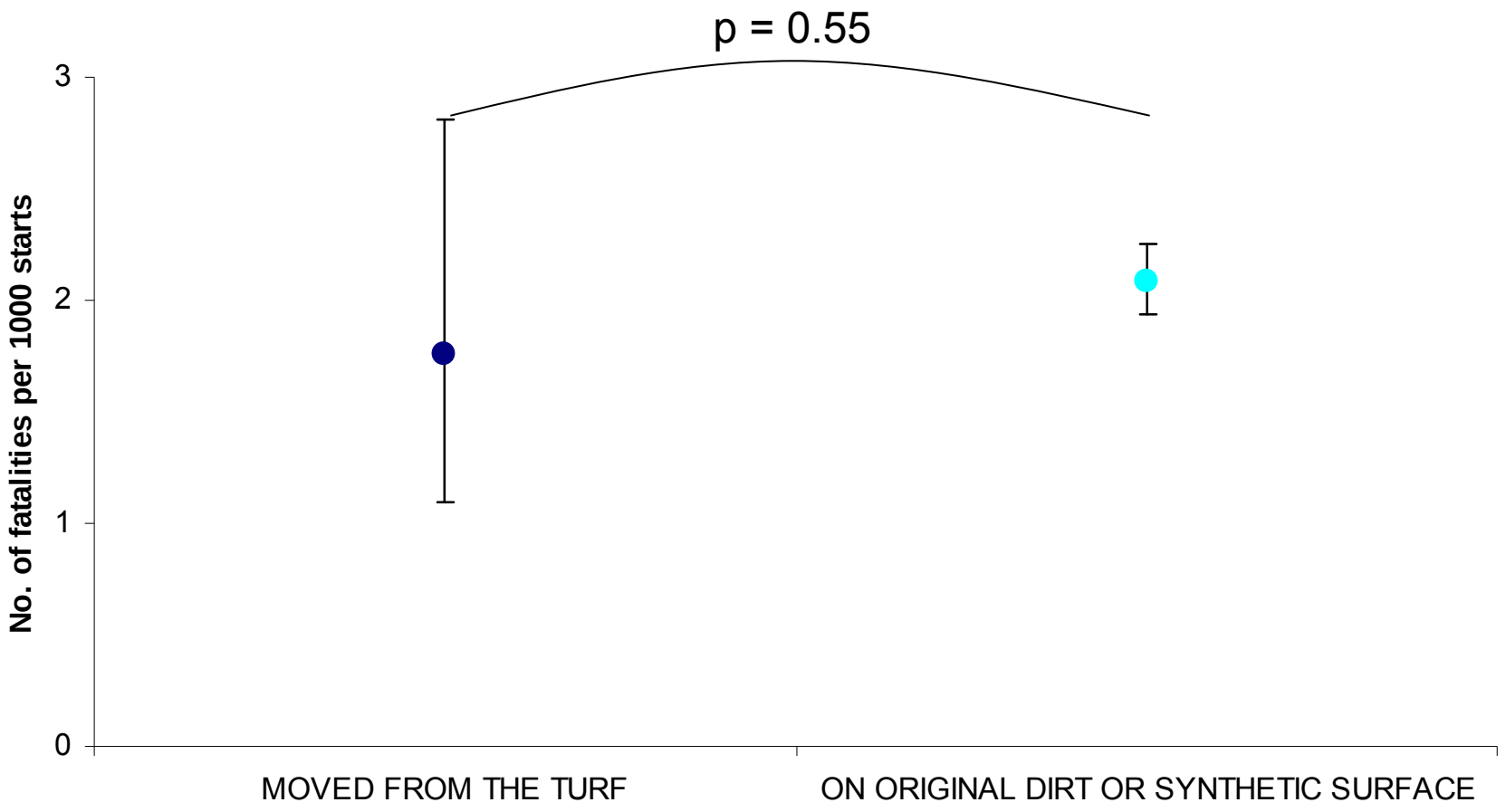
Incidence	1.91	1.36
95% CI	1.67 – 2.18	0.95 – 1.94

Gender – All Surfaces Combined



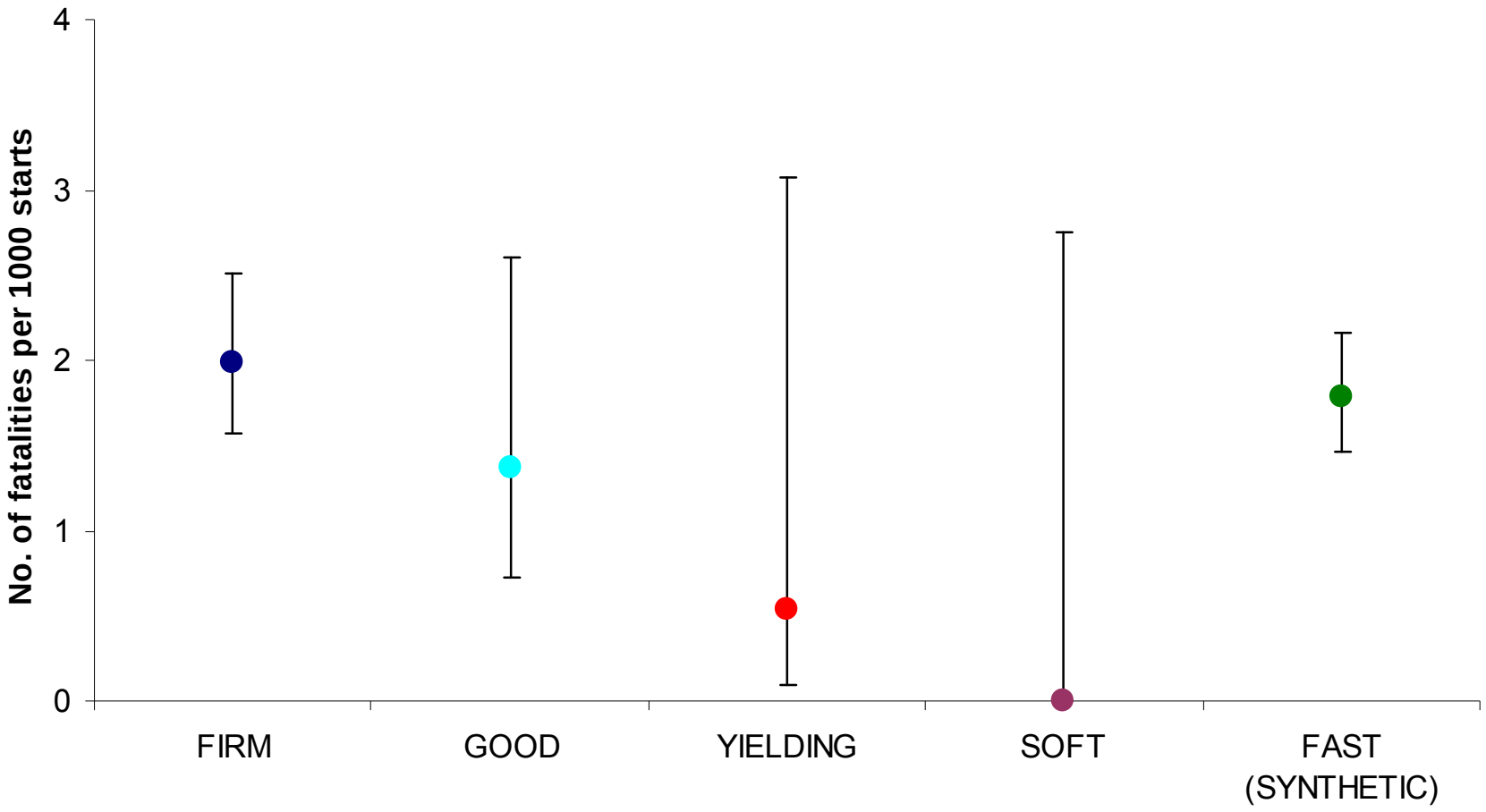
Incidence	3.37	1.79
95% CI	2.9 – 4.0	1.6 – 2.0

Change of Racing Surface



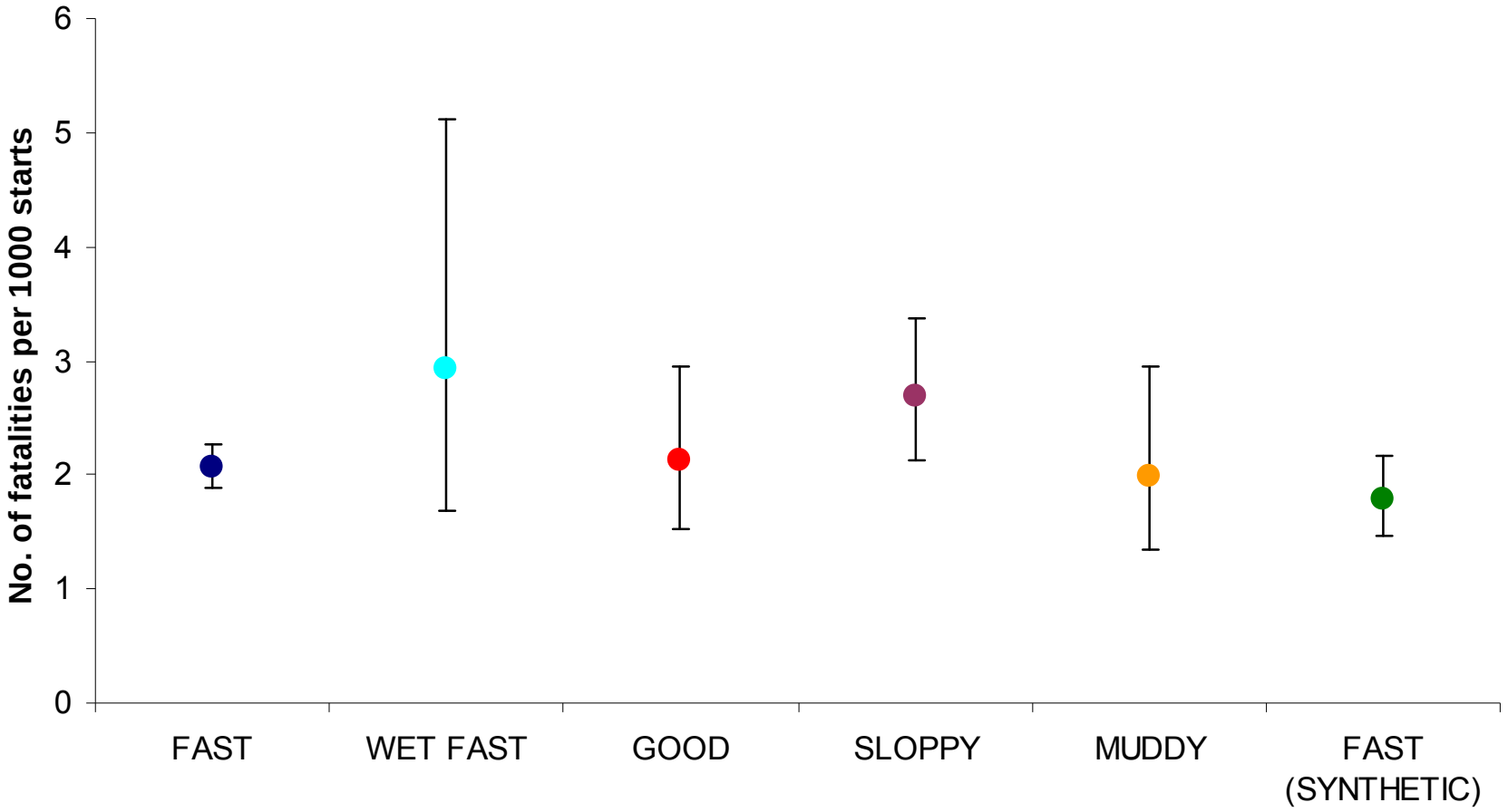
Incidence	1.75	2.08
95% CI	1.09 – 2.81	1.93 – 2.25

Surface Condition – Turf (and Synthetic)



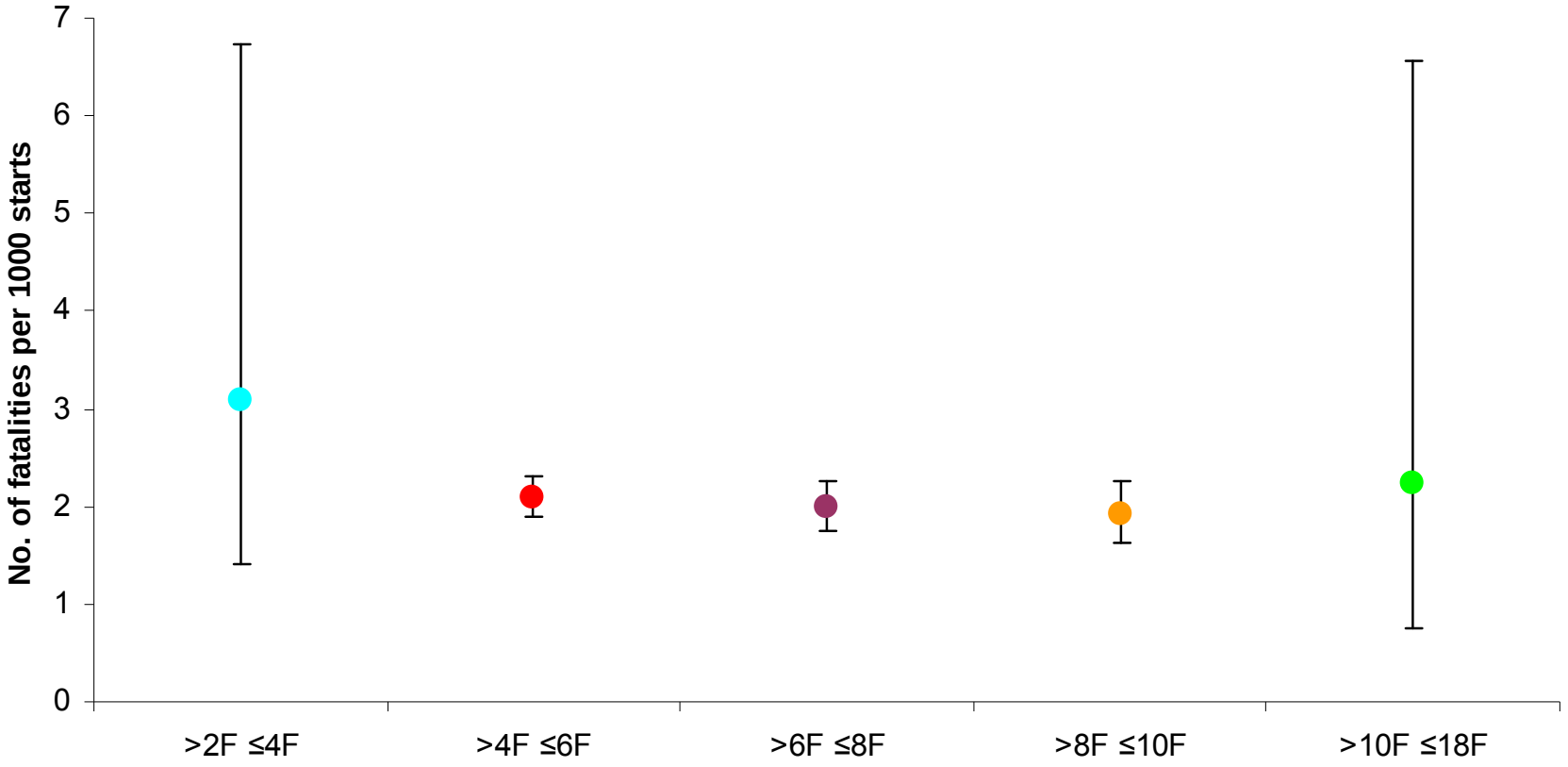
Incidence	1.99	1.37	0.54	0	1.78
95% CI	1.58 – 2.51	0.72 – 2.61	0.10 – 3.07	0 – 2.75	1.47 – 2.16

Surface Condition – Dirt (and Synthetic)



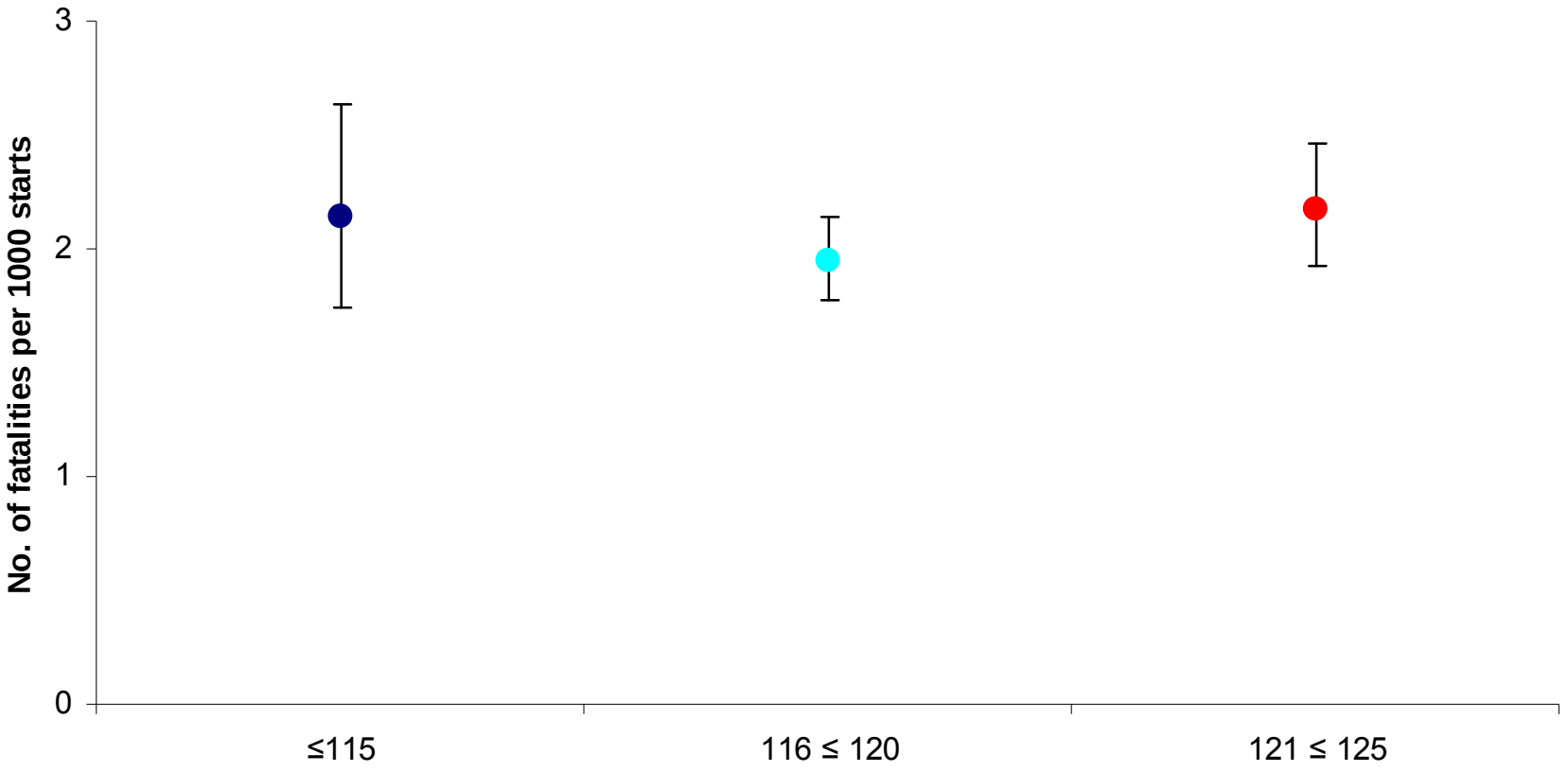
Incidence	2.07	2.93	2.13	2.68	1.99	1.78
95% CI	1.89 – 2.27	1.68 – 5.12	1.53 – 2.96	2.13 – 3.38	1.34 – 2.96	1.47 – 2.16

Race Distance – All Surfaces Combined



Incidence	3.09	2.10	2.0	1.91	2.24
95% CI	1.42 – 6.73	1.91 – 2.32	1.75 – 2.27	1.62 – 2.26	0.76 – 6.56

Weight Carried (lb) – All Surfaces Combined



Incidence	2.14	1.95	2.17
95% CI	1.74 – 2.63	1.77 – 2.14	1.92 – 2.46

Summary

- No statistically significant difference in the incidence of fatality
  - On different surface types
  - In mares and fillies in open or restricted races
  - In races that have been moved off turf
  - On different surface conditions
  - In different race distances
  - In horses carrying different weight

Summary

- Starts made by females were 50% less likely to end in fatal injury than starts made by intact males ($p < 0.001$)
- Starts made by 2-year-olds were 30% less likely to end in fatal injury than starts made by older horses ($p = 0.03$)

What are the next steps?

Movement from identification of
“risk factors”

to

The identification of the “at risk” horse

Acknowledgments

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Hong Kong & UK

- Hong Kong
  - Risk factors for retirement due to tendon strain injury
  - Management strategies to reduce the incidence of serious tendon injury

- UK
  - Targets for future research
  - Policy advice documents for the racing industry

Career-ending tendon injury in Hong Kong

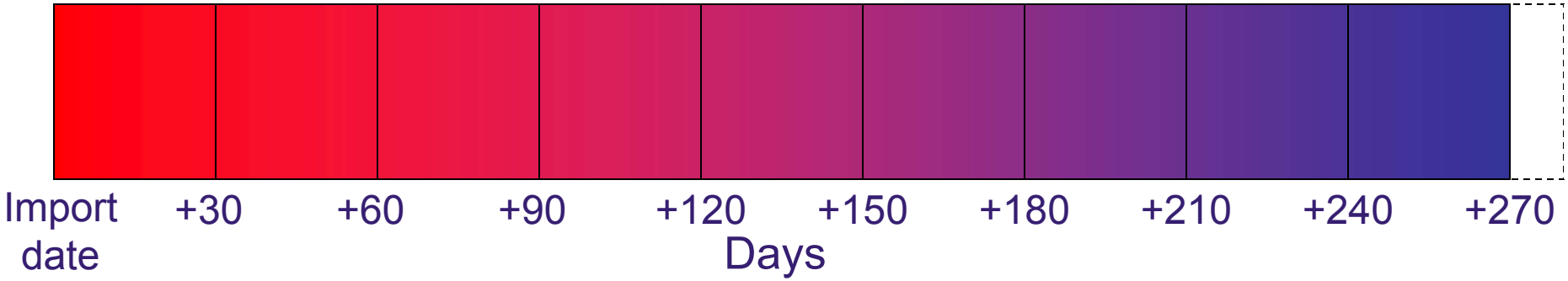
Ken Lam, Chris Riggs &
Kenton Morgan

HKJC Data

- Detailed training and race data
  - Daily records for every horse
  - Differences in training regimens
- Detailed veterinary histories
  - 1200 horses stabled at Sha Tin
  - All veterinary needs provided by HKJC
- 1992 - Racing Information System (RIS)
  - 3700 fields in >400 tables

Exercise Intensity

- Distance raced – per 1000m
- Days after import

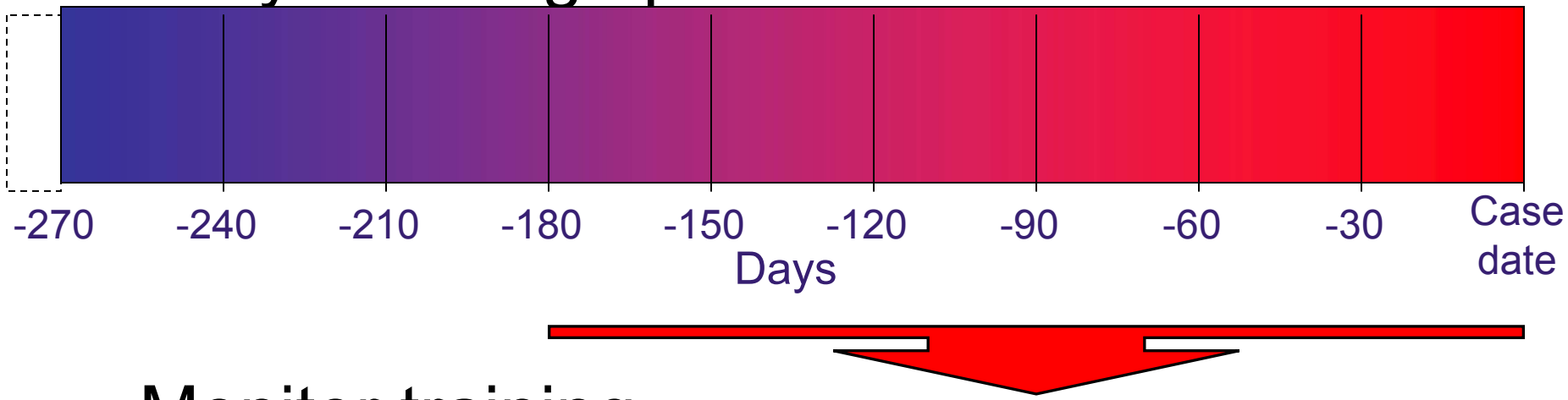


High risk period for long-term increased risk of tendon injury

Encourage trainers to work horses with less intensity soon after import

Exercise Intensity

- No. of fast pace episodes (gallop, barrier trial, race)
- Days leading up to case date

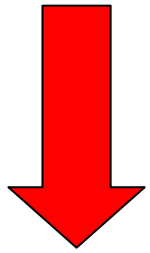


Monitor training intensity and conduct veterinary examinations

Significantly reduced exercise intensity as much as six months before retirement

Management Tools

- Vet exams and exercise history
  - "On Watch" system introduced
    - Based on exercise patterns and medical histories
    - "At risk" horses are then monitored more closely



20%

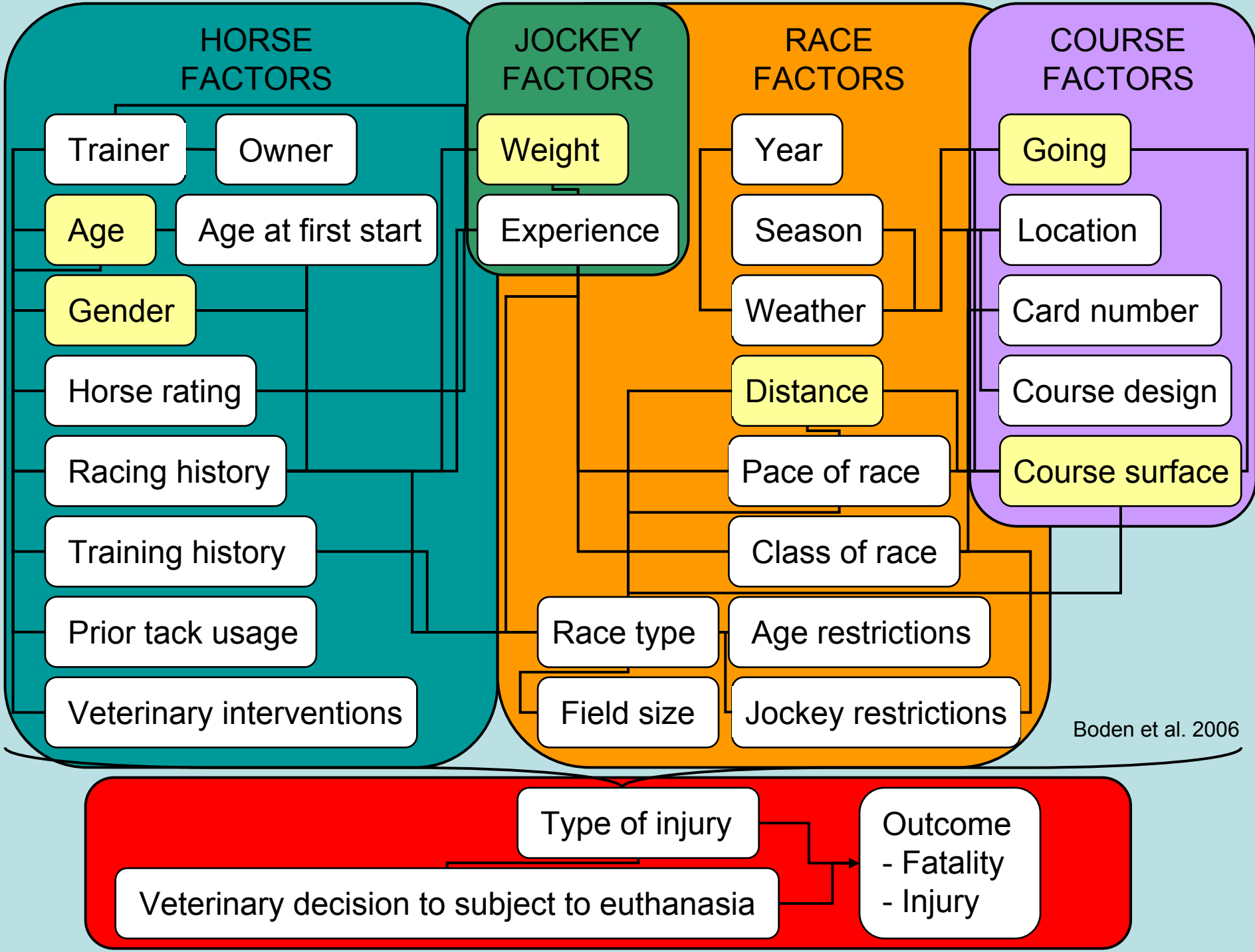
- Process control charts
  - Potential in data rich environments
  - Identify "abnormal" patterns
- Identify at-risk horses BEFORE retirement

Fatal and non-fatal injuries in jump racing in the UK

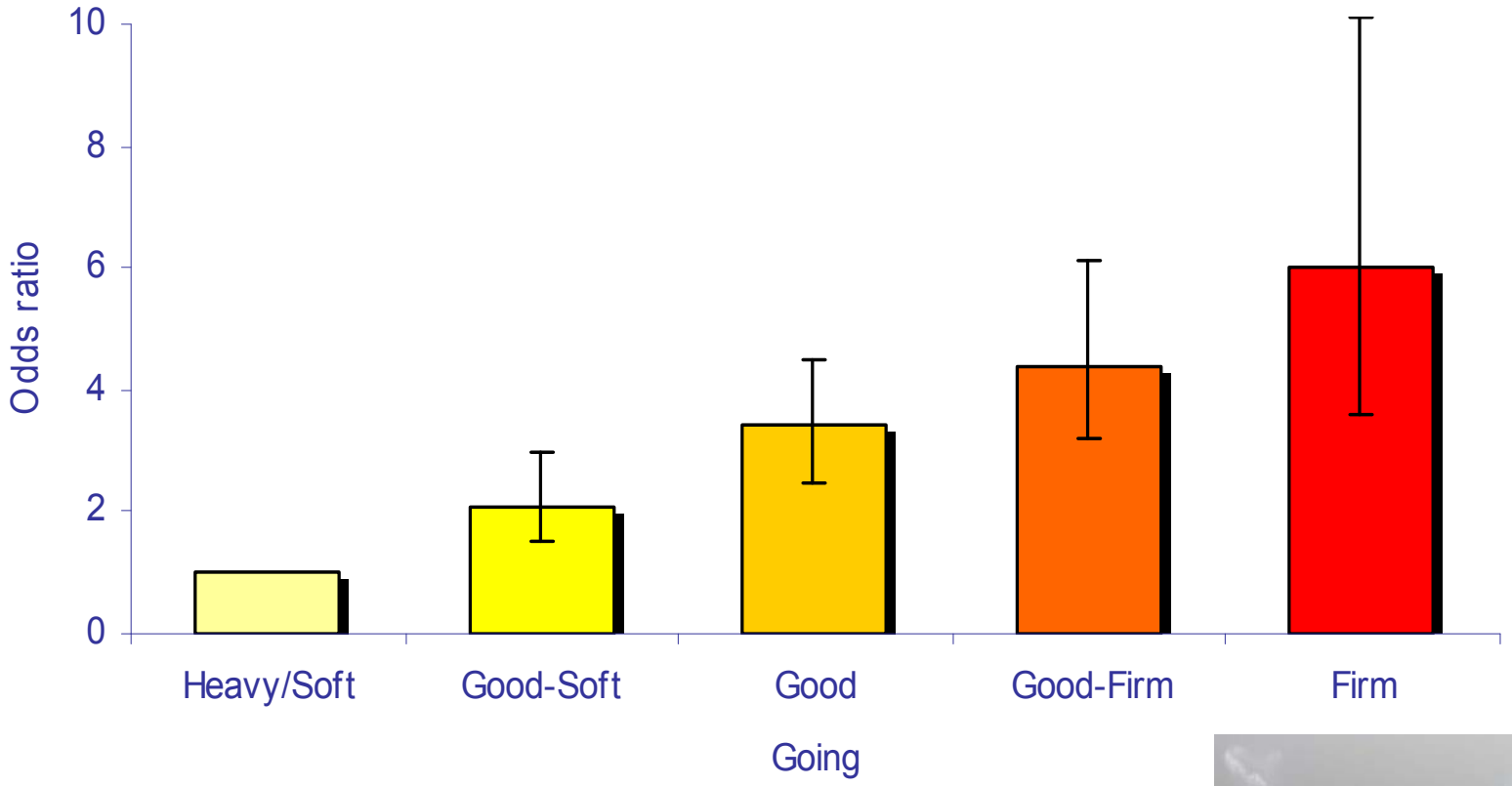
Richard Newton, Anthony Stirk,
Tim Morris, Lynn Hillyer,
Peter Webbon

Data

- BHA Welfare and Injury database since 2000
- More than 200 potential fields for all race starts on all UK racecourses
- To date more than 900,000 race starts
- ~ 1500 tendon strain injuries
- Clean and accurate
- We can be very speculative
  - No preconceptions about factors that may increase the risk of tendon injury
- Account for the effect of all variables together

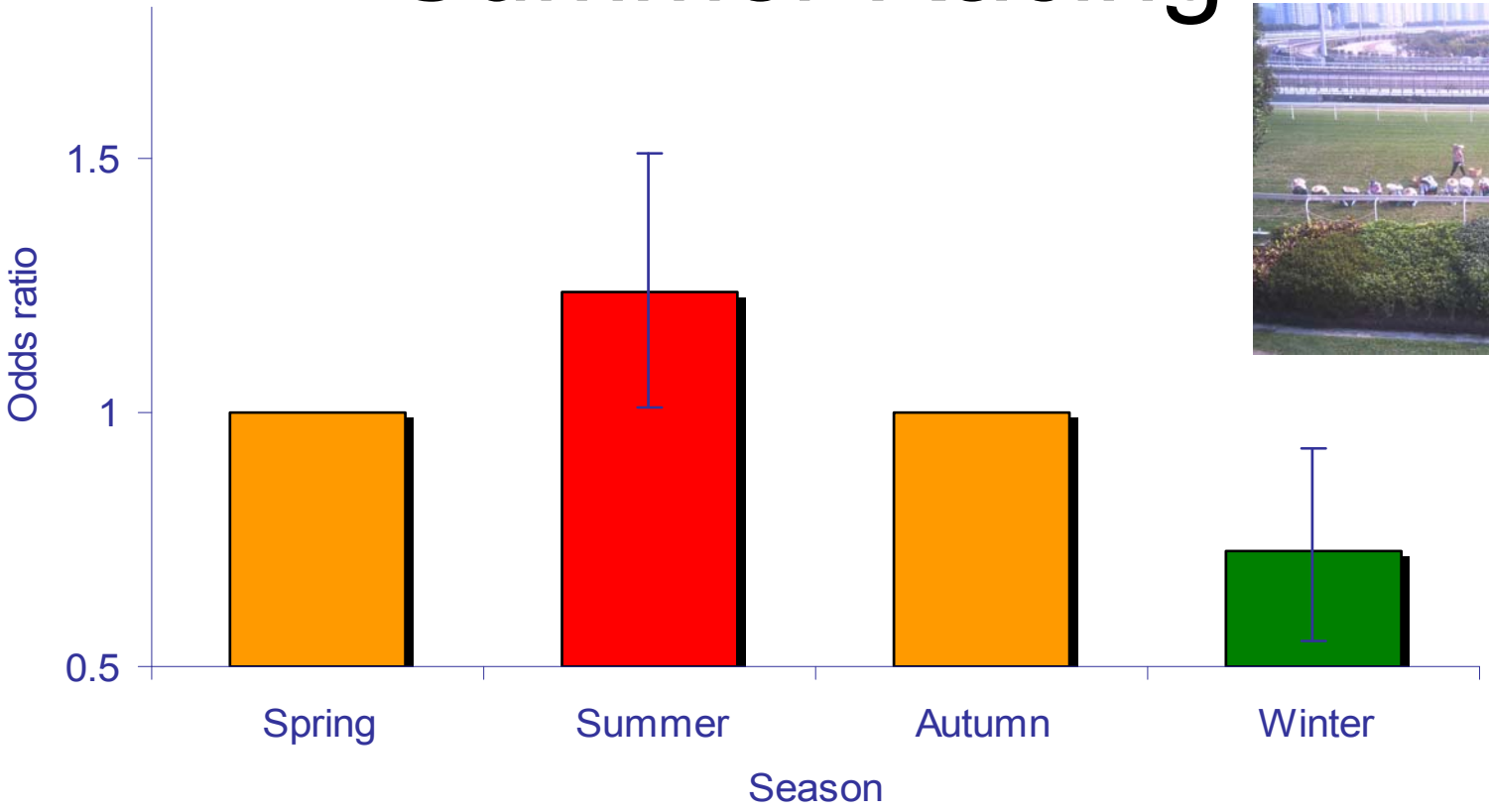

HORSE FACTORS
Trainer
Owner
Age
Age at first start
Gender
Horse rating
Racing history
Training history
Prior tack usage
Veterinary interventions
JOCKEY FACTORS
Weight
Experience
RACE FACTORS
Year
Season
Weather
Distance
Pace of race
Class of race
Race type
Age restrictions
Field size
Jockey restrictions
COURSE FACTORS
Going
Location
Card number
Course design
Course surface
Boden et al. 2006
Type of injury
Veterinary decision to subject to euthanasia
Outcome
- Fatality
- Injury

Firmer Going on Turf



- Particular focus of current research
  - Racetrack management strategies
    - Watering, moving running rails/fences, etc.

Summer Racing

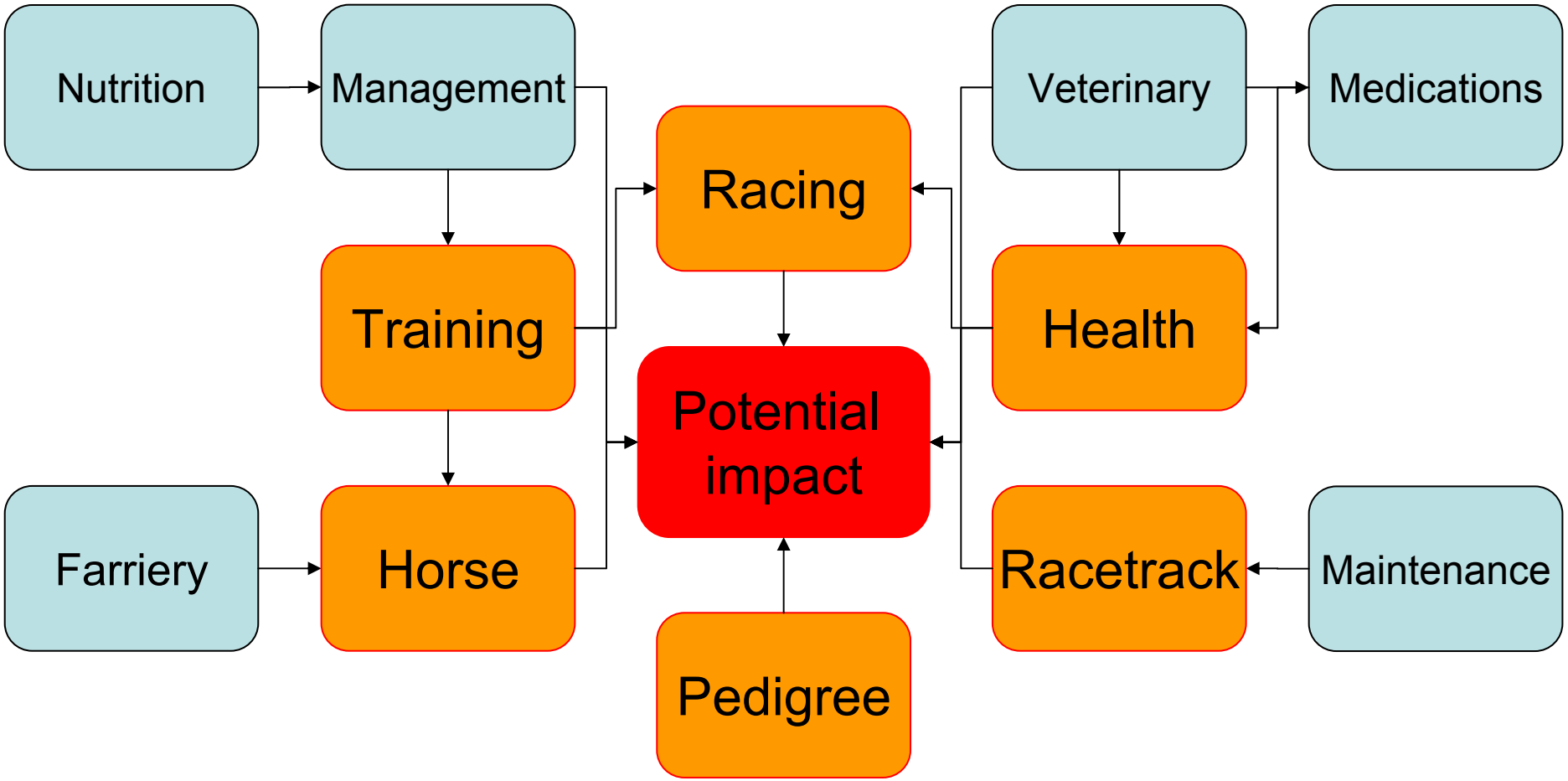


- Summer jump racing
- Ability to accurately measure surface condition
  - Effect of track maintenance throughout the year

Previous Tendon Injury

- Horses with a previous (racecourse) tendon injury were 40 times more likely to sustain another tendon injury during racing
- Greater emphasis on accurate recording of previous medical histories
- Need for multiple data platforms
  - Harmonisation of data recording and analysis
    - International
    - National

Benefit of Multiple Data Platforms



EID – Take Home Messages

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The Next Steps?

- Use what we have learned from Hong Kong and UK to better predict fatality in the USA
  - Validate Hong Kong and UK models on EID data
- Conduct multivariable analysis of EID data to identify factors that increase the risk of
  - Fatality
  - Non-fatal injury
- Identify factors that improve “durability”
- Will take time and requires quality data