Match Loads and Injury Risk in Elite Women's Rugby Union

A Two-Season Cohort Study

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Background

- Player welfare is key to **growth**
- Growth of game → more matches
- Matches: **3-10%** of exposure, **20x** injury risk

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The story from the men's game

- 2019/20 → 35 match involvements (>20 mins), 30 FGEs
- 2023/24 › 30 match involvements
- Psychological load

Red flags raised as exhausted England stars on course to break agreed match limit... again

England players frustrated no club or union has ever been admonished for exceeding welfare guidelines

Premiership clubs fear 30-game limit could see top players regularly benched

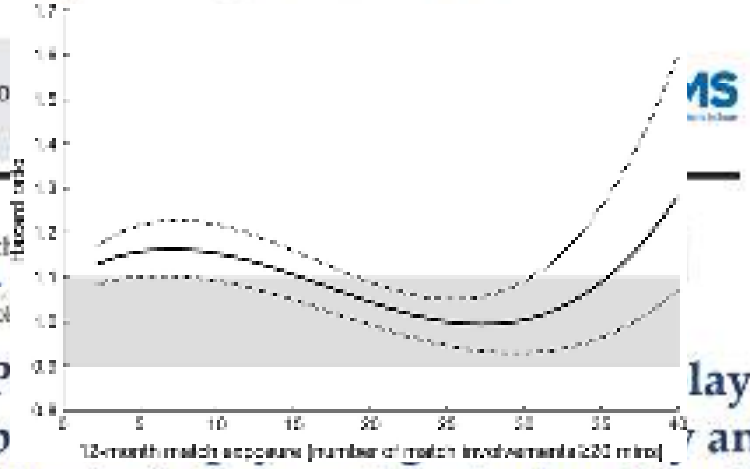
Exclusive: With a new, reduced limit on appearances over a season, there is concern that key players may end up being left out unnecessarily

There is growing concern among Premiership clubs that the new [illegible] 30-game limit for players as part of the new professional game partnership will force them into odd tactical selections during the season.

ORIGINAL RESEARCH ARTICLE

How Much Rugby is Too Much? A Seven-Season Prospective Cohort Study of Match Exposure and Injury Risk in Professional Rugby Union Players

Sean Williams[1] · Grant Trewartha[1] · Simon P. T. Kemp[2] · John H. M. Brooks[3] · Colin W. Fuller[4] · Aileen E. Taylor[5] · Matthew J. Cross[1,2] · Gavin Shaddick[6] · Keith A. Stokes[1]



ELSEVIER

Original research

The influence of match

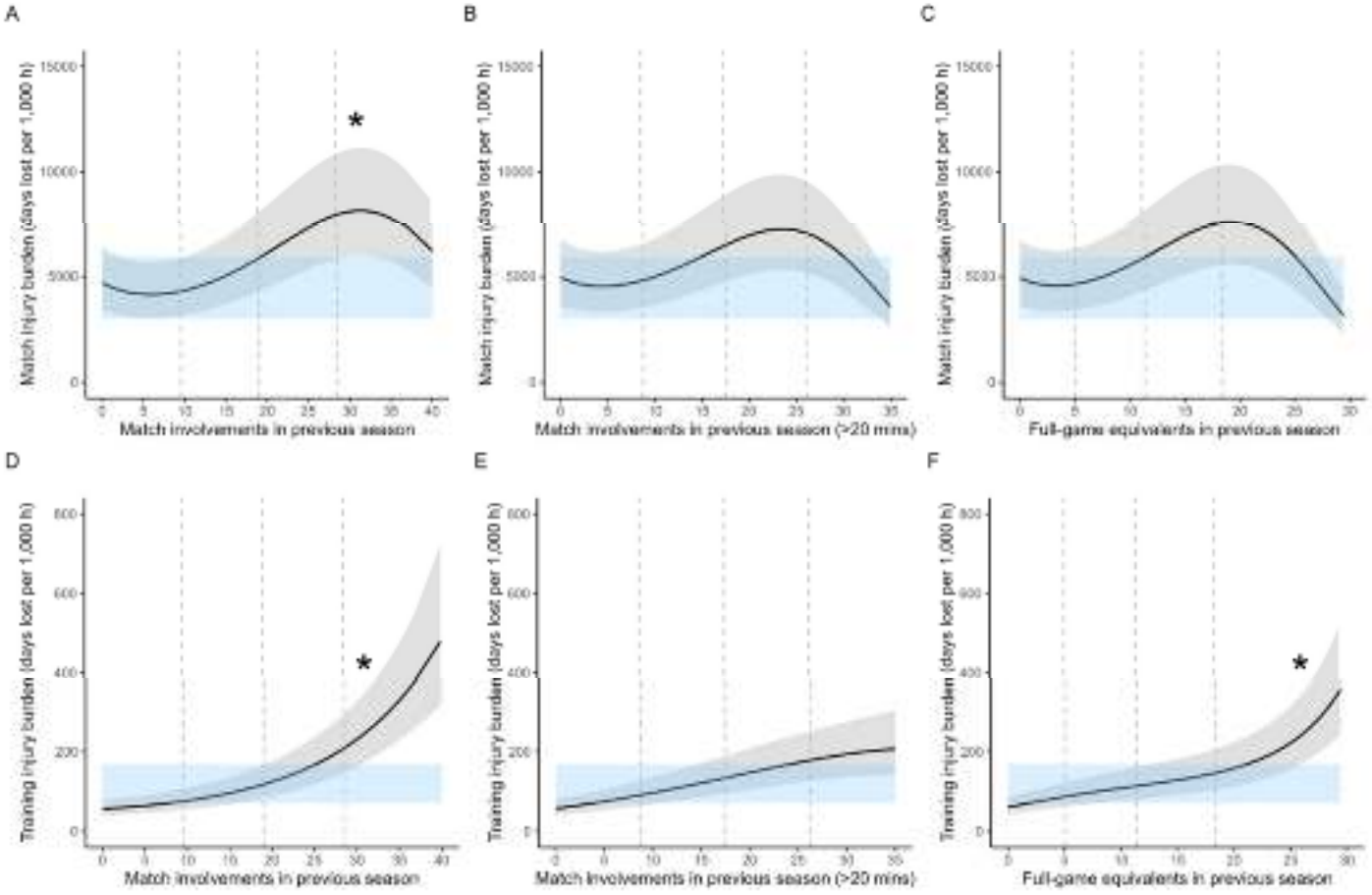
Scott Williams [illegible], Ella Key [illegible], Simon Kemp [illegible], Keith A. Stok

BMJ Open Sport & Exercise Medicine

P layers' p and physical regeneration during the off-season

Stephen D Mellalieu ,[1] Paul Sellars,[1] Rachel Arnold,[2] Sean Williams ,[2] Mickael Campo,[3,4] Deirdre Lyons[5]

Evidence from the men's game



- All match involvements, regardless of duration, should be considered.
- High match involvements (≥31 matches) elevates injury burden rates in both matches and training in the following season.
- Match burden → older Forwards
- Training burden → older Backs

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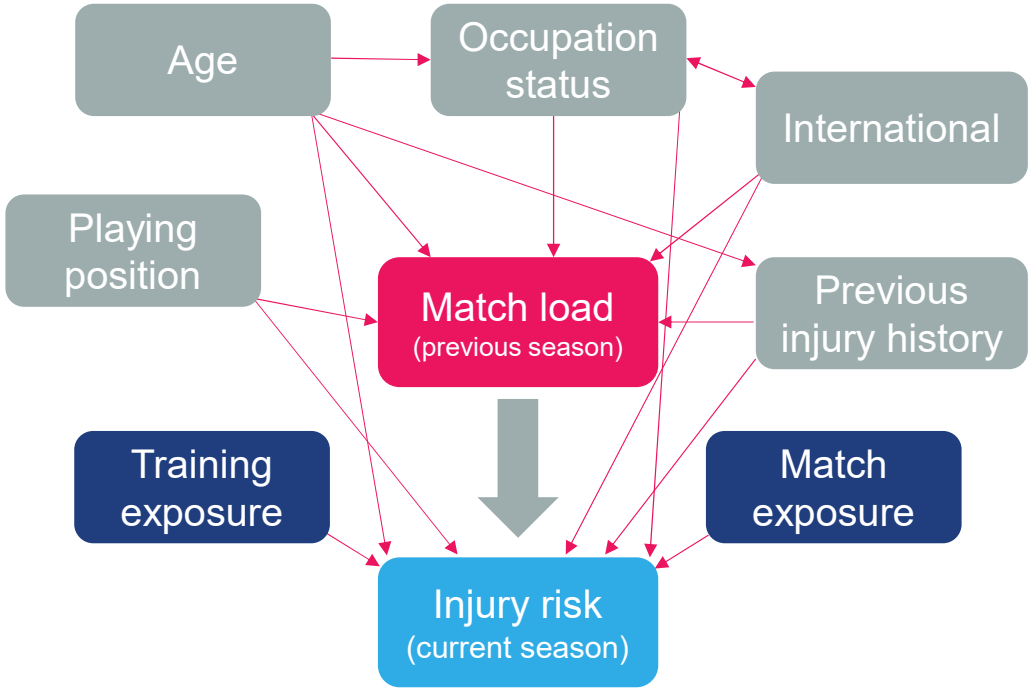
Study aims

- Explore the **association** between **match loads** and **injury risk** in the elite women's game



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Methods

Women's Rugby Injury Surveillance Project

Exposure (individual match minutes)

2022-23

2023-24

2024-25

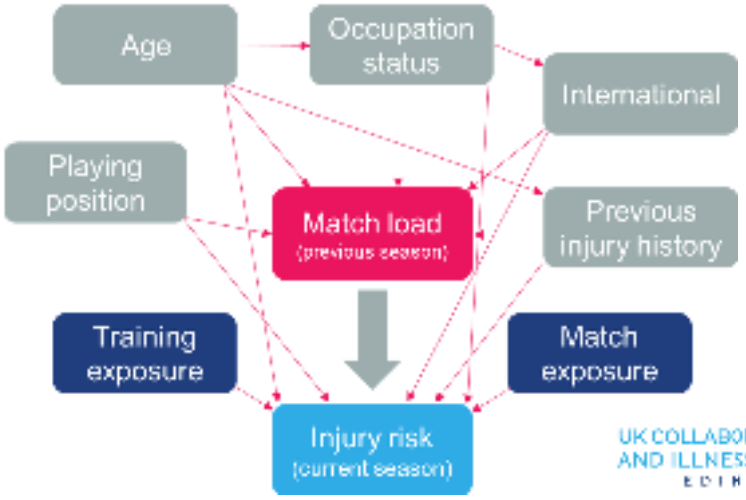
- **Previous season match counts and minutes**
- **Age**
- **Injury history**
- **Playing position**
- **Red Rose**
- **Match / training injury counts and days lost**
- **Individual match exposure**
- **Team training exposure (adjusted for injury)**

Time-loss injury data

2022-23

2023-24

2024-25



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Statistical Modelling Approach

glmmTMB Framework
Separate models for match and training injury risk

Distributions
Poisson for incidence | Negative binomial for burden

Non-linear effects
Natural splines (df=2-3) capture non-linear effects

Covariates
Age, injury history, international status, playing position

Random effects
Player nested within team

Quartile comparisons

25th	50th	75th
6 matches	13 matches	18 matches

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Results

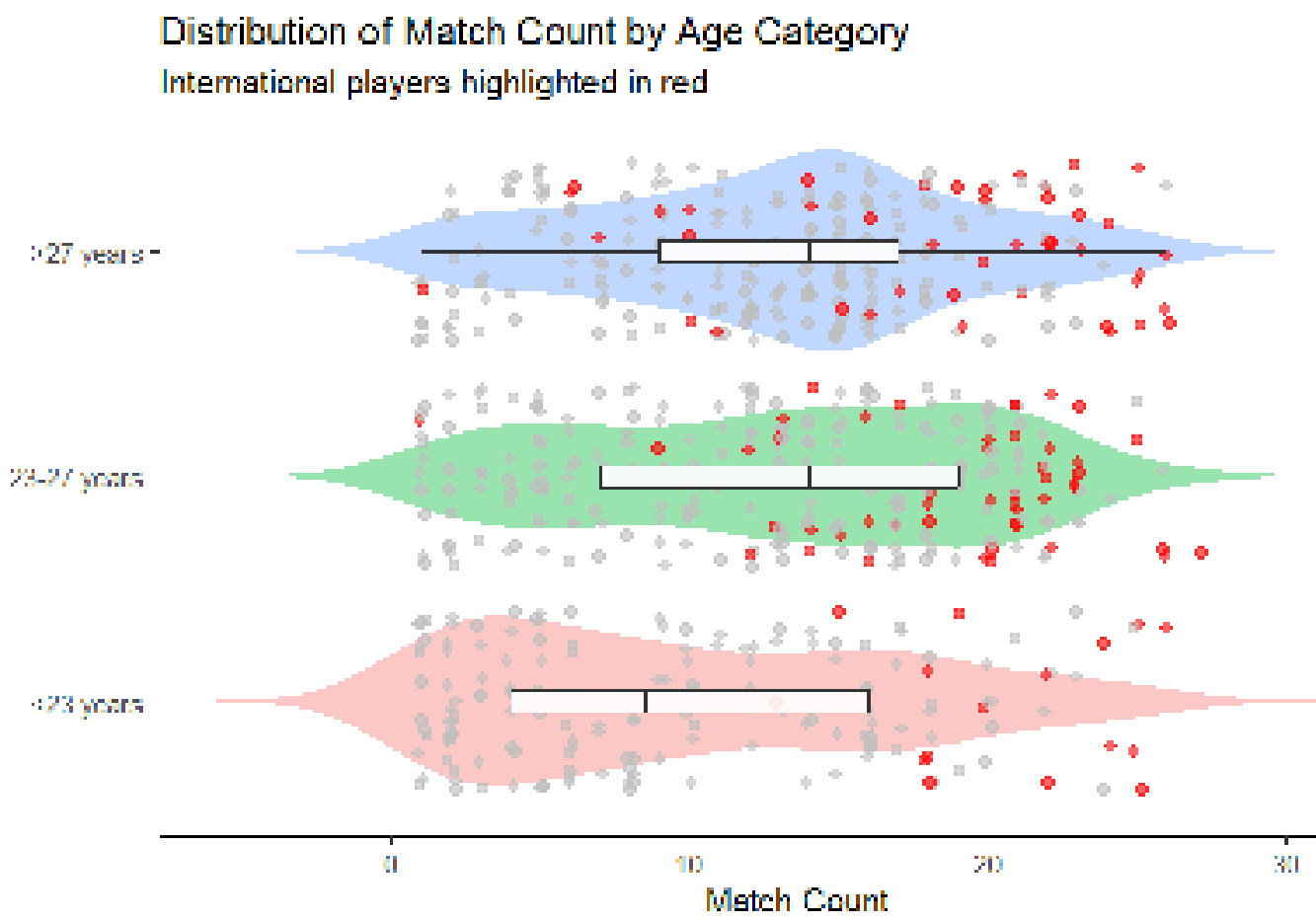
451 players

Match involvements

Age category	Mean (SD)	Median	Max
<23 years	10.0 (7.1)	8.5	26
23-27 years	13.1 (6.8)	14.0	27
>27 years	13.1 (6.2)	14.0	26

Match minutes

Age category	Mean (SD)	Median	Max
<23 years	510 (452)	378	1831
23-27 years	740 (470)	742	1898
>27 years	741 (453)	714	1817



Injury descriptives

Match Injuries	
Injury count	182
Exposure h	6,606
Total days lost	5,031
Incidence rate	27.5
Burden rate	762
Mean severity	28

Training Injuries	
Injury count	251
Exposure h	112, 089
Total days lost	8,425
Incidence rate	2.2
Burden rate	75
Mean severity	34

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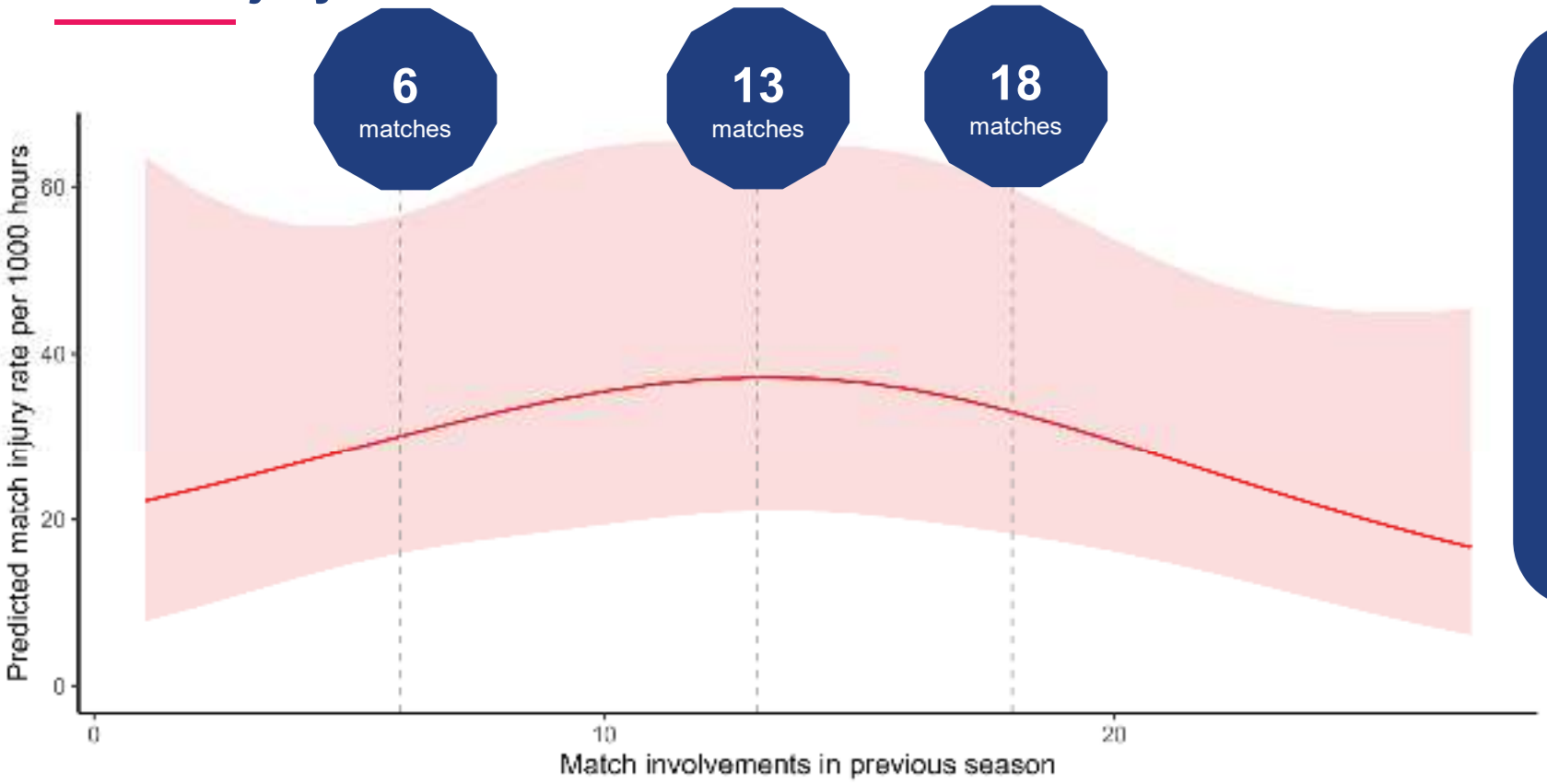
Match injury incidence



6 → 13 matches
RR: 1.25 [0.79-1.99]

6 → 18 matches
RR: 1.12 [0.65-1.95]

13 → 18 matches
RR: 0.89 [0.70-1.15]

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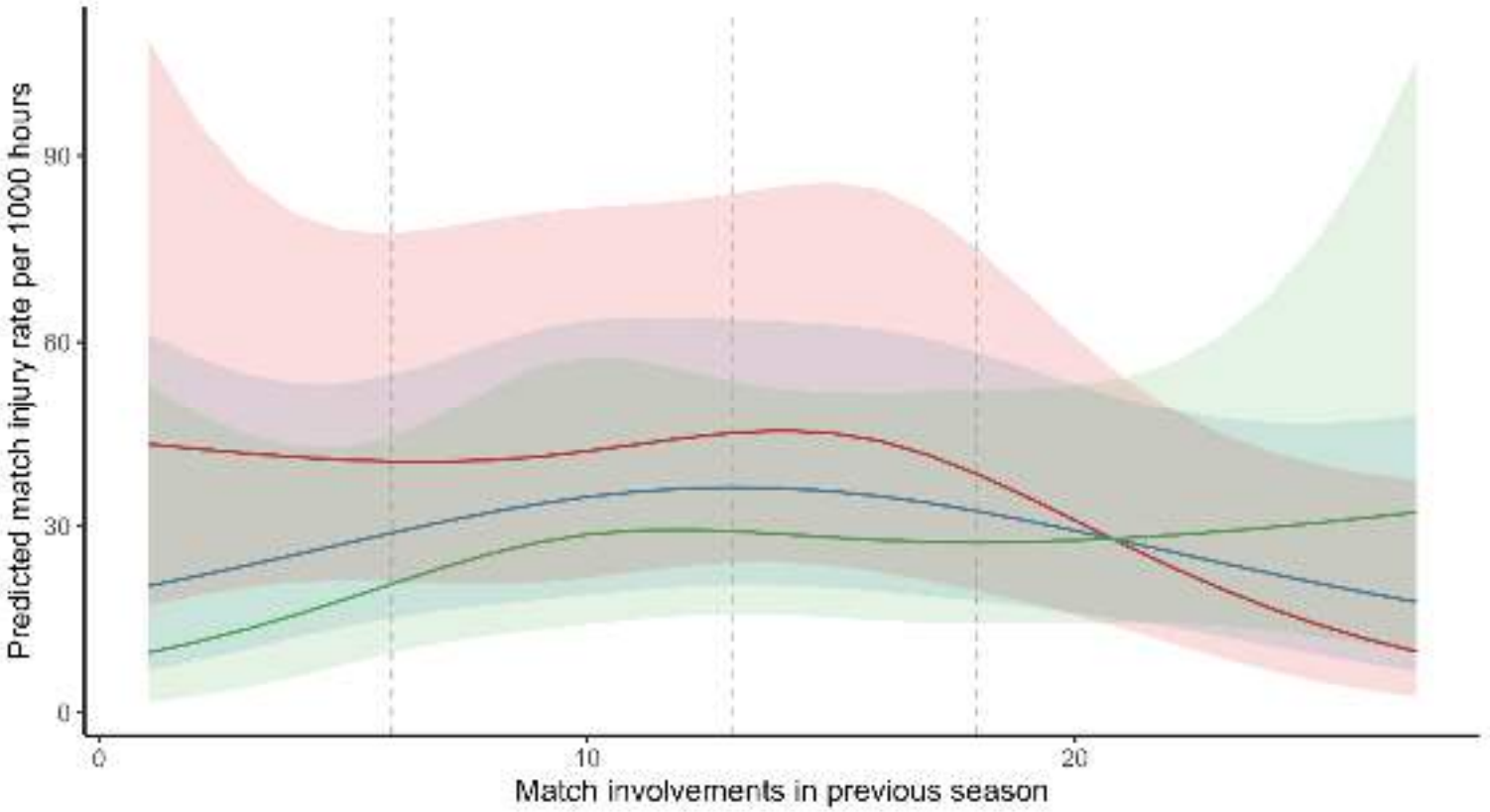
Match injury incidence – Age interaction



At **6** matches:

25 y vs. 21 y
RR: **0.73 [0.51-1.04]**

29 y vs. 21 y
RR: **0.49 [0.22-1.10]**

29 y vs. 25 y
RR: **0.68 [0.43-1.06]**

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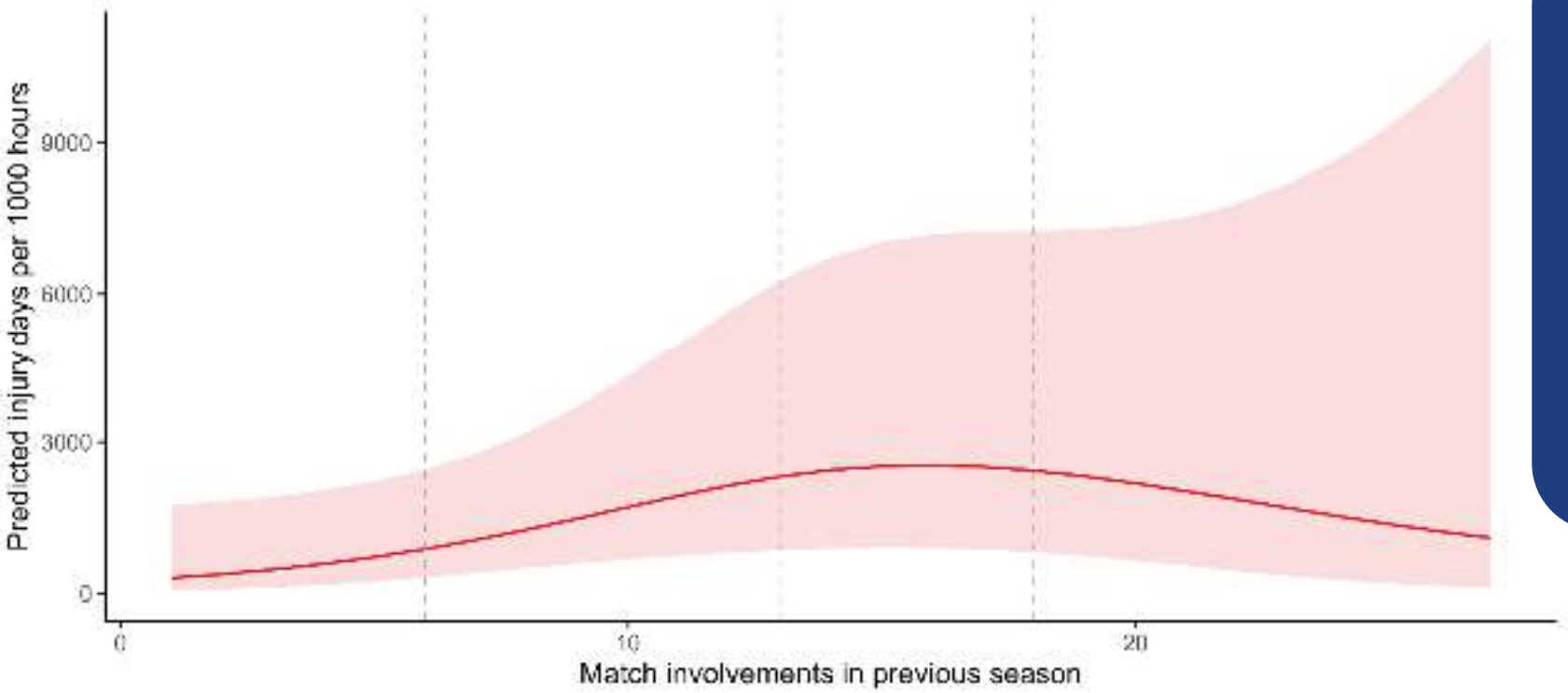
Match injury burden



6 → 13 matches
RR: 2.64 [0.81-8.52]

6 → 18 matches
RR: 2.77 [0.62-12.33]

13 → 18 matches
RR: 1.05 [0.52-2.13]

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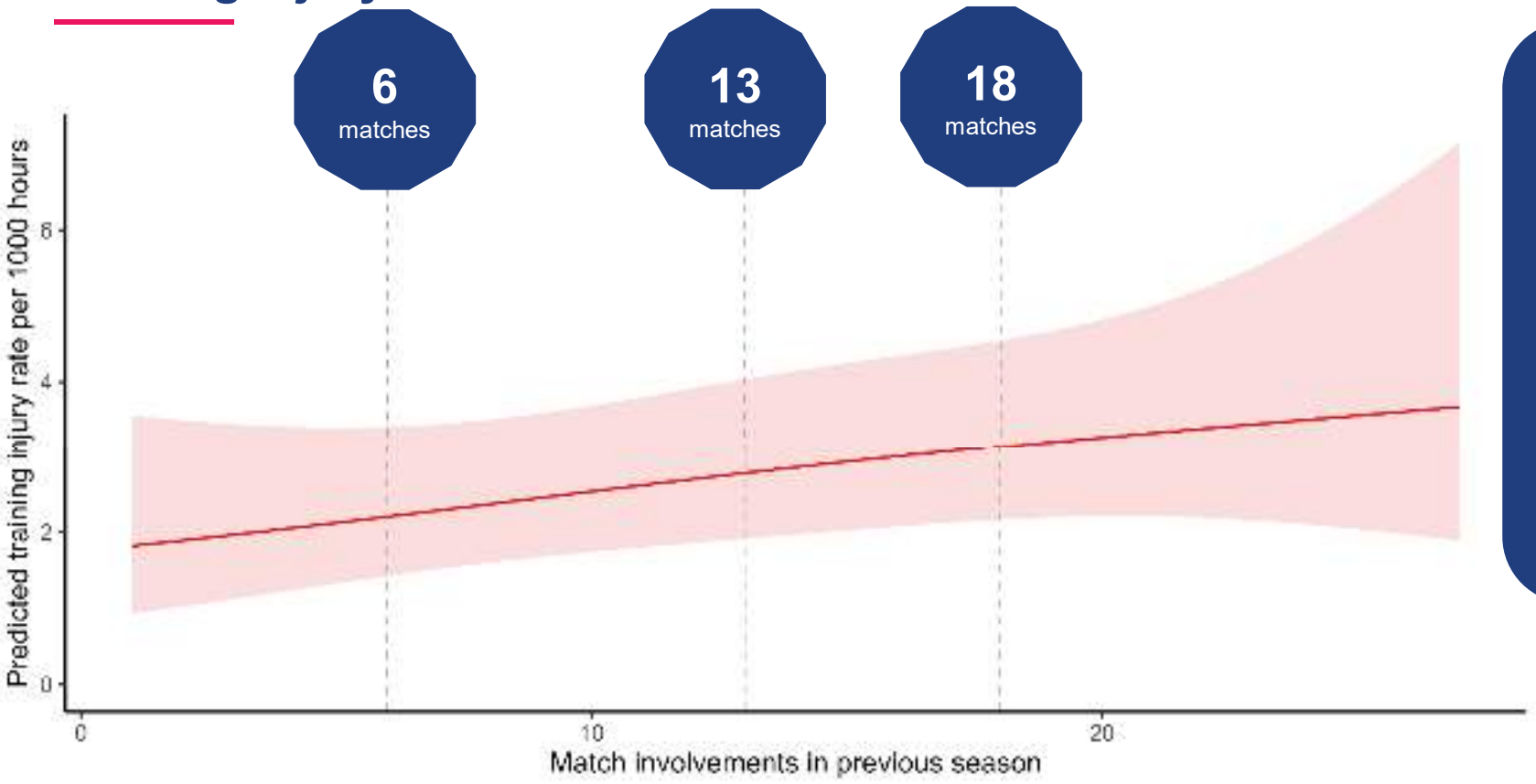
Training injury incidence



6 → 13 matches
RR: 1.31 [0.88-1.96]

6 → 18 matches
RR: 1.48 [0.93-2.37]

13 → 18 matches
RR: 1.13 [0.94-1.37]

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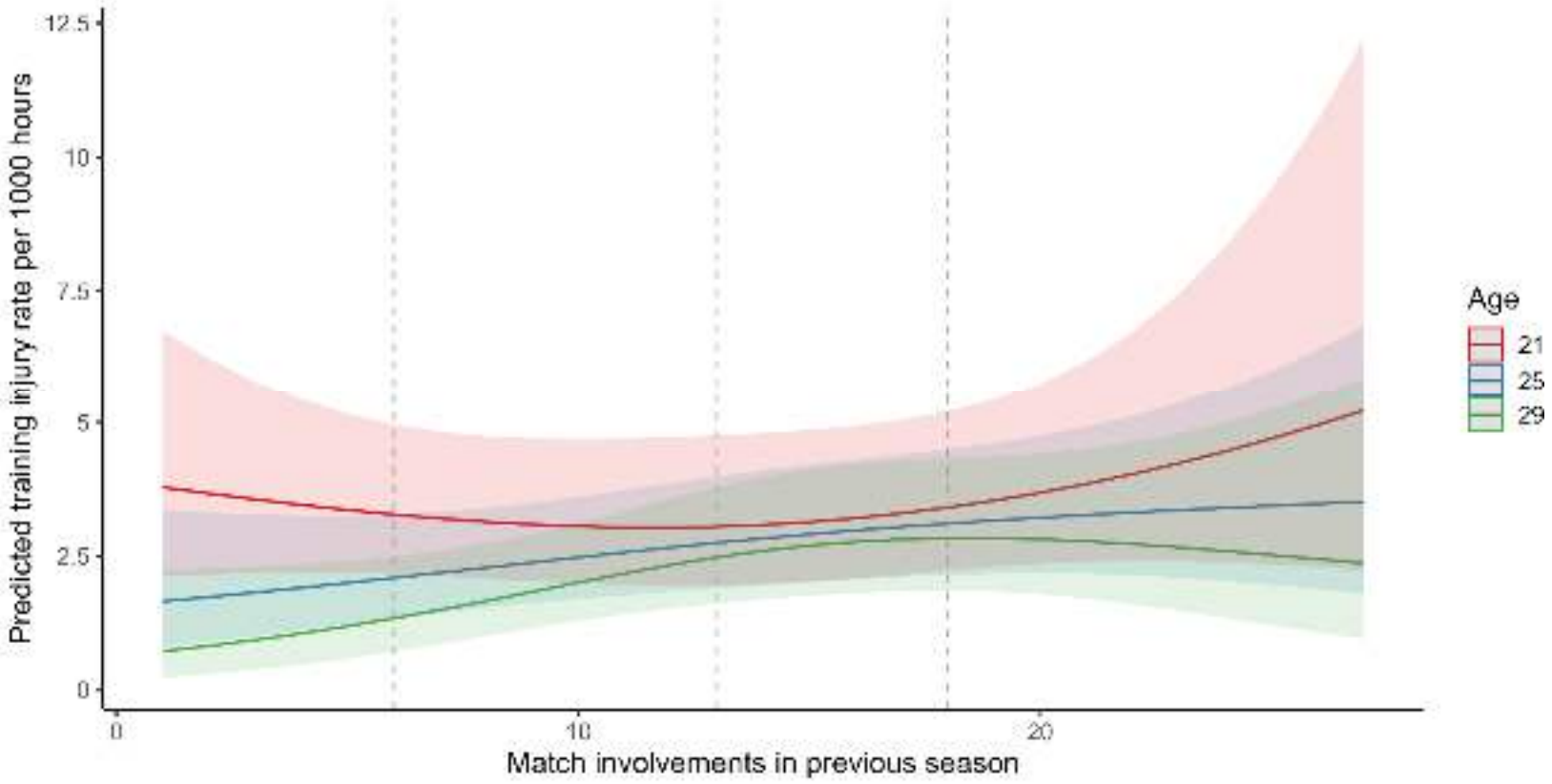
Training injury incidence – Age interaction



At **6** matches:

25 y vs. 21 y
RR: **0.66 [0.48-0.91]**

29 y vs. 21 y
RR: **0.39 [0.19-0.80]**

29 y vs 25 y
RR: **0.59 [0.40-0.88]**

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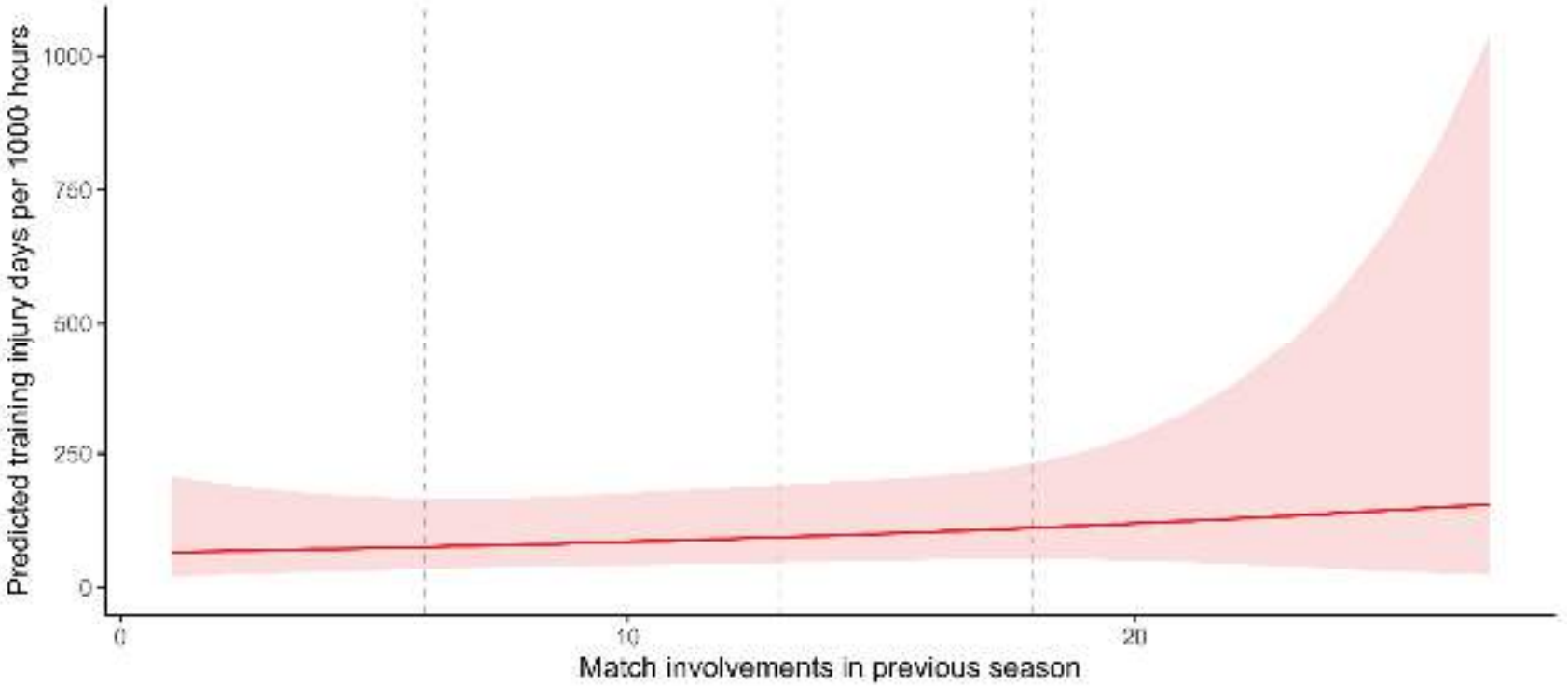
Training injury burden



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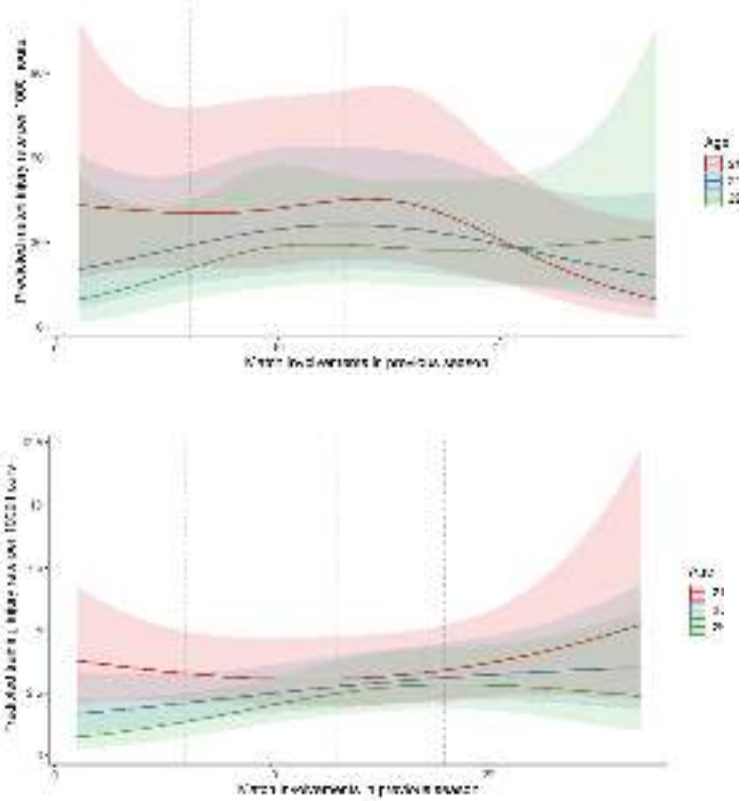
Key outcomes

- Large **variation** in match loads (median = 13 involvements, 9 FGEs)
- Few players (top **16%**) go beyond **20 match involvements**
- Associations found for **incidence**, but not burden.
- Effects currently relatively **small / unclear**.
- Upper limits **not currently necessary**.
- **High-exposure** players may represent "**survivor**" subset.
- **Young players** with limited exposure at ↑ **risk**.



Next steps

- Further exploratory analyses
  - Recent concussions, training experience, occupation status

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