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Mitigating Relative Age Effect in Sports Performance Evaluation: Constructing Performance Corridors with Mixed Models

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This study aimed to develop a new statistical approach to assess the effect of chronological age on physical performance.

1740 Elite French youth rugby union players were initially recruited. Time to complete a 50m sprint, broad jump for distance and maximal aerobic speed were retained for analysis. Linear Mixed models were used to model the relationship between chronological age and physical performance with log transformations on both variables to account for the non-linearity of their relationship. Additionally, confidence intervals ranging from 10 to 90% were used to rank individual's with respect to all performances of a same age category while accounting for the chronological age at which it was achieved. Furthermore a second approach using estimated individual effects were computed to represent an individualized expected progression curve.

The results of this study provided novel methodological insights. First the integration of a double logarithmic transformation improved the predictive capabilities of the model used in this study. Additionally, the use of confidence interval allow a better representation of individual physical performance compare to the rest of the population. Finally, individual expected progression curve could be consider to track athletes'progress overtime.

Thématiques

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