

Abstract

Rugby union is a high-intensity, intermittent sport with varying positional demands. Whole-match (WM) global navigation satellite system (GNSS) analysis may underestimate peak physical outputs. This study compared match demands in Super Rugby Américas using ball-in-play (BiP) versus WM data to better inform conditioning strategies, with positional demands considered as secondary context. GNSS data were collected from 35 professional players of the 2023 Super Rugby Américas champion team across 14 matches. Metrics included total distance (TD), high-speed running (HSR), accelerations (ACC), and high-metabolic-load distance (HMLD), reported in absolute and relative terms. Linear mixed models assessed differences between BiP and WM while accounting for positional group (forwards and backs). BiP phases exhibited significantly greater relative demands than WM. $TD \cdot \text{min}^{-1}$ was ~ 2.5 times higher during BiP (114.9 ± 7.7 vs $47.5 \pm 4.1 \text{ m} \cdot \text{min}^{-1}$; $p < 0.001$). Similar patterns were observed for $ACC \cdot \text{min}^{-1}$ (0.8 ± 0.1 vs $0.2 \pm 0.03 \text{ accelerations} \cdot \text{min}^{-1}$), $HSR \cdot \text{min}^{-1}$ (15.4 ± 2.6 vs $3.7 \pm 0.5 \text{ m} \cdot \text{min}^{-1}$), and $HMLD \cdot \text{min}^{-1}$ (27.9 ± 3.7 vs $7.0 \pm 0.8 \text{ m} \cdot \text{min}^{-1}$; all $p < 0.001$). Within this BiP–WM comparison, backs demonstrated greater TD, ACC, HSR, and HMLD than forwards ($p < 0.001$). Overall, BiP analysis better reflects match demands and highlights the importance of aligning conditioning programmes with BiP-derived per-minute intensity profiles. Positional differences may guide emphasis within this BiP-focused framework, rather than distinct exercise selection, to better prepare players for the most demanding phases of match play.

Keywords

rugby union; GNSS tracking; Ball-in-Play analysis; match demands; training load

Introduction

Rugby union, particularly at the professional level such as Super Rugby Américas, is characterised by its high-intensity, intermittent nature, requiring players to perform a wide range of physical activities including running, collisions, and static efforts (such as scrummaging, rucking, mauling, and tackling) with varying work-to-rest ratios¹⁻³. Players are typically categorised into two main positional units—forwards and backs—each with distinct physical and technical responsibilities⁴⁻⁶. Forwards primarily engage in static exertions, scrummaging, lineouts, and physical confrontations to gain and maintain possession of the ball. Backs are more involved in multidirectional running, high-speed sprints, and kicking actions^{5,7-9}.

The ability to consistently perform high-intensity efforts is linked to success in rugby union, making the physical preparation of players crucial^{1,5}. Position-specific demands further underscore the need for tailored training programmes^{4-6,10}. Understanding these demands is essential for optimising player performance, reducing injury risk, and ensuring that players are physically equipped to meet the challenges of competitive rugby union at all levels¹¹. Recognising the contrasting physical profiles of forwards (strength- and collision-dominant) and backs (speed- and agility-dominant) helps contextualise positional demands and inform emphasis within conditioning programmes aligned with key performance indicators¹².

The use of global navigation satellite systems (GNSS) (previously referred to as global positioning systems) has become integral in assessing the physical demands of rugby union match play^{5,13}. GNSS enables the quantification of player movement patterns and running velocities during competition, with locomotor variables derived from positional data. These systems provide practitioners with objective information regarding external load exposure and are widely used to support performance analysis and training prescription in professional rugby environments^{5,10,12}. Furthermore, GNSS technology enables the monitoring of these same metrics during training sessions, facilitating the design of programmes that replicate or exceed match-play demands to better prepare players for competition^{4,11,14,15}. While the majority of studies at club and international level have reported whole-match (WM), per-half demands, or rolling averages, it is important to recognise that WM averages may not accurately reflect the fluctuations in running or playing intensity that occur throughout a match^{6,7,10,13,14,16}. Therefore, a more detailed examination of match demands is required to better reflect in-game fluctuations in intensity and variability, particularly during active passages of play.

Ball-in-play (BiP) analysis examines only active phases and excludes stoppages, providing a more accurate representation of match demands than WM data^{10,17,18}. This approach is particularly valuable given the rugby union's intermittent nature, where the

ball is typically in play for less than half of the overall match time^{10,14,17,18}. For instance, during the Rugby World Cup 2023, the ball was in play for approximately 43% of the total match duration¹⁹. Recent studies examining high-intensity phases of match play, such as worst-case scenarios and attacking 22-meter entries, have reported substantially higher running intensities than WM averages. For example, the longest BiP periods yielded average locomotor demands of approximately 116.8 m·min⁻¹, while values during attacking 22-meter entries ranged from ~98.8 to 115.6 m·min⁻¹, compared to the typical WM average of ~68 m·min⁻¹^{20,21}. By focusing on BiP data, researchers and coaches can gain a more accurate understanding of the true intensity and variability of match demands, leading to better-informed training programmes and performance strategies that more closely reflect the realities of competitive play^{10,17,18,22}.

The purpose of this study was to compare the demands of Uruguayan professional rugby union players from the 2023 Super Rugby Américas championship-winning team using WM and BiP data, to inform training design and match preparation. Because WM averages include inactive periods, they may underestimate true in-play intensity. To our knowledge, this study provides the first quantitative description of BiP match demands in South American professional rugby and examines how the use of BiP versus WM analysis alters the interpretation of positional workloads in an emerging professional competition. Accordingly, differences between BiP and WM were quantified across key external load metrics, and the magnitude and positional distribution of these differences were described within this competitive context. It was hypothesised that, in South American professional rugby, BiP analysis would meaningfully modify the magnitude and positional interpretation of external load demands compared with WM data, thereby providing context-specific reference values to inform training design for forwards and backs.

Methods

Subjects. A total of 35 male Uruguayan professional players from the 2023 Super Rugby Américas championship-winning team took part in the study (Table 1). GNSS tracking data were collected during 14 matches undertaken during this tournament. All players were healthy and partaking in full training at the time and research approval was granted from the Middlesex University ethics committee (ethics application number: 30233) with the study conforming to the recommendation of the Declaration of Helsinki. The national federation (Unión de Rugby del Uruguay) granted organisational consent for research use of de-identified tracking data collected as part of routine performance monitoring. The Ethics Committee approved a waiver of individual informed consent due to the use of anonymised data and minimal risk.

[Insert Table 1 here]

Methodology. GNSS data were collected from 14 professional matches (including the semi-final and final) during the 2023 Super Rugby Américas Championship, played across multiple countries in South and North America. The units were placed in dedicated pockets within GNSS-specific compression tops worn underneath the players' match jerseys, between their shoulder blades close to their thoracic spine, minimising movement artefacts²³. The GNSS units sampled at 18 Hz and the accelerometers at 952 Hz (APEX Pro Series Pod, STATSports, Newry, Northern Ireland, UK) and collected data from four satellite signals. While there is a paucity of research into the reliability of the 18 Hz GNSS units^{24,25}, the 10 Hz units have previously been shown to be reliable when assessing team sport movement patterns across a variety of sports^{10,16,26,27}.

The GNSS units were turned on approximately 2-h prior to kick-off to gain the necessary signal. During the matches, a live-monitoring app was used to split BiP periods (SONRA Live iPad App, STATSports, Newry, Northern Ireland, UK). BiP sequences were initiated when the ball was put into play following the referee's whistle and were terminated when the ball exited the pitch, or the referee stopped the game^{10,18}. All players who entered the field were included. WM windows were defined as kick-off to half-time and second-half kick-off to full-time. For substitutes and temporary removals (yellow card or head-injury assessment), off-field intervals within those WM windows were excised from the player's file; consequently, WM and BiP metrics were calculated only from each player's on-field data within the defined match windows. The data were downloaded using specific hardware and a consistent version of software (APEX Pro Series SONRA 4.0 Software, Version 4.4.11, STATSports, Newry, Northern Ireland, UK). GNSS data were viewed to identify any files that lost GNSS signal for sections of the match, and if found were removed from the dataset. Data were then exported into Microsoft Excel (Microsoft Excel, Version 2019, Microsoft Corporation, Washington, USA) for further analyses. GNSS metrics were displayed as absolute values and per minute as a measure of intensity of match play for either BiP or WM. A list of the analysed dependent variables can be seen in Table 2 and were chosen based on previous research^{10,26}.

[Insert Table 2 here]

Statistical Analysis. Linear mixed models were used to examine differences between BiP and WM conditions for each dependent variable (absolute and relative GNSS metrics), and to assess interaction effects with respect to position (forwards and backs). Bonferroni correction was applied for post hoc comparisons. Partial η^2 was reported as a measure of effect size for model-based main effects and interactions and interpreted as small (0.01–0.05), medium (0.06–0.13), and large (≥ 0.14). For descriptive comparison of BiP and WM conditions, effect sizes are additionally presented as standardised mean differences (SMD) with 95% confidence intervals. Model estimates and pairwise

contrasts are reported with adjusted p-values and 95% confidence intervals (95% CI). All analyses were conducted using IBM SPSS Statistics (Version 29; IBM Corp., Armonk, NY, USA), with significance set at $p < 0.05$.

Results

On average, forwards were heavier (112.9 ± 10.8 kg vs 86.8 ± 8.6 kg) and taller (186.9 ± 5.2 cm vs 178.8 ± 4.5 cm) than backs (Table 1).

Total distance (TD). There was a significant effect of condition for TD, $F(3,78) = 1923.951$, $p < 0.001$, partial $\eta^2 = 0.987$. Bonferroni-adjusted post hoc tests indicated that absolute TD was higher during WM than BiP, whereas $\text{TD} \cdot \text{min}^{-1}$ was substantially higher during BiP than WM ($p < 0.001$; Table 3). Significant positional differences were also observed, $F(1,26) = 77.567$, $p < 0.001$, partial $\eta^2 = 0.749$, with Bonferroni-adjusted post hoc tests revealing that backs consistently covered greater distance than forwards (Table 3).

Accelerations (ACC). There was a significant effect of condition for ACC, $F(3,78) = 909.838$, $p < 0.001$, partial $\eta^2 = 0.972$. Bonferroni-adjusted post hoc tests showed that absolute ACC was higher during WM than BiP, whereas $\text{ACC} \cdot \text{min}^{-1}$ was substantially higher during BiP than WM ($p < 0.001$; Table 3). Significant positional differences were also noted, $F(1,26) = 48.402$, $p < 0.001$, partial $\eta^2 = 0.651$, with Bonferroni-adjusted post hoc tests revealing that backs performed more ACC than forwards (Table 3).

High-speed running (HSR). There was a significant effect of condition for HSR, $F(3,78) = 1099.204$, $p < 0.001$, partial $\eta^2 = 0.977$. Bonferroni-adjusted post hoc tests indicated that WM data exceeded BiP data for absolute HSR at the team level, whereas $\text{HSR} \cdot \text{min}^{-1}$ was substantially higher during BiP than WM periods ($p < 0.001$; Table 3). When examined within positions, no significant differences were observed between BiP and WM conditions for absolute HSR (forwards $p = 0.444$; backs $p = 0.187$).

High-metabolic-load distance (HMLD). There was a significant effect of condition for HMLD, $F(3,78) = 1480.385$, $p < 0.001$, partial $\eta^2 = 0.983$. Bonferroni-adjusted post hoc tests revealed that absolute HMLD was higher during WM than BiP, whereas $\text{HMLD} \cdot \text{min}^{-1}$ was substantially higher during BiP than WM ($p < 0.001$; Table 3). Significant positional differences were also observed, $F(1,26) = 211.329$, $p < 0.001$, partial $\eta^2 = 0.890$, with Bonferroni-adjusted post hoc tests revealing that backs accumulated greater HMLD than forwards (Table 3).

[Insert Table 3 here]

Discussion

The present study aimed to compare the demands of BiP against WM periods of the 2023 Super Rugby Américas champion team. Significant differences were observed between BiP and WM for both absolute and relative metrics of TD, ACC, HSR, and HMLD, indicating that the analytical approach substantially alters the interpretation of match demands. These findings reflect the demands of a high-performing team in an emerging professional South American competition; external validity beyond this league, particularly to elite international rugby, should be interpreted with caution (Table 3).

Across matches, the ball was in play for an average of 28 min 41 s $\pm$ 2 min 50 s, representing $31.3 \pm 3.7\%$ of total match duration (range 24 min 39 s–34 min 44 s), while WM duration averaged 91 min 47 s $\pm$ 5 min 39 s. BiP phases demonstrated significantly higher physical intensities than WM data, underscoring their relevance as the most demanding passages of play within matches^{10,18,28}. In this cohort, TD·min⁻¹ during BiP was more than double that observed during WM, while ACC·min⁻¹ was approximately four times higher (Table 3). Similarly, HSR·min⁻¹ and HMLD·min⁻¹ were markedly elevated during BiP, reflecting a substantially greater density of high-intensity locomotor activity compared with WM conditions (Table 3). Although absolute HSR did not differ between BiP and WM at the positional level, HMLD·min⁻¹ was consistently higher during BiP. This pattern likely reflects the greater contribution of frequent accelerative and decelerative actions occurring during active passages of play, rather than differences in sustained HSR alone^{26,27}. Accordingly, the elevated locomotor demands observed during BiP appear to be driven primarily by increased movement density and repeated changes in velocity.

Comparable patterns have been reported in elite European and international rugby, where BiP phases concentrate physical output into short, high-intensity passages of play. For example, Sheehan et al.¹⁸ reported that BiP accounted for ~43% of total match time in the 2023 United Rugby Championship champion team. Similarly, Pollard et al.¹⁰, examining international rugby union, reported a mean team BiP running intensity of 108.6 ± 8.5 m·min⁻¹. In the present study, BiP TD·min⁻¹ (~115 m·min⁻¹) falls within a comparable range, suggesting that, despite differences in competition structure, the physiological intensity of active phases of play may be broadly comparable across professional environments. However, differences emerge in how match demands are accumulated. In elite European competition, greater total BiP time has been reported, reflecting longer or more frequent active passages of play. In contrast, the reduced proportion of BiP observed in Super Rugby Américas may reflect contextual factors such as tactical tempo, refereeing style, and competition-specific match flow. Consequently, while per-minute BiP intensity appears similar, the overall exposure to repeated high-intensity passages across a match may differ between emerging and established professional competitions.

Taken together, these findings indicate that differences in match structure influence how physical load is accumulated, with match flow concentrating a large proportion of locomotor demands into active sequences. Periods when the ball is out of play are also an important component of match structure, as these intervals may facilitate partial recovery between high-intensity passages and support players' ability to repeatedly express elevated BiP demands. This results in a greater concentration of high-speed and accelerative locomotor actions during BiP phases and alters how positional contrasts manifest within a BiP-focused analytical framework, relative to WM averages. These findings align with prior research, which similarly found the highest physical demands concentrated in high-intensity phases of rugby and other intermittent sports^{10,18,22,26,28-30}. Accordingly, training should reference BiP per-minute targets to reflect the load concentration observed in active sequences. This can be operationalised through short, repeated constrained games that start from typical transition events (kicks, turnovers, quick taps) and apply position-specific rules (space for backs; contact frequency and proximity for forwards), with GNSS-derived per-minute thresholds used to monitor and progress drill intensity.

Positional differences between forwards and backs provide additional context regarding how intensified demands are distributed during BiP phases. During these phases, backs consistently covered greater distances and achieved higher HSR·min⁻¹ than forwards, with mean BiP TD approximately 685 m greater in backs and HSR·min⁻¹ around 12 m·min⁻¹ higher compared with forwards (Table 3). These differences reflect backline movement demands, including wider-channel positioning, frequent support running, and kick-chase and counter-attack sequences, which produce longer, less interrupted running and more frequent transitions to high velocity, thereby elevating TD and HSR^{4,20}. During BiP phases, forwards were characterised by short, intense efforts, with ACC·min⁻¹ and HMLD·min⁻¹ reflecting a greater contribution of repeated accelerative and decelerative actions relative to WM conditions (Table 3). This pattern likely reflects frequent stop-go movements, rapid repositioning between phases, quick lateral adjustments, and close-range ball carries that punctuate open play. These differences align with established positional demands in rugby, as highlighted in prior studies^{2,4}.

Interestingly, no statistically significant differences in HSR were found between BiP and WM for either positional group ($p = 0.444$ for forwards; $p = 0.187$ for backs), suggesting that HSR is largely confined to active play rather than accumulated during stoppages¹⁰. Despite similar absolute HSR between BiP and WM at the positional level, HMLD·min⁻¹ was substantially higher during BiP. As HMLD accumulates distance while accelerating ($\geq 2.5 \text{ m}\cdot\text{s}^{-2}$) and sprinting ($\geq 5.5 \text{ m}\cdot\text{s}^{-1}$) (Table 2), the concurrent increase in ACC·min⁻¹ supports an acceleration-driven elevation in locomotor load during BiP, independent of absolute HSR volume. Accordingly, conditioning should reference the BiP per-minute thresholds for TD, HSR, ACC, and HMLD reported in this study and be progressed with

position-specific tasks that reproduce these loads during active sequences, rather than WM averages.

This study analysed data from a single team, limiting generalisability across teams with varying playing styles or competition levels. Additionally, GNSS data, while valuable for quantifying physical output, do not capture tactical or technical elements influencing performance.

Practical Applications

These findings highlight the importance of tailoring training programmes to reflect the specific in-play intensity patterns quantified in this study, where BiP exceeded WM for ACC, HSR and HMLD with large effects (partial $\eta^2 \approx 0.97$ -0.98). Accordingly, conditioning should reproduce concentrated BiP passages and reference per-minute demands observed during active play, so that training targets the in-play intensity profile rather than WM averages.

Based on the current findings showing higher per-minute TD and ACC demands during BiP phases, particularly for players operating in wider and higher-speed roles (e.g., backs), training should emphasise repeated high-speed efforts performed within dense work periods, to replicate the clustered nature of running demands during active passages of play, consistent with previous work on rugby-specific running profiles^{18,28}. In this framework, sprint exposure is interpreted as repeated HSR occurring alongside elevated ACC·min⁻¹ and limited recovery, rather than as isolated maximal efforts, reflecting a shared BiP demand across positions with positional differences influencing emphasis rather than exercise type. Consistent with the higher ACC·min⁻¹ and elevated HMLD observed during BiP (despite similar absolute HSR), drills that pair HSR with frequent ACC and changes of speed directly target the locomotor demands of active play^{11,31}. Methods such as small-sided or transition-based games, when appropriately constrained, promote sustained HSR, positional awareness, and decision-making under fatigue³¹⁻³³, while allowing practitioners to elicit per-minute intensities comparable to BiP demands, reinforcing the relevance of game-based and running-based drills for replicating in-play demands^{4,15}. Elevated HMLD during BiP supports using extended transition/turnover games in larger playing areas to sustain HSR while preserving frequent accelerations (high ACC·min⁻¹) and repeated changes of speed under fatigue; unlike small-sided games or shuttle formats, these drills prioritise continuous high-intensity sequences rather than short stop-go bouts¹⁸.

Training considerations for forwards should likewise be grounded in the elevated per-minute ACC and HMLD observed during BiP phases, reflecting the elevated density of short-duration, high-intensity actions required during active play^{4,15}. Within this BiP-focused framework, forwards are typically exposed to frequent accelerative efforts, rapid

repositioning between phases, and repeated contact-related actions performed under fatigue, which collectively contribute to the elevated locomotor load captured by ACC and HMLD metrics ^{4,15}. Conditioning approaches that integrate repeated accelerations, brief recovery periods, and contact-specific constraints (e.g., wrestling, grappling, or ruck-based tasks) may therefore help reproduce the intensity profile of BiP passages for forward players ^{13,18}. Short, repeated shuttle-based accelerations and game- or circuit-based formats combining locomotor efforts with rugby-specific skills (e.g., tackling, rucking, recovery jogs) can further support exposure to BiP-relevant demands while maintaining technical specificity ^{18,33}. Overall, the elevated BiP ACC and HMLD per-minute values highlight the need for training approaches that integrate explosive actions with sustained effort under fatigue, rather than relying on WM-derived averages ^{13,18}.

Overall, these results emphasise the importance of aligning conditioning strategies with the measured in-play intensity profile of South American professional rugby. BiP data revealed concentrated, high-density workloads that should guide drill structure, intensity monitoring and load progression. This provides a new applied benchmark for teams competing in emerging professional environments and preparing athletes for transition to higher-tier international play.

Conclusion

This study demonstrates that BiP metrics provide a more accurate reflection of the physical demands of professional rugby union match play compared to WM data, while highlighting how positional demands manifest differently when expressed relative to active phases of play. The findings underscore the need for conditioning programmes that reference phase-specific BiP intensity profiles, rather than WM averages, to better reflect the most demanding passages of competition. Within this framework, positional considerations can guide emphasis without altering the underlying BiP-focused training rationale. Future research examining specific match phases (e.g., attack, defence, transitions) and tactical contexts would further clarify how playing style and match flow influence BiP demands within professional rugby competitions ^{17,22}.

328 **Statements and Declarations**

329 **Ethical considerations**

330 Ethical approval for this study was granted by the Middlesex University Ethics
331 Committee (ethics application number: 30233). The study was conducted in accordance
332 with the principles of the Declaration of Helsinki. Organisational consent for the use of
333 de-identified player tracking data was provided by the Unión de Rugby del Uruguay. The
334 Ethics Committee approved a waiver of individual informed consent due to the use of
335 anonymised data and the minimal risk nature of the study.

336 **Consent to participate**

337 Not applicable. Individual informed consent was waived by the approving Ethics
338 Committee due to the use of anonymised data collected as part of routine performance
339 monitoring.

340 **Consent for publication**

341 Not applicable.

342 **Declaration of conflicting interest**

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348 **Data availability**

349 The datasets generated and/or analysed during the current study are available from the
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Tables

Table 1. Anthropometrics data is presented for each positional group and whole team.

Positional Group	Age (year)	Bodyweight (kg)	Stature (cm)
Forwards (n=21)	25.1 (3.7)	112.9 (10.8)	186.9 (5.2)
Backs (n=14)	23.5 (4.2)	86.8 (8.6)	178.8 (4.5)
Team (n=35)	24.5 (3.9)	102.5 (16.3)	183.6 (6.3)

Data is presented as mean (SD).

Table 2. Analysed absolute and relative metrics and operational descriptions from GNSS units.

Metric	Description
Total Distance (TD)	Total distance covered (m) including walking, running, and sprinting
Total Distance per minute (TD·min ⁻¹)	Total distance covered (m) including walking, running, and sprinting divided by the total minutes played
Accelerations (ACC)	Number of changes in velocity over 3 m·s ⁻²
Accelerations per minute (ACC·min ⁻¹)	Number of changes in velocity over 3 m·s ⁻² divided by the total minutes played
High-Speed Running (HSR)	Distance covered (m) over 5 m·s ⁻¹
High-Speed Running per minute (HSR·min ⁻¹)	Distance covered (m) over 5 m·s ⁻¹ divided by the total minutes played
High-Metabolic-Load Distance (HMLD)	Distance (m) accumulated when running speed ≥ 5.5 m·s ⁻¹ or positive acceleration ≥ 2.5 m·s ⁻² , capturing cumulative high-intensity locomotor load during intermittent match play
High-Metabolic-Load Distance per minute (HMLD·min ⁻¹)	Distance (m) accumulated when running speed ≥ 5.5 m·s ⁻¹ or positive acceleration ≥ 2.5 m·s ⁻² divided by the minutes played

Table 3. Average outputs for whole match (WM) and ball-in-play (BiP) for all GNSS absolute and relative metrics.

		Mean BiP	Mean WM	BiP vs WM ES [95% CI]	Magnitude (SMD classification)
TD (m)	Forwards	1948.8 (174.6) *°	3706.3 (225.7) °	-8.26 [-11.82; -4.71]	Large
	Backs	2633.4 (362.3) *^	4989.9 (569.6) ^	-4.76 [-6.90; -2.62]	Large
	Team	2291.1 (228.1) *	4348.1 (331.4)	-6.92 [-9.93; -3.91]	Large
TD per min (m·min ⁻¹)	Forwards	111.3 (8.1) *°	40.5 (2.9) °	12.12 [6.94; 17.29]	Large
	Backs	118.5 (8.6) *^	54.5 (6.6) ^	7.93 [4.47; 11.38]	Large
	Team	114.9 (7.7) *	47.5 (4.1)	10.75 [6.15; 15.36]	Large
ACC (count)	Forwards	12.7 (2.6) *°	15.9 (2.5) °	-1.18 [-1.78; -0.58]	Large
	Backs	20.1 (3.4) *^	23.4 (3.0) ^	-0.97 [-1.59; -0.35]	Large
	Team	16.3 (2.8) *	19.6 (2.5)	-1.17 [-1.81; -0.53]	Large
ACC per min (count·min ⁻¹)	Forwards	0.7 (0.1) *°	0.2 (0.03) °	7.24 [4.12; 10.36]	Large
	Backs	1.0 (0.2) *^	0.3 (0.03) ^	5.73 [3.20; 8.26]	Large
	Team	0.8 (0.1) *	0.2 (0.03)	8.69 [4.95; 12.42]	Large
HSR (m)	Forwards	167.5 (26.1) °	188.2 (28.8) °	-0.71 [-1.08; -0.34]	Moderate
	Backs	448.9 (56.8) ^	490.3 (57.2) ^	-0.68 [-1.32; 0.05]	Moderate
	Team	308.2 (38.7)	339.2 (39.9)	-0.74 [-1.30; -0.18]	Moderate
HSR per min (m·min ⁻¹)	Forwards	9.1 (1.9) *°	2.1 (0.3) °	5.99 [3.41; 8.57]	Large
	Backs	21.7 (3.8) *^	5.4 (0.6) ^	6.97 [3.97; 9.98]	Large
	Team	15.4 (2.6) *	3.7 (0.5)	7.10 [4.05; 10.16]	Large
HMLD (m)	Forwards	382.8 (49.9) *°	457.3 (50.9) °	-1.39 [-2.07; -0.71]	Large
	Backs	726.6 (91.8) *^	798.1 (84.8) ^	-0.76 [-1.46; -0.06]	Moderate
	Team	554.6 (64.2) *	642.1 (60.6)	-1.32 [-2.09; -0.55]	Large
HMLD per min (m·min ⁻¹)	Forwards	21.1 (3.1) *°	5.0 (0.6) °	8.18 [4.67; 11.71]	Large
	Backs	34.5 (4.8) *^	9.0 (1.1) ^	8.14 [4.61; 11.66]	Large
	Team	27.9 (3.7) *	7.0 (0.8)	8.74 [4.98; 12.50]	Large

Data presented as mean (standard deviation); Effect sizes (ES) are presented as standardised mean differences with 95% confidence intervals. Magnitude classifications were based on the following thresholds: trivial (<0.2), small (0.2–0.5), moderate (0.5–0.8), and large (≥0.8).

* = significantly different from WM

° = significantly different from Backs

^ = significantly different from Forwards