

CORRECTION

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Correction: Quantifying Collision Frequency and Intensity in Rugby Union and Rugby Sevens: A Systematic Review

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Correction to: Sports Medicine - Open (2022) 8:12
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The following errors are noted and corrected:

1. In Abstract, Results, sentence 5: '156.1 (121.2–191.0)' should have been '171.2 (140.5–201.8)'.
2. In section Microtechnology, Rugby Union Training, final sentence: 'contacts' should have been 'tackles' and vice versa.
3. In section Video-Based Analysis, Rugby Union Match Play, sentence 3: '156.1 (121.2–191.0)' should have been '171.2 (140.5–201.8)'.

4. In Table 4: The following additional data have been added to the Vaz et al. (2010) (89) row:
Column 2: S12 competition: 95 matches;
Column 5: 112.7 ± 33.1 ;
Column 6: 99.4 ± 3.0 .

The original version of Table 4 has been replaced with the version shown below:

5. Fig. 5c: The two entries for Vaz et al. 2010 (89) have now been removed from this figure. The original version of Fig. 5 has been replaced with the version shown below:

The original article can be found online at <https://doi.org/10.1186/s40798-021-00398-4>.

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Table 4 Characteristics of collision frequency detected by video-based analysis in rugby union and rugby sevens.

Study: author (year)	Number of matches/ training sessions	Type of collisions	Frequency definition	Frequency of collisions: mean ± SD		Relative frequency of collisions: mean ± SD (no. per min)	
Rugby union							
Austin et al. (2011) [31]	7 matches	Tackling	Number during match play	Front row forwards: 20 ± 4 Back row forwards: 19 ± 4 Inside backs: 25 ± 13 Outside backs: 20 ± 7 Front row forwards: 62 ± 13		NR	
		Scrummaging (ruck/maul/ scrum)		Back row forwards: 68 ± 15 Inside backs: 17 ± 7 Outside backs: 14 ± 5			
Bradley et al. (2017) [33]	60 matches	Scrum	Scrum (count) total:	2013: 16.9 ± 4.3 2014: 14.7 ± 3.3 2015: 14.5 ± 3.3 2016: 16.5 ± 4.5		NR	
Campbell et al. (2017) [34]	14 matches	Tackles	Per match or training session	Match:	Training:	Match:	Training:
	29 training session		Outside backs:	1.5 ± 1	1.1 ± 1.5	0.01 ± 0.01	0.01 ± 0.01
			Centres:	5.7 ± 2.6	2.9 ± 3.1	0.06 ± 0.02	0.03 ± 0.04
			Halves:	4.5 ± 2.4	1.8 ± 2.2	0.05 ± 0.02	0.02 ± 0.02
			Loose forwards:	7.2 ± 3.2	2.4 ± 2.6	0.08 ± 0.03	0.02 ± 0.04
			Locks forwards:	6 ± 2.9	2.4 ± 2.6	0.07 ± 0.04	0.02 ± 0.02
			Front row forwards:	5.6 ± 3	1.7 ± 1.8	0.07 ± 0.05	0.02 ± 0.02
		Rucks	Loose forwards:	12.9 ± 4.2	1.3 ± 3.8	0.1 ± 0.04	0.01 ± 0.04
			Locks forwards:	15 ± 6.4	1 ± 4.1	0.2 ± 0.1	0.01 ± 0.04
			Front row forwards:	10.9 ± 4.5	1.2 ± 3.6	0.2 ± 0.1	0.01 ± 0.03
		Mauls	Loose forwards:	3.1 ± 2.7	1.5 ± 3	0.03 ± 0.03	0.01 ± 0.03
			Locks forwards:	3.3 ± 3	1.9 ± 3.3	0.03 ± 0.03	0.02 ± 0.03
			Front row forwards:	2.9 ± 2.6	1.8 ± 3.4	0.04 ± 0.04	0.02 ± 0.04
		Scrum	Loose forwards:	23.4 ± 3.9	1.8 ± 3.4	0.3 ± 0.06	0.02 ± 0.06
			Locks forwards:	21.4 ± 7.2	1.6 ± 3.2	0.3 ± 0.1	0.01 ± 0.03
			Front row forwards:	21.7 ± 5.5	1.6 ± 3.2	0.3 ± 0.2	0.01 ± 0.03
Deutsch et al. (1998) [40]	4 matches	Ruck/maul	Total	Props and Locks: 72 ± 7 Back row: 78 ± 8 Inside backs: 12 ± 2 Outside backs: 9 ± 4		NR	
		Scrum		Props and Locks: 32 ± 3 Back row: 35 ± 1			
Deutsch et al. (2007) [41]	9 matches			Forwards:	Backs:	NR	
		Ruck/maul	Total	66.9 ± 15.8	9.5 ± 5.7		
		Scrum		38.2 ± 8.7			

Table 4 (continued)

Study: author (year)	Number of matches/training sessions	Type of collisions	Frequency definition	Frequency of collisions: mean \pm SD		Relative frequency of collisions: mean \pm SD (no. per min)
Duthie et al. (2005) [43]	16 matches	Tackling		23.1 \pm 14	23.4 \pm 10.2	NR
				Forwards:	Backs:	
		Static exertion	No per game	Front row: 78 \pm 16	Inside back: 27 \pm 10	
				Back row: 82 \pm 17	Outside back: 13 \pm 5	
Eaton et al. (2006) [44]	6 matches	Tackles	No per game	Total: 80 \pm 17	Total: 21 \pm 11	NR
				Front row: 10 \pm 8	Inside back: 11 \pm 6	
				Back row: 13 \pm 5	Outside back: 7 \pm 4	
				Total: 11 \pm 7	Total: 9 \pm 6	
		Rucks and mauls	Number	Prop: 38 \pm 12		
				Hooker: 49 \pm 10		
				Lock: 49 \pm 19		
				Loose: 48 \pm 13		
		Tackling: Tackler		Scrum half: 15 \pm 5		
				Inside back: 15 \pm 9		
				Outside back: 13 \pm 6		
				Prop: 8 \pm 4		
		Tackled		Hooker: 8 \pm 4		
				Lock: 11 \pm 3		
				Loose: 13 \pm 6		
				Scrum half: 11 \pm 4		
Fuller et al. (2007) [45]	50 matches	Contact events	Average total	Inside back: 9 \pm 4		NR
				Outside back: 6 \pm 3		
				Prop: 5 \pm 3		
				Hooker: 7 \pm 4		
		Scrums		Lock: 4 \pm 2		
				Loose: 8 \pm 5		
				Scrum half: 9 \pm 4		
				Inside back: 5 \pm 3		
Fuller et al. (2008) [46]	26 matches	Tackles	General play total	Outside back: 5 \pm 3		NR
				Prop: 29 \pm 6		
				Hooker: 29 \pm 6		
				Lock: 29 \pm 6		
				Loose: 27 \pm 7		
				29 \pm 6		
Fuller et al. (2007) [45]	50 matches	Contact events	Total	22,842		NR
		Scrums	Total	1447		
		Tackles	Total	11,048		
		Rucks	Total	7124		
Fuller et al. (2008) [46]	26 matches	Mauls	Total	921		NR
		Tackles	General play total	6219		

Table 4 (continued)

Study: author (year)	Number of matches/training sessions	Type of collisions	Frequency definition	Frequency of collisions: mean \pm SD	Relative frequency of collisions: mean \pm SD (no. per min)
		One on one tackles	No of tackles in general play:	Tackler-1 (all): 3558 Arm: 1690 Collision: 384 Jersey: 93 Lift: 16 Shoulder: 826 Smoother: 526 Tap: 23	
		Double tackles	No of tackles in general play:	Tackler-1 (all): 2512 Arm: 1443 Collision: 10 Jersey: 86 Lift: 11 Shoulder: 746 Smoother: 209 Tap: 7 Tackler-2 (all): 2512 Arm: 1589 Collision: 14 Jersey: 22 Lift: 3 Shoulder: 358 Smoother: 527 Tap: 2	
		Arm double tackles:	No of tackles in general play:	Ball Carrier: Forward: 650 Back: 750	
		One-on-one collision tackles:	No of tackles in general play:	Ball Carrier: Forward: 146 Back: 217	
Hendricks et al. (2013) [49]	21 matches	Tackles	Per match	114 \pm 20	NR
Hendricks et al. (2014) [50]	18 matches	Scrum	Total	199	NR
		Maul	Total	152	
		Tackles	Per match	116 \pm 20	
Hendricks et al. (2018) [8]	12: Six Nations	Tackles	Each competition week	149	NR
			Per team	131	
			Total	4479	
			Championship	1853	
	15: Championship		Six Nations	2626	

Table 4 (continued)

Study: author (year)	Number of matches/training sessions	Type of collisions	Frequency definition	Frequency of collisions: mean \pm SD		Relative frequency of collisions: mean \pm SD (no. per min)	
Jones et al. (2014) [52]	4 matches	Rucks	Per match in Six Nations	175 \pm 21			
			Per match in Championship	154 \pm 36			
			Total	2914			
			Championship	1234			
			Six Nations	1680			
			Per match in Six Nations	112 \pm 27			
			Per match in Championship	103 \pm 30			
				Forwards:	Backs:		
		Tackles	Per match	5 \pm 3		4 \pm 3	
		Contacts hit	Per match	15 \pm 6		6 \pm 4	
Lacome et al. (2016) [54]	18 matches	Impacts	Total	25 \pm 9		15 \pm 7	
		Scrum	Number	13 \pm 5		0	
		Contacts	Total	31 \pm 14		16 \pm 7	
		Tackles	Players Completing Entire Match	NR		Forwards:	Backs:
						First half: 0.1 \pm 0.1	First half: 0.1 \pm 0.1
Lindsay et al. (2015) [55]	NR	Impacts:	Total	NR		Second half: 0.1 \pm 0.1	Second half: 0.1 \pm 0.1
						Group: 0.5 \pm 0.2	
						Forwards: 0.6 \pm 0.2	
						Backs: 0.4 \pm 0.2	
						Front row: 0.5 \pm 0.1	
		Tackles and tackle assists:	Total			Locks: 0.5 \pm 0.01	
						Loose forwards: 0.6 \pm 0.4	
						Inside backs: 0.4 \pm 0.2	
						Outside backs: 0.3 \pm 0.1	
						Groups: 0.1 \pm 0.1	
		Rucks:	Total			Forwards: 0.2 \pm 0.1	
						Backs: 0.1 \pm 0.1	
						Front row: 0.1 \pm 0.1	
						Locks: 0.2 \pm 0.1	
						Loose forwards: 0.2 \pm 0.1	
						Inside backs: 0.1 \pm 0.1	
						Outside backs: 0.07 \pm 0.1	
						Groups: 0.2 \pm 0.2	
						Forwards: 0.3 \pm 0.3	
						Backs: 0.1 \pm 0.1	
						Front row: 0.3 \pm 0.1	
						Locks: 0.3 \pm 0.1	
						Loose forwards: 0.4 \pm 0.4	
						Inside backs: 0.2 \pm 0.1	

Table 4 (continued)

Study: author (year)	Number of matches/training sessions	Type of collisions	Frequency definition	Frequency of collisions: mean \pm SD		Relative frequency of collisions: mean \pm SD (no. per min)
		Ball carries	Total			Outside backs: 0.1 ± 0.03 Groups: 0.1 ± 0.1 Forwards: 0.1 ± 0.1 Backs: 0.1 ± 0.1 Front row: 0.1 ± 0.1 Locks: 0.1 ± 0.02 Loose forwards: 0.1 ± 0.1 Inside backs: 0.1 ± 0.1 Outside backs: 0.1 ± 0.1
Lindsay et al. (2017) [56]	2 matches	Impacts	Total	Game 1: 21.3 ± 13.4		NR
				Game 2: 26.8 ± 13.5		
McIntosh et al. (2010) [57]	77 matches (15 Elite, 15 Grade, 24 < 20)	Collisions	Total	Elite: 1422		Tackle per hour:
				Grade: 1368		Elite: 142
				< 20: 2000		Grade: 152
						< 20: 135
Quarrie et al. (2007) [63]	26 matches		Number of match activities	1995:	2004:	NR
		Scrum		33 ± 7	26 ± 7	
		Rucks		72 ± 18	178 ± 27	
		Mauls		33 ± 8	22 ± 9	
		Tackles		160 ± 32	270 ± 25	
Quarrie et al. (2008) [64]	434 matches	Tackle events	Total analysed	140,269		NR
			Per game	203 ± 29		
Quarrie et al. (2012) [65]	27 matches	Scrum	Per match	Prop: 25 ± 7.8		NR
				Hooker: 25 ± 7.6		
				Lock: 25 ± 7.9		
				Flankers: 25 ± 7.9		
				Number 8: 25 ± 7.5		
				Prop: 1.4 ± 1.5		
				Hooker: 2 ± 2.04		
				Lock: 1.9 ± 1.9		
				Flankers: 1.8 ± 1		
				Number 8: 1.8 ± 1.4		
				Scrum Half: 0.2 ± 1		
				Fly Half: 0.2 ± 0.8		
				Midfield back: 0.3 ± 0.8		
				Wing: 0.2 ± 1		
				Full back: 0.3 ± 0.8		
		Successful tackles	Per match	Prop: 7.9 ± 3.6		
				Hooker: 9.7 ± 3.8		
				Lock: 11 ± 3.8		
				Flankers: 14 ± 4.1		
				Number 8: 12 ± 4		

Table 4 (continued)

Study: author (year)	Number of matches/training sessions	Type of collisions	Frequency definition	Frequency of collisions: mean \pm SD		Relative frequency of collisions: mean \pm SD (no. per min)
		Number of times tackled	Per match	Scrum Half: 8.2 ± 3.3 Fly Half: 9.7 ± 3.5 Midfield back: 10 ± 4 Wing: 5.5 ± 2.7 Full back: 4.1 ± 2.3 Prop: 3.6 ± 2.6 Hooker: 6.2 ± 3.2 Lock: 4.7 ± 2.8 Flankers: 6.1 ± 3.4 Number 8: 9.7 ± 3.9 Scrum Half: 4.3 ± 2.7 Fly Half: 3.9 ± 2.6 Midfield back: 6.5 ± 3.1 Wing: 5.4 ± 2.9 Full back: 6.1 ± 3.1 Prop: 33 ± 8		
Reardon et al. (2017) [24]	13 matches	Collisions	Total	Hooker: 29 ± 8 Second row: 33 ± 7 Back row: 42 ± 8 Scrum half: 10 ± 6 Out half: 19 ± 3 Centre: 23 ± 7 Wing: 22 ± 3 Fullback: 20 ± 5		NR
Reardon et al. (2017) [66]	17 matches	Collisions	NR	NR		Tight five forwards: 0.7 ± 0.6 – 0.8 Back row forwards: 0.9 ± 0.8 – 1.01 Inside backs: 0.3 ± 0.2 – 0.4 Outside backs: 0.4 ± 0.3 – 0.6
Roberts et al. (2008) [68]	NR			Forwards:	Backs:	NR
		Rucks	Number	35 ± 8	11 ± 6	
		Mauls		25 ± 8	4 ± 4	
		Scrum		21 ± 12		
		Tackle		14 ± 4	10 ± 4	
Roberts et al. (2014) [69]	30 matches (10 from each group: A, B, C)	Collisions	Total analysed	370		NR
		Scrum	Per match	32.2		
		Tackles	Per match	140.9		
		Rucks	Per match	115.0		
		Mauls	Per match	23.4		
Schoeman et al. (2015) [73]	30 matches	Tackles	Per position	60		NR
			Total tackles in 30 games:	Loose-head prop: 568		

Table 4 (continued)

Study: author (year)	Number of matches/training sessions	Type of collisions	Frequency definition	Frequency of collisions: mean \pm SD	Relative frequency of collisions: mean \pm SD (no. per min)
Smart et al. (2008) [74]	5 matches		Mean collision rate/80 min:	Hooker: 475	
				Tight-head prop: 553	
				Loose-head lock: 666	
				Tight-head lock: 674	
				Blind-side flank: 742	
				Open-side flank: 868	
				Eighthman: 797	
				Scrum-half: 423	
				Fly-half: 505	
				Left wing: 277	
				Inside centre: 668	
				Outside centre: 515	
				Right wing: 319	
				Full-back: 301	
				Loose-head prop: 39.3	
			Mean tackle rate/80 min:	Hooker: 38.5	
				Tight-head prop: 42.1	
				Loose-head lock: 44.8	
				Tight-head lock: 41.2	
				Blind-side flank: 46.1	
				Open-side flank: 50.9	
				Eighthman: 43.1	
				Scrum-half: 16.3	
				Fly-half: 19.5	
				Left wing: 19.4	
				Inside centre: 32.3	
				Outside centre: 25.7	
				Right wing: 19.9	
				Full-back: 20.5	
				Loose-head prop: 12.1	
				Hooker: 11.1	
				Tight-head prop: 13.2	
				Loose-head lock: 13.7	
				Tight-head lock: 14.1	
				Blind-side flank: 16.6	
				Open-side flank: 17.3	
				Eighthman: 14.7	
				Scrum-half: 8.9	
				Fly-half: 9.4	
				Left wing: 5.2	
				Inside centre: 12.9	
				Outside centre: 9.9	
				Right wing: 6.3	
				Full-back: 5.4	
				Forwards:	Backs:
				Forwards:	Backs:

Table 4 (continued)

Study: author (year)	Number of matches/training sessions	Type of collisions	Frequency definition	Frequency of collisions: mean \pm SD		Relative frequency of collisions: mean \pm SD (no. per min)	
		Tackles made	Per match	13.6 \pm 7.5	6.5 \pm 4.7	0.6 \pm 0.2	0.2 \pm 0.1
		Scrum	Number	12 \pm 4.4	0		
		Scrum	Total	147.4 \pm 89.8	0		
		Impact Collisions	Per match	43.6 \pm 18.3	13.5 \pm 7.4		
Smart et al. (2014) [75]	296 matches	Tackles	Successful tackles (%)	Forwards: 88 \pm 14	Backs: 80 \pm 20	NR	
Takarada (2003) [79]	2 matches	Tackle	Mean tackles per match	14 \pm 7.4		NR	
Tucker et al. (2017) [85]	1516 matches	Rucks	Per match	162.9		NR	
		Mauls	Per match	10.4			
		Tackles	Per match	158			
			Tackles/player/match	Fly half: 5			
				Scrum half: 3.8			
				Centre: 5.8			
				Full back: 2.1			
				Wing: 2.7			
				Hooker: 6.9			
				Number 8: 6.4			
				Prop: 5.5			
				Lock: 6.1			
				Flanker: 7.4			
Van Rooyen et al. (2008) [86]	7 matches	Impact contacts	Average per game	Total: 386		NR	
				Forwards: 257			
				Backs: 125			
			Scrum:	Forwards: 81			
			Ruck:	Forwards: 48			
				Backs: 8			
			Maul:	Forwards: 14			
				Backs: 4.5			
Van Rooyen et al. (2012) [87]	69 matches	Tackles	Total per match	21,886 (average 159 \pm 42)		NR	
			6 Nations	165 \pm 28			
			Tri Nations	141 \pm 24			
			RWC	156 \pm 47			
Van Rooyen et al. (2014) [88]	15 matches	Tackle	Tackle situations per match	Average: 191 \pm 32		NR	
				Average winning team: 89 \pm 30			
				Average losing team: 101 \pm 24			
Vaz et al. (2010) [89]	ons: 64 matches	Tackles made:	Total	Winners: 88 \pm 27.6	Losers: 89 \pm 37.8	NR	

Table 4 (continued)

Study: author (year)	Number of matches/ training sessions	Type of collisions	Frequency definition	Frequency of collisions: mean \pm SD		Relative frequency of collisions: mean \pm SD (no. per min)
	S12 competition: 95 matches			112.7 \pm 33.1	99.4 \pm 30	
Vaz et al. (2012) [90]	Training session (Small sided games)	Tackles	Tackles made:	Novice:	Experienced:	NR
Villarejo et al. (2013) [92]	48 matches	Tackles	Attempted tackles	28.2 \pm 3.3 Front row: 10 Second row: 10.9 Back row: 14.3 Scrum halves: 12.5 Middle backs: 10.5 Back three: 5.9	48.7 \pm 3.3	NR
			Tackles made	Front row: 8 Second row: 8.6 Back row: 11.2 Scrum halves: 8.3 Middle backs: 7.2 Back three: 3.7		
			Ineffective tackles	Front row: 0.7 Second row: 0.6 Back row: 1.1 Scrum halves: 1.7 Middle backs: 1.2 Back three: 0.9		
Villarejo et al. (2015) [93]	48 matches	Tackles	Attempted tackles	Winning team: Front row: 10.5 \pm 14.04 Second row: 10.2 \pm 8.6 Back row: 14.5 \pm 14.6 Scrum halves: 9.5 \pm 11.1 Inside backs: 9.3 \pm 12.9 Outside backs: 5.5 \pm 9.6	Losing team: Front row: 9.4 \pm 12.4 Second row: 11.6 \pm 14.9 Back row: 14.2 \pm 17.6 Scrum halves: 15.3 \pm 24.7 Inside backs: 11.4 \pm 10.6 Outside backs: 6.2 \pm 7.4	NR
			Effective tackles:	Front row: 8.9 \pm 12.9 Second row: 8.4 \pm 7.3 Back row: 12 \pm 11.6 Scrum halves: 7.5 \pm 9.3 Inside backs: 7.02 \pm 10.9	Front row: 6.8 \pm 9.8 Second row: 8.7 \pm 9.5 Back row: 10.6 \pm 14.9 Scrum halves: 8.8 \pm 15.4 Inside backs: 7.1 \pm 7.2	

Table 4 (continued)

Study: author (year)	Number of matches/training sessions	Type of collisions	Frequency definition	Frequency of collisions: mean \pm SD		Relative frequency of collisions: mean \pm SD (no. per min)
Virr et al. (2014) [94]	10 matches	Ruck/maul/tackle Scrum	Total number Ineffective tackles:	Outside backs: 4 ± 7.5	Outside backs: 3.3 ± 3.7	NR
				Front row: 0.5 ± 2	Front row: 0.9 ± 2.4	
				Second row: 0.5 ± 1.1	Second row: 0.8 ± 1.5	
				Back row: 1 ± 4.1	Back row: 1.1 ± 2.8	
				Scrum halves: 1.1 ± 3.1	Scrum halves: 2.3 ± 6	
				Inside backs: 0.7 ± 2.03	Inside backs: 1.5 ± 2.8	
				Outside backs: 0.5 ± 1.7	Outside backs: 1.4 ± 6.1	
Clarke et al. (2016) [37]	2 matches	Collisions	Collisions	Forwards: 61 ± 12 33 ± 7	Backs: 25 ± 11	NR
				Men: 51 Women: 44		
Hendricks et al. (2019) [3]	135 matches	Tackles	Per match	1.9 ± 1.3		NR
Higham et al. (2014) [5]	196 matches	Ruck	Total	8.4 ± 4.1		NR
		Scrum	Total	0.4 ± 0.7		
		Rucks	Per team per match			
Peeters et al. (2019) [60]	32 matches	Contact actions	Tackles/collisions/rucks/mauls	Forwards:	Backs:	NR
				First half: 5.3 ± 2.8	First half: 5.3 ± 3	
				Second half: 6.3 ± 2.9	Second half: 6.1 ± 2.7	
Reyneke et al. (2018) [67]	15 matches	Tackles:	Low (< 21 score):	3.4 ± 1.8		NR
			High (≥ 21 score):	3 ± 2		
		Scrum	Low (< 21 score):	1.6 ± 1.3		
			High (≥ 21 score):	1.2 ± 1.8		
		Ball Carry	Low (< 21 score):	4.4 ± 2.9		
			High (≥ 21 score):	4.9 ± 2.5		
Ross et al. (2015) [70]	NR	Tackles:	Total	NR		

Table 4 (continued)

Study: author (year)	Number of matches/ training sessions	Type of collisions	Frequency definition	Frequency of collisions: mean \pm SD		Relative frequency of collisions: mean \pm SD (no. per min)
Ross et al. (2015) [71]	54 matches	Rucks:	Provincial:			0.2 \pm 0.1
			International:			0.2 \pm 0.2
			Provincial:			0.1 \pm 0.1
			International:			0.2 \pm 0.2
		Ball Carries:	Provincial:			0.3 \pm 0.2
			International:			0.2 \pm 0.2
				Forwards:	Backs:	NR
		Tackles	Per match	2.7 \pm 2.6	2.41 \pm 2.5	
		Scrums		1.8 \pm 1.9		
		Ball Carries		3.2 \pm 2.4	4.1 \pm 3.2	
Ross et al. (2016) [72]	37 matches (between team analysis)	Tackles	Dominant tackles per match:	2.1 \pm 2.3		NR
	50 matches (single team analysis)		Ineffective tackles:	8.1 \pm 3.9		
		Rucks	Defensive ruck average per match:	1.2 \pm 0.3		
			Ruck average:	1.2 \pm 0.2		

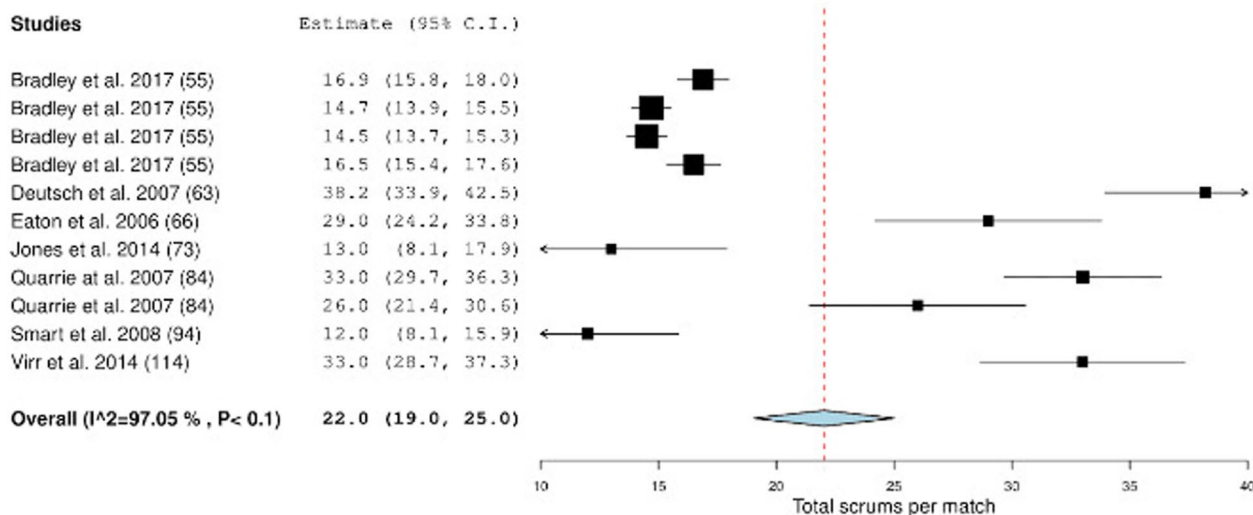
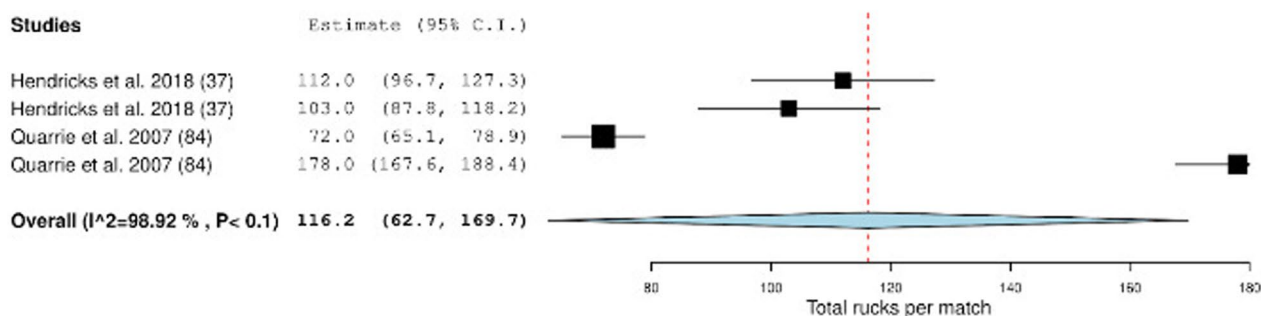
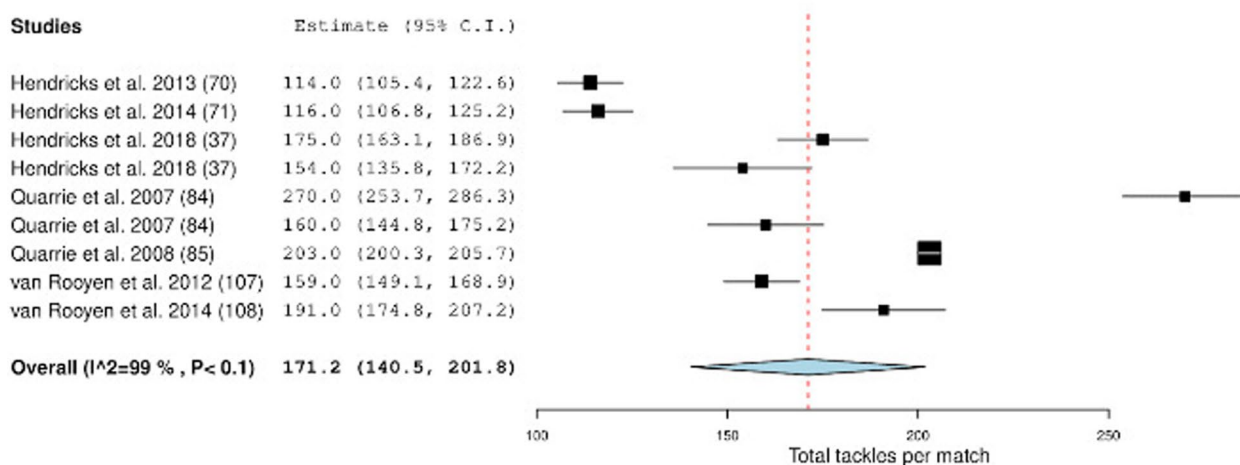
a.**b.****c.**

Fig. 5 Meta-analysis of studies reporting absolute total scrums, rucks, and tackles per match (n) from video-based analysis in rugby union. The forest plot (mean and 95% confidence interval (CI)) presents the results of the meta-analysis of the pooled data estimates for the total **a** scrums, **b** rucks and **c** tackles per match. The squares and horizontal lines represent individual study mean and 95% CI and the diamond presents the pooled mean and 95% CI. The bigger the square the larger the sample size

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