

BUCS Super Rugby Injury Surveillance Project

Season Report 2018-2019

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The authors would like to thank the coaches and sports injury staff at all participating teams in the BUCS Super Rugby Injury Surveillance Project for 2018-19.



**England
Rugby**

KEY FINDINGS

BUCS SUPER RUGBY MATCH INJURIES

Overall match injury incidence rate:

72.1 per 1000 player match-hours

or

Overall: 1.4 injuries per team per match

Mean severity:

32 days missed per injury

Injury event:

62% of all injuries in the tackle

Most common injury diagnosis

Concussion (19% of all injuries)

Injury accounting for most days lost

Knee joint/ligament injuries

EXECUTIVE SUMMARY

OVERALL FINDINGS

- ❖ The overall rate of injuries causing a player to miss more than 24 hours from training and match play in community rugby during season 2018-19 (72.1 injuries per 1000 player match hours) was similar compared with season 2017-18 (75.9 injuries per 1000 player match hours).
- ❖ On average, a team can expect one injury for every 1.4 games played.
- ❖ The injury rate is slightly lower than Premiership rugby and similar to Championship rugby.

Concussion – Most common injury diagnosis

- ❖ The incidence of reported concussion during season 2018-19 was 14.0 injuries per 1000 player match hours, compared with 16.6 injuries per 1000 player match hours in season 2017-18 and does not indicate a significant difference.
- ❖ This incidence is slightly lower to that reported for Premiership rugby and higher than men's adult community rugby.
- ❖ There was one concussion approximately every three to four team games.
- ❖ 79% of all concussions were sustained in the tackle and the incidence of concussions sustained when tackling (7.1 per 1000 player match hours) was almost double that of being tackled (3.9 injuries per 1000 player match hours).
- ❖ Concussion incidence for forwards (16.7 concussions per 1000 player match hours) was higher than for backs (11.6 concussions per 1000 player match hours).

The Tackle – Most common injury event

- ❖ The tackle was associated with 62% of all injuries.
- ❖ When the player is tackling, the most commonly injured sites are the head (mainly concussion) and upper limb (mainly shoulder). Good tackling technique has the potential to reduce injuries to these areas.
- ❖ The most commonly injured sites to the ball carrier are in the lower limb (ankle, thigh and knee).

Injury burden (number x time lost per injury)

- ❖ Knee ligament/joint injuries incurred the highest number of days lost to injury, mainly due to a high average severity.

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INTRODUCTION

The BUCS Super Rugby competition represents the highest level of university rugby in the UK and a potential pathway for university players into elite rugby. For these reasons the inception of The BUCS Super Rugby injury surveillance project was seen as an important step in understanding the injury patterns at this level of play. Similar Injury surveillance projects have been ongoing in Premiership (PRISP) and in a range of levels (RFU 3-9) in the community game (CRISP) as well as in schoolboy rugby. The information generated through this project helps to inform the medical provision and player welfare standards required for the league as set out in the minimum operating standards for BUCS Super Rugby. It should be noted that the BUCS Super rugby competition represents the highest level of University rugby with advanced coaching and medical support and therefore may not be representative of teams playing in lower-level university leagues.

Over the 2018-19 season, the BUCS Super Rugby competition comprised ten teams and the following report provides information on the mean of all teams playing in the league who contributed to the Project. The methods used in the BUCS Super Rugby injury surveillance project are the same as those used in the Professional rugby injury surveillance project (PRISP) and Community rugby injury surveillance project (CRISP) so that where possible, data is comparable.

DEFINITIONS

All methods and definitions used in this study comply with those outlined in the consensus statement for injury definitions and data collection procedures for studies of injuries in rugby union (Fuller et al 2007).

Time-loss injury

A time-loss injury was defined as 'any injury that prevents a player from taking a full part in all training activities typically planned for that day and/or match play for more than 24 hours from midnight at the end of the day the injury was sustained'. For example, if a player was injured during a match on Wednesday and he was able to take a full part in training on Friday, the incident would not be classed as an injury. If the player's training was restricted on Friday due to the injury received on Wednesday, the incident would be classed as a time-loss injury and reported.

Injury severity

Injury severity was measured as time (days) lost from competition and practice and defined as the number of days from the date of the injury to the date that the player was deemed to have regained full fitness not including the day of injury or the day of return. A player was deemed to have regained full fitness when he was 'able to take a part in training activities (typically planned for that day) and was available for match selection.' Severity is subdivided into the following categories: 2-7 days, 8-28 days, 29-84 days and greater than 84 days.

Injury incidence and days absence

The likelihood of sustaining an injury during match play or training is reported as the injury incidence. Time-loss injury data is presented as the number of injuries per 1000 player-hours of match exposure. This is a standardised method of presenting injury information so that data can be compared between different groups with a different number of matches. It is calculated by:

Injury incidence =

$$\text{number of Injuries} / \left((\text{number of matches} \times \text{number of players (15)} \times \text{match duration (1.33 hours)}) / 1000 \right)$$

Confidence interval (CI)

The confidence interval shows, with 95% certainty, the likely range of the true value for a given statistic.

Burden

The burden of injury is a measure which takes into account both the frequency and severity of injuries. Burden is measured as the number of days absence per 1,000 player-hours of exposure.

Statistical significance

A result is considered to be statistically significant if the probability that it has arisen by chance is less than 5% or 1 in 20. In this report, statistical analysis has been performed for the match incidence and days absence.

MATCH INJURY INFORMATION

Overall injury incidence and severity

For the 2018-19 BUCS Super Rugby season, 222 match injuries were reported over 154 matches for all teams. This resulted in an overall time-loss injury incidence of 72.1 injuries per 1000 player match hours which is not significantly different compared with the value of 75.9 injuries per 1000 player match hours in 2017-18. This information, along with the average severity (number of days absence) and burden (days absence per 1000 player match hours) is shown in Table 1. Figure 1 shows the injury incidence compared with Premiership, Championship and Under 18 schoolboy rugby in the same season.

Table 1. Match injury incidence, severity and burden for time-loss injuries over multiple seasons.

Season	Injuries	Match hours	Incidence (95% CI)	Average days absence	Burden
2017-18	220	2900	75.9 (66.2-86.6)	27.6	2109
2018-19	222	3080	72.1 (62.9-82.2)	31.9	2301
Mean (2017-19)	442	5980	73.9 (67.2-81.1)	29.9	2210

Table 2. Match injury incidence for each severity classification.

	2-7 days	8-28 days	29-84	>84	Unknown
2017-18	24.5	24.1	13.4	4.5	9.3
2018-19	19.2	28.9	13.3	4.9	5.8
Mean	21.7	26.6	13.4	4.7	7.5
(2007-19)	(18.2-25.8)	(22.6-31.1)	(10.6-16.6)	(3.1-6.8)	(5.5-10.1)

Note: The injury severity categories in this table are equivalent to the categories used in other reports where classification are presented as days lost.

Likelihood of match injury when playing compared with other playing levels

The data collection methods used in this project are standardised across other related projects at other levels of the English game. This allows a comparison of all injuries of greater than 24 hours time-loss across different playing levels. Figure 6 demonstrates a very similar injury incidence for BUCS Super Rugby compared with the Greene King IPA Championship and a general increase incidence of injury as the level of player increases across age groups.

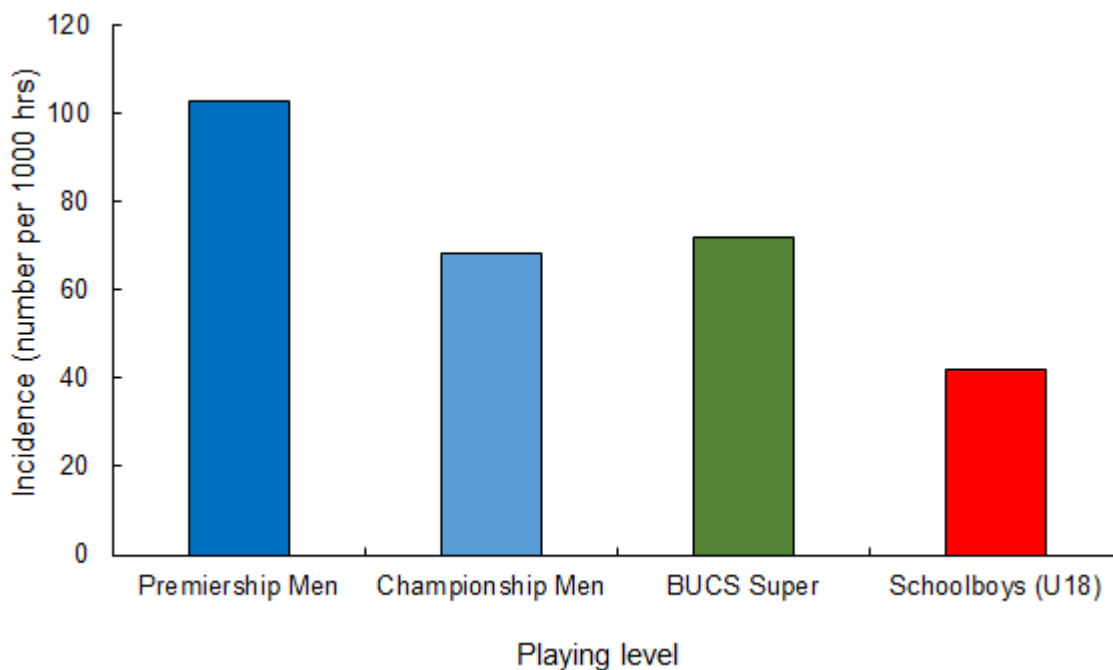


Figure 1. A comparison of injury rates for different levels of BUCS Super Rugby with professional and Under-18 schoolboy rugby.

Data sources: Professional data is taken from the Professional Rugby Injury Surveillance Project (PRISP) report 2018-2019. Information on schools is derived from the youth rugby injury surveillance report for 2018-19.

Injury event

The events associated with injury are shown in Figure 2. The tackle was the most common injury event associated with injury, collectively accounting for 62% of match injuries. This finding is common across other injury surveillance studies and season 2017-18 of this project (Figure 2). Within the tackle, the tackled player (ball carrier) incurs a higher incidence compared with the tackling player.

Figure 3, provides information which combines both the incidence and the average severity (days absence) for each injury event. This shows that the tackled player (ball carrier) is associated with the highest incidence, the mean severity is great for the tackling player. Further information on injury events, particularly relating to the tackle, can be found in the supplementary data.

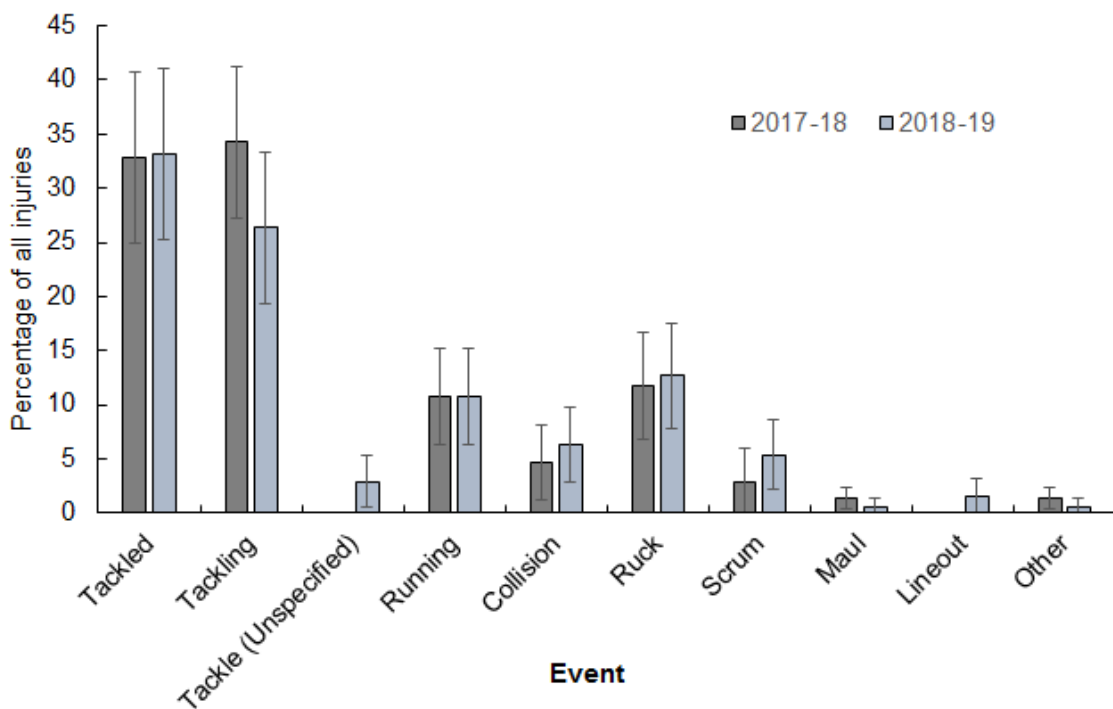


Figure 2. The incidence of injuries for specific match events for all playing levels combined

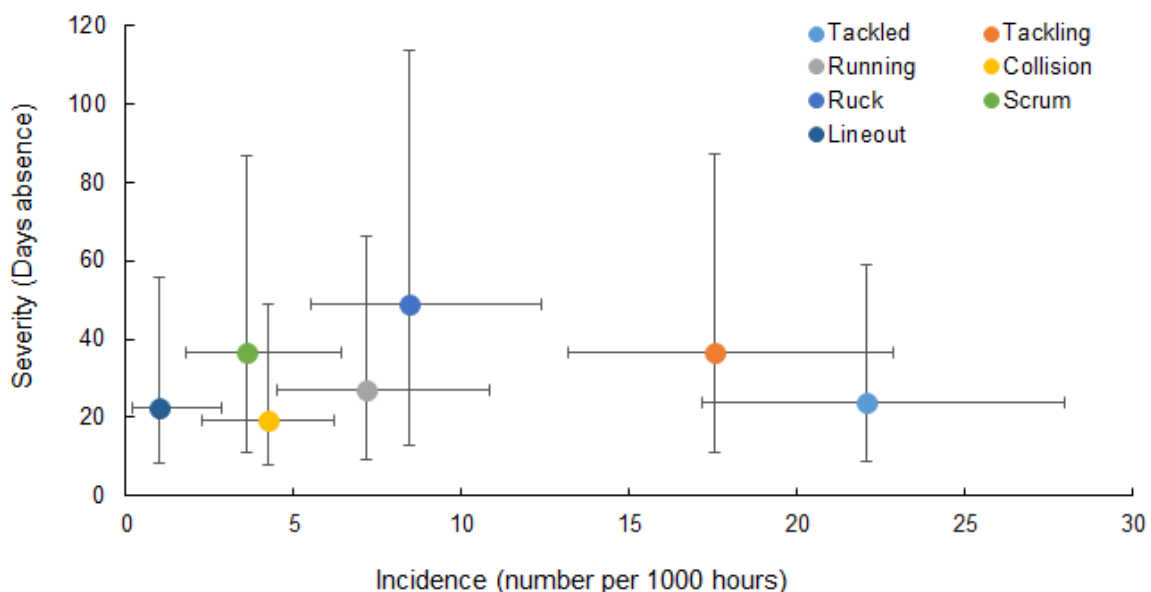


Figure 3. Injury event by incidence and severity for all playing levels combined.

Injury location

The section provides some information on the most common injury sites of the body. Figure 4 provides the distribution across the four body regions and shows that the most commonly injured body region is the lower limb, accounting for 43% of all injuries.

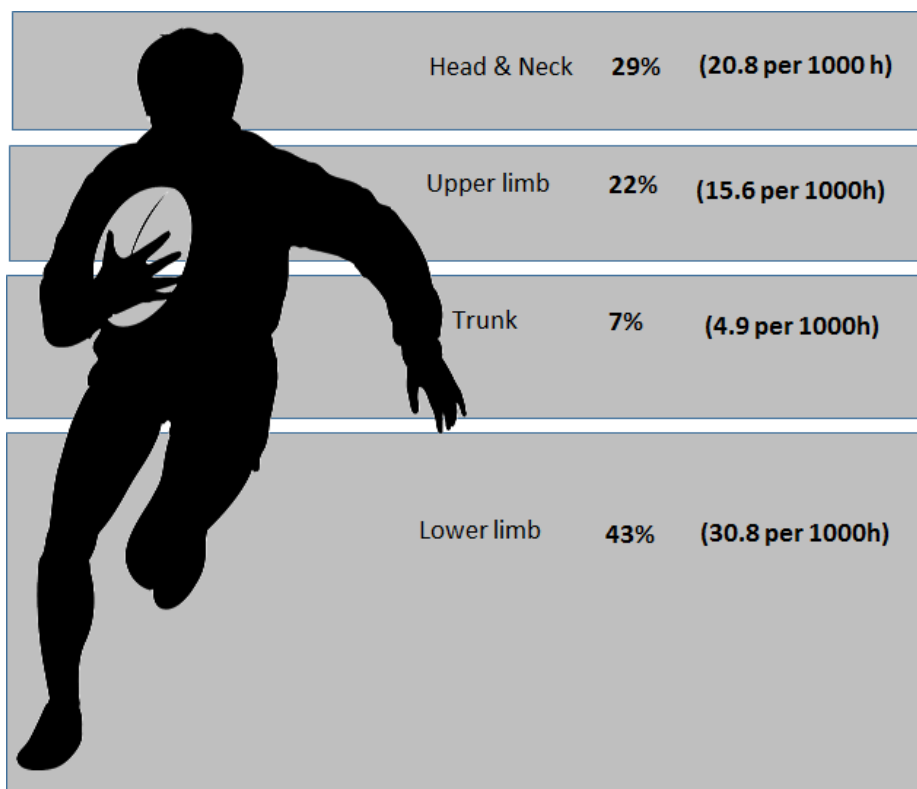


Figure 4. The distribution of match injuries by body region by percentage and incidence.

Table 3 provides more detailed information on the specific body sites and the associated incidence, severity and burden. Sites are ranked overall by colour coding (red: highest and green: lowest) while also ranked in order of burden within each body region. The head/face has the highest incidence (16.9 injuries per 1000 player match hours) but by virtue of a higher mean severity, the shoulder has the highest burden (644 days absence per 1000 player match hours). Collectively, when the injuries to the knee, ankle and thigh are combined, lower limb injuries account for the greatest number of days absence.

Table 3. Incidence, mean severity and burden by body location (ranked within regions for burden). For incidence and burden, values are colour coded (red: highest value; green: lowest value).

Body region	Location of injury	Number of injuries	Incidence	Mean severity	Burden
Head/neck	Head/face	52	16.9	20.5	346
	Neck	12	3.9	11.9	46
Upper limb	Shoulder	38	12.3	52.2	644
	Wrist & hand	7	2.3	36.0	82
	Elbow	1	0.3	13.0	4
	Forearm	1	0.3	6.0	2
	Upper arm	1	0.3	4.0	1
Trunk	Lumbar Spine	6	1.9	67.5	131
	Trunk & Abdomen	6	1.9	10.5	20
	Thoracic Spine	1	0.3	25.0	8
	Chest	1	0.3	5.0	2
Lower limb	Knee	22	7.1	55.8	399
	Ankle	32	10.4	31.1	323
	Thigh	23	7.5	19.1	143
	Hip & groin	5	1.6	33.0	54
	Foot	3	1.0	50.0	49
	Lower leg	9	2.9	8.2	24
	Pelvis & buttock	2	0.6	27.5	18

Injury diagnoses

The top five most common injury diagnoses (site and general injury type) for all clubs over the current and previous season are presented in Figure 5. The top five injuries remain the same across both seasons, with concussion, in both seasons having the highest incidence.

Figure 6 shows the top five injuries defined by the total amount of time that the injury keeps players out of match play and training. This is the injury burden defined as the incidence of injuries combined with the severity to determine the total time lost.

Figure 7 shows how the top injury diagnoses by burden are distributed by incidence and severity. For example the higher total days lost through knee ligament/joint injuries compared with concussion is largely governed by a higher injury severity.

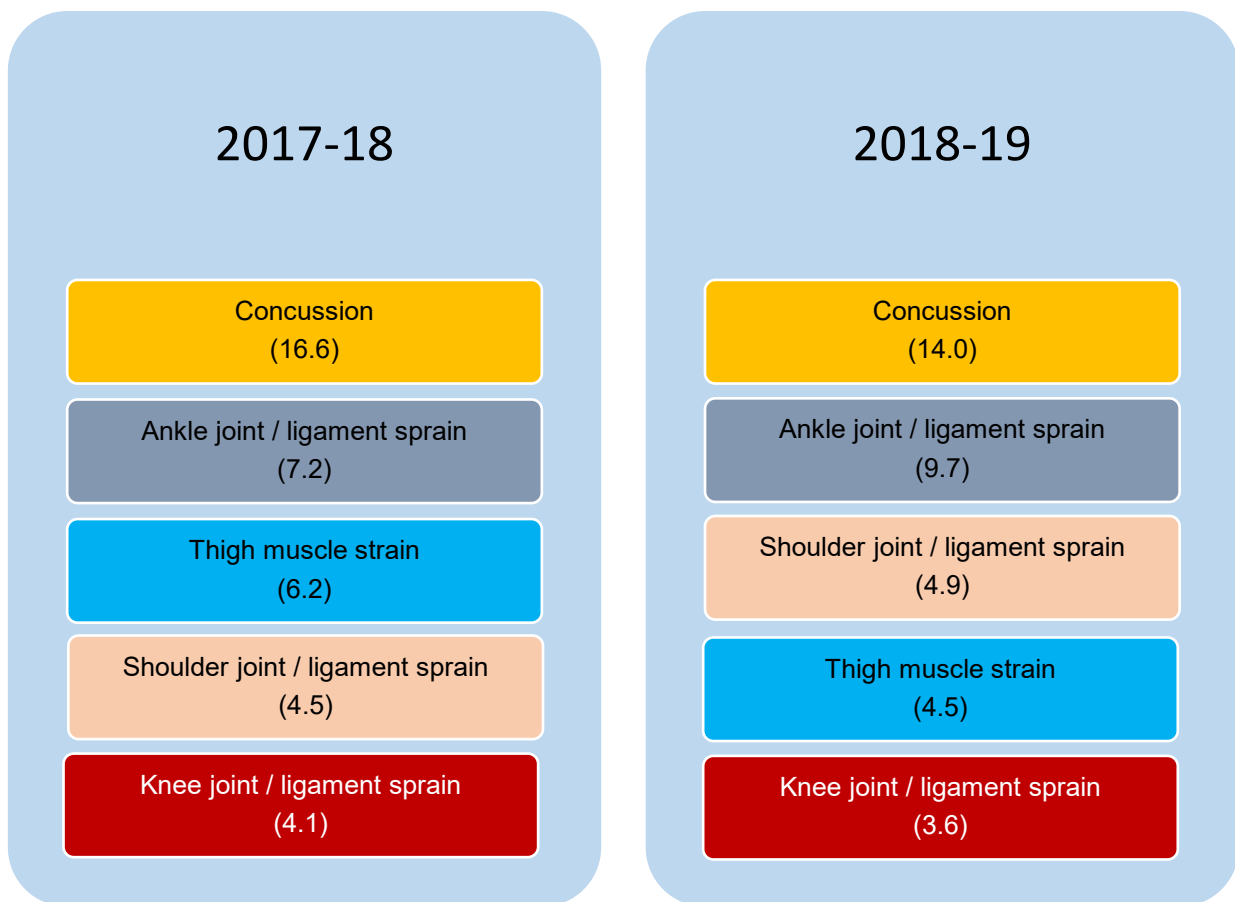


Figure 5. Top five injury diagnoses in rank order for **incidence** over seasons 2017-18 to 2018-19. Numbers within brackets denote incidences (injuries per 1000 player match hours).

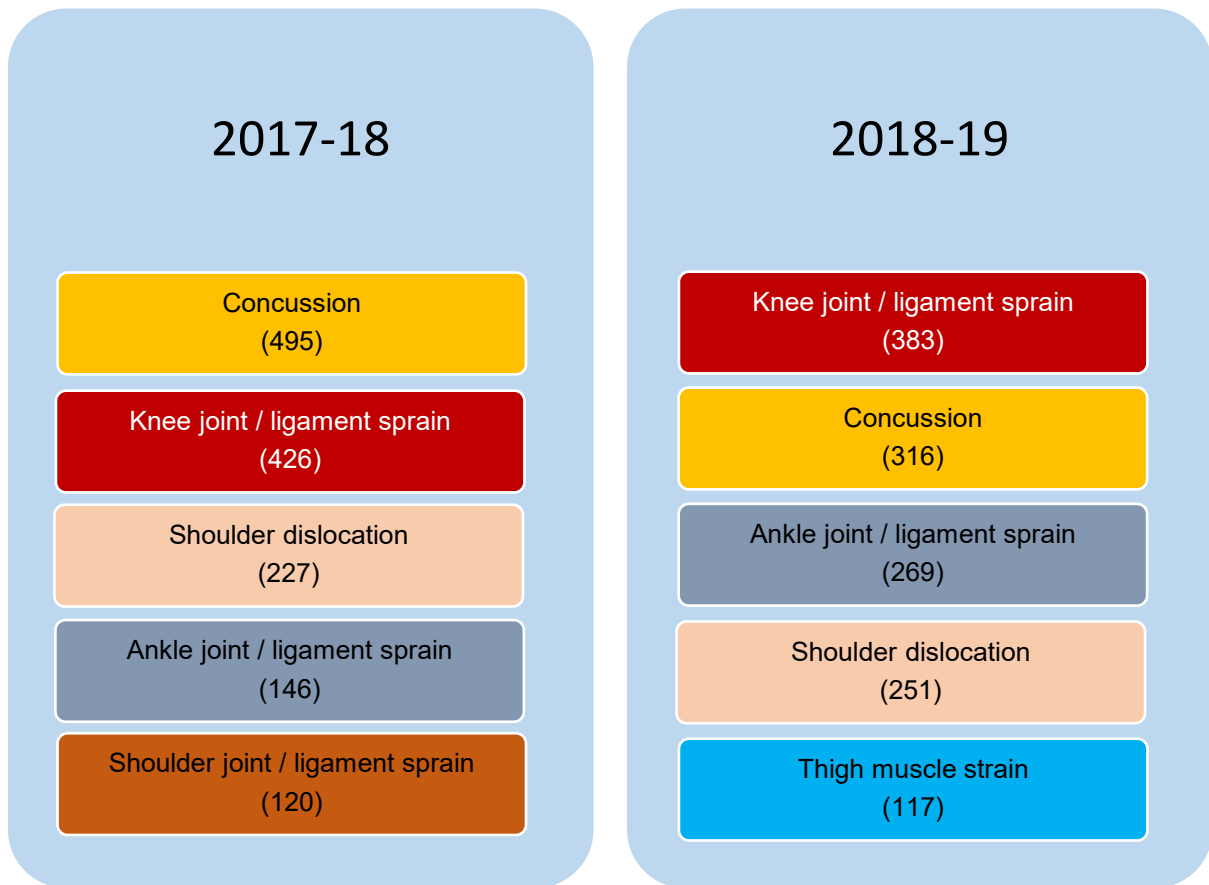


Figure 6. Top five injury diagnoses in rank order of **burden** over seasons 2017-18 to 2018-19. Numbers within brackets denote (number of days missed per 1000 player match hours).

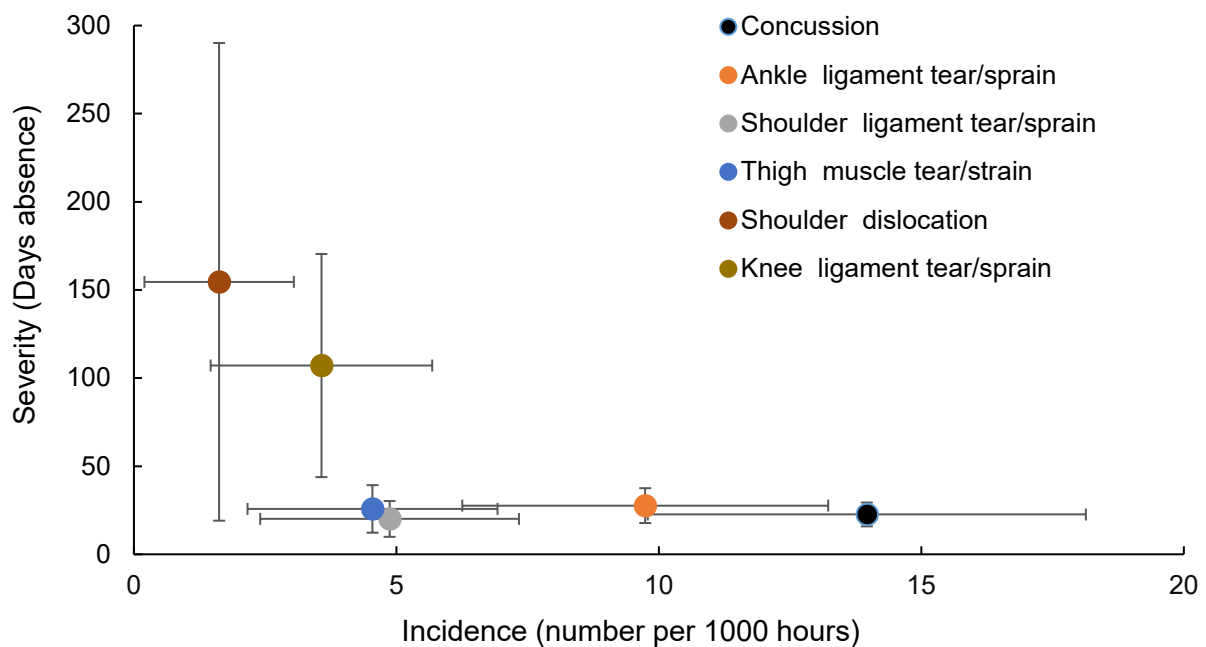


Figure 7. Injury diagnosis type by incidence and severity for season 2018-19.

Concussion

Concussion incidence and severity

The overall concussion incidence was 14.0 per 1000 player match hours (19 percent of all injuries), which compares with the incidence of 16.6 per 1000 player match hours for season 2017-18. The Premiership concussion incidence for 2018-19 was 20.4 per 1000 player match hours. The incidence for RFU National leagues 1 and 2 North and South was lower at 4.7 per 1000 player match hours.

Table 4. Concussion injury incidence for severity categories.

	2-7 days	8-28 days	29-84	>84	Unknown	ALL
2017-18	2.1	9.0	2.8	1.0	1.7	16.6
2018-19	1.0	9.7	1.9	0.3	1.0	14.0
Mean (2007-19)	1.7 (0.8-3.1)	9.2 (6.9-12.0)	2.3 (1.3-3.9)	0.7 (0.2-1.7)	1.3 (0.6-2.6)	15.2 (12.3-18.7)

Concussion and Return to Play

The average number of days absence for a concussion was 23 days (median of 20 days) which is very similar to the average of 22 days for Premiership players. This difference may be partly due to players in the BUCS Super rugby having less access to the enhanced care setting compared with Premiership players which provides the possibility of an accelerated return to play through more comprehensive medical supervision during recovery. Table 6 shows that 13% are resolved in less than 8 days with the majority between 8 and 28 days. Figure 7 shows the percentage of concussions for which the player had regained fitness and the number of days which the concussions take to resolve. This figure shows that seven percent (three injuries) of all concussed players returned in six days which is the minimum time in which a player can return when the enhanced care setting is available at a club. Additionally, 39 percent of all concussions resolved in less than 19 days which is the minimum amount of time within which a player can return when the enhanced care setting is not available.

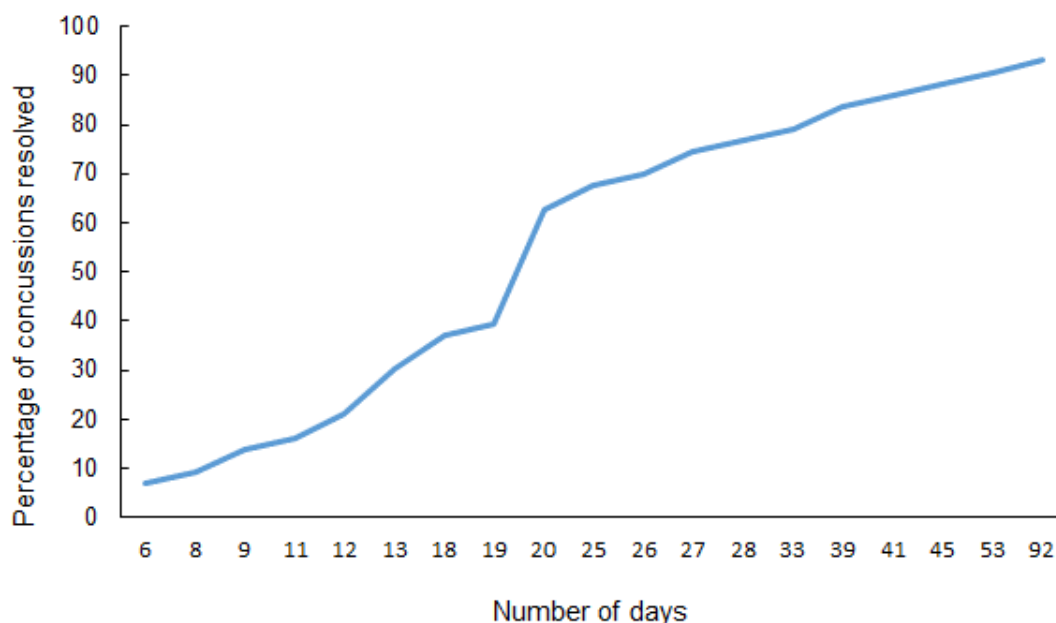


Figure 7. The percentage of concussions resolved over the number of days.

Match events associated with concussion

For season 2018-19, the tackle was reported as the injury event for 79% of all concussions with 28% of all concussions to the ball carrier and 51% to the tackling player (Figure 14). This is a common finding across previous seasons and other levels of play (Professional, University and Schoolboy). Further work is required to understand the specific characteristics of tackles which result in injury.

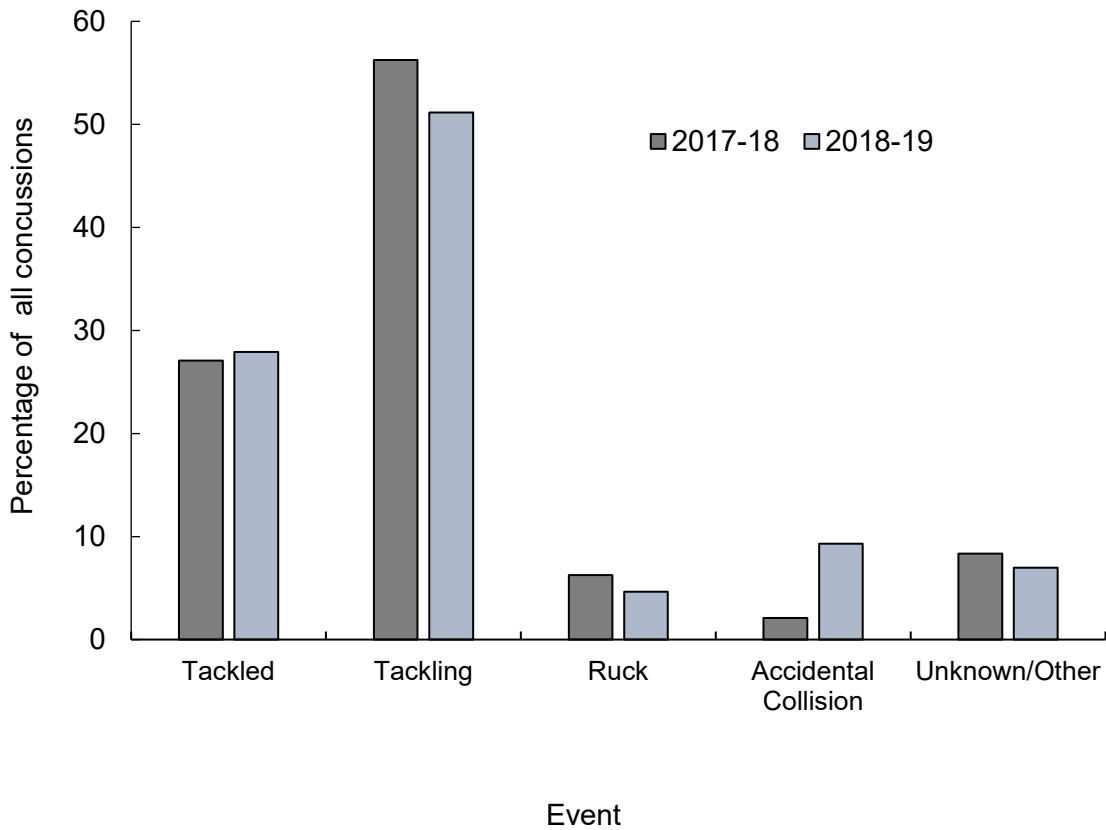


Figure 14. Percentage of reported concussions by match event for season 2018-19.

Playing position

There was no significant difference in the injury incidence in forwards (68.2 injuries per 1000 player hours) compared with backs (71.7 injuries per 1000 player hours). Figure 15 shows the injury incidence for positional groups for season 2018-19 compared with season 2017-18.

The mean number of days missed for an injury to a forward was 33 compared with 32 for a back and therefore there is no difference in the severity of injury for these groups.

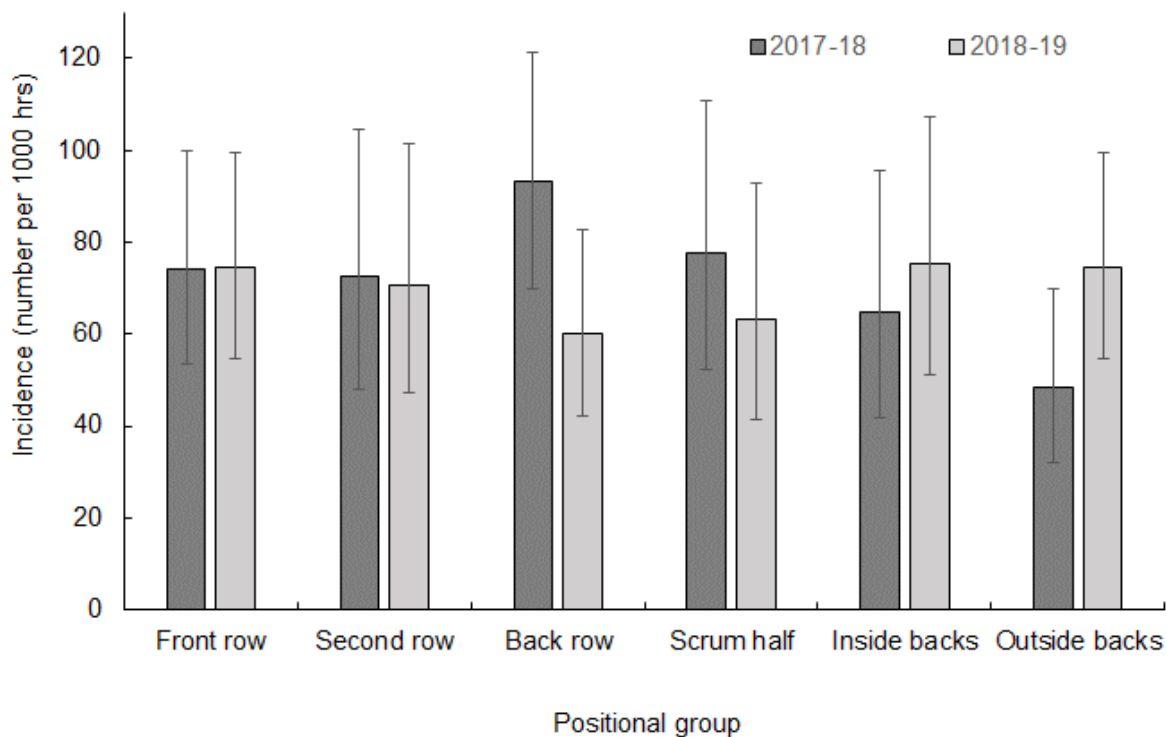


Figure 15. Comparison between positional groups for injury incidence.

Forwards: Front row: loose head and tight head props, hooker, Second row: left and right locks; Back row: open side and blind side flankers, No. 8; Backs: Half backs: scrum half and outside half; Inside backs: inside centre, outside centre; Outside backs: left and right wings, full back.

Figure 16 shows the distribution of injuries for forward and backs by body region. There was a higher incidence of injuries to the head and neck for the forwards which is partly driven by a higher incidence of concussion injuries for forward (Figure 17). This is likely to be a result of forwards being involved in more contact events where nearly all head injuries are sustained. There were more lower limb injuries for backs partly due to more thigh haematomas and muscle strains (Figure 17), the latter of which are mostly sustained through a greater high speed running load in this positional group.

Forwards		Backs	
Head & Neck	35% (23.7 per 1000 h)	Head & Neck	24% (17.4 per 1000 h)
Upper limb	21% (14.0 per 1000h)	Upper limb	22% (16.0 per 1000h)
Trunk	8% (5.5 per 1000h)	Trunk	5% (3.5 per 1000h)
Lower limb	37% (25.0 per 1000h)	Lower limb	49% (34.8 per 1000h)

Figure 16. Percentage and injury incidence for each body region for forwards and backs.



Figure 17. Top five injury types for forwards and backs by incidence.

Timing of the season

The distribution of injuries by each month of the season are shown in Figure 18. There is a high amount of variability for injury incidence in September and January but it is important to note that there was a low number of matches (and injuries) in these month as the BUCS Super rugby season begins towards the end of September and comprises an extended break in matches between the latter end of December and the second half of January. This may account for the large differences in injury incidence in September and January.

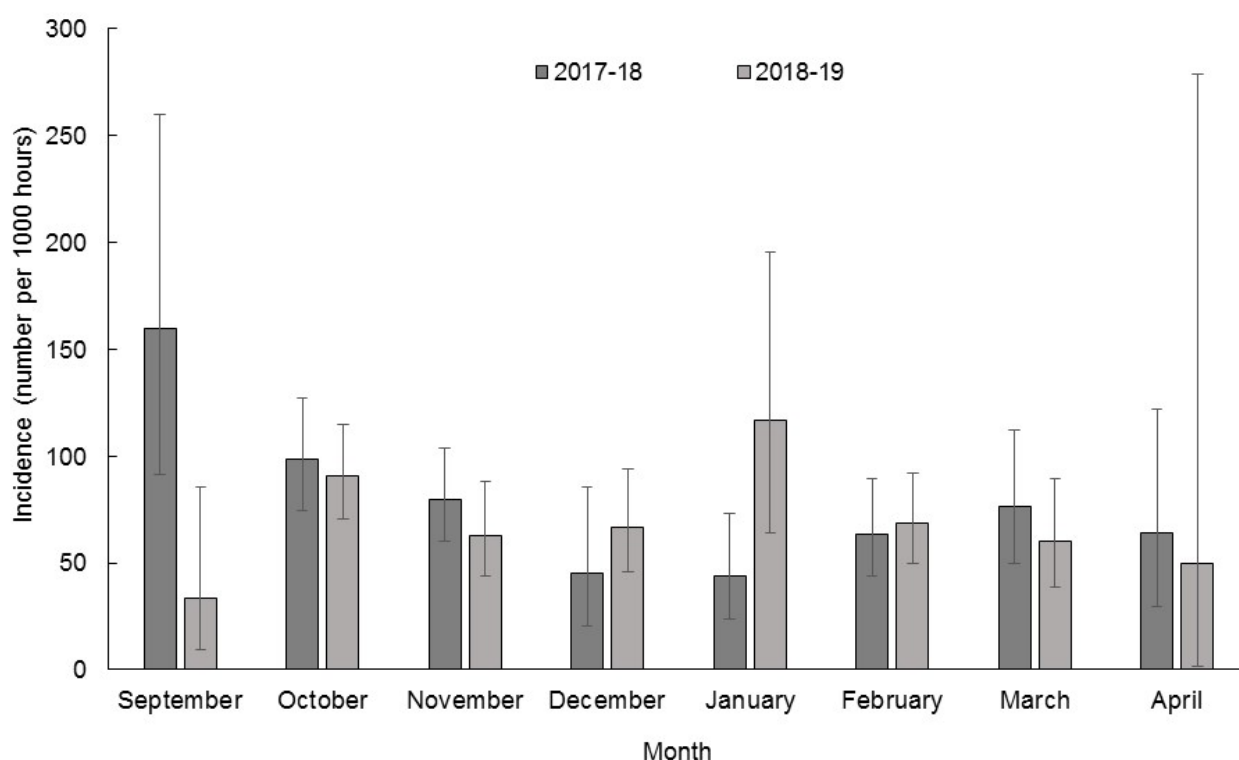


Figure 18. Incidence of time-loss injuries over each month for the 2018-19 rugby season, with equivalent data combined for 2017-18 for comparison.

Note: A low number of matches took place in September, January and April which results in a greater chance or variability in the injury incidence for these months between seasons.

FUTURE DIRECTIONS FOR THE PROJECT

Continued injury surveillance

The BUCS Super rugby injury surveillance project has now been run over two seasons with data collection ongoing for season 2019-20. This information provides an increasingly large number of injuries to further our confidence of injury patterns at this level of rugby. Additionally, this information provides the opportunity to compare injury trends over consecutive seasons. In this way, it is possible to examine the potential influence of law changes or the effects of any other methods of intervention on injury patterns.

The results provided in this report are only relevant to the men's elite level university rugby and it would not be appropriate to be generalise this to different playing levels and groups. Similar surveillance studies are running concurrently in English Professional rugby (PRISP), Women's elite game (WRISP), Championship rugby, University Super Rugby and Schools rugby from U13-U18., using similar injury definitions and therefore providing data which can be compared across these different playing levels.

Understanding tackle characteristics

The data provided over season 2017-18 and 2018-19 has shown that in this level of rugby, the tackle accounts for over 60% of all injuries and approximately 80% of all concussions. Current work is being carried out to understand more about the tackle in BUCS Super rugby by coding video footage to characterise which tackle types may have the potential to lead to injury.

PROJECT METHODS

- Injuries from consented 1st team squad players sustained in all matches from eight teams in BUCS Super rugby competition were included.
- Match exposure data were provided by eight BUCS Super rugby team in 2018-2019.
- Medical personnel at teams reported the details of match injuries sustained by a player at their team that were included in the study group together with the details of the associated injury event.
- Injury and illness diagnoses were recorded using the Orchard Sports Injury Classification System (OSICS) version 10.1. This sports specific injury classification system allows detailed diagnoses to be reported and injuries to be grouped by body part and injury pathology.
- The definitions and data collection methods utilised in this study are aligned with the IRB (now World Rugby) Consensus statement on injury definitions and data collection procedures for studies of injuries in rugby union.

ACKNOWLEDGEMENTS

Many thanks to the coaches and sports injury staff at all participating teams in the BUCS super rugby Injury surveillance project for 2018-19:

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Cardiff Metropolitan University
Durham University
University of Exeter
Hartpury University
Loughborough University
Northumbria University
Nottingham Trent University

BUCS super rugby Injury surveillance project team

Prof Keith Stokes - Department for Health, University of Bath (Lead Investigator)
Dr Simon Roberts - Department for Health, University of Bath (Research Fellow)
Dr Simon Kemp - RFU Medical Services Director
Rachel Faull-Brown - RFU Player Welfare Manager

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SUPPLEMENTARY DATA

This section contains additional data to that of the main findings.

Tackle-related injuries

The tackle event (both as tackler and ball carrier) accounts for 62% of all injuries and this injury events warrants further analysis. Figures S1, S2 and S3 demonstrate the incidence, severity and burden of tackle injuries to the tackler and ball carrier.

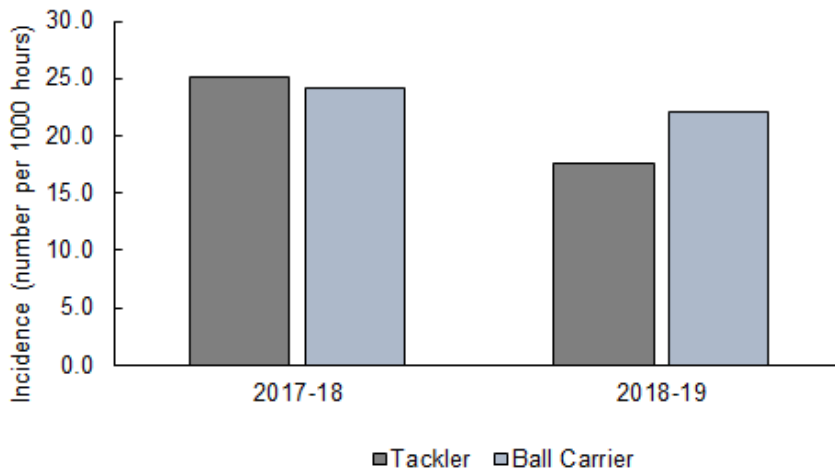


Figure S1. Injury incidence to the tackler and ball carrier over seasons 2017-18 and 2018-19

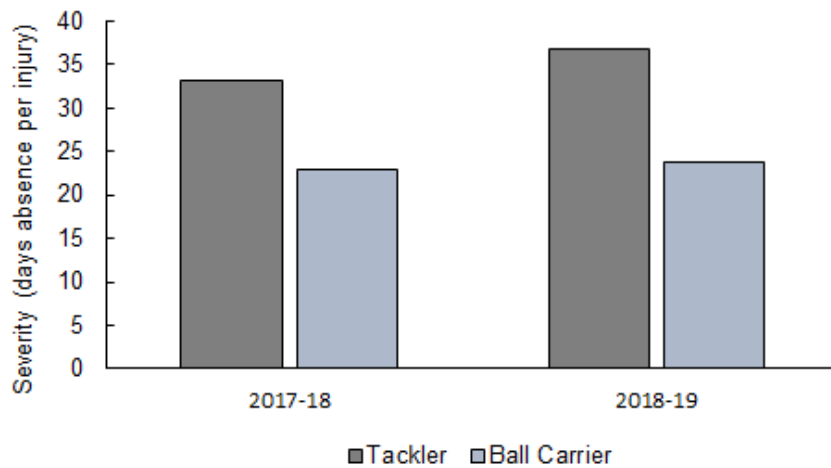


Figure S2. Injury severity (average days missed per injury) to the tackler and ball carrier over seasons 2017-18 and 2018-19

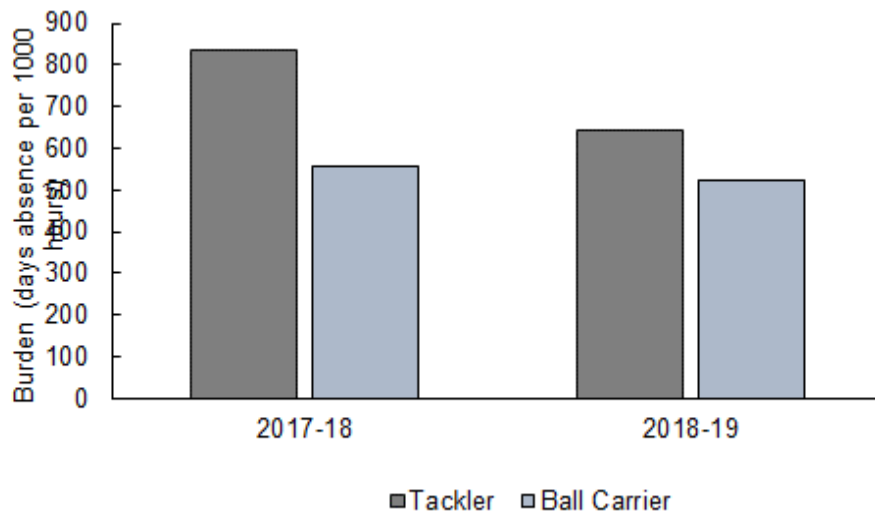


Figure S3. Injury burden (days missed per 1000 player hours) to the tackler and ball carrier over seasons 2017-18 and 2018-19

The tackle and injury diagnosis

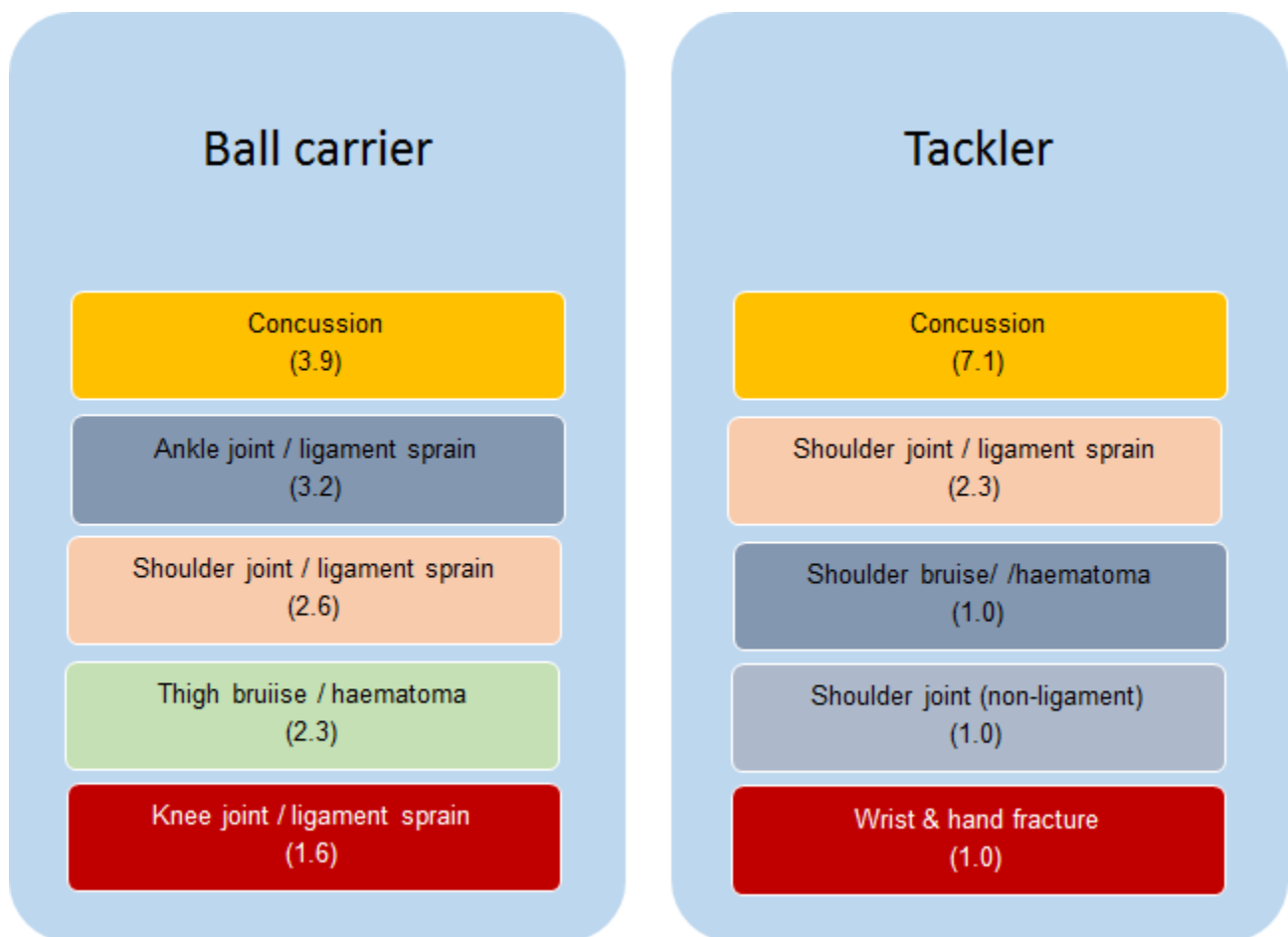


Figure S4. Injury incidence by diagnosis for the ball carrier and tackler for season 2018-19

The tackle and injured body region

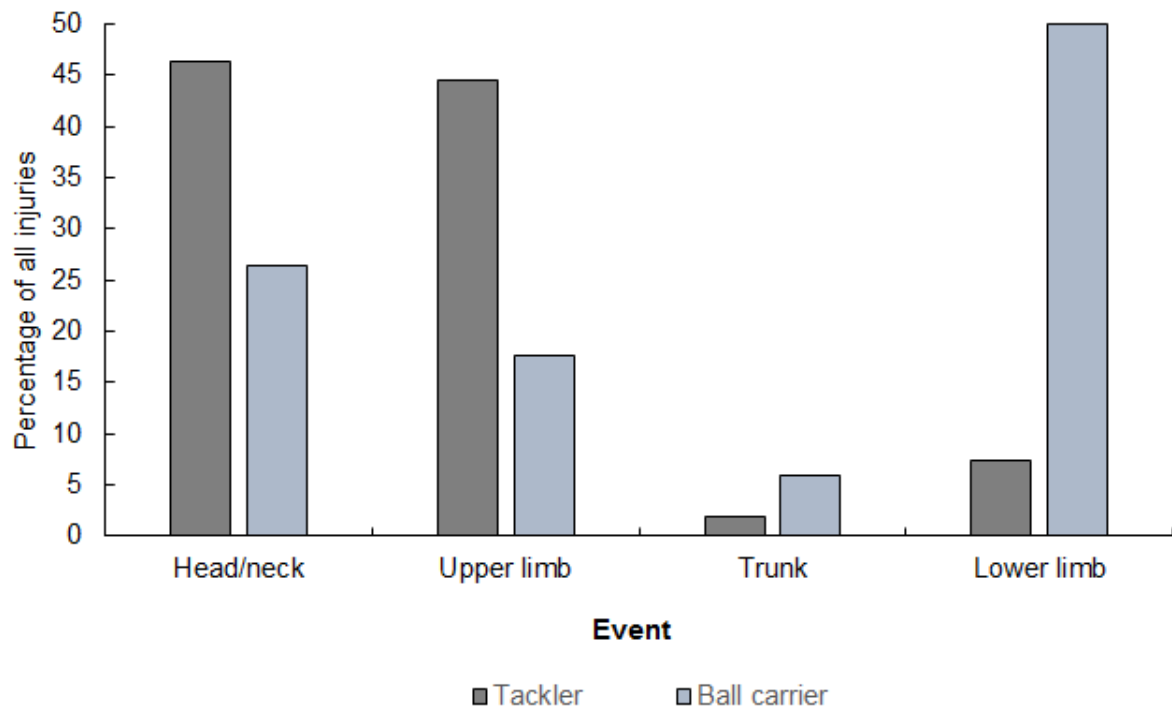


Figure S5. Percentage of all tackler and ball carrier injuries by body region for season 2018-19