

# RFU Community Rugby Injury Surveillance and Prevention Project

## CRISP

### Season Report 2017-2018

Authored by the Community Rugby Injury Surveillance Project (CRISP) steering group

**RFU:**

Simon Kemp (Medical Services Director)  
Rachel Brown (Player Welfare Manager)  
Karen Hood (Head of RFU Injured Players Foundation)

**University of Bath:**

Keith Stokes (Professor)  
Carly McKay (Lecturer)  
Simon Roberts (Research Associate)

The authors would like to thank the coaches and sports injury staff at all participating clubs in the Community Rugby Injury Surveillance and Prevention Project for 2017-18.



# KEY FINDINGS

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## COMMUNITY MATCH INJURIES

Overall injury incidence rate:

**22.8 per 1000 player match-hours**

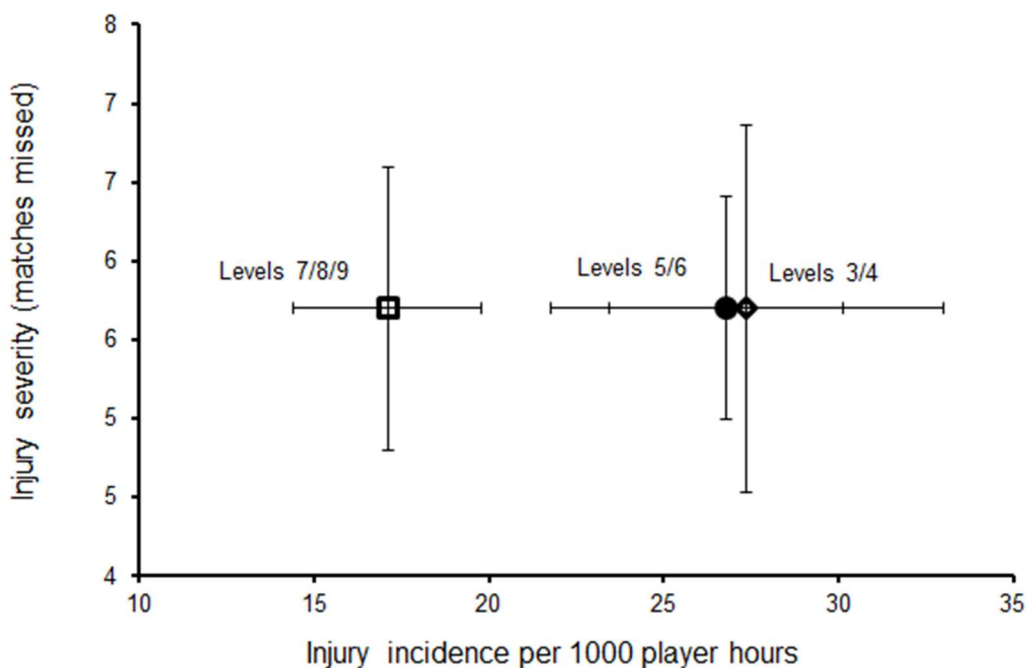
or

**Overall: 1 injury every 2.2 matches**

**Levels 3/4 and Levels 5/6: 1 injury every 2 matches; 7/8/9:1 injury every 3 matches**

Mean severity:

**5.7 matches missed**



Injury event:

**48% in the tackle**

Most common injury diagnosis

**Concussion - 15% of all injuries**

Injury accounting for most days lost

**Knee ligament/joint sprain**

# EXECUTIVE SUMMARY

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## OVERALL FINDINGS

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- ❖ The overall rate of injuries causing a player to miss more than seven days in community rugby during season 2017-18 (22.8 injuries per 1000 player match hours) was similar compared to season 2016-17 (22.3 injuries per 1000 player match hours).
- ❖ On average, a player would have to play 33 games to sustain one injury. A community team plays approximately 30 games in one season and therefore a player playing in every match, can expect a high likelihood of sustaining one injury in the season.
- ❖ On average, a team can expect approximately one injury every 2.2 matches played.
- ❖ On average two players per team will be unavailable for match play each week throughout the season due to injury.
- ❖ One-week time-loss injury rates in men's senior community rugby are approximately one third of that reported for professional rugby.

## Concussion – Most common injury diagnosis

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- ❖ The incidence of reported concussion during season 2017-18 was 3.6 injuries per 1000 player match hours, compared with 3.0 injuries per 1000 player match hours in season 2015-16.
- ❖ This incidence of concussion is one fifth of that currently reported in Premiership rugby.
- ❖ There was one concussion for every 14 team games and on average a player would have to play 214 games to sustain one concussion.
- ❖ The incidence of concussion has increased since the launch of the RFU 'Headcase' concussion education programme in 2013 which may be due to greater awareness, a lower threshold for reporting this injury and the increased media focus on concussion.
- ❖ 71% of all concussions were sustained in the tackle but there was no difference in the incidence of concussion for the ball carrier or tackling player.

## The Knee – Highest burden (number x time lost per injury)

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- ❖ The knee was the third most commonly injured site, but incurred the highest number of matches missed per injury (average of 9 matches). Therefore knee injuries account for the greatest total of matches missed.

## The Tackle – Most common injury event

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- ❖ The tackle was associated with approximately half (48%) of all injuries.
- ❖ When the player is tackling, the most commonly injured sites are the head and shoulder. Good tackling technique has the potential to reduce injuries to these areas.
- ❖ The most commonly injured sites to the tackled player are in the lower limb particularly the knee and ankle.

## CRISP Injury prevention warm-up programme – 'Activate'

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- ❖ The RFU Activate warm-up programme is now freely accessible for anyone working in rugby union to use with their team. Further details are available on: <http://www.englandrugby.com/rugbysafe/activate/>

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# INTRODUCTION

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## **An injury surveillance programme for community rugby union...**

With the increasing attention on injuries in rugby union in recent years, it has become ever more important that injuries in the game are appropriately monitored. Since 2002, the Professional Rugby Injury Surveillance Project (PRISP) has provided injury information on the Premiership and International game in England. However, to understand more about injuries that occur in the men's community game, representing the largest senior male playing population in the world, the Community Rugby Injury Surveillance and Prevention (CRISP) Project has also been running since 2009.

The CRISP Project is managed by a team at the University of Bath and funded by the RFU as part of the RugbySafe research strand. Now running for nine consecutive rugby seasons, the CRISP project is the longest continuously running large-scale injury surveillance programme of any community sport in the UK. The project involves the voluntary participation of a sample of English clubs across RFU playing levels 3-9 who provide information on injuries which occur during 1<sup>st</sup> XV matches. The purpose is to understand more about the number of injuries and types of injuries occurring, how they happen and how they might be reduced. Over the project duration, the incidence and nature of match play injuries have been monitored and information on player physical characteristics has shown how different attributes may affect the risk of injury.

## **Providing information to make an impact...**

The information generated by the CRISP Project has been used to inform a number of injury management and prevention strategies and provides a comparison of injury risk compared with the professional game. It also informs the risk assessment used to determine the level of first aid/immediate care provision required as set out in RFU Regulation 9 (Player Safety) and accompanying guidelines. With data over multiple seasons, it is possible to detect changes in injury patterns over time, either in response to law changes, education programmes or the evolving progression of the game. Information is used in a number of educational resources within the RFU's RugbySafe player welfare and wellbeing programme. This project has demonstrated that a rugby specific warm-up programme could reduce targeted injuries in match play. This study has culminated in the RFU Activate warm-up programme which is now freely accessible for anyone working in rugby union to use with their team. Further details are available on: <http://www.englandrugby.com/rugbysafe/activate/>

The quality of the project has been demonstrated through a number of academic publications and conference presentations.

By any measure, CRISP is one of the world's leading research programmes in community sport.

## DEFINITIONS

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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 causes a player to be absent from training and match play for greater than seven days. For example, if a player was injured during a match on Saturday and he was not fit to participate in the following Saturday's match, the incident would be classed as a time-loss injury and reported.

**Concussion injuries** in community rugby are managed using the principle of "recognise and remove" whereby any player displaying any signs or symptoms of concussion should be removed from play. Further information can be found on:

[https://www.englandrugby.com/mm/Document/MyRugby/Headcase/01/30/49/51/3RecogniseandRemove\\_English.pdf](https://www.englandrugby.com/mm/Document/MyRugby/Headcase/01/30/49/51/3RecogniseandRemove_English.pdf)

### ***Injury severity***

In this study, the severity of the injury is recorded in terms of the amount of time that the player is absent from match play (number of matches missed). For time-loss injuries in this study, a minimum of one match will have been missed.

### ***Injury incidence and days absence***

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 matches 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.

This report provides a summary of the CRISP data for the 2017-18 season, including some comparisons with previous season. For the purposes of comparisons between different levels of community rugby, playing levels were grouped as follows:

RFU Levels	3/4	5/6	7/8/9
Number of clubs	7	21	22

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# TIME-LOSS INJURY INFORMATION

## Overall injury rate and severity

For the 2017-18 season, information from 1084 matches was included, in which 495 time-loss injuries were reported (any injury resulting in greater than seven days absence from match play), resulting in an injury incidence of 22.8 per 1000 player hours (Table 1). Figure 1 shows injury incidence over multiple seasons and the expected natural variation from season-to-season. For seasons 2016-17 and 2017-18, the incidence has increased slightly above the boundaries for this natural variation, but there is no significant increase for season 2017-18 from season 2016-17. This recent increase can at least partly attributed to an increase in reported concussions which are discussed in more detail in this report.

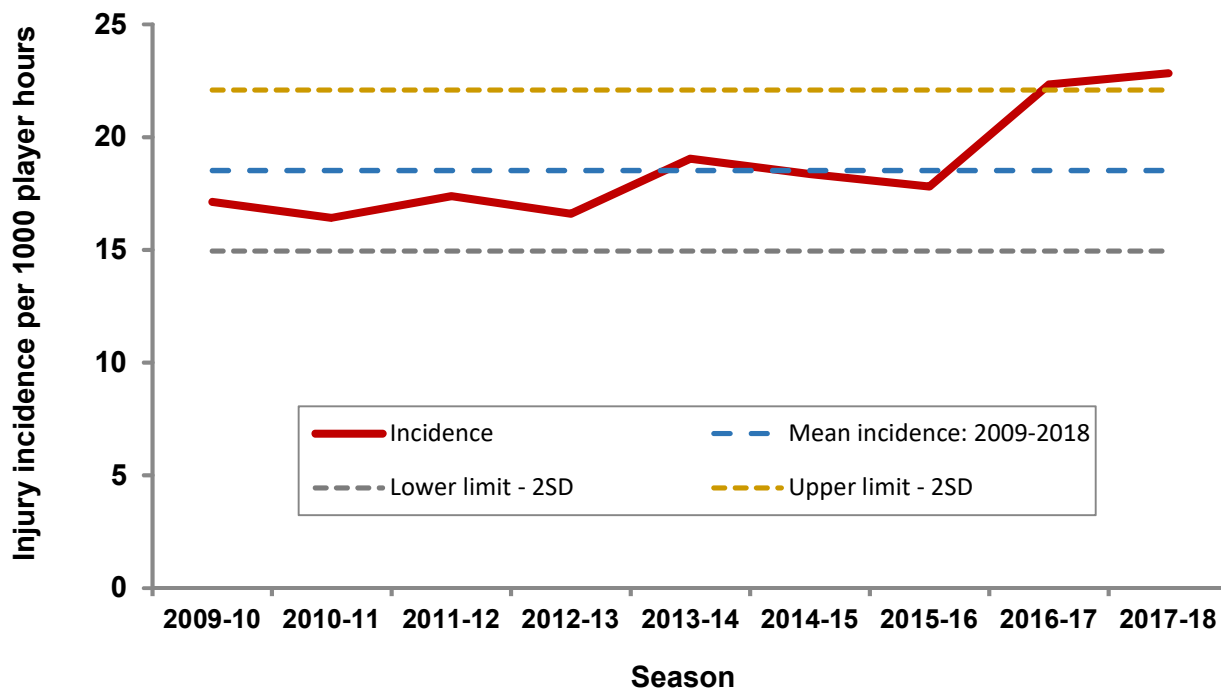
**Table 1.** Match injury incidence and severity for time-loss injuries over multiple seasons.

Season	Player match hours	Match injuries	Injuries per 1000 player hours (95% CI)	Number of matches per injury per team	Number of matches per injury per player	Average matches missed/injury
2009-10	22540	385	17.1 (15.4-18.8)	2.9	44	6.1
2010-11	32820	539	16.4 (15.0-17.8)	3.0	46	7.0
2011-12	37100	645	17.4 (16.0-18.7)	2.9	43	6.5
2012-13	24040	399	16.6 (15.0-18.2)	3.0	45	7.0
2013-14	32180	613	19.0 (17.5-20.6)	2.6	39	6.4
2014-15	27020	496	18.4 (16.7-20.0)	2.7	41	6.0
2015-16	28180	502	17.8 (16.3-19.4)	2.8	42	7.2
2016-17	26640	595	22.3 (20.5-24.1)	2.2	34	6.0
<b>2017-18</b>	<b>21680</b>	<b>495</b>	<b>22.8 (20.8-24.8)</b>	<b>2.2</b>	<b>33</b>	<b>5.7</b>
<b>2009-18</b>	<b>230520</b>	<b>4174</b>	<b>18.1 (17.6-18.7)</b>	<b>2.8</b>	<b>41</b>	<b>6.6</b>

**Table 2.** Match injury incidence for each severity classification

Injury severity	Incidence	Percentage of all injuries
Moderate (1-3 matches missed)	11.3	49
Severe (4-11 matches missed)	4.3	19
Very severe (>12 matches missed)	2.8	12
Unknown	4.5	20

Note: The injury severity categories in this table are equivalent to the categories used in other reports where classification are presented as days lost: Moderate: 8-28 days, Severe: 29-84 days and Very severe: greater than 84 days.



**Figure 1.** Injury incidence for CRISP over nine seasons. 2 standard deviations (2SD) above and below the mean incidence denote the range within which a natural variation in the data is expected.

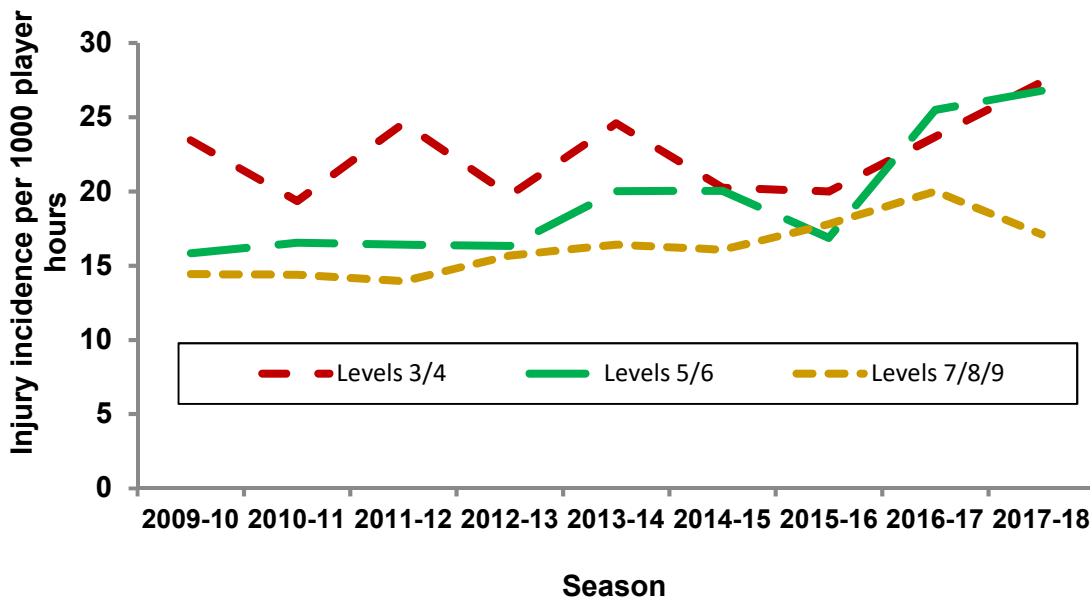
### Injury incidence at different playing levels

The injury incidence for each playing level in season 2017-18 is shown in Table 3, demonstrating significantly higher injury incidences for Levels 3/4 and Levels 5/6 compared with Levels 7/8/9. The trend over nine seasons is shown in Figure 2.

**Table 3.** Match injury incidence and severity for time-loss injuries between playing levels in season 2017-18.

Playing level	Total number of matches	Total number of match injuries	Injuries per 1000 player hours (95% CI)	Median incidence	Number of matches for one injury	Mean severity (matches missed)
Level 3/4	168	92	27.4 (21.8-33.0)	24.2	1.8	5.7
Level 5/6	463	248	26.8 (23.4-30.1)	23.5	1.9	5.7
Level 7/8/9	453	155	17.1 (14.4-19.8)	15.6	2.9	5.7





**Figure 2.** Injury incidence over multiple seasons by different playing levels.

### What do the different injury incidences mean for the average team and its individual players?

If a team were to play 30 matches over a season, the following number of injuries would be expected at each playing level based on the mean incidence values shown in Table 4. This information demonstrates that there are only small differences in the number of injuries a team can expect and the risk for an individual player does not change to a large degree between playing levels.

**Table 4.** Injury risk for a typical season

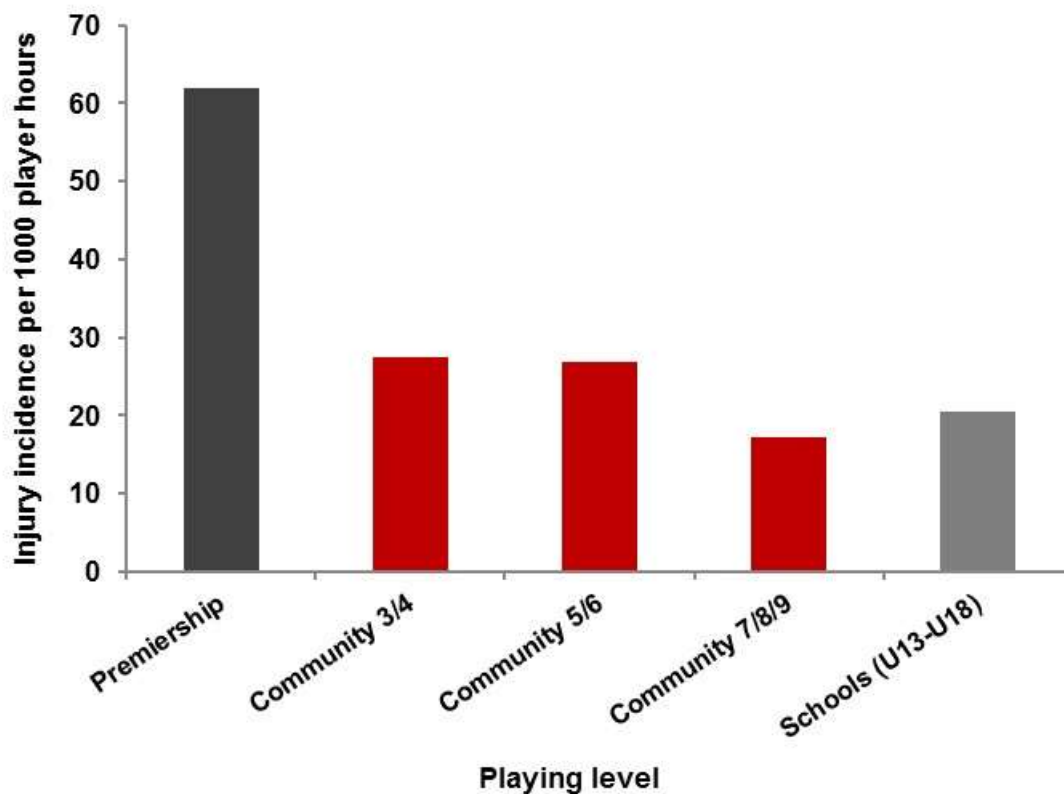
Playing Level	Number of injuries expected if a team were to play 30 matches in a season.	Number of injuries expected if a player were to play 30 matches in a season.	Approximate number of players unavailable due to injury each week
Level 3/4	16.4 injuries	1.1 injuries	2
Level 5/6	16.1 injuries	1.1 injuries	2
Level 7/8/9	10.2 injuries	0.7 injuries	2

### Management of time-loss injuries:

- The injured player was removed from play for 83% of all time-loss injuries (81% in 2016/17).
- 3 (1%) injuries required an ambulance. Therefore an ambulance was used for one in every 217 team games.
- 111 (22%) injuries resulted in the player attending a hospital either immediately at the time of injury or subsequently following advice from a healthcare professional. This equates to one player being referred to hospital every 10 team games.

## Likelihood of injury when playing community rugby compared with other playing levels

While there are some differences within different levels of community rugby (shown in Figure 2), the overall injury rate is considerably lower than that of professional rugby for injuries which cause the player to be absent from training or match play for greater than seven days as shown in Figure 3.

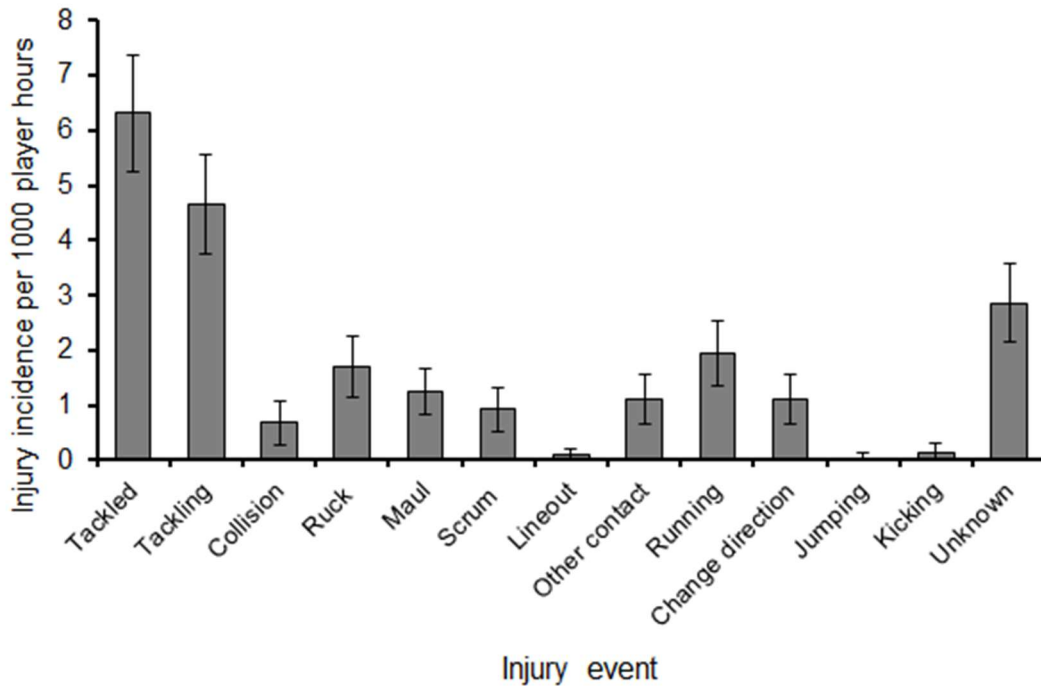


**Figure 3.** A comparison of injury rates for different levels of community rugby with elite level and schools rugby.

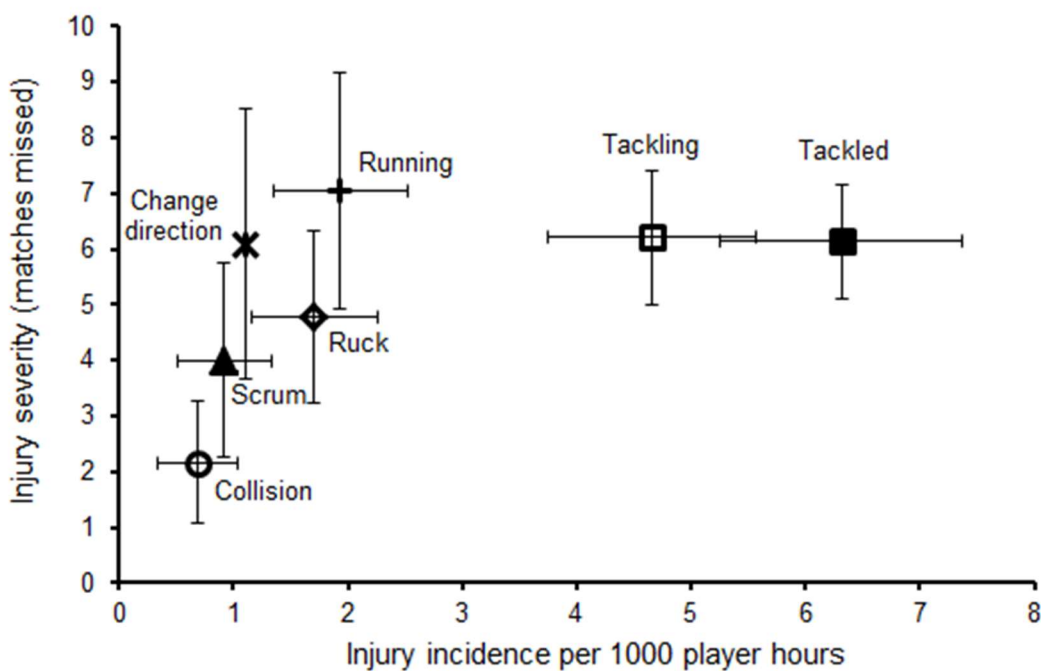
*Data sources:* Community level 3/4, 5/6 and 7/8/9 are taken from the 2017-18 findings of this current report. Professional data is taken from the Professional Rugby Injury Surveillance Project (PRISP) report 2017-2018. Information on schools is derived from the youth rugby injury surveillance report for 2017-18.

## Injury event

For the 2017-18 season, 76% of all time-loss injuries were sustained during contact events (Figure 4) with 48% occurring in the tackle event. Figure 5 demonstrates that not only do the tackle events incur the highest injury incidence, the severity of these injuries are also higher than most other events, other than running. Further information on injury events of particular interest can be found in the supplementary data.



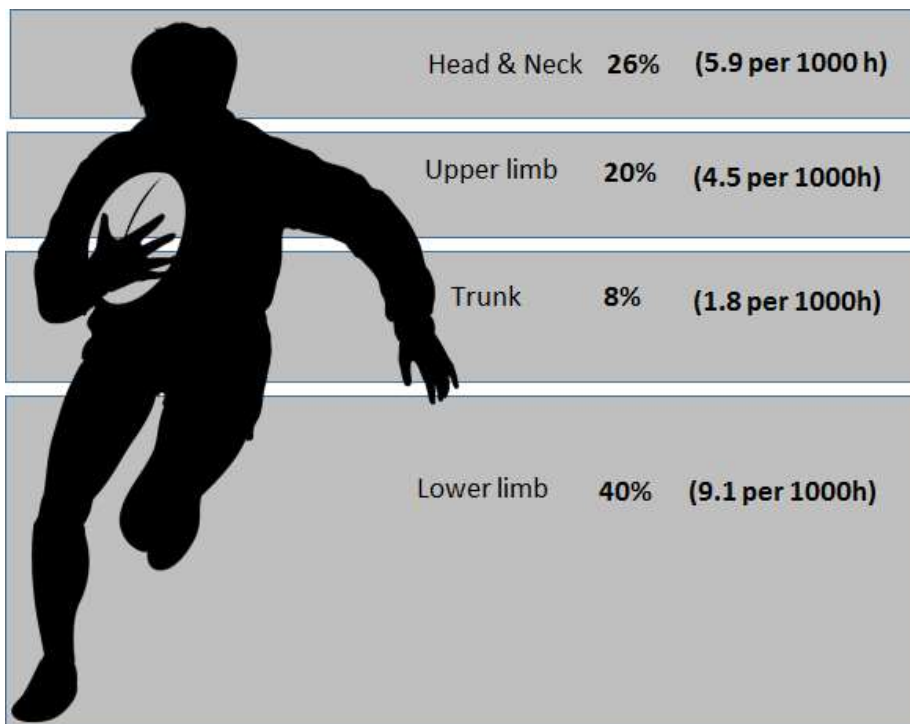
**Figure 4.** The incidence of injuries for specific match events for all playing levels combined



**Figure 5.** Injury incidence and severity for injury events. (Lineouts are excluded due to only 2 injuries being reported).

## Injury location

The most commonly injured body region is the lower limb (Figure 6), accounting for 40% of all injuries. More specifically for body locations, the most commonly injured body site is the head, followed by the knee, shoulder, thigh and ankle (Table 5), while the knee has the highest burden.



**Figure 6.** The distribution of match injuries by body region.

**Table 5.** Incidence, mean severity and burden expressed as both matches and days missed by body location (ranked within each region for burden). Across incidence, mean matches missed and burden, values are colour coded for all sites (red: highest value – green: lowest value).

Body region	Location of injury	Number of injuries	Incidence	Matches missed		Days missed	
				Mean	Burden	Mean	Burden
Head/neck	Head/face	115	5.3	2.7	14	25	133
	Neck	13	0.6	2.9	2	27	16
Upper limb	Shoulder	61	2.8	6.2	17	51	143
	Hand	22	1.0	5.1	5	43	44
	Elbow	6	0.3	12.7	4	96	26
	Forearm	2	0.1	26.5	2	193	18
	Wrist	4	0.2	11.6	2	88	16
	Up arm	3	0.1	8.0	1	63	9
	Trunk	Chest	19	0.9	4.4	4	37
Low back		15	0.7	3.6	2	31	22
Up back		2	0.1	24.0	2	175	16
Stomach		3	0.1	1.5	0	18	2
Lower limb	Knee	54	2.5	9.2	23	71	177
	Ankle	49	2.3	6.6	15	53	121
	Thigh	55	2.5	4.7	12	40	101
	Low leg	19	0.9	3.6	3	59	52
	Groin	12	0.6	5.2	3	44	24
	Foot	4	0.2	14.3	3	107	20
	Buttocks	5	0.2	1.5	0	18	4

## Injury diagnoses

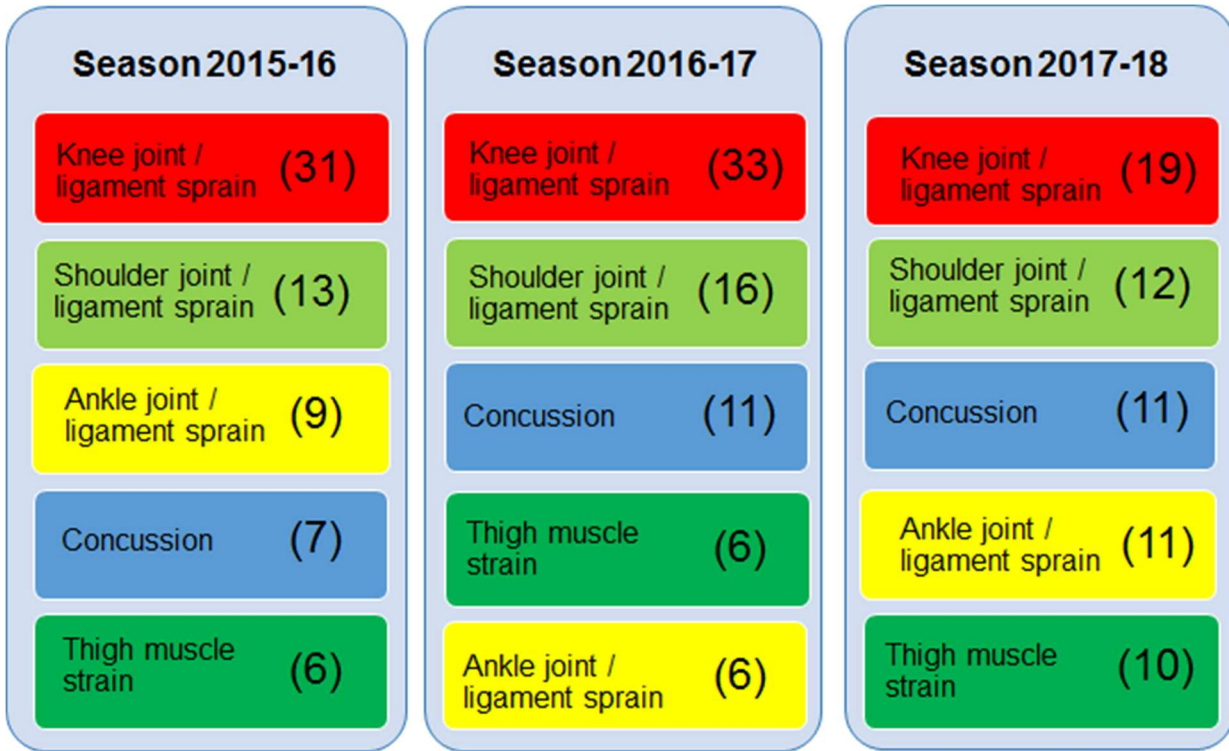
The top five most common injury diagnoses (site and general injury type) for all clubs over the current and previous two seasons are presented in Figure 7. It should be noted that the five injuries presented in Figure 7 are the same each year and represent approximately half of all injuries and therefore it is important that practitioners are able manage these injuries effectively.

Also important are the top injuries defined by the total amount of time that the injury keeps players out of match play. This is the injury burden defined as the incidence of injuries combined with the severity to determine the total time lost. The top five injuries presented as burden are shown in Figure 8. Figure 9 shows the incidence and severity for the most common injury types.

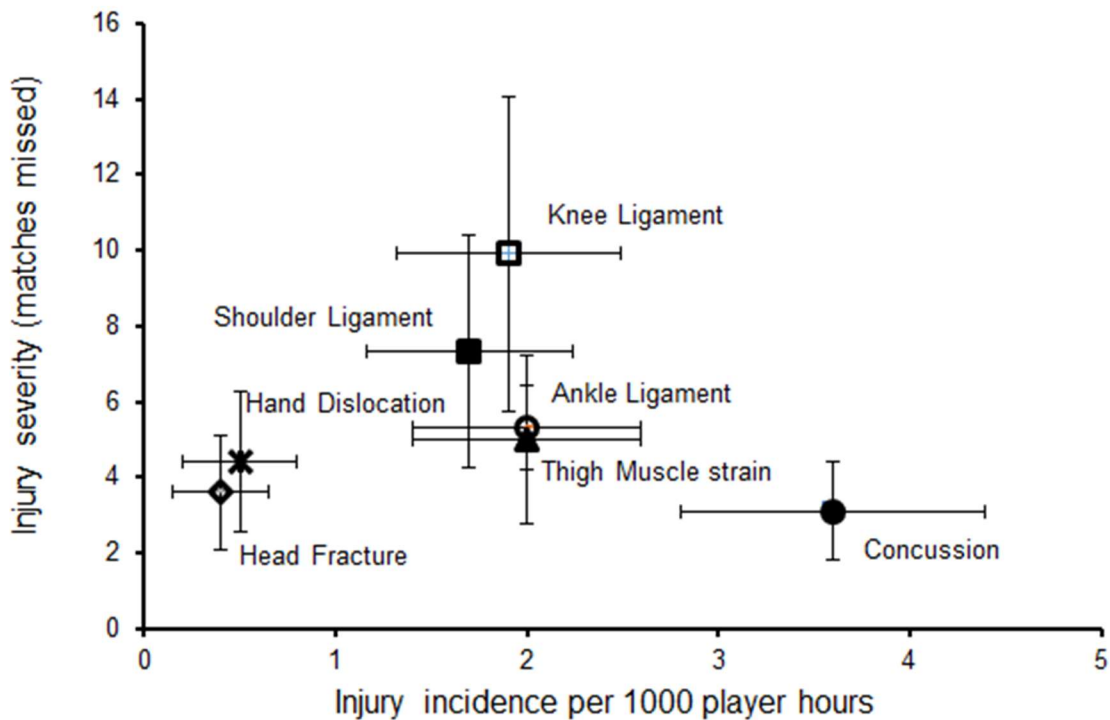


**Figure 7.** Top five injury diagnoses in rank order for **incidence** for all playing levels combined over seasons 2015-16, 2016-17 and 2017-18. Numbers within brackets denote incidences (injuries per 1000 player match hours).

*Note: 'Joint/ligament injuries' include all diagnoses for ligament, jar/joint, dislocations and cartilage injuries.*



**Figure 8.** Top five injury diagnoses in rank order of **burden** for all playing levels combined over seasons 2015-16, 2016-17 and 2017-18. Numbers within brackets denote (number of matches missed per 1000 player match hours).



**Figure 9.** Incidence and mean matches missed for the most common injury diagnoses.



## Concussion

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### **Concussion incidence and severity**

Concussion accounted for 15% of all time-loss injuries, equating to 1 concussion in every 14 team games (Table 6) that a team plays or 1 in every 7 matches (involving two teams). The rate of injury is 1 in every 13 team games at level 3/4, 1 in every 14 team games at level 5/6 and 1 in every 15 team games at level 7/8/9.

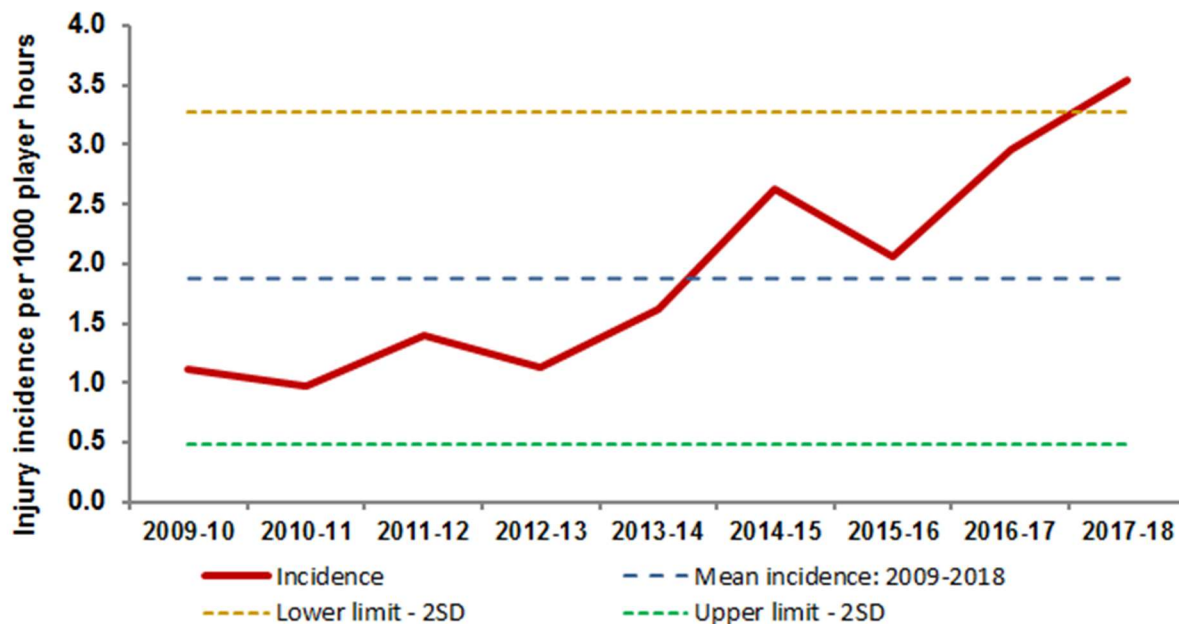
**Table 6.** Concussion incidence and severity between playing levels in season 2017-18.

Playing level	Total number of matches	Total number of concussions	Concussions per 1000 player hours (95% CI)	Number of team games for one concussion	Mean severity (matches missed)
Level 3/4	168	13	3.9 (1.8-6.0)	13	3.3
Level 5/6	463	33	3.6 (2.3-4.8)	14	3.4
Level 7/8/9	453	30	3.3 (2.1-4.5)	15	2.7
All Levels	1084	76	3.5 (2.7-4.3)	14	3.1

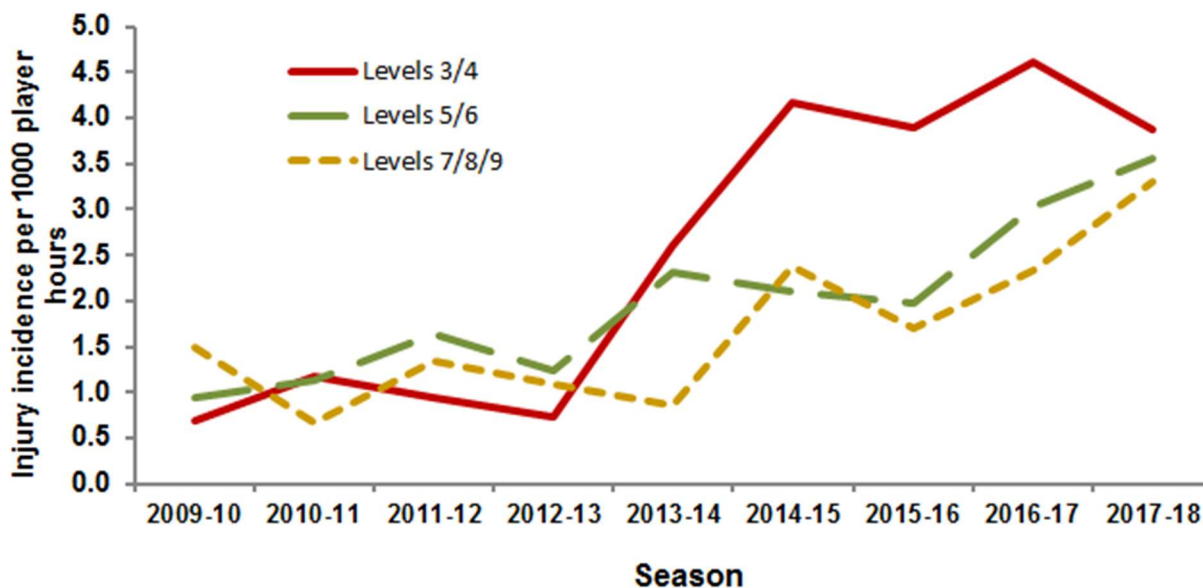
### **Concussion trends over time**

The increase in concussions, particularly since season 2013-14 (Figure 10), may be associated with changes in the characteristics of the game such as a greater number of contact events, or greater levels of intensity in these events. However, there is currently no information or research conducted to demonstrate that these factors are increasing in the community game. This higher concussion incidence may also be due to the raised awareness and diagnosis of this type of injury through the RFU 'Headcase' initiative which has been promoted extensively through the community game since January 2013. Through this programme, it is likely that players and medical staff now recognise signs and symptoms of concussion which previously may have been missed or not understood to be defined as concussion. In particular, Figure 11 shows that while initially the incidence in levels 3/4 has risen more quickly, there has been a more recent increase in the incidence at lower playing levels, perhaps suggesting that awareness is also increasing at these levels. The high profile of concussion in the media may have also been a factor in raising awareness for both players and club staff.

The increase in incidence of concussion in this report is also in line with recent increases in reported concussions in professional rugby but the match incidences of concussion in community rugby are much lower.



**Figure 10.** Incidence of reported concussions over seven seasons for all playing levels combined, including the mean incidence over this period with upper and lower limits of two standard deviations.



**Figure 11.** Incidence of reported concussions over seven seasons for each playing level.

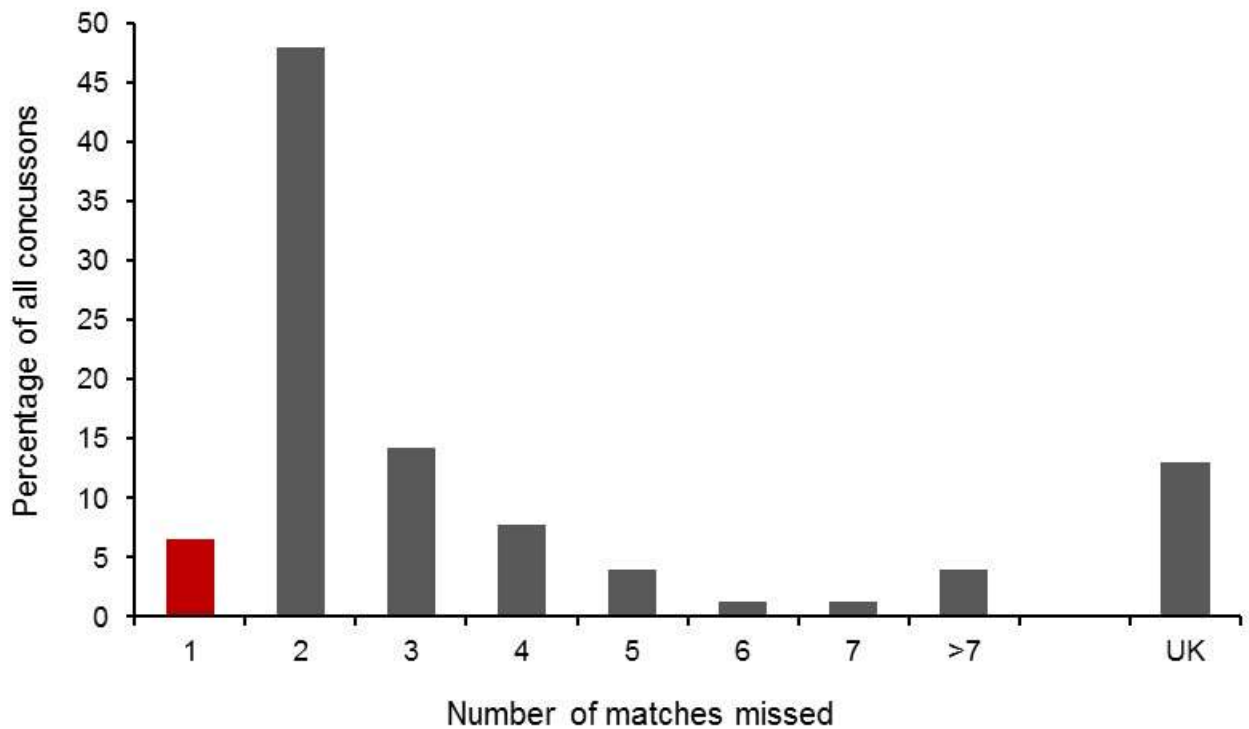
**Match events associated with concussion**

For season 2017-18, the tackle was reported as the injury event for 71% of all concussions with 34% of all concussions to the tackled player and 37% to the tackling player. Further work is required to understand the specific characteristics of tackles which result in injury.



### Concussion and Return to Play

There was an average of 3.1 matches missed per concussion injury. The percentage of concussions according to the number of matches missed is shown in Figure 12. An RFU Regulation introduced in March 2014 permits the concussed player to return at the earliest after 19 days. This would result in concussed players missing a minimum of 2 matches (assuming there is one match each week). Figure 12 shows that in almost all cases this was the case but, for five concussions (6% of cases) (denoted by the red bar), the concussed player returned to play following the absence of just one match (a total of 14 days absence) which suggests that some players are still returning prematurely to match play. This is an improvement compared with the 19% of players who returned after one match in the 2016-17 season.



**Figure 12.** The percentage of concussions for different numbers of matches missed. 'UK': Return to play date not reported.

## Concussion

### Recognising this injury

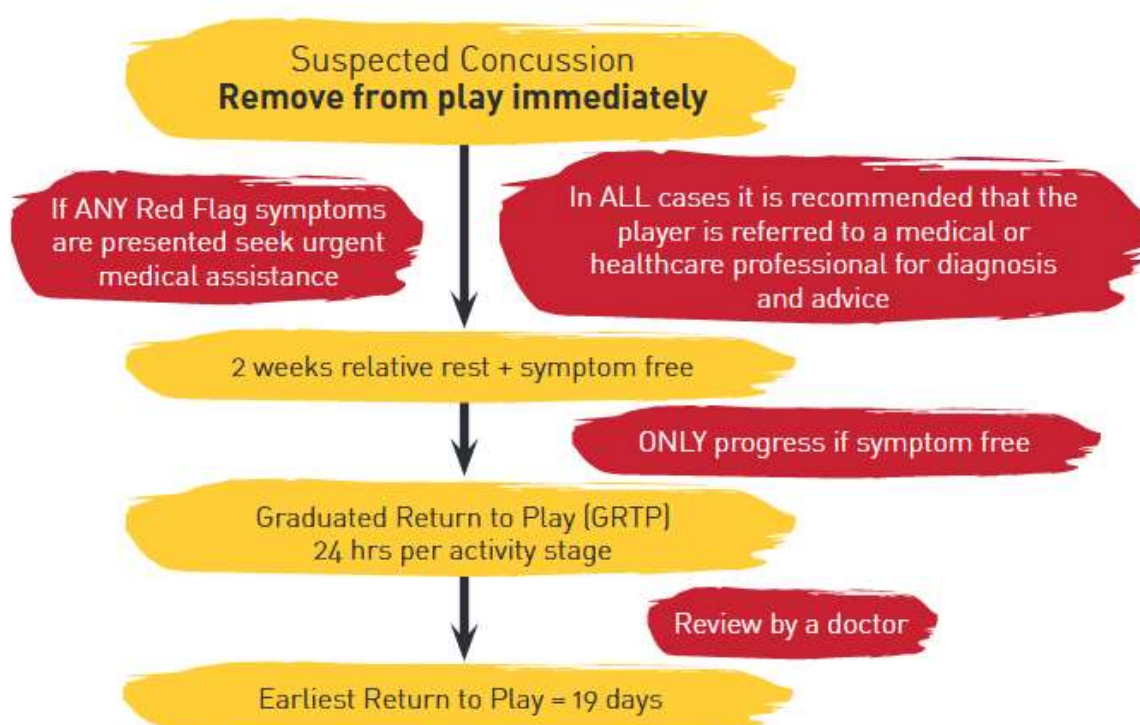
In community rugby, all teams should adhere to the principle of recognising the signs and symptoms of concussion and subsequently removing the player from play immediately. This player should not then return to the field during that match. More detailed information can be found on:

[https://www.englandrugby.com/mm/Document/MyRugby/Headcase/01/30/49/51/3RecogniseandRemove\\_English.pdf](https://www.englandrugby.com/mm/Document/MyRugby/Headcase/01/30/49/51/3RecogniseandRemove_English.pdf)

### Return to play guidelines

The routine return to play pathway for adult players (aged 19 years or older) who do not have access to the enhanced care setting (which is normally only available in professional rugby) is shown in Figure 13. Specific guidelines on the pathways for concussed adult players returning to play can be accessed via the RFU's Headcase resource:

[https://www.englandrugby.com/mm/Document/News/General/01/33/13/26/HEADCASEAdultConcussionManagementGuidelines2018\\_Neutral.pdf](https://www.englandrugby.com/mm/Document/News/General/01/33/13/26/HEADCASEAdultConcussionManagementGuidelines2018_Neutral.pdf)



**Figure 13.** Return to play pathway for concussed adult players not in an enhanced care setting.

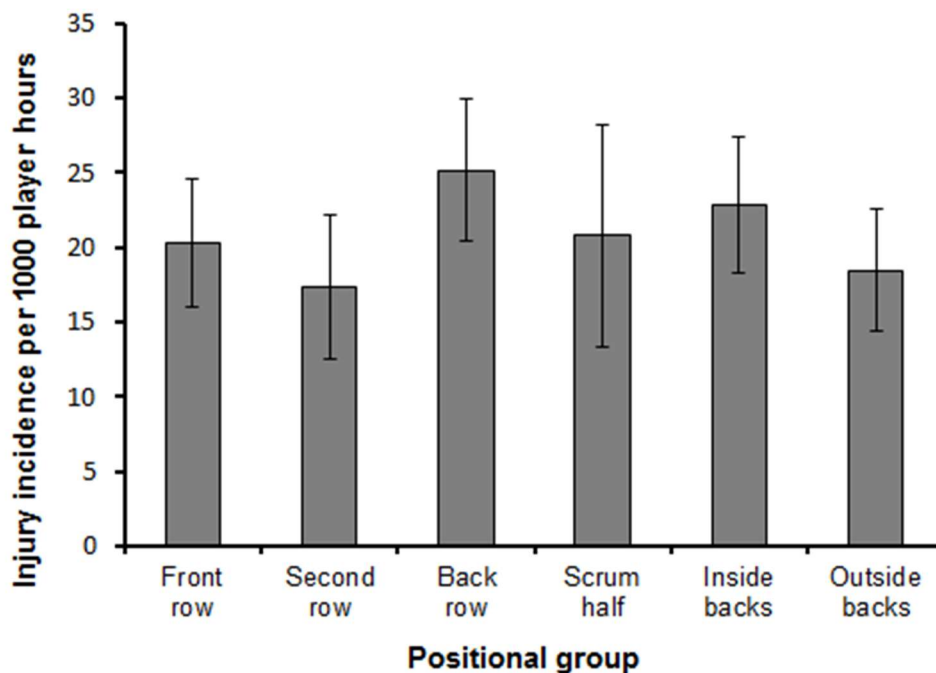
### Catastrophic injury

No catastrophic injuries were reported by any participating clubs over the 2017-18 season but it is important to note that only a sample of community clubs participate and that catastrophic injuries are relatively rare. The reporting of catastrophic injuries (and any which results in the player being admitted to a hospital - not including those that attend an Accident or Emergency Department and are allowed home from there) to the RFU is mandatory for any club (regardless of participation in CRISP) and the injury data is collated in a separate injury surveillance programme. More information on the support available for these injuries and the research taking place can be found on the RFU Injured Players Foundation (IPF) website: <http://www.rfuipf.org.uk/>.

## Playing position

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When the injuries for all playing level groups were combined, there was no statistical difference in the incidence of time-loss injuries in forwards (21.4 injuries per 1000 player hours) compared with backs (20.7 injuries per 1000 player hours). Back row forwards (25.1 injuries per 1000 player hours) sustained more injuries compared with the other forwards groups but there was no difference between the specific positional groups in the backs (Figure 14).



**Figure 14.** 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: Inside backs: outside half, inside centre, outside centre; outside backs: left and right wings, full back.

### Playing position and severity

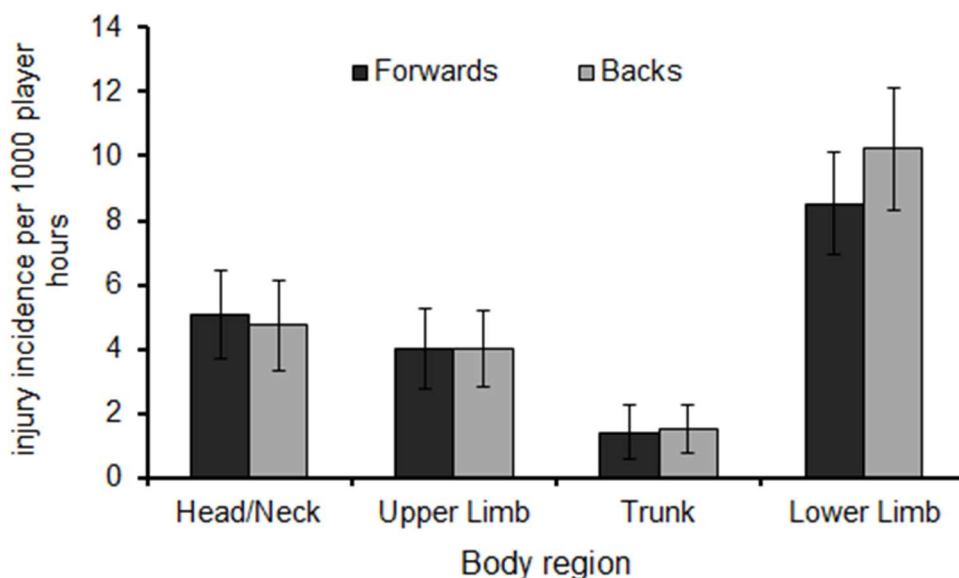
The mean number of matches missed for an injury to a forward is 5.4, compared with 5.8 for a back.

### Playing position and injury event

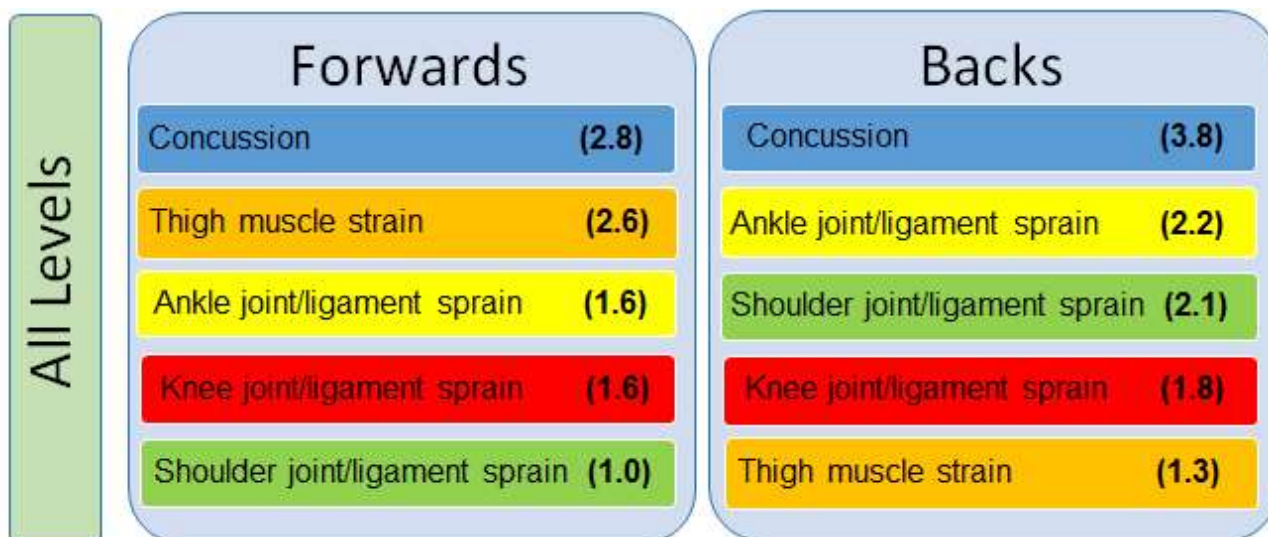
For forwards, 89% of all injuries were associated with contact events, compared with 76% for backs. It is likely that these findings are due to forwards competing in more contact events during a match compared with backs and therefore the risk of injury per event may not be different for forwards and backs.

## Playing position and injury type

The information summarised in Figure 15 shows that the pattern of injuries sustained by forwards and backs are similar in terms of body region. Figure 16 shows the top five specific injuries for each positional group. Only small differences are shown between the top injury diagnoses with the exception of thigh muscle strains (mostly hamstring injuries) which are higher in backs.



**Figure 15.** Comparison between forwards and backs for injury incidence by different body regions.



**Figure 16** The top injury types for forwards and backs (numbers in brackets denote injury incidences).

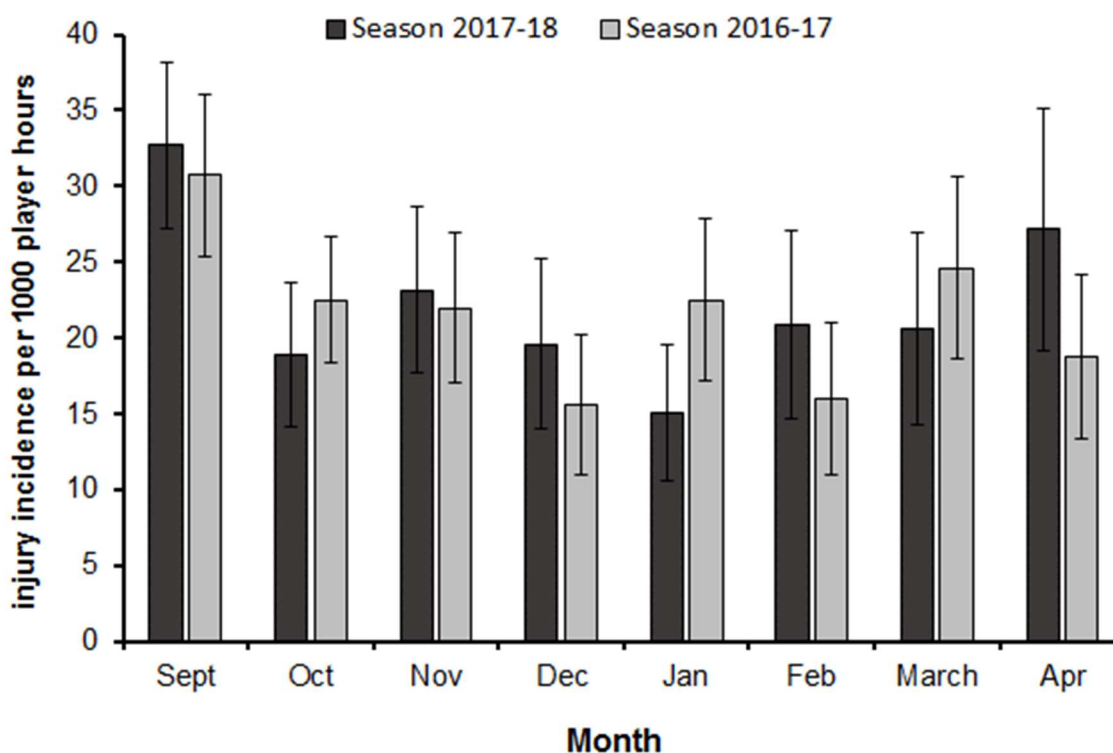
## Timing of injuries

### Season month and incidence

Figure 17 demonstrates a trend towards more injuries at the start of the season (September), a finding which was also present in season 2016-17. Furthermore this injury pattern is consistent in both contact and non-contact injuries and more specifically for tackle and running events.

The exact reason for higher injury incidences at the beginning of the season is unknown but the following factors should be considered:

- Harder pitches at the start of the season resulting in higher ground impacts
- Those players who sustain injuries at the start of the season may be those who are more susceptible to injury and therefore are removed from the pool of players exposed to the risk of injury for subsequent matches.
- A lack of appropriate pre-season training may also be a factor in this finding.



**Figure 17.** Incidence of time-loss injuries over each month of the 2017-18 rugby season, with equivalent data in 2016-17 for comparison.

*Note: Due to very small numbers of matches and injuries reported during August and May, injury incidences for these months have been excluded.*

# FUTURE DIRECTIONS OF COMMUNITY RUGBY INJURY SURVEILLANCE

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## **Continued injury surveillance**

The community rugby injury surveillance project has now been established over multiple seasons. 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 community games 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.

## **Artificial grass pitches**

With the ongoing and expanding programme to install artificial grass pitches (AGPs) in community clubs across England ('Rugby 365'), a key future research question is the comparison of injury rates and types between AGPs compared with natural grass. During season 2018-19, over 23 men's community teams will be playing home matches on artificial grass pitches and these teams will be included into the CRISP project. As the number of AGPs in use across the country increase in future seasons, these teams will contribute to the CRISP project to further our understanding of the risk of injury on this surface in the community game.

## **British University and Colleges Sport (BUCS) Super Rugby competition**

This competition provides university players with a potential pathway from high level university rugby to playing at the elite level. As such, it is imperative to understand the injury risk in this competition. The first season of injury surveillance for this playing level was completed in season 2017-18 and the results are available in a separate report which can be found on: [Provide a link].

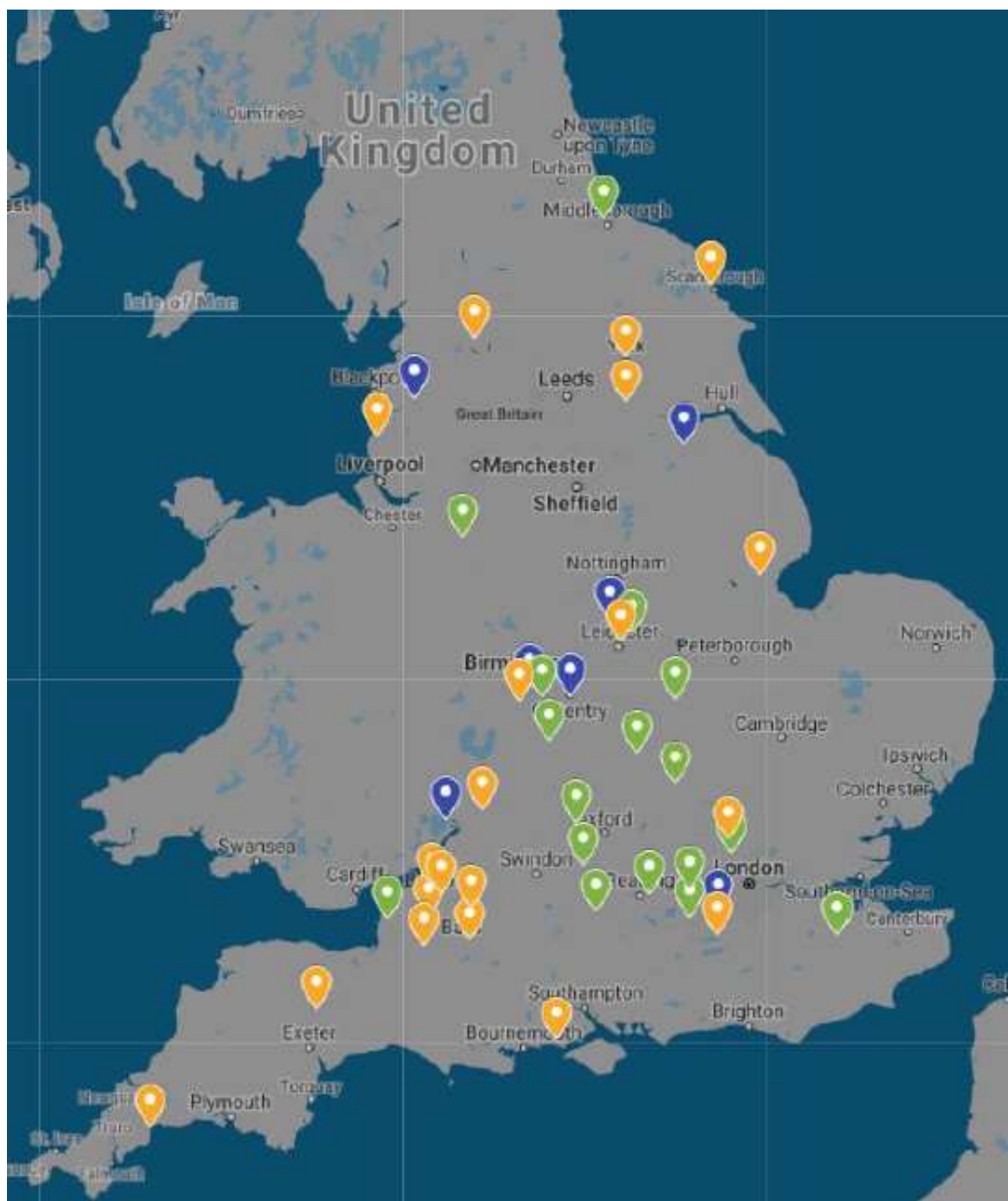


# PROJECT METHODS

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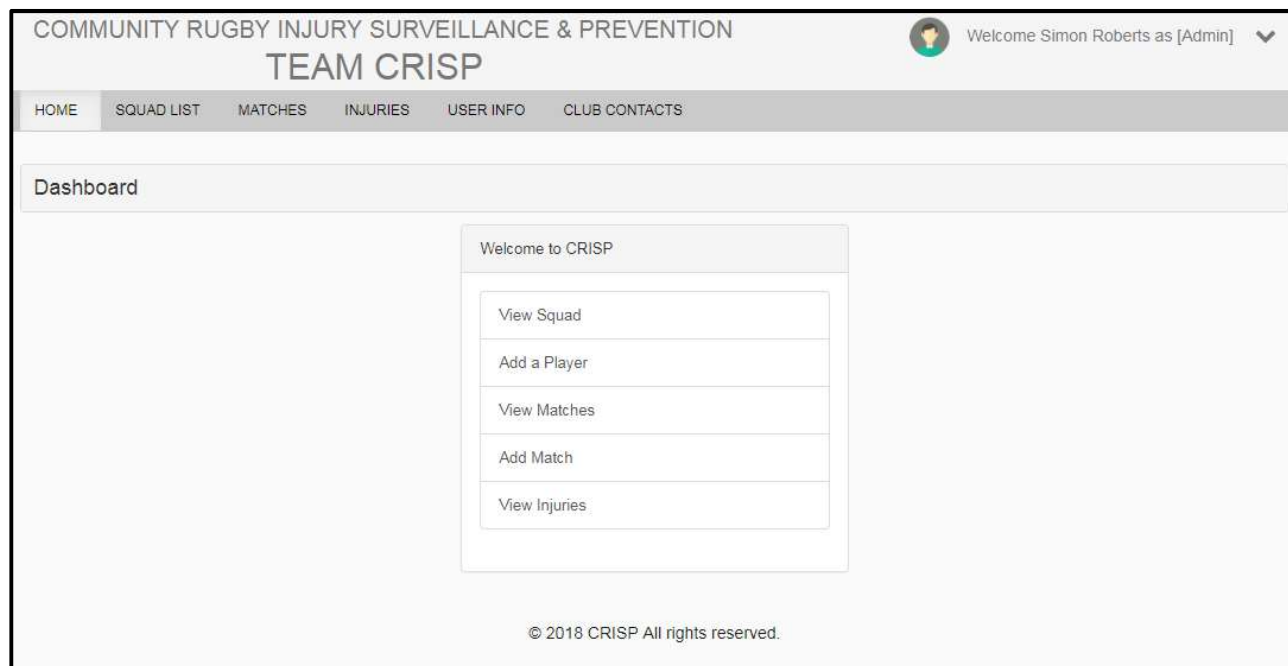
## Recruitment

All clubs participate in this project voluntarily by responding to invitation emails sent directly to all men's first teams participating in RFU leagues 3-9, or to advertisement material distributed through coaching courses, newsletters and social media. Each season, a number of teams continue participation from the previous season, with 51% of clubs who participated in season 2016-17 continuing participation in season 2017-18. The diverse geographical range of participating clubs for the 2017-18 season is shown in the map below. Coloured pins represent the locations of clubs in Levels 3/4 (blue), Levels 5/6 (green) and Level 7/8/9 (orange).



## Data collection

Participating clubs have the option to report injuries using either paper data collection forms or through the club's dedicated web page on the project's online data entry platform as shown below.



Each participating club assigns one or more primary contact (normally the team's sports therapist or physiotherapist) who is responsible for collating and reporting the following data:

- A first team squad list with brief information for each player
- Brief details for all first team matches – used to understand the injury risk per match
- Any time-loss injury sustained during first team match which caused the player to miss at least one match (eight days or greater absence from playing).
- Player consent for their injury data to be reported to the CRISP team, obtained in accordance with GDPR.



## PUBLICATIONS AND REPORTS

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The information collected by the community rugby injury surveillance and prevention project has resulted in a number of Journal publications and conference communications.

### Journal publications

Attwood, M.J., Roberts, S.P., Stokes, K.A., England, M. and Trewartha, G. (2018). Association of the Functional Movement Screen™ with match-injury burden in men's community rugby union. *Journal of Sports Sciences. Online First*:

Attwood, M.J., Roberts, S.P., Stokes, K.A., England, M. and Trewartha, G. (2017). Efficacy of a movement control injury prevention programme in adult men's community rugby union: a cluster randomised controlled trial. *British Journal of Sports Medicine, Online First: 21 October 2017. doi: 10.1136/bjsports-2017-098005*.

Roberts, S.P., Trewartha, G., England, M., Goodison, W. & Stokes, K.A. (2016). Concussion and head injuries in English community rugby union match play. *American Journal of Sports Medicine, doi: 10.1177/0363546516668296*.

Singh V.R., Trewartha, G., Roberts, S.P., England, M. & Stokes, K.A. (2016). Shoulder injuries in English community rugby union. *International Journal of Sports Medicine, 37(08), 659-664*.

Roberts, S.P., Trewartha, G., England, M. & Stokes, K.A. (2014). Incidence and nature of medical attention injuries in English community rugby union. *Orthopaedic Journal of Sports Medicine, 2,(12), 2325967114562781, DOI: 10.1177/2325967114562781*.

Roberts, S.P., Trewartha, G., England, M. & Stokes, K.A. (2014). Collapsed scrums and collision tackles: what is the injury risk? *British Journal of Sports Medicine, 10 February 2014doi:10.1136/bjsports-2013-092988*.

Roberts, S.P., Trewartha, G., England, M., Shaddick, G. & Stokes, K.A. (2013). Epidemiology of time-loss injuries in English community-level rugby union. *BMJ Open, 2013. 3(11): p. e003998*.

# ACKNOWLEDGEMENTS

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Many thanks to the coaches and sports injury staff at all participating clubs in the Community Rugby Injury Surveillance Project for 2017-18.

**Level 3/4:** Cinderford, Coventry, Henley Hawks, Loughborough Students, Preston Grasshoppers, Scunthorpe, Tynedale

**Level 5/6:** Beckenham, Chobham, Cobham, Grove, Kendal, Liverpool St Helens, Longton, Maidenhead, Maidstone, Old Haberdashers, Reading, Sandbach, Sidcup, Weston Hornets, Witney

**Level 7/8/9:** Belgrave, Chew Valley, Crowborough, Effingham & Leatherhead, Finchley, Fleetwood, Frome, Gordano, Isle Of Wight, New Milton, North Ribblesdale, Northallerton, Northampton Casuals, Old Richians, Old Yardleians, Oswestry, Portsmouth, Scarborough, Selby, Skegness, Southmead, Southport, St Austell Sudbury, Tiverton, Tunbridge Wells, Verulamians, Wells, Woodrush, York

## Community Rugby Injury Surveillance Team

Dr Simon Roberts	- Research Associate, Department for Health, University of Bath
Prof Keith Stokes	- Department for Health, University of Bath (Lead Investigator)
Dr Carly McKay	- Lecturer, Department for Health, University of Bath
Dr Simon Kemp	RFU Medical Services Director
Dr Karen Hood	- Head of RFU Injured Players Foundation
Rachel Brown	- RFU Player Welfare Manager

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## SUPPLEMENTARY DATA

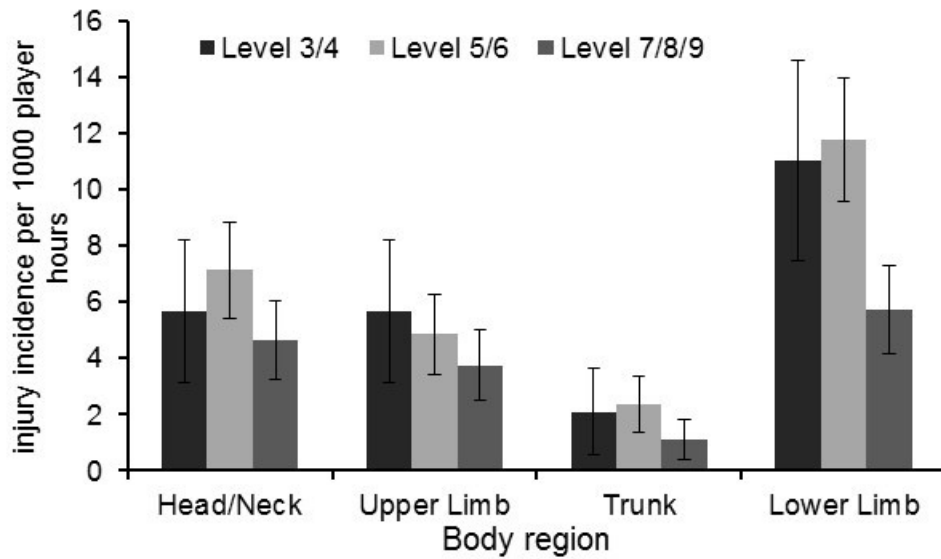
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This section contains additional data to that of the main findings.

### Injured body region and playing level

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When injured body sites are grouped into regions, Figure 7.1 demonstrates that the lower limb accounts for the most injuries across levels 3/4 and 7/8/9.

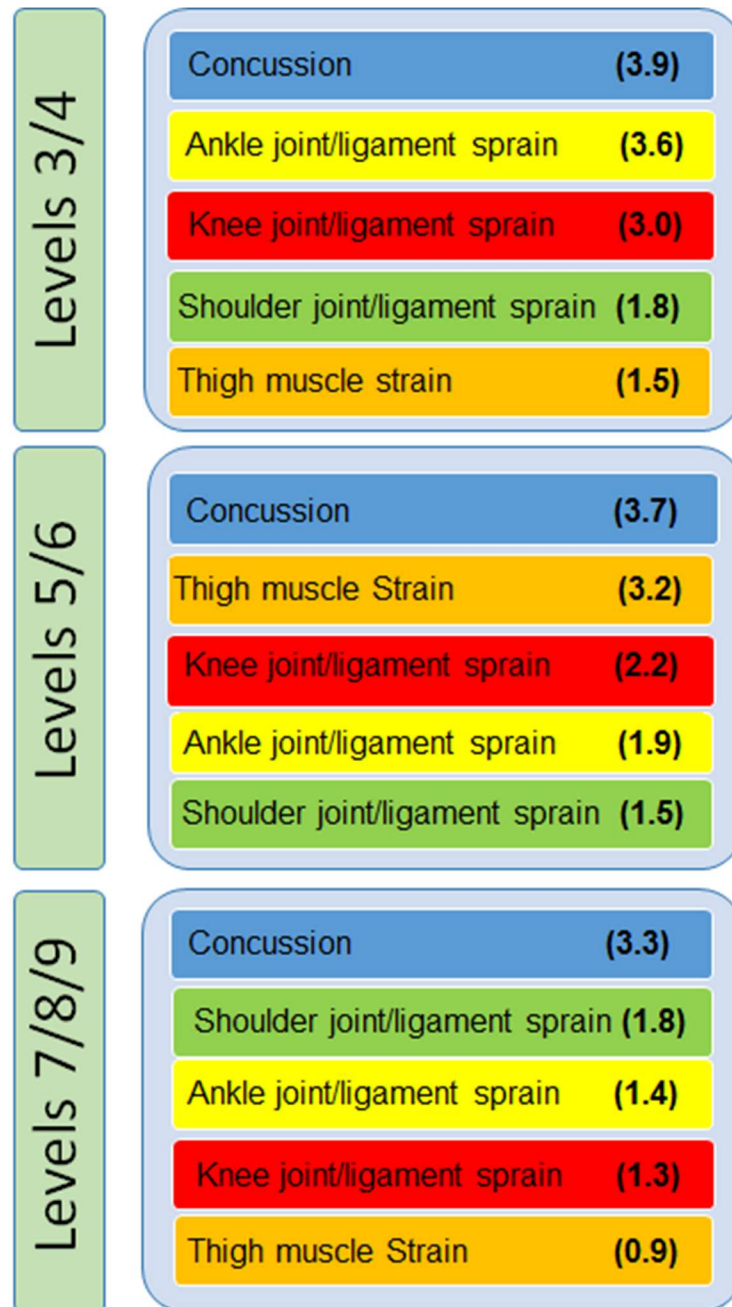


**Figure S1.** Injury incidence according to body region by playing level for all time-loss injuries in 2017-18.

## Injury diagnoses by playing level

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The top five Injury diagnoses by different playing levels are shown in Figure S2 below. The same top five diagnoses appear within each playing level, with just small changes in the order.



**Figure S2.** Top five injury diagnoses in rank order for the three different playing levels, for season 2017-18. Numbers within brackets denote incidence (injuries per 1000 player match hours) of all injuries within each playing level for each diagnosis.

## Concussion – additional information

### Concussion management and treatment

Table S1 shows how concussions were managed following a match, according to which medical professionals the concussed player were referred to.

**Table S1.** Percentage of concussions referred to practitioners including a comparison with 2013-14, 2014-15 and 2015-16.

Playing level	Percentage of players referred to....				
	Sports Therapist	Physiotherapist	Hospital	GP	Specialist
2017-18					
Level 3/4	17%	30%	39%	17%	35%
Level 5/6	21%	21%	17%	21%	8%
Level 7/8/9	22%	13%	22%	13%	0%
2016-17 – All	20%	20%	25%	16%	16%
2015-16 – All	10%	26%	33%	33%	5%
2014-15 – All	14%	25%	34%	32%	3%
2013-14 – All	25%	33%	27%	15%	3%

**Note:** A concussed player may have received treatment from more than one of the above practitioners.

### Concussion incidence by positional group

The incidence of concussion in forwards was 3.3 per 1000 player match hours, 95% CI 2.1-3.9 compared with 3.2 per 1000 player match hours, 95% CI 1.9-3.8 for backs and was not a statistically significant difference.

### Match events associated with concussion.

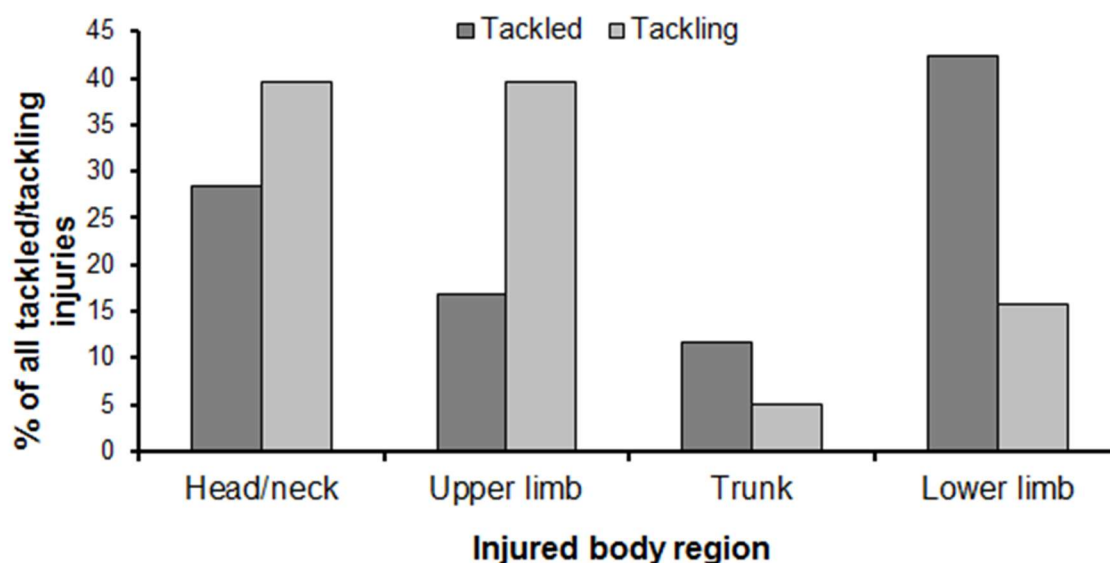
**Table S2.** Percentage of concussions relating to match events for 2017-18 season.

Event	Tackled	Tackling	Ruck	Collison (accidental)	Maul	Unknown
Percentage of concussions	34	37	8	8	1	8

## Match events associated with Injury

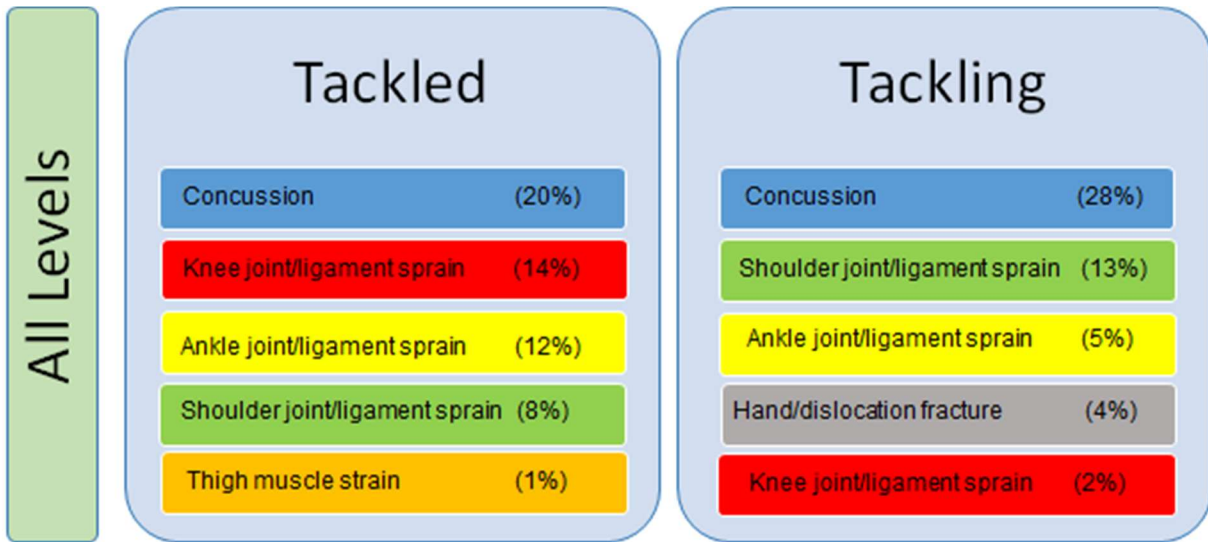
### The Tackle

- The tackle (both being tackled and tackling) was the most common injury event accounting for 48% of all injuries (28% through being tackled; 20% through tackling).
- The head was the body site most commonly injured in the tackle (32% of all tackle injuries), followed by the shoulder (17%), knee (11%) and ankle (11%).
- Figure S3 shows that while the upper limb was more susceptible to injury when the player was tackling, the tackled player sustained more injuries to the lower limb.
- Tackle injuries resulted in an average of 6.2 matches absence (Tackled: 6.13 matches and Tackling: 6.2 matches missed).



**Figure S3.** Percentage distribution by body regions for time-loss injuries sustained when being tackled and when tackling.

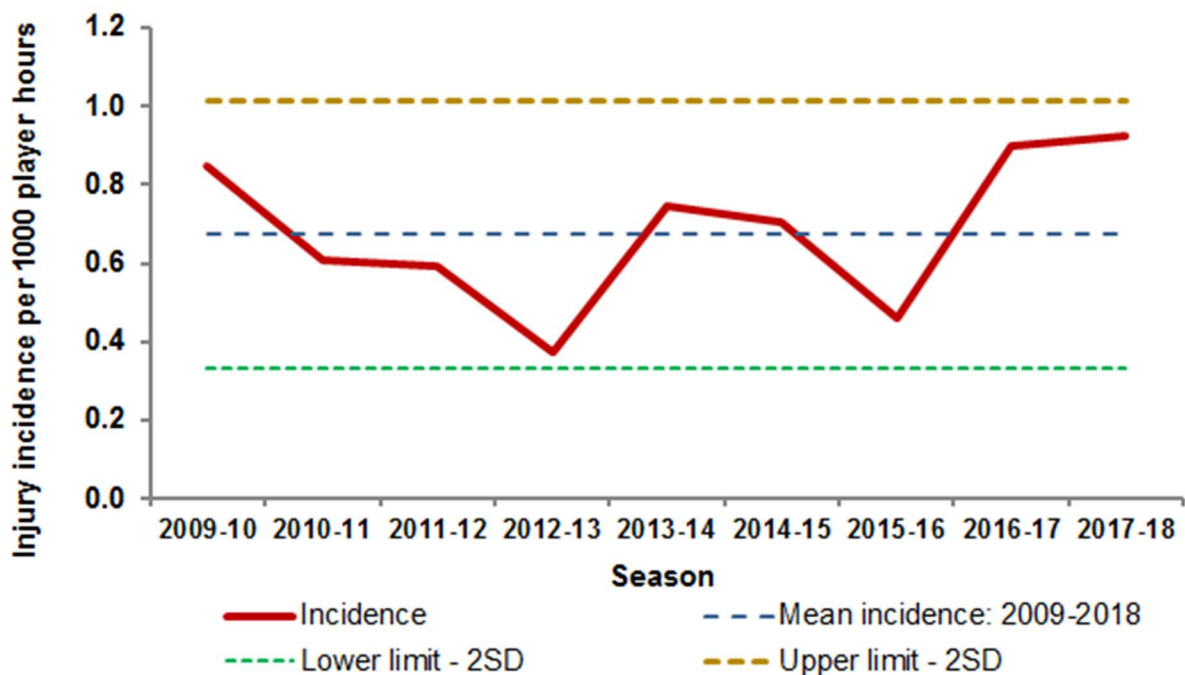
Figure S4 shows that while a high percentage of concussions were sustained for all tackles, the higher proportion of lower limb injuries to the tackled player appear to be knee and ankle joint/ligament injuries and the primary upper limb injuries to the tackling player are to the shoulder, and hand.



**Figure S4.** Top five most common injury diagnoses for the player being tackled and the player tackling in season 2017-18. Numbers in brackets denotes the percentage of all tackled or tackling injuries.

### The Scrum

Scrum injuries for the 2017-18 season, accounted for only 4% (20 injuries) of the total number. Figure 7.5 shows the scrum injury incidence over nine seasons and while there have been some fluctuations, the incidence is statistically stable over the period.



**Figure S5.** Incidence of scrum injuries reported over eight seasons. Note: two standard deviations (2SD) above and below the mean incidence denote the range within which a natural variation in the data is expected.

## Further information scrum injuries

- There were two scrum injuries reported for level 3/4, with 17 for level 5/6 and 1 for level 7/8/9.
- The severity of scrum injuries was a mean of 2.5 matches absence
- 14 injuries occurred to front row players, hooker: 4 injuries, tight head prop: 10 injuries with three injuries sustained by a second row and one to the back row.
- There was a range of types of injury sustained in the scrum distributed between the neck (6 injuries), shoulder (5 injuries), chest (1 injury), lower back (6 injuries), buttocks (2 injuries).

## Comparing scrum injuries before and after new scrum engagement laws.

The new scrum engagement laws which were introduced for the season 2013-14, provide an interesting backdrop to the injuries sustained in the scrum over seasons 2013-14 to 2017-18 in comparison with previous seasons. However, there is no statistical difference between the incidence of scrum injuries when mean data for seasons before new engagement laws (2009-13: 0.60 injuries per 1000 player hours) are compared with the seasons following (2013-18: 0.74 injuries per 1000 player hours).

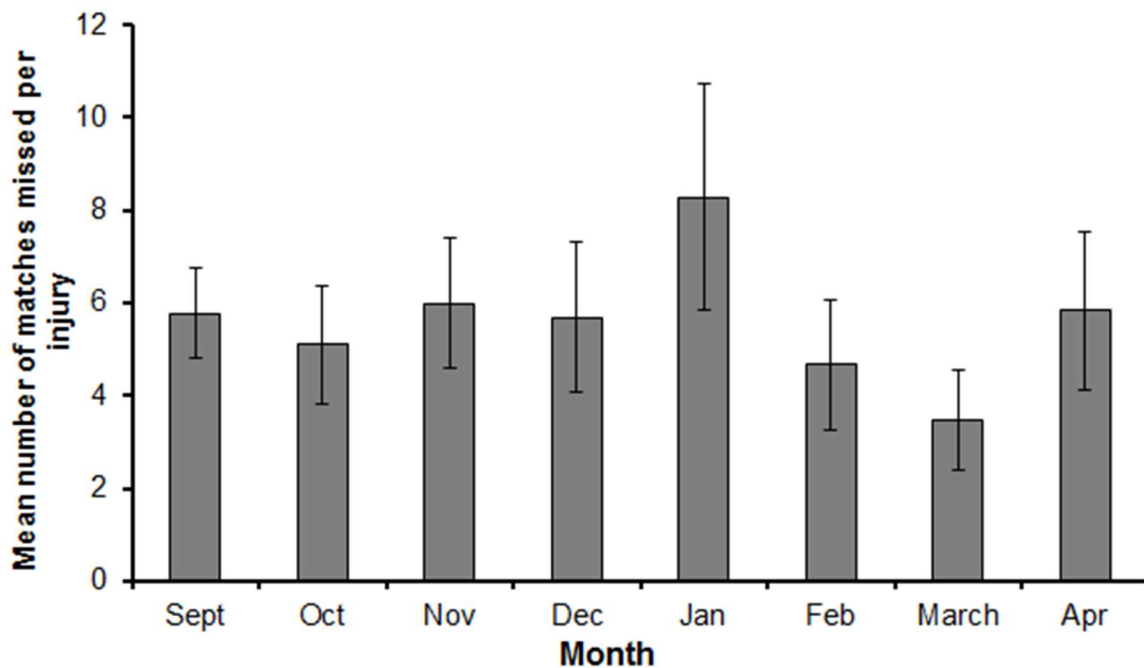
## Non-contact injuries

- Overall, non-contact injuries accounted for 22% of all injuries
- 93% of all non-contact injuries were to the lower limb region
- Of non-contact events, running was found to be the most common injury event (10% of all injuries).
- Hamstring injuries accounted for 6% of all injuries.
- More information on injury prevention exercises for the lower limb (ankles, knees, hamstring) is available via the Activate programme:  
<http://www.englandrugby.com/rugbysafe/activate/>



### Season month and injury severity

Figure S6 shows that although there is some fluctuation in the severity of injuries over the course of the season, these are not statistically significant.



**Figure S6.** Mean number of matches missed per injury over each month of the 2017-18 rugby season. *Note: Injury incidences for August and May have been excluded due to very small numbers of matches and injuries.*