

# **RFU Community Rugby Injury Surveillance and Prevention Project**

## **CRISP**

### **Season Report 2016-2017**

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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 2016-17.



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# SECTION 1 - EXECUTIVE SUMMARY

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## OVERALL FINDINGS

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- ❖ The injury rate of match injuries that caused a player to miss eight days or more (one-week time loss injuries) in community rugby during the season 2016-17 (22.3 injuries per 1,000 player match hours) was higher than that for the season 2015-16 (17.8 injuries per 1,000 player match hours). Much of this increase can be attributed to an increase in concussion and hamstring injuries.
- ❖ On average, a player would need to play 34 games to sustain one injury. A community team plays approximately 30 games in one season and therefore a player playing in every match, is likely to sustain 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 one third of the one-week time-loss injury rates currently reported in Premiership rugby.

## CONCUSSION – MOST COMMON INJURY DIAGNOSIS

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- ❖ The incidence of reported concussion during the season 2016-17 was 3.0 injuries per 1,000 player match hours, which is higher than in the season 2015-16 (2.1 injuries per 1,000 player match hours).
- ❖ This incidence of concussion is one seventh of that currently reported in Premiership rugby.
- ❖ There was one concussion for every 17 team games and on average a player would need to play 253 games to sustain one concussion.
- ❖ The incidence of reported concussion has increased since the launch of the RFU's 'Don't be a Headcase' concussion education programme in 2013, which is designed to increased awareness of concussion. Other possible contributing factors for this increase in concussion incidence include an increased profile of this injury as a result of media focus and a lower threshold for suspecting concussion.
- ❖ 68% 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 second most commonly injured site, but injuries to this site were the most severe in terms of matches missed. Therefore knee injuries account for the greatest total number of matches missed and are a focus for injury prevention initiatives.

## **THE SHOULDER – HIGHEST BURDEN FOR UPPER LIMB**

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- ❖ The shoulder is the third most commonly injured site, with a high mean severity (matches missed). Therefore shoulder injuries account for the most matches missed for an upper limb site.

## **THE TACKLE – MOST COMMON INJURY EVENT**

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- ❖ The tackle was associated with 45% of all injuries.
- ❖ The most commonly injured sites to the tackler are the head and 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 particularly the knee and ankle.

## **CRISP INJURY PREVENTION WARM-UP STUDY – ‘ACTIVATE’**

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- ❖ During the 2015-16 season, the CRISP Project incorporated the first ever large-scale study of an injury prevention warm-up in community rugby union, with the intention to reduce the number and severity of injuries in participating clubs.
- ❖ The study showed that a warm-up comprising exercises designed to target specific injury sites and types was successful in reducing injuries to the head (concussion) and lower limb, but resulted in an increase to injuries to the shoulder.
- ❖ This study has resulted in the development of 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/>

## **SECTION 2 - 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, the players at these levels are full-time professionals with physical attributes resulting in a game which has far greater physical demands than men's community rugby. It is therefore important to have a surveillance programme which is specifically tailored to represent the English men's community game which comprises the largest senior male playing population in the world.

The Community Rugby Injury Surveillance and Prevention (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 eight 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. Work over the 2015-16 season has for the first time shown how a rugby specific warm-up programme – ‘Activate’ – can be effective in reducing targeted injuries.

### **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. 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. Most recently, this project 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/>

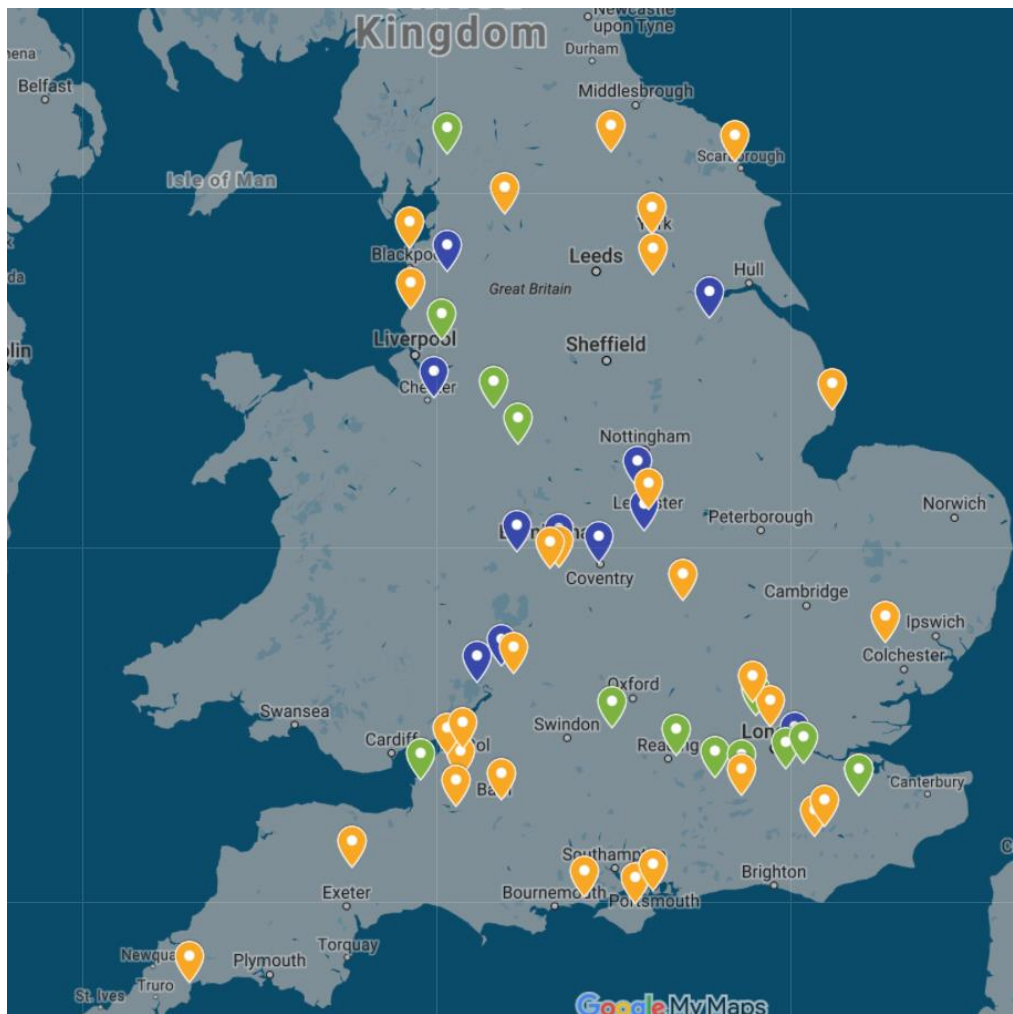
The quality of the project has been demonstrated through a number of academic publications and conference presentations (see Section 7).

## **2.1. Methods and definitions**

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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 advertisement material distributed through coaching courses, newsletters and social media. Each season, a number of teams continue participation from the previous season, with 31% of clubs who participated in season 2015-16 continuing participation in season 2016-17. The diverse geographical range of participating clubs for the 2016-17 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.

COMMUNITY RUGBY INJURY SURVEILLANCE & PREVENTION

Welcome Simon Roberts as [Admin] ▼

## TEAM CRISP

HOME | SQUAD LIST | MATCHES | INJURIES | USER INFO | CLUB CONTACTS

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Dashboard

Welcome to CRISP

- View Squad
- Add a Player
- View Matches
- Add Match
- View Injuries

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Each participating club identifies one or more primary contacts (normally the team's sports therapist or physiotherapist) that are 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 a first team match which caused the player to miss at least one match (eight days or greater absence from playing).

## Presentation of data in this report

This report provides a summary of the CRISP data for the 2016-17 season, including some comparisons with previous seasons. 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	13	15	30

### *Injury incidence*

Time-loss injury data is presented as the number of injuries per 1,000 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 =

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

### *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.

### *Burden (days absence)*

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

### *Statistical significance*

In this report, 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. The use of 95% confidence intervals (CI) provides an estimate of reliability of the value (i.e. small intervals means a very reliable estimate).

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).



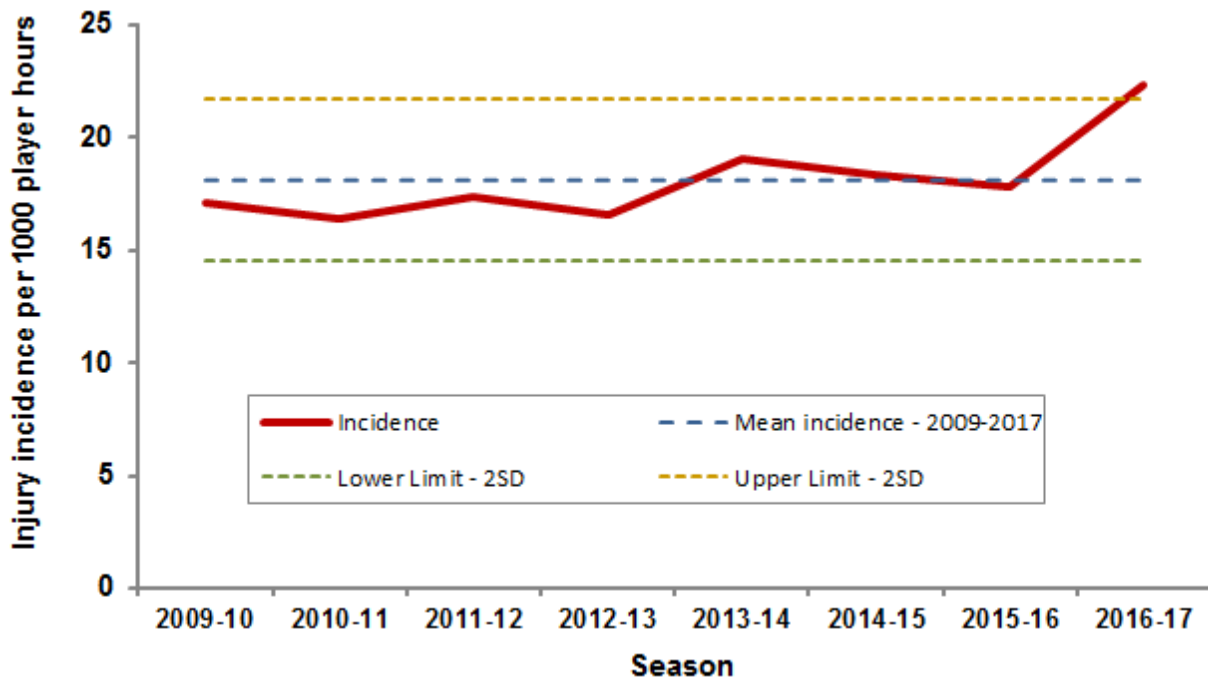
## SECTION 3 - TIME-LOSS INJURY INFORMATION

### 3.1. Overall injury rate and severity

For the 2016-17 season, information from 1,332 matches was included, in which 595 time-loss injuries were reported (any injury resulting in eight days or greater absence from match play). The information presented in Table 3.1 and Figure 3.1 shows small fluctuations in injury incidence over the first seven seasons within the expected natural variation from season-to-season. For the season 2016-17, the incidence has increased slightly above the boundaries for this natural variation as shown in Figure 3.1. While it is not possible to definitively explain the reasons for this increase compared with the season 2015-16, inspection of the body sites of injury show that the majority of this increase can be largely attributed to higher injury rates to the head/neck region (increase of 2.1 injuries per 1,000 player match hours of which 0.9 injuries per 1,000 player match hours were concussion) and the thigh (increase of 1.1 injuries per 1,000 player match hours of which 0.7 were hamstring injuries). Concussion injuries are discussed in more detail in Section 3.6. A small number of clubs in levels 5/6 and 7/8/9 also reported very high incidences which resulted in higher overall incidences for these playing levels in particular compared with the season 2015-16 (Figure 3.1) but also contributed to a higher overall incidence.

**Table 3.1.** 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
<b>2016-17</b>	<b>26640</b>	<b>595</b>	<b>22.3 (20.5-24.1)</b>	<b>2.2</b>	<b>34</b>	<b>6.0</b>
<b>2009-17</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>



**Figure 3.1.** Injury incidence for CRISP over eight 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 rate between different playing levels

The injury incidence for each playing level is demonstrated for the season 2016-17 in Table 3.2 while the trend over eight seasons is shown in Figure 3.2.

The injury incidence at each playing level can be influenced by large variations in the number of injuries reported by different clubs. An additional method to present the ‘typical’ incidence for each playing level is the median incidence which is the middle value of a set of data (club incidences in this case) and is less influenced by a small number of very high or very low values. The median values are shown in Table 3.2. A lower average incidence compared with the median suggests that a small number of teams have a very low average incidence (Level 3/4) while a higher median than the average shows that a small number of teams in the group have a much higher incidence than the typical team (Level 5/6).

**Table 3.2.** Match injury incidence and severity for time-loss injuries between playing levels in season 2016-17.

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	249	118	23.7 (19.4-28.0)	25.0	2.1	6.1
Level 5/6	396	202	25.5 (22.0-29.0)	20.0	2.0	4.9
Level 7/8/9	687	275	20.0 (17.6-22.4)	19.2	2.5	6.7

When the above injury incidences and severities are accounted for, the typical club within each playing level can expect approximately two players to be unavailable due to injury each week of the season (Table 3.2 below).

### 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 3.2. 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 3.3. 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	14.2 injuries	0.9 injuries	2
Level 5/6	15.3 injuries	1.0 injuries	2
Level 7/8/9	12.0 injuries	0.8 injuries	2

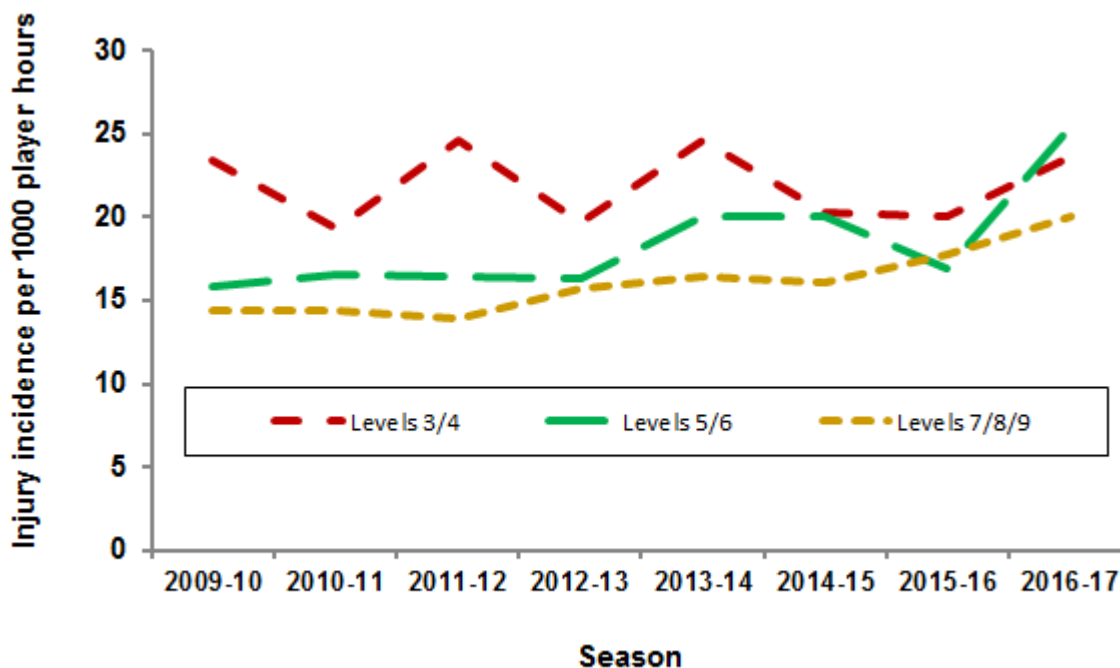
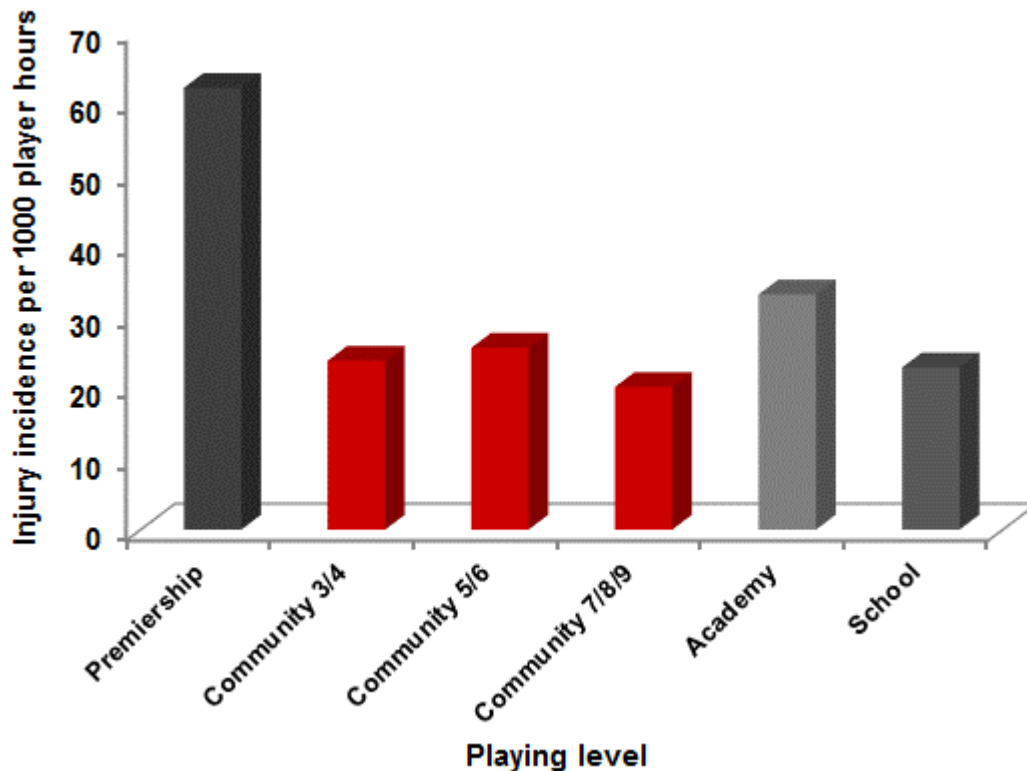


Figure 3.2. Injury incidence over multiple seasons by different playing levels.

## 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 Figures 3.2 and 3.3), the overall injury rate is considerably lower than that of international and Premiership rugby for injuries which cause the player to be absent from training or match play for eight days or longer as shown in Figure 3.3.



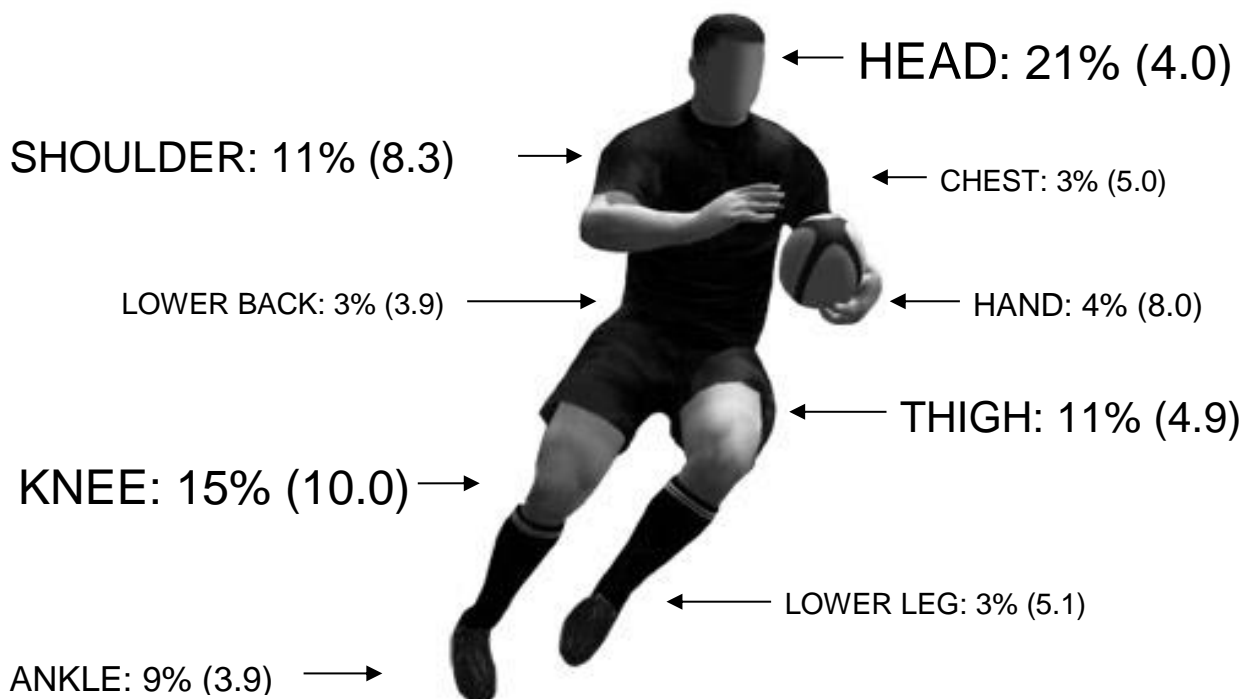
**Figure 3.3.** A comparison of injury rates for different levels of community rugby with elite level and schools rugby.

*Data sources:* Community level 3/4, 5/6 and 7/8/9 are taken from the 2016-17 findings of this current report. Premiership data is taken from the Professional Rugby Injury Surveillance Project (PRISP) report 2016-2017. Information on academies and schools derived from the game-wide report on injury risk in English youth rugby over the seasons 2006-2007 and 2007-2008 (published by the University of Bath/RFU, April 2011).

### 3.4. Site of injury

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The most commonly injured body site is the head, followed by the knee, shoulder, thigh and ankle (Figure 3.4). Knee injuries also account for the most days lost to injury due to the high severity (average number of matches missed).



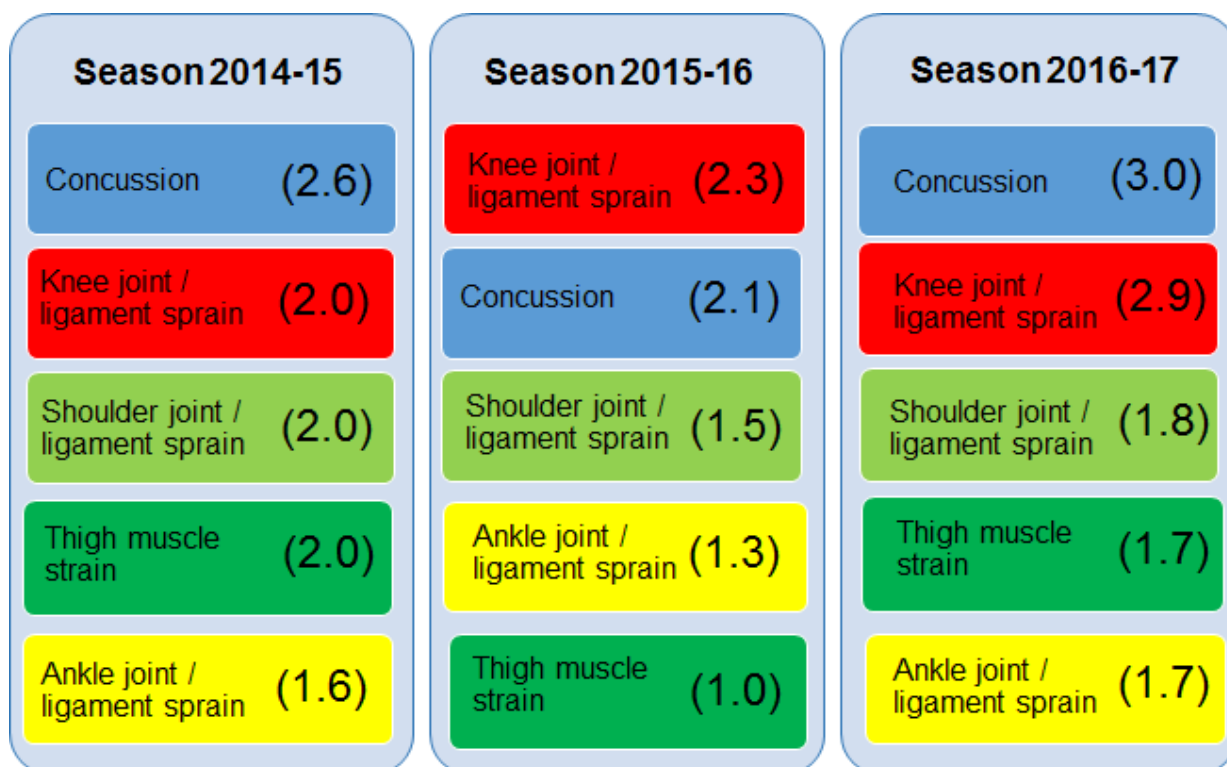
**Figure 3.4.** The most common injury sites (average number of matches missed per injury) for time-loss injuries in 2016-17.

### 3.5. Injury diagnoses

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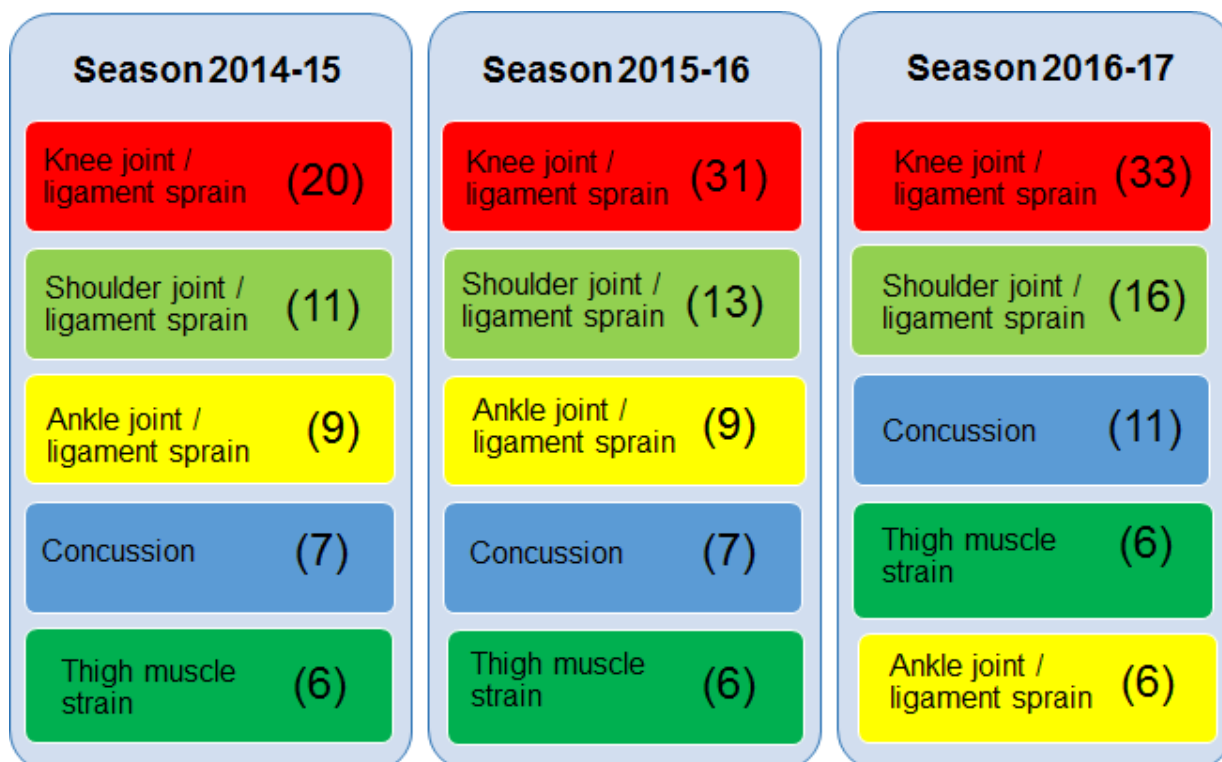
The top five most common injury diagnoses (site and general injury type) for all clubs over the current and previous two seasons are presented in Figure 3.5. It should be noted that the five injuries presented in Figure 3.5 represent approximately half of all injuries reported and therefore it is important that practitioners are able to treat these injuries effectively.

Perhaps more 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 3.6



**Figure 3.5.** Top five injury diagnoses in rank order for **incidence** for all playing levels combined over seasons 2014-15, 2015-16 and 2016-17. Numbers within brackets denote incidences (injuries per 1,000 player match hours).

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



**Figure 3.6.** Top five injury diagnoses in rank order of **burden** for all playing levels combined over seasons 2014-15, 2015-16 and 2016-17. Numbers within brackets denote (number of matches missed per 1,000 player match hours).

## Concussion

### **Concussion incidence and severity**

Concussion accounted for 13% of all time-loss injuries, equating to one concussion in every 17 team games (Table 3.4) that a team plays or one in every eight matches (involving two teams). The rate of injury is higher at level 3/4 (one in every 11 team games) compared with 5/6 (one in every 17 team games) and 7/8/9 (one in every 22 team games).

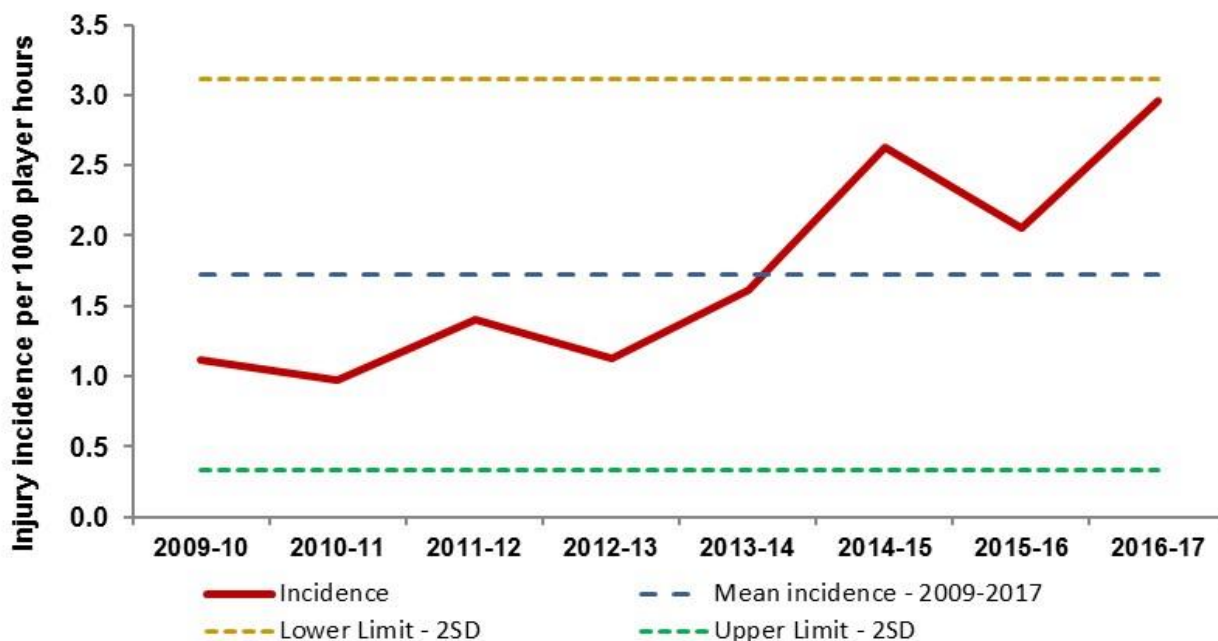
**Table 3.4.** Concussion incidence and severity between playing levels in season 2016-17.

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	249	23	4.6 (2.7-6.5)	11	3.6
Level 5/6	396	24	3.0 (1.8-4.2)	17	4.2
Level 7/8/9	687	32	2.3 (1.5-3.1)	22	3.8
All Levels	1332	79	3.0 (2.3-3.6)	17	3.8

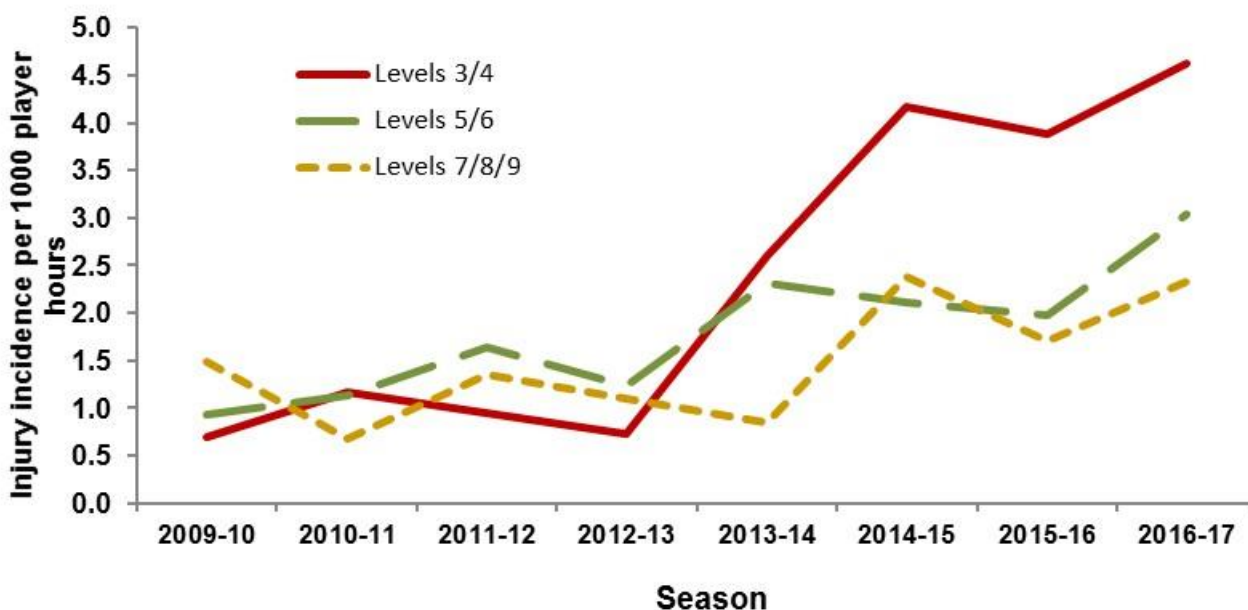
### **Concussion trends over time**

The average incidence of concussion over seasons 2014-15 to 2016-17 (average of 2.5 injuries/1,000 player match hours) has been higher compared with the average over seasons 2009-10 to 2012-13 (1.3 injuries/1,000 player match hours). This may be associated with changes in the characteristics of the game which are related with concussion such as a greater number of contact events, or greater levels of intensity in these events. However, there is currently no evidence 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 3.8 shows that the incidence in levels 3/4 has risen faster than the lower playing levels which may reflect a greater penetration of concussion awareness at these levels and/or that there is a difference in the frequency and nature the game events that the players are exposed to. 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 for concussion in this report is also in line with the recent increases seen in reported concussions in Premiership rugby, but the incidence of match concussion in community rugby is much lower.



**Figure 3.7.** 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 3.8.** Incidence of reported concussions over seven seasons for each playing level.

***Match events associated with concussion***

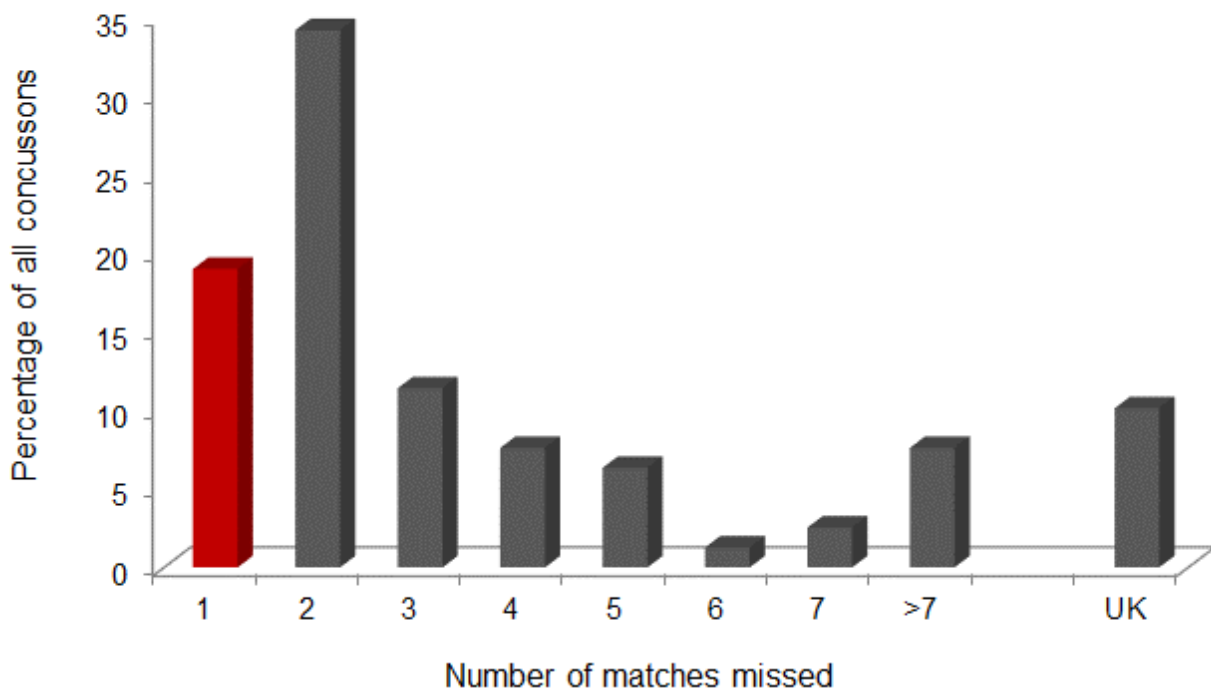
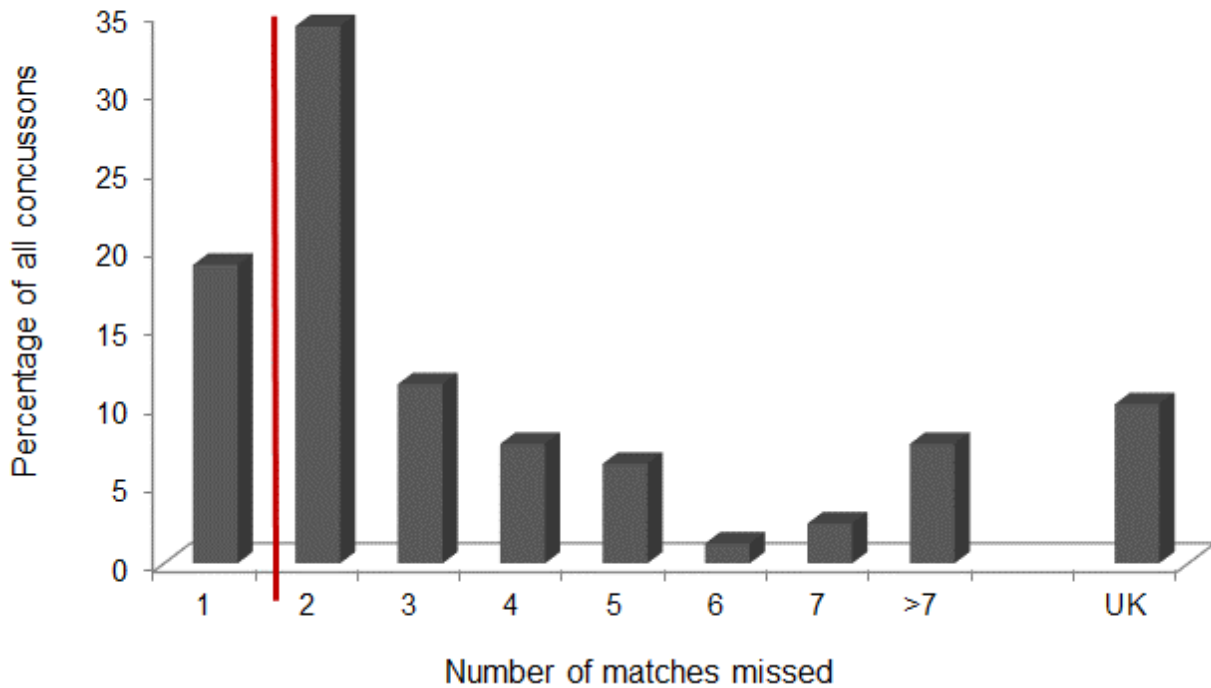
For season 2016-17, the tackle was reported as the injury event for 68% of all concussions (Table 3.6) with 34% of concussions to the tackled player and 34% to the tackling player. Further work is required to understand the specific characteristics of tackles which result in injury. This will be achieved through video analysis.

***Concussion and Return to Play***

There was an average of 3.8 matches missed per concussion injury. The percentage of concussions according to the number of matches missed is shown in Figure 3.9. An RFU Regulation introduced



in March 2014 states that the earliest a concussed player may return to play is 19 days. This should result in all concussed players missing a minimum of two matches (assuming there is one match each week). Figure 3.9 shows that in most cases this was the case but, for 19% of cases (denoted by the red bar), the concussed player returned to play after missing a single match (and returning to play after an average of 14 days absence) which suggests that some players are still returning prematurely to match play.



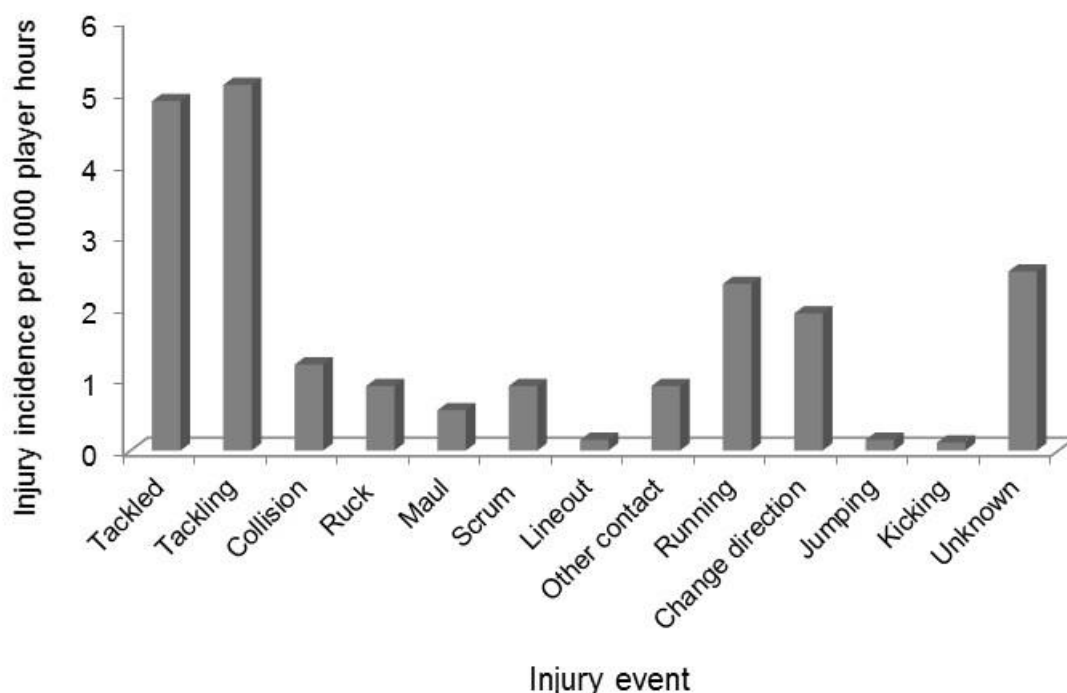
**Figure 3.9.** The percentage of concussions for different numbers of matches missed. 'UK': Return to play date not reported.

### Catastrophic injury

No catastrophic injuries were reported by any participating clubs over the 2016-17 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/>.

### 3.6. Events associated with injury

For the 2016-17 season, 70% of all time-loss injuries were sustained during contact events (Figure 3.11) with 45% occurring in the tackle event. Further information on injury events of particular interest can be found in supplementary data section 7.4.



**Figure 3.11.** The incidence of injuries for specific match events for all playing levels combined

## SECTION 4 - ACTIVATE – INJURY REDUCTION

The Activate injury prevention warm-up programme was used by 21 of the 58 participating CRISP clubs during season 2015-16 to assess its effectiveness in reducing injuries during match play.

Twenty of the participating clubs used a standard warm-up.

The main findings were that clubs using the programme as a training and pre-match warm-up experienced:

- A 60% reduction in concussion
- A 40% reduction in lower limb injuries (mainly including thigh, knee and ankle injuries).

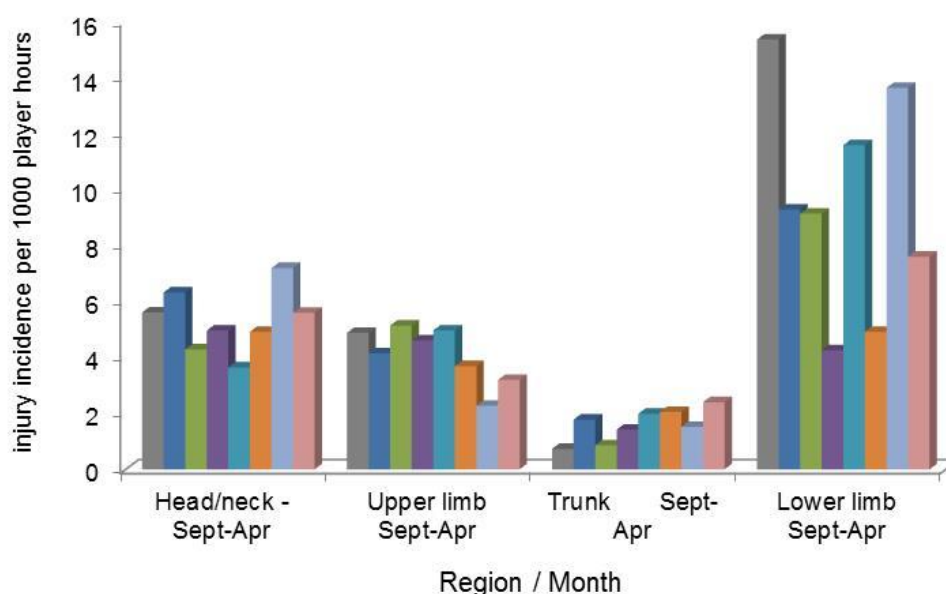
The findings demonstrate that Activate can have a positive impact on some of the key injuries which occur in the men's community game:

### Concussion

The incidence of concussion has increased in recent seasons (Figure 3.7) but the incidence in the season 2015-16 was the lowest of the last three seasons. Twenty-one of the 58 participating clubs in 15-16 were using the Activate warm-up which has been shown to result in a 60% reduction in concussion. In the 16-17 season fewer than five participating clubs were using Activate.

### Lower limb and targeted injuries

These types of injuries include diagnoses such as muscle strains, ligamentous sprains, joint injuries and concussion. The information provided in Section 3.6, Figures 3.5 and 3.6 show that lower limb injuries of this type account for three or the top five most common injuries for incidence and burden. Therefore the use of the Activate programme has the potential to reduce these common injuries. Also, additional data (below) shows a higher incidence of lower limb injuries early in the season, which supports the use of Activate during pre-season and early season period.



**Figure 7.10.** Incidence of time-loss injuries for each body region over each month of the 2016-17 rugby season. *Note: Injury incidences for August and September have been excluded due to very small numbers of matches and injuries.*

### Find out more about Activate

More information on the Activate programme and how to access the exercises can be found on: <http://www.englishrugby.com/rugbysafe/activate/>

## SECTION 5 - FUTURE DIRECTIONS OF COMMUNITY RUGBY INJURY SURVEILLANCE

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### Enhanced Community injury surveillance for 2017-18 and beyond

The community rugby injury surveillance project is now well established and has captured data over multiple seasons. This dataset provides an increasingly large number of injuries to report on injury patterns with confidence 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.

In the 2017-18 season the CRISP project will be expanded to capture injury information from traditional rugby playing schools, CBRE All Schools as well as Schools 7s tournaments.

A pilot injury surveillance study is also being set-up in the British University and Colleges Sport (BUCS) Super Rugby competition (approximately similar to levels 3/4 of men's community rugby) and a full-scale study is planned for the 2018-19 season.

Injury data from clubs who play on an artificial grass pitch (AGP) is now being captured to inform our understanding of the injury risk in community rugby of playing on an AGP.

## SECTION 6 - 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. (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.

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## SECTION 7 - 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 the 2016-17 season.

**Level 3/4:** Bishop's Stortford, Blackheath, Chester, Cinderford, Coventry, Hartpury College, Henley Hawks, Leicester Lions, Loughborough Students, Preston Grasshoppers, Scunthorpe, Stourbridge, 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

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# RFU Community Rugby Injury Surveillance and Prevention Project

## CRISP

### Supplementary data 2016-2017

Authored by: Dr Simon Roberts (Community Rugby Injury Surveillance and Prevention Project Research Associate, University of Bath), Professor Keith Stokes (Community Rugby Injury Surveillance and Prevention Project Principal Investigator, University of Bath), Dr Simon Kemp (Medical Services Director, RFU)

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 2016-17.



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## SECTION 8 – SUPPLEMENTARY DATA

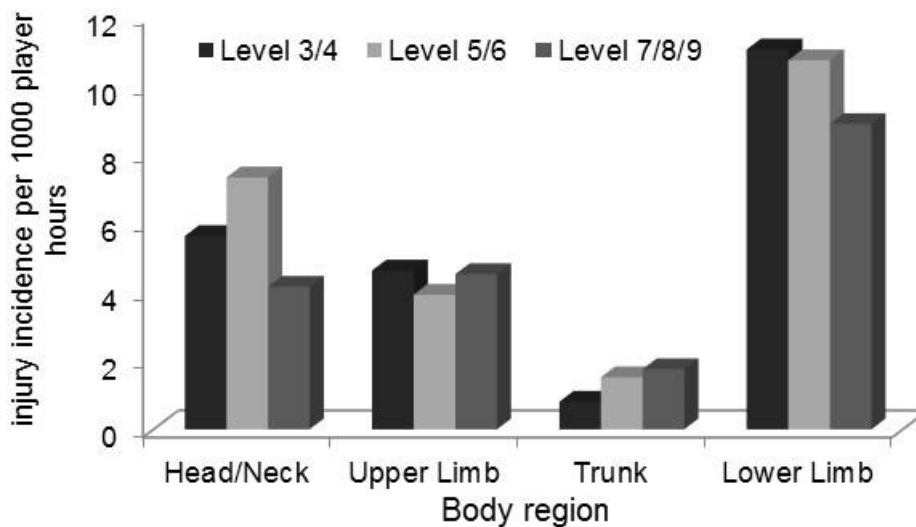
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This section contains additional data to that of the main section

### 8.1 - 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 all playing levels.

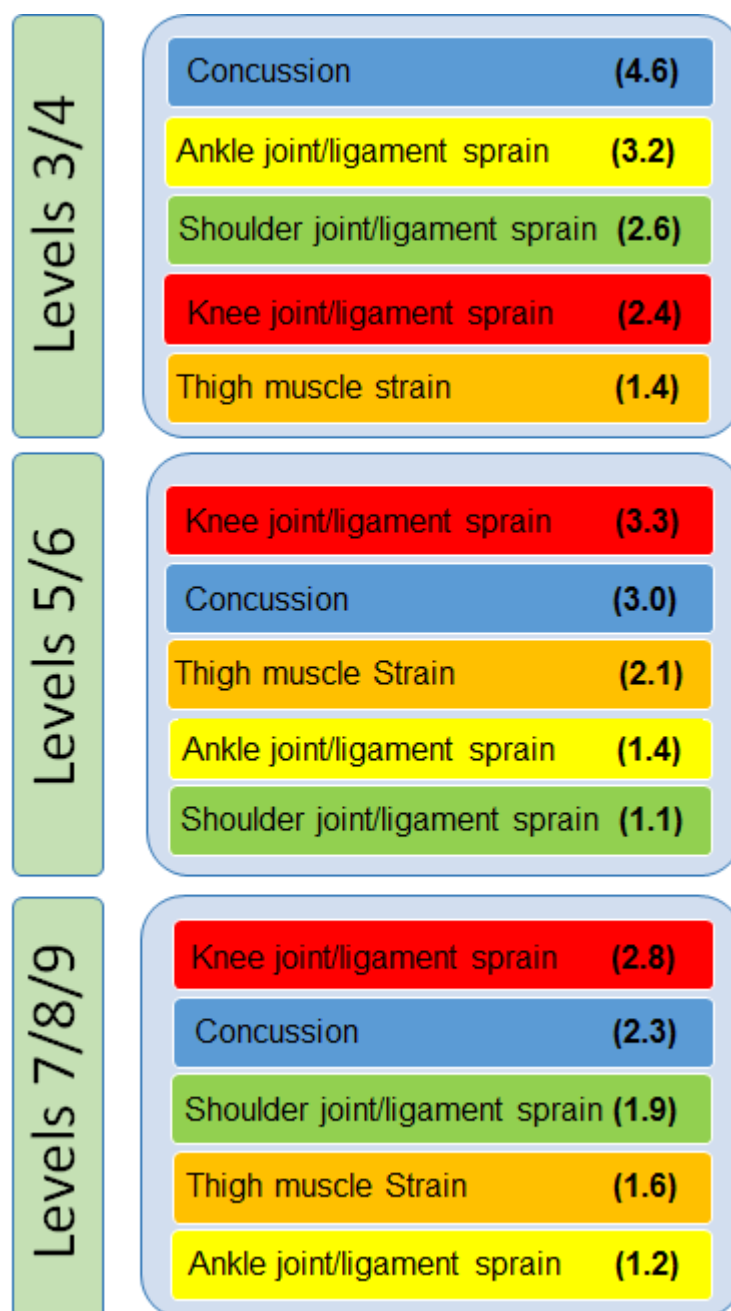


**Figure 8.1.** Injury incidence according to body region by playing level for all time-loss injuries in 2016-17.

## 8.2 - Injury diagnoses by playing level

---

The top five injury diagnoses by different playing levels are shown in Figure 8.2 below. The same top five diagnoses appear within each playing level, with just small changes in the order.



**Figure 8.2.** Top five injury diagnoses in rank order for the three different playing levels, for season 2016-17. Numbers within brackets denote incidence (injuries per 1,000 player match hours) of all injuries within each playing level for each diagnosis.

## 8.3 - Concussion – additional information

### **Concussion management and treatment**

Table 8.1 shows how concussions were managed following a match, according to which medical professionals the concussed player were referred to.

**Table 8.1.** 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
2016-17					
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 3.0 per 1,000 player match hours, 95% CI 2.1-3.9 compared with 2.9 per 1,000 player match hours, 95% CI 1.9-3.8 for backs and was not a statistically significant difference.

### **Match events associated with concussion.**

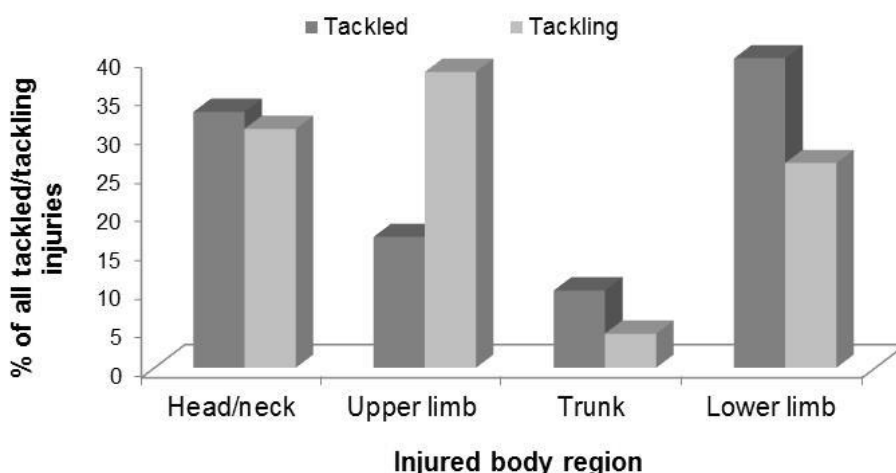
**Table 8.2.** Percentage of concussions relating to match events for the 2016-17 season.

Event	Tackled	Tackling	Ruck	Collison (accidental)	Maul	Unknown
Percentage of concussions	34	34	9	8	1	8

## 8.4 - Match events associated with Injury

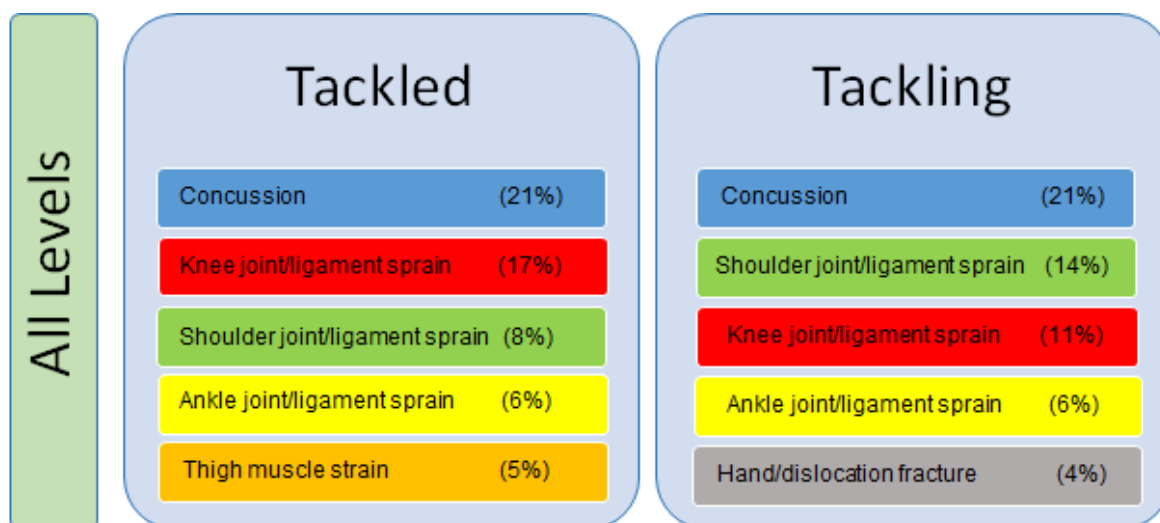
### The Tackle

- The tackle (both being tackled and tackling) was the most common injury event accounting for 45% of all injuries (22% through being tackled; 23% through tackling).
- The head was the body site most commonly injured in the tackle (28% of all tackle injuries), followed by the shoulder (17%), knee (15%) and thigh (7%).
- Figure 8.3 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 5.1 matches absence (Tackled: 5.3 matches and Tackling: 4.9 matches missed) compared with a mean of 6.0 matches missed for all injuries.



**Figure 8.3.** Percentage distribution by body regions for time-loss injuries sustained when being tackled and when tackling.

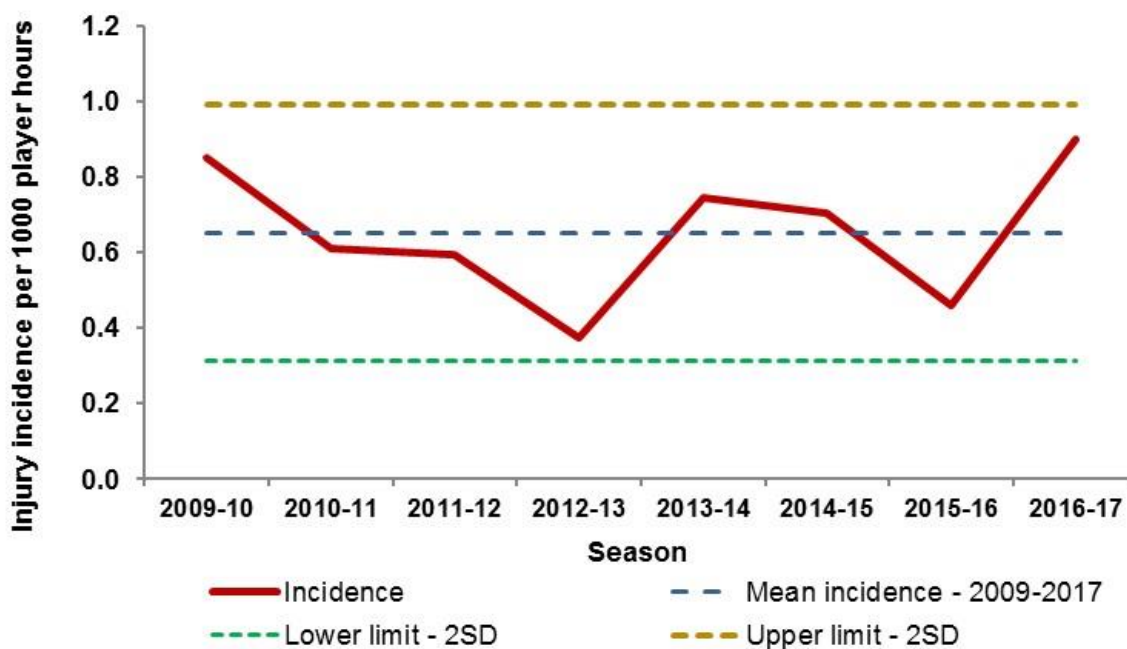
Figure 8.4 shows that while a high percentage of concussions were sustained for all tackles, the higher proportion of lower limb injuries to the tackled player appear to be knee and ankle joint/ligament injuries and the primary upper limb injuries to the tackling player are to the shoulder, and hand.



**Figure 8.4.** Top five most common injury diagnoses for the player being tackled and the player tackling in season 2016-17. Numbers in brackets denotes the percentage of all tackled or tackling injuries.

## The Scrum

Scrum injuries for the 2016-17 season, accounted for only 4% (24 injuries) of the total number. Figure 7.5 shows the scrum injury incidence over eight seasons and while there have been some fluctuations, the incidence is statistically stable over the period.



**Figure 8.5.** 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 no scrum injuries reported for level 3/4, with 12 for level 5/6 and 12 for level 7/8/9.
- The severity of scrum injuries was a mean of 6.9 matches absence (similar to the mean for any injury type).
- 15 injuries occurred to front row players (loose head prop: four injuries, hooker: three injuries, tight head prop: eight injuries) with one injury sustained by a second row and six to the back row.
- There was a range of types of injury sustained in the scrum distributed between the head (two injuries), shoulder (three injuries), neck (seven injuries), chest (one injury), knee (three injuries) and lower back (three injuries), upper back (two injuries) lower leg (one injury), ankle (one injury), wrist (one injury).
- Collapsed scrums resulted in injuries to the head (one injury), neck (two injuries), shoulder (one injury), upper back (one injury), knee (two injuries) and these were less severe (average of 2.3 matches missed) than the average severity for all 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 2016-17 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 1,000 player hours) are compared with the seasons following (2013-17: 0.70 injuries per 1,000 player hours).

## Non-contact injuries

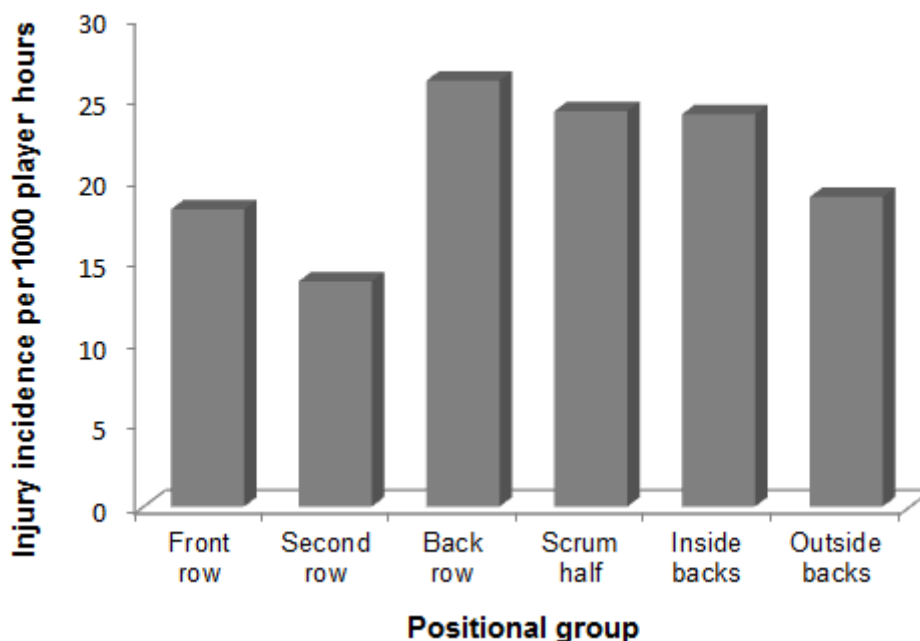
- Overall, non-contact injuries accounted for 22% of all injuries
- 93% of all non-contact injuries were to the lower limb region
- Of non-contact events, running was found to be the most common injury event (10% of all injuries).
- Hamstring injuries accounted for 6% of all injuries.
- More information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

<http://www.englandrugby.com/rugbysafe/activate/>

## 8.5 - Effect of playing position on injury

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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 (20.1 injuries per 1,000 player hours) compared with backs (21.9 injuries per 1,000 player hours). Back row forwards sustained more injuries compared with the other forwards groups but there was no difference between the backs specific positional groups (Figure 8.6).



**Figure 8.6.** Comparison between positional groups for injury incidence. Forwards: front row: loosehead and tighthead props, hooker, Second row: left and right locks; Back row: openside and blindside flankers, No. 8; Backs: inside backs: outside half, inside centre, outside centre; outside backs: left and right wings, full back.

## Playing position and severity

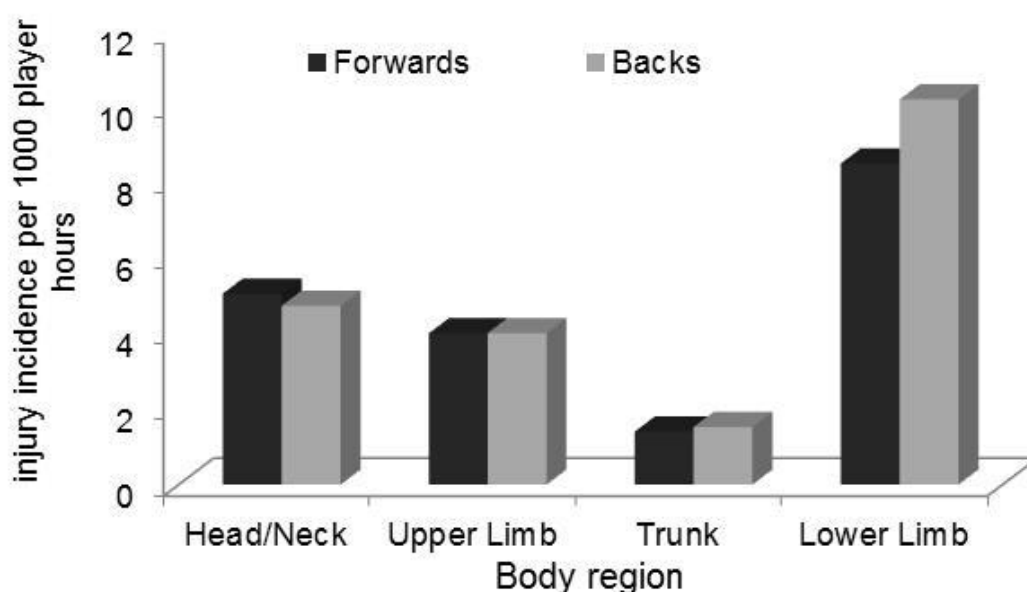
The mean number of matches missed for an injury to a forward is 6.6, compared with 5.1 for a back.

## Playing position and injury event

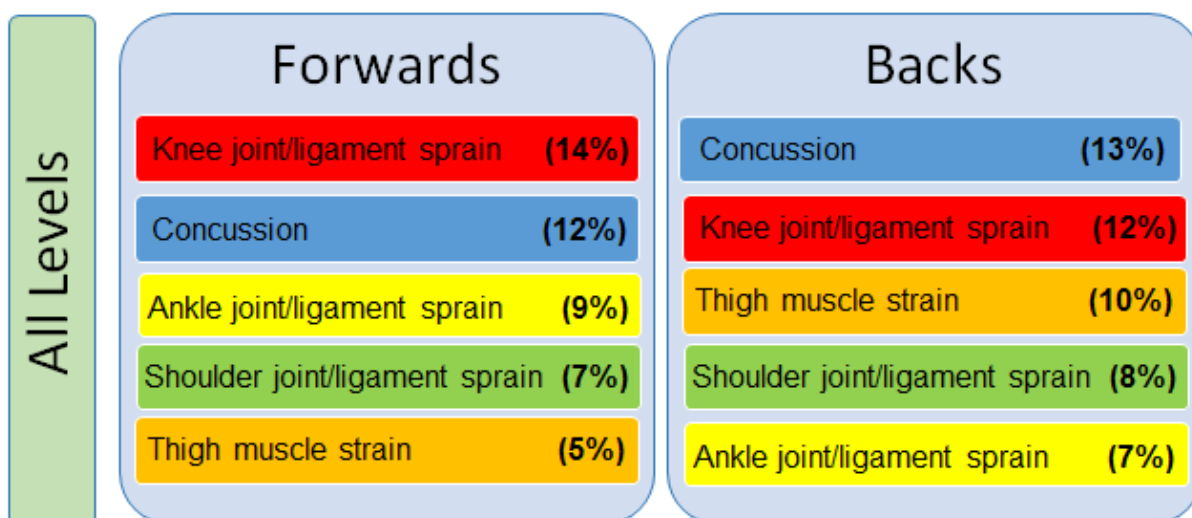
For forwards, 83% of all injuries were associated with contact events, compared with 74% for backs. It is likely that these findings are due to forwards competing in more contact events during a match compared with backs and therefore the risk of injury per event may not be different for forwards and backs.

## Playing position and injury type

The information summarised in Figure 8.7 shows few differences in the body region of injuries sustained by forwards and backs. Figure 8.8 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 8.7.** Comparison between forwards and backs for injury incidence by different body regions.



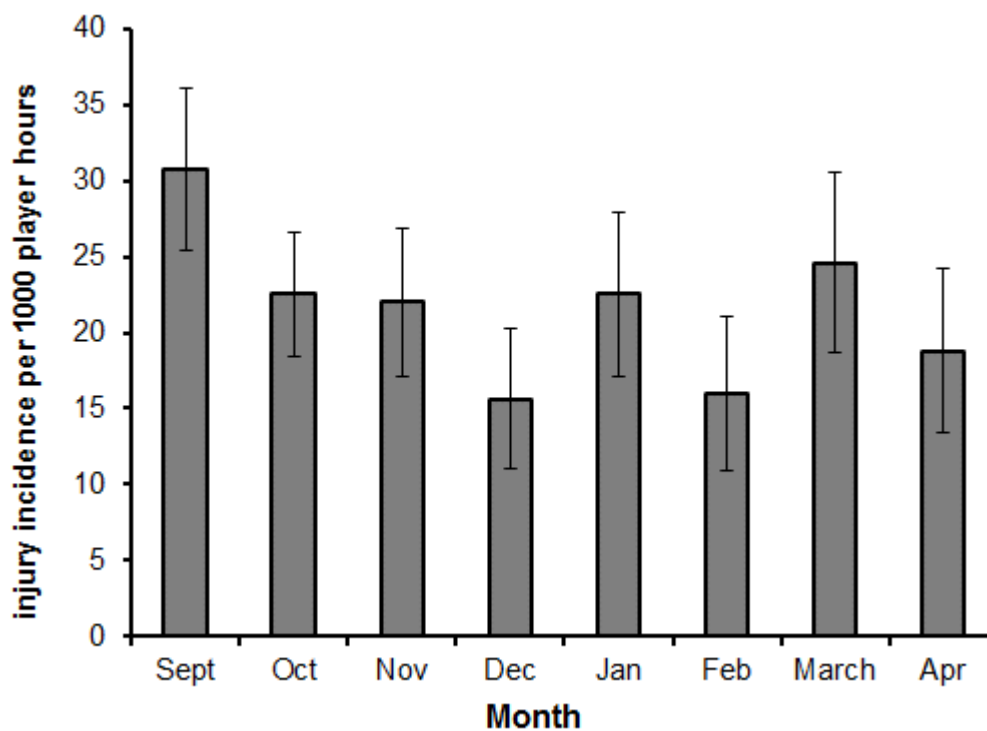
**Figure 8.8.** The top specific injury diagnoses for forwards and backs (numbers in brackets denote percentages of total injuries for forwards and backs).

## 8.6 - Timing of injuries

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### Season month and incidence

Figure 8.9 demonstrates a trend towards more injuries at the start of the season (September). Furthermore, this injury pattern is consistent in both contact and non-contact injuries and more specifically for tackle and running events.

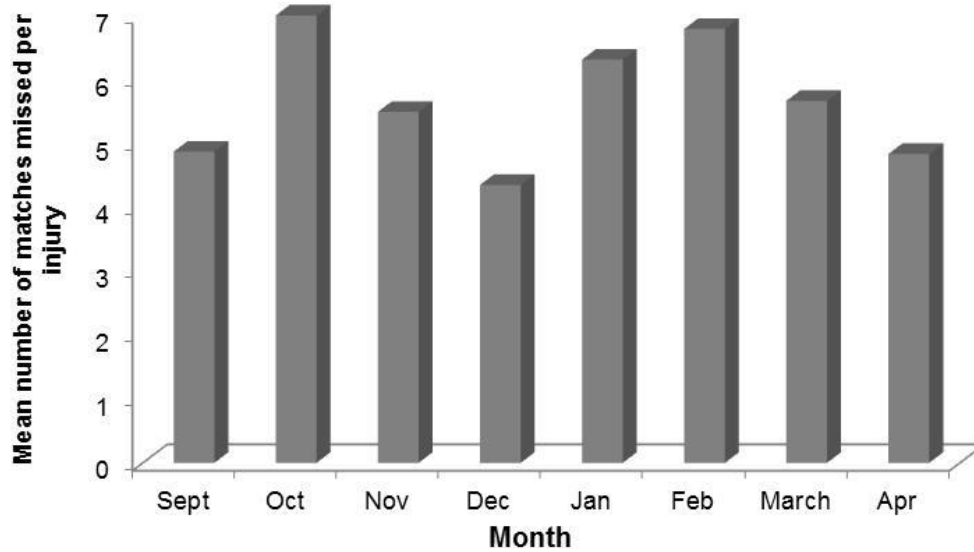


**Figure 8.9.** Incidence of time-loss injuries over each month of the 2016-17 rugby season.  
*Note: due to very small numbers of matches and injuries reported during August and May, injury incidences for these months have been excluded.*



### Season month and injury severity

Figure 8.11 shows that although there is some fluctuation in the severity of injuries over the course of the season, these are not statistically meaningful.



**Figure 8.11.** Mean number of matches missed per injury over each month of the 2016-17 rugby season. *Note: injury incidences for August and September have been excluded due to very small numbers of matches and injuries.*

## 8.7 - Physical characteristics of community rugby union players

Each participating club provides anthropometric characteristics for their squad players. Table 8.3 shows the age, height and mass for community club players of different playing levels, compared with similar information reported previously for Premiership players\*. The data demonstrates a trend for players to be taller and heavier as the playing level increases.

**Table 8.3.** Player anthropometric characteristics for different levels of community rugby and compared with data previously reported for Premiership rugby players\*.

	Forwards	Backs
<b>Age</b>		
Premiership	25.6	24.8
Level 3/4	25	24
Level 5/6	27	26
Level 7/8/9	27	25
<b>Height (cm)</b>		
Premiership	189	182
Level 3/4	186	181
Level 5/6	183	180
Level 7/8/9	183	180
<b>Mass (Kg)</b>		
Premiership	111	91
Level 3/4	106	88
Level 5/6	102	87
Level 7/8/9	100	86

\* Fuller, C.W., Taylor, A.E., Brooks, J.M., Kemp, S.P.T. (2013). Changes in the stature, body mass and age of English professional rugby players: A 10-year review, *Journal of Sports Sciences*, 31(7):795-80.