Youth Rugby Injury Surveillance Project Season Report 2017-18

Authored by the Youth Rugby Injury Surveillance Project (YRISP) Steering Group

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The authors would like to acknowledge the hard work of all the coaches, medical professionals and staff at the schools who have collected injury data to make this report possible.

Key Findings

PROJECT OVERVIEW

Schools Participating:
19 Schools, 39 teams

Age Groups:
Under 13, 15, 18

Match Exposure:
332 games, 5289 hours

Injury Definition:
24 hour time-loss

Injuries Reported:
179 injuries

OVERALL MATCH INJURIES

Injury Incidence Rate:
33.8 per 1000 player match-hours

Mean Severity:
31 days

Injury Burden:
1053 days absence per 1000 hours

Injury Event:
31% tackling; 21% being tackled

Injury Type
Joint & Ligament - 30% of all injuries

OVERVIEW PER AGE GROUP

Matches per Injury: **U13 – 3.5, U15 – 2.8, U18 – 2.0**

Injury Incidence Rate (per 1000 player match-hours): **U13 – 22.6, U15 – 28.1, U18 – 39.1**

Mean Injury Severity (days): **U13 - 24, U15 – 27, U18 – 35**

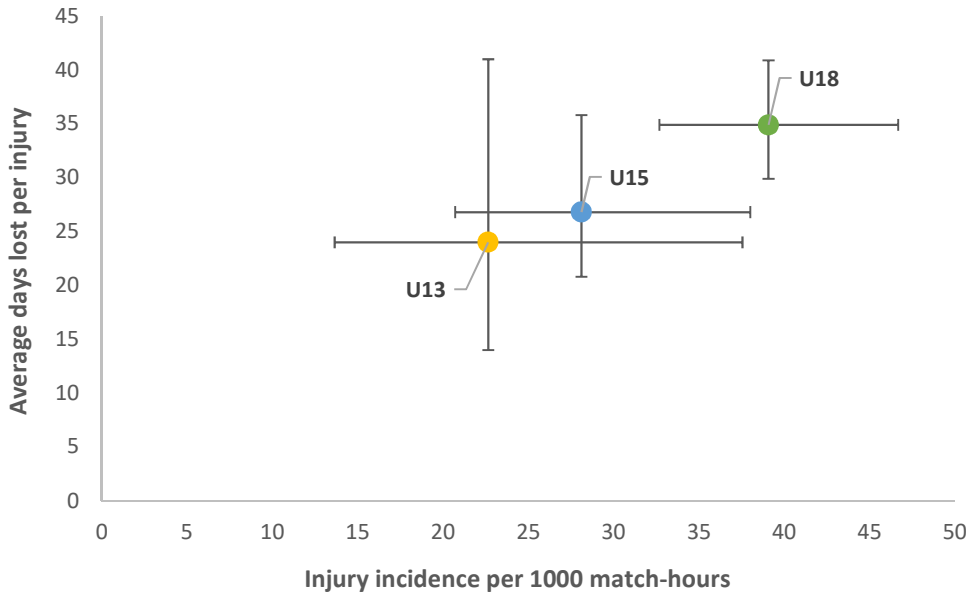

Figure 1. Summary of match injury data in the Schools Rugby

Executive Summary

- 19 schools participated in the project over the course of the 2017-18 season, providing data for 39 individual teams (U13 - 9, U15 - 12, U18 - 18).
- A total of 332 matches (5289 player hours) were recorded, along with 179 match injuries (U13 – 15, U15 – 43, U18 – 121).
- The overall match injury incidence was 33.8 per 1000 player match-hours (/1000h), with the incidence at 22.6/1000h (3.5 matches / injury) for U13's, 28.1/1000h (2.8 matches / injury) for U15's and 39.1/1000h (2.0 matches / injury) for U18's.
- Using a 7-day time-loss definition overall injury incidence was 21.2/1000h.
- Burden, calculated by multiplying the severity (days lost) of injuries by the incidence, was found to be 1053 days lost/1000h overall. It was higher at the U18 age group (1364 days lost/1000h) than the U15 (753 days lost/1000h) and U13 (543 days lost/1000h) age groups.
- Concussion incidence was similar for the U13 (6.0/1000h) and U15 (5.9/1000h) age groups but was higher for the U18 age group at 8.7/1000h. Most concussions were sustained whilst tackling (2.5/1000h). 23% of players sustaining a concussion returned to play quicker than the minimum timeframe (23 days) for under-19 players in the routine return to play pathway.

Contents

Section 1. Introduction

The Youth Rugby Injury Surveillance Project (YRISP) collects match exposure and match injuries from schools across England at the under-13, under-15 and under-18 age groups. The aim of the project is to better understand the risk, types and mechanisms of injuries in schoolboy rugby across different age groups. This will allow us to better inform injury prevention strategies, such as rule changes, so that the safety of the game can be improved for those participating.

This is the first YRISP season report, with the project intended to continue longitudinally to mirror the annual Professional (PRISP) and Community (CRISP) Rugby Injury Surveillance Projects. Injury risk in youth and school rugby has been researched intermittently over the past decade. The most recent study in English schools was conducted in 2015-16, reporting an injury incidence of 26-30 per 1000 match-hours in U15-18 age groups[1]. A 2-season study from 2006-2008 investigated the risk of injury in U17-18 schools and academy rugby, finding a higher injury rate in academy matches (35 and 47 injuries per 1000 match-hours respectively)[2]. In the 2014-15 season, a study in Irish schools first XV rugby reported an incidence rate of 29 per 1000 match-hours[3]. For reference, the incidence rates presented in the in the PRISP report for the 2017-18 season was 92 per 1000 match-hours[4]. All of the previously mentioned studies used the same 24-hour time loss definition adopted in this report. The CRISP report uses a 7-day time loss injury, reporting an incidence rate of 23 per 1000 match-hours[5].

Section 2. Project Definitions

Time-loss Injury: Any injury that prevents a player from taking a full part in all training activities typically planned for that day and/or match play for more than 24 hours from midnight at the end of the day the injury was sustained.

Injury Incidence: The number of time-loss injuries per 1000 match-hours of exposure.

Injury Severity: The number of days that have elapsed from the date of injury to the date of the player's return to full availability for match selection.

Injury Burden: Combining injury incidence with severity to provide a total number of day's absence per 1000 player-hours of exposure.

Injury Mechanism: Injuries will be classified as contact (tackling, tackled, maul, ruck, lineout, scrum or accidental collision), non-contact (running) or other (other, unknown) injuries.

Match Exposure (player-hours) = (match length (minutes) x 15)/60

Section 3. Season 2017-18 Findings

Overview

For the 2017-18 season, 332 matches (5289 hours of match exposure) were reported across the 3 age groups, with 179 time-loss injuries recorded. The overall incidence rate from matches across all age groups was 33.8 per 1000 match-hours, with an average severity of 31 days leading to an overall injury burden of 1053 per 1000 math-hours. Overall match injury data from the season, along with a breakdown per age group, can be seen in Table 1.

Injury Incidence, Severity and Burden

Injury incidence in the U13 and U15 age groups was not significantly different, but the U18 injury incidence was higher than both the U13 and U15 age groups (Figure 2). The severity of U13 injuries should be interpreted with caution due to the relatively low number of injuries recorded throughout the season (Figure 3). Overall, 32% of all injuries were moderate, with 25% being minor and 23% being severe (Table 2). Match injury burden in U18 matches was higher than that of the U13 and U15 age groups (Figure 4).

Injury incidence using a 7-day time loss (> 7-days) definition was calculated to allow for comparison to studies adopting this definition. The overall incidence was 21.2 per 1000 match-hours, with 112 match injuries having a severity of 8 days or greater, whilst overall incidence of minor/mild injuries (≤ 7 days) was 8.3 per 1000 match-hours. 24 injuries were excluded from this analysis as the return to play date was unknown. Breakdown of injury incidence using this definition can be seen in Figure 5.

Table 1. Overview of injury incidence, severity and burden by age group.

Overview	Exposure (player-hours)	Injuries (n)	Incidence (/1000h)	Severity (days)	Burden (/1000h)	Matches per Injury
Overall	5290	179	33.8	31	1053	N/A
U13	663	15	22.6	24	543	3.5
U15	1530	43	28.1	27	753	2.4
U18	3097	121	39.1	35	1364	1.5

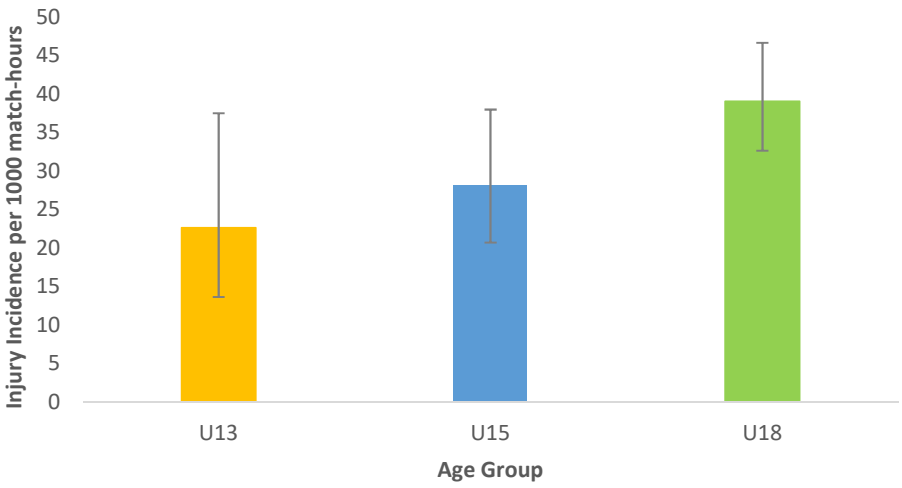

Figure 2. Injury incidence per 1000 match-hours by age group.

Table 2. Incidence and proportion of injuries of different severity.

Injury Severity	Incidence (/1000h)	Proportion of Total (%)
Minor (2-7 days)	8.5	25
Moderate (8-28 days)	10.8	32
Severe (29-84 days)	7.9	23
Very Severe (>84 days)	1.7	5
Unknown	4.9	15

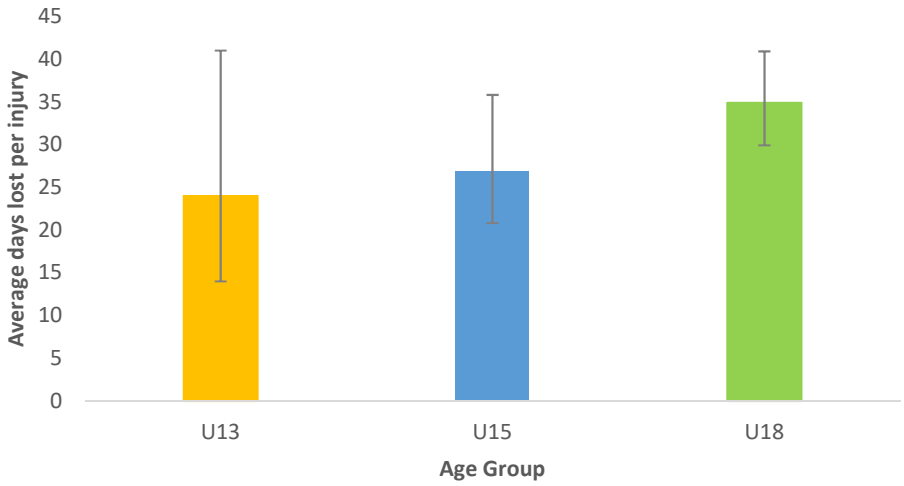

Figure 3. Match injury severity (average days lost / injury) by age group.

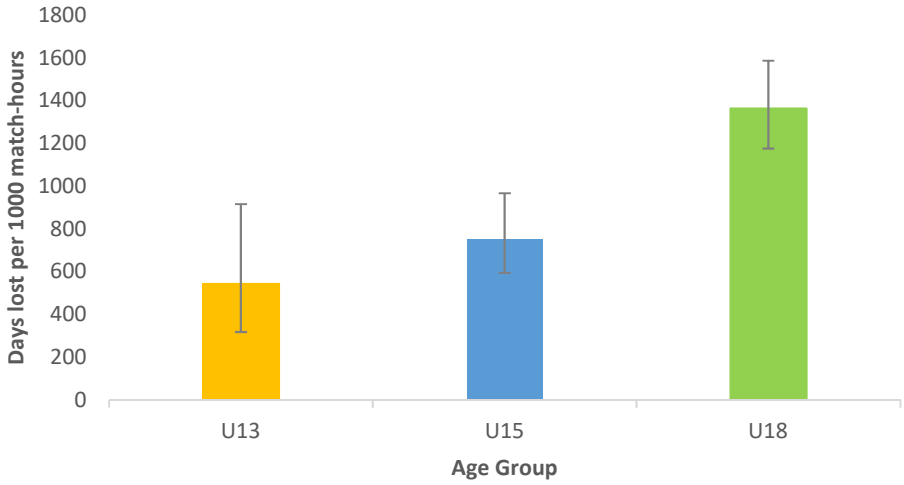

Figure 4. Match injury burden (days lost per 1000 match-hours) by age group.

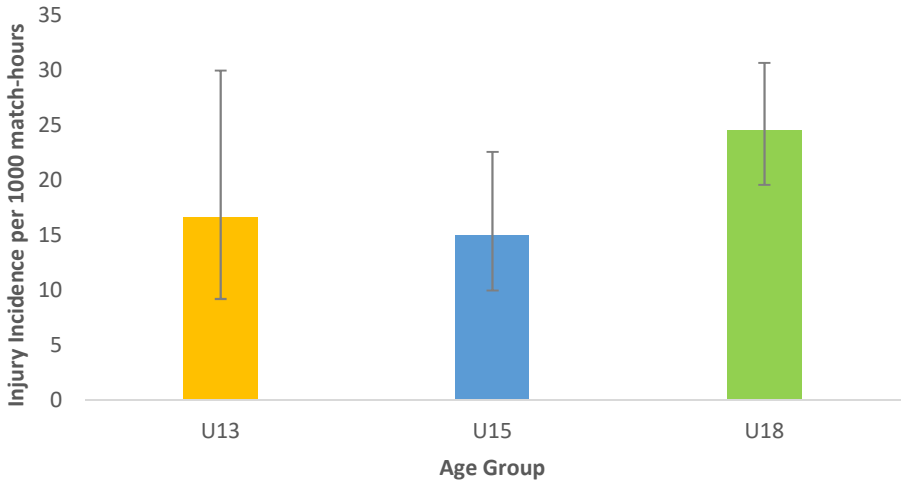

Figure 5. Injury incidence per 1000 match-hours using a >7-day time-loss definition

Injury Event

Over 87% of match injuries recorded across all age groups resulted from contact, with 8% of injuries classified as non-contact and the remaining given as 'Unknown' (Figure 6). As is seen across all levels of rugby, contact is the primary mechanism for injury.

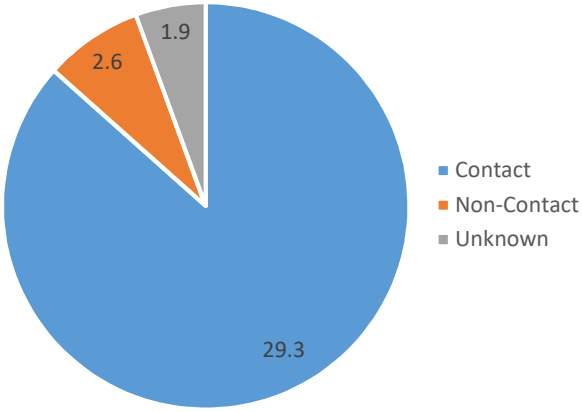

Figure 6. Injury incidence per 1000 match-hours per general mechanism for all age groups combined.

Overall, tackling was the most common specific mechanism of injury (10.6 per 1000 match-hours, Figure 7), followed by the injuries to those being tackled (7.2 per 1000 match-hours). The propensity for injury occurring in the tackle is a common finding across many rugby epidemiology studies, with the tackler appearing at a greater risk. The risk of injury to the tackler was shown to be 1.4 times higher than to the player being tackled in the U15 and U18 age groups. This was found to be 5.0 times higher at the U13 age group, due to a low number of injuries occurring to the player being tackled.

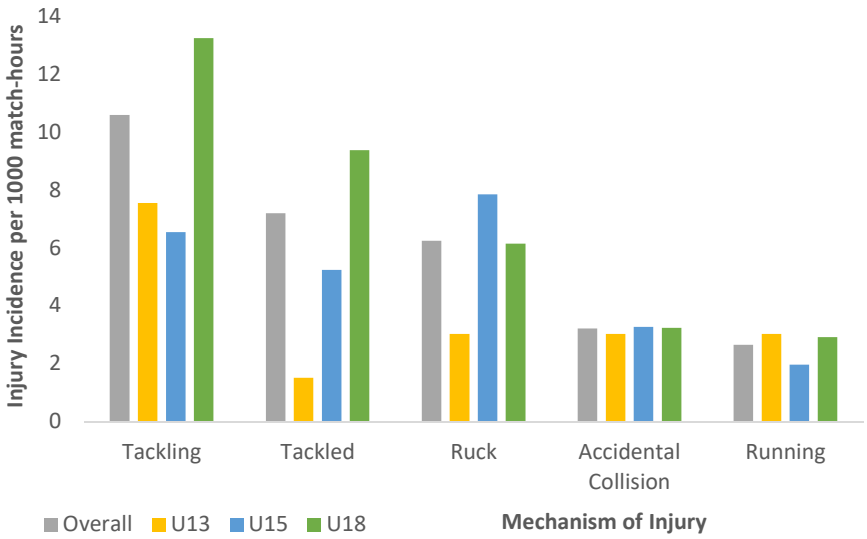

Figure 7. Injury event per 1000 match-hours across different age groups

Injury Location

Injuries were grouped into broad body locations (Figure 8). Frequency of injury to the head/neck (11.7 per 1000 match-hours), lower limb (10.8 per 1000 match-hours) and upper limb (10.4 per 1000 match-hours) were similar, with a lower incidence of injuries to the trunk.

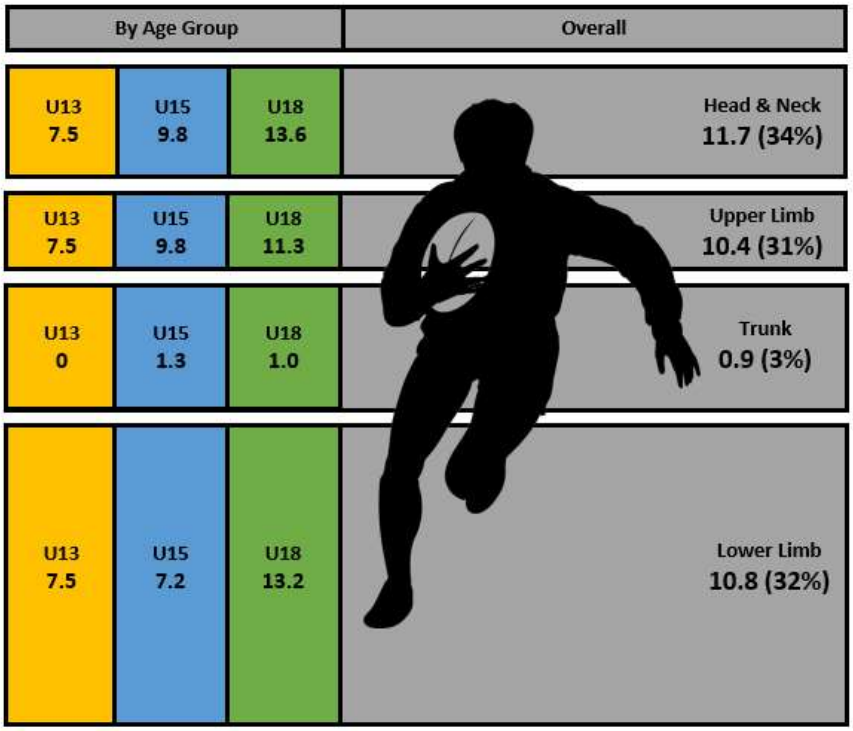

Figure 8. Overall injury incidence for each general body location (per 1000 match-hours), with U13/U15/U18 data respectively beneath.

Injury Type

The most common type of match injury differed between each age groups, with Central Nervous System (CNS) & Peripheral Nervous System (PNS) injuries being the most common in U13 matches, muscle & tendon injuries being the most common in U15's and joint & ligament injuries being the most common in U18 matches (Figure 9). The incidence of joint & ligament injuries appeared to be higher for older age groups, as U18 matches were over double that of U15 matches. CNS & PNS injury incidence, including concussions, was similar for both U13's and U15's, but was higher for U18 matches.

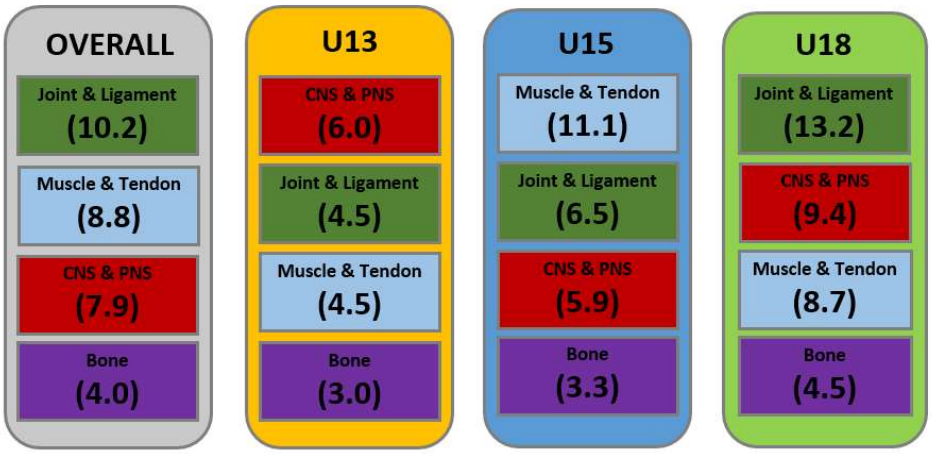

Figure 9. Injury type per 1000 match-hours per age group.

Concussion

40 concussions were reported in the 2017-18 season (Table 3). The injury incidence was similar for the U13 and U15 age groups, at 5.9 and 6.0 per 1000 match-hours respectively. This was higher for the U18 group at 8.7 concussions per 1000 match-hours. Tackling was the most common overall mechanism of injury (Figure 10), at 2.7 concussions per 1000 match-hours, followed by accidental collisions (1.7) and being tackled (1.5). Sustaining a concussion whilst tackling was almost twice as likely as being tackled.

Table 3. Overview of concussion incidence, severity and burden by age group.

Overview	Exposure (player-hours)	Injuries (n)	Incidence (/1000h)	Severity (days)	Burden (/1000h)
Overall	5290	40	7.6	30	228
U13	663	4	6.0	22	134
U15	1530	9	5.9	25	147
U18	3097	27	8.7	33	290

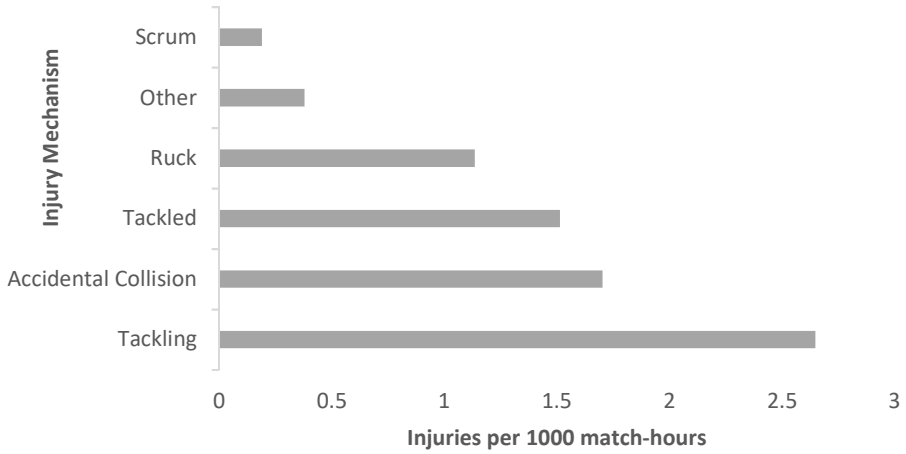

Figure 10. Overall mechanisms of concussion.

All concussions resolved within 89 days (Figure 11). 23 percent of concussed players returned to play in less than 23 days, the minimum timeframe possible for player's under-19 and below in the routine return to play pathway (Figure 12). 6% of players returned within 7 days, quicker than possible for player's under-19 and below even that possible in the enhanced care setting protocol (typically only used by professional clubs and academies), suggesting that players are returning to play quicker than regulations allow.

Identification of players with a suspected concussion is not always easy and the approach "if in doubt, sit them out" should be adopted if there is any uncertainty. It is important that coaches, referees and medical staff "recognise and remove" any players with a suspected concussion immediately. Signs and symptoms that a concussed athlete may present with, along with guidance on when to seek medical assistance, are available:
https://www.englandrugby.com/mm/Document/MyRugby/Headcase/01/30/49/51/3RecogniseandRemove_English.pdf.

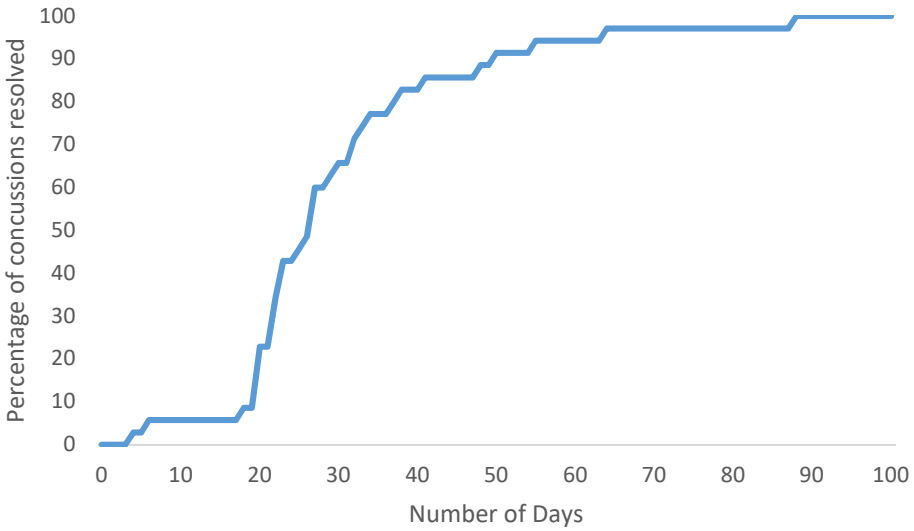

Figure 11. The percentage of concussions resolved over the number of days

The return to play pathway for player's under-19 and below can be seen in Figure 12. This includes a minimum of two weeks physical rest, prior to commencing a graduated return to play (GRTP) protocol once the athlete is symptom free. All players must be reviewed by a medical Doctor prior to commencing contact. The minimum timeframe in which the protocol can be completed is 23 days. However, not all athletes will recover fully within this timeframe and may need longer. More information on the return to play pathway, GRTP protocol and training resources can be accessed via the RFU's Headcase resource: http://www.englandrugby.com/headcase. As can be seen from Figure 10, in the 2017-18 season, not all players diagnosed with concussion followed the return to play guidelines.

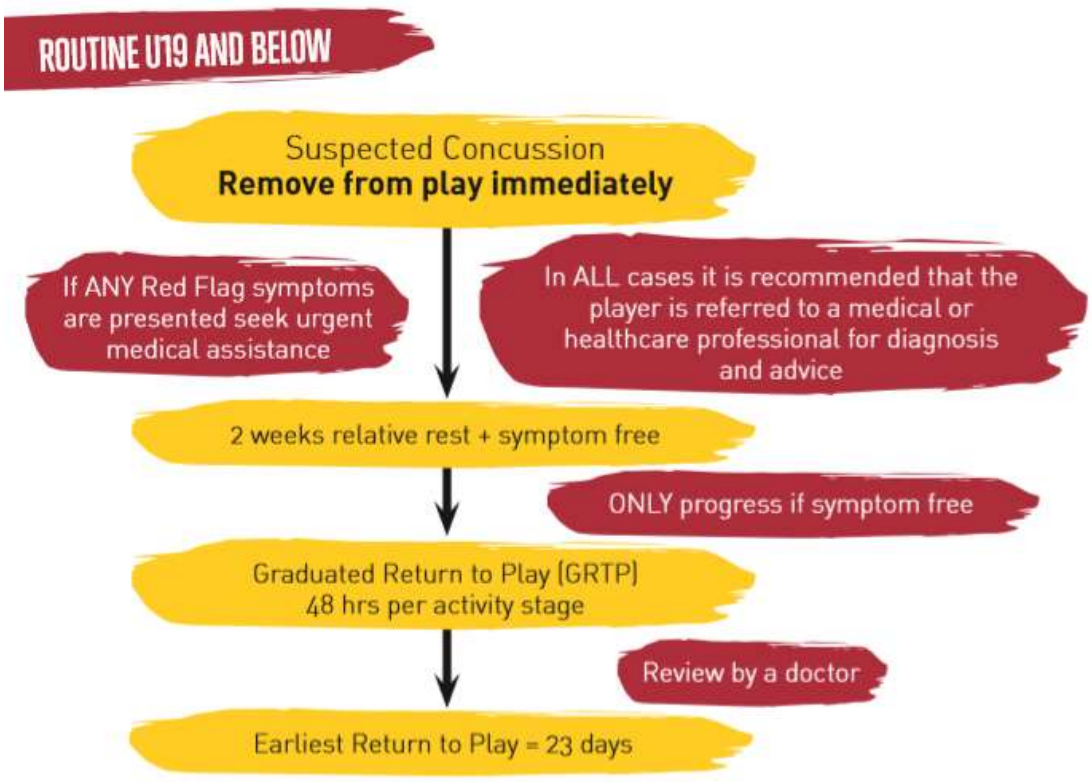

Figure 12. Standard return to play pathway for concussed youth players (under-19 and below)

Playing Position

Overall forwards had an injury risk of 18.3 per 1000 match-hours and backs had an injury risk of 15.5 per 1000 match-hours (Figure 13). Differences between age groups may be due to the physical development which occurs in later adolescence, causing increases in speed and power and leading to higher forces in the tackle. It may also be due to a greater number of tackles during the game, although further work is need to confirm this and we will report these findings in the 2018-19 season report.

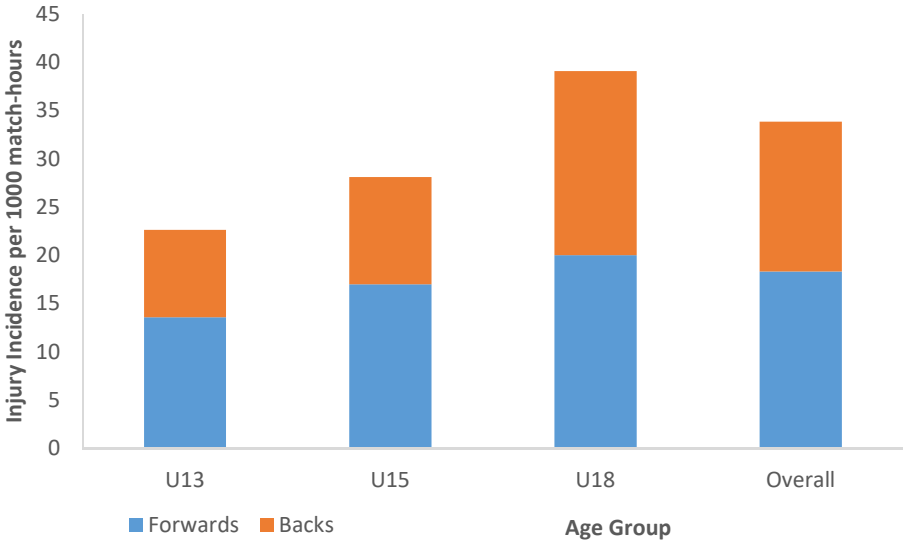

Figure 13. Match injury incidence for forwards and backs by age group.

Section 4. Methods & Definitions

Recruitment

A database of schools and contacts from previous projects was used for recruitment. Schools were contacted via email and invited to participate in YRISP. Schools who wished to do so participated voluntarily and consent was gained from players and their parents at the beginning of the season.

Data Collection

Each participating school assigned a primary contact who was provided with exposure and injury reporting forms. The primary contact was asked to complete these weekly and send them back to the research team at the University of Bath, who transferred the information to an electronic database. Report forms contained the following information:

- Match exposure data (location, length of game, opponent, outcome)
- Injury data (date of injury, return to play date, match quarter, position, mechanism, location, type)

Section 5. Future Directions of the Youth Rugby Injury Surveillance Project

There have been intermittent studies of injury in school's rugby in England since 2006, but this project represents the start of longitudinal data collection enabling comparisons of trends over consecutive seasons. With a larger dataset we will be able to investigate the aetiology of injuries in greater detail across age groups.

Section 6. References

1. Hislop MD, Stokes, KA, Williams S, McKay CD, England ME, Kemp SPT, Trewartha G. (2017) Reducing musculoskeletal injury and concussion risk in schoolboy rugby players with a pre-activity movement control exercise programme: a cluster randomised controlled trial. Br J Sports Med, 51(15):1140-1146.

2. Palmer-Green DS, Stokes KA, Fuller CW, England M, Kemp SP, Trewartha G. (2013) Match injuries in English youth academy and school's rugby union: an epidemiological study. Am J Sports Med, 41(4):749–755.

3. Archbold HA, Rankin AT, Webb M, Nicholas R, Eames NW, Wilson RK, Henderson LA, Heyes GJ, Bleakley CM (2017) RISUS Study: Rugby Injury Surveillance in Ulster Schools. Br J Sports Med, 51(7):600-606.

4. England Rugby (2019) Professional Rugby Injury Surveillance Project, Season Report 2017-18. Available at: https://www.englandrugby.com/mm/Document/General/General/01/33/22/57/InjurySurveillanceReport2017-18_English.pdf

5. England Rugby (2019) Community Rugby Injury Surveillance Project, Season Report: 2017-18. Available at:https://www.englandrugby.com//dxdam/52/52361b22-8559-4a42-89bb-38df120f94a6/YRISP%2017-18.pdf

Section 7. Appendices

Appendix 1. Many thanks to the coaches and sports injury staff at the following participating schools in the Youth Rugby Injury Surveillance Project for 2017-18:

Bishop Vesey's Grammar School, Brighton College, Canford School, Haileybury School, Hurstpierpoint College, The John Fisher School, Lord Wandsworth College, Reeds School, RGS Colchester, Shiplake College, Skinners School, St Albans School, St Benedict's School (London), St Johns School (Surrey), The Mosslands School, Portsmouth Grammar School, University College School, Warden Park, Warwick School.

Appendix 2. Map showing locality of participating schools and their status.