



The
Irish Rugby Injury Surveillance
Project

All-Ireland League Rugby
2017 - 2018 Season Report



UNIVERSITY of LIMERICK
OLLSCOIL LUIMNIGH





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Irish Rugby Football Union Foreword

Player welfare is of paramount importance to the IRFU and understanding the nature and type of injury that occurs in Rugby is vital in the planning and provision of medical care to players. The IRFU has partnered in a six year project with the University of Limerick to do injury surveillance across our amateur game (both club and school) and we are delighted their first report is published from the All-Ireland league from the 17/18 season.

The IRFU is very excited to work with the University of Limerick who have a long established record of research in the area of sport and exercise and their expertise provides us with independent, high quality research in amateur Rugby union.

We look forward to further annual reports from the University of Limerick on this project which will give us a comprehensive understanding of injuries in amateur Rugby in Ireland.

Dr. Rod McLoughlin



Irish Rugby Injury Surveillance Foreword

The Irish Rugby Injury Surveillance (IRIS) project involves research stemming from ongoing sports performance, injury prevention and psychological preparation work by University of Limerick academics across a range of sports, as well as our specific expertise in Rugby Union. It has effectively brought together academics with expert practitioner experience from the fields of biomechanics, general practice medicine, mathematics and statistics, physiotherapy, physiology, sport psychology, and strength & conditioning as well as three doctoral researchers. This holistic approach to injury surveillance and prevention is central to the project.

Comprehensive injury surveillance systems in amateur Rugby Union are rare and this innovative project to date has involved the research, design and implementation of an online injury recording platform. Collection has now been completed of a full season's data and this 2017/18 season report documents our collaborative work with the IRFU, and with 19 male and female All-Ireland League Clubs. It represents 418 matches, over 600 players, and support from dedicated data injury recorders, coaches, doctors, physiotherapists, managers and ancillary staff within clubs: thank you. Annual injury surveillance reports will be published over the coming years and the project in the future will also report on the incidence, nature and severity of injuries in schools, and underage amateur Rugby.

IRIS Principal Investigators

Dr. Tom Comyns, PhD

Dr. Ian Kenny, PhD



1.0 Executive Summary

1.1 Match Injuries

Starting in September 2017, the Irish Rugby Injury Surveillance (IRIS) project collected one full season of injury data across 418 matches from 19 All-Ireland League (AIL) clubs.

Men's AIL

- There was 15 men's clubs involved in the IRIS project (8 Division 1 and 7 Division 2 clubs).
- There was a total of 479 male players registered in the IRIS project (261 Division 1 and 218 Division 2 players).
- The overall match time-loss injury incidence rate for males was 49.7/1,000 player hours.
 - The match time-loss injury incidence rate for Division One males was 50.5/1,000 player hours.
 - The match time-loss injury incidence rate for Division Two males was 48.7/1,000 player hours.
- A single player would have to play 15 matches to sustain one injury.

Women's AIL

- There was 4 women's clubs involved in the IRIS project.
- There was a total of 129 female players registered in the IRIS project.
- The overall match time-loss injury incidence rate for females was 46.2/1,000 player hours.
- A single player would have to play 16 matches to sustain one injury.

1.2 Training Injuries

There was a total of 85 training injuries reported in the men's clubs.

- There was a total of 56 training injuries in Division 1 men's clubs.
- There was a total of 29 training injuries in Division 2 men's clubs.

There was a total of 16 training injuries reported in the women's clubs.

1.3 Injury Occurrence

The most commonly reported match injuries for the men's clubs were concussion (12%), followed by ankle ligament sprains (11%). Concussion injuries resulted in an average of 30 days absence from Rugby match or training activities, while ankle ligament sprains resulted in an average of 25 days absence.

The most commonly reported match injuries for the women's clubs were ankle ligament sprains (11%) and concussion (11%). Ankle ligament sprains resulted in an average of 25 days absence from Rugby match or training activities, while concussion injuries resulted in an average of 23 days absence.

1.4 Injury Event

The tackle event accounted for the majority of match and training injuries, with 54% of all injuries happening during the tackle. The ball carrier (being tackled) appeared at a slightly increased risk of injury with 54% of the tackle-related injuries due to being tackled as opposed to tackling (46%).

1.5 Playing Position

Of all match and training injuries recorded in the men's clubs, 57% were to the forwards (position no. 1-8), while 43% were to the backs (position no. 9-15). Openside flankers (no.7) had the highest proportion of match injuries in the men's clubs with 11% of all injuries. Of all match and training injuries recorded in the women's clubs, 56% were to the forwards (position no. 1-8), while 44% were to the backs (position no. 9-15). Inside centres (no.12) had the highest proportion of match injuries in the women's clubs with 18% of all injuries.

1.6 Injury Burden (number x time lost per injury)

The burden of an injury assesses the frequency of an injury in relation to the severity of the injury (measured as the number of days absent). Hamstring strains accounted for 11% of all severe match injuries (>28 days absence) in the men's clubs and resulted in an average of 54 days absence from Rugby match or training activities. Ankle ligament sprains accounted for 14% of all severe match injuries (>28 days absence) in the women's clubs, resulting in an average of 103 days absence from Rugby match or training activities.



2.0 Introduction

2.1 The IRIS Project

The Irish Rugby Injury Surveillance (IRIS) project has developed and implemented the first long-term Rugby Union specific injury surveillance system within amateur Rugby Union in Ireland. This system will monitor the incidence, type, nature and severity of both match and training injuries occurring across the amateur game in Ireland. By monitoring this information, injury trends may emerge which will aid in the development and implementation of future evidence-based injury prevention strategies in order to minimise injury risk and enhance player welfare.

IRIS Aims:

- To develop and implement an injury surveillance system for amateur Rugby Union in Ireland.
- To monitor the incidence and type of injuries occurring and identify any possible injury risk factors.
- To enhance the health and welfare of Rugby Union players by using this information to assist the IRFU policy regarding injury prevention strategies.



2.2 Injury Definitions

The IRIS project follows the guidelines from the World Rugby 'Consensus statement on injury definitions and data collection procedures for studies of injuries in Rugby Union'.¹

An injury is defined as "Any physical complaint, which was caused by a transfer of energy that exceeded the body's ability to maintain its structural and/or functional integrity that was sustained by a player during a Rugby match or Rugby training, irrespective of the need for medical attention or time-loss from Rugby activities."

A recurrent injury is one of the same site and same type as the original injury and occurs after the player has made a full return to match play following the original injury.

Both time-loss and medical attention injuries have been monitored and analysed separately. Medical attention injuries are any injury that resulted in 0-1 days absent from Rugby match or training activities (i.e. slight injuries). Any injury that results in greater than 1 day absence from match or training activities is classed as a time-loss injury and categorised according to injury severity. Only these injuries were included in injury incidence calculations.¹

Injury severity is calculated as the number of days that elapsed from the date of injury to the date of the player's return to full participation in training and availability for match selection.

Injury severity is classified as;

slight (0-1 days), minimal (2-3 days), mild (4-7 days), moderate (8-28 days) and severe (>28 days).

Match injury data are presented as the number of injuries per 1,000 player hours of match exposure. In order to calculate match injury incidence rates, the following calculation was used:

Team match injury incidence rate (IR):

$$IR = \frac{\text{number of injuries}}{\text{number of matches} \times \text{number of players (15)} \times \text{match duration (1.33)}} \times 1000$$

¹ Fuller, C. W., Molloy, M. G., Bagate, C., Bahr, R., Brooks, J. H., Donson, H., Kemp, S. P., McCrory, P., McIntosh, A. S., Meeuwisse, W. H., Quarrie, K. L., Raftery, M. & Wiley, P. 2007. Consensus statement on injury definitions and data collection procedures for studies of injuries in Rugby Union. Br J Sports Med, 41, 328-31.

2.3 Recruitment

At the end of the 2016-2017 season, the IRIS team recruited 21 clubs from the men's and women's AIL. The men's AIL is split into two divisions; Division One (Men's AIL 1) and Division Two (Men's AIL 2).

The IRIS project had a 90% compliance rate for the 2017-2018 season, as shown in Table 1.

Table 1: The IRIS clubs.

	Men's AIL	Women's AIL
Number of clubs	15 (Division 1 = 8; Division 2 = 7)	4
Number of players	479 (Division 1 = 261; Division 2 = 218)	129

Each club nominated an 'injury recorder', who was trained on use of the IRIS system during the pre-season training of the 2017-2018 season. In the majority of clubs, the physiotherapist or doctor to the Senior 1XV acted as the injury recorder. Each injury recorder was given a secure and confidential login to their own clubs home-page on the IRIS system. Each club registered all players involved with the Senior 1XV on the IRIS system. Beginning with the start of the AIL season in September 2017, the injury recorder documented all injuries occurring to the Senior 1XV male or female team. The injury recorders also reported when a player returned to play so that injury severity data could be calculated.



3.0 Match Injuries

3.1 Overall Time-loss Match Injuries

For the 2017-2018 season, data from 19 clubs across 418 matches were collected.

A total of 410 match time-loss injuries (any injury resulting in more than 1 days absence from Rugby match or training activities) were recorded. Any injuries resulting in 0-1 days absence from Rugby match or training activities (slight injuries) were considered to be 'medical attention injuries' and were not included in the analysis of time-loss injuries, as per international best practice.²

The overall team match time-loss injury incidence rates:

- Men's teams – 49.7/1,000 player hours.
- Women's teams – 46.2/1,000 player hours.
- This is approximately one time-loss injury per match in both the men's and women's divisions.
- A male player would have to play 15 matches in order to suffer one injury.
- A female player would have to play 16 matches in order to suffer one injury.

Table 2 shows the overall team match time-loss injury incidence rate for the division one men's clubs (Men's AIL 1), the division 2 men's teams (Men's AIL 2) and the division one women's clubs (Women's AIL).

Table 2: Match time-loss injuries (excluding 'slight' injuries).

Division	No. Clubs	No. Players	No. Matches	Exposure hours	No. Injuries	IR*
Men's AIL 1	8	261	186	3720	188	50.5
Men's AIL 2	7	218	154	3080	150	48.7
Overall men's	15	479	340	6800	338	49.7
Women's AIL	4	129	78	1560	72	46.2
Overall women's	4	129	78	1560	72	46.2

*IR – Incidence rate per 1,000 player hours.

- 13% of match time-loss injuries resulted in a hospital visit for medical investigation and imaging.
- 4% of match time-loss injuries resulted in surgical intervention.
- 3% of match injuries required pitch-side suturing and 2% required pitch-side joint relocation.

² Fuller, C. W., Molloy, M. G., Bagate, C., Bahr, R., Brooks, J. H., Donson, H., Kemp, S. P., McCrory, P., McIntosh, A. S., Meeuwisse, W. H., Quarrie, K. L., Raftery, M. & Wiley, P. 2007. Consensus statement on injury definitions and data collection procedures for studies of injuries in Rugby Union. Br J Sports Med, 41, 328-31.
Williams, S., Trewartha, G., Kemp, S. & Stokes, K. 2013. A meta-analysis of injuries in senior men's professional Rugby Union. Sports Med, 43, 1043-55.

3.2 Match Injury Classification

The injury diagnosis refers to the specific bodily location alongside the nature of the injury.

The most common injury diagnosis for the men's clubs was concussion, followed by ATFL (anterior talo-fibular ligament) sprains, accounting for 12% and 11% of all time-loss match injuries respectively.

The most common injury diagnoses for the women's clubs were ATFL sprains and concussion, each accounting for 11% of all match time-loss injuries.

Table 3 shows the top three most common specific match time-loss injury diagnosis for all the men's and women's clubs.

Table 3:³ Most frequent injury locations, nature and diagnoses (IR/1,000 player hours, %frequency).

Men's AIL	Women's AIL
Concussion 6.1 (12%)	ATFL sprains 5.1 (11%)
ATFL sprains 5.7 (11%)	Concussion 5.1 (11%)
Hamstring strains 4.1 (8%)	Rotator Cuff strains 3.2 (7%)

Table 4 shows the top three most common specific match time-loss injury diagnosis for each of the men's divisions (Division 1 and Division 2).

Table 4:³ Most common injury diagnoses for each men's Division 1 and Division 2 (IR/1,000 player hours, %frequency)

Men's AIL 1	Men's AIL 2
ATFL sprains 6.7 (14%)	Concussion 5.8 (12%)
Concussion 6.2 (13%)	Hamstring strains 4.9 (10%)
ACJ sprains 4.3 (9%)	ATFL sprains 4.5 (9%)

³ An 'ATFL sprain' (anterior talo-fibular ligament sprain) refers to a tear of the ligament located on the outside of the ankle joint. It is also called an inversion sprain or lateral ligament sprain.
 A 'hamstring strain', refers to a tear of the muscle group located on the back (posterior aspect) of the thigh.
 A 'rotator cuff strain', refers to a tear of any of the four tendons that surround the shoulder joint.
 An 'ACJ sprain' (acromio-clavicular joint sprain) refers to a tear of the ligaments that connect the collar bone (clavicle) to the shoulder (glenohumeral joint).

The shoulder was the most commonly injured bodily location in the men's clubs, accounting for 19% of all injuries. ACJ sprains were the most common injury diagnosis of the shoulder.

The ankle, head and hand were the most commonly injured bodily locations in the women's clubs, each accounting for 14% of all match time-loss injuries.

Tables 5 and 6 show the top three most common injury diagnoses, for each of the top three most commonly injured bodily locations.

Table 5:⁴ Men's AIL: Most common injury diagnoses with regards body location (IR/1,000 player hours, %frequency)

Location	Diagnosis
Shoulder 9.1/1,000 player hours (19%)	ACJ sprain 3.4 Rotator Cuff strains 2.5 GHJ dislocations 1.3
Head 6.5/1,000 player hours (13%)	Concussion 6.1 Laceration 0.2 Haematoma 0.2
Ankle 6.3/1,000 player hours (13%)	ATFL sprains 5.7 Achilles tendon strains 0.3 Ankle fracture dislocations 0.2

Table 6:⁴ Women's AIL: Most common injury diagnoses with regards body location (IR/1,000 player hours, %frequency)

Location	Diagnosis
Ankle 6.4 (14%)	ATFL sprains 5.1 Ankle fracture 0.6 Achilles tendon strain 0.6
Head 6.4 (14%)	Concussion 5.1 Lacerations 1.3
Wrist/hand/finger/thumb 6.4 (14%)	MCP sprains 2.6 MCP fractures 1.9 Wrist ligament sprain 1.3

⁴ An 'ACJ sprain' (acromio-clavicular joint sprain) refers to a tear of the ligaments that connect the collar bone (clavicle) to the shoulder (glenohumeral joint).
 A 'rotator cuff strain', refers to a tear of any of the four tendons that surround the shoulder joint.
 A 'GHJ dislocation' (gleno-humeral joint dislocation) refers to the separation of the upper arm bone (humerus) from the shoulder socket (glenoid fossa).
 A 'laceration' refers to a cut located anywhere on the body.
 A 'haematoma/contusion' refers to a bruise located anywhere on the body.
 An 'ATFL sprain' (anterior talo-fibular ligament sprain) refers to a tear of the ligament located on the outside of the ankle joint. It is also called an inversion sprain or lateral ligament sprain.
 An 'achilles tendon strain', refers to a tear of the tendon located on the back (posterior aspect) of the ankle.
 A 'MCP fracture/sprain', (metacarpal phalangeal joint) refers to a sprain or fracture of one of the finger/hand joints.

3.3 Timing of Match Injury

The majority of injuries occurred in the 3rd quarter amongst the men's teams, however an equal number of injuries occurred in the 2nd and 3rd quarters in the women's teams. Figure 1 shows the time of injury occurrence during match play.

A small proportion of injuries occurred during match play where the exact timing of injury was unknown (0.9/1,000 player hours in the Men's AIL and 1.9/1,000 player hours in the Women's AIL).

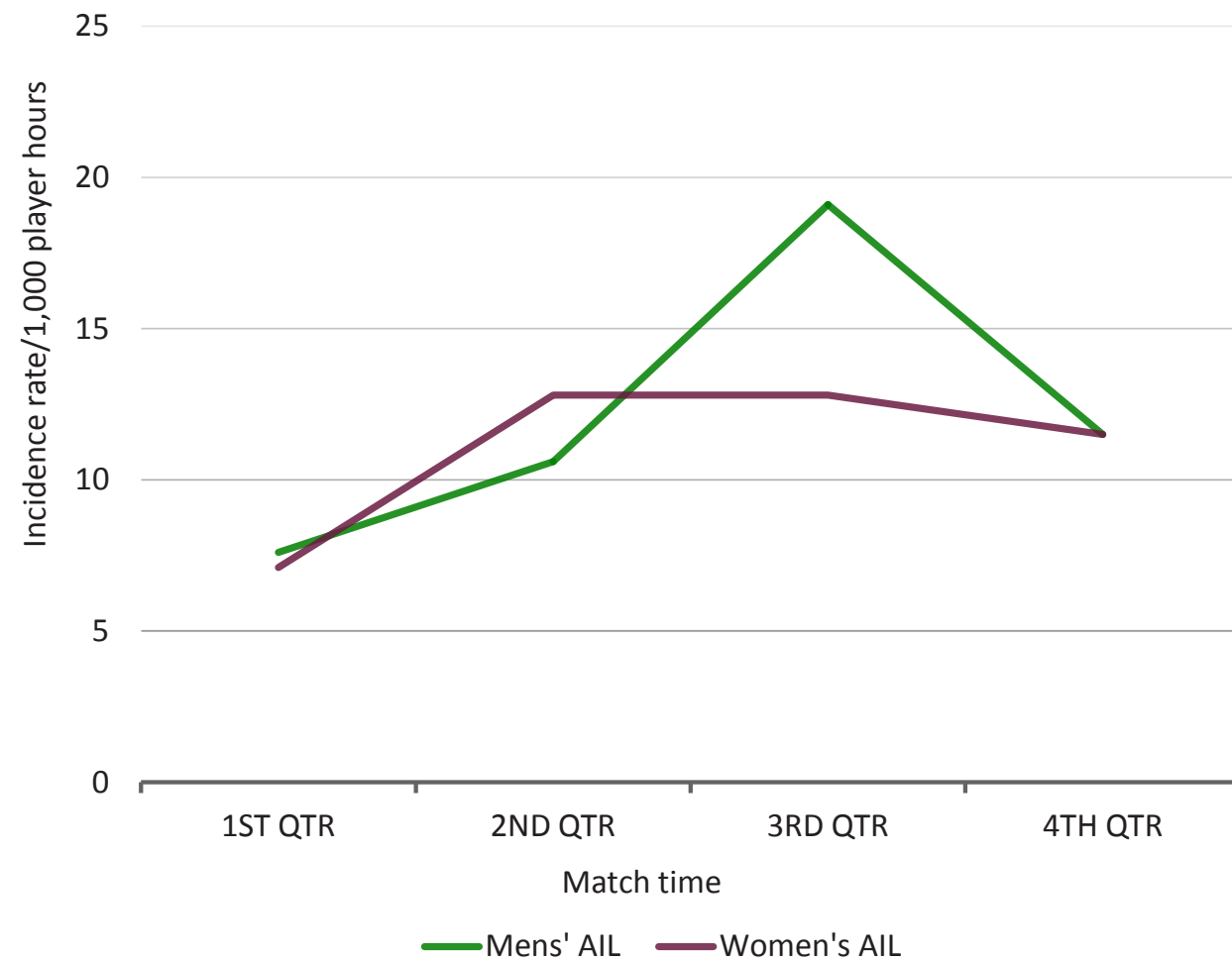


Figure 1: Timing of injury during match play (IR/1,000 player hours).

3.4 Match Injury Event

Figure 2 shows the event surrounding the occurrence of an injury.

The tackle event accounted for the majority of injuries across both the men's and women's clubs, with more injuries resulting from being tackled than tackling. The Men's AIL 2 clubs had a higher incidence of non-contact injuries (i.e. running in open play) than either the Men's AIL 1 or Women's AIL clubs. The Women's AIL had a higher incidence of injuries occurring in the ruck than either of the men's divisions.

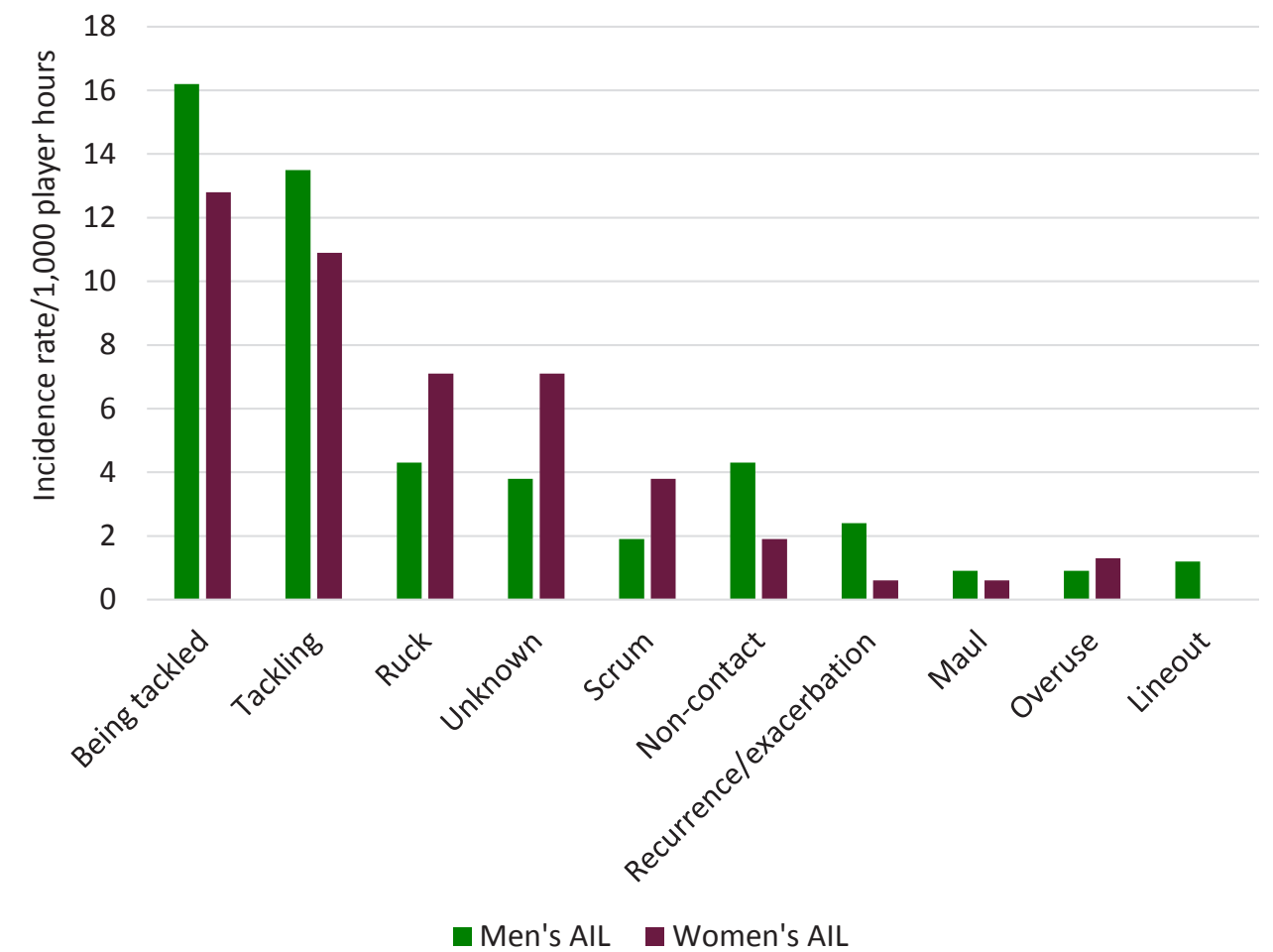


Figure 2: Injury event (IR/1,000 player hours).

3.5 Nature of Match Injury

The nature of injury refers to the type of injury occurring.

Sprains (referring to ligament tears) and strains (referring to muscle or tendon tears) were the most common injury type across both the men's and women's clubs, as shown in Figure 3.

The Men's AIL 2 clubs had a higher incidence of haematomas and contusions than either the Men's AIL 1 or Women's AIL clubs, while the Women's AIL had a higher incidence of fractures.

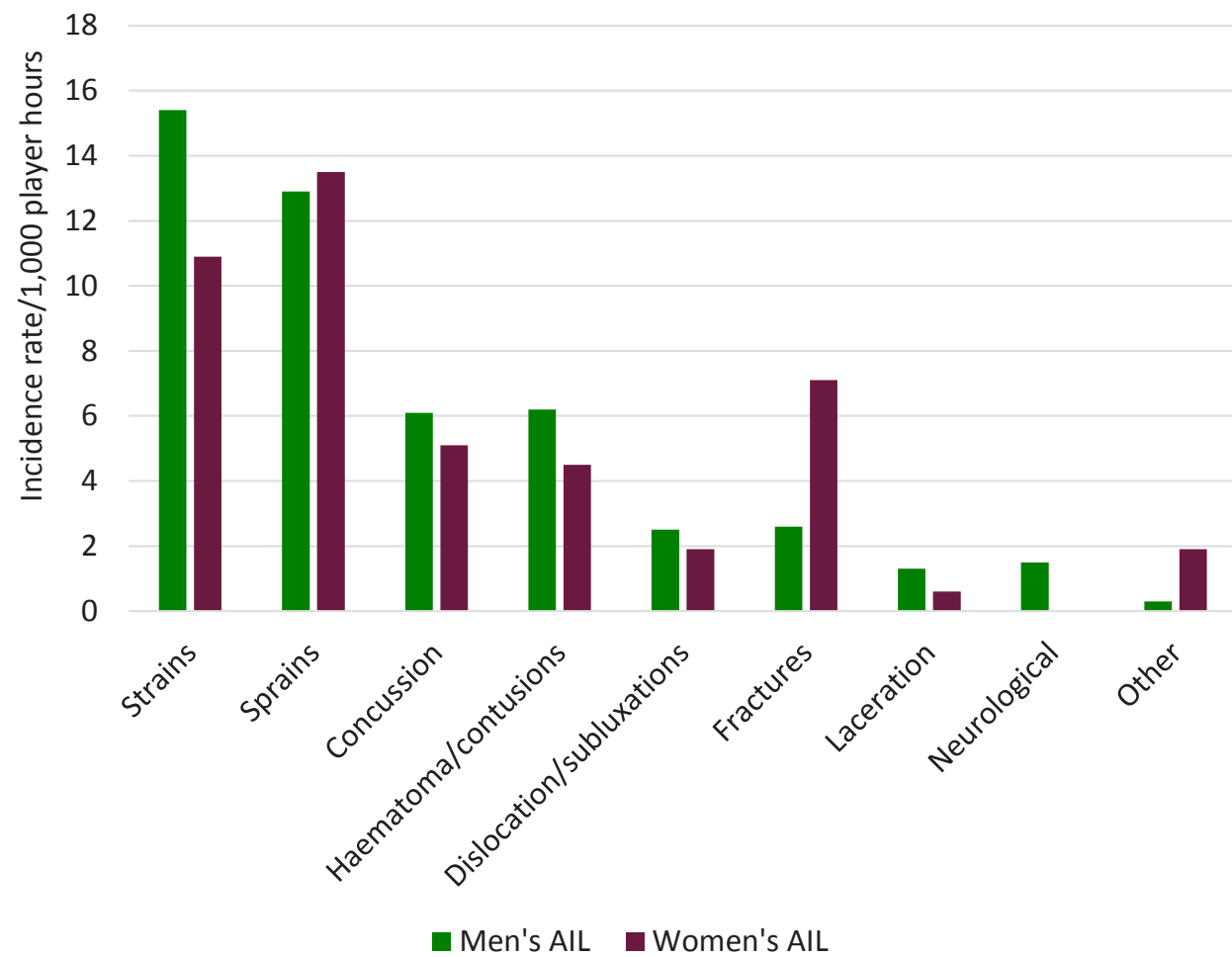


Figure 3: Nature of injury (IR/1,000 player hours).

3.6 Body Location of Match Injury

The shoulder was the most commonly injured area in the men's clubs, while the ankle joint, head and hand were the most commonly injured areas in the women's clubs.

The most common lower limb location of injury was the ankle (Men's AIL 1) and posterior thigh (Men's AIL 2) in the men's teams. The most common upper limb location of injury was to the wrist and hand in the Women's AIL.

Figure 4 shows the incidences of injury according to bodily location for the Men's AIL (Fig. 4a) and the Women's AIL (Fig. 4b).

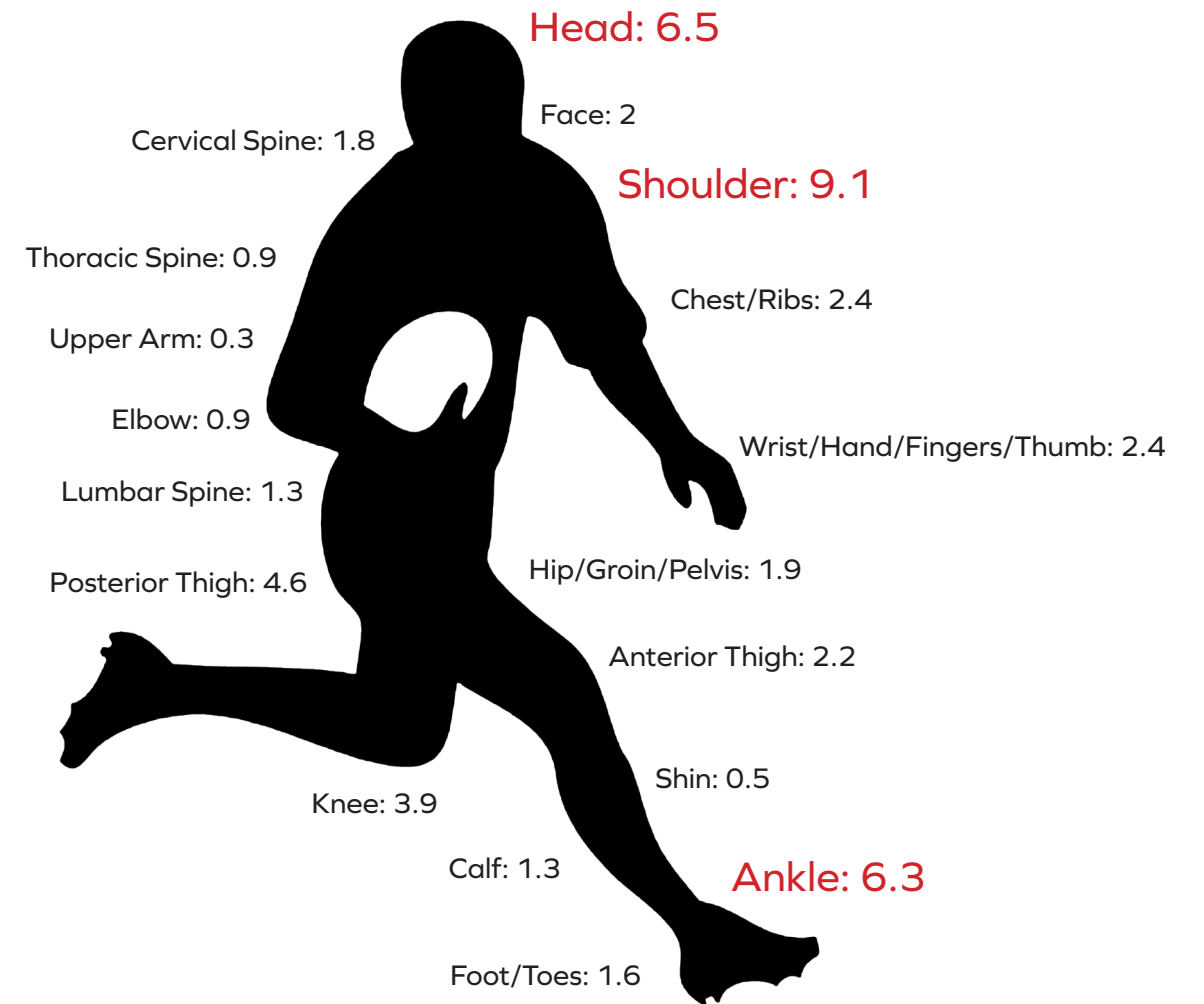


Figure 4 (a): Location of injury for the Men's AIL (IR/1,000 player hours).

Wrist/Hand/Finger/Thumb: 6.4

Head: 6.4

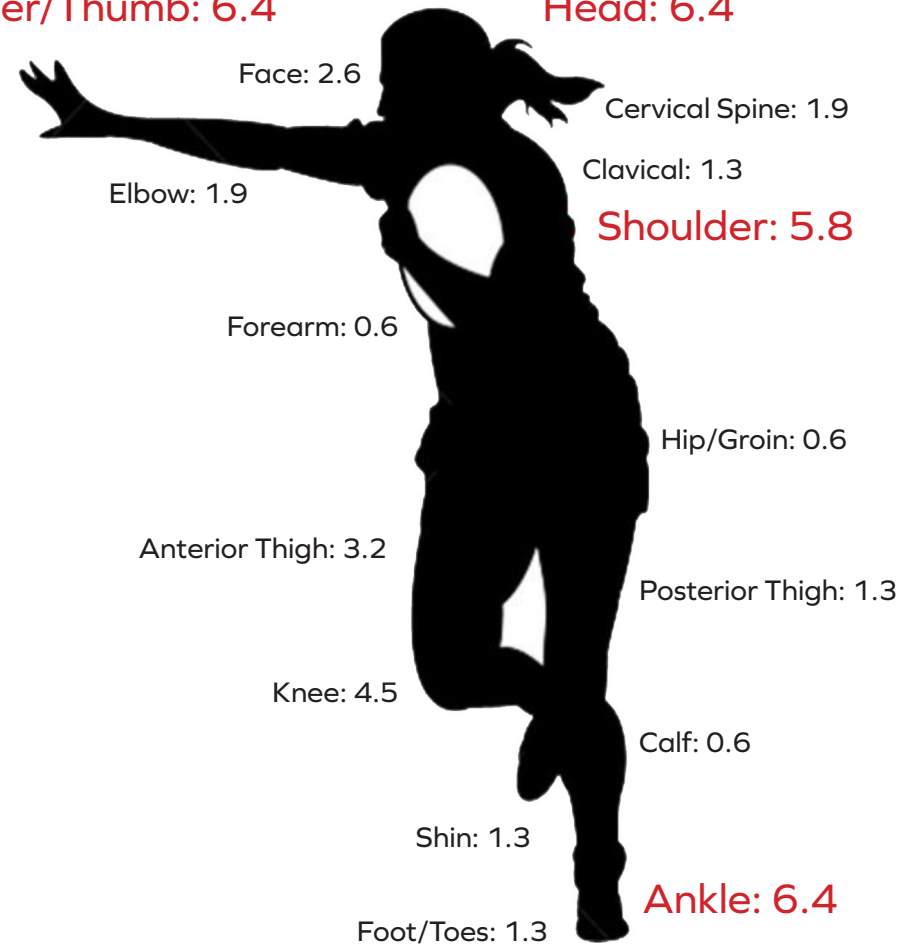


Figure 4 (b): Location of injury for the Women's AIL (IR/1,000 player hours).

3.7 Playing Position of Match Injury

Rugby player positions are split into 'forwards' (position no. 1-8) and 'backs' (position no. 9-15).

The openside flanker (no. 7) suffered the most injuries in the men's clubs (11%), with the majority of injuries to the openside flanker (no. 7) occurring due to the tackle event (tackling = 33% and being tackled = 33%). The loosehead prop (no. 1) and hooker (no. 2) also suffered more injuries than any other position in the men's clubs, each accounting for 9% of the injuries.

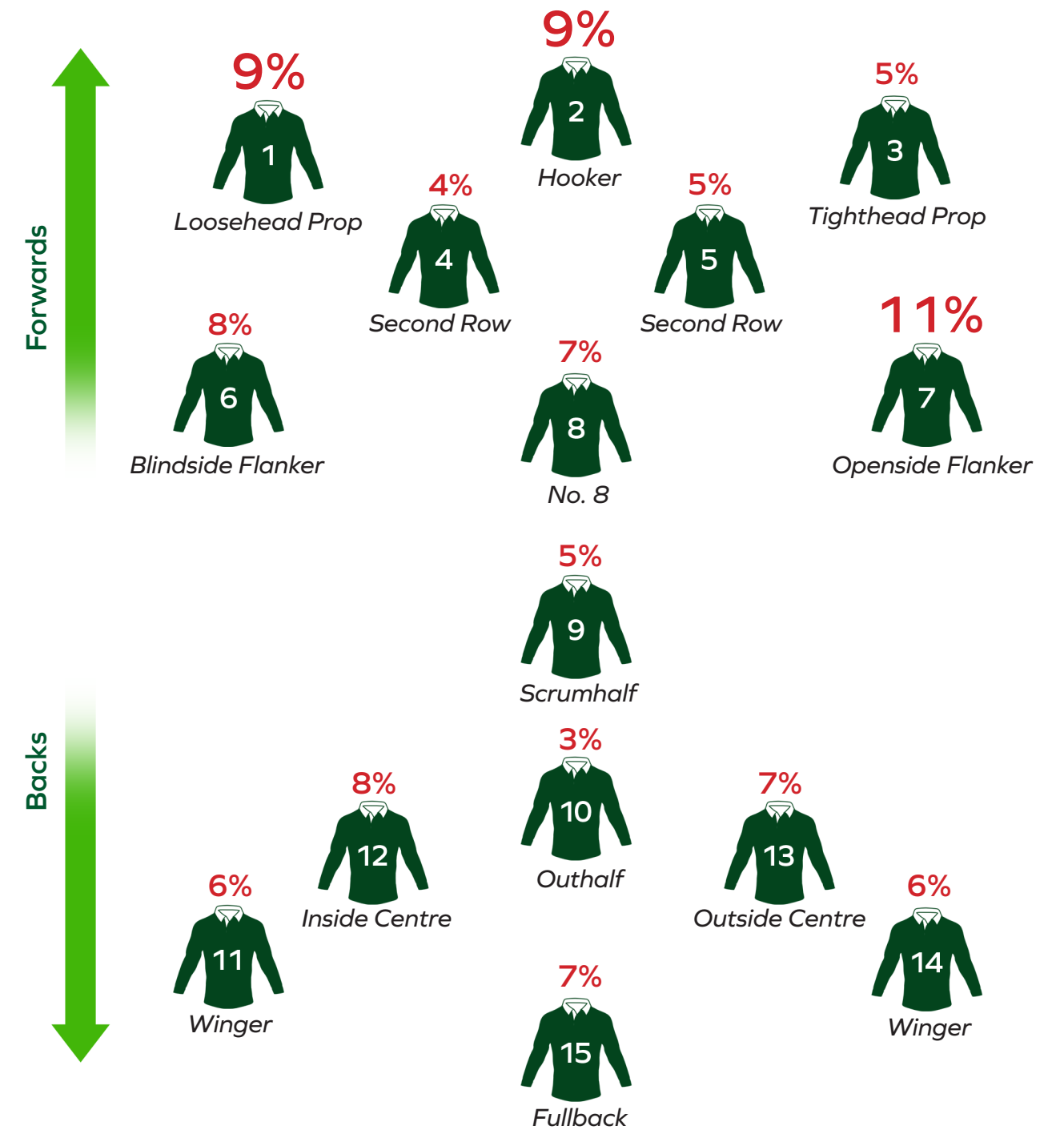


Figure 5 (a): Percentage of injuries occurring per playing position in the Men's AIL

The inside centre (no. 12) suffered the majority of injuries in the Women's AIL with 18% of all injuries (Fig. 5b). Thirty-one percent of these were due to being tackled. This was followed by the blindside flanker (no. 6) and the openside flanker (no. 7) with 13% and 9% respectively.

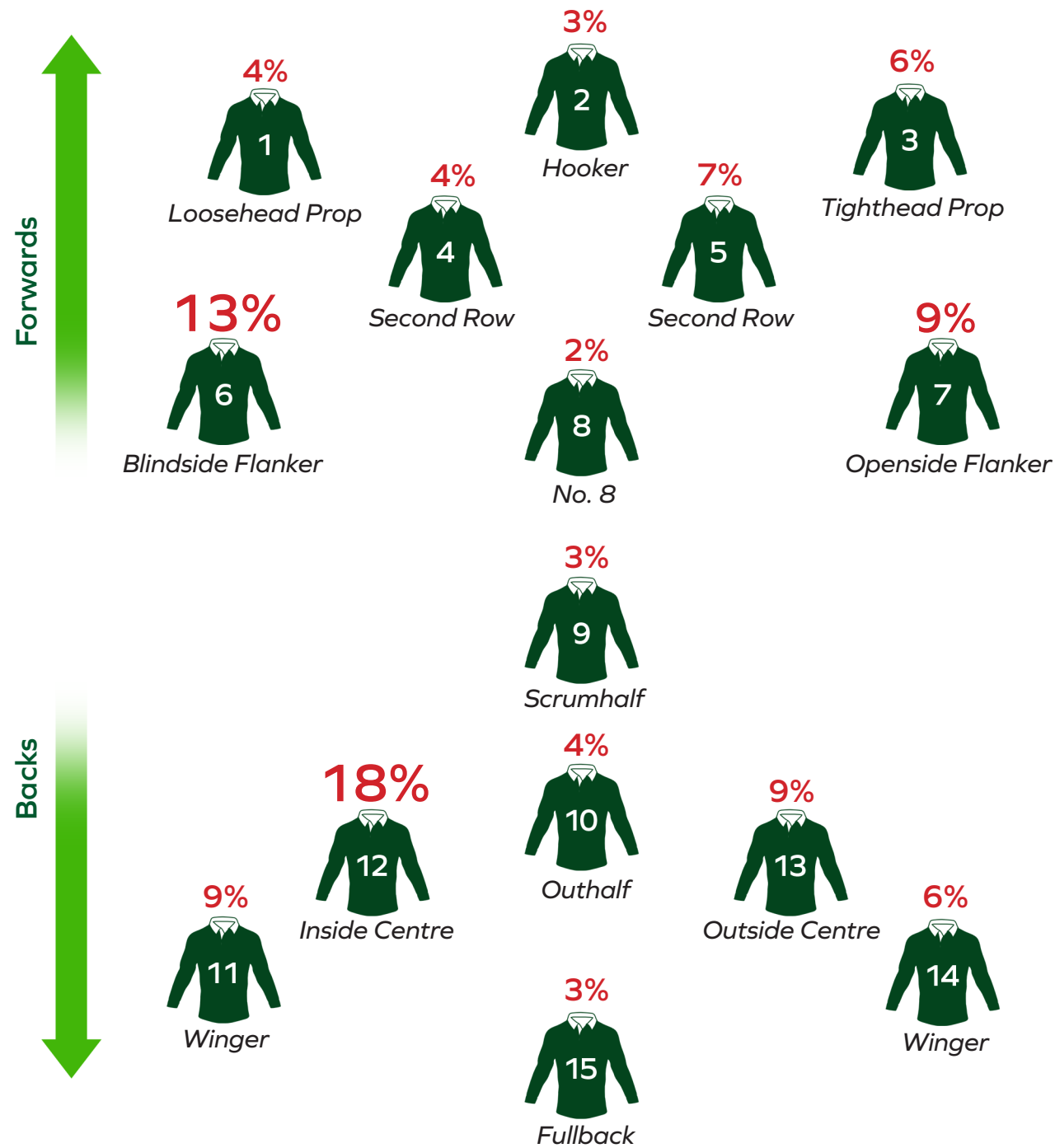


Figure 5 (b): Percentage of injuries occurring per playing position in the Women's AIL.

3.8 Match Injury Severity

Injury severity was calculated as total number of days absent from Rugby match or training and classified according to the World Rugby Consensus guidelines. The majority of injuries were moderate or severe (resulting in greater than eight days absence), as shown in Figure 6.

Slight injuries (0-1 days absence) were considered as 'medical attention injuries' and were not included in analysis of time-loss injuries.⁵ Slight injuries are discussed in more detail in sub-section 3.10.

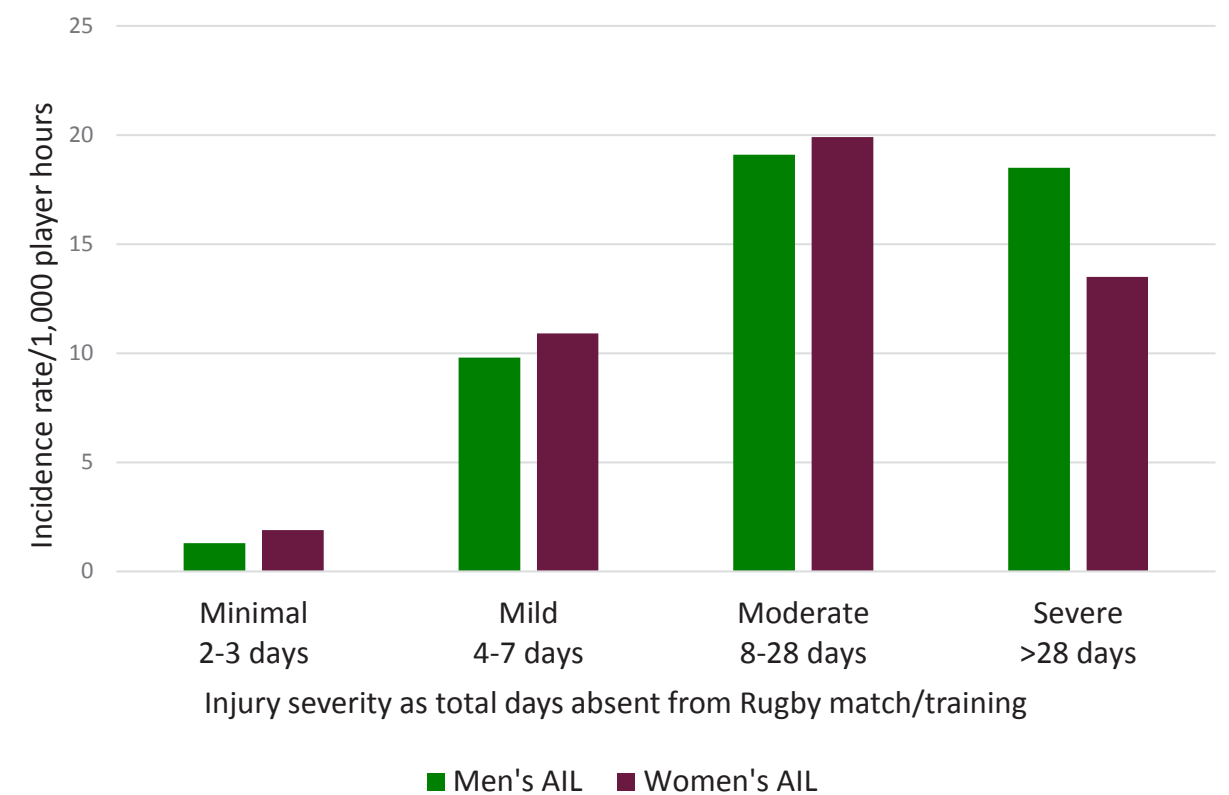


Figure 6: Injury severity of time-loss injuries (IR/1,000 player hours).

⁵ Fuller, C. W., Molloy, M. G., Bagate, C., Bahr, R., Brooks, J. H., Donson, H., Kemp, S. P., McCrory, P., McIntosh, A. S., Meeuwisse, W. H., Quarrie, K. L., Raftery, M. & Wiley, P. 2007. Consensus statement on injury definitions and data collection procedures for studies of injuries in Rugby Union. Br J Sports Med, 41, 328-31.
Williams, S., Trewartha, G., Kemp, S. & Stokes, K. 2013. A meta-analysis of injuries in senior men's professional Rugby Union. Sports Med, 43, 1043-55.

3.9 Match Injury Burden (number of injuries x time lost per injury)

The burden of an injury assesses the frequency of an injury in relation to the severity of the injury (measured as the number of days absence).

Hamstring strains accounted for 11% of all severe match injuries (>28 absence) in the men's clubs and resulted in an average of 54 days absence from Rugby match or training activities.

In the men's clubs, the knee and the shoulder joints were commonly injured sites, which resulted in severe injuries (in terms of total number of days absent from Rugby match or training). Four anterior cruciate ligament (ACL) ruptures in the knee (1% of all match injuries) occurred during matches, resulting in an average of 259 days absence, while eight glenohumeral joint (GHJ) dislocations in the shoulder (2% of all match injuries) also occurred, resulting in an average of 144 days absence.

Ankle ligament sprains accounted for 14% of all severe match injuries (>28 absence) in the women's clubs and resulted in an average of 103 days absence from Rugby match or training activities.

In the women's clubs only one ACL rupture occurred (1% of all match injuries), resulting in 369 days absence. One Achilles tendon rupture was also reported (1% of all match injuries), resulting in 293 days absence.

Table 7:⁶ Most frequent injury burden diagnoses per division.

	Injury Burden	Average Total Days Off
Men's AIL	Hamstring strains 2.1 (11%)	54
	Concussion 1.9 (10%)	47
	ATFL sprains 1.8 (9%)	55
Women's AIL	ATFL sprains 1.9 (14%)	103
	MCP fractures 1.9 (14%)	46
	Ankle fractures 1.3 (9%)	193

⁶ An 'ACL rupture' (anterior cruciate ligament) refers to the complete tear of the main stabilising ligaments of the knee joint. A 'GHJ dislocation' (gleno-humeral joint dislocation) is the separation of the upper arm bone (humerus) from the shoulder socket (glenoid fossa). A 'hamstring strain' refers to a tear of the muscles located on the back (posterior aspect) of the thigh. An 'ATFL sprain' (anterior talo-fibular ligament sprain) is a tear of the ligament located on the outside of the ankle joint. It is also called an inversion sprain or lateral ligament sprain. An 'MCP fracture' (metacarpal phalangeal joint) refers to a break of the bones in the hand and finger joints.

3.10 Medical Attention Match Injuries (slight injuries)

Any injuries resulting in 0-1 days absence from Rugby match or training are considered as slight, or 'medical attention', injuries and therefore were excluded from the analysis of time-loss injuries, as per international best practice.⁷

During the 2017-2018 season, only 20 medical attention injuries occurred in 418 matches and these are shown in Table 8.

The overall team match medical attention injury incidence rates:

- Men's AIL clubs – 3.1/1,000 player hours.
- Women's AIL clubs – 4.5/1,000 player hours.

Table 8: Most frequent injury burden diagnoses per division.

Division	No. Clubs	No. Players	No. Matches	Exposure hours	No. Injuries	IR*
Men's AIL 1	8	261	186	3720	1	0.3
Men's AIL 2	7	218	154	3080	12	3.9
Overall men's	15	479	340	6800	13	3.1
AIL 1	4	129	78	1560	7	4.5
Overall women's	4	129	78	1560	7	4.5

*Incidence rate per 1,000 player hours

- Medical attention injuries occurred mainly in the 2nd quarter of the match.
- The chest, face and shoulder were the most commonly injured sites, with 'being winded' the most common type of injury, followed by laceration, sprains and strains.
- The tackle event accounted for the majority of medical attention injuries, with being tackled resulting in more injuries than tackling across the three divisions.

⁷ Fuller, C. W., Molloy, M. G., Bagate, C., Bahr, R., Brooks, J. H., Donson, H., Kemp, S. P., McCrory, P., McIntosh, A. S., Meeuwisse, W. H., Quarrie, K. L., Raftery, M. & Wiley, P. 2007. Consensus statement on injury definitions and data collection procedures for studies of injuries in Rugby Union. Br J Sports Med, 41, 328-31. Williams, S., Trewartha, G., Kemp, S. & Stokes, K. 2013. A meta-analysis of injuries in senior men's professional Rugby Union. Sports Med, 43, 1043-55.

3.11 Other Match-related Injuries

A small proportion of injuries occurred during the warm-up and these were not included in the analysis of the time-loss match injury incidence, as only injuries occurring during the match play counted as match injuries.

- In the men's AIL 12 warm-up injuries occurred, while only 1 warm-up injury occurred in the women's AIL.
- The shoulder was the most commonly injured site, followed by the posterior thigh.
- ACJ sprains accounted for 25% of all warm-up injuries in the men's clubs, while hamstring strains accounted for 17%.
- The only warm-up injury in the women's clubs was an ACJ sprain.
- Tackling and non-contact injuries were the most common injury event during the warm-up phases.



4.0 Training Injuries

4.1 Overall Time-loss Training Injuries

For the 2017-2018 season, training injury data from 19 clubs (15 men's and 4 women's) were also collected. For operational reasons, as the frequency and duration of training sessions were not recorded for this season, training injury incidence rates are not available. Therefore, the total number of training injuries that occurred are reported.

Any injuries resulting in 0-1 days absent from Rugby match or training activities were considered to be medical attention injuries and are not included in the analysis of time-loss injuries, as per international best practice.⁸

The overall number of training injuries for the Men's AIL clubs was 85, while the overall number of training injuries for the Women's AIL clubs was 16.

Table 9 shows the overall number of training injuries for the division one men's teams (Men's AIL 1), the division 2 men's teams (Men's AIL 2) and the division one women's teams (Women's AIL).

Table 9: Training time-loss injuries (excluding slight injuries).

Division	No. Clubs	No. Players	No. Injuries
Men's AIL 1	8	261	56
Men's AIL 2	7	218	29
Overall men's	15	479	85
Women's AIL	4	129	16
Overall women's	4	129	16

⁸ Fuller, C. W., Molloy, M. G., Bagate, C., Bahr, R., Brooks, J. H., Donson, H., Kemp, S. P., McCrory, P., McIntosh, A. S., Meeuwisse, W. H., Quarrie, K. L., Raftery, M. & Wiley, P. 2007. Consensus statement on injury definitions and data collection procedures for studies of injuries in Rugby Union. Br J Sports Med, 41, 328-31.
Williams, S., Trewartha, G., Kemp, S. & Stokes, K. 2013. A meta-analysis of injuries in senior men's professional Rugby Union. Sports Med, 43, 1043-55.

4.2 Training Injury Classification

The injury diagnosis refers to the specific bodily location and nature of the injury.

The most common injury diagnosis for the men's clubs was hamstring strains, accounting for 13% of all training time-loss injuries. This was followed by ATFL sprains and adductor strains, each with 11% of all training time-loss injuries.

The most common injury diagnosis for the women's clubs was ATFL sprains, accounting for 19% of all time-loss training injuries. This was followed by hamstring strains and lumbar spine strains, each with 13% of all time-loss training injuries.

Table 10 shows the top three most common specific training time-loss injury diagnoses for both the men's and women's clubs.

Table 10:⁹ Overall most common injury diagnoses for all men's and women's clubs (%frequency).

Men's AIL	Women's AIL
Hamstring strains (12%)	ATFL sprains (19%)
ATFL sprains (11%)	Hamstring strains (13%)
Adductor strains (11%)	Lumbar spine strains (13%)

Table 11 shows the top three most common specific training time-loss injury diagnosis for each of the men's divisions (Division 1 and Division 2).

Table 11:⁹ Most common injury diagnoses for each men's Division 1 and Division 2 (%frequency).

Men's AIL 1	Men's AIL 2
Hamstring strains (14%)	ATFL sprains (14%)
Adductor strains (13%)	Hamstring strains (11%)
Concussion (11%)	Thumb sprains (11%)

⁹ A 'hamstring strain', refers to a tear of the muscle group located on the back (posterior aspect) of the thigh.

An 'ATFL sprain' (anterior talo-fibular ligament sprain) refers to a tear of the ligament located on the outside of the ankle joint. It is also called an inversion sprain or lateral ligament sprain.

An 'adductor strain', refers to a tear of the muscle group located on the inner thigh, also called a 'groin strain'.

A 'lumbar spine strain' refers to a tear of the muscles located in the lower back. A 'thumb sprain' refers to a tear of one of the ligaments at the thumb joint.

4.3 Body Location of Training Injuries

Overall, the posterior thigh was the most common injury site in the men's clubs, followed by the hip and groin. While the posterior thigh was still the most common injury location the Men's AIL 1 clubs, the knee was the most common injury location in the Men's AIL 2 clubs.

The ankle was the most commonly injured joint in the women's clubs, followed by the knee joint.

Figure 7 shows the incidences of injury according to bodily location for the Men's AIL (Fig. 7a) and the Women's AIL (Fig. 7b).

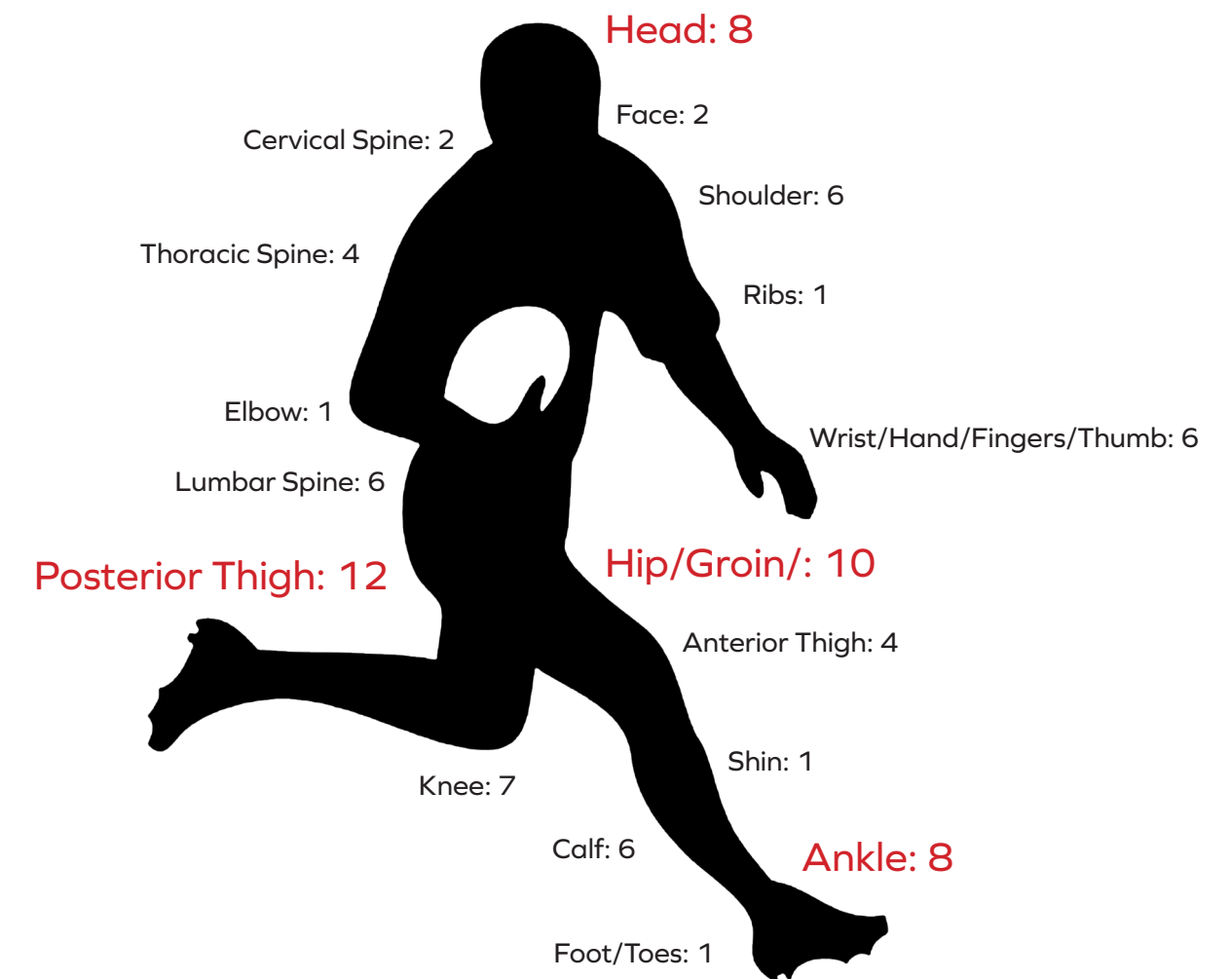


Figure 7 (a): Location of injury for the Men's AIL (number of injuries).

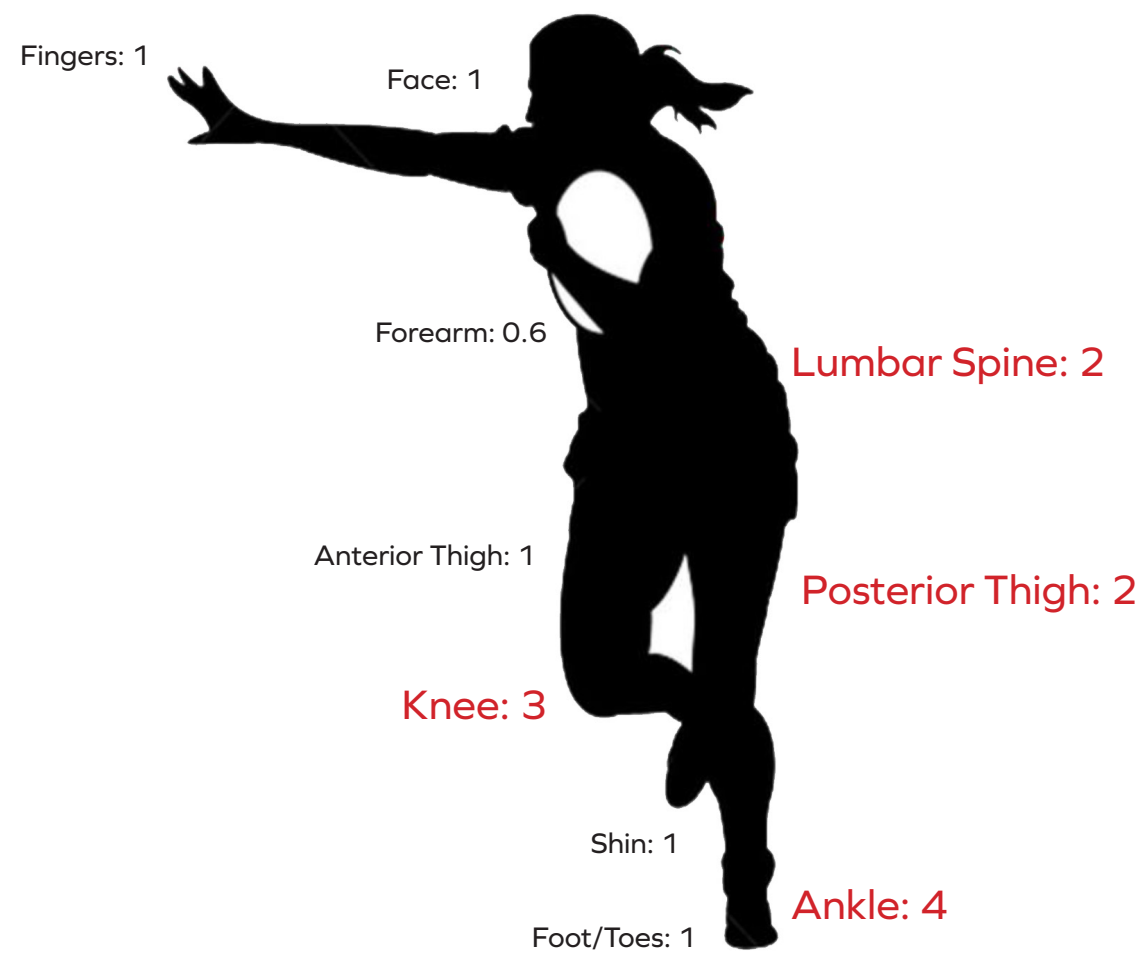


Figure 7 (b): Location of injury for Women's AIL (number of injuries).

4.4 Nature of Training Injuries

The nature of injuries refers to the type of injury occurring.

Sprains (referring to ligament injuries) and strains (referring to muscle or tendon injuries) were the most common injury type across both the men's and women's clubs, as shown in Figure 8. The Men's AIL 1 had a higher rate of dislocations during training than either the Men's AIL 2 or Women's AIL.

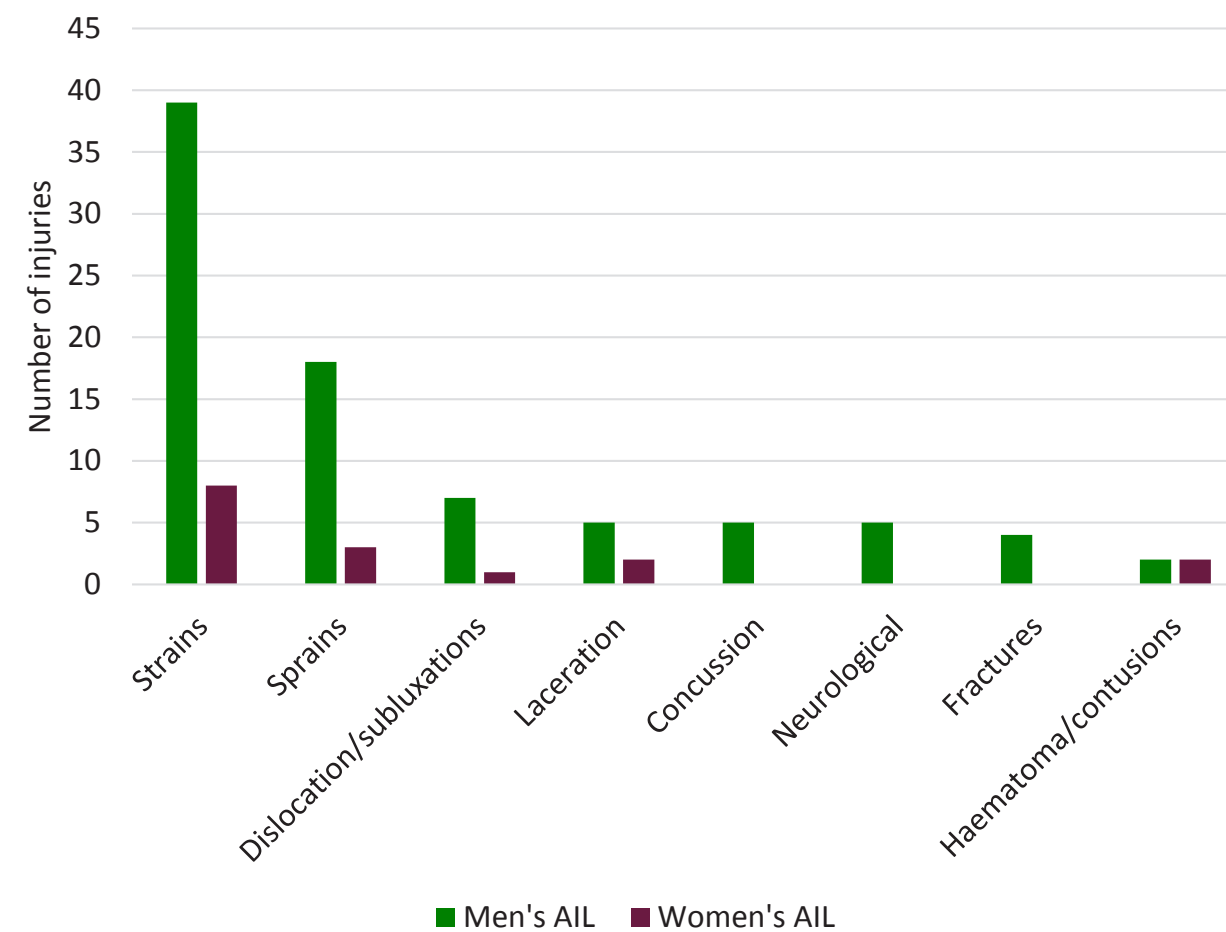


Figure 8: Nature of injury (number of injuries).

4.5 Training Injury Event

Figure 9 shows the events surrounding the occurrence of an injury.

Tackling resulted in the most injuries in the men's clubs, while the majority of injuries in the women's clubs were as a result of non-contact situations and 'set-piece' training.

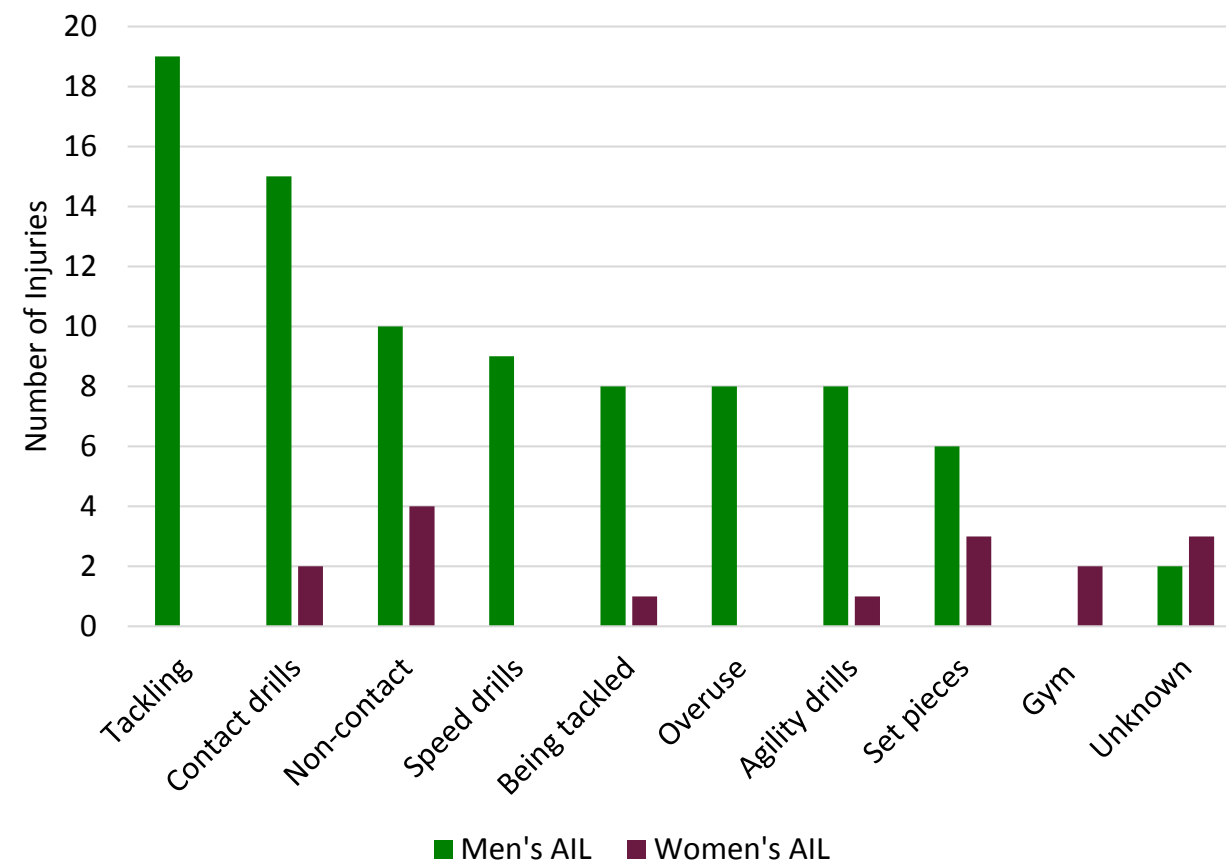


Figure 9: Injury event (number of injuries).

4.6 Training Injury Severity

Injury severity was calculated as total number of days absent from Rugby match or training and classified according to the World Rugby Consensus guidelines. The majority of injuries were moderate or severe (resulting in greater than eight days absent), as shown in Figure 10.

Slight injuries (0-1 days absence) were considered as 'medical attention injuries' and were not included in analysis of time-loss injuries, as per international best practice.¹⁰ Slight injuries are discussed in more detail in sub-section 4.8.

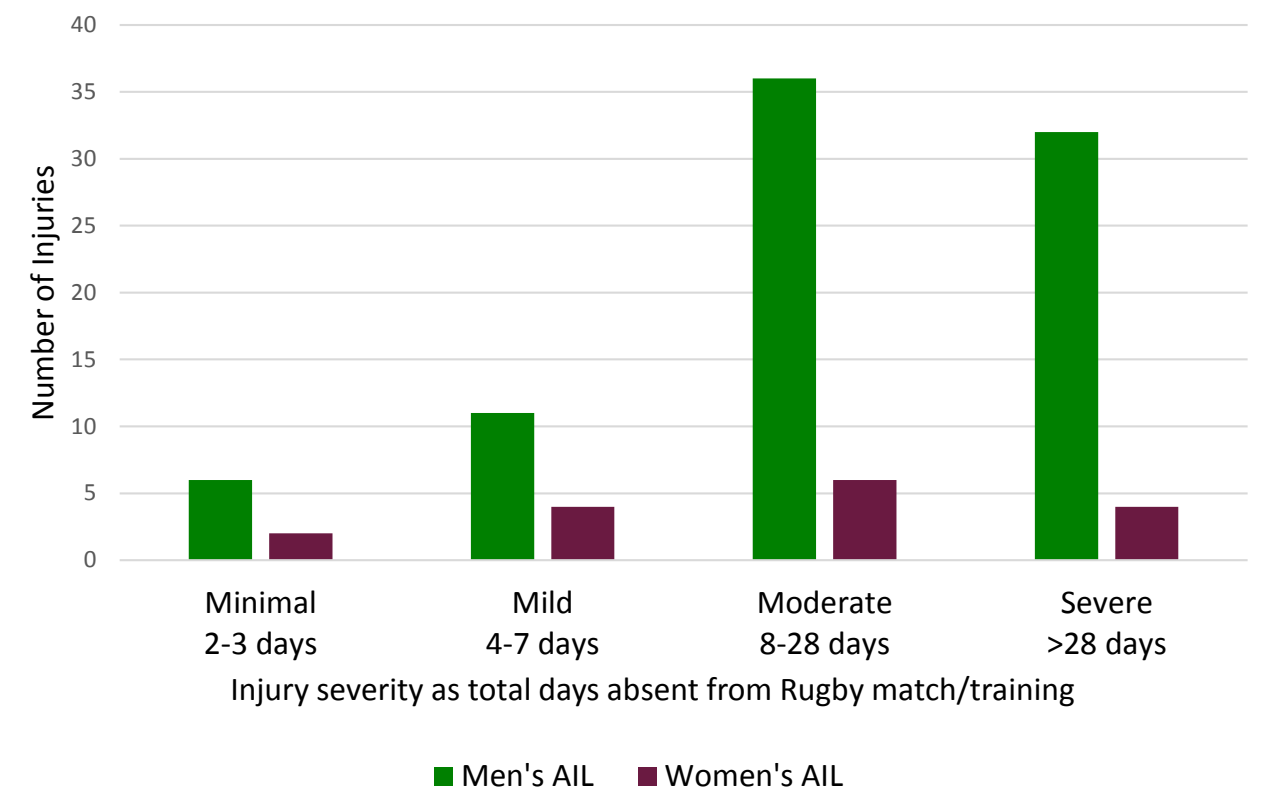


Figure 10: Injury severity (number of injuries).

¹⁰ Fuller, C. W., Molloy, M. G., Bagate, C., Bahr, R., Brooks, J. H., Donson, H., Kemp, S. P., McCrory, P., McIntosh, A. S., Meeuwisse, W. H., Quarrie, K. L., Raftery, M. & Wiley, P. 2007. Consensus statement on injury definitions and data collection procedures for studies of injuries in Rugby Union. Br J Sports Med, 41, 328-31.
Williams, S., Trewartha, G., Kemp, S. & Stokes, K. 2013. A meta-analysis of injuries in senior men's professional Rugby Union. Sports Med, 43, 1043-55.

4.7 Training Injury Burden (number of injuries x time lost per injury)

The burden of an injury assesses the frequency of an injury in relation to the severity of the injury (measured as the number of days absence).

Hamstring strains accounted for 19% of all severe training injuries (>28 days absence) in the men's clubs and resulted in an average of 48 days absence from Rugby match or training activities.

In the men's clubs, the knee and the shoulder joints were commonly injured sites, which resulted in severe injuries (in terms of total number of days absent from rugby match or training). Three anterior cruciate ligament (ACL) ruptures in the knee (4% of all training injuries) occurred, resulting in an average of 343 days absence, while four glenohumeral joint (GHJ) dislocations in the shoulder (5% of all training injuries) also occurred, resulting in an average of 208 days absence.

Ankle ligament sprains accounted for 50% of all severe training injuries (>28 days absence) in the women's clubs and resulted in an average of 117 days absence from Rugby match or training activities.

Table 12:¹¹ Injury Burden (%frequency of severe training injuries), average TDO (total days off).

	Injury Burden	Average Total Days Off
Men's AIL	Hamstring strains 6 (19%)	48
	GHJ dislocation 4 (13%)	208
	Adductor strains 4 (13%)	57
Women's AIL	ATFL sprains 2 (50%)	117
	Thumb dislocation 1 (25%)	79
	Lumbar spine strain 1 (25%)	38

¹¹ A 'hamstring strain' refers to a tear of the muscles located on the back (posterior aspect) of the thigh. A 'GHJ dislocation' (gleno-humeral joint dislocation) is the separation of the upper arm bone (humerus) from the shoulder socket (glenoid fossa). An 'adductor strain' refers to a tear of the muscles located on the inner thigh. This is also called a 'groin strain'. An 'ATFL sprain' (anterior talo-fibular ligament sprain) is a tear of the ligament located on the outside of the ankle joint. It is also called an inversion sprain or lateral ligament sprain. A 'lumbar spine strain' refers to a tear of the muscles located in the lower back.

4.8 Medical Attention Training Injuries (slight injuries)

Any injury resulting in 0-1 days absent from Rugby match or training is considered a slight, or 'medical attention' injury and therefore were excluded from the analysis of time-loss injuries, as per best international practice.¹²

During the 2017-2018 season, only 5 medical attention injuries occurred during training activities.

Table 13: Training medical attention injuries.

Division	No. Clubs	No. Players	No. Injuries
Men's AIL 1	8	261	1
Men's AIL 2	7	218	1
Overall men's	15	479	2
Women's AIL	4	129	3
Overall women's	4	129	3

- Strains were the most common injury type, followed by sprains and fractures.
- Lower limb muscle strains (adductors and quadriceps) were the most common injury site.
- The fingers were the most common upper limb injury site.
- Contact drills accounted for the majority of medical attention injuries.

¹² Fuller, C. W., Molloy, M. G., Bagate, C., Bahr, R., Brooks, J. H., Donson, H., Kemp, S. P., McCrory, P., McIntosh, A. S., Meeuwisse, W. H., Quarrie, K. L., Raftery, M. & Wiley, P. 2007. Consensus statement on injury definitions and data collection procedures for studies of injuries in Rugby Union. Br J Sports Med, 41, 328-31. Williams, S., Trewartha, G., Kemp, S. & Stokes, K. 2013. A meta-analysis of injuries in senior men's professional Rugby Union. Sports Med, 43, 1043-55.

5.0 Future Directions of the IRIS Project

Following a successful first season of the IRISweb system, the IRIS project aims to expand and recruit additional clubs, and schools, for the 2018-2019 season. Recruitment shall continue in the men's AIL across both Division 1 and Division 2, while recruitment will expand beyond the women's AIL to the first league division in each province in order to recruit more women's teams.

Proving the IRISweb system's validity, accuracy and manageability by clubs and medical professionals is paramount. Proving its reliability and efficiency is essential at this structured club level to enable future planned roll-out across all levels of junior and underage amateur Rugby.



6.0 Publications and Conferences

6.1 Journal Publications

Yeomans, C., Kenny, I.C., Cahalan, R., Warrington, G.D., Harrison, A.J., Hayes, K., Lyons, M., Campbell, M.J & Comyns, T.M. (2018) 'The Incidence of Injury in Amateur Male Rugby union: a Systematic Review and Meta-analysis'. *Sports Medicine*, 48(4), 837-848

Yeomans, C., Comyns, T. M., Cahalan, R., Warrington, G. D., Harrison, A. J., Hayes, K., Lyons, M., Campbell, M.J & Kenny, I. C. (2018). Current injury monitoring and player education practices in Irish amateur rugby union. *Physical Therapy in Sport*, 33, 27-32.

6.2 Conference Communications

Yeomans, C., Kenny, I.C., Cahalan, R., Warrington, G.D., Harrison, A.J., Hayes, K., Lyons, M., Campbell, M.J., Comyns, T.M. 'The Incidence of Injury in Amateur Rugby union: a Systematic Review and Meta-analysis'. All-Ireland Postgraduate Conference. Carlow I.T., April 2017

Yeomans, C., Cahalan, R., Kenny, I.C., Warrington, G.D., Harrison, A.J., Hayes, K., Lyons, M., Campbell, M.J. and Comyns, T.M. 'The Irish Rugby Injury Surveillance (IRIS) Project: a meta-analysis of global injury incidence and a survey of Irish injury surveillance and prevention strategies'. Health Research Symposium. University Hospital Limerick, November 2017

Yeomans, C., Comyns, T.M., Cahalan, R., Warrington, G.D., Harrison, A.J., Hayes, K., Lyons, M., Campbell, M.J., Kenny, I.C. 'Injury Surveillance in Irish Rugby, 'The Irish Rugby Injury Surveillance (IRIS) Project'. FSEM Spring Study Day University of Limerick, March 2018

Yeomans, C., Comyns, T.M., Cahalan, R., Warrington, G.D., Harrison, A.J., Hayes, K., Lyons, M., Campbell, M.J., Kenny, I.C. 'Injury Monitoring and Player Education: a Survey of Current Practices in Irish Amateur Rugby Union'. ACSM Annual Congress. Minneapolis U.S.A, May 2018

7.0 References

Fuller, C. W., Molly, M. G., Bagate, C., Bahr, R., Brooks, J. H., Donson, H., Kemp, S. P., McCrory P., McIntosh, A. S., Meeuwisse, W. H., Quarrie, K. L., Raftery, M. & Wiley, P. 2007. Consensus statement on injury definitions and data collection procedures for studies of injuries in Rugby Union. Br J Sports Med, 41, 328-31.

Williams, S., Trewartha, G., Kemp, S. & Stokes, K. 2013. A meta-analysis of injuries in senior men's professional Rugby Union. Sports Medicine, 43, 1043-55.



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