WRISP REPORT 2020-21

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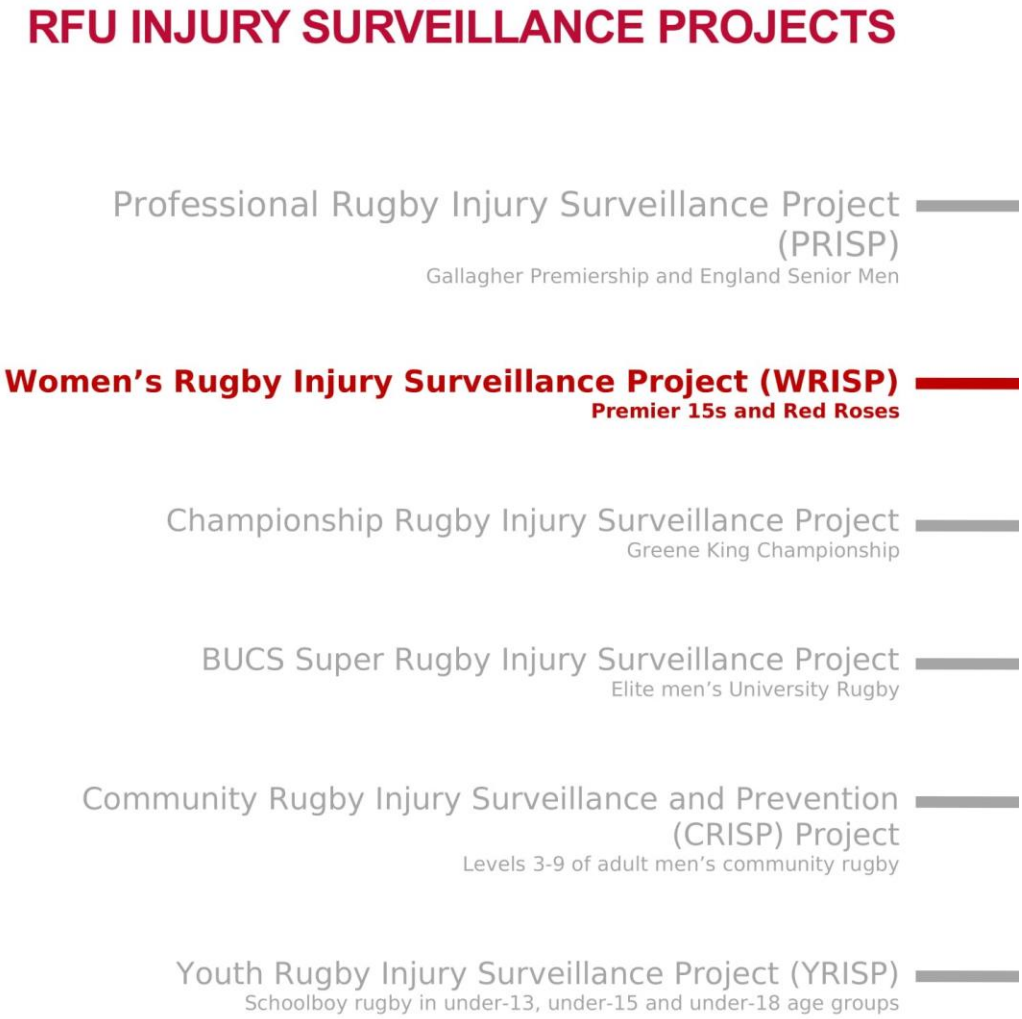
WOMEN'S PROFESSIONAL RUGBY INJURY SURVEILLANCE PROJECT

SEASON REPORT

2020-21



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At-a-Glance Summary

Premier 15s Match Injuries

- Injury incidence rate: **47.6 / 1000 h**
- Mean days missed: **57 days**
- Burden: **2713 days absence / 1000 h**
- Highest burden event: **Tackled**
- Highest burden injury diagnosis: **Knee sprain/ligament**

Premier 15s Training Injuries

- Injury incidence rate: **1.46 / 1000 h**
- Mean days missed: **52 days**
- Burden: **76 days absence / 1000 h**
- Highest burden event: **Rugby skills, full contact**
- Highest burden injury diagnosis: **Knee sprain/ligament**

England Match Injuries

- Injury incidence rate: **200 / 1000 h**
- Mean days missed: **7 days**
- Burden: **1400 days absence / 1000 h**
- Highest burden event: **Tackling**
- Highest burden injury diagnosis: **Neck/cervical spine lesion of cartilage/meniscus/disc**

England Training Injuries

- Injury incidence rate: **14 / 1000 h**
- Mean days missed: **30 days**
- Burden: **420 days absence / 1000 h**
- Highest burden event: **Rugby skills, full contact**
- Highest burden injury diagnosis: **Ankle sprain/ligament**

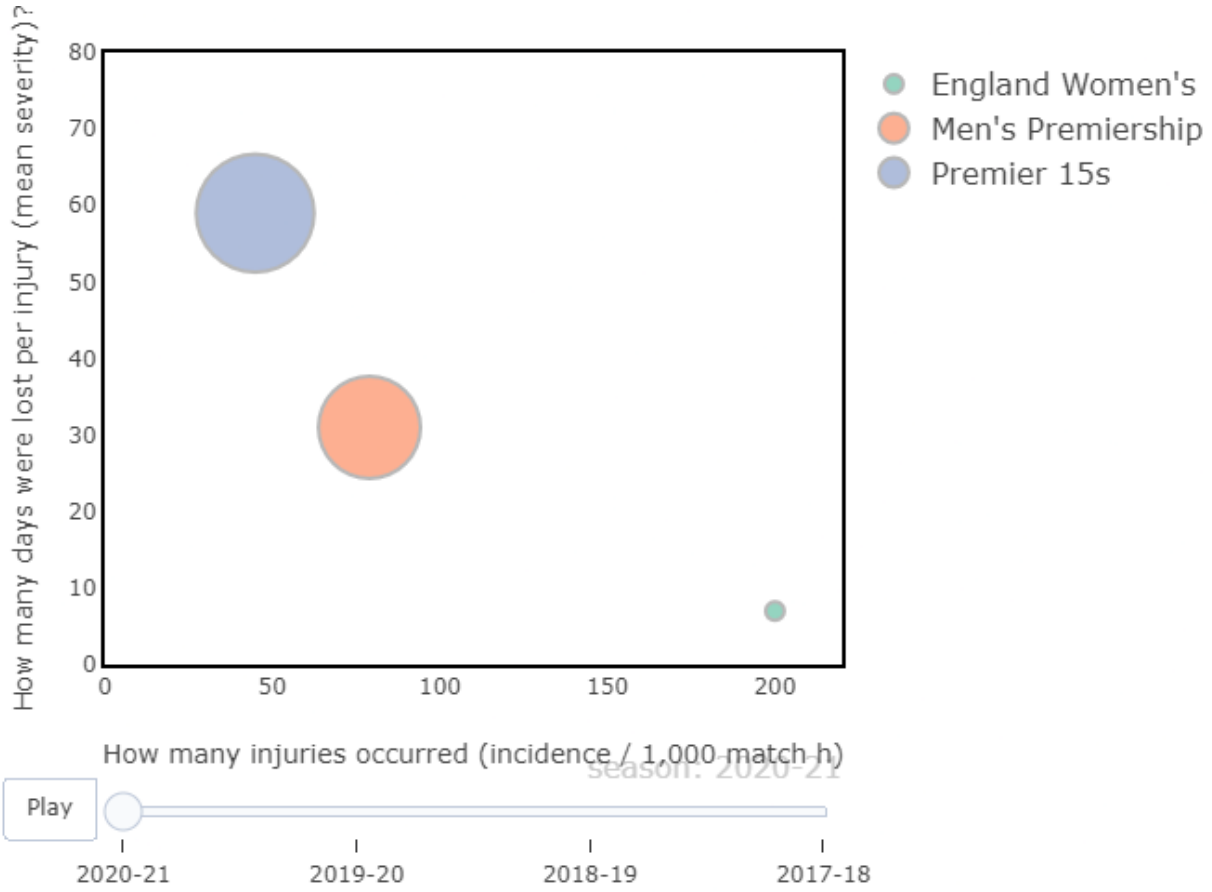

Figure 1. Summary of match injury data in the Premier 15s, England Women's team, and Men's Premiership (for comparison) over the past four seasons. Size of bubble represents injury burden.

Executive Summary

This is the fourth injury surveillance report from the women's Premier 15s competition. The women's Rugby Injury Surveillance Project (WRISP) will be pivotal in both providing the baseline data needed to assess trends in injury risk, and in guiding further investigation into injuries that are common, severe, or increasing in incidence. It cannot be assumed that the injury risk profile from other rugby settings is applicable to the women's professional game in England, and so appropriate injury prevention strategies can only be designed and evaluated through the collection of high-quality injury surveillance data.

The 2020-21 season was unlike any previous season, which is important to consider when reading this report. In the Premier 15s, several laws were adapted to minimise face-to-face contact during matches and thus lower the risk of Covid-19 transmission. These included measures to reduce the number of scrums and mauls, as well as the length of mauls. Indeed, the number of scrums per match was reduced from 10 in 2019-20, to 2 in 2020-21. Premier 15s matches were reduced to 70 mins in duration due to the increased ball-in-play time associated with the aforementioned law amendments. This resulted in an average reduction in overall ball-in-play time of approximately one minute (2019-20 = 38:08 mins, 2020-21 = 36:54 mins). In addition, the preparation time and season schedule was different to other Premier 15s seasons. The law amendments did not apply to the Red Roses (England Senior Women's) fixtures. Finally, written informed consent was obtained from only ~73% of registered Premier 15s squad players during the 2020-21 season, which meant that some injury events could not be included in this analysis. Together, these factors mean that the the 2020-21 was atypical, and so it is not appropriate to comment on trends in injury risk or the significance of changes between seasons at this stage.

- The overall incidence of match injury in the Premier 15s was 47.6 / 1000 hs (16 injuries per team, or 1.7 injuries per match), which was similar to 2019-20 (39 per 1000 hours).

- The average time missed per match injury was 57 days. This figure is higher than the men's Premiership (38 days). The context within which both the players and medical practitioners in the Premier 15s competition operate should be noted; the non-rugby work commitments of players will influence their injury risk and may prolong rehabilitation in some cases, whilst the reduced contact time for medical practitioners with players (compared to the men's professional setting) may inhibit their ability to report minor injury/illness episodes. These factors may influence the time taken to return from injury in this setting.

- Concussion was again the most commonly reported match injury (12.6 per 1000 hours), making up 26% of all match injuries. The rate of concussion was substantially higher than last season (5.3 per 1000 h), which likely reflects more consistent identification and reporting of concussion injuries. The 2021-22 season sees the introduction of the World Rugby Head Injury Assessment (HIA) protocol, supported by access to real-time video replay, both of which have been shown to consolidate and enhance the detection and management of concussion injuries in similar settings.

- A more detailed breakdown of all match injuries incurred during Premier 15s matches since the 2017-18 season can be found here.
- The incidence rate for training injuries was low (1.46 / 1000 h), whilst the average number of days missed per training injury was high (52 days). This equates to approximately one time-loss training injury every 8 team-training sessions (assuming 2 h sessions involving 45 players), or 13 training injuries per team each season. These data may reflect the challenges associated with detecting and reporting injuries in this setting. For instance, medics do not see players as regularly as in the men's Premiership, and so minor injuries are more likely to be missed in the women's game. Developing medical resources and practitioner reporting will impact upon this.
- Despite their low incidence rate, training injuries still accounted for 46% all injuries reported in this setting. Given the more controllable nature of the training environment, these injuries should be a priority for future preventative efforts.
- The incidence rate in England women's international matches and training was high (200 and per 1000 hours, respectively), and comparable to the England men's team. These data may reflect an improved ability to report minor injuries in the England international setting. For instance, England medical practitioners will have greater contact with players during international camps, compared to the practitioners in the Premier 15s, enhancing their ability to report minor injuries.

Definitions

Time-loss Injury

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

Days missed

The time (days) lost from competition and practice was used as a marker of injury severity and was defined as the number of days from the date of the injury to the date that the player was deemed to have regained full fitness not including the day of injury or the day of return. A player was deemed to have regained full fitness when she was 'able to take a part in training activities (typically planned for that day) and was available for match selection.'

Confidence interval (CI)

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

Injury incidence rate

The likelihood of sustaining an injury during match play or training is reported as the injury incidence rate. The injury incidence rate is the number of injuries expressed per 1,000 player-hours of match exposure (or training exposure).

Burden

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

Statistical significance

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

Premier 15s Match Injuries

Injury incidence rate

In the 2020-21 Premier 15s season there were 155 auditable match injuries that led to time-loss from training and/or match play. The analysis included 3255 total hours of match exposure, resulting in a match injury incidence rate of **47.6 injuries per 1000 match-hours** (95% CI: 40.7-55.7). This equates to 16 injuries per team per season, and 1.7 injuries per Premier 15s fixture. Last season (2019-20) the injury incidence rate was 39 injuries per 1000 match-hours (95% CI:32-48). For comparison, the incidence rate in the men's Premiership was 79 per 1000 match-hours during the 2020-21 season. The incidence rate of injuries resulting in greater than seven days of absence was 39.9 per 1000 match-hours (95% CI: 33.6-47.4).

Days missed

Estimated return-to-play dates were provided for 20 match injuries, and these estimations were used to calculate the number of days missed for those injuries. The mean number of days missed per match injury during the 2020-21 season was **57 days**, while the median was 25 days. Last season, the mean and median number of days missed per injury in the Premier 15s was 46 and 17 days, respectively. For comparison, the mean and median number of days missed for match injuries in the men's Premiership was 31 and 14 days, respectively, during the 2020-21 season. The context within which both the players and medical practitioners in the Premier 15s competition operate should be noted; the non-rugby work commitments of players will influence their injury risk and may prolong rehabilitation in some cases, whilst the reduced contact time for medical practitioners with players (compared to the men's professional setting) may inhibit their ability to report minor injury/illness episodes.The overall burden of match injury was **2713 days absence per 1000 hours**. This value equates to approximately 29 days absence per team per match.

Table 1. Premier 15s match injury incidence rate by 'days missed' grouping.

	Days missed category	n	Incidence rate (injuries / 1000 h)
1	2-7	25	7.7
2	8-28	58	17.8
3	29-84	35	10.8
4	>84	37	11.4

Injury event

Figure 2 shows the incidence, mean days missed and burden attributed to each specific match injury event for the 2020-21 Premier 15s season. Being tackled was the (known) match event most likely to result in a time-loss injury, and was the match event associated with the highest overall injury burden. This finding aligns the men's Professional game 2020-21 report, where a greater proportion of injuries were also incurred by the ball

carrier rather than the tackler. The characteristics of tackle events in the women's game will be explored in more detail in future seasons. Running was the second highest burden match event. 'Unknown' and 'Other' classifications are not displayed in Figure 2 (n = 36, 23% of all match injuries).

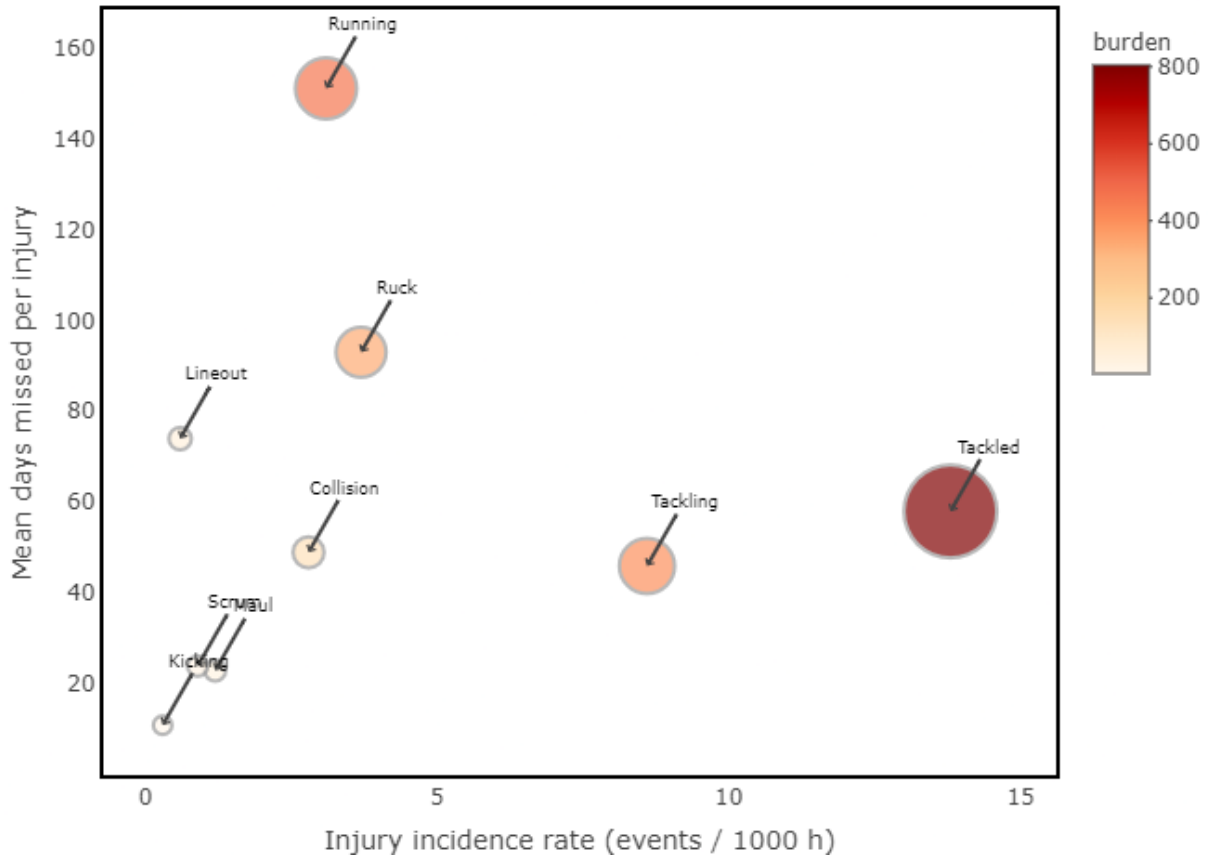

Figure 2. Incidence and mean days missed of Premier 15s match injuries by injury event. Size of bubble represents relative injury burden. 'Unknown' and 'Other' classifications are not displayed.

Injury location

Figure 3 provides the distribution of injuries across the four body regions. Overall, 45% of match injuries occurred to the lower limb, whilst 32% occurred to the head/neck. For specific injury locations, the head/face, knee, and ankle were the body locations with the highest incidence rate, whilst the knee and ankle were associated highest overall burden.

Body region

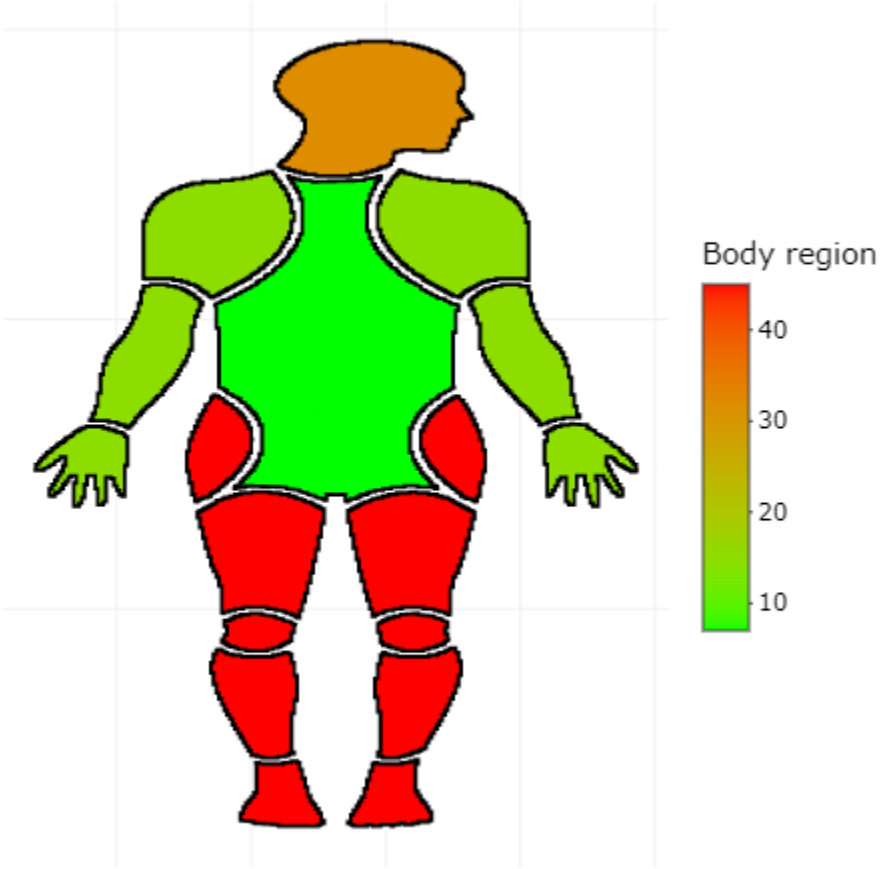

Figure 3. The distribution of Premier 15s match injuries by body region (lower limb, upper limb, trunk, head/neck). Hover over the region to see the percentage of injuries incurred in that region

Location

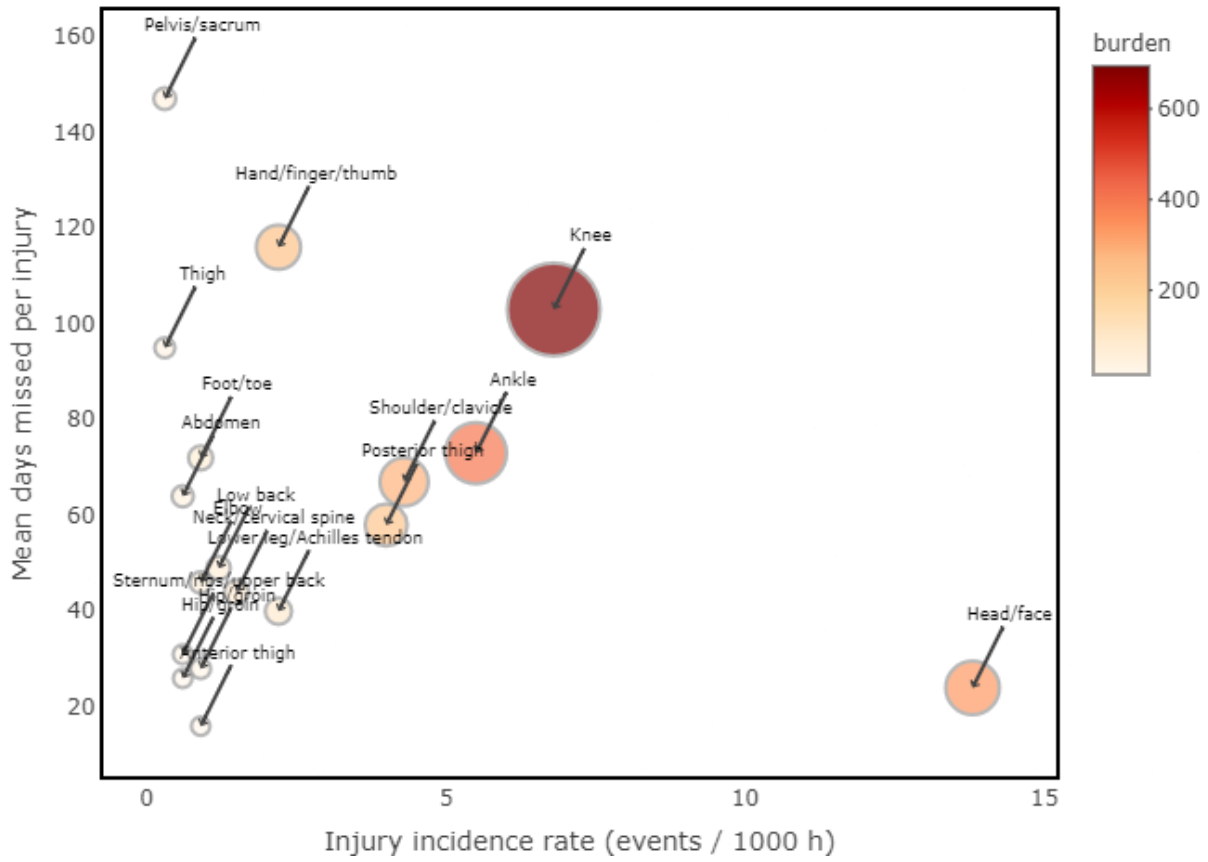

Figure 4. Incidence and mean days missed of Premier 15s match injuries by injury location. Size of bubble represents relative injury burden.

Injury diagnosis

This section provides information about the injury diagnoses. The diagnoses comprise the body site and general injury type but do not provide the details of specific diagnoses. For example, knee ligament injuries are grouped rather than displaying specific injuries such as MCL or ACL. Concussion was the most common match injury. Knee sprain/ligament injuries carried the highest overall injury burden (Table 2). A more detailed breakdown of all match injuries incurred during Premier 15s matches since the 2017-18 season can be found here.

Table 2. Incidence, mean days missed, and burden of Premier 15s match injuries by injury diagnosis.

	Injury diagnosis	n	Incidence rate (injuries / 1000 h)	Mean days missed per injury	Burden (days missed / 1000 h)
1	Knee sprain/ligament	15	4.6	138.1	636.6
2	Concussion	41	12.6	25.1	316.4
3	Ankle sprain/ligament	16	4.9	63.0	309.7
4	Posterior thigh muscle strain/rupture/cramps	11	3.4	66.8	225.8
5	Hand/finger/thumb fracture	4	1.2	137.8	169.3
6	Shoulder/clavicle dislocation/subluxation	3	0.9	163.0	150.2
7	Shoulder/clavicle sprain/ligament	7	2.2	51.4	110.6
8	Lower leg/achilles tendon fracture	1	0.3	182.0	55.9
9	Ankle other	1	0.3	163.0	50.1
10	Hand/finger/thumb sprain/ligament	2	0.6	73.5	45.2

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Artificial turf

Five teams included in the current analysis played their home fixtures on 3G artificial turf pitches, resulting in a total exposure of 1495 match hours on these surfaces, compared to 1760 hours played on natural grass surfaces. Overall, there was no statistically significant difference in the injury burden on artificial turf (2349 days per 1000 match-hours, 95% CI: 1839-3001) compared with natural grass (2719 days per 1000 match-hours, 95% CI: 2165-3414). The injury incidence rate was higher on artificial turf versus natural grass (42.8 / 1000 h vs. 42 / 1000 h), whilst the mean number of days lost per injury was lower on artificial turf surfaces (55 days vs. 65 days, Figure 5). When combining data pertaining to surface type over the past four seasons, there was no significant difference in the overall burden of injury between playing surfaces (Figure 6).

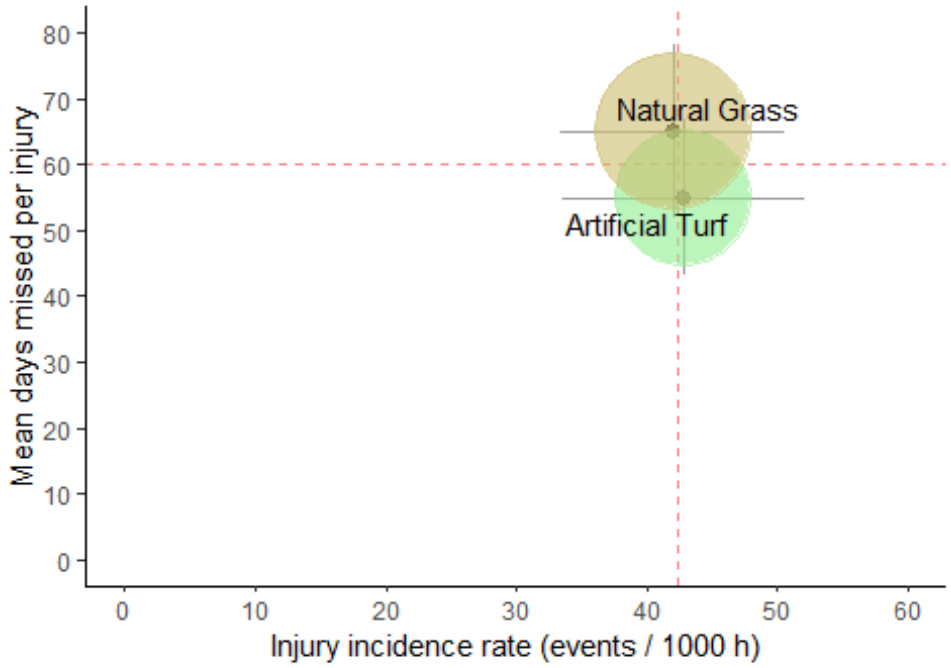

Figure 5. Incidence and mean days missed per injury for Premier 15s match injuries played on artificial turf and natural grass surface during the 2020-21 season. Size of bubble represents relative injury burden.

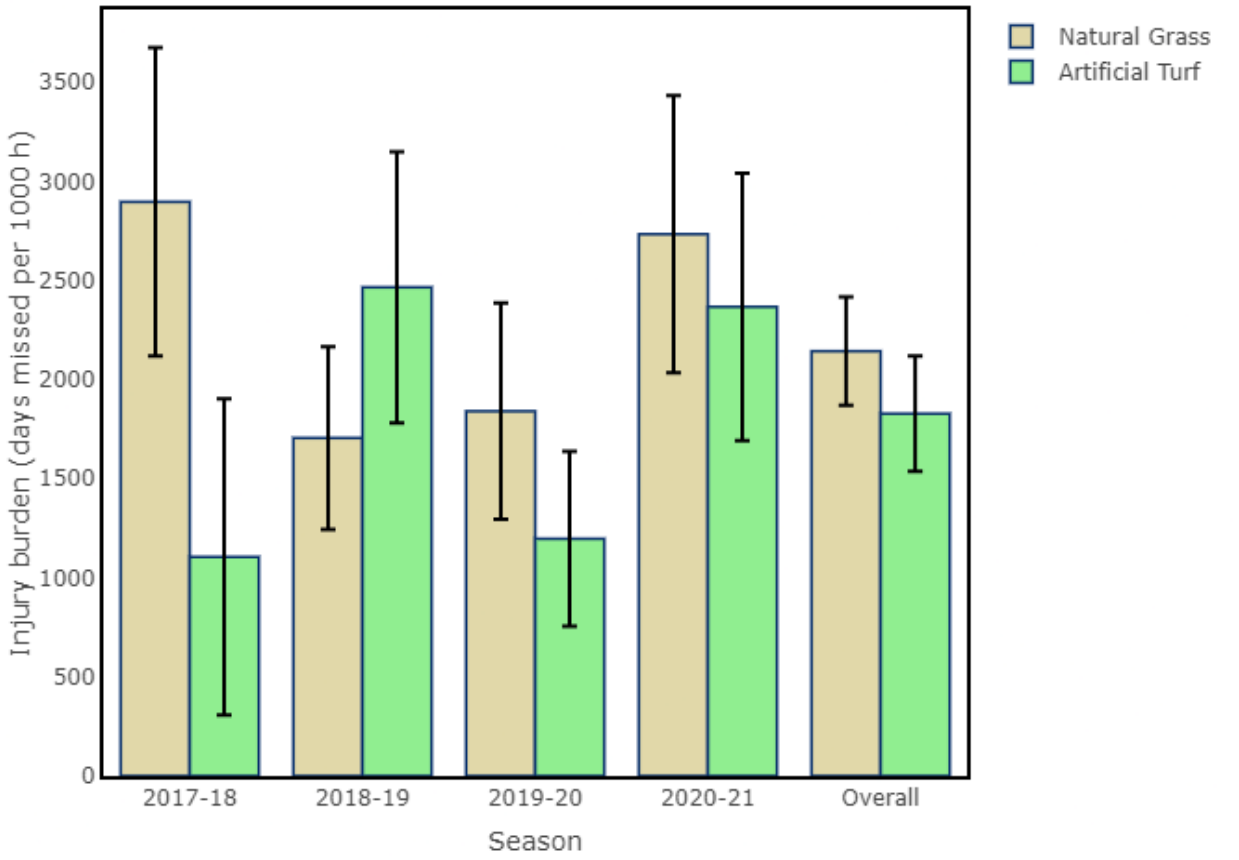

Figure 6. Burden associated with Premier 15s match injuries incurred on artificial turf and natural grass surfaces for the 2017-18, 2018-19, 2019-20, 2020-21 seasons, and for all seasons combined.

Premier 15s Training Injuries

Injury incidence rate

In the 2020-21 Premier 15s season there were 127 auditable training injuries that led to time-loss from training and/or match play. The analysis included 117047 total hours of training exposure, resulting in a training injury incidence rate of **1.46 injury per 1000 training-hours** (95% CI: 1.2-1.7). The overall training injury incidence rate equated to approximately one time-loss training injury every 8 team-training sessions (assuming 2 h sessions involving 45 players), or 13 training injuries per team each season. The incidence rate for the 2019-20 season was 1.0 injuries per 1000 training-hours. For comparison, the incidence rate in the men's Premiership was 2.9 per 1000 training-hours during the 2020-21 season. The incidence of training injuries resulting in more than seven days of absence was 1.2 per 1000 training-hours (95% CI: 1 - 1.5). Despite their low incidence rate, training injuries still accounted for over half of all injuries reported in this setting. Given the more controllable nature of the training environment, these injuries should be a priority for future preventative efforts.

Days missed

Estimated return-to-play dates were provided for 12 training injuries, and these estimations were used to calculate the number of days missed for those injuries. The mean number of days missed for training injuries during the 2020-21 Premier 15s season was **52 days**, while the median was 26 days. Last season, the mean and median injury days missed were 51 and 30 days, respectively. For comparison, the mean and median severity of training injuries in the men's Premiership was 36 and 19 days during the 2020-21 season, respectively; these findings may again reflect a reduced ability to report minor (2-7 day) injuries in the Premier 15s, due to differences in medical/administrative resources in comparison to the men's Premiership setting (Table 3). The overall burden of training injury was 76 days absence per 1000 hours.

Table 3. Premier 15s training injury incidence rate by 'days missed' grouping.

	Days missed category	n	Incidence rate (injuries / 1000 h)
1	2-7	22	0.3
2	8-28	43	0.5
3	29-84	43	0.5
4	>84	19	0.2

Injury event

Table 4 shows the incidence, mean days missed and burden attributed to each specific training injury event for the 2020-21 season. Rugby skills training (full-contact) was the training format most likely to result in a time-loss injury and also represented the training format with the highest overall burden.

Table 4. Incidence, mean days missed per injury, and burden by training event in the Premier 15s.

	Training event	n	Incidence rate (injuries / 1000 h)	Mean days missed per injury	Burden (days missed / 1000 h)
1	Rugby skills, full contact	53	0.6	49.0	30.0
2	Rugby skills, non contact	19	0.2	82.0	18.0
3	Rugby skills, semi contact	20	0.2	44.0	10.0
4	Conditioning, skill based	9	0.1	69.0	7.0
5	Conditioning, running endurance	11	0.1	36.0	5.0
6	Conditioning, speed/agility	7	0.1	28.0	2.0
7	Conditioning, weights	4	0.0	32.0	1.0
8	Unknown - non-specific onset injury	1	0.0	92.0	1.0

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Injury location

In training, 68% of injuries were to the lower limbs (Figure 7), with a large majority of these (n=20) related to the ankle (Table 5).

Body region

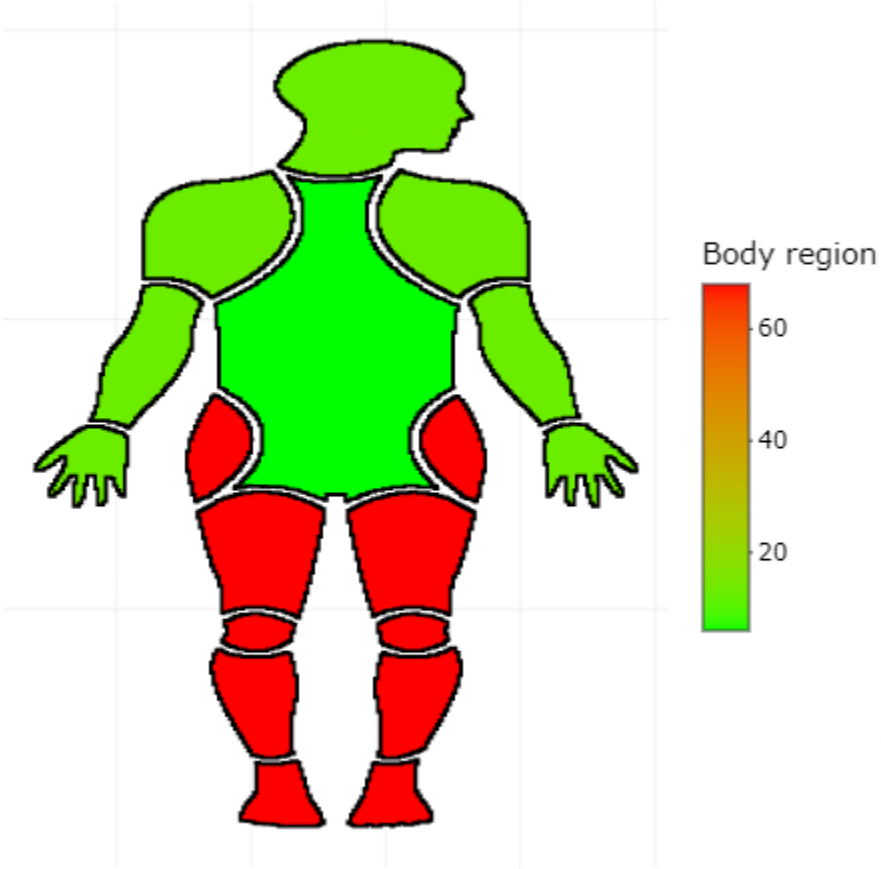

Figure 7. The distribution of Premier 15s training injuries by body region (lower limb, upper limb, trunk, head/neck). Hover over the region to see the percentage of injuries incurred in that region

Location

Table 5. Incidence, mean days missed, and burden of Premier 15s training injuries by body location.

	Location	Body region	n	Incidence rate (injuries / 1000 h)	Mean days missed per injury	Burden (days missed / 1000 h)
1	Knee	Lower Limb	19	0.2	134.0	29.0
2	Ankle	Lower Limb	20	0.2	45.0	10.0
3	Posterior thigh	Lower Limb	15	0.2	42.0	7.0
4	Lower leg/Achilles tendon	Lower Limb	13	0.1	37.0	6.0
5	Hand/finger/thumb	Upper Limb	8	0.1	44.0	4.0
6	Head/face	Head and Neck	15	0.2	23.0	4.0
7	Hip/groin	Lower Limb	9	0.1	38.0	4.0
8	Foot/toe	Lower Limb	4	0.1	69.0	3.0
9	Anterior thigh	Lower Limb	6	0.1	43.0	3.0
10	Shoulder/clavicle	Upper Limb	8	0.1	30.0	3.0

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Injury diagnosis

This section provides information about the training injury diagnoses relating to the Premier 15s. Ankle and posterior thigh strains were the most common injury diagnosis in training, whilst knee sprain/ligament injuries were associated with the highest overall burden.

Table 6. Incidence, mean days missed, and burden of Premier 15s training injuries by injury diagnosis.

	Injury diagnosis	n	Incidence rate (injuries / 1000 h)	Mean days missed per injury	Burden (days missed / 1000 h)
1	Knee sprain/ligament	10	0.1	200.0	23.0
2	Ankle sprain/ligament	15	0.2	44.0	8.0
3	Posterior thigh muscle strain/rupture/cramps	15	0.2	42.0	7.0
4	Lower leg/achilles tendon other	6	0.1	56.0	4.0
5	Concussion	13	0.1	22.0	3.0
6	Knee laceration/abrasion	1	0.0	275.0	3.0
7	Hand/finger/thumb fracture	5	0.1	54.0	3.0
8	Anterior thigh muscle strain/rupture/cramps	3	0.0	60.0	2.0
9	Hip/groin muscle strain/rupture/cramps	5	0.1	32.0	2.0
10	Foot/toe sprain/ligament	1	0.0	158.0	2.0

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England Match Injuries

Injury incidence rate

In the 2020-21 season there were 24 auditable match injuries during England women's matches that led to time-loss from training and/or match play. The analysis included 120 total hours of match exposure, resulting in a match injury incidence rate of **200 injuries per 1000 match-hours** (95% CI: 134-298). Last season (2019-20) the injury incidence rate for England match injuries was 114 injuries per 1000 match-hours. In addition, the mean injury incidence rate during the 2010-2017 women's Rugby World Cup tournaments was 44 per 1000 match-hours. The incidence rate of injuries resulting in greater than seven days of absence was 75 per 1000 match-hours (95% CI: 39-144.1).

Days missed

The mean number of days missed per match injury for the 2020-21 season was **7 days**, while the median was 6 days. Last season, the mean and median number of days missed per injury in England matches was 28 and 7 days, respectively. The mean days missed for injuries during the 2010-2017 women's Rugby World Cup tournaments was 46 days. The overall burden of match injury was **1400 days absence per 1000 hours**. This value equates to approximately 233 total days absence per match. Compared to the Premier 15s, England injuries occurred at a higher rate but resulted in fewer days missed per injury (on average), resulting in an overall burden of injury that was significantly lower than that of the Premier 15s (1400 vs. 2713 days/1000 match-hours).

Table 7. England match injury incidence rate by 'days missed' grouping.

	Days missed category	n	Incidence rate (injuries / 1000 h)
1	2-7	15	125.0
2	8-28	9	75.0

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Injury event

Figure 8 shows the incidence and mean days missed for each specific match injury event for the 2020-21 season. Tackling was the most common and highest burden match event leading to injury. In contrast to Premier 15s matches, tackling was associated with a higher burden of injury compared to being tackled.

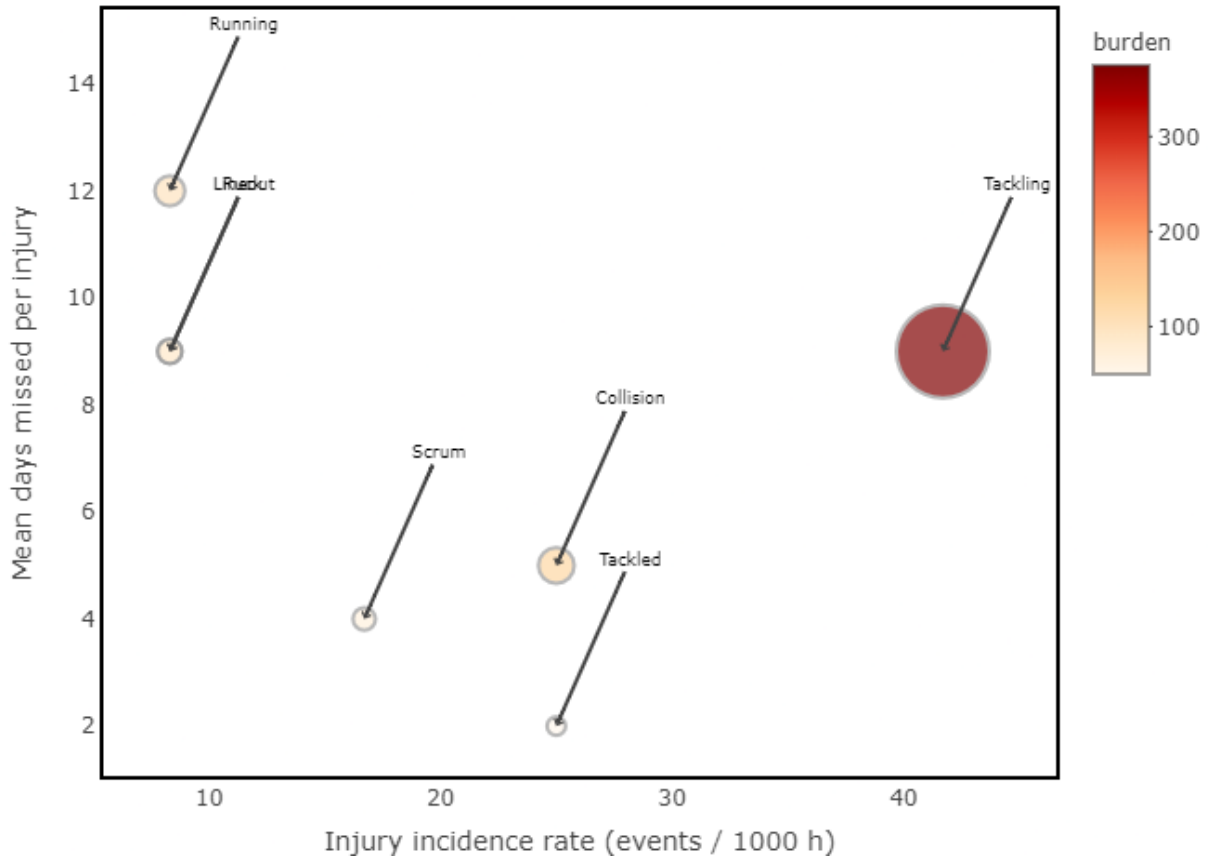

Figure 8. Incidence and mean days missed of England match injuries by injury event. Size of bubble represents relative injury burden.

Injury location

Figure 9 provides the distribution of injuries across the four body regions. Overall, 47% of match injuries occurred to the lower limbs, whilst 24% occurred to the head/neck and upper limbs. For specific injury locations, the neck/cervical spine was the body location with the highest incidence rate whilst foot/toe injuries had the greatest overall burden, though this was accounted for by just two injuries. As such, the high burden of foot/toe injuries is unlikely to be a consistent injury pattern in future seasons (Table 8).

Body region

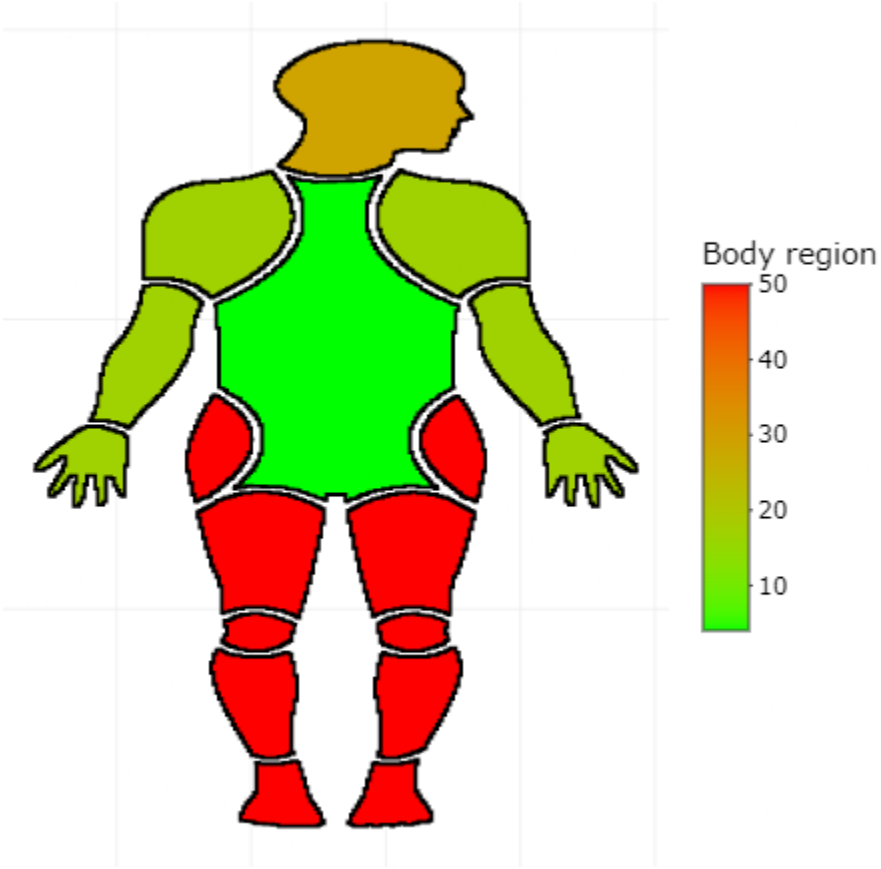

Figure 9. The distribution of England match injuries by body region (lower limb, upper limb, trunk, head/neck). Hover over the region to see the percentage of injuries incurred in that region

Location

Table 8. Incidence, mean days missed, and burden of England match injuries by body location.

	Location	Body region	n	Incidence rate (injuries / 1000 h)	Mean days missed per injury	Burden (days missed / 1000 h)
1	Neck/cervical spine	Head and Neck	5	41.7	9.0	367.0
2	Head/face	Head and Neck	2	16.7	15.0	250.0
3	Anterior thigh	Lower Limb	5	41.7	6.0	250.0
4	Knee	Lower Limb	2	16.7	10.0	175.0
5	Hip/groin	Lower Limb	3	25.0	4.0	108.0
6	Ankle	Lower Limb	1	8.3	9.0	75.0
7	Elbow	Upper Limb	2	16.7	3.0	50.0
8	Foot/toe	Lower Limb	1	8.3	6.0	50.0
9	Hip/groin	Trunk	1	8.3	6.0	50.0
10	Shoulder/clavicle	Upper Limb	1	8.3	6.0	50.0

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Injury diagnosis

This section provides information about the specific match injury diagnoses relating to the England women's team. Neck/cervical spine sprain/ligament injuries were the most common injury diagnosis (Table 9), though all diagnoses had a low absolute number of occurrences.

Table 9. Incidence, mean days missed, and burden of England match injuries by injury diagnosis.

	Injury diagnosis	n	Incidence rate (injuries / 1000 h)	Mean days missed per injury	Burden (days missed / 1000 h)
1	Neck/cervical spine lesion of cartilage/meniscus/disc	2	16.7	16.0	266.7
2	Knee lesion of cartilage/meniscus/disc	2	16.7	10.5	175.0
3	Anterior thigh haematoma/contusion	4	33.3	4.5	150.0
4	Head/face sprain/ligament	1	8.3	18.0	150.0
5	Anterior thigh muscle strain/rupture/cramps	1	8.3	12.0	100.0
6	Concussion	1	8.3	12.0	100.0
7	Neck/cervical spine sprain/ligament	3	25.0	4.0	100.0
8	Hip/groin haematoma/contusion	3	25.0	3.7	91.7
9	Ankle sprain/ligament	1	8.3	9.0	75.0
10	Hip/groin muscle strain/rupture/cramps	1	8.3	8.0	66.7

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England Training Injuries

Injury incidence rate

In the 2020-21 season there were 27 auditable training injuries that led to time-loss from training and/or match play. The analysis included 1983 total hours of training exposure, resulting in a training injury incidence rate of **14 injuries per 1000 match-hours** (95% CI: 9-20). Last season, the injury incidence rate during England training was 11 per 1000 training-hours. The incidence of training injuries resulting in more than seven days of absence was 10.6 per 1000 training-hours (95% CI: 6.9-16.2).

Days missed

The mean number of days missed per training injury for the 2020-21 season was **30 days**, while the median was 16 days. Last season, the mean and median number of days missed for England training injuries was 33 and 16 days, respectively. The majority of injuries resulted in 8-28 days of absence (Table 10). The overall burden of injury was **420 days absence per 1000 hours**.

Table 10. England training injury incidence rate by 'days missed' grouping.

	Days missed category	n	Incidence rate (injuries / 1000 h)
1	2-7	6	3.0
2	8-28	12	6.1
3	29-84	6	3.0
4	>84	3	1.5

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Injury event

Table 11 shows the incidence, mean days missed and burden attributed to each specific training injury event for the 2020-21 season. Full-contact rugby skills sessions was the training format associated with the highest injury incidence rate and burden.

Table 11. Incidence, mean days missed per injury, and burden by England training event.

	Training event	n	Incidence rate (injuries / 1000 h)	Mean days missed per injury	Burden (days missed / 1000 h)
1	Rugby skills, full contact	16	8.1	32.0	260.0
2	Conditioning, weights	2	1.0	57.0	57.0
3	Rugby skills, non contact	1	0.5	87.0	44.0
4	Conditioning, running endurance	3	1.5	17.0	26.0
5	Rugby skills, semi contact	4	2.0	12.0	24.0
6	Unknown - non-specific onset injury	1	0.5	2.0	1.0

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Injury location

In training, a large majority (59%) of injuries were to the lower limbs (Figure 10), with lower leg/Achilles tendon, anterior thigh, and ankle injuries having the biggest burden (Table 12).

Body region

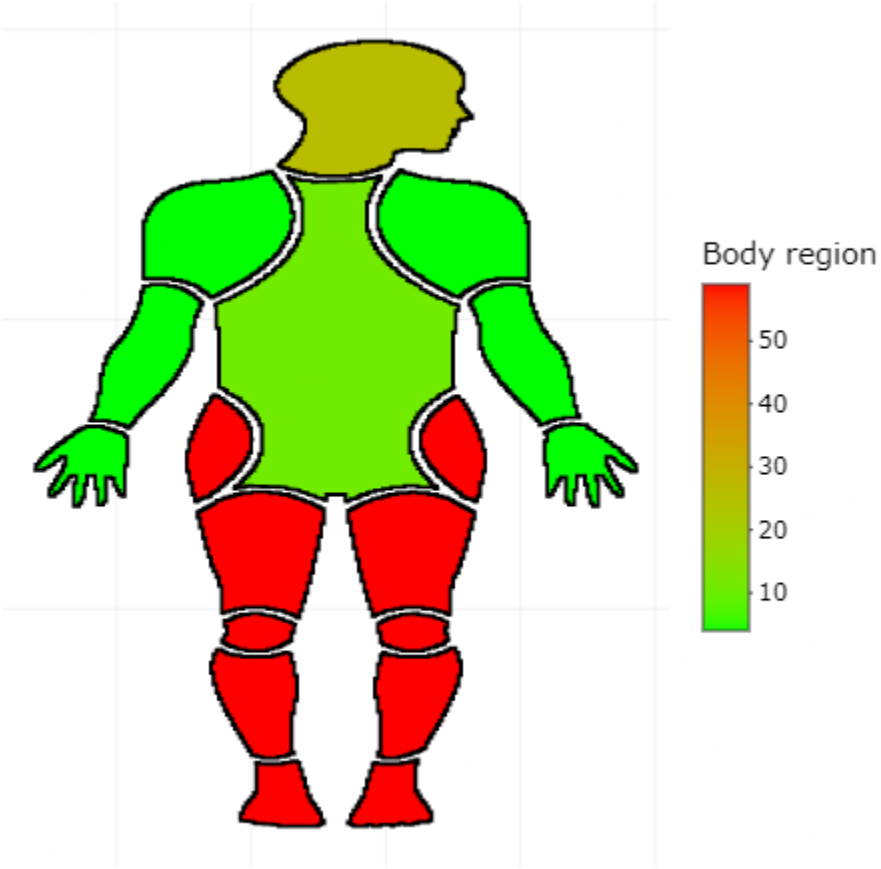

Figure 10. The distribution of England training injuries by body region (lower limb, upper limb, trunk, head/neck). Hover over the region to see the percentage of injuries incurred in that region

Location

Table 12. Incidence, mean days missed, and burden of England training injuries by body location.

	Location	Body region	n	Incidence rate (injuries / 1000 h)	Mean days missed per injury	Burden (days missed / 1000 h)
1	Lower leg/Achilles tendon	Lower Limb	3	1.5	54.0	82.0
2	Anterior thigh	Lower Limb	5	2.5	31.0	79.0
3	Ankle	Lower Limb	4	2.0	36.0	72.0
4	Knee	Lower Limb	2	1.0	58.0	58.0
5	Neck/cervical spine	Head and Neck	4	2.0	18.0	35.0
6	Abdomen	Trunk	1	0.5	50.0	25.0
7	Posterior thigh	Lower Limb	2	1.0	22.0	22.0
8	Head/face	Head and Neck	3	1.5	10.0	15.0
9	Shoulder/clavicle	Upper Limb	1	0.5	27.0	14.0
10	Low back	Trunk	2	1.0	10.0	10.0

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Injury diagnosis

This section provides information about the injury diagnoses relating to England training injuries. Anterior thigh muscle strain injuries had the highest incidence rate (n = 3), though all diagnoses had a low absolute number of occurrences.

Table 13. Incidence, mean days missed, and burden of England training injuries by injury diagnosis.

	Injury diagnosis	n	Incidence rate (injuries / 1000 h)	Mean days missed per injury	Burden (days missed / 1000 h)
1	Ankle sprain/ligament	2	1.0	59.0	60.0
2	Knee lesion of cartilage/meniscus/disc	1	0.5	101.0	51.0
3	Anterior thigh muscle strain/rupture/cramps	3	1.5	33.0	50.0
4	Lower leg/achilles tendon other	2	1.0	49.0	49.0
5	Neck/cervical spine nerve injury	1	0.5	65.0	33.0
6	Lower leg/achilles tendon muscle strain/rupture/cramps	1	0.5	64.0	32.0
7	Anterior thigh haematoma/contusion	2	1.0	28.0	28.0
8	Abdomen muscle strain/rupture/cramps	1	0.5	50.0	25.0
9	Posterior thigh muscle strain/rupture/cramps	2	1.0	22.0	22.0
10	Concussion	3	1.5	10.0	15.0

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WRISP Methods

Written informed consent was obtained from ~73% of registered Premier 15s squad players for the 2020-21 season. A total of 186 team games were included in the analyses for the 2020-21 season. Injuries from consented first team squad players sustained in training and in all matches in the Premier 15s competition were included. Injuries sustained while players represented England were reported and analysed separately. Match and training injury data were provided by all 10 Premier 15 teams in 2020-21. One team did not provide training exposure data in 2020-21, and so this was estimated based on the mean value provided by the other nine teams. Medical personnel at each Premier 15 club and the England women's team reported the details of injuries and illnesses sustained by a player at their club/team that were included in the study group together with the details of the associated injury event using an online medical record keeping system. Strength and conditioning staff recorded the squad's weekly training schedules and exposure on a password protected online system. Team match days were also recorded by strength and conditioning staff. Injury and illness diagnoses were recorded using the Orchard Sports Injury Classification System (OSICS) version 10.1. This sports specific injury

classification system allows detailed diagnoses to be reported and injuries to be grouped by body part and injury pathology. The definitions and data collection methods utilised in this study are aligned with the World Rugby Consensus statement on injury definitions and data collection procedures for studies of injuries in rugby union.

A number of quality control processes are embedded within the WRISP data collection process to ensure the validity and integrity of the data being presented within this report. All match exposures are crosschecked against fixture lists for each club at the end of the season to ensure match exposure is correct. Furthermore, concussions reported in the WRISP database are crosschecked with the CSx (concussion management mobile application) data to ensure all concussions are logged correctly. This process identified a further nine concussion injuries that were subsequently added to the 2020-21 season analysis. Finally, before the WRISP data is analysed, all injuries are checked for duplicates and inconsistencies and final approval of the included injuries is sought from the medical lead in each club.