

Original Research

Injury and Illness Incidence in 2017 Super Rugby Tournament: A Surveillance Study on a Single South African Team

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Background

Professional rugby presents significant injury and illness risks to players, which need to be regularly assessed to monitor the effects of interventions and competition rules changes.

Hypothesis/Purpose

The purpose of this study was to determine the incidence and nature of time-loss injuries and illness during the pre-season and competition period of the 2017 Super Rugby tournament in a single South African team.

Study Design

Descriptive Epidemiology Study

Methods

Forty-five adult players were recruited from one 2017 Super Rugby South African team, with 39 included in the final data set. Daily injury and illness data were routinely collected during the season by support staff over a 28-week period (January to July 2017), based on standardized injury and illness definitions. Retrospective analyses of the data were performed.

Results

The incidence of match injuries (241.0 per 1000 player hours) was significantly higher than training injuries (3.3 per 1000 player hours). Twenty one percent of all injuries occurred during the tackle; 37.5% of all injuries were of a “moderate” severity. The proportion of players who sustained a time-loss injury was 76.9% (n=30). The overall incidence of illness was 1.8 per 1000 player days. Acute respiratory tract infection (28.6%) was the most common diagnosis, and the majority of illnesses (64.3%) did not result in time-loss.

Conclusion

This study presented a longer study period than previous research by including the pre-season training, but represented only one single team. The incidence of match injuries was significantly higher than previously reported in Super Rugby tournaments, whereas illness rates were significantly lower. Support staff in professional rugby need to be trained on the standardized Orchard System of Classifications to ensure good quality data that can be compared to other teams within the same or other sporting codes.

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Level of evidence

Level 3

INTRODUCTION

In professional team sports, rugby union has one of the highest reported incidences of injury and illness.¹ The combination of high physical demands, together with repetitive collisions and contact, means the inherent risk of injury is substantial in rugby union.¹ Previous studies on rugby union and Super Rugby have reported a match injury incidence between 66 and 107 per 1000 player hours.¹⁻⁴ Between 48 and 64% of players in Super Rugby will sustain a time-loss injury during the tournament.² The lower limb has previously been the most commonly injured region (48-57%), and injuries are most frequently reported as “minimal” severity (2-3 days time loss).²⁻⁴

The Super Rugby tournament is played annually between professional rugby union teams from Japan, South Africa, Argentina, New Zealand and Australia, and is considered to be one of the most competitive rugby competitions in the world.² Between 2006 and 2016, there has been an increase in the number of teams, weekly matches, bonus incentives and demanding travel schedules in the Super Rugby tournament. These factors have been associated with insufficient recovery times, reduction in game-related key performance indicators, and an elevated risk of injury and acute illness.^{5,6}

The demanding nature of the Super Rugby tournament provides an opportunity to further investigate the incidence and nature of injury and illness in rugby union. To improve inter-study comparisons, in 2007 the Rugby Injury Consensus Group (RICG) standardized the definitions and methodologies for recording and reporting of injuries.⁵ Recent research has focused on improving both quality and quantity of epidemiological data on injuries and illness in professional rugby union. Understanding the burden of both injury and illness within the context of rugby union will facilitate the development of preventative measures.⁷ Previous epidemiological studies have not included the pre-season phase of training in the study period, which contribute to overall load. Injuries and illnesses that occur in the pre-season have not previously been considered recurrent if they reoccur later in the season due to this omission. The objectives of this study were to determine the incidence and nature of time-loss injuries and illness during the 2017 Super Rugby tournament in a single South African team, including the pre-season training period.

MATERIALS AND METHODS

This study had a retrospective surveillance design. Forty-five adult male professional Rugby Union players from one South African team participating in the 2017 Super Rugby tournament over a complete season (including pre-season) were recruited for this study. The team selected was based on the availability of previously collected (prospective) data from consistent, ongoing recordings of injury and illness over a 28-week period by team management staff. Ethical approval was granted by the Human Research Ethics Com-

mittee (HREC) of the Faculty of Health Sciences, University of Cape Town (HREC REF: 124/2018) and permission was granted by the Chief Executive Officer of the relevant Rugby Union. Players were not involved in planning and/or conducting the study.

Although the players were previously aware of, and participated in ongoing daily monitoring, written informed consent was additionally obtained to use these previously collected data in this study. Players with complete datasets of training loads, injury, and illness records over the complete 2017 Super Rugby tournament were included. Players who were released from their contract during the monitoring period or had not been contracted for the full 2017 Super Rugby tournament were excluded. Players who did not consent to participate or who withdrew from the study were not included.

INJURY AND ILLNESS DATA COLLECTION

Training and match-related injury data were collected daily by the team physician and physiotherapist. The inclusion of injuries was based on the time-loss definition of an injury according to the 2007 Consensus Statement.³ A ‘time-loss’ injury was an injury preventing a player from participating fully in all training activities planned for that day and/or match for more than one day following the day of injury.³ The Orchard Sports Injury Classification System 10.1 was used to code injury diagnosis.⁸ Injury classifications including location (match or training), anatomical site, type, mechanism, and time-loss were used.^{2,3} The severity of time-loss injuries was classified as minimal (2-3 days), mild (4-7 days), moderate (8-28 days) and severe (\geq 28 days).^{2,3} The main player position (forwards or backs) was recorded for the injured player. More than one time-loss injury in the same player was recorded as a separate injury. Illness events were recorded by the team physician. Illness data included the presenting symptoms, diagnosis, suspected cause of illness, and time-loss from training and/or matches.⁵ A recurrent illness was defined as an additional onset of the same illness within the 2017 season.⁵ A randomized number was assigned to each player once injury and illness data were recorded to ensure confidentiality.

STATISTICAL ANALYSIS

The team strength and conditioning coach routinely recorded information on daily squad size, the type of training day (match, training, or rest day), team, and individual training minutes. Training exposure was calculated by multiplying the number of players on a training day to have completed the training session by the session’s duration in minutes.² Match player hours were calculated per player as the exact number of minutes of participation in each match.²

Data on the number of injuries and players injured, and the number of illnesses and players who experienced illness were collected. Injuries were classified as match or training related injuries. The incidence of injury was calculated per

Table 1. Number of injuries, player hours and the incidence of time-loss injuries for all, match, and training injuries, presented as injuries per 1000 player hours (95% confidence intervals).

	Time-loss injuries (n)	Player hours	Incidence of injury
All injuries	80	6277	12.7 (10.0-15.8)
Match injuries	60	249	241.0 (185.5-308.0)
Training injuries	20	6028	3.3 (2.1-5.0)

Table 2. Injury incidence for overall, training and matches per season phase presented as number, percentage, and injuries per 1000 player hours (95% confidence intervals).

		Overall injuries		Training injuries		Matches injuries	
		Injury (%)	Incidence	Injury (%)	Incidence	Injury (n)	Incidence
Season Phase (weeks)	Preseason (weeks 1-7)	7 (8.7%)	3.6 (1.6-7.2)	7 (35%)	3.6 (1.6-7.2)	-	-
	Early (weeks 8-17)	39 (48.8%)	18.0 (13.7-25.7)	7 (35%)	3.6 (1.6-7.2)	32 (53.3%)	237.0 (165.0-331.0)
	Late (weeks 18-28)	34 (42.5)	14.9 (10.5-20.1)	6 (30%)	2.8 (1.1-5.7)	28 (46.7%)	245.0 (166.0-350.0)

1000 player hours of exposure.^{2,9} Illness incidence was calculated per 1000 player-days and time-loss was classified as “illness resulting in one or more lost training and/or match days”.⁵ The total player-days were calculated by the total team tournament days multiplied by the daily squad size.⁵ Total player-days included training and match days from the first day of pre-season training until the last match day of the 2017 season.

RESULTS

Forty-five players were recruited for this study. Thereafter six players were excluded based on the exclusion criteria, resulting in a sample of 39 players. Data on the players' descriptive characteristics were limited to age to protect confidentiality of individual players given the small and potentially identifiable study cohort. The mean age of the overall squad was 25.3 ± 4.0 years. A total of 6277 player hours of exposure were recorded with a mean per player of 160.9 hours. Total, match and training hours, and injury incidence are shown in [Table 1](#). The overall incidence of injury was 12.7 per 1000 player hours (95% CI: 10.0-15.8) with 241.0 injuries per 1000 player hours (95% CI: 185.5-308.0) and 3.3 per 1000 player hours (95% CI: 2.1-5.0) during matches and training, respectively.

Injury incidence per season phase is shown in [Table 2](#). A total of 80 injuries were recorded over the season. The highest percentage of injuries were reported in the early competition phase (48.8%).

MAIN AND SPECIFIC ANATOMICAL LOCATION

The majority of the injuries occurred in the lower limb (62.5%), followed by the head or neck region (15%). The lower limb had the highest proportion of match (60%) and training (70%) related injuries ([Table 3](#)). According to specific anatomical location, the thigh region had the highest

frequency of injuries (20%), followed by the knee (12.5%). No specific information on the injury related to structure, grade, or diagnosis was available in the dataset.

INJURED PLAYER PROPORTION

From the total squad, 30 players sustained at least one time-loss injury (76.9%). Twenty-eight percent (n=11) experienced a minimal severity injury (2-3 days time-loss). This was followed by mild (4-7 days) 23% (n=9), moderate (8-28 days) 23% (n=9), and severe (≥ 28 days) 3% (n=1). Therefore, 26% of the total squad sustained an injury severe enough to prevent eight days or more of participation in training and/or matches.^{2,5}

INJURY TYPES

Injuries to the soft tissues combined (muscle/tendon, joint/ligament, brain and skin) accounted for 95% of all injuries ([Table 3](#)). Of the soft-tissue injuries, the majority occurred in muscles or tendons (62.5%), followed by joints or ligaments (25%). In matches, the incidence of muscle or tendon injuries was 148 per 1000 player hours (95% CI: 106-203) and joint or ligament injuries was 60 per 1000 player hours (95% CI: 35-97). During training, the incidence of muscle or tendon injuries was 2.2 per 1000 player hours (95% CI: 1.2-3.6) and joint or ligament injuries was 0.8 per 1000 player hours (95% CI: 0.3-1.8) ([Table 4](#)).

INJURY SEVERITY

A total of 736 days of time-loss occurred due to injury over the 28-week period ([Table 4](#)). The most frequent severity was “moderate” for all injuries (37.5%) and match-related injuries (40%). The most frequent severity recorded for training injuries was “mild” severity (35%).

Table 3. The number, percentage, and incidence of all, training, and match related injuries for all players by main anatomical location, and anatomical type. Incidence is presented per 1000 player hours (95% confidence intervals).

		All injuries			Match injuries			Training injuries		
		Injury (%)	Player hours	Incidence	Injury (%)	Player hours	Incidence	Injury (%)	Player hours	Incidence
Main Anatomical Region	All players	80 (100.0%)	6277	12.7 (10.0-15.8)	60 (100.0%)	249	241.0 (185.5-308.0)	20 (100.0%)	6028	3.3 (2.1-5.0)
	Head/neck	12 (15.0%)	6277	1.9 (1.0-3.3)	10 (16.7%)	249	40.1 (20.4-71.6)	2 (10.0%)	6028	0.3 (0.06-0.10)
	Upper limb	10 (12.5%)	6277	1.6 (0.8-2.8)	10 (16.7%)	249	40.1 (20.4-71.6)	-	6028	-
	Trunk	8 (10.0%)	6277	1.3 (0.6-2.4)	4 (6.6%)	249	16.1 (5.1-38.8)	4 (20.0%)	6028	0.6 (0.2-1.6)
	Lower limb	50 (62.5%)	6277	8.0 (6.0-10.4)	36 (60.0%)	249	145.0 (103.0-198.0)	14 (70.0%)	6028	2.3 (1.3-3.8)
Anatomical type	All injuries	80 (100.0%)	6277	12.7 (10.0-15.8)	60 (100.0%)	249	241.0 (185.5-308.0)	20 (100.0%)	6028	3.3 (2.1-5.0)
	Muscle/tendon	50 (62.5%)	6277	8.0 (6.0-10.4)	37 (61.7%)	249	148.0 (106.0-203.0)	13 (65%)	6028	2.2 (1.2-3.6)
	Joint/ligament	20 (25.0%)	6277	3.2 (2.0-4.8)	15 (25.0%)	249	60.0 (35.0-97.0)	5 (25%)	6028	0.8 (0.3-1.8)
	Skin	2 (2.5%)	6277	0.3 (0.1-1.1)	1 (1.7%)	249	4.0 (0.2-20.0)	1 (5%)	6028	0.1 (0-0.8)
	Bone	3 (3.8%)	6277	0.5 (0.1-1.3)	3 (5.0%)	249	12.0 (3.0-32.0)	-	6028	-
	Brain	4 (5.0%)	6277	0.6 (0.2-1.5)	4 (6.6%)	249	16.0 (5.1-3.9)	-	6028	-
	Unspecified	1 (1.2%)	6277	-	-	249	-	1 (5%)	6028	0.1 (0-0.8)

Table 4. The incidence and percentage for all, match and training injuries according to time-loss severity. Incidence is presented per 1000 player hours (95% confidence intervals).

	Injury severity	Injury (n)	Percent (%)	Time-loss (days)	Incidence (95% CI)
All injuries	Total:	80	100	736	12.7 (10.0-15.8)
	Minimal (2-3 days)	24	30	44	3.8 (2.5-5.6)
	Mild (4-7 days)	24	30	134	3.8 (2.5-5.6)
	Moderate (8-28 days)	30	37.5	414	4.8 (3.3-6.7)
	Severe (\geq 28 days)	2	2.5	144	0.3 (0.1-1.0)
Match injuries	Total:	60	100	557	241.0 (185.5-308.0)
	Minimal (2-3 days)	18	30	35	72.3 (44.0-112.0)
	Mild (4-7 days)	17	28	95	68.3 (41.0-107.0)
	Moderate (8-28 days)	24	40	336	96.4 (63.0-141.0)
	Severe (\geq 28 days)	1	2	91	4.0 (0.2-19.8)
Training injuries	Total:	20	100	179	3.3 (2.1-5.0)
	Minimal (2-3 days)	6	30	9	0.9 (0.4-2.0)
	Mild (4-7 days)	7	35	39	1.1 (0.5-2.3)
	Moderate (8-28 days)	6	30	78	0.9 (0.4-2.0)
	Severe (\geq 28 days)	1	5	53	0.2 (0-0.8)

INJURY MECHANISMS

The most common mechanism for all injuries was “other” (32.5%) followed by 28.8% occurring in the tackle (including being tackled or being the tackler) (Table 5). The “other” category represented grappling or wrestling, landing from a jump, punching, or a mechanism that the player or data collector were unable to recall. Being tackled (including being tackled side on, front on and from behind) contributed to 21.3% of all injuries. From the match injuries, the mechanism of being tackled accounted for 26.6%. The most common mechanism for training injuries were “other” (60%) as defined above. From the overall injuries, contact injuries (37.5%) were greater than non-contact injuries (30.0%) with “other” accounting for 32.5% of all injuries.

INCIDENCE OF ILLNESS

Illness incidence was calculated using player-days (Table 6). Over the 28-week period, 7644 player-days were recorded. The overall incidence of illness was 1.8 per 1000 player days (95% CI: 1.0-3.0).

ILLNESS PLAYER PROPORTION

The proportion of players who acquired an illness was 28.2% (n=11). From the total number of illnesses (n=14), new illnesses accounted for 93.0% (n=13) and recurrent illnesses accounted for 7.0% (n=1).

BODILY SYSTEMS AFFECTED AND SYMPTOMS

The respiratory system (50%) was the most commonly affected bodily system followed by the digestive system (43%) (Table 6). An incidence of 0.9 per 1000 player days (95% CI: 0.4-1.8) and 0.7 per 1000 player days (95% CI: 0.3-1.6) were demonstrated for the respiratory and digestive system, re-

spectively. Diarrhea (28.7%) was the most commonly presented symptom followed by symptoms listed as “other” (21.4%), sore throat (14.3%) and fatigue (14.3%).

Acute upper respiratory tract infections (URTI) were the most common specific diagnosis (28.6%) followed by non-infective gastroenteritis (21.4%). Infection (n = 5) was the most common suspected cause of illness (35.6%) respectively followed by environmental (21.5%). Of the total illnesses, 64.3% resulted in no time-loss, 21.4% in one day of time-loss and 14.3% more than one day of time-loss (Table 6).

DISCUSSION

In this study, the aim was to investigate the training and match related injuries in a South African Super Rugby Team during the 2017 tournament including the pre-season training period. The match related injuries were significantly higher than in previous studies, but the area, type and severity of injury were comparable. Epidemiological studies provide the information required to develop and implement injury prevention strategies within sports teams. The epidemiological findings presented below can guide the future injury prevention and training programs within this franchise (considering the specific setting of the team) and in rugby union in general.

The sample size in this study is comparable to studies in general professional Rugby Union, but notably smaller than previous Super Rugby studies covering multiple teams.^{2,4,5,10} The data from six Super Rugby franchises in South Africa including 482 players between 2012 and 2016 has been previously reported.¹⁰ The use of independent data collection procedures from the team’s support staff in a standardized prospective manner resulted in accurate recording of routinely collected data. This study included

Table 5. The mechanism and frequency of all, match, and training injuries.

Mechanism	All injuries		Match injuries		Training injuries	
	Injury (n)	Percentage (%)	Injury (n)	Percentage (%)	Injury (n)	Percentage (%)
Total:	80	100	60	100	20	100
Other*	26	32.5	14	23.3	12	60.0
Being tackled (total)	17	21.3	16	26.6	1	5.0
<i>Tackled side on</i>	10	12.5	6	10.0	0	0.0
<i>Tackled front on</i>	5	6.3	8	13.3	1	5.0
<i>Tackled from behind</i>	2	2.5	2	3.3	0	0
Collision	7	8.8	6	10.0	1	5.0
Acceleration	6	7.5	4	6.7	2	10.0
Tackling (total)	6	7.5	6	10	0	0
<i>Tackling front on</i>	5	6.3	5	8.3	0	0
<i>Tackling side on</i>	1	1.2	1	1.7	0	0
Twisted	5	6.3	5	8.3	0	0
Sidestep	3	3.8	3	5.0	0	0
Deceleration	3	3.8	0	0	0	0
Kicked	2	2.5	1	1.7	1	5.0
Conditioning	1	1.2	0	0	1	5.0
Landing	1	1.2	1	1.7	0	0
Weight training	1	1.2	0	0	1	5.0
Slipped	1	1.2	1	1.7	1	5.0
Knead	1	1.2	1	1.7	0	0

* Other = grappling or wrestling, landing from a jump, punching, or a mechanism that the player or data collector were unable to recall

Table 6. The overall number, percentage, incidence per 1000 player-days and time-loss of illness per bodily system. Incidence is presented per 1000 player hours (95% confidence intervals).

Bodily System	Illnesses (n)	Percentage (%)	Incidence	No time-loss	One day time-loss	> One day time-loss
All systems	Illnesses (n=14)	100	1.8 (1.0-3.0)	9	3	2
Respiratory	All respiratory system illnesses (n=7)	50.0	0.9 (0.4-1.8)	4	2	1
	Acute upper respiratory tract infection (n=4)	28.6	0.5 (0.2-1.3)	1	2	1
	Allergic rhinitis (n=2)	14.3	0.3 (0-0.9)	2	-	-
	Allergic sinusitis (n=1)	7.1	0.1 (0-0.6)	1	-	-
Digestive	All digestive system illnesses (n=6)	43.0	0.7 (0.3-1.6)	4	1	1
	Non-infective gastroenteritis (n=3)	2.1	0.4 (0.1-1.0)	3	-	1
	Other (n=3)	2.1	0.4 (0.1-1.0)	3	1	-
Other	Eye (n=1)	7.1	0.1 (0-0.6)	1	-	-

preseason, early, and late competition phases for 28 weeks which is longer than reported in previous studies.^{2,4,5,10}

The overall injury incidence of 12.7 per 1000 player hours (95% CI: 10.0-15.8) was higher than reported in five Super Rugby tournaments from 2012 to 2016 with 10.0 per 1000 player hours (95% CI: 9.4-10.7).¹⁰ The high overall injury incidence could hypothetically be related to differences in training methods like the volume of contact and non-contact training, coaching techniques, conditioning, injury prevention strategies, travel schedules in the expanded tournament format, and rotational player systems.²

The incidence of match injuries of 241.0 per 1000 player hours (95% CI: 185.5-308.0) was notably higher than previously reported in the Super Rugby tournament and in general professional Rugby Union ranging from 66.1 to 107.0 per 1000 player hours.^{1,2,4,5,10-13} The incidence of match injuries were 73 times higher in comparison to training injuries. The precise reason for the high incidence of match injuries is unclear but could be related to the strongest teams participating against each other in the 2017 tournament format, or the smaller sample size in this study. Findings in this study were consistent with several studies showing a higher incidence of injuries in matches in contrast to training.^{2,4,5,10} The high incidence of injury in matches could be related to contact events during matches which occur at a higher rate than in training, but the high percentage recorded in the "Other" category make it difficult to determine which contact events present the greatest danger. In the match setting these could include 'dangerous play', side-stepping, punching, static grappling, landing from a jump, 'grass cutter' tackle and twisting related mechanisms.

In this study, 76.9% (n=30) of the squad sustained at least one time-loss injury which was greater than the 1999 (64%) and 2012 to 2016 Super Rugby tournaments with an average of 48% over the five Super Rugby tournaments.^{10,14} However, the proportion of injured players reported in this study was lower than the 2008 Super Rugby tournament (82%) which only reported match injuries.¹² Again, the authors hypothesize that changes in training methods, training environments due to travel, the implementation of new game laws and individual injury prevention in teams over a five-year period may have contributed to the difference.

Calculating the injured player proportion must be applied with caution as the number of players with more than one injury is not included in the calculation. The 2007 Consensus Statement does not include the reporting of the injured player proportion but authors have recommended exploration using this method.^{2,3}

Overall, the lower limb was the most frequently injured anatomical location (62.5%). This finding is higher than previously reported in the 2012 (48.1%) and 2014 (57.1%) Super Rugby tournaments.^{2,9} Results from this study are consistent with previous studies which report the lower limb as the most commonly injured anatomical location.^{1,10,11}

Soft-tissue injuries (95%) represented a large proportion of all injuries with 62.5% in muscles or tendons and 25% in joints or ligaments. This was similar to findings from the 2012 Super Rugby tournament and across five Super Rugby tournaments reporting on match injuries.^{2,10} The most frequent severity of injury in this study was "moderate," which

accounted for 4.8 per 1000 player hours (95% CI: 3.3-6.7) in contrast to "minimal" reported in five Super Rugby tournament studies with 3.9 per 1000 player hours (95% CI: 3.5-4.4).¹⁰ The high incidence of "moderate" severity for match injuries found in this study was contrary to the "minimal" severity reported in five Super Rugby tournament studies.¹⁰ The increased severity of match injuries over time could be related to numerous factors such as an increase in the "level of play" over time, changes in game laws, the format of contact training, or fatigue and technique related mechanisms.¹⁵

In this study, the incidence of illness was 1.8 per 1000 player days (95% CI: 1.0-3.0) was lower than previously reported.⁵ The reason for the greater illness rates reported in the previous studies in comparison to this study could be related to the larger cohort of players (range: 259-736) in the previous studies.^{5,16} This study also focused solely on South African players whereas previous studies used various populations.⁵ Population differences in lifestyle and behavioural factors could be related to the difference in illness incidence.⁵ Over a seven-year period, strict hygiene protocols and illness prevention strategies within this team could have contributed to minimizing the incidence of illness.

The proportion of players that acquired an illness (28%) in this study was lower than previously reported (72%).⁵ However, the authors reported a higher frequency of new illnesses with 93% in contrast to 88%, and a lower frequency of recurrent illnesses of 7% in comparison to 12% in the 2010 Super Rugby tournament.⁵ The high incidence of new illness could be related to the environment in which teams make use of communal facilities which could facilitate the spread of infection.⁵ The lower incidence of recurrent illness could indicate sufficient prevention strategies such as probiotics, vaccines, and additional supplementation.

Results from this study concur with the main findings in Rugby Union and across sporting codes that most of the reported illnesses affected the respiratory (50%) and digestive systems (43%).^{5,16-19} Prolonged competition load and insufficient recovery have been linked with immune changes associated with an increased risk of illness.⁵ Prolonged training and competition load as demonstrated in the Super Rugby tournament has been linked to an increase in the risk of sub-clinical immunological changes that may increase the risk of illness.⁵

LIMITATIONS AND RECOMMENDATIONS

Epidemiological data are essential as part of the injury prevention process as described by van Mechelen et al.²⁰ They provide the basis upon which injury prevention programs may be developed and evaluated over future seasons in the same sport. The challenge with descriptive epidemiological studies is the inability to describe cause-and-effect relationships, and results in authors having to create hypotheses to explain findings. In rugby, there have many changes in game laws, travel, and match schedules, as well as increase in professionalism of players and format of contact training, and it is challenging to establish which individual factors may contribute to changes in the injury rates over time.

While a smaller sample was used in comparison to previous studies on the Super Rugby tournament, data over a 28-week period represented an extended period in comparison to previous studies. The inclusion of the preseason phase in the Super Rugby tournament and general professional rugby union is recommended as it contributes to the overall epidemiological data on injury profiles and illness rates across entire seasons.

The authors acknowledge that data on a single team remains a limitation. The lack of anthropometric data like body mass, height and body mass index limits population specific comparisons to previous study populations in general professional Rugby Union and the Super Rugby tournament but these details were removed from the dataset in this study to prevent identification of individual players.

Data collected by medical and support staff were limited to the routinely collected data, and resulted in a large number of “other” injury and illness mechanisms. Training the medical staff to adopt data collection methods according to the 2007 Consensus Statement could prevent non-specific categories like “other” under injury mechanism and causes of illness. This category requires further investigation as it represents a high proportion of injuries and illness.

CONCLUSION

The overall injury incidence in the 2017 Super Rugby tournament was higher than previously reported. The incidence of match injuries specifically was higher than in previous studies. The illness rates in the 2017 Super Rugby tournament were lower than reported in Rugby Union and across sporting codes. Use of the Orchard system of diagnostic

categories should be encouraged to prevent the use of the “other” classification under mechanism of injury as this cause of injury accounted for many of the reported mechanisms. Injury prevention strategies should target match related causes of soft-tissue injury to the lower limb to reduce the time-loss and severity of injury in-season. Clinical staff and team management can use epidemiological data of this nature to anticipate the potential burden of injuries and illness in their squads and therefore make the required planning regarding squad dynamics and prevention strategies.

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COMPETING INTERESTS

CB was employed by the rugby franchise at the time of the study, but was working with the junior teams, and not involved in the care of the Super Rugby team. He was also not involved in the data collection during this study and therefore would not be considered to have a conflict of interest. The other authors declare no conflicts of interest exist.

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