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Surveillance Studies

Rugby World Cup Sevens 2022 Report

Men's and Women's Tournaments

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22 December 2022

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1 Introduction

World Rugby is committed to implementing injury surveillance studies (ISS) at all major World Rugby tournaments and to disseminate the results within the Rugby community.

The aims of these studies are:

- to record and analyse injuries sustained by male and female players at individual Tournaments,
- to identify changing patterns of injury, and
- to bring injury-related areas of concern to the attention of World Rugby's Chief Medical Officer.

Previous surveillance studies in Rugby Sevens reported the incidence and nature of injuries sustained during the men's Sevens Series (2008/09 to 2021/22), women's Sevens Series (2011/12 to 2021/22), men's and women's Rugby World Cup Sevens (2009 to 2018) and men's and women's Olympics (2016, 2020). This report continues the on-going study of World Rugby competitions by reporting injuries sustained during the men's and women's Rugby World Cup Sevens 2022 (RWCS 2022).

2 Methods

All studies were conducted in accordance with the definitions and protocols described in the World Rugby approved consensus statement on definitions and procedures for injury surveillance studies in Rugby (Fuller et al., 2007).

The definition of injury was: *'Any injury sustained during a Sevens Tournament match activity that prevents a player from taking a full part in all normal training activities and/or match play for more than one day following the day of injury'*. A recurrent injury was defined as: *'An injury (as defined above) of the same type and at the same site as an index injury and which occurs after a player's return to full participation from the index injury'*.

Specific injuries were classified using OSICS 8 (Orchard et al., 2010). Injury location, type, nature and cause together with the events leading to the injuries were also recorded.

Injuries not related directly to Rugby Sevens match-related activities were not included.

Injury severity was determined by the number of days a player was injured: a player was deemed to be 'injured' until he/she could undertake full, normal training and be available for match selection, whether or not he/she was actually selected. Team medical staff were required to make an informed clinical judgement about a player's fitness to train/play on those days when players were not scheduled to train or play. Injured players were followed up after each Tournament to obtain their return to play date: the return to play dates for players with injuries that remained unresolved 3 months after the final game in a Tournament were estimated on the basis of a clinical judgement and prognosis provided by the injured player's medical staff.

The complete lists of categories and sub-categories used for categorising injury locations and injury types are provided in the rugby injury consensus publication (Fuller et al., 2007).

Where appropriate, differences in players' anthropometric data were assessed using unpaired t-tests; differences in the incidences, mean severity and proportions of injuries were assessed using z-tests and differences in median severity using a Mann-Whitney U test. Differences in injury numbers were assessed using the chi-squared test. Statistical significance was accepted at the $p \leq 0.05$ level, although it is recognised that this could identify some differences that occurred by chance, due to the number of statistical comparisons being made in the study.

3 Data collection

The men's and women's RWCS 2022 tournaments took place in Cape Town, South Africa in the period 9 to 11 September 2022. Team medical staff were asked to explain to their squad players the purpose of the ISS.

Medical staff were asked to record players' anthropometric data (playing position [back, forward]; date of birth; body mass [Kg]; stature [cm]) and injuries sustained during the tournament using the World Rugby on-line ISS Web App.

4 Results

Results are presented separately for the men's and women's RWCS 2022 tournaments. The match exposures and numbers of match injuries sustained during a single Rugby Sevens tournament such as RWCS 2022 are relatively small and consequently 95% confidence intervals for the results presented are wide; it is important, therefore, to take this point into account when assessing the results presented. For this reason, RWCS 2022 data have not been "over-analysed" by using too many sub-categories and the results have been compared to the long-term average results obtained from the well-established men's and women's SS to provide benchmark comparisons. For similar reasons, some statistical comparisons have been made using the simpler approach of comparing 95% CI values.

4.1 Women's Rugby World Cup Sevens 2022

The 16 countries taking part in the women's RWCS 2022 were: Australia*, Brazil, Canada*, China, Colombia, England*, Fiji*, France*, Ireland*, Japan*, Madagascar, New Zealand*, Poland, South Africa, Spain*, USA*.

(*: denotes the 10 core SS countries taking part in the competition).

Of the 16 participating teams, listed above:

- (i) Anthropometric data were obtained for players from all teams;
- (ii) China, Madagascar and Poland did not provide women's injury data.

4.1.1 Players' anthropometric data

Table 1 summarises the numbers and anthropometric data of players categorised as backs, forwards and all players at RWCS 2022, together with the equivalent average values for the SS over the period from 2011/12 to 2021/22.

Table 1: Players' anthropometric data: RWCS 2022 and SS (2011/12 to 2021/22).

Tournament/ Measure	Mean (Standard deviation, number of players)		
	Backs	Forwards	ALL players
RWCS 2022			
Stature, cm	166.4 (5.7, 105)	169.5 (5.7, 87)	167.8 (5.9, 192)
Body mass, Kg	63.7 (6.3, 105)	69.0 (6.2, 87)	66.1 (6.8, 192)
Age, years	24.4 (3.5, 105)	25.7 (4.3, 87)	25.0 (3.9, 192)
Sevens Series (2011/12 – 2021/22)			
Stature, cm	167.0 (5.4, 1076)	170.6 (5.6, 831)	168.6 (5.8, 1907)
Body mass, Kg	65.4 (5.7, 1077)	71.1 (6.4, 834)	67.9 (6.6, 1911)
Age, years	23.7 (3.8, 1078)	24.6 (3.8, 834)	24.1 (3.8, 1912)

Forwards were significantly taller ($p < 0.001$), heavier (< 0.001) and older ($p = 0.021$) than backs at RWCS 2022. Compared to the SS values, backs at RWCS 2022 were older ($p = 0.070$) and lighter ($p = 0.004$) but there was no significant difference in their stature ($p = 0.240$). The forwards at RWCS 2022 were older ($p = 0.011$), lighter ($p = 0.004$) and shorter ($p = 0.011$) than SS forwards.

Table 2 compares the anthropometric data for players representing the 10 core and 6 non-core SS teams that were taking part in RWCS 2022.

Players in core teams were taller (backs: $p = 0.037$; forwards: $p = 0.041$) and heavier (backs: $p = 0.038$; forwards: $p = 0.308$) than non-core SS teams. There were no significant differences in the players' ages (backs: $p = 0.889$; forwards: $p = 0.920$).

Table 2: Players' anthropometric data for core and non-core SS teams taking part in RWCS 2022.

Tournament/ Measure	Mean (Standard deviation, number of players)		
	Backs	Forwards	ALL players
RWCS 2022 (CORE SS teams)			
Stature, cm	167.3 (5.2, 66)	170.5 (5.3, 53)	168.7 (5.4, 119)
Body mass, Kg	64.7 (6.8, 66)	69.5 (6.9, 53)	66.8 (7.2, 119)
Age, years	24.4 (3.5, 66)	25.6 (4.2, 53)	24.9 (3.9, 119)
RWCS 2022 (non-CORE SS teams)			
Stature, cm	164.9 (6.4, 39)	168.0 (6.0, 34)	166.3 (6.4, 73)
Body mass, Kg	62.1 (5.1, 39)	68.1 (5.1, 34)	64.9 (5.9, 73)
Age, years	24.3 (3.4, 39)	25.7 (4.6, 34)	25.0 (4.0, 73)

4.1.2 Injuries

The 13 women's teams reporting injuries at RWCS 2022 recorded nine match injuries (backs: 7; forwards: 2), during 52 team-games (backs: 48.5 player-match-hours; forwards: 36.4 player-match-hours; all players: 84.9 player-match-hours) played during RWCS 2022.

4.1.2a Incidence of match injuries

Table 3 summarises the number of match injuries, exposure and incidence of injuries at RWCS 2022 for backs, forwards and all players together, for comparison, with the incidences of match injuries averaged across the Sevens Series (2011/12 to 2021/22).

Table 3: Number, exposure (player-match-hours) and incidence (injuries/1000 player-match-hours, 95% confidence interval) of match injuries at RWCS 2022 and incidence of injuries at SS (2011/12 to 2021/22).

Tournament	Backs	Forwards	ALL players
RWCS 2022			
Injuries	7	2	9
Exposure	48.5	36.4	84.9
Incidence	144.3 (68.8 – 302.7)	55.0 (13.7 – 219.8)	106.0 (55.2 – 203.7)
Sevens Series (2011/12 – 2021/22)			
Incidence	114.9 (102.7 – 128.5)	86.2 (74.2 – 100.1)	94.6 (86.1 – 103.9)

The incidence of injury for forwards at RWCS 2022 was almost one third that of the backs but the difference was not statistically significant ($p=0.230$).

The overall incidence of injury at RWCS 2022 is similar to the average value for the SS (2011/12 to 2021/22) ($p=0.749$). The incidences of injury for backs ($p=0.549$) and forwards ($p=0.529$) are also not significantly different to the average values for the SS (2011/12 to 2021/22).

4.1.2b Severity of injury

Table 4 summarises the mean and median severities of all injuries sustained during RWCS 2022 together with the average values for SS (2011/12 to 2021/22).

Table 4: Mean and median severities of match injuries: RWCS 2022 and SS (2011/12 to 2021/22).

Tournament/ Severity, days	<i>Severity (95% Confidence interval), days</i>		
	<i>Backs</i>	<i>Forwards</i>	<i>ALL players</i>
RWCS 2022			
Mean	63.1 (13.7 – 112.6)	16.0 (10.1 – 21.9)	52.7 (12.5 – 92.8)
Median	28.0 (6 – 184)	16.0 (13 – 19)	19.0 (13 – 112)
Sevens Series (2011/12 – 2021/22)			
Mean	52.3 (45.1 – 59.5)	55.2 (44.1 – 66.3)	53.4 (47.3 – 59.5)
Median	30.0 (25 – 34)	29.0 (23 – 35)	29.0 (27 – 32)

It is important to recognise that the values presented in Table 4 should be interpreted with caution, as the number of injuries sustained at RWCS 2022 is small; this is reflected within the wide 95% CI values shown.

Based on the 95% CI values shown in Table 4, there are no significant differences between backs and forwards for either the mean or median values at RWCS 2022 or when the RWCS 2022 values for backs and forwards are compared with the SS (2011/12 to 2021/22) values.

4.1.2c Location of injury

The number of injuries sustained in a single Rugby Sevens tournament is too small to provide a meaningful tournament-based analysis of the sub-locations of injuries sustained by backs and forwards. Table 5 summarises the results for the main locations of injuries sustained by backs, forwards and all players at RWCS 2022 and compares these values with the average results for the SS (2011/12 to 2021/22).

It is not meaningful to compare the separate results for backs and forwards either within the RWCS 2022 or between RWCS 2022 and SS (2011/12 to 2021/22). However, comparing the RWCS 2022 95% CI results for all players with the 95% CI values for all players shown for SS (2011/12 to 2021/22), the only significant difference is that no upper limb injuries were sustained at RWCS 2022.

Table 5: Main locations of match injuries: RWCS 2022 and SS (2011/12 to 2021/22).

Tournament / Location of injury	Proportion, % (95% Confidence interval)		
	Backs	Forwards	ALL players
RWCS 2022			
Head/neck	42.9 (6.2 – 79.5)	0.0 (-)	33.3 (2.5 – 64.1)
Upper limbs	0.0 (-)	0.0 (-)	0.0 (-)
Trunk	14.3 (0 – 40.2)	0.0 (-)	11.1 (0 – 31.6)
Lower limbs	42.9 (6.2 – 79.5)	100.0 (-)	55.6 (23.1 – 88.0)
Sevens Series (2011/12 – 2021/22)			
Head/neck	21.7 (17.1 – 26.3)	28.1 (21.3 – 34.8)	24.0 (20.2 – 27.8)
Upper limbs	18.4 (14.1 – 22.8)	21.1 (14.9 – 27.2)	19.4 (15.8 – 22.9)
Trunk	6.3 (3.5 – 9.0)	7.6 (3.6 – 11.6)	6.7 (4.5 – 9.0)
Lower limbs	53.6 (48.0 – 59.2)	43.3 (35.8 – 50.7)	49.9 (45.4 – 54.4)

4.1.2d Type of injury

Similarly, there are too few injuries sustained during RWCS 2022 to provide a meaningful analysis of the sub-types of injuries sustained by players. Table 6 summarises the main types of injuries sustained by backs, forwards and all players during RWCS 2022 and the average values for SS (2011/12 to 2021/22). Comparing the all-player 95% CI values for RWCS 2022 with the all-player 95% CI values for SS (2011/12 to 2021/22) shows no statistically significant differences.

Table 6: Main types of match injuries: RWCS 2022 and SS (2011/12 to 2021/22).

Tournament / Type of injury	Proportion, % (95% Confidence interval)		
	Backs	Forwards	ALL players
RWCS 2022			
Bone	14.3 (0 – 40.2)	0.0 (-)	11.1 (0 – 31.6)
C/PNS	28.6 (0 – 62.0)	0.0 (-)	22.2 (0 – 49.4)
Joint (non-bone)/lig ^t	28.6 (0 – 62.0)	0.0 (-)	22.2 (0 – 49.4)
Muscle/tendon	0.0 (-)	50.0 (0 – 100)	11.1 (0 – 31.6)
Other	28.6 (0 – 62.0)	50.0 (0 – 100)	33.3 (2.5 – 64.1)
Sevens Series (2011/12 – 2021/22)			
Bone	12.2 (8.5 – 15.8)	15.2 (9.8 – 20.6)	13.3 (10.2 – 16.3)
C/PNS	15.5 (11.4 – 19.5)	21.1 (14.9 – 27.2)	17.5 (14.1 – 20.9)
Joint (non-bone)/lig ^t	45.4 (39.8 – 51.0)	38.0 (30.7 – 45.3)	42.7 (38.3 – 47.2)
Muscle/tendon	24.0 (19.2 – 28.8)	23.4 (17.0 – 29.7)	23.8 (20.0 – 27.6)
Other	3.0 (1.1 – 4.9)	2.3 (0.1 – 4.6)	2.7 (1.3 – 4.2)

C/PNS: Central and peripheral nervous systems

There were 2 brain/concussion injuries sustained during RWCS 2022, which equates to 22.2% (95% CI: 0 – 49.4%) of all injuries sustained at RWCS 2022. This is a similar value ($p=0.924$) to the average value for SS (2022/12 to 2021/22) of 16.2% (95% CI: 12.9 – 19.5%).

4.1.2e Nature of onset of injury

Table 7 summarises the nature of onset of injuries sustained at RWCS 2022 and the average SS values over the period 2011/12 to 2021/22 for backs, forwards and all players.

Table 7: Nature of onset of injury: RWCS 2022 and SS (2011/12 to 2021/22).

Tournament / Nature of onset	Proportion, % (95% Confidence interval)		
	Backs	Forwards	ALL players
RWCS 2022			
Acute	100.0 (-)	100.0 (-)	100.0 (-)
Gradual	0.0 (-)	0.0 (-)	0.0 (-)
Sevens Series (2011/12 – 2021/22)			
Acute	93.8 (91.0 – 96.5)	94.2 (90.6 – 97.7)	93.9 (91.7 – 96.0)
Gradual	6.3 (3.5 – 9.0)	5.8 (2.3 – 9.4)	6.1 (4.0 – 8.3)

All injuries sustained at RWCS 2022 were acute in nature. This follows the general trend shown within the SS (2011/12 to 2021/22) results.

4.1.2f Cause of onset of injury

Table 8 summarises the causes of injury onset at RWCS 2022 compared to SS over the period 2011/12 to 2021/22, by backs, forwards and all players.

Table 8: Cause of onset of injury: RWCS 2022 and SS (2011/12 to 2021/22).

Tournament / Nature of onset	Proportion, % (95% Confidence interval)		
	Backs	Forwards	ALL players
RWCS 2022			
Contact	100.0 (-)	50.0(0 – 100)	88.9 (68.4 – 100)
Non-contact	0.0 (-)	50.0(0 – 100)	11.1 (0 – 31.6)
Sevens Series (2011/12 – 2021/22)			
Contact	86.3 (82.3 – 90.2)	87.7 (82.7 – 92.8)	86.8 (83.7 – 89.9)
Non-contact	13.7 (9.8 – 17.7)	12.3 (7.2 – 17.3)	13.2 (10.1 – 16.3)

Almost 90% of all injuries sustained during RWCS 2022 were the result of contact events. There are no significant differences between the RWCS 2022 results for all players compared with the general trends shown by the all-player results at the SS (2011/12 to 2021/22).

4.1.2g Time of injury

Table 9 provides a summary of the periods during matches when injuries were sustained at RWCS 2022 and the average results for the SS (2011/12 to 2021/22), as a function of playing position.

Table 9: Match periods when injuries were sustained: RWCS 2022 and SS (2011/12 to 2021/22).

Tournament/ Injury period	<i>Proportion, % (95% Confidence interval)</i>		
	<i>Backs</i>	<i>Forwards</i>	<i>ALL players</i>
RWCS 2022			
First half	42.9 (6.2 – 79.5)	50.0(0 – 100)	44.4 (12.0 – 76.9)
Second half	57.1 (20.5 – 93.8)	50.0(0 – 100)	55.6 (23.1 – 88.0)
Sevens Series (2011/12 – 2021/22)			
First half	38.7 (33.2 – 44.3)	48.2 (40.6 – 55.8)	42.1 (37.6 – 46.6)
Second half	61.3 (55.7 – 66.8)	51.8 (44.2 – 59.4)	57.9 (53.4 – 62.4)

There are no significant differences between the all-player results for RWCS 2022 and the average results for SS (2011/12 to 2021/22).

4.2 Men's Rugby World Cup Sevens 2022

The 24 countries taking part in the men's RWCS 2022 were: Argentina*, Australia*, Canada*, Chile, England*, Fiji*, France*, Germany, Hong Kong, Ireland, Jamaica, Kenya*, Korea, New Zealand*, Portugal, Samoa*, Scotland*, South Africa*, Tonga, Uganda, Uruguay, USA*, Wales*, Zimbabwe.
(*: denotes a core SS country).

Of the 24 participating teams, listed above:

- (i) Anthropometric data were obtained for players from all teams;
- (ii) Jamaica did not provide men's injury data.

4.2.1 Players' anthropometric data

Table 10 summarises the numbers and anthropometric data for players categorised as backs, forwards and all players at RWCS 2022, together with the equivalent values for SS (2008/09 to 2021/22).

Table 10: Players' anthropometric data: RWCS 2022 and SS (2008/09 to 2021/22).

Tournament/ Measure	Mean (Standard deviation, number of players)		
	Backs	Forwards	ALL players
RWCS 2022			
Stature, cm	179.4 (6.6, 162)	185.2 (5.9, 125)	181.9 (6.9, 287)
Body mass, Kg	84.2 (7.2, 162)	92.3 (7.3, 125)	87.7 (8.3, 287)
Age, years	26.0 (4.1, 162)	25.4 (3.7, 125)	25.7 (4.0, 287)
Sevens Series (2008/09 – 2021/22)			
Stature, cm	180.4 (6.3, 2410)	186.9 (5.6, 1668)	183.1 (6.9, 4097)
Body mass, Kg	86.5 (7.5, 2413)	96.3 (6.8, 1668)	90.5 (8.7, 4100)
Age, years	23.7 (3.5, 2412)	24.4 (3.7, 1668)	24.0 (3.6, 4099)

Forwards competing at RWCS 2022 were significantly taller ($p < 0.001$) and heavier ($p < 0.001$) than the backs competing at RWCS 2022 but there was no significant difference ($p = 0.201$) in the players' ages.

Backs at RWCS 2022 were significantly older ($p < 0.001$), shorter ($p = 0.051$) and lighter ($p < 0.001$) than SS (2008/09 to 2021/22) backs. Forwards were significantly older ($p < 0.004$), shorter ($p < 0.001$) and lighter ($p < 0.001$) than SS (2008/09 to 2021/22) forwards.

Table 11 compares the anthropometric data for players representing the 13 core and 11 non-core SS teams taking part in RWCS 2022.

Table 11: Players' anthropometric data for core and non-core SS teams taking part in RWCS 2022.

Tournament/ Measure	Mean (Standard deviation, number of players)		
	<i>Backs</i>	<i>Forwards</i>	<i>ALL players</i>
RWCS 2022 (core SS teams)			
Stature, cm	180.3 (6.6, 89)	186.3 (6.0, 67)	182.9 (7.0, 156)
Body mass, Kg	85.0 (7.2, 89)	94.1 (6.5, 67)	88.9 (8.2, 156)
Age, years	25.7 (4.0, 89)	25.4 (3.3, 67)	25.5 (3.7, 156)
RWCS 2022 (non-core SS teams)			
Stature, cm	178.4 (6.6, 73)	183.8 (5.5, 58)	180.8 (6.7, 131)
Body mass, Kg	83.1 (7.2, 73)	90.2 (7.7, 58)	86.3 (8.2, 131)
Age, years	26.4 (4.3, 73)	25.5 (4.2, 58)	26.0 (4.3, 131)

At RWCS 2022, backs in core teams were younger ($p=0.285$), taller ($p=0.069$) and heavier ($p=0.095$) than backs in non-core teams. Similarly, forwards in core teams at RWCS 2022 were younger ($p=0.881$), taller ($p=0.016$) and heavier ($p=0.002$) than backs in non-core teams.

4.2.2 Injuries

The twenty-three teams reporting injuries at RWCS 2022 recorded 25 match injuries (backs: 17; forwards: 8); these injuries resulted from 100 team-games played by the 23 teams (backs: 93.3 player-match-hours; forwards: 70.0 player-match-hours; all players: 163.3 player-match-hours).

4.2.2a Incidence of match injuries

Table 12 summarises the number of match injuries, exposure and incidence of match injuries reported at RWCS 2022 for backs, forwards and all players and, for comparison, the incidence of match injuries averaged across the SS for the 2008/09 to 2021/2022 period.

Table 12: Number, exposure (player-match-hours) and incidence (injuries/1000 player-match-hours, 95% confidence interval) of match injuries: RWCS 2022 and SS (2008/09 to 2021/22).

Tournament	<i>Backs</i>	<i>Forwards</i>	<i>ALL players</i>
RWCS 2022			
Injuries	17	8	25
Exposure	93.3	70.0	163.3
Incidence	182.2 (113.3 – 293.1)	114.3 (57.2 – 228.6)	153.1 (103.4 – 226.6)
Sevens Series (2008/09 – 2021/22)			
Incidence	134.3 (126.5 – 142.6)	107.4 (99.4 – 116.0)	122.8 (117.1 – 128.7)

Despite the values, there is no significant difference ($p=0.276$) between the incidences of injury for backs and forwards at RWCS 2022.

The overall incidence of injury recorded at RWCS 2022 was higher than the average incidence for SS over the period 2008/09 to 2021/22; however the difference is not statistically significant ($p=0.276$).

4.2.2b Severity of injury

Table 13 summarises the mean and median severities of all injuries sustained during RWCS 2022 together with the average values for SS (2008/09 to 2021/22).

Table 13: Mean and median severities of match injuries: RWCS 2022 and SS (2008/09 to 2021/22).

Tournament/ Severity, days	Severity (95% Confidence interval), days		
	Backs	Forwards	ALL players
RWCS 2022			
Mean	42.1 (22.1 – 62.1)	41.1 (28.4 – 53.8)	41.8 (27.7 – 55.8)
Median	24.0 (20 – 42)	47.5 (9 – 63)	25.0 (22 – 47)
Sevens Series (2008/09 – 2021/22)			
Mean	45.3 (42.0 – 48.5)	43.5 (39.0 – 48.0)	44.6 (42.0 – 47.2)
Median	28.0 (25 – 30)	24.0 (22 – 28)	27.0 (24 – 28)

There were no significant difference between backs and forwards at RWCS 2022 for injury severity (mean: $p=0.920$; median: $p=0.232$).

Based on the 95% CIs, there are no significant differences between the severity results recorded for backs, forwards or all players at RWCS 2022 and the average values recorded for backs, forwards and all players at SS over the period 2008/09 to 2021/22.

4.2.2c Location of injury

The number of injuries sustained in a single Sevens tournament is too small to provide a meaningful tournament-based analysis of injury sub-locations. Table 14, therefore, reports the results for the main locations of injuries sustained by backs, forwards and all players at RWCS 2022 and compares these results with the values reported for SS over the period 2008/09 to 2021/22.

The majority of injuries sustained at RWCS 2022 by backs, forwards and all players were lower limb injuries. Based on the 95% CIs, there are no significant differences between backs and forwards for the injury distributions across the various locations.

Based on the 95% CIs for all players, there were no significant differences between the locations of injuries sustained at RWCS 2022 and the injuries sustained at the SS over the period 2008/09 to 2021/22.

Table 14: Main locations of match injuries: RWCS 2022 and SS (2008/09 to 2021/22).

Tournament / Location of injury	Proportion, % (95% Confidence interval)		
	Backs	Forwards	ALL players
RWCS 2022			
Head/neck	35.3 (12.6 – 58.0)	25.0 (0 – 55.0)	32.0 (13.7 – 50.3)
Upper limbs	11.8 (0 – 27.1)	0.0 (-)	8.0 (0 – 18.6)
Trunk	0.0 (-)	37.5 (4.0 – 71.0)	12.0 (0 – 24.7)
Lower limbs	52.9 (29.2 – 76.7)	37.5 (4.0 – 71.0)	48.0 (28.4 -67.6)
Sevens Series (2008/09 – 2021/22)			
Head/neck	17.3 (15.0 – 19.5)	19.4 (16.4 – 22.5)	18.1 (16.2 – 19.9)
Upper limbs	18.5 (16.1 – 20.8)	19.3 (16.2 – 22.3)	18.8 (16.9 – 20.6)
Trunk	4.9 (3.6 – 6.2)	7.5 (5.4 – 9.5)	5.9 (4.8 – 7.0)
Lower limbs	59.3 (56.4 – 62.3)	53.9 (50.0 – 57.7)	57.3 (54.9 – 59.6)

4.2.2d Type of injury

Table 15 summarises the main types of injuries sustained by backs, forwards and all players at RWCS 2022 compared with injuries sustained at the SS over the period 2008/09 to 2021/22.

Table 15: Main types of match injuries sustained: RWCS 2022 and SS (2008/09 to 2021/22).

Tournament / Type of injury	Proportion, % (95% Confidence interval)		
	Backs	Forwards	ALL players
RWCS 2022			
Bone	0.0 (-)	25.0 (0 – 55.0)	8.0 (0 – 18.6)
C/PNS	29.4 (7.8 – 51.1)	12.5 (0 – 35.4)	24.0 (7.3 – 40.7)
Joint (non-bone)/lig ^t	35.3 (12.6 – 58.0)	25.0 (0 – 55.0)	32.0 (13.7 – 50.3)
Muscle/tendon	29.4 (7.8 – 51.1)	37.5 (4.0 – 71.0)	32.0 (13.7 – 50.3)
Other	5.9 (0 – 17.1)	0.0 (-)	4.0 (0 – 11.7)
Sevens Series (2008/09 – 2021/22)			
Bone	8.0 (6.4 – 9.6)	9.5 (7.2 – 11.7)	8.6 (7.2 – 9.9)
C/PNS	14.9 (12.8 – 17.1)	14.6 (11.9 – 17.3)	14.8 (13.1 – 16.5)
Joint (non-bone)/lig ^t	41.8 (38.8 – 44.7)	43.2 (39.3 – 47.0)	42.3 (40.0 – 44.6)
Muscle/tendon	32.9 (30.1 – 35.7)	28.3 (24.8 – 31.7)	31.2 (29.0 – 33.4)
Other	2.3 (1.4 – 3.2)	4.5 (2.9 – 6.1)	3.1 (2.3 – 4.0)

C/PNS: Central and peripheral nervous systems

The majority of injuries sustained at RWCS 2022 by backs were joint (non-bone)/ligament injuries but for forwards they were muscle/tendon injuries. Based on the 95% CIs, however, the differences in the distributions of injury types for backs and forwards were not significant.

There were 6 brain/concussion injuries sustained during RWCS 2022, which equates to 24.0% (95% CI: 7.3 – 40.7%) of all injuries sustained at RWCS 2022. This is a similar value (p=0.881) to the average value for SS (2022/12 to 2021/22) of 22.7% (95% CI: 15.4 – 29.9%).

Based on the 95% CIs for all players, there were no significant differences between the types of injuries sustained at RWCS 2022 and the types of injuries sustained at the SS over the period 2008/09 to 2021/22.

4.2.2e Nature of onset of injury

Table 16 summarises the nature of the onset of injuries sustained at RWCS 2022 compared to SS over the period 2008/09 to 2021/22 for backs, forwards and all players.

Table 16: Nature of onset of injury: RWCS 2022 and SS (2008/09 to 2021/22).

Tournament / Nature of onset	Proportion, % (95% Confidence interval)		
	Backs	Forwards	ALL players
RWCS 2022			
Acute	82.4 (64.2 – 100)	100.0 (-)	88.0 (75.3 – 100)
Gradual	17.6 (0 – 35.8)	0.0 (-)	12.0 (0 – 24.7)
Sevens Series (2008/09 – 2021/22)			
Acute	92.0 (90.4 – 93.6)	91.4 (89.3 – 93.6)	91.8 (90.5 – 93.1)
Gradual	8.0 (6.4 – 9.6)	8.6 (6.4 – 10.7)	8.2 (6.9 – 9.5)

Almost 90% of RWCS 2022 injuries were acute in nature. Based on the 95% CIs, there were no significant differences between backs and forwards at RWCS 2022.

Based on the 95% CIs, there were also no significant differences between the nature of injury onset at RWCS 2022 and the nature of onset for the SS over the period 2008/09 to 2021/22.

4.2.2f Cause of onset of injury

Table 17 summarises the cause of onset of injuries sustained at RWCS 2022 and SS over the period 2008/09 to 2021/22 by backs, forwards and all players.

Table 17: Cause of onset of injuries: RWCS 2022 and SS (2008/09 to 2021/22).

Tournament / Nature of onset	Proportion, % (95% Confidence interval)		
	<i>Backs</i>	<i>Forwards</i>	<i>ALL players</i>
RWCS 2022			
Contact	68.8 (46.0 – 91.5)	87.5 (64.6 – 100)	75.0 (57.7 – 92.3)
Non-contact	31.3 (8.5 – 54.0)	12.5 (0 – 35.4)	25.0 (7.7 – 42.3)
Sevens Series (2008/09 – 2021/22)			
Contact	76.8 (74.3 – 79.4)	85.0 (82.2 – 87.8)	79.9 (78.0 – 81.8)
Non-contact	23.2 (20.6 – 25.7)	15.0 (12.2 – 17.8)	20.1 (18.2 – 22.0)

Seventy-five per cent of all injuries sustained at RWCS 2022 were the result of contact events. Based on the 95% CIs, there were no significant differences between backs and forwards.

Based on the 95% CIs, there were also no significant differences in injury causation between RWCS 2022 and SS over the period 2008/09 to 2021/22.

4.2.2g Time of injury

Table 18 provides a summary of the periods during matches when injuries were sustained, as a function of playing position.

Table 18: Match periods when injuries were sustained: RWCS 2022 and SS (2008/09 to 2021/22).

Tournament/ Injury period	Proportion, % (95% Confidence interval)		
	<i>Backs</i>	<i>Forwards</i>	<i>ALL players</i>
RWCS 2022			
First half	52.9 (29.2 – 76.7)	50.0 (15.4 – 84.6)	52.0 (32.4 – 71.6)
Second half	47.1 (23.3 – 70.8)	50.0 (15.4 – 84.6)	48.0 (28.4 – 67.6)
Sevens Series (2008/09 – 2021/22)			
First half	38.7 (35.7 – 41.6)	39.1 (35.3 – 42.8)	38.8 (36.5 – 41.2)
Second half	61.3 (58.4 – 64.3)	60.9 (57.2 – 64.7)	61.2 (58.8 – 63.5)

Unusually, more injuries were sustained in the first half of matches at RWCS 2022. However, based on the 95% CIs, these results were not significantly different from those recorded for the SS over the period 2008/09 to 2021/22 where more injuries are normally sustained in the second half of matches.

5 Key conclusions

The total match exposure and the corresponding small number of injuries sustained in a single Rugby Sevens tournament preclude analysing and reporting detailed data for some injury surveillance parameters. However, the values reported for the women's and men's RWCS 2022 do provide useful information about the risks associated with the women's and men's RWCS. In this respect, collecting similar injury surveillance data over several RWCS competitions enables robust information to be accumulated.

The following key points can be obtained from the data presented in this Report:

- All 16 participating women's teams provided anthropometric data and 13 of the 16 teams provided match injury and exposure data for the women's Rugby World Cup Sevens 2022 ISS.
- All 24 participating teams provided anthropometric data and 23 of the 24 participating men's teams provided match injury and exposure data for the men's Rugby World Cup Sevens 2022 ISS.
- For both women's and men's teams, players representing countries that are core participants in the World Rugby Sevens Series were significantly taller and heavier than players representing non-core members.
- There were no statistically significant differences in the incidences of injury at Rugby World Cup Sevens 2022, for both women's and men's competitions, compared to the long-term average values reported for the women's and men's Sevens Series.
- There were no statistically significant differences in the mean or median severities of injuries sustained at Rugby World Cup Sevens 2022, for both women's and men's teams, compared to the long-term average values reported for the women's and men's Sevens Series.
- Apart from the differences between the anthropometric parameters for core and non-core SS teams participating in RWCS 2022, no other new issues were identified from the data reported.

6. References

- Fuller CW, Molloy MG, Bagate C, et al. Consensus statement on injury definitions and data collection procedures for studies of injuries in rugby union. *Br J Sports Med* 2007;**41**;328-331.
- Fuller CW, Taylor A. World Rugby. Surveillance Studies: Sevens World Series (Women). Summary of Results: 2011/12 to 2021/22. World Rugby; Dublin: 2022.
- Fuller CW, Taylor A. World Rugby. Surveillance Studies: Sevens World Series (Men). Summary of Results: 2008/09 to 2021/22. World Rugby; Dublin: 2022.
- Orchard J, Rae K, et al., Revision, uptake and coding issues related to the open access Orchard Sports Injury Classification System (OSICS) versions 8, 9 and 10.1. *Open Access Journal of Sports Medicine* 2010: 1; 207-214.

7. Acknowledgements

The authors acknowledge the valuable support provided for injury data collection and reporting by the following team physicians and physiotherapists during RWCS 2022:

Country	Men's tournament	Women's tournament
Argentina	Julian Frraris	
Australia	Louise McGuinness	Francesca Faulkner
Brasil		Beatriz Rodrigo
Canada	Andrew McMillian	Randi Hunter
Chile	Esteban Cisterna	
China		*
Colombia		Ivar Velencia
England	Olivia Withers	Olivia Withers, Caroline White
Fiji	Kristine Lilidamu	Josua Mataitoga
France	Flavien Girard	Jean-Loup Hadadji
Germany	Bjorn Burgler	
Hong Kong	James Rees	
Ireland	Orla Armstrong	Jo Montgomery
Jamaica	*	
Japan		Makoto Tanaka, Ugajin Nao
Kenya	Lamech Francis	
Korea	Jeahong KIm	
Madagascar		*
New Zealand	Damian Banks	Kate Niederer
Poland		*
Portugal	Jan Jaques	
Samoa	Jon Garcia Cobos	
Scotland	Jennifer Sweeting	
South Africa	Hugh Everson	Reagan Cele Khumbuza
Spain		Sergio Lopez Castillo
Tonga	Aurora Paris	
Uganda	Rwakijuma Asimwe	
Uruguay	Diego Gonzalez	
USA	Bobby Grayston	Nicole Titmas
Wales	Conor Dunleavy	
Zimbabwe	Margaret Gibson	

* Injury information not reported