

FIS Injury Surveillance System

2006-2015



Oslo Sports Trauma
RESEARCH CENTER

Introduction

The FIS Injury Surveillance System (FIS ISS) was developed prior the 2006/07 winter season by FIS in collaboration with the Oslo Sports Trauma Research Center (OSTRC). The purpose of the FIS ISS is firstly to monitor injury patterns and trends in the different FIS disciplines (alpine skiing, freestyle skiing, snowboarding and telemark skiing) and secondly to provide background data for in-depth studies of the causes of injury. The ultimate objective is to reduce the risk of injuries among the athletes by suggesting preventive measure for the future. The purpose of this internal FIS report is to provide complete data to all stakeholders within FIS as a basis for discussions on injury prevention in the different FIS disciplines.

So far, injuries among the World Cup (WC) athletes have been recorded through 9 winter seasons (2006-2015) based on athlete interviews. Athletes were interviewed by research groups from the OSTRC at the final WC events each season. The number of athletes interviewed for each of the 9 seasons is shown in Table 1. Thus, it should be noted that the injuries in this report do not represent the total number of injuries on the World Cup, but only those occurring to the athletes covered by the interviews.

The alpine European Cup was included in the injury surveillance for the first time from the 2013/14 season. European Cup skiers were interviewed at the final European Cup events at the end of the 2013/14 season, and the interviews were again completed at the end of the 2014/15 season. FIS asked us to re-include WC male and female ski jumpers in the interviews for the first time since 2008, starting from the 2014/15 season. We were also asked by FIS to discontinue the interviews of telemark skiers from the 2014/15 season, as sufficient data has been collected.

The athletes were asked about injuries they had sustained in training and competition during the 5-month WC season and which required attention by medical personnel. Coaches and medical staff were interviewed about athletes who did not participate in the final WC events. For all reported injuries, an injury form was completed, and the specific injury information requested on the form included: (1) injury location, expressed as the body part injured and which side of the body, (2) injury severity, expressed as number of days of absence from full participating in training and competition, (3) injury type, (4) injury circumstances and (5) specific diagnosis. An injury that resulted in at least 1 day of absence from training or competition is referred to as a “time-loss injury”, and an injury with absence > 28 days is defined as a “severe injury”. As we continue our research to understand the causes of injury, focusing on the injury mechanisms for the most prevalent injury types and the contribution of course design and safety equipment, we hope that this report will inspire all stakeholders to consider how they can contribute in the quest for ways to reduce the risk of injuries to our athletes.

Oslo, May 2015

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Athlete interviews- World Cup

Table 1. The number of athletes interviewed in the different FIS World Cup disciplines for each of the 9 seasons (2006-15) among females and males.

Season	Alpine skiing		Freestyle skiing		Snowboarding		Telemark skiing		Ski jumping		Total
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	All
2006/07	144	116	107	46	92	50					555
2007/08	148	113	177	86	186	94					804
2008/09	148	115	143	103	173	96	94	37			909
2009/10	140	128	96	56	172	99	92	31			814
2010/11	157	118	171	105	202	113	107	45			1018
2011/12	148	118	89	53	102	54	60	24			648
2012/13	163	124	208	132	238	125	53	22			1065
2013/14	149	119	145	85	177	105	52	20			852
2014/15	147	107	208	134	127	78			73	41	915
Total	1344	1058	1344	800	1469	814	458	179	73	41	7580

Athlete interviews- Alpine European Cup

Table 2. The number of athletes interviewed, the source of information for the interviews and the number of reported injuries during the 2013/14 and 2014/15 European Cup seasons.

Season	Number of athletes interviewed		Source of information		Number of injuries	
2013/14	Males	91	Athlete	60	Males	24
	Females	64	Coach	95	Females	20
	Total	155	Total	155	Total	44
2014/15	Males	78	Athlete	52	Males	16
	Females	68	Coach	94	Females	24
	Total	146	Total	146	Total	40

Injury incidence, World Cup

Time-loss injuries (n=2213)

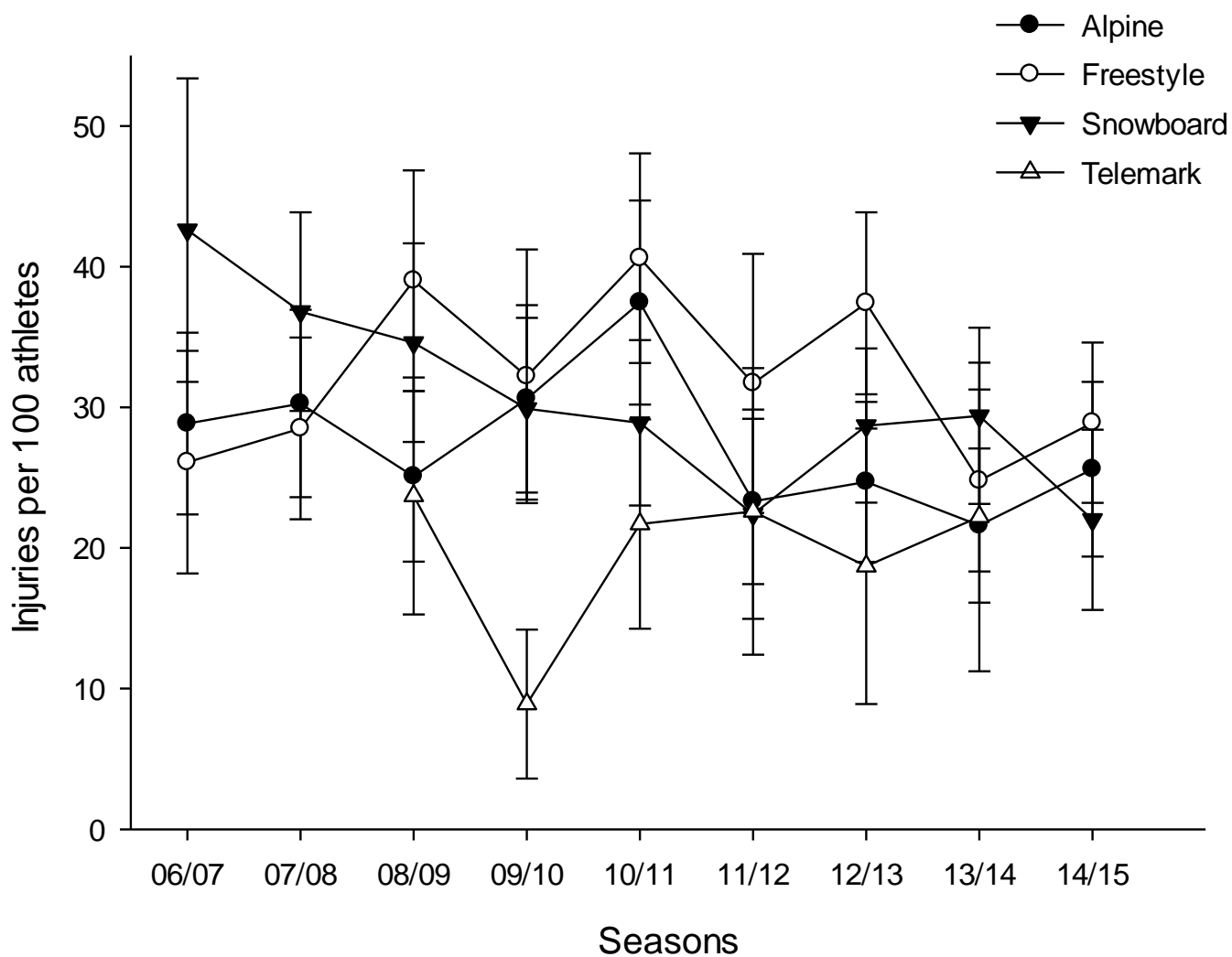


Figure 1. Injury incidence, expressed as injuries per 100 athletes (with 95% confidence intervals), for time-loss injuries reported for each of the 9 seasons (2006-15) in the different FIS World Cup disciplines. Note: Telemark is not included for the 2014/15 season.

Alpine skiing, World Cup

All injuries (n=808)

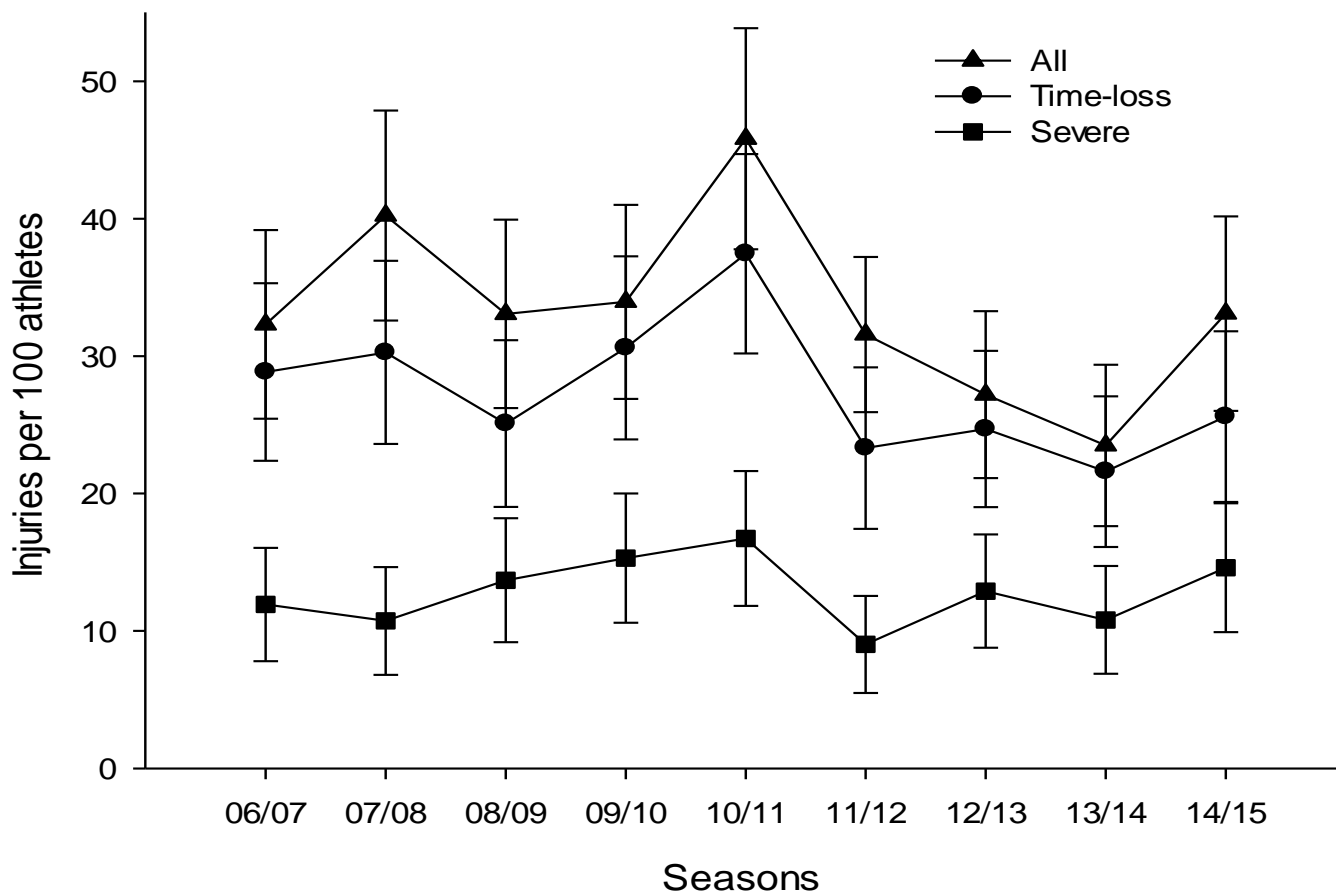


Figure 2. Injury incidence, expressed as injuries per 100 athletes (with 95% confidence intervals), for all injuries, time-loss injuries and severe injuries, reported for each of the 9 seasons (2006-15) in alpine skiing.

Alpine skiing, World Cup

Time-loss injuries (n=673)

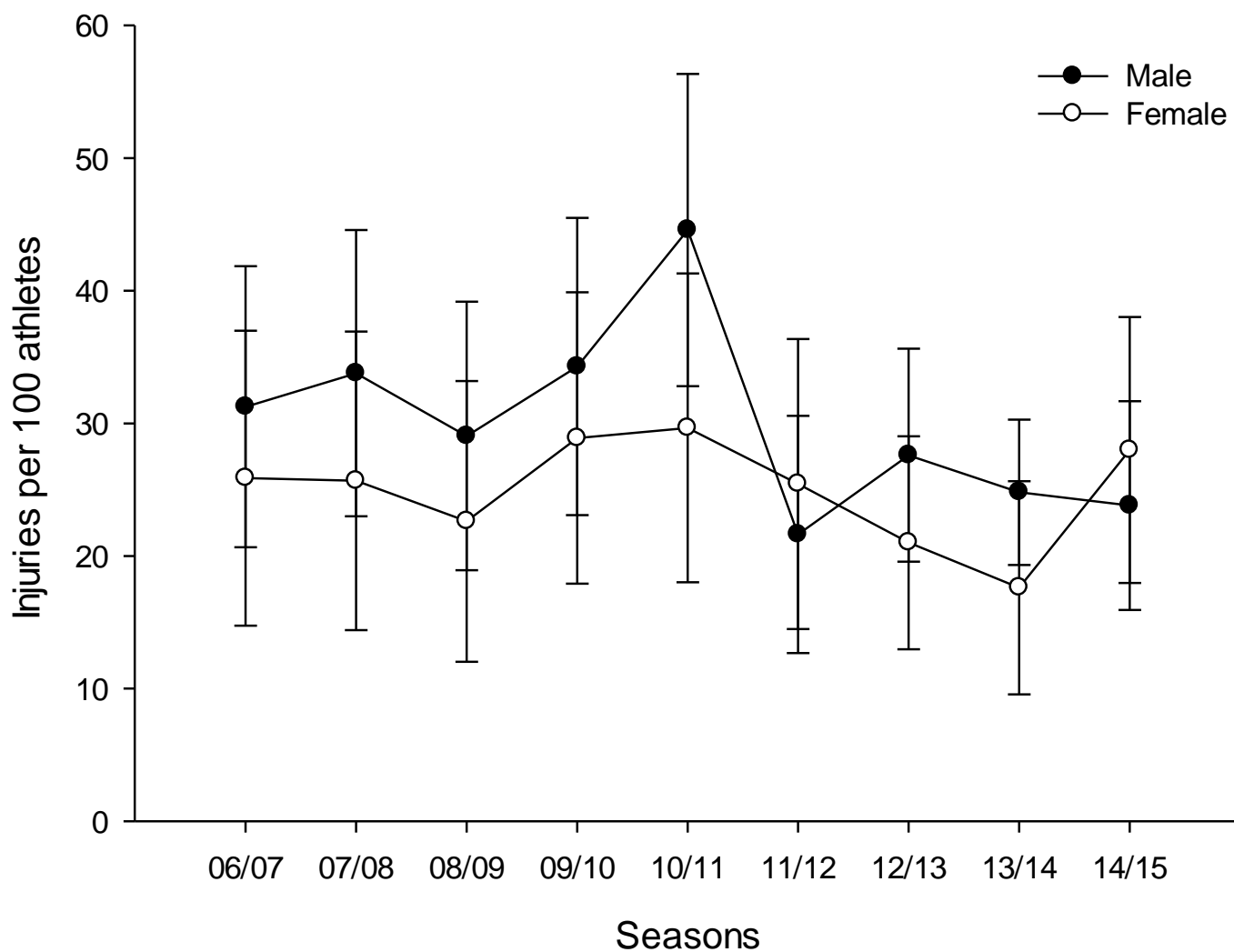


Figure 3. Injury incidence, expressed as injuries per 100 athletes (with 95% confidence intervals), for time-loss injuries reported among males versus females for each of the 9 seasons (2006-15) in alpine skiing.

Alpine skiing, World Cup

Time-loss injuries in WC races (n= 279)

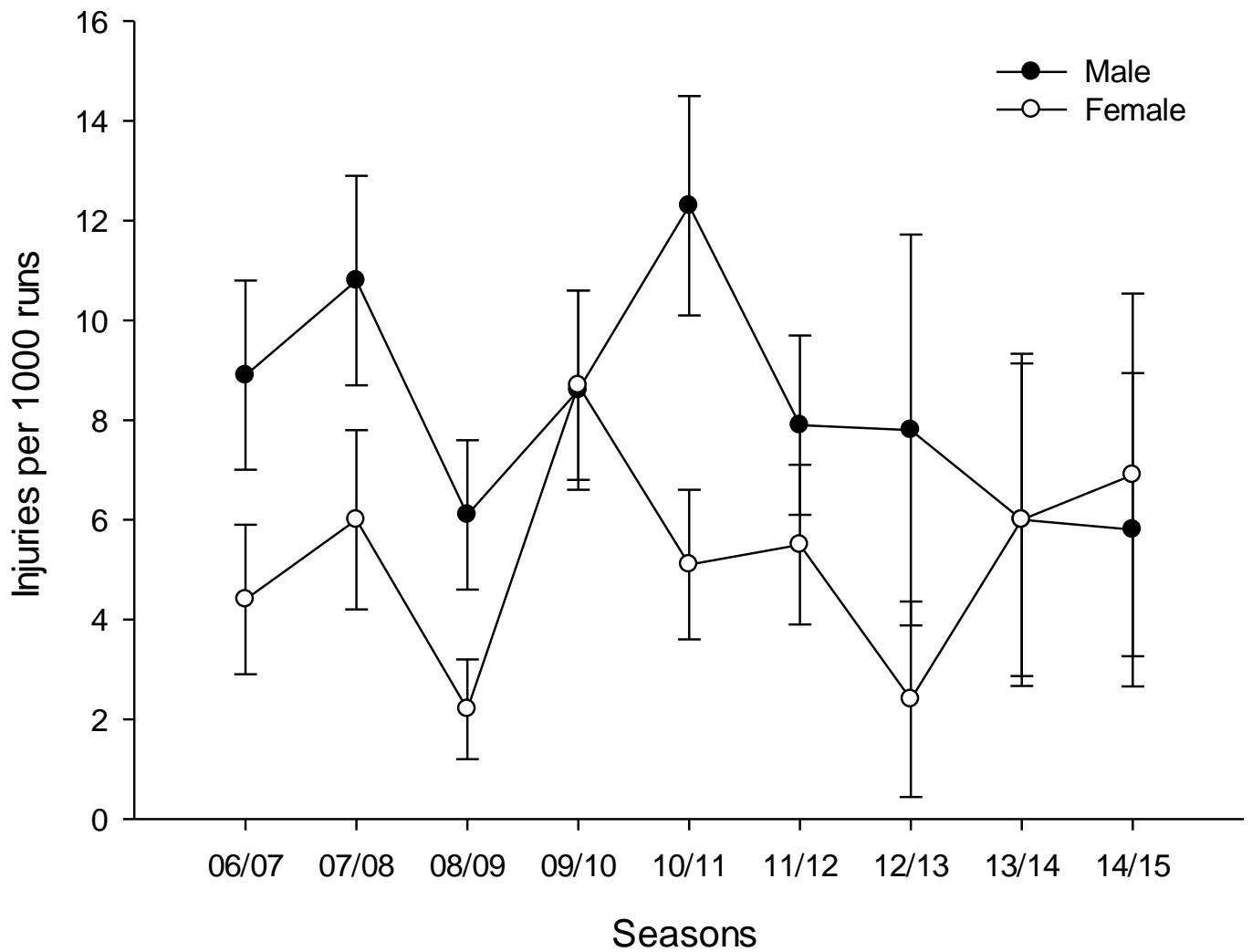


Figure 4. Time-loss injury incidences in WC races, expressed as the number of injuries per 1000 runs (with 95% confidence intervals) among females and males for each of the 9 seasons (2006-15).

Freestyle skiing

All injuries (n=851)

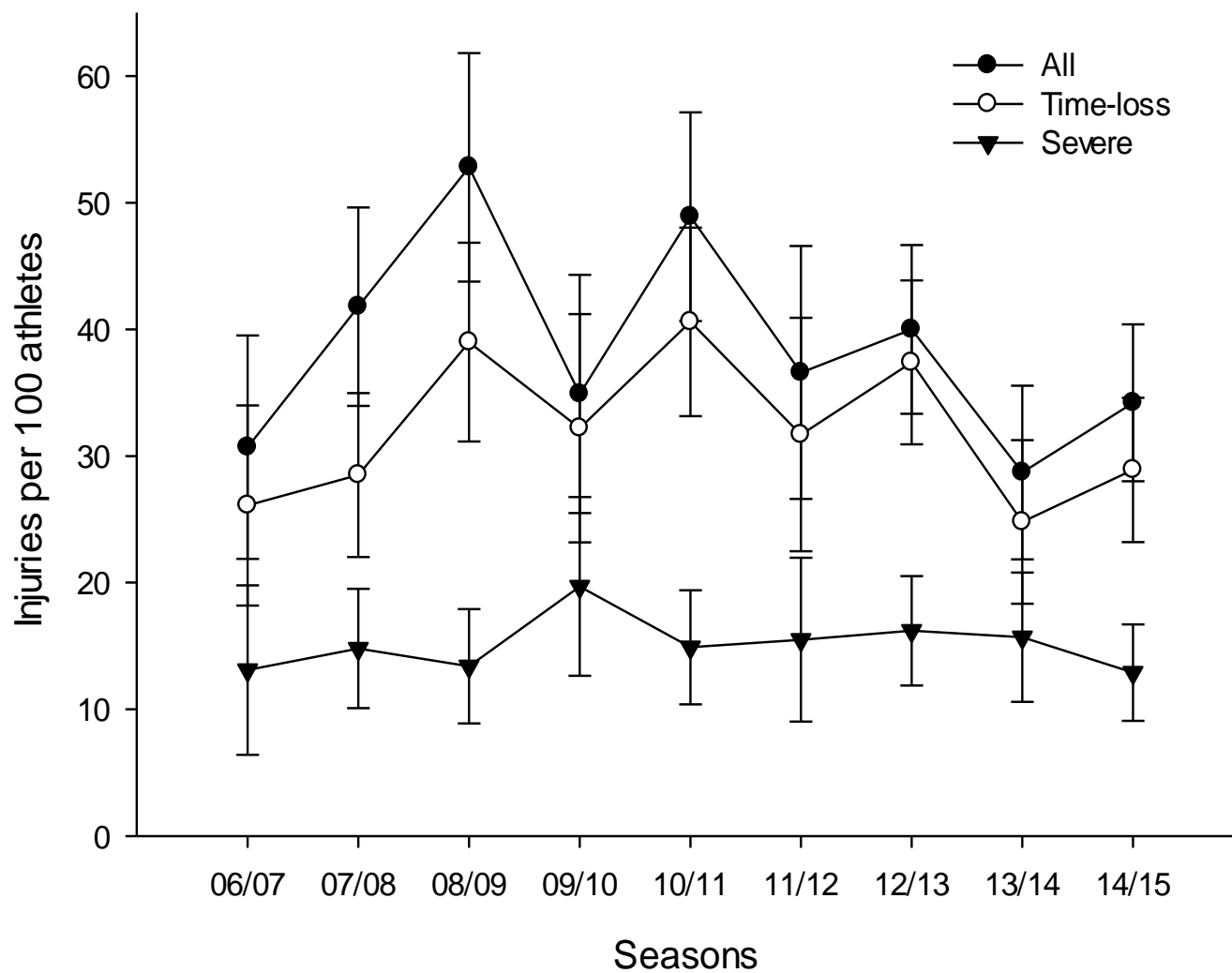


Figure 5. Injury incidence, expressed as injuries per 100 athletes (with 95% confidence intervals), for all injuries, time-loss injuries and severe injuries, reported for each of the 9 seasons (2006-15) in freestyle skiing.

Freestyle skiing

Time-loss injuries (n=703)

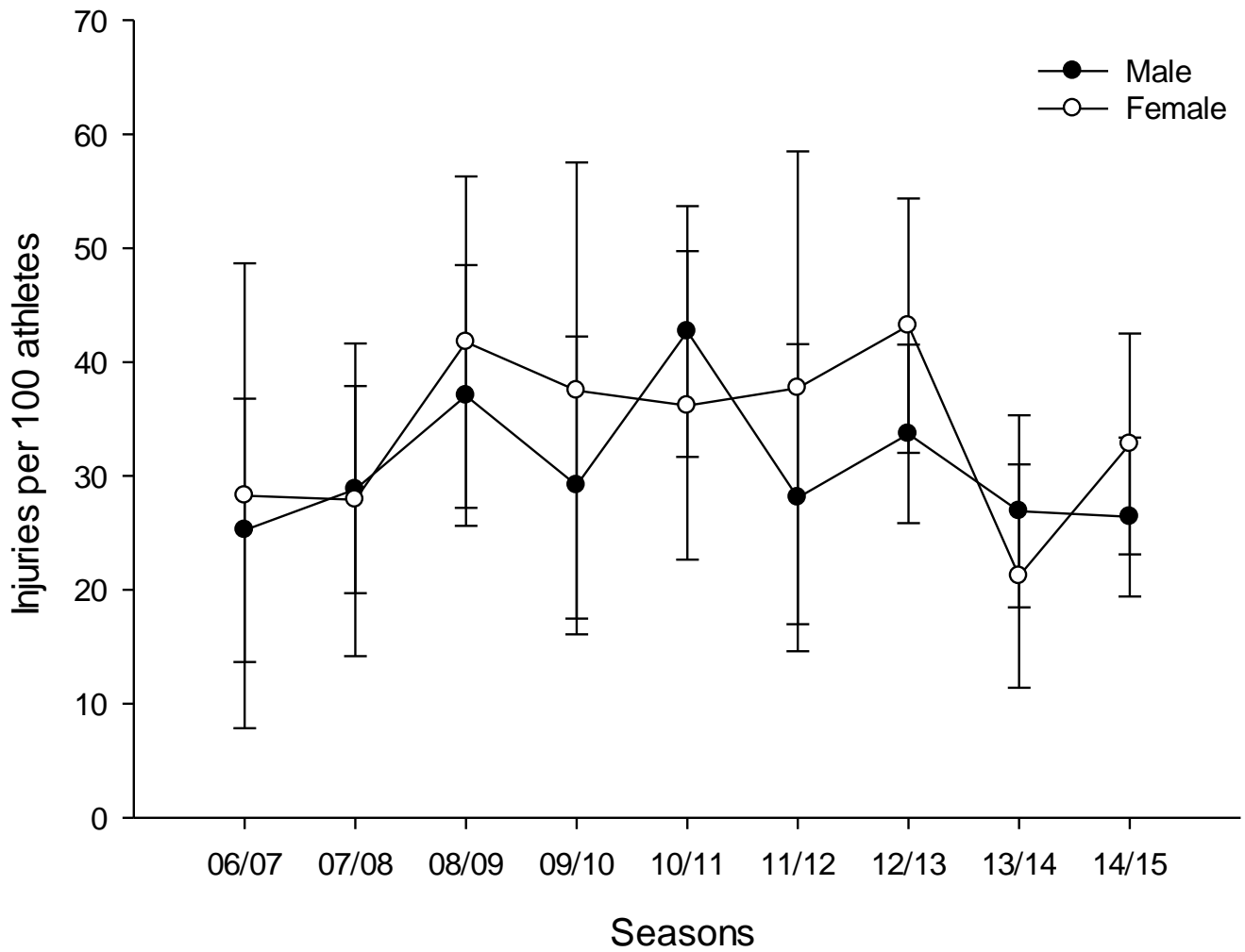


Figure 6. Injury incidence, expressed as injuries per 100 athletes (with 95% confidence intervals), for time-loss injuries reported among males versus females for each of the 9 seasons (2006-15) in freestyle skiing.

Snowboarding

All injuries (n=901)

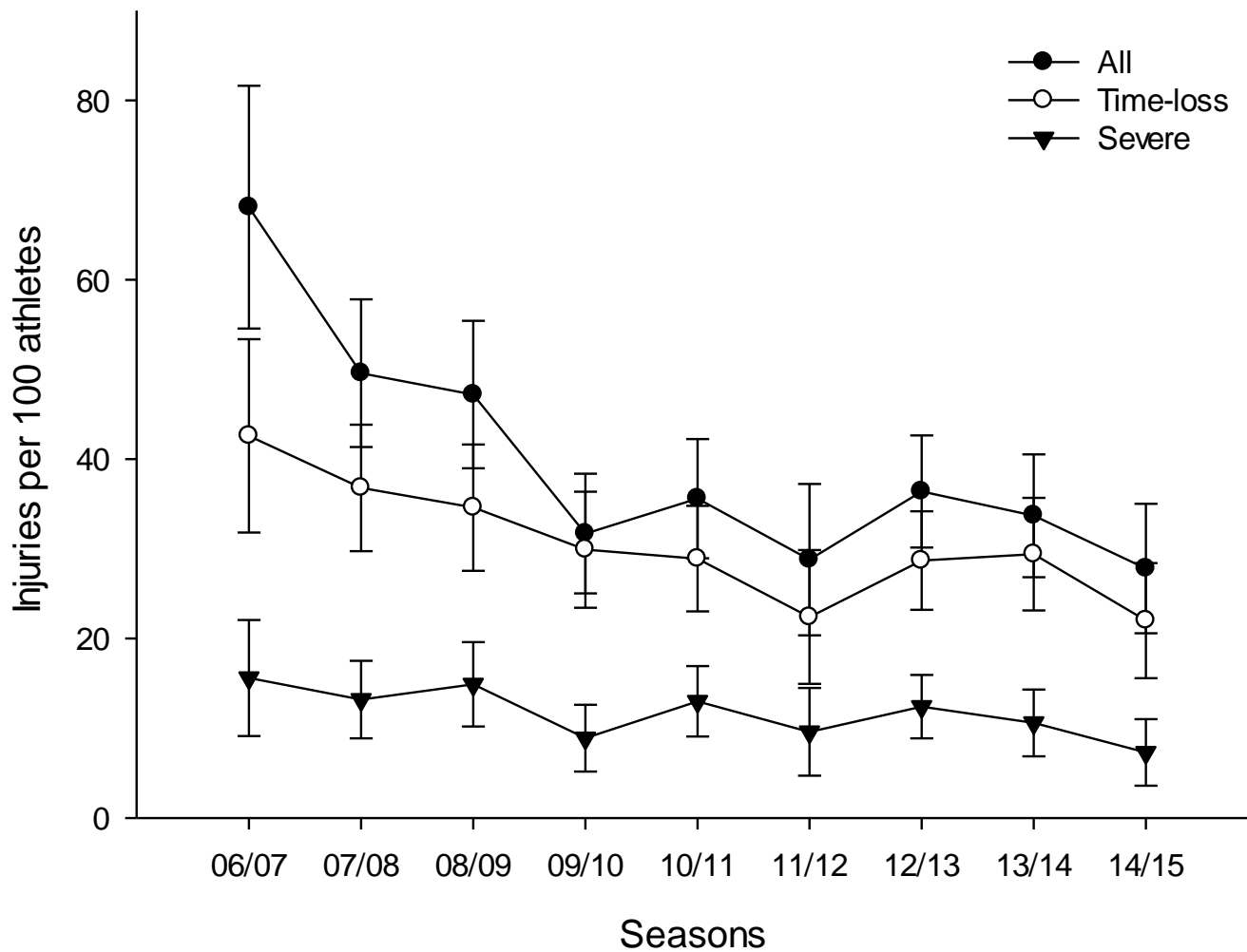


Figure 7. Injury incidence, expressed as injuries per 100 athletes (with 95% confidence intervals), for all injuries, time-loss injuries and severe injuries, reported for each of the 9 seasons (2006-15) in snowboarding.

Snowboarding

Time-loss injuries (n=706)

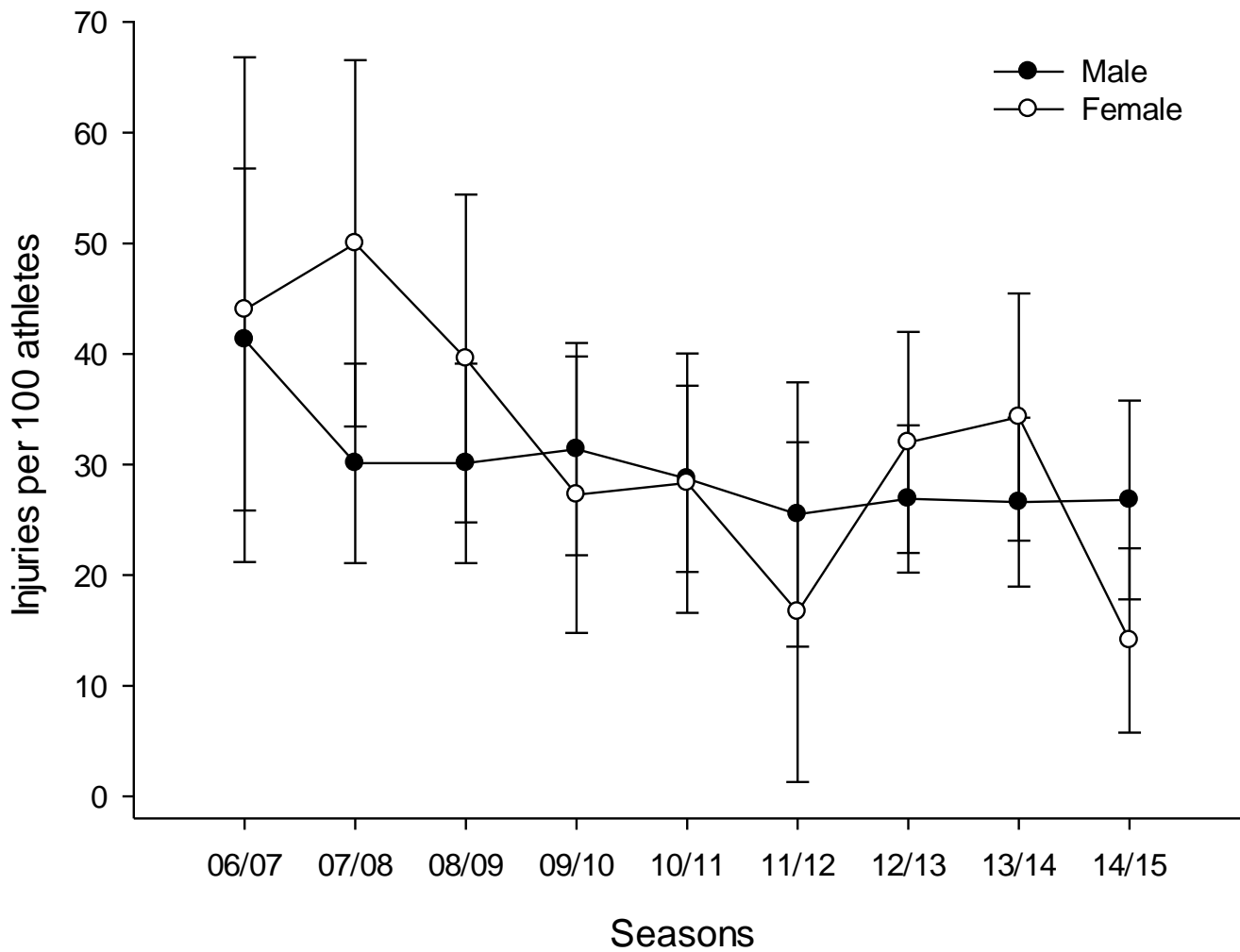


Figure 8. Injury incidence, expressed as injuries per 100 athletes (with 95% confidence intervals), for time-loss injuries reported among males versus females for each of the 9 seasons (2006-15) in snowboarding.

Ski jumping

Number of athletes interviewed (n= 114) and injuries reported (n=23)

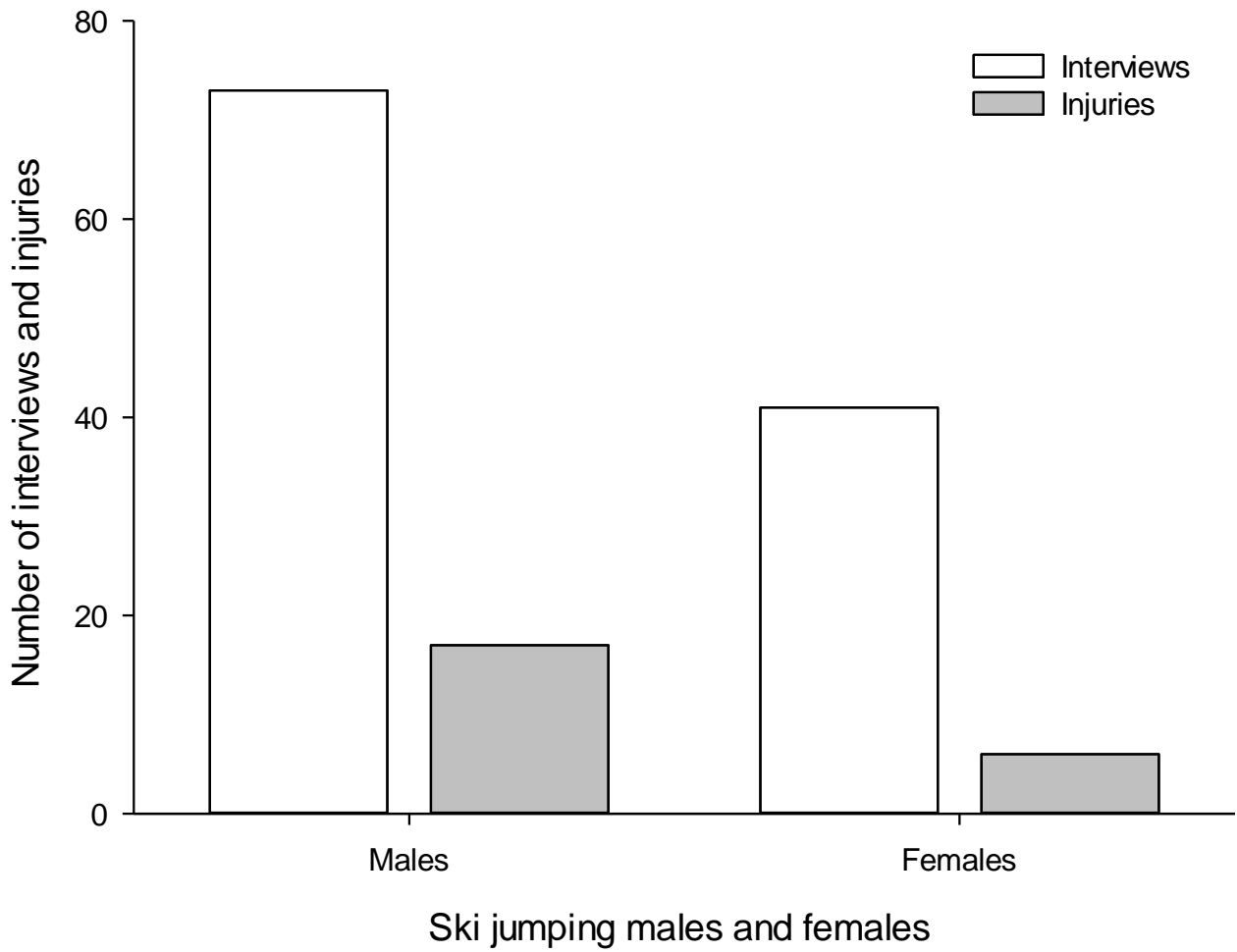


Figure 9. Number of interviews conducted and number of reported injuries among male and female ski jumping athletes during the 2014/15 season.

Ski Jumping

Injuries during all in-season training and competitions (n=23)

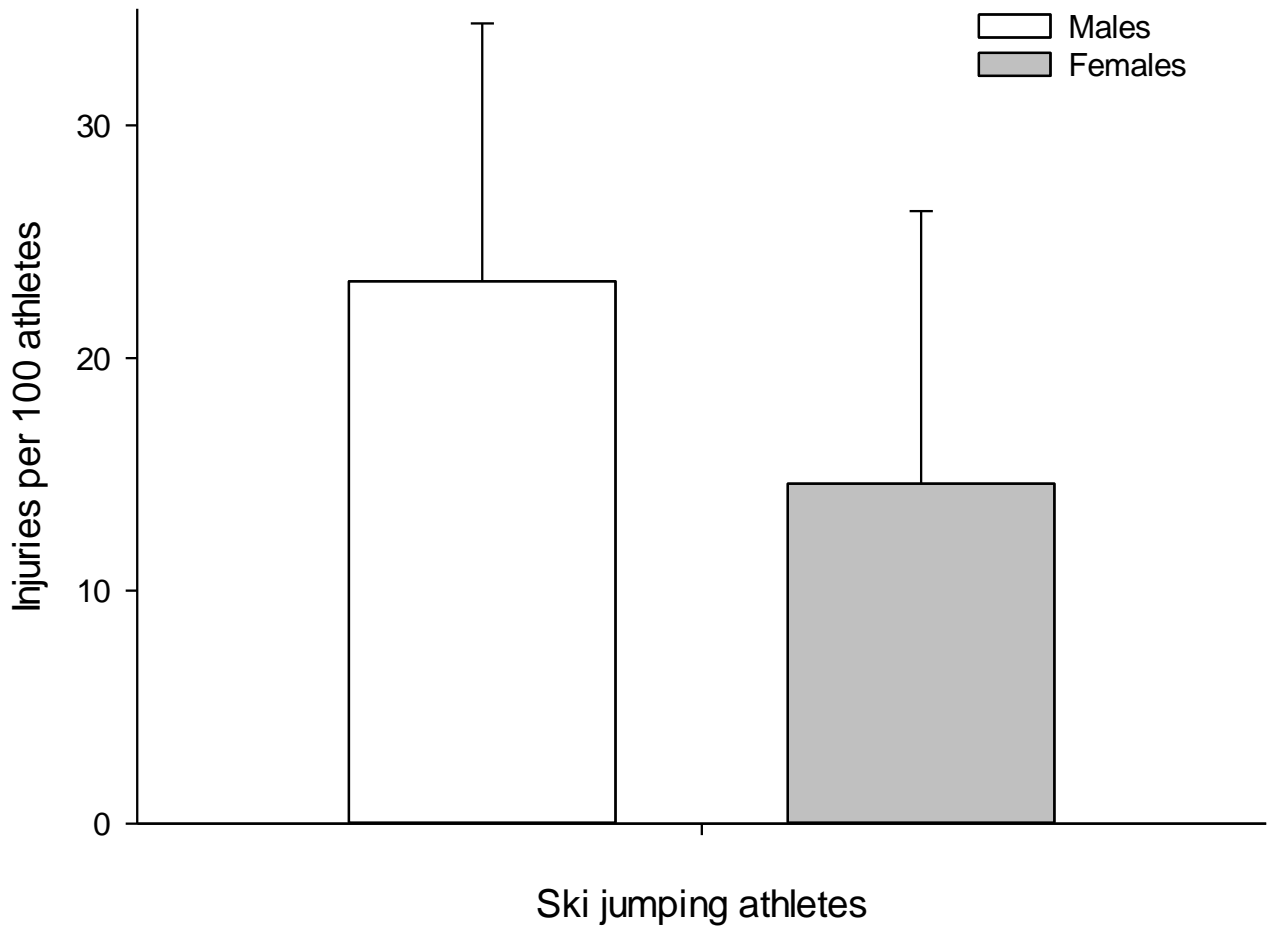


Figure 10. Injury incidence, expressed as injuries per 100 athletes (with 95% confidence intervals), for injuries reported among males versus females for the 2014/15 season in ski jumping.

Ski jumping

Injuries during World Cup and World Ski Championship competitions (n= 11)

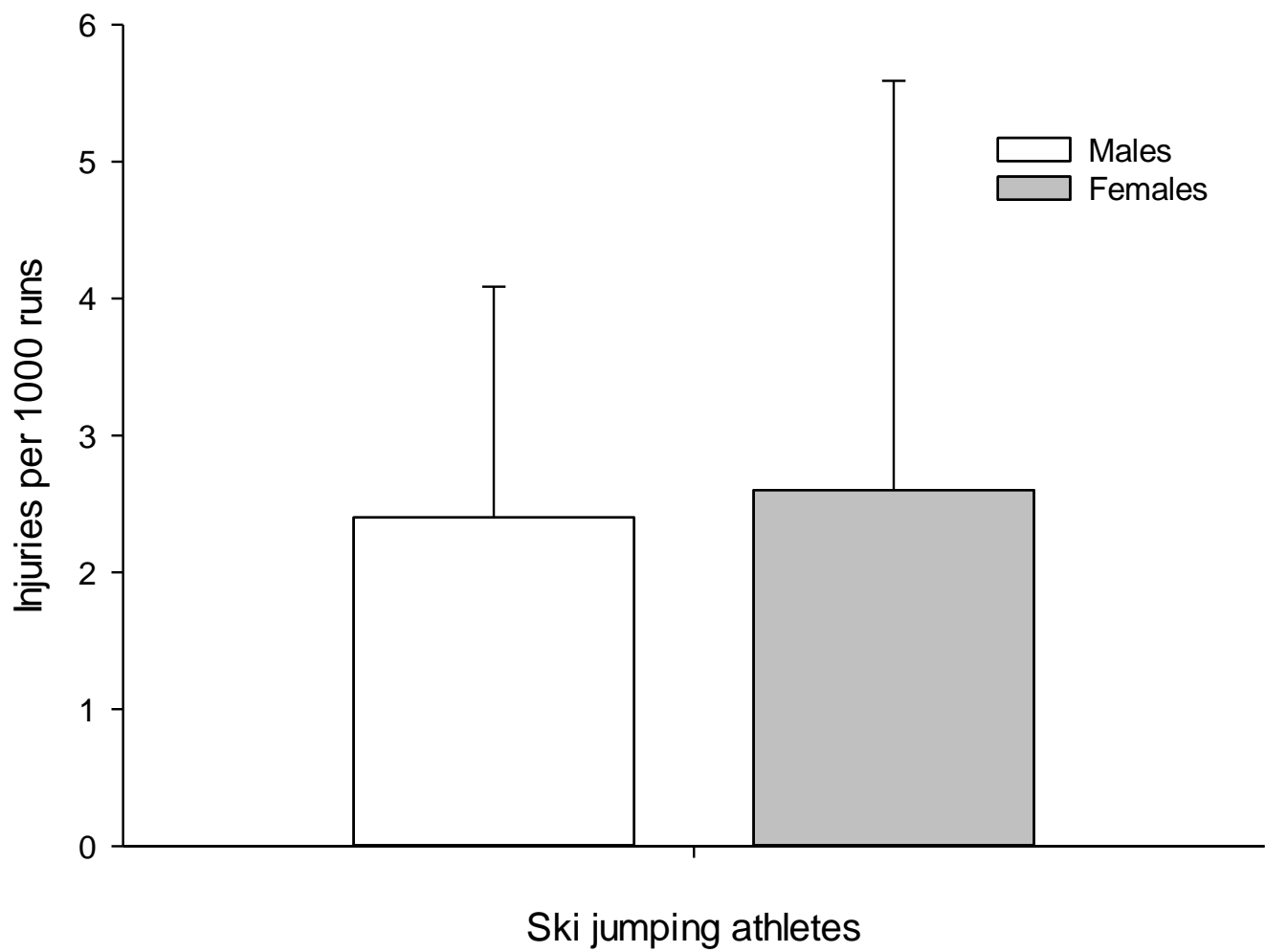


Figure 11. Injury incidence, expressed as injuries per 1000 runs (with 95% confidence intervals), for injuries reported among males versus females for the 2014/15 season in ski jumping.

Injury circumstances

All injuries 2006-15

Table 3. The total number of injuries (with percentages) in the FIS World Cup disciplines (n=2756), reported through all 9 seasons (2006-15), regarding injury circumstances, expressed as type of activity when the injury occurred. *Telemark skiing includes data from 8 seasons (2006-2014), ^αSki Jumping includes data from one season only (2014/15)

Activity	Alpine skiing	Freestyle skiing	Snowboarding	Telemark skiing*	Ski Jumping ^α	Total, n (%)
World Cup	313 (38.7)	238 (28.0)	210 (23.3)	72 (41.6)	10 (43.5)	843 (30.6)
World Ski/Snowboard Championships	32 (4.0)	40 (4.7)	23 (2.6)	8 (4.6)	1 (4.3)	104 (3.8)
Olympic Winter Games	9 (1.1)	8 (0.9)	14 (1.6)	0 (0)	0 (0)	31 (1.1)
FIS competitions	67 (8.3)	32 (3.8)	57 (6.3)	2 (1.2)	1 (4.3)	159 (5.8)
Other Competitions	3 (0.4)	88 (10.3)	102 (11.3)	11 (6.4)	0 (0)	204 (7.4)
Training (on and off snow)	384 (47.5)	445 (52.3)	480 (53.3)	80 (46.2)	11 (47.8)	1400 (50.8)
Info missing	0 (0)	0 (0)	15 (1.7)	0 (0)	0 (0)	15 (0.5)
Total	808 (100)	851 (100)	901 (100)	173 (100)	23 (100)	2756 (100)

Injury severity

All injuries 2006-15

Table 4. The total number of injuries (with percentages) in the FIS World Cup disciplines (n=2756), reported through all 9 seasons (2006-15), regarding injury severity, expressed as days of absence from full participation in training and competition. *Telemark skiing includes data from 8 seasons (2006-2014), ^αSki Jumping includes data from one season only (2014/15)

	Alpine skiing	Freestyle skiing	Snowboarding	Telemark skiing*	Ski Jumping ^α	Total, n (%)
Absence						
No absence	135 (16.7)	148 (17.4)	195 (21.6)	44 (25.4)	7 (30.4)	529 (19.2)
1-3 days	64 (7.9)	86 (10.1)	91 (10.1)	29 (16.8)	3 (13.0)	273 (9.9)
4-7 days	97 (12.0)	99 (11.6)	121 (13.4)	20 (11.6)	2 (8.7)	339 (12.3)
8-28 days	193 (23.9)	174 (20.4)	189 (21.0)	32 (18.5)	3 (13.0)	591 (21.4)
>28 days	309 (38.2)	321 (37.7)	276 (30.6)	42 (24.3)	8 (34.8)	956 (34.7)
Info missing	10 (1.2)	23 (2.7)	29 (3.2)	6 (3.5)	0 (0)	68 (2.5)
Total	808 (100)	851 (100)	901 (100)	173 (100)	23 (100)	2756 (100)

Injury type

All injuries 2006-15

Table 5. The total number of injuries (with percentages) in the FIS World Cup disciplines (n=2756), reported through all 9 seasons (2006-15), regarding injury type.

*Telemark skiing includes data from 8 seasons (2006-2014), \square Ski Jumping includes data from one season only (2014/15)

Injury type	Alpine skiing	Freestyle skiing	Snowboarding	Telemark skiing*	Ski jumping \square	Total, n (%)
Fracture/bone stress	173 (21.4)	172 (20.2)	230 (25.5)	30 (17.3)	5 (21.7)	610 (22.1)
Joint/ligament	380 (47.0)	375 (44.1)	326 (36.2)	71 (41.0)	8 (34.8)	1160 (42.1)
Muscle/tendon	98 (12.1)	79 (9.3)	97 (10.8)	26 (15.0)	7 (30.4)	307 (11.1)
Contusion	57 (7.1)	94 (11.0)	116 (12.9)	26 (15.0)	2 (8.7)	295 (10.7)
Skin/laceration	25 (3.1)	6 (0.7)	8 (0.9)	5 (2.9)	0 (0)	44 (1.6)
Nervous system /concussion	62 (7.7)	111 (13.0)	105 (11.7)	10 (5.8)	1 (4.3)	289 (10.5)
Other	10 (1.2)	10 (1.2)	15 (1.7)	5 (2.9)	0 (0)	40 (1.5)
Info missing	3 (0.4)	4 (0.5)	4 (0.4)	0 (0)	0 (0)	11 (0.4)
Total	808 (100)	851 (100)	901 (100)	173 (100)	23 (100)	2756 (100)

Injury location

All injuries 2006-15

Table 6. The total number of injuries (with percentages) in the FIS World Cup disciplines (n=2756), reported through all 9 seasons (2006-15), regarding injury location, expressed as body part injured. *Telemark skiing includes data from 8 seasons (2006-2014), ☒Ski Jumping includes data from one season only (2014/15)

	Alpine skiing	Freestyle skiing	Snowboarding	Telemark skiing*	Ski jumping☒	Total, n (%)
Body part injured						
Head/face	74 (9.2)	119 (14.0)	113 (12.5)	15 (8.7)	1 (4.3)	322 (11.7)
Neck, cervical spine	7 (0.9)	14 (1.6)	10 (1.1)	0 (0)	0 (0)	31 (1.1)
Shoulder, clavicle	53 (6.6)	89 (10.5)	127 (14.1)	21 (12.1)	2 (8.7)	292 (10.6)
Upper arm	3 (0.4)	3 (0.4)	8 (0.9)	1 (0.6)	0 (0)	15 (0.5)
Elbow	5 (0.6)	17 (2.0)	20 (2.2)	1 (0.6)	0 (0)	43 (1.6)
Forearm	4 (0.5)	7 (0.8)	10 (1.1)	1 (0.6)	0 (0)	22 (0.8)
Wrist	11 (1.4)	21 (2.5)	43 (4.8)	3 (1.7)	2 (8.7)	80 (2.9)
Hand, finger, thumb	83 (10.3)	57 (6.7)	52 (5.8)	31 (17.9)	0 (0)	223 (8.1)
Chest (sternum, ribs, upper back)	15 (1.9)	37 (4.3)	45 (5.0)	6 (3.5)	0 (0)	103 (3.7)
Abdomen	4 (0.5)	5 (0.6)	7 (0.8)	3 (1.7)	0 (0)	19 (0.7)
Lower back, pelvis, sacrum	80 (9.9)	66 (7.8)	102 (11.3)	6 (3.5)	3 (13.0)	257 (9.3)
Hip, groin	17 (2.1)	42 (4.9)	31 (3.4)	5 (2.9)	1 (4.3)	96 (3.5)
Thigh	19 (2.4)	14 (1.6)	13 (1.4)	5 (2.9)	0 (0)	51 (1.9)
Knee	318 (39.4)	275 (32.3)	158 (17.5)	40 (23.1)	11 (47.8)	802 (29.1)
Lower leg, Achilles tendon	74 (9.2)	35 (4.1)	24 (2.7)	13 (7.5)	1 (4.3)	147 (5.3)
Ankle	30 (3.7)	35 (4.1)	87 (9.7)	21 (12.1)	2 (8.7)	175 (6.3)
Foot, heel, toe	11 (1.4)	15 (1.8)	51 (5.7)	1 (0.6)	0 (0)	78 (2.8)
Total	808 (100)	851 (100)	901 (100)	173 (100)	23 (100)	2756 (100)

Injury location versus injury severity

Alpine skiing, World Cup (n=808)

Table 7. The total number of injuries reported in alpine skiing through all 9 seasons (2006-15) regarding injury location (rows) versus injury severity (columns). Injury location is expressed as body part injured, and injury severity is expressed as days of absence from full participation in training and competition

Body part injured	No absence	1-3 days	4-7 days	8-28 days	>28 days	Info missing	Total, n (%)
Head/face	12	5	9	21	24	3	74 (9.2)
Neck, cervical spine	2	1	1	1	2	0	7 (0.9)
Shoulder, clavicle	13	4	9	12	13	2	53 (6.6)
Upper arm	0	0	1	1	1	0	3 (0.4)
Elbow	0	3	0	1	1	0	5 (0.6)
Forearm	1	1	0	0	2	0	4 (0.5)
Wrist	2	3	3	2	1	0	11 (1.4)
Hand, finger, thumb	39	11	10	17	5	1	83 (10.3)
Chest (sternum, ribs, upper back)	4	1	4	4	2	0	15 (1.9)
Abdomen	1	0	0	1	2	0	4 (0.5)
Lower back, pelvis, sacrum	12	8	23	24	11	2	80 (9.9)
Hip, groin	3	4	2	3	5	0	17 (2.1)
Thigh	3	2	1	7	6	0	19 (2.4)
Knee	30	14	24	64	184	2	318 (39.4)
Lower leg, Achilles tendon	9	4	4	19	38	0	74 (9.2)
Ankle	4	3	6	10	7	0	30 (3.7)
Foot, heel, toe	0	0	0	6	5	0	11 (1.4)
Total	135 (16.7)	64 (7.9)	97 (12.0)	193 (23.9)	309 (38.2)	10 (1.2)	808 (100)

Freestyle skiing (n=851)

Table 8. The total number of injuries reported in freestyle skiing through all 9 seasons (2006-15) regarding injury location (rows) versus injury severity (columns). Injury location is expressed as body part injured, and injury severity is expressed as days of absence from full participation in training and competition

Body part injured	No absence	1-3 days	4-7 days	8-28 days	>28 days	Info missing	Total, n (%)
Head/face	15	11	28	35	22	8	119 (14.0)
Neck, cervical spine	6	3	0	0	4	1	14 (1.6)
Shoulder, clavicle	11	5	12	24	35	2	89 (10.5)
Upper arm	0	0	0	0	3	0	3 (0.4)
Elbow	3	4	2	5	3	0	17 (2.0)
Forearm	1	2	1	0	3	0	7 (0.8)
Wrist	3	3	2	3	9	1	21 (2.5)
Hand, finger, thumb	28	5	6	10	8	0	57 (6.7)
Chest (sternum, ribs, upper back)	9	8	2	8	9	1	37 (4.3)
Abdomen	0	1	2	0	1	1	5 (0.6)
Lower back, pelvis, sacrum	16	12	8	11	18	1	66 (7.8)
Hip, groin	12	3	6	9	11	1	42 (4.9)
Thigh	6	2	1	2	2	1	14 (1.6)
Knee	17	15	16	51	171	5	275 (32.3)
Lower leg, Achilles tendon	12	5	3	5	10	0	35 (4.1)
Ankle	5	5	8	7	9	1	35 (4.1)
Foot, heel, toe	4	2	2	4	3	0	15 (1.8)
Total	148 (17.4)	86 (10.1)	99 (11.6)	174 (20.4)	321 (37.7)	23 (2.7)	851 (100)

Snowboarding (n=901)

Table 9. The total number of injuries reported in snowboarding through all 9 seasons (2006-15) regarding injury location (rows) versus injury severity (columns). Injury location is expressed as body part injured, and injury severity is expressed as days of absence from full participation in training and competition

Body part injured	No absence	1-3 days	4-7 days	8-28 days	>28 days	Info missing	Total, n (%)
Head/face	18	13	28	26	20	8	113 (12.5)
Neck, cervical spine	6	2	0	2	0	0	10 (1.1)
Shoulder, clavicle	25	12	16	22	50	2	127 (14.1)
Upper arm	1	0	0	2	5	0	8 (0.9)
Elbow	8	2	2	2	6	0	20 (2.2)
Forearm	1	0	3	0	6	0	10 (1.1)
Wrist	19	3	8	5	8	0	43 (4.8)
Hand, finger, thumb	22	8	5	10	3	4	52 (5.8)
Chest (sternum, ribs, upper back)	11	8	3	11	10	2	45 (5.0)
Abdomen	0	1	2	3	1	0	7 (0.8)
Lower back, pelvis, sacrum	30	14	16	23	18	1	102 (11.3)
Hip, groin	8	5	6	6	5	1	31 (3.4)
Thigh	4	2	2	1	4	0	13 (1.4)
Knee	15	10	13	32	83	5	158 (17.5)
Lower leg, Achilles tendon	3	1	3	1	14	2	24 (2.7)
Ankle	11	7	11	29	27	2	87 (9.7)
Foot, heel, toe	13	3	3	14	16	2	51 (5.7)
Total	195 (21.6)	91 (10.1)	121 (13.4)	189 (21.0)	276 (30.6)	29 (3.2)	901 (100)

Telemark skiing (n=173)

Table 10. The total number of injuries reported in telemark skiing through the 6 seasons (2008-14) regarding injury location (rows) versus injury severity (columns). Injury location is expressed as body part injured, and injury severity is expressed as days of absence from full participation in training and competition.

Body part injured	No absence	1-3 days	4-7 days	8-28 days	>28 days	Info missing	Total, n (%)
Head/face	5	1	4	3	2	0	15 (8.7)
Neck, cervical spine	0	0	0	0	0	0	0 (0)
Shoulder, clavicle	7	4	1	6	3	0	21 (13.2)
Upper arm	0	0	0	1	0	0	1 (0.6)
Elbow	0	0	0	1	0	0	1 (0.6)
Forearm	0	0	0	0	1	0	1 (0.6)
Wrist	3	0	0	0	0	0	3 (1.7)
Hand, finger, thumb	14	9	1	5	1	1	31 (17.9)
Chest (sternum, ribs, upper back)	2	0	0	2	2	0	6 (3.5)
Abdomen	0	0	1	0	2	0	3 (1.7)
Lower back, pelvis, sacrum	1	3	1	0	0	1	6 (3.5)
Hip, groin	2	2	0	0	0	1	5 (2.9)
Thigh	1	0	2	1	1	0	5 (2.9)
Knee	2	6	3	7	21	1	40 (23.1)
Lower leg, Achilles tendon	4	2	2	2	3	0	13 (7.5)
Ankle	3	2	5	4	5	2	21 (12.1)
Foot, heel, toe	0	0	0	0	1	0	1 (0.6)
Total	44 (25.4)	29 (16.8)	20 (11.6)	32 (18.5)	42 (24.3)	6 (3.5)	173 (100)

Ski jumping (n=23)

Table 11. The total number of injuries reported in ski jumping through the 2014/15 season regarding injury location (rows) versus injury severity (columns). Injury location is expressed as body part injured, and injury severity is expressed as days of absence from full participation in training and competition.

Body part injured	No absence	1-3 days	4-7 days	8-28 days	>28 days	Info missing	Total, n (%)
Head/face	0	0	0	0	1	0	1 (4.3)
Neck, cervical spine	0	0	0	0	0	0	0 (0)
Shoulder, clavicle	1	0	0	0	1	0	2 (8.7)
Upper arm	0	0	0	0	0	0	0 (0)
Elbow	0	0	0	0	0	0	0 (0)
Forearm	0	0	0	0	0	0	0 (0)
Wrist	0	0	0	1	1	0	2 (8.7)
Hand, finger, thumb	0	0	0	0	0	0	0 (0)
Chest (sternum, ribs, upper back)	0	0	0	0	0	0	0 (0)
Abdomen	0	0	0	0	0	0	0 (0)
Lower back, pelvis, sacrum	0	0	1	0	2	0	3 (13.0)
Hip, groin	0	0	1	0	0	0	1 (4.3)
Thigh	0	0	0	0	0	0	0 (0)
Knee	4	2	0	2	3	0	11 (47.8)
Lower leg, Achilles tendon	1	0	0	0	0	0	1 (4.3)
Ankle	1	1	0	0	0	0	2 (8.7)
Foot, heel, toe	0	0	0	0	0	0	0 (0)
Total	7 (30.4)	3 (13.0)	2 (8.7)	3 (13.0)	8 (34.8)	0 (0)	23 (100)

Alpine disciplines

World Cup injuries (n=354), 9 seasons

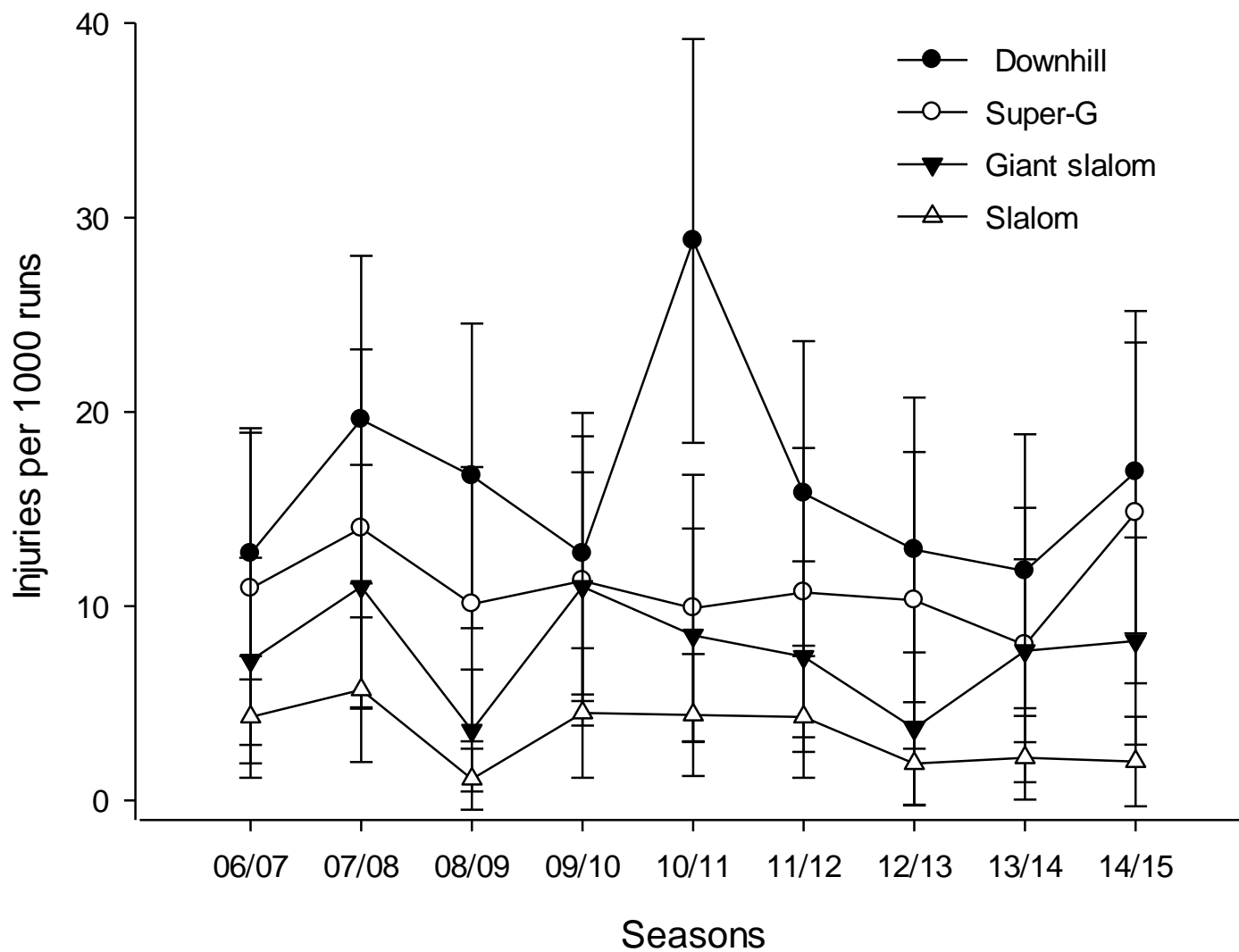


Figure 12. Injury incidence, expressed as number of injuries per 1000 runs (with 95% confidence intervals), for all injuries reported in World Cup races for each of the 9 seasons (2006-15) in the different alpine disciplines.

Alpine skiing

Injuries to the knee ($n=318$) & ACL ($n=112$), 9 seasons

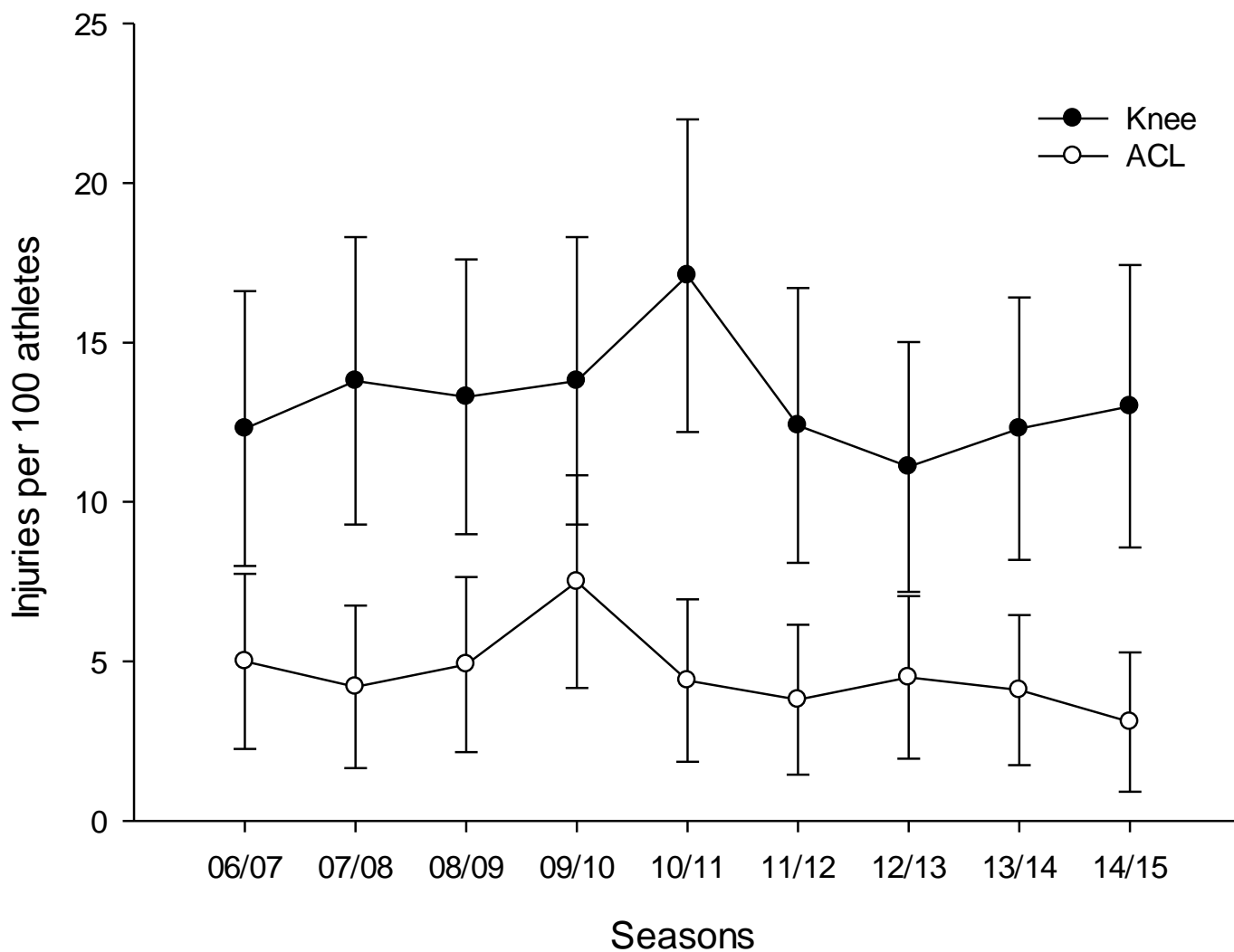


Figure 13. Injury incidence, expressed as number of injuries per 100 World Cup athletes (with 95% confidence intervals), for injuries to the knee and ACL only, among males and females, reported through all 9 seasons (2006-15) in alpine skiing.

Alpine skiing

World Cup injuries to the knee (n=148) & ACL (n=55), 9 seasons

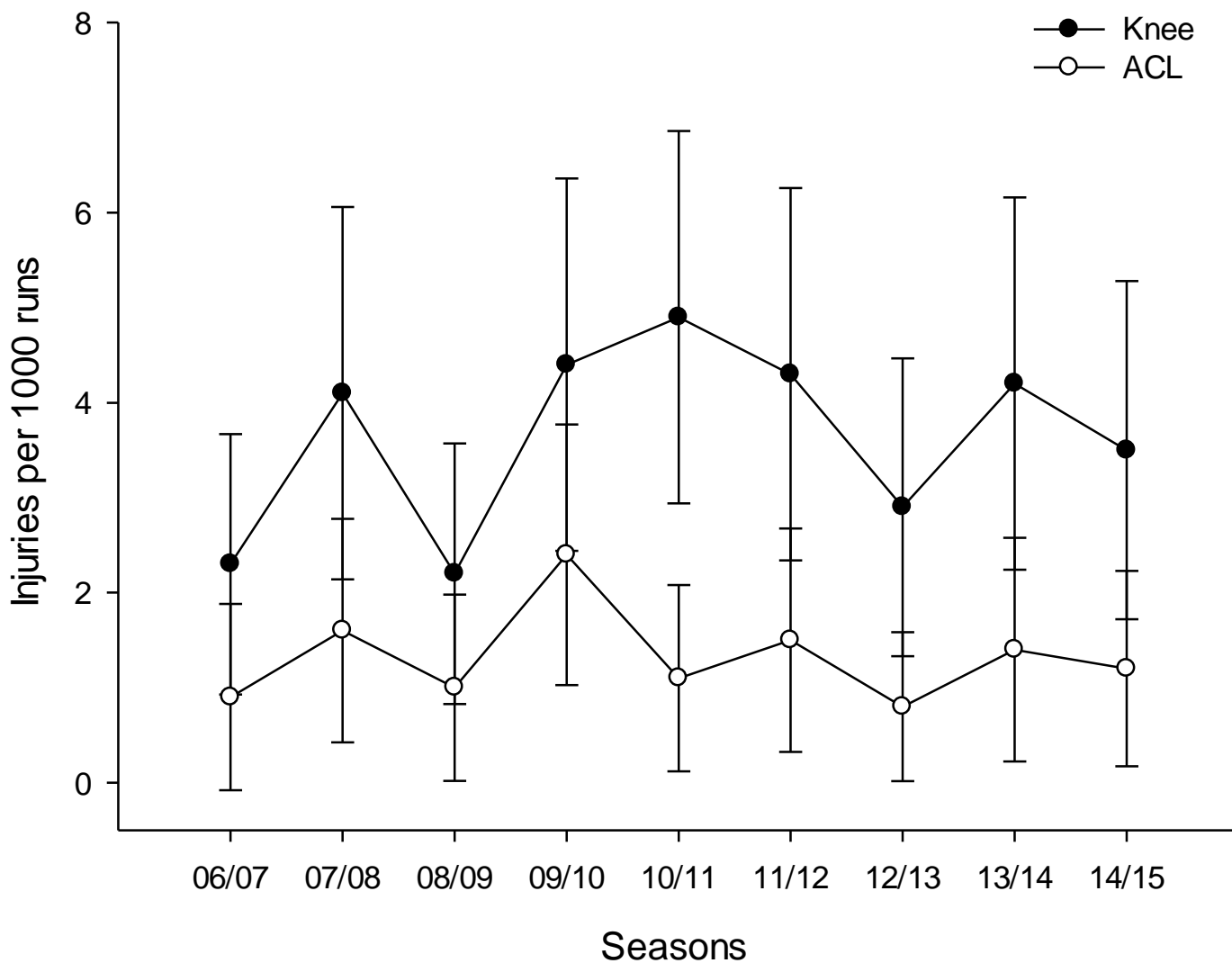


Figure 14. Injury incidence, expressed as number of injuries per 1000 World Cup runs (with 95% confidence intervals), for injuries to the knee and ACL only, among males and females, reported in World Cup races through all 9 seasons (2006-15) in alpine skiing.

Alpine European Cup

All injuries during training and competition (n=84)

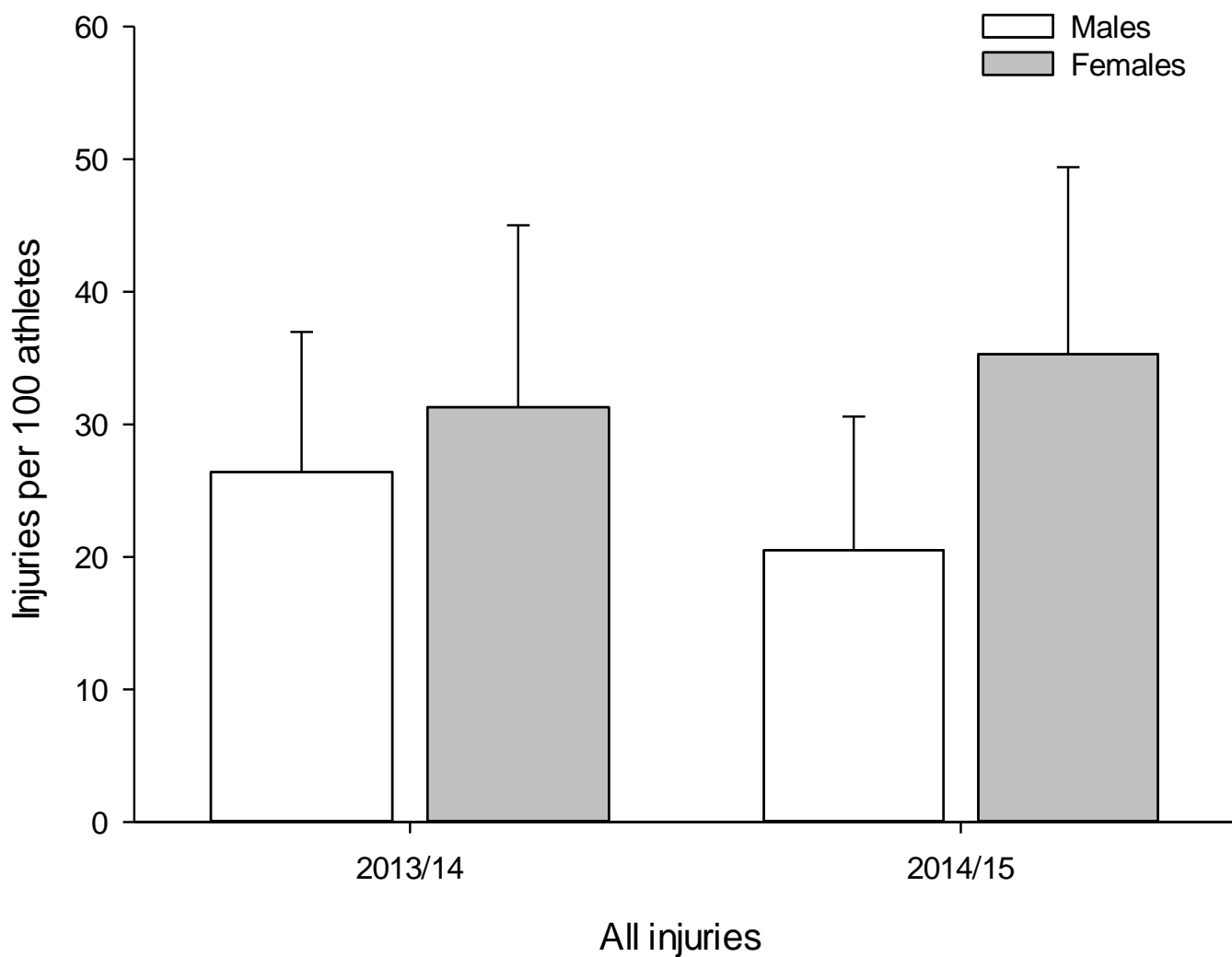


Figure 15. Injury incidence, expressed as injuries per 100 athletes (with 95% confidence intervals), for all injuries during training and competition (n=84) throughout the 2013/14 and 2014/15 European Cup seasons

Alpine European Cup

All injuries during European Cup competitions (n=34)

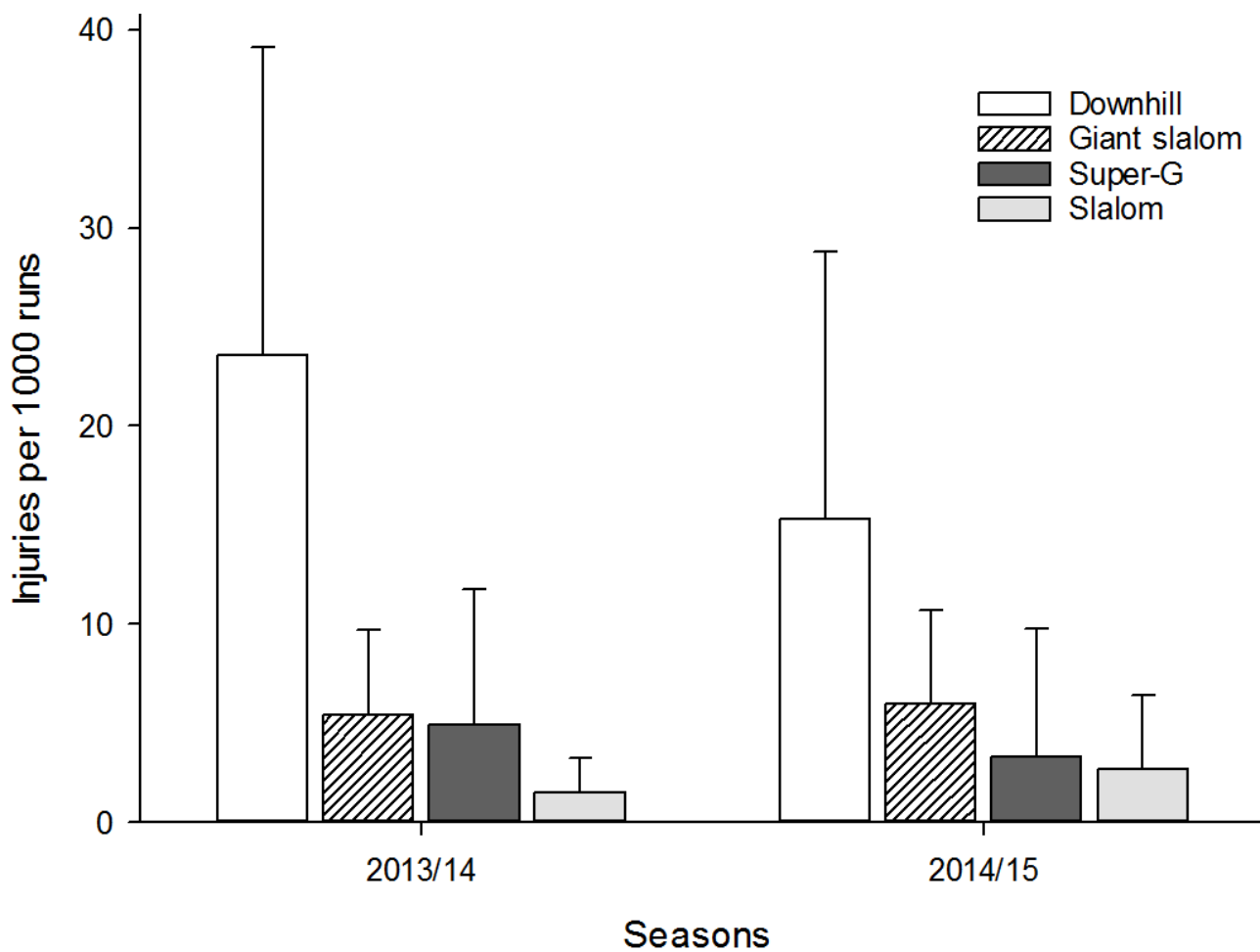


Figure 16. Injury incidence, expressed as number of injuries per 1000 runs (with 95% confidence intervals), for all injuries reported in European Cup competitions throughout the 2013/14 (n=20) and 2014/15 (n=14) seasons, in the different alpine disciplines.

Alpine World Cup and European Cup Time-loss injuries

All time-loss injuries during World Cup competitions (n=279) vs. European Cup competitions (n=29)

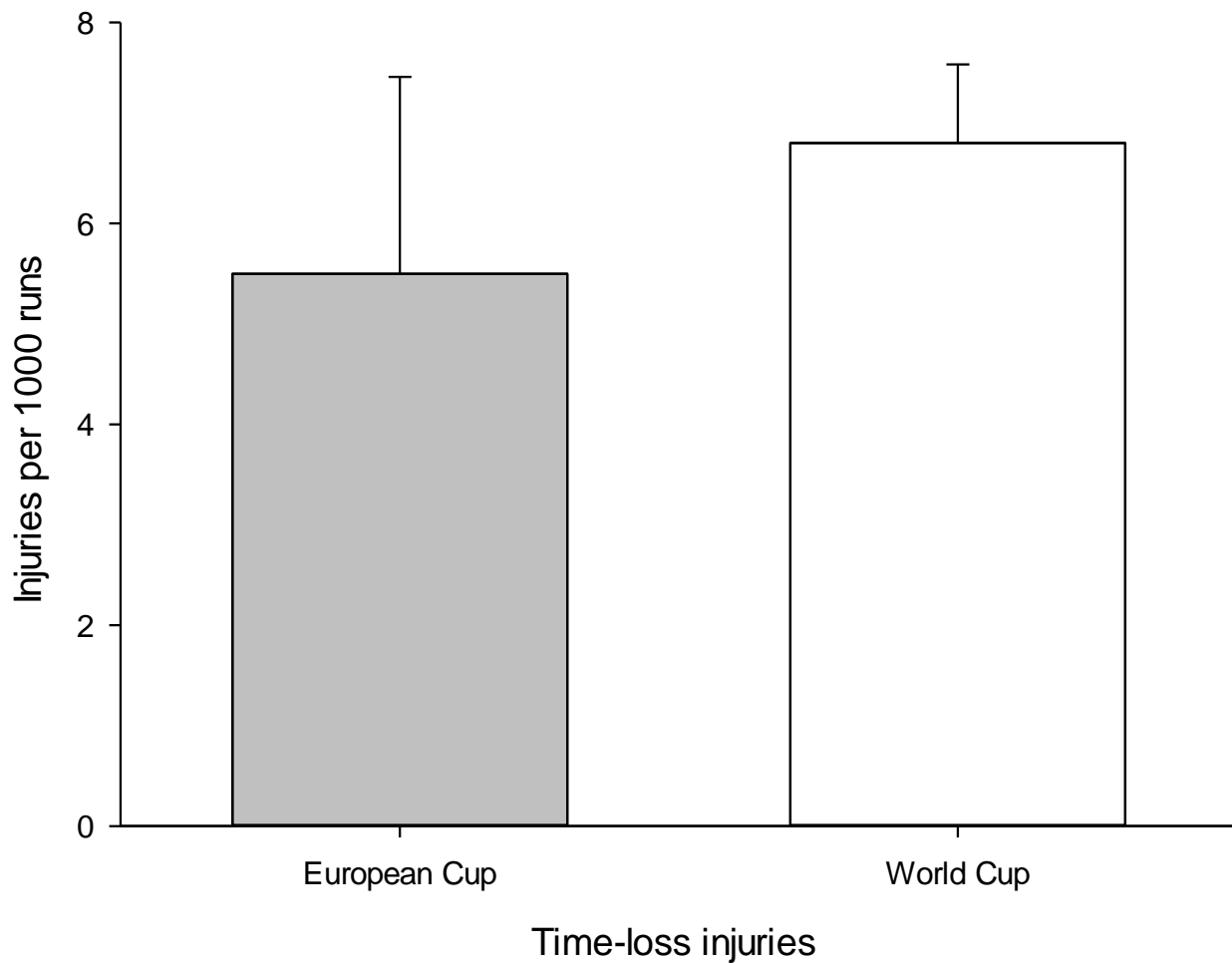


Figure 17. Time-loss injuries (absence from training or competition ≥ 1 day) expressed as number of injuries per 1000 runs in World Cup competitions (n=279) vs. European Cup competitions (n=29), including 95% confidence intervals. Note: World Cup data are from 9 seasons (2006-15) while European Cup data are from 2 seasons only (2013/14 & 2014/15).

Knee injuries and ACL total ruptures

All knee injuries and ACL total ruptures during alpine World Cup competitions vs. alpine European Cup competitions

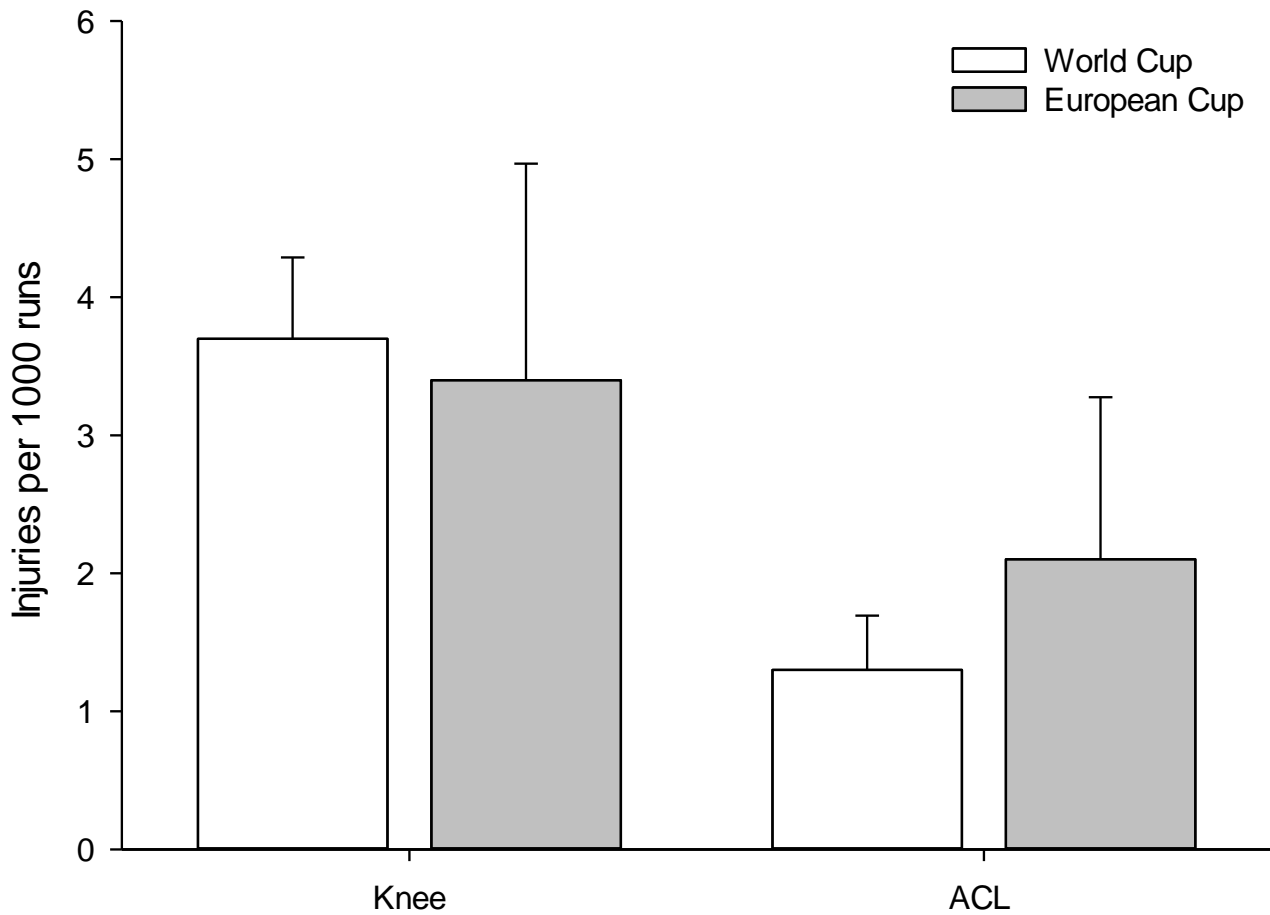


Figure 18. Knee injuries and ACL total ruptures, expressed as number of injuries per 1000 runs in World Cup competitions (knee n=148, ACL n=55) vs. European Cup competitions (knee n=18, ACL n=11), including 95% confidence intervals. Note: World Cup data are from 9 seasons (2006-15) while European Cup data are from 2 seasons only (2013/14 & 2014/15).



DJO has generously supported the International
Ski Federation Injury Surveillance System

