Anterior Cruciate Ligament Injury in National Collegiate Athletic Association Basketball and Soccer

A 13-Year Review

Julie Agel,*† MA, ATC, Elizabeth A. Arendt,† MD, and Boris Bershadsky,†‡ PhD
From the †Departments of Orthopaedic Surgery and ‡Health Services Research, University of Minnesota, Minneapolis, Minnesota

Background: Female collegiate athletes have been reported to have a higher rate of anterior cruciate ligament injury compared to male collegiate athletes. This finding has spawned a branch of research focused on understanding and preventing this injury pattern.

Purpose: To determine if the trends reported in 1994 have continued.

Study Type: Descriptive epidemiology study.

Methods: The National Collegiate Athletic Association Injury Surveillance System database was reviewed for all data relating to men's and women's basketball and soccer anterior cruciate ligament injuries for 1990 to 2002.

Results: No significant difference was seen in basketball comparing frequency of contact versus noncontact injuries between men (70.1%) and women (75.7%). Male basketball players sustained 37 contact injuries and 78 noncontact injuries. Female basketball players sustained 100 contact injuries and 305 noncontact injuries. In soccer, there was a significant difference in frequency of injury for male (49.6%) and female (58.3%) athletes when comparing contact and noncontact injuries ($\chi^2 = 4.1$, $P < .05$). Male soccer players sustained 72 contact injuries and 66 noncontact injuries. Female soccer players sustained 115 contact injuries and 161 noncontact injuries. The magnitude of the difference in injury rates between male and female basketball players (0.32-0.21, $P = .93$) remained constant, whereas the magnitude of the difference in the rate of injuries between male and female soccer players (0.16-0.21, $P = .08$) widened. Comparing injury within gender by sport, soccer players consistently sustained more anterior cruciate ligament injuries than did basketball players. The rate of anterior cruciate ligament injury for male soccer players was 0.11 compared to 0.08 for male basketball players ($P = .002$). The rate of anterior cruciate ligament injury for female soccer players was 0.33 and for female basketball players was 0.29 ($P = .04$). The rates for all anterior cruciate ligament injuries for women were statistically significantly higher ($P < .01$) than the rates for all anterior cruciate ligament injuries for men, regardless of the sport. In soccer, the rate of all anterior cruciate ligament injuries across the 13 years for male soccer players significantly decreased ($P = .02$), whereas it remained constant for female players.

Conclusions: In this sample, the rate of anterior cruciate ligament injury, regardless of mechanism of injury, continues to be significantly higher for female collegiate athletes than for male collegiate athletes in both soccer and basketball.

Clinical Relevance: Despite vast attention to the discrepancy between anterior cruciate ligament injury rates between men and women, these differences continue to exist in collegiate basketball and soccer players. Also demonstrated is that although the rate of injury for women is higher than for men, the actual rate of injury remains low and should not be a deterrent to participation in sports.

Keywords: epidemiology; anterior cruciate ligament (ACL); basketball; soccer

In 1995, Arendt and Dick[2] reviewed knee injuries among men and women in National Collegiate Athletic Association (NCAA) basketball and soccer over a 5-year period (1989-1993). The authors reported that female collegiate athletes had a significantly higher rate of ACL injury, regardless of mechanism of injury, than did male collegiate athletes in soccer (0.31 vs 0.13) and basketball (0.26 vs 0.07).

*Address correspondence to Julie Agel, MA, ATC, Department of Orthopaedic Surgery, University of Minnesota, 2450 Riverside Avenue, Suite R200, Minneapolis, MN 55454 (e-mail: agelx001@umn.edu).

No potential conflict of interest declared.

The American Journal of Sports Medicine, Vol. 33, No. 4
DOI: 10.1177/0363546504269937

Their data were obtained from the NCAA Injury Surveillance System (ISS). Begun in 1982 with the stated purpose of providing "current and reliable data on injury trends in intercollegiate athletics," ISS participation is open to all NCAA schools. There is an internal stratification in the database of the participating schools based on divisions (I, II, and III), which guarantees a minimum of 10% representation of each division for each sport. Where necessary, schools are recruited to ensure the minimum divisional representation. Injuries and exposures are reported in an anonymous fashion by the individual school's certified athletic trainer (ATC) on a weekly basis. Additional variables are collected on each injury, including the mechanism of injury, equipment worn, the position played, game or practice setting, and time into the event. Starting in 1989, a variable identifying which specific structure in the knee was injured was added.

To determine if the trends reported by Arendt and Dick[2] have continued, we reviewed the NCAA ISS from the 1989-1990 through 2001-2002 academic years. The NCAA works on a fiscal year; the year 1990 in this report represents the academic year 1989-1990. All data presented in this article will follow the same convention.

The questions explored were as follows:

1. Has the rate of male and female ACL (contact or noncontact) injury changed for collegiate basketball or soccer across this 13-year time period?
2. Has the difference in the rate of ACL (contact or noncontact) injury between male and female athletes changed in either collegiate basketball or soccer?
3. How does the rate of ACL (contact or noncontact) injury for collegiate basketball compare with that of collegiate soccer?

MATERIALS AND METHODS

The NCAA ISS database was reviewed for all data relating to men's and women's basketball and soccer injuries for the 13-year period 1990 to 2002. The variables used for analysis were ACL injury, mechanism of injury, and exposure.

Within the ISS, an injury is defined as an event requiring medical attention from the ATC or team physician that results in restriction of the student-athlete's participation for 1 or more days beyond the day of injury.

Noncontact injuries were classified as those reported to be caused by no apparent contact, contact with the ball, or contact with the floor. Those injuries reported as occurring because of contact with another person or equipment were classified as contact injuries.

Exposure was calculated by having the ATC at each participating school complete a weekly form listing the number of athletes eligible to participate in games or practices and the number of games or practices that occurred. An athlete-exposure is 1 player participating in a game or practice in which there is a possibility of an injury being sustained. Injury rates are reported per 1000 athlete-exposures.

Frequencies and rate of injury per 1000 athlete-exposures for contact and noncontact ACL injuries were calculated. Chi-square analysis was used to evaluate the differences in frequency between contact and noncontact injuries. *t* tests were used to evaluate the differences between rates of injury by sport, and linear regression analysis using 1-way analysis of variance was used to analyze trends over time. Where appropriate, 95% confidence intervals were also calculated.

These data are presented in 3 groups: all ACL injuries (regardless of injury mechanism), noncontact injuries, and contact injuries. This grouping allows for comparison in the literature that reflects a mixture of these injuries. These data combined all ACL injuries, regardless of whether the injury was reported as complete or incomplete in accordance with prior NCAA reporting methods.

To our knowledge, this is the largest series reported on a specific injury in competitive collegiate-age athletes. This study also represents the longest duration (13 years) of data collected.

A limitation of this data set is that the NCAA did not run any checks on its data at the time the data were collected. The assumption was made that all injury information received was accurate and representative of the schools involved.

RESULTS

Over this 13-year time period, there were a total of 1268 ACL injuries reported. Overall, 6176 individual schools, representing 15.6% of all the schools sponsoring these sports, participated in this project. There were 682 ACL injuries that occurred in basketball (514 women, 168 men) and 586 ACL injuries that occurred in soccer (394 women, 192 men). There were 3412 schools reporting for basketball (1722 for women and 1690 for men). There were 2764 schools reporting for soccer (1301 for women and 1463 for men). Some schools are represented more than once in the 13-year sample, but in all cases the selection was random.

Tables 1 through 4 demonstrate the number of total ACL injuries sustained in each year by sport and gender grouped by contact and noncontact mechanism of injury. Of these injuries, 334 (26%) did not have a mechanism of injury defined. The ACL injuries sustained by a noncontact mechanism ranged from a low of 29% of all ACL injuries reported for male soccer players in 1998 to a high of 100% of all ACL injuries reported for male basketball players in 1991.

No significant difference was seen in the basketball athletes when comparing frequency of contact versus noncontact injuries between men and women. In soccer, there was a significant difference in frequency of injury for male and female athletes when comparing contact to noncontact injuries ($\chi^2 = 4.1$, $P < .05$), with the majority of injuries in female athletes occurring by a noncontact mechanism.

All ACL Injuries

In basketball, the rate of all ACL injuries remained stable for both men and women across the 13 years. In soccer, the rate of all ACL injuries across the 13 years for male soccer players significantly decreased ($P = .02$), whereas it

TABLE 1
Mechanism of ACL Injuries for Women's Basketball

Year	Contact	Noncontact	Unknown	Total Mechanism Known	Overall Total	Noncontact, %[a]
1990	9	26	15	35	50	74.3
1991	7	18	9	25	34	72.0
1992	7	20	11	27	38	74.1
1993	4	19	6	23	29	82.6
1994	10	22	6	32	38	68.8
1995	10	31	6	41	47	75.6
1996	3	26	10	29	39	89.7
1997	11	22	4	33	37	66.7
1998	10	18	5	28	33	64.3
1999	15	40	13	55	68	72.7
2000	5	15	8	20	28	75.0
2001	4	19	6	23	29	82.6
2002	5	29	10	34	44	85.3

[a]Percentage noncontact is the number of noncontact divided by total mechanism known.

TABLE 2
Mechanism of ACL Injuries for Men's Basketball

Year	Contact	Noncontact	Unknown	Total Mechanism Known	Overall Total	Noncontact, %[a]
1990	1	2	4	3	7	66.7
1991	0	4	1	4	5	100.0
1992	5	3	4	8	12	37.5
1993	4	7	2	11	13	63.6
1994	3	6	3	9	12	66.7
1995	3	8	8	11	19	72.7
1996	3	9	4	12	16	75.0
1997	3	5	10	8	18	62.5
1998	1	4	5	5	10	80.0
1999	2	5	4	7	11	71.4
2000	3	9	1	12	13	75.0
2001	8	9	4	17	21	52.9
2002	1	7	3	8	11	87.5

[a]Percentage noncontact is the number of noncontact divided by total mechanism known.

TABLE 3
Mechanism of ACL Injuries for Women's Soccer

Year	Contact	Noncontact	Unknown	Total Mechanism Known	Overall Total	Noncontact, %[a]
1990	4	3	7	7	14	42.9
1991	3	7	10	10	20	70.0
1992	7	8	5	15	20	53.3
1993	6	8	7	14	21	57.1
1994	5	11	6	16	22	68.8
1995	11	9	8	20	28	45.0
1996	5	10	14	15	29	66.7
1997	15	18	9	33	42	54.5
1998	10	14	14	24	38	58.3
1999	12	17	8	29	37	58.6
2000	14	21	11	35	46	60.0
2001	8	17	14	25	39	68.0
2002	15	18	5	33	38	54.5

[a]Percentage noncontact is the number of noncontact divided by total mechanism known.

TABLE 4
Contact and Noncontact ACL Injuries for Men's Soccer

Year	Contact	Noncontact	Unknown	Total Mechanism Known	Overall Total	Noncontact, %[a]
1990	1	6	7	7	14	85.7
1991	8	7	4	15	19	46.7
1992	7	5	7	12	19	41.7
1993	7	5	4	12	16	41.7
1994	3	8	2	11	13	72.7
1995	6	6	4	12	16	50.0
1996	5	5	3	10	13	50.0
1997	4	4	6	8	14	50.0
1998	10	4	8	14	22	28.6
1999	7	4	2	11	13	36.4
2000	6	4	2	10	12	40.0
2001	5	4	3	9	12	44.4
2002	3	4	2	7	9	57.1

[a]Percentage noncontact is the number of noncontact divided by total mechanism known.

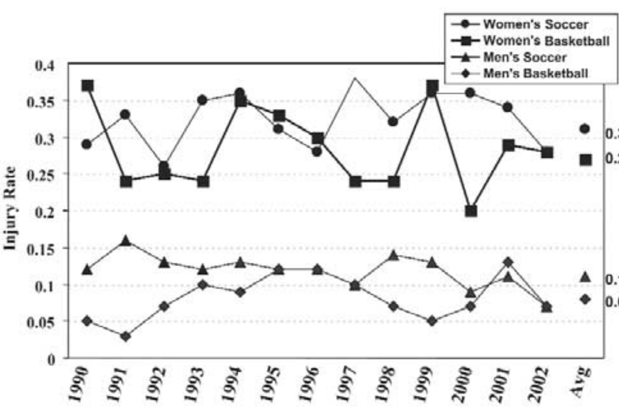

Figure 1. Exposure rate for all ACL injuries. *, mean across 13 years.

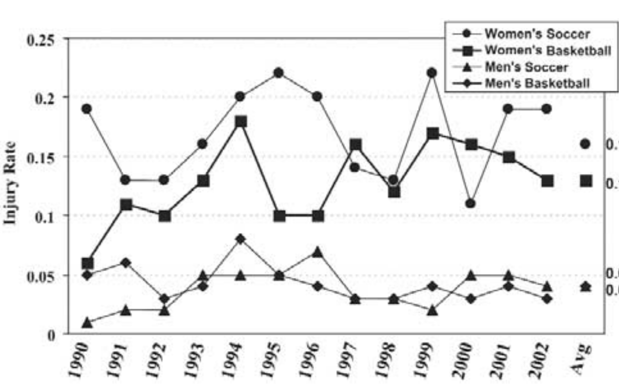

Figure 2. Exposure rate for noncontact ACL injuries. *, mean across 13 years.

remained constant for female players. The rates for all ACL injuries for female players were statistically significantly higher ($P < .01$) than the rates for all ACL injuries

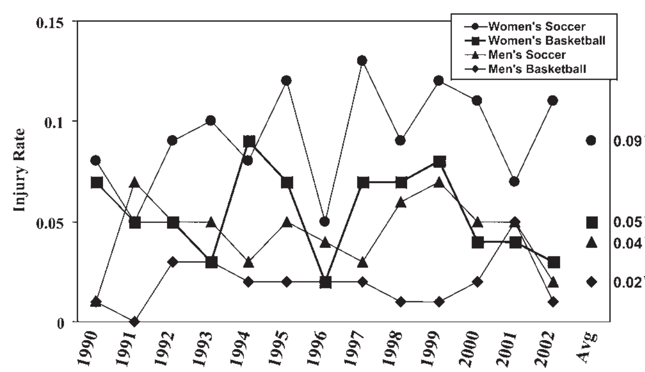

Figure 3. Exposure rate for contact ACL injuries. *, mean across 13 years.

for male players regardless of the sport (Figure 1, Table 5). The magnitude of the difference in injury rates between male and female basketball players remained constant, whereas the magnitude of the difference in the rate of injuries between male and female soccer players widened but did not achieve statistical significance ($P = .08$). Confidence intervals for these data are shown in the online appendixes (available at www.ajsm.org/cgi/content/33/4/524/DC1). Male soccer players (0.11) sustained a statistically significantly higher rate of ACL injuries than did male basketball players (.08; $P = .002$). Female soccer players (0.31) sustained a statistically significantly higher rate of ACL injuries than did female basketball players (0.27; $P = .04$).

Noncontact ACL Injuries

Rates of noncontact ACL injuries for female soccer and basketball players remained constant. The mean rate of noncontact ACL injuries for female soccer players across the 13 years was 1/7692, and for female basketball players the rate was 1/6250. For men, noncontact ACL injuries in

TABLE 5
ACL Injury Rate by Gender[a]

Year	Female Basketball Injury Rate	Male Basketball Injury Rate	Female-Male Basketball Rate Ratio	Confidence Interval	Female Soccer Injury Rate	Male Soccer Injury Rate	Female-Male Soccer Rate Ratio	Confidence Interval
1990	0.37	0.05	7.75	3.52-17.1	0.29	0.12	2.40	1.14-5.02
1991	0.24	0.03	8.39	3.28-21.45	0.33	0.16	2.07	1.11-3.91
1992	0.25	0.07	3.65	1.91-6.99	0.26	0.13	2.07	1.10-3.87
1993	0.24	0.10	2.52	1.31-4.85	0.35	0.12	2.97	1.55-5.69
1994	0.35	0.09	3.69	1.93-7.07	0.36	0.13	2.80	1.41-5.56
1995	0.33	0.12	2.74	1.57-4.55	0.31	0.12	2.54	1.37-4.69
1996	0.30	0.12	2.55	1.43-4.56	0.28	0.12	2.44	1.27-4.7
1997	0.24	0.10	2.37	1.35-4.16	0.38	0.10	3.72	2.03-6.81
1998	0.24	0.07	3.57	1.76-7.24	0.32	0.14	2.34	1.39-3.96
1999	0.37	0.05	7.08	3.74-13.38	0.36	0.13	2.77	1.47-5.21
2000	0.20	0.07	2.74	1.42-5.29	0.36	0.09	3.98	2.11-7.51
2001	0.29	0.13	2.25	1.28-3.94	0.34	0.11	3.03	1.59-5.79
2002	0.28	0.07	4.24	2.34-8.78	0.28	0.07	3.95	1.91-8.16
Total	0.27	0.08	3.59	2.99-4.24	0.31	0.11	2.78	2.33-3.29

[a]Rate = (number of injuries/number of exposures) × 1000.

TABLE 6
Noncontact ACL Injury Rate by Gender[a]

Year	Female Basketball Injury Rate	Male Basketball Injury Rate	Female-Male Basketball Rate Ratio	Confidence Interval	Female Soccer Injury Rate	Male Soccer Injury Rate	Female-Male Soccer Rate Ratio	Confidence Interval
1990	0.19	0.01	14.11	3.35-59.46	0.06	0.05	1.20	0.3-4.79
1991	0.13	0.02	5.55	1.88-16.40	0.11	0.06	1.97	0.69-5.61
1992	0.13	0.02	7.69	2.29-25.89	0.10	0.03	3.14	1.03-9.6
1993	0.16	0.05	3.07	1.29-7.29	0.13	0.04	3.62	1.18-11.06
1994	0.20	0.05	4.28	1.73-10.55	0.18	0.08	2.28	0.92-5.66
1995	0.22	0.05	4.30	1.98-9.35	0.10	0.05	2.18	0.77-6.11
1996	0.20	0.07	3.02	1.42-6.45	0.10	0.04	2.19	0.75-6.41
1997	0.14	0.03	5.07	1.92-13.38	0.16	0.03	5.58	1.89-16.49
1998	0.13	0.03	4.87	1.65-14.38	0.12	0.03	4.75	1.56-14.43
1999	0.22	0.02	9.16	3.62-23.22	0.17	0.04	4.14	1.39-12.3
2000	0.11	0.05	2.12	0.93-4.84	0.16	0.03	5.45	1.87-15.88
2001	0.19	0.05	3.44	1.56-7.6	0.15	0.04	3.97	1.34-11.79
2002	0.19	0.04	4.39	1.93-10.03	0.13	0.03	4.20	1.42-12.43
Total	0.16	0.04	4.59	3.55-5.84	0.13	0.04	3.31	2.47-4.38

[a]Rate = (number of injuries/number of exposures) × 1000.

soccer and basketball averaged 1/25 000. The rates for all noncontact ACL injuries for women were significantly higher than the rates for all noncontact ACL injuries for men, regardless of the sport ($P < .01$). The magnitude of the difference of noncontact ACL injury rates between men and women showed no change in the difference of rates for either soccer or basketball players (Figure 2, Table 6). Male soccer players (0.04) sustained no significantly different rate of noncontact ACL injury over time to that of male basketball players (0.04). Female basketball players (0.16) sustained a statistically significantly higher rate of noncontact ACL injuries than did female soccer players (0.13; $P = .008$).

Contact ACL Injuries

The rate of contact injuries for male and female basketball and soccer players did not demonstrate any significant change across the 13 years (Figure 3, Table 7). The mean rate of contact ACL injuries for female soccer players was 1/11 111 and for female basketball players was 1/20 000. The mean rate of contact ACL injuries for male soccer players was 1/25 000 and for male basketball players was 1/50 000. The rates for all contact ACL injuries for women were significantly higher than the rates for all men, regardless of the sport ($P < .01$). The difference in rates between the male and female athletes remained constant

TABLE 7
Contact ACL Injury Rate by Gender[a]

Year	Female Basketball Injury Rate	Male Basketball Injury Rate	Female-Male Basketball Rate Ratio	Confidence Interval	Female Soccer Injury Rate	Male Soccer Injury Rate	Female-Male Soccer Rate Ratio	Confidence Interval
1990	0.07	0.01	9.77	1.24-77.7	0.08	0.01	9.58	1.07-85.74
1991	0.05	0.00	0.00		0.05	0.07	0.74	0.20-2.78
1992	0.05	0.03	1.62	0.51-5.1	0.09	0.05	1.96	0.69-5.6
1993	0.03	0.03	1.13	0.28-4.52	0.10	0.05	1.94	0.65-5.77
1994	0.09	0.02	3.89	1.07-14.13	0.08	0.03	2.76	0.66-11.59
1995	0.07	0.02	3.70	1.02-13.43	0.12	0.05	2.66	0.73-4.27
1996	0.02	0.02	1.05	0.21-5.18	0.05	0.04	1.10	0.32-3.78
1997	0.07	0.02	4.22	1.18-15.14	0.13	0.03	4.65	1.54-14.02
1998	0.07	0.01	10.82	1.38-84.5	0.09	0.06	1.36	0.71-4.08
1999	0.08	0.01	8.59	1.96-37.57	0.12	0.07	1.67	0.66-4.24
2000	0.04	0.02	2.12	0.51-8.87	0.11	0.05	2.42	0.93-6.31
2001	0.04	0.05	0.81	0.25-2.70	0.07	0.05	1.49	0.49-4.57
2002	0.03	0.01	5.30	0.62-45.40	0.11	0.02	4.67	1.35-16.14
Total	0.06	0.02	3.17	2.16-4.59	0.10	0.04	2.17	1.61-2.89

[a]Rate = (number of injuries/number of exposures) × 1000.

in both basketball and soccer. The rate of contact ACL injury for male soccer players (0.04) was twice as high as that for male basketball players (0.02; $P = .0003$). The rate of contact ACL injury for female soccer players (0.10) was almost twice as high as that for female basketball players (0.06; $P = .0006$).

The online appendixes (available at www.ajsm.org/cgi/content/33/4/524/DC1) contain tables with the details of the actual number of injuries by year, sport, and gender, as well as the number of exposures.

DISCUSSION

The literature reports that the frequency of noncontact injuries is 70% of all ACL injuries sustained.[7] This data set showed a range of noncontact injuries from 29% to 100% across the 13 years and both sports and genders. Female athletes averaged 67% noncontact injuries, and male athletes averaged 58% noncontact ACL injuries, slightly lower than that previously reported. The large percentage of injuries in this sample that had no known mechanism of injury makes it difficult for us to confirm the information in the literature.

In this representative sample of NCAA schools, the rate of ACL injury, regardless of mechanism of injury, continued to be significantly higher for female collegiate athletes than for male collegiate athletes in both soccer and basketball. No narrowing of the difference appeared to have occurred despite vigorous efforts to address this concern. Since the publication of the original article addressing this information in 1995, much time and energy have been expended in attempts to understand why this difference exists.[1,4-6]

If the theory that lack of experience[3,5] for the female athlete is a reason for ACL injury had validity, one would expect with the existence of Title IX[10] that some decrease in ACL injury to female athletes would be evident. If the theories of poor mechanics or neuromuscular control[8,9] were to have validity, one would expect to see some evidence of change in the rate of injury over the years of study. Although we cannot identify the training regimens the schools in this study followed, one could assume that one would see some change in some aspect of the injury rates.

The overall rate of ACL injury for male soccer players did demonstrate a decrease ($P = .02$), but we are unable to explain the reason for this based on the data available to us.

When comparing injury results within gender by sport, soccer players consistently sustained more ACL injuries than did basketball players. The narrowing of the difference of rate of injury between basketball and soccer in our group of all ACL injuries, which was not demonstrated in either the noncontact or contact injury groups, may be because of the high number of injuries included for which the injury mechanism remains unknown.

Little attention has been paid to the fact that male athletes also sustain ACL injuries, and the cause of their noncontact injuries also remains unknown. Investigation into the cause of ACL injury, regardless of gender, may help shed light on the differences in rates between genders. The fact that male soccer athletes had a decrease in overall rate of injury merits specific consideration.

The rate of contact or noncontact ACL injury has remained stable in collegiate basketball and soccer over a 13-year time span. There are significantly more noncontact than contact injuries in soccer, with the higher frequency of those injuries occurring to the women. The rate of overall ACL injury as well as contact injury remains higher in both male and female soccer players than in basketball players. Soccer athletes consistently sustained more ACL injuries than did basketball players when compared by gender.

The rate of ACL injuries in female athletes has received significant amounts of discussion, particularly in relation to the rate of ACL injuries in male athletes. It is important to remember that over a 13-year period, there were 908 ACL injuries reported in female collegiate basketball and soccer players over 3 006 726 exposures.

ACKNOWLEDGMENT

The authors wish to acknowledge Randall W. Dick (NCAA) and the ATCs who contributed the data.

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APPENDIX A
Women's Basketball

Year	Total Number of ACL Injuries	Exposure	Total Rate	95% Confidence Interval[a]
1990	50	135 993	0.37	0.26 to 0.47
1991	34	139 326	0.24	0.16 to 0.33
1992	38	151 823	0.25	0.17 to 0.33
1993	29	119 981	0.24	0.15 to 0.33
1994	38	109 180	0.35	0.24 to 0.46
1995	47	142 909	0.33	0.23 to 0.43
1996	39	129 395	0.30	0.21 to 0.40
1997	37	156 739	0.24	0.16 to 0.31
1998	33	135 561	0.24	0.16 to 0.33
1999	68	182 902	0.37	0.28 to 0.46
2000	28	137 555	0.20	0.13 to 0.28
2001	29	101 075	0.29	0.18 to 0.39
2002	44	155 291	0.28	0.20 to 0.37
Total	514	1 797 730	0.27	0.26 to 0.31

[a]Includes injuries with known and unknown mechanism of injuries.

APPENDIX B
Men's Basketball

Year	Total Number of ACL Injuries	Exposure	Total Rate	95% Confidence Interval[a]
1990	7	147 613	0.05	0.01 to 0.08
1991	5	171 863	0.03	0.00 to 0.06
1992	12	175 217	0.07	0.03 to 0.11
1993	13	135 555	0.10	0.04 to 0.15
1994	12	127 381	0.09	0.04 to 0.15
1995	19	158 480	0.12	0.07 to 0.18
1996	16	135 292	0.12	0.06 to 0.18
1997	18	180 555	0.10	0.05 to 0.15
1998	10	146 611	0.07	0.03 to 0.11
1999	11	209 454	0.05	0.02 to 0.08
2000	13	174 935	0.07	0.03 to 0.12
2001	21	164 558	0.13	0.07 to 0.18
2002	11	164 710	0.07	0.03 to 0.11
Total	168	2 092 224	0.08	0.07 to 0.09

[a]Includes injuries with known and unknown mechanism of injuries.

APPENDIX C
Women's Soccer

Year	Total Number of ACL Injuries	Exposure	Total Rate	95% Confidence Interval[a]
1990	14	48 339	0.29	0.14 to 0.44
1991	20	61 125	0.33	0.18 to 0.47
1992	20	77 071	0.26	0.14 to 0.38
1993	21	60 453	0.35	0.20 to 0.50
1994	22	61 840	0.36	0.20 to 0.51
1995	28	90 377	0.31	0.19 to 0.43
1996	29	102 836	0.28	0.18 to 0.39
1997	42	111 887	0.38	0.26 to 0.49
1998	38	117 026	0.33	0.22 to 0.43
1999	37	101 667	0.36	0.24 to 0.48
2000	46	128 294	0.36	0.25 to 0.46
2001	39	114 575	0.34	0.23 to 0.45
2002	38	133 504	0.29	0.19 to 0.38
Total	394	1 208 994	0.31	0.29 to 0.36

[a]Includes injuries with known and unknown mechanism of injuries.

APPENDIX D
Men's Soccer

Year	Total Number of ACL Injuries	Exposure	Total Rate	95% Confidence Interval[a]
1990	14	115 803	0.12	0.06 to 0.19
1991	19	120 187	0.16	0.09 to 0.23
1992	19	151 224	0.13	0.07 to 0.18
1993	16	136 746	0.12	0.06 to 0.18
1994	13	102 401	0.13	0.06 to 0.20
1995	16	131 092	0.12	0.06 to 0.18
1996	13	112 635	0.12	0.05 to 0.18
1997	14	138 769	0.10	0.05 to 0.16
1998	22	158 820	0.14	0.08 to 0.20
1999	13	98 998	0.13	0.06 to 0.20
2000	12	133 213	0.09	0.04 to 0.14
2001	12	106 940	0.11	0.05 to 0.18
2002	9	124 746	0.07	0.02 to 0.12
Total	192	1 631 574	0.11	0.10 to 0.14

[a]Includes injuries with known and unknown mechanism of injuries.