Original Sample Summary Report

NATIONAL HIGH SCHOOL SPORTS-RELATED INJURY SURVEILLANCE STUDY

2021-22 School Year

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ACKNOWLEDGEMENTS

We thank the certified athletic trainers (ATs) for their hard work and dedication in providing us with complete and accurate data. Without their efforts, this study would not have been possible. We would like to thank the National Federation of State High School Associations (NFHS) for their support of this project. The content of this report was funded in part by the Centers for Disease Control and Prevention (CDC) grants #R49/CE000674-01 and #R49/CE001172-01. The content of this report is solely the responsibility of the authors and does not necessarily represent the official views of the CDC. We would also like to acknowledge the generous research funding contributions of the NFHS, NFHS Foundation, National Operating Committee on Standards for Athletic Equipment (NOCSAE), and DonJoy Orthotics.

NOTE

The analyses presented here provide only a brief summary of collected data, with the feasibility of a more detailed presentation limited by the extensive breadth and detail contained in the dataset. The principal investigator, Dr. Christy Collins, is happy to provide further information or to discuss research partnership opportunities upon request.

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I. Introduction & Methodology

1.1 Project Overview

To combat the epidemic of obesity among youth in the United States (US), adolescents must be encouraged to participate in physically active sports, recreation, and leisure activities. Participation in high school sports, one of the most popular physical activities among adolescents, has grown rapidly from an estimated 4.0 million participants in 1971-72 to over 7.6 million in 2021-22. While the health benefits of a physically active lifestyle including participating in sports are undeniable, high school athletes are at risk of sports-related injury because a certain endemic level of injury can be expected among participants of any physical activity. The challenge to injury epidemiologists is to reduce injury rates among high school athletes to the lowest possible level without discouraging adolescents from engaging in this important form of physical activity. This goal can best be accomplished by investigating the etiology of preventable injuries; by developing, implementing, and evaluating protective interventions using science-based evidence; and by responsibly reporting epidemiologic findings while promoting a physically active lifestyle among adolescents.

1.2 Background and Significance

High school sports play an important role in the adoption and maintenance of a physically active lifestyle among millions of US adolescents. Too often injury prevention in this population is overlooked as sports-related injuries are thought to be unavoidable. In reality, sports-related injuries are largely preventable through the application of preventive interventions based on evidence-based science. The morbidity, mortality, and disability caused by high school sports-related injuries can be reduced through the development of effective prevention strategies and through programmatic decisions based on injury prevention. However, such efforts rely upon accurate national estimates of injury incidence, injury rate calculations, and risk and protective factor data. Previously, no injury surveillance system capable of providing researchers with the needed quality of injury and exposure data for high school sports-related injuries existed.

Since the 2005-06 school year, the National High School Sports-Related Injury Surveillance Study has monitored injuries among US high school athletes participating in boys' football, boys' and girls' soccer, girls' volleyball, boys' and girls' basketball, boys' wrestling, boys' baseball, and girls' softball. Other sports were added in subsequent years including girls' field hockey, girls' gymnastics, boys' volleyball, boys' ice hockey, boys' and girls' lacrosse, boys' and girls' swimming & diving, boys' and girls' track & field, boys' and girls' tennis, boys' and girls' cross country, and cheerleading (boys' volleyball, girls' gymnastics, and boys' and girls' tennis are no longer under surveillance). The study data have been collected using the time- and cost-efficient RIO™ (Reporting Information Online) surveillance system. Through the generous contributions of the National Federation of State High School Associations (NFHS) and the NFHS Foundation, the National High School Sports-Related Injury Surveillance Study was able to be continued during the 2021-22 school year. Previous years of this study were funded by the Centers for Disease Control and Prevention (CDC), National Federation of State High School Associations (NFHS), the National Operating Committee on Standards for Athletic Equipment (NOCSAE), the Research Institute at Nationwide Children's Hospital, DonJoy Orthotics, EyeBlack, and The Ohio State University.

During the 2019-20 school year, the National High School Sports-Related Injury Surveillance Study transitioned from Dr. Dawn Comstock at the University of Colorado to Dr. Christy Collins at the Datalys Center for Sports Injury Research and Prevention, Inc. Dr. Collins worked with Dr. Comstock on the National High School Sports-Related Injury Surveillance Study during the 2005-06 through 2013-14 school years and is carrying on the important work of this surveillance system.

1.3 Specific Aims

The continuing objectives of this study are to maintain the National High School Sports-Related Injury Surveillance Study among a nationally representative sample of US high schools. The specific aims of this study are:

A. To determine the incidence (number) of injuries among US high school boys' football, boys' and girls' soccer, girls' volleyball, boys' and girls' basketball, boys' wrestling, boys' baseball, and girls' softball athletes.
B. To calculate the rate of injuries per 1,000 athlete-competitions, per 1,000 athlete-practices, and per 1,000 athlete-exposures for US high school athletes in the 9 sports of interest.
C. To provide detailed information about the injuries sustained by US high school athletes including the type, site, severity, initial and subsequent treatment/care, outcome, etc.
D. To provide detailed information about the injury events including athlete demographics, position played, phase of play/activity, etc.
E. To identify potential risk or protective factors.
F. To compare injury rates and patterns from the 2005-06 through the 2021-22 school years.

1.4 Project Design

The National High School Sports-Related Injury Surveillance Study defined an injury as:

A. An injury that occurred as a result of participation in an organized high school competition or practice, and
B. Required medical attention by a team physician, certified athletic trainer, personal physician, or emergency department/urgent care facility, and
C. Resulted in restriction of the high school athlete's participation for one or more days beyond the day of injury, OR
D. Any fracture, concussion, dental injury, or exertional heat event regardless of whether or not it resulted in restriction of the student-athlete's participation.

An athlete exposure was defined as one athlete participating in one practice or competition where he or she is exposed to the possibility of athletic injury. Exposure was expressed in two parts:

A. Number of athlete-practices = the sum of the number of athletes at each practice during the past week. For example, if 20 athletes practiced on Monday through Thursday and 18 practiced on Friday, the number of athlete-practices would equal 98.
B. Number of athlete-competitions = the sum of the number of athletes at each competition during the past week. For example, if 9 athletes played in a freshman game, 12 in a junior varsity game, and 14 in a varsity game, the number of athlete-competitions would equal 35.

1.5 Sample Recruitment

Certified athletic trainers (AT) who provide care to high school athletes were eligible to participate. Each eligible AT received an email introducing the study and inviting them to participate. All high schools with an AT willing to serve as a reporter were categorized into 8 sampling strata by geographic location (northeast, midwest, south, and west) and high school size (enrollment <= 1,000 or > 1,000 students). Participant schools were then randomly selected from each substrata to obtain 100 study schools. To maintain a nationally representative sample, if a school dropped out of the study, another school from the same stratum was randomly selected for replacement. Participating ATs were offered a $300-$350 honorarium depending on the number of sports reported along with an individualized injury report and 10 Category B CEUs following the study's conclusion.

1.6 Data Collection

ATs enrolled in the National High School Sports-Related Injury Surveillance Study received an email every Monday throughout the study period reminding them to enter their school's data into the RIO surveillance system. Each participating AT was asked to complete 48 weekly exposure reports: one for each week from July 26, 2021 through June 26, 2022. Exposure reports collected exposure information (number of athlete-competitions, athlete-practices, and athlete-performances for cheerleading) and the number of reportable injuries sustained by student athletes for each sport currently in session at their school. For each reportable injury, the AT was asked to complete an injury report. The injury report collected detailed information about the injured player (e.g., age, year in school, etc.), the injury (e.g., site, type, severity, etc.) and the injury event (e.g., position played, phase of play, etc.). The internet-based surveillance tool provided ATs with the ability to view all their submitted data throughout the study and update reports as needed (e.g., need for surgery, days till resuming play, etc.).

1.7 Data Management

In an effort to decrease loss-to follow up, a log of reporters' utilization of the internet-based injury surveillance system was maintained throughout the study period. Reporters who repeatedly failed to complete the weekly exposure and injury reports or who had errors with their reporting were contacted by the study staff and either reminded to report, asked to correct errors, or assessed for their willingness to continue participating in the study.

1.8 Data Analysis

Data were analyzed using SAS software, version 9.4. Although fractures, concussions, dental injuries, and exertional heat events resulting in <1 day time loss were collected, unless otherwise noted, analyses in this report excluded these injuries. With the exception of injury rates, data were weighted for all analyses to produce national estimates. For each sport in each stratum, weights account for the total number of US high schools offering the sport and the average number of participating study schools reporting each week for that sport. For example, following is the algorithm used to calculate football weights for the small (enrollment <= 1,000) west stratum:

$$\text{weight} = \frac{\text{national total \# of small west US high schools}}{\text{average \# of small west participating schools reporting football each week}}$$

Injury rates were calculated as the ratio of unweighted case counts per 1,000 athlete-exposures, and they were compared using rate ratios (RR) with 95% confidence intervals (CIs). Following is an example of the RR calculation comparing the rate of injury in boys' soccer to the rate of injury in girls' soccer:

$$\text{RR} = \frac{\text{\# boys' soccer injuries / total \# boys' soccer athlete-exposures}}{\text{\# girls' soccer injuries / total \# girls' soccer athlete-exposures}}$$

Injury proportions were compared using injury proportion ratios (IPR) and corresponding 95% CIs adjusted to account for the sampling weights and the complex sampling design. Following is an example of the IPR calculation comparing the proportion of male soccer concussions to the proportion of female soccer concussions:

$$\text{IPR} = \frac{\text{\# boys' soccer concussions / total \# boys' soccer injuries}}{\text{\# girls' soccer concussions / total \# girls' soccer injuries}}$$

An RR or IPR >1.00 suggests a risk association while an RR or IPR <1.00 suggests a protective association. CIs not including 1.00 were considered statistically significant. Injury rates over time were compared using linear regression and testing for trend.

II. Overall Injury Epidemiology

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Table 2.1 Injury Rates by Sport and Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	Event Type	# Injuries	# Exposures	Injury Rate (per 1,000 AEs)	Nationally Estimated # Injuries
Overall	***Total***	***3,350***	***1,419,981***	***2.36***	***1,385,717***
	Competition	1,866	412,371	4.53	766,617
	Practice	1,484	1,007,610	1.47	619,100
Boys' Football	***Total***	***1,331***	***322,724***	***4.12***	***478,688***
	Competition	767	57,801	13.27	276,694
	Practice	564	264,923	2.13	201,994
Boys' Soccer	***Total***	***257***	***146,032***	***1.76***	***174,322***
	Competition	165	43,904	3.76	111,007
	Practice	92	102,128	0.90	63,315
Girls' Soccer	***Total***	***288***	***122,927***	***2.34***	***168,680***
	Competition	198	38,917	5.09	118,572
	Practice	90	84,010	1.07	50,108
Girls' Volleyball	***Total***	***160***	***127,676***	***1.25***	***68,994***
	Competition	75	45,021	1.67	30,805
	Practice	85	82,655	1.03	38,189
Boys' Basketball	***Total***	***328***	***187,848***	***1.75***	***101,263***
	Competition	181	59,043	3.07	53,165
	Practice	147	128,805	1.14	48,098
Girls' Basketball	***Total***	***323***	***133,160***	***2.43***	***111,665***
	Competition	165	41,691	3.96	51,976
	Practice	158	91,469	1.73	59,689
Boys' Wrestling	***Total***	***355***	***120,131***	***2.96***	***142,959***
	Competition	164	30,433	5.39	64,629
	Practice	191	89,698	2.13	78,330

Boys' Baseball	***Total***	***151***	***157,883***	***0.96***	***63,115***
	Competition	80	58,771	1.36	29,855
	Practice	71	99,112	0.72	33,260
Girls' Softball	***Total***	***157***	***101,600***	***1.55***	***76,031***
	Competition	71	36,790	1.93	29,914
	Practice	86	64,810	1.33	46,117

* Only includes injuries resulting in ≥1 day time loss. COVID-19 may have affected these results.

Table 2.2 Proportion of Injuries Resulting in Time Loss, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	< 1 Day Time Loss	≥ 1 Day Time Loss	Time Loss Data Missing	Total
	%	%	%	%
Overall	***0.9%***	***95.2%***	***3.9%***	***100.0%***
Boys' Football	1.3%	95.4%	3.3%	100.0%
Boys' Soccer	1.8%	94.8%	3.3%	100.0%
Girls' Soccer	0.3%	92.6%	7.1%	100.0%
Girls' Volleyball	0.6%	95.2%	4.2%	100.0%
Boys' Basketball	0.6%	96.2%	3.2%	100.0%
Girls' Basketball	0.3%	95.0%	4.7%	100.0%
Boys' Wrestling	0.0%	95.9%	4.1%	100.0%
Boys' Baseball	2.5%	93.8%	3.7%	100.0%
Girls' Softball	0.0%	97.5%	2.5%	100.0%

* By study definition, non-time loss injuries were fractures, concussions, dental injuries, and exertional heat events that resulted in < 1 day time loss. Because they accounted for a small proportion of all injuries overall, they are not included in any other analyses. COVID-19 may have affected these results.

Table 2.3 Demographic Characteristics of Injured Athletes by Sex, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	Male		Female	
Year in School	**n**	**%**	**n**	**%**
Freshman	214,659	23.4%	98,798	24.1%
Sophomore	222,753	24.3%	119,143	29.0%
Junior	245,011	26.7%	86,826	21.2%
Senior	234,377	25.6%	105,435	25.7%
Total **	***916,801***	***100.0%***	***410,202***	***100.0%***

Age (years)		
Minimum	10	12
Maximum	19	19
Mean (SD)	15.9 (1.2)	15.8 (1.2)
n	784,906	294,542

BMI		
Minimum	14.1	15.4
Maximum	50.8	51.9
Mean (SD)	24.9 (5.0)	22.9 (4.3)
n	608,183	224,859

* All remaining analyses in this chapter present data weighted to provide national injury estimates. COVID-19 may have affected these results.
** Throughout this chapter, totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Figure 2.1 Injury Diagnosis by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year

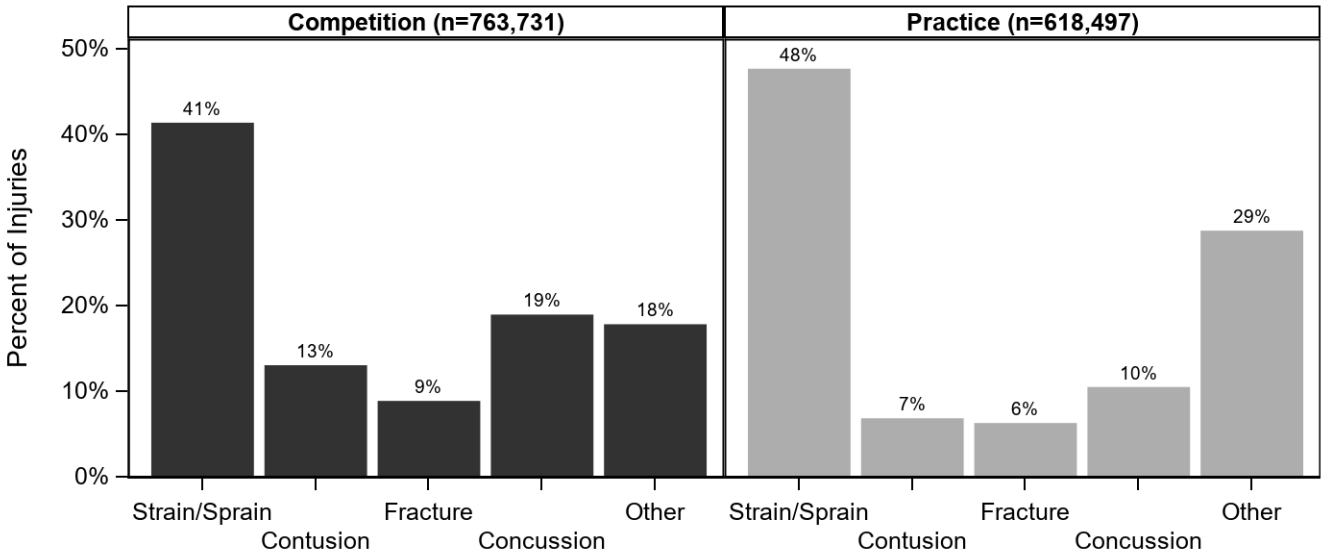


Table 2.4 Body Site of Injury by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	Competition		Practice		Overall	
Body Site	**n**	**%**	**n**	**%**	**n**	**%**
Head/Face	160,462	20.9%	86,296	14.0%	246,758	17.8%
Ankle	124,239	16.2%	119,835	19.4%	244,074	17.6%
Knee	129,211	16.9%	77,316	12.5%	206,527	14.9%
Hip/Thigh/Upper Leg	71,031	9.3%	73,930	12.0%	144,961	10.5%
Shoulder	56,147	7.3%	42,607	6.9%	98,755	7.1%
Hand/Wrist	53,498	7.0%	43,959	7.1%	97,458	7.0%
Trunk	38,653	5.0%	32,031	5.2%	70,684	5.1%
Foot	39,582	5.2%	26,207	4.2%	65,789	4.7%
Lower Leg	26,861	3.5%	32,818	5.3%	59,679	4.3%
Systemic	15,164	2.0%	44,425	7.2%	59,589	4.3%
Arm/Elbow	30,489	4.0%	27,717	4.5%	58,206	4.2%
Other	11,163	1.5%	5,808	0.9%	16,971	1.2%
Neck	10,116	1.3%	5,607	0.9%	15,722	1.1%
Total	***766,616***	***100.0%***	***618,556***	***100.0%***	***1,385,172***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries. COVID-19 may have affected these results.

Table 2.5 Most Commonly Injured Ankle Structures, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	Male (n=147,669)		Female (n=90,093)		Overall (n=237,762)	
Ankle Ligament Injuries	**n**	**%**	**n**	**%**	**n**	**%**
Anterior Talofibular Ligament	103,139	69.8%	66,317	73.6%	169,456	71.3%
Calcaneofibular Ligament	57,614	39.0%	36,510	40.5%	94,124	39.6%
Anterior Tibiofibular Ligament	26,112	17.7%	22,457	24.9%	48,569	20.4%
Posterior Talofibular Ligament	15,506	10.5%	9,914	11.0%	25,420	10.7%
Deltoid Ligament	9,702	6.6%	9,073	10.1%	18,775	7.9%
Posterior Tibiofibular Ligament	5,551	3.8%	5,455	6.1%	11,006	4.6%

* Multiple ligament responses allowed per injury report. Totals and n's are not always equal due to slight rounding of the weighted number of injuries and missing responses. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries. COVID-19 may have affected these results.

Table 2.6 Most Commonly Injured Knee Structures, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	Male (n=138,113)		Female (n=63,745)		Overall (n=201,858)	
Knee Ligament Injuries	**n**	**%**	**n**	**%**	**n**	**%**
Medial Collateral Ligament	33,074	23.9%	17,006	26.7%	50,080	24.8%
Patella and/or Patellar Tendon	30,363	22.0%	16,508	25.9%	46,871	23.2%
Anterior Cruciate Ligament	28,953	21.0%	11,858	18.6%	40,811	20.2%
Torn Cartilage (Meniscus)	28,057	20.3%	12,421	19.5%	40,478	20.1%
Lateral Collateral Ligament	11,670	8.4%	1,838	2.9%	13,508	6.7%
Posterior Cruciate Ligament	4,377	3.2%	1,428	2.2%	5,805	2.9%

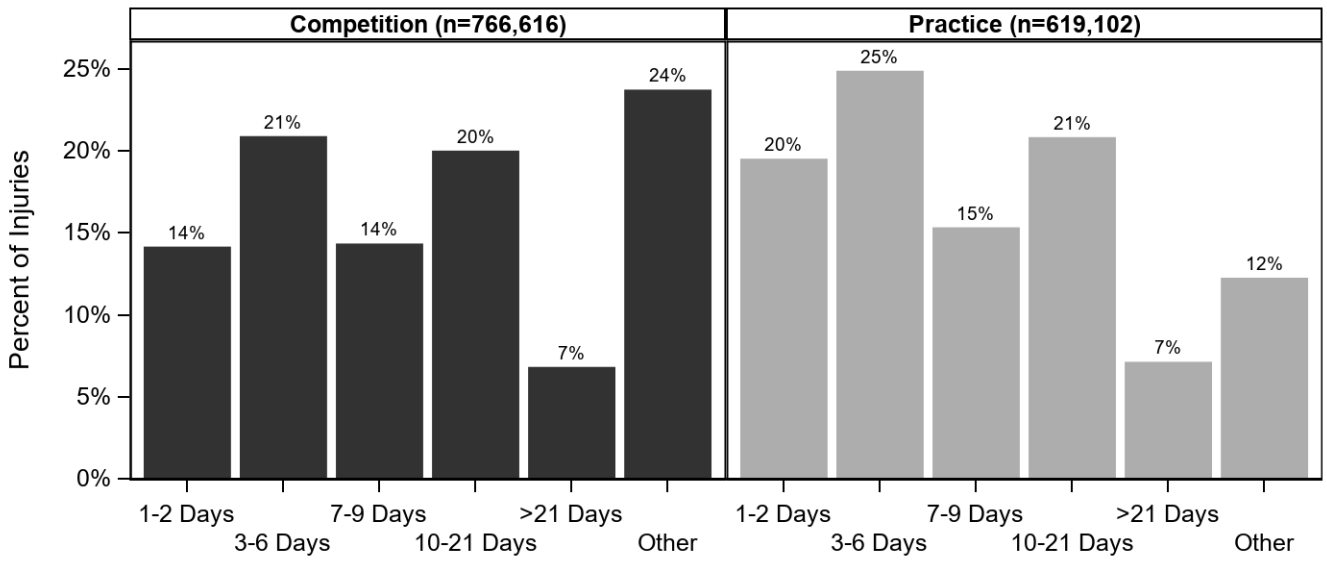
* Multiple ligament responses allowed per injury report. Totals and n's are not always equal due to slight rounding of the weighted number of injuries and missing responses. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries. COVID-19 may have affected these results.

Table 2.7 Ten Most Common Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	Competition (n=763,728)		Practice (n=617,945)		Overall (n=1,381,680)	
Diagnosis	**n**	**%**	**n**	**%**	**n**	**%**
Ankle Strain/Sprain	111,383	14.6%	108,924	17.6%	220,307	15.9%
Head/Face Concussion	144,664	18.9%	64,844	10.5%	209,507	15.2%
Hip/Thigh/Upper Leg Strain/Sprain	47,080	6.2%	66,604	10.8%	113,684	8.2%
Knee Strain/Sprain	63,609	8.3%	33,694	5.5%	97,303	7.0%
Knee Other	41,003	5.4%	30,758	5.0%	71,761	5.2%
Systemic Other	15,164	2.0%	44,425	7.2%	59,589	4.3%
Shoulder Other	31,151	4.1%	22,965	3.7%	54,117	3.9%
Hand/Wrist Fracture	27,579	3.6%	15,925	2.6%	43,504	3.1%
Shoulder Strain/Sprain	23,539	3.1%	18,491	3.0%	42,030	3.0%
Knee Contusion	21,050	2.8%	12,078	2.0%	33,128	2.4%

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries. COVID-19 may have affected these results.

Figure 2.2 Time Loss by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *



* Other category is made up of medical disqualification for season, medical disqualification for career, athlete chooses not to continue, and season ended before athlete returned to play. COVID-19 may have affected these results.

Table 2.8 Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	Competition		Practice		Overall	
Need for Surgery	**n**	**%**	**n**	**%**	**n**	**%**
Required Surgery	56,500	7.4%	18,915	3.1%	75,414	5.5%
Did Not Require Surgery	702,132	92.6%	598,061	96.9%	1,300,193	94.5%
Total	***758,632***	***100.0%***	***616,976***	***100.0%***	***1,375,608***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries. COVID-19 may have affected these results.

Figure 2.3 New and Recurring Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year

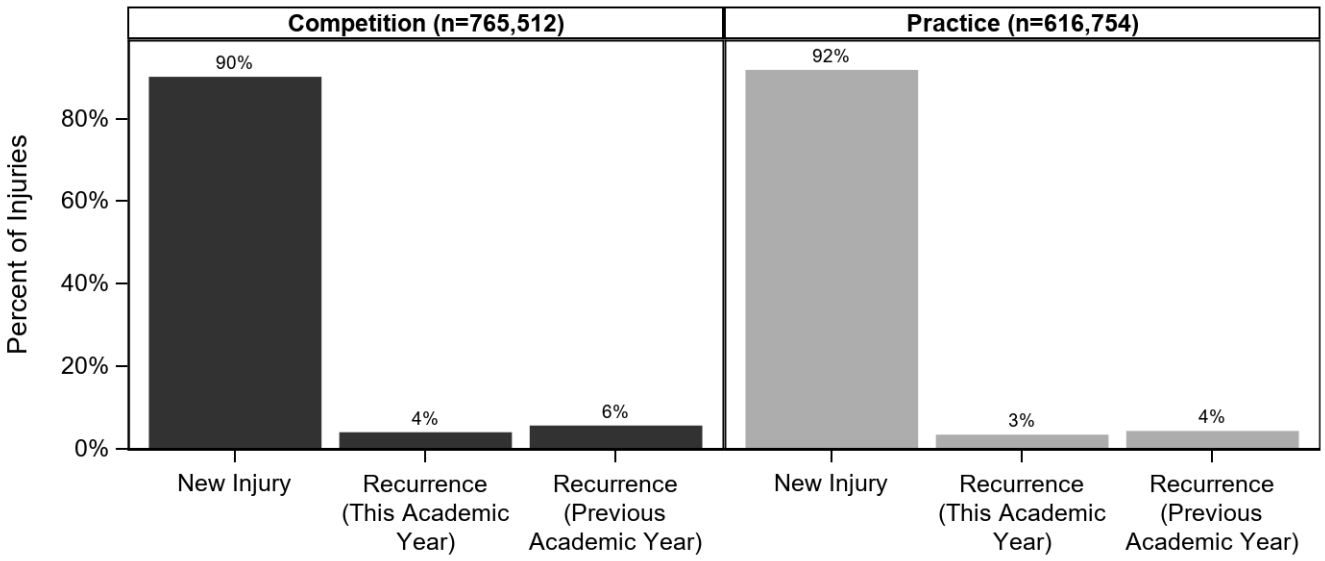


Table 2.9 Time during Season of Injury, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Time in Season	n	%
Preseason	286,997	20.7%
Regular Season	1,018,452	73.6%
Post Season	75,332	5.4%
Unknown/Other	2,370	0.2%
Total	***1,383,151***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries. COVID-19 may have affected these results.

Table 2.10 Practice-Related Variables, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Time in Practice	n	%
First 1/2 Hour	41,515	6.9%
Second 1/2 Hour	74,698	12.4%
1-2 Hours into Practice	266,189	44.1%
>2 Hours into Practice	25,559	4.2%
Unknown	195,391	32.4%
Total	***603,352***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries. COVID-19 may have affected these results.

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Table 2.11 Methods for Injury Evaluation and Assessment, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Injuries Evaluated By:	n=1,385,718	%
Certified Athletic Trainer	1,260,658	91.0%
Orthopedic Physician	229,754	16.6%
Physician/Pediatrician	204,818	14.8%
Physician's Assistant	31,177	2.2%
Other	28,865	2.1%
Nurse Practitioner	13,585	1.0%
Chiropractor	7,845	0.6%
Neurologist/Neuropsychologist	6,935	0.5%
Dentist/Oral Surgeon	5,542	0.4%

Assessment Method:	n=1,385,718	%
Evaluation	1,328,541	95.9%
X-Ray	480,312	34.7%
MRI	160,760	11.6%
Blood Work/Lab Test	47,146	3.4%
CT-Scan	22,220	1.6%
Other	13,783	1.0%

* Multiple responses allowed per injury report. COVID-19 may have affected these results.

III. Boys' Football Injury Epidemiology

Table 3.1 Football Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	# Injuries	# Exposures	Injury Rate (per 1,000 AEs)	Nationally Estimated # Injuries
Total	***1,331***	***322,724***	***4.12***	***478,688***
Competition	767	57,801	13.27	276,694
Practice	564	264,923	2.13	201,994

* All remaining analyses in this chapter present data weighted to provide national injury estimates. COVID-19 may have affected these results.

Table 3.2 Demographic Characteristics of Injured Football Athletes, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Year in School	n	%
Freshman	101,866	21.8%
Sophomore	107,477	23.0%
Junior	129,982	27.8%
Senior	127,694	27.3%
Total	***467,019***	***100.0%***

Age (years)	
Minimum	10
Maximum	19
Mean (SD)	15.9 (1.3)
n	409,408

BMI	
Minimum	14.8
Maximum	50.5
Mean (SD)	25.9 (5.0)
n	318,742

* Throughout this chapter, totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Figure 3.1 Diagnosis of Football Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year

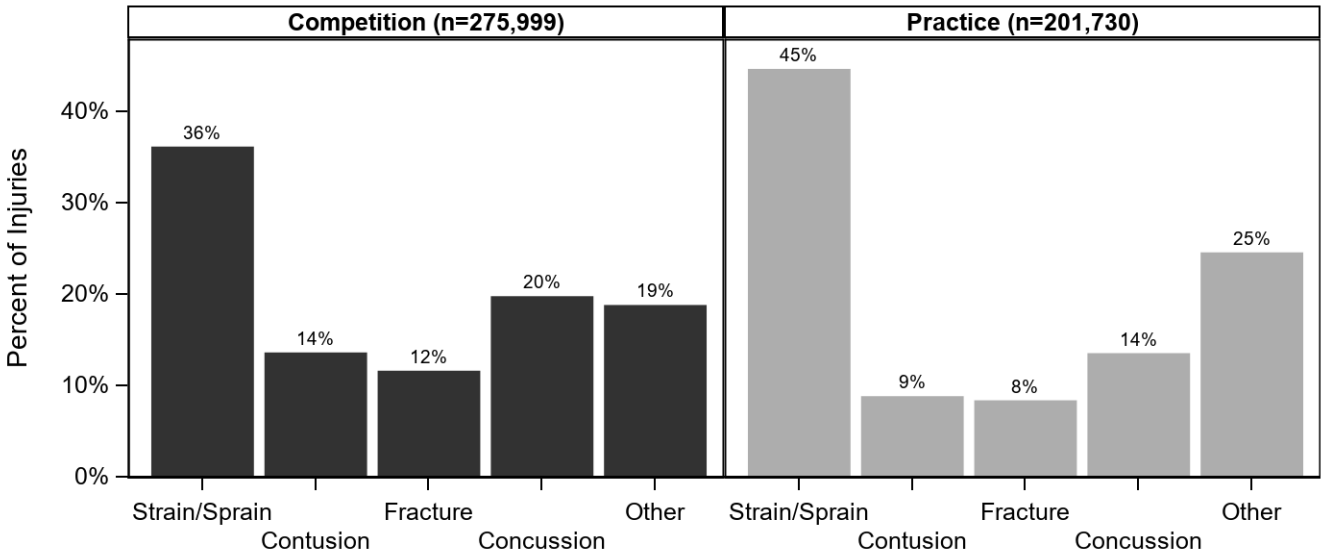


Table 3.3 Body Site of Football Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	Competition		Practice		Overall	
Body Site	**n**	**%**	**n**	**%**	**n**	**%**
Head/Face	56,620	20.5%	28,400	14.1%	85,020	17.8%
Knee	51,387	18.6%	33,385	16.5%	84,772	17.7%
Ankle	28,133	10.2%	25,505	12.6%	53,638	11.2%
Shoulder	33,572	12.1%	16,839	8.3%	50,411	10.5%
Hip/Thigh/Upper Leg	17,328	6.3%	28,093	13.9%	45,421	9.5%
Hand/Wrist	25,388	9.2%	17,262	8.5%	42,650	8.9%
Trunk	17,328	6.3%	4,520	2.2%	21,848	4.6%
Lower Leg	11,231	4.1%	9,913	4.9%	21,144	4.4%
Arm/Elbow	11,576	4.2%	6,624	3.3%	18,201	3.8%
Systemic	1,935	0.7%	15,511	7.7%	17,446	3.6%
Foot	8,992	3.2%	7,739	3.8%	16,731	3.5%
Other	7,274	2.6%	4,136	2.0%	11,410	2.4%
Neck	5,930	2.1%	4,066	2.0%	9,996	2.1%
Total	***276,694***	***100.0%***	***201,994***	***100.0%***	***478,688***	***100.0%***

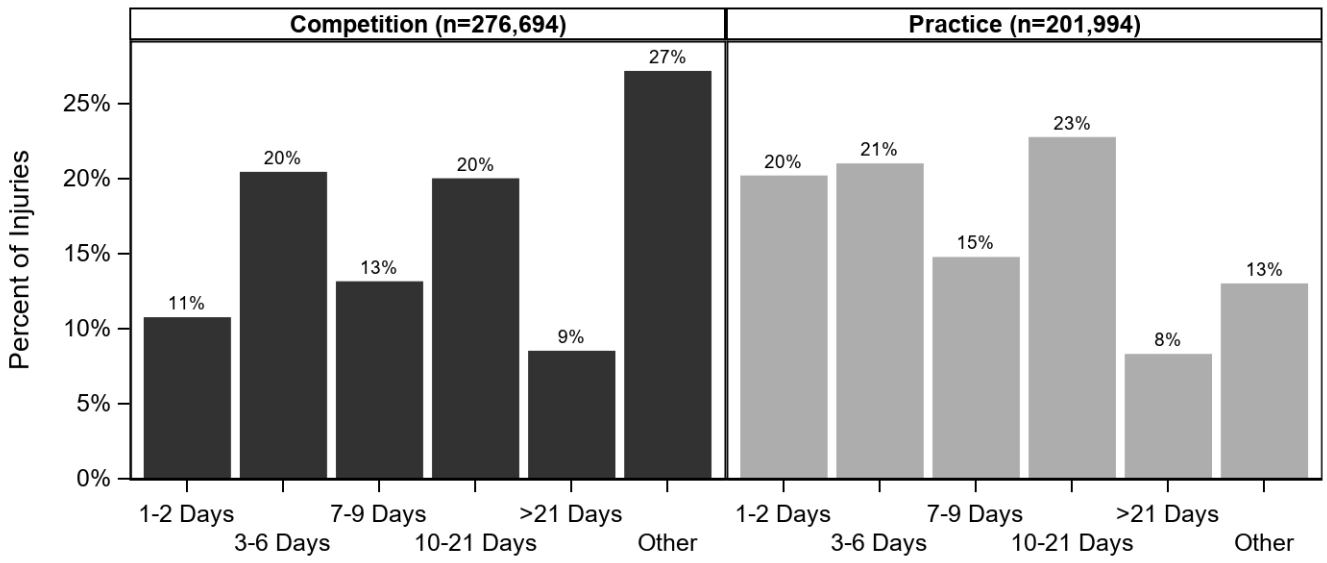
* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries. Totals and n's are not always equal due to slight rounding of the weighted number of injuries.

Table 3.4 Ten Most Common Football Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	Competition (n=276,002)		Practice (n=201,723)		Overall (n=477,725)	
Diagnosis	**n**	**%**	**n**	**%**	**n**	**%**
Head/Face Concussion	54,594	19.8%	27,312	13.5%	81,906	17.1%
Ankle Strain/Sprain	25,223	9.1%	21,840	10.8%	47,063	9.9%
Knee Strain/Sprain	28,010	10.1%	16,929	8.4%	44,940	9.4%
Hip/Thigh/Upper Leg Strain/Sprain	9,950	3.6%	25,268	12.5%	35,218	7.4%
Shoulder Other	22,427	8.1%	8,481	4.2%	30,907	6.5%
Knee Other	15,716	5.7%	11,443	5.7%	27,159	5.7%
Hand/Wrist Fracture	12,606	4.6%	8,747	4.3%	21,353	4.5%
Shoulder Strain/Sprain	10,583	3.8%	7,560	3.7%	18,143	3.8%
Systemic Other	1,935	0.7%	15,511	7.7%	17,446	3.7%
Knee Contusion	6,847	2.5%	4,640	2.3%	11,487	2.4%

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries. Totals and n's are not always equal due to slight rounding of the weighted number of injuries.

Figure 3.2 Time Loss of Football Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *



* Other category is made up of medical disqualification for season, medical disqualification for career, athlete chooses not to continue, and season ended before athlete returned to play.

Table 3.5 Football Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	Competition		Practice		Overall	
Need for Surgery	**n**	**%**	**n**	**%**	**n**	**%**
Required Surgery	26,234	9.6%	10,408	5.2%	36,642	7.7%
Did Not Require Surgery	246,128	90.4%	191,372	94.8%	437,501	92.3%
Total	***272,362***	***100.0%***	***201,780***	***100.0%***	***474,142***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries. Totals and n's are not always equal due to slight rounding of the weighted number of injuries.

Figure 3.3 History of Football Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year

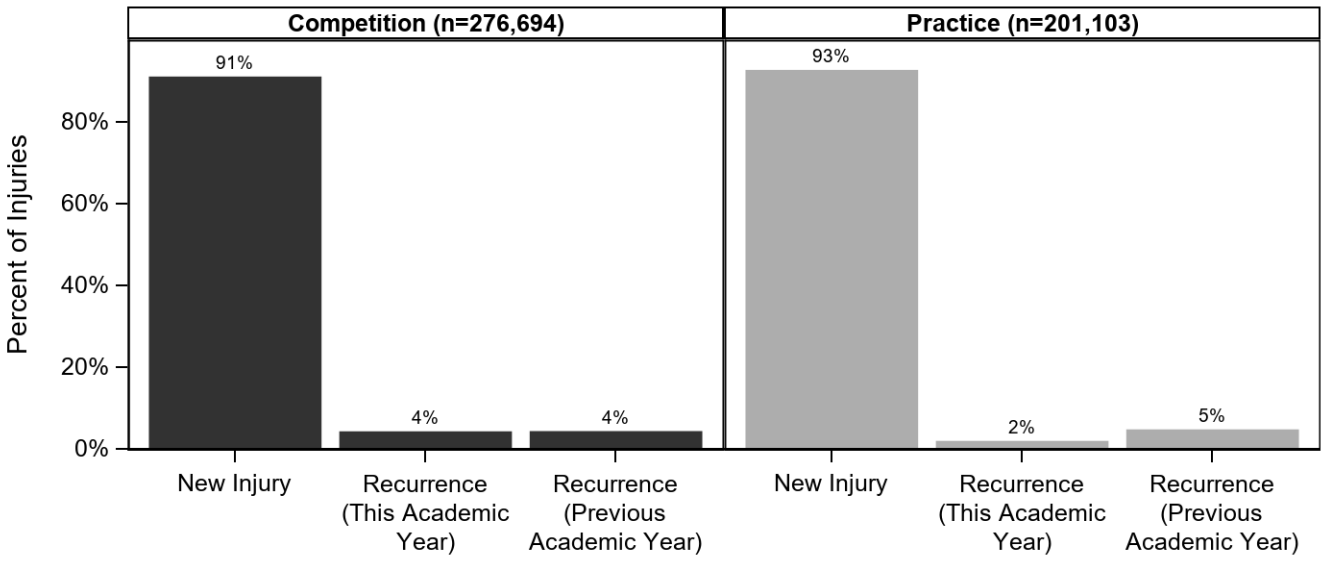


Table 3.6 Time during Season of Football Injuries, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Time in Season	n	%
Preseason	110,150	23.1%
Regular Season	346,427	72.6%
Post Season	20,703	4.3%
Total	***477,280***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Table 3.7 Competition-Related Variables for Football Injuries, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Time in Competition	n	%
Pre-competition/Warm-Ups	3,372	1.3%
First Quarter	33,764	13.4%
Second Quarter	72,935	29.0%
Third Quarter	80,881	32.1%
Fourth Quarter	60,019	23.8%
Overtime	785	0.3%
Total	***251,756***	***100.0%***

Field Location		
End Zone	5,858	2.2%
Red Zone (20 Yard Line to Goal Line)	35,050	13.2%
Between the 20 Yard Lines	135,122	51.0%
Off the Field	1,495	0.6%
Unknown	87,344	33.0%
Total	***264,870***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries. Totals and n's are not always equal due to slight rounding of the weighted number of injuries.

Table 3.8 Practice-Related Variables for Football Injuries, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Time in Practice	n	%
First 1/2 Hour	15,295	7.7%
Second 1/2 Hour	22,912	11.6%
1-2 Hours into Practice	99,846	50.3%
>2 Hours into Practice	14,137	7.1%
Unknown	46,140	23.3%
Total	***198,329***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries. Totals and n's are not always equal due to slight rounding of the weighted number of injuries.

Figure 3.4 Player Position of Football Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year

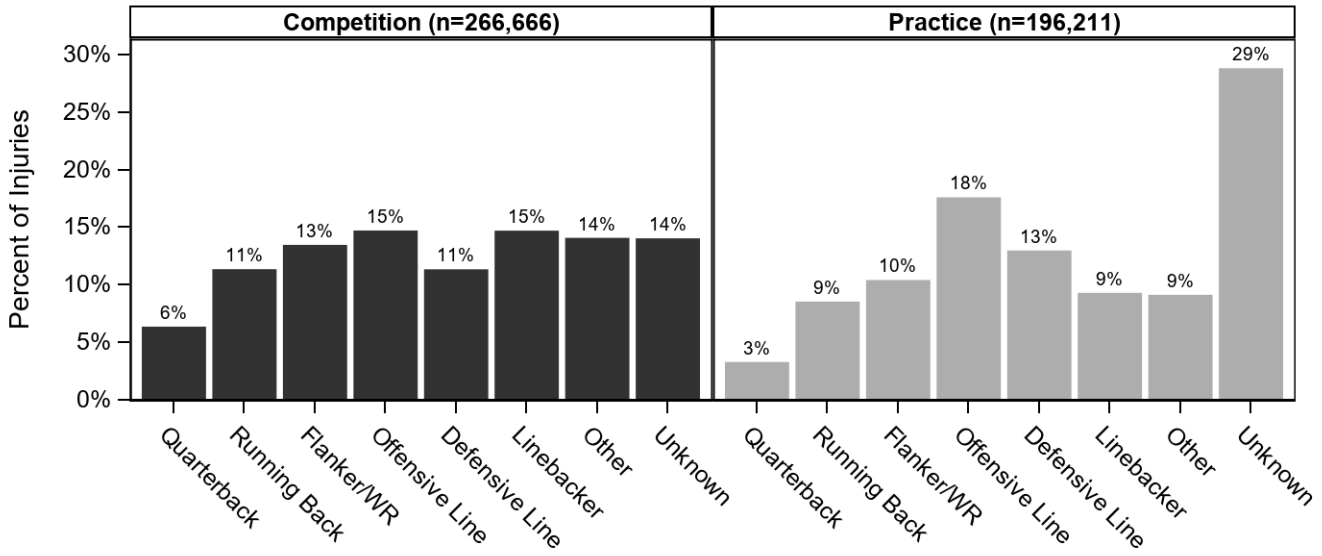


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Table 3.9 Activities Leading to Football Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	Competition		Practice		Overall	
Activity	**n**	**%**	**n**	**%**	**n**	**%**
Being Tackled	72,114	27.0%	24,769	12.5%	96,883	20.9%
Tackling	62,130	23.3%	21,966	11.1%	84,096	18.1%
Unknown	37,400	14.0%	34,968	17.7%	72,368	15.6%
Blocking	37,412	14.0%	27,995	14.2%	65,406	14.1%
N/A **	5,268	2.0%	37,520	19.0%	42,789	9.2%
Being Blocked	17,650	6.6%	9,083	4.6%	26,734	5.8%
Rotation Around a Planted Foot/Inversion	10,161	3.8%	13,520	6.8%	23,682	5.1%
Stepped On, Fell On or Kicked	14,673	5.5%	8,377	4.2%	23,050	5.0%
Other	8,918	3.3%	9,718	4.9%	18,636	4.0%
Contact with Ball	852	0.3%	3,135	1.6%	3,987	0.9%
Uneven Playing Surface	265	0.1%	3,622	1.8%	3,887	0.8%
Contact with Blocking Sled/Dummy	0	0.0%	2,852	1.4%	2,852	0.6%
Total	***266,844***	***100.0%***	***197,526***	***100.0%***	***464,370***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.
** Includes overuse, heat illness, conditioning, etc. Totals and n's are not always equal due to slight rounding of the weighted number of injuries.

Table 3.10 Activity Resulting in Football Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
Activity	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Being Blocked	8,705	4.7%	4,281	8.0%	819	1.7%	7,752	9.8%	5,177	5.2%
Being Tackled	34,492	18.8%	14,770	27.7%	13,316	27.3%	23,050	29.2%	11,183	11.3%
Blocking	24,187	13.2%	3,063	5.7%	7,193	14.7%	14,945	18.9%	15,466	15.7%
Contact with Ball	1,775	1.0%	107	0.2%	1,129	2.3%	0	0.0%	976	1.0%
Contact with Blocking Sled/Dummy	2,063	1.1%	0	0.0%	71	0.1%	0	0.0%	718	0.7%
N/A **	19,802	10.8%	0	0.0%	524	1.1%	0	0.0%	22,462	22.7%
Other	11,257	6.1%	1,709	3.2%	1,642	3.4%	907	1.1%	3,120	3.2%
Rotation Around a Planted Foot/Inversion	18,878	10.3%	71	0.1%	2,066	4.2%	0	0.0%	2,595	2.6%
Stepped On, Fell On or Kicked	6,469	3.5%	7,302	13.7%	5,513	11.3%	552	0.7%	3,214	3.3%
Tackling	27,295	14.9%	9,114	17.1%	9,412	19.3%	18,805	23.8%	19,399	19.6%
Uneven Playing Surface	3,545	1.9%	0	0.0%	0	0.0%	0	0.0%	342	0.3%
Unknown	25,024	13.6%	12,905	24.2%	7,118	14.6%	13,034	16.5%	14,094	14.3%
Total	***183,494***	***100.0%***	***53,321***	***100.0%***	***48,804***	***100.0%***	***79,046***	***100.0%***	***98,745***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries. Totals and n's are not always equal due to slight rounding of the weighted number of injuries.
** Includes overuse, heat illness, conditioning, etc.

IV. Boys' Soccer Injury Epidemiology

Table 4.1 Boys' Soccer Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	# Injuries	# Exposures	Injury Rate (per 1,000 AEs)	Nationally Estimated # Injuries
Total	***257***	***146,032***	***1.76***	***174,322***
Competition	165	43,904	3.76	111,007
Practice	92	102,128	0.90	63,315

* All remaining analyses in this chapter present data weighted to provide national injury estimates. COVID-19 may have affected these results.

Table 4.2 Demographic Characteristics of Injured Boys' Soccer Athletes, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Year in School	n	%
Freshman	47,767	28.2%
Sophomore	33,597	19.8%
Junior	43,038	25.4%
Senior	44,925	26.5%
Total	***169,327***	***100.0%***

Age (years)	
Minimum	14
Maximum	18
Mean (SD)	15.9 (1.2)
n	141,573

BMI	
Minimum	16.3
Maximum	44.4
Mean (SD)	22.1 (3.4)
n	122,993

* Throughout this chapter, totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Figure 4.1 Diagnosis of Boys' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year

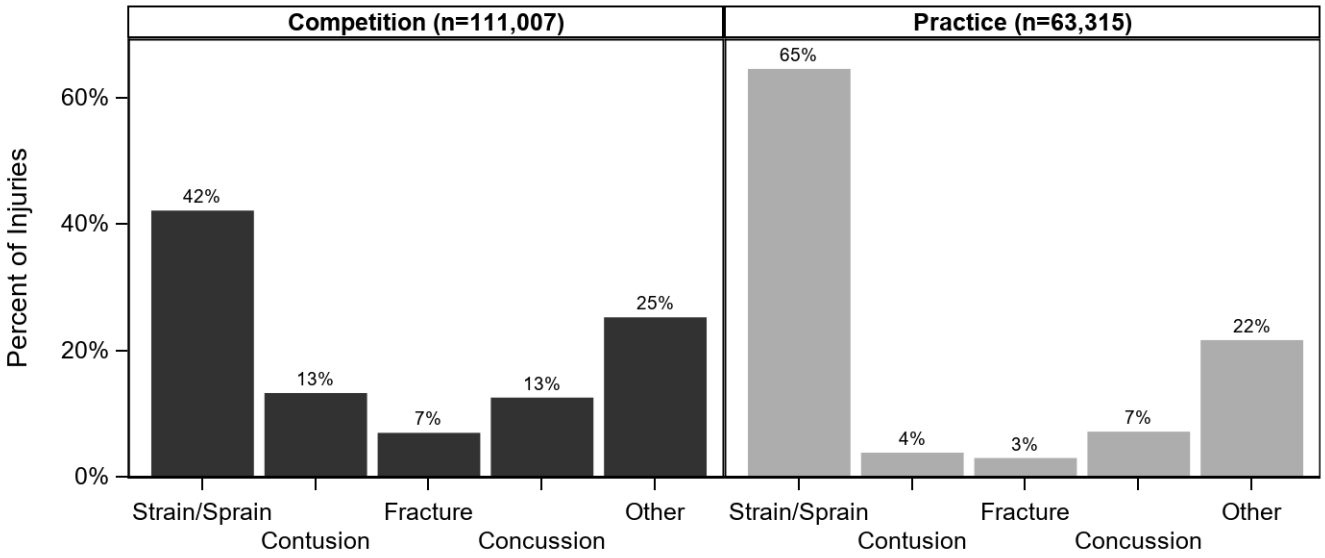


Table 4.3 Body Site of Boys' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	Competition		Practice		Overall	
Body Site	**n**	**%**	**n**	**%**	**n**	**%**
Ankle	15,435	13.9%	24,037	38.0%	39,472	22.6%
Hip/Thigh/Upper Leg	27,266	24.6%	10,650	16.8%	37,916	21.8%
Knee	22,811	20.5%	4,921	7.8%	27,733	15.9%
Head/Face	15,892	14.3%	7,138	11.3%	23,030	13.2%
Foot	13,912	12.5%	3,071	4.9%	16,983	9.7%
Lower Leg	2,669	2.4%	6,126	9.7%	8,794	5.0%
Hand/Wrist	4,585	4.1%	3,082	4.9%	7,667	4.4%
Trunk	2,946	2.7%	1,910	3.0%	4,857	2.8%
Shoulder	2,632	2.4%	0	0.0%	2,632	1.5%
Systemic	0	0.0%	2,117	3.3%	2,117	1.2%
Arm/Elbow	1,275	1.1%	0	0.0%	1,275	0.7%
Neck	1,093	1.0%	0	0.0%	1,093	0.6%
Other	489	0.4%	263	0.4%	753	0.4%
Total	***111,007***	***100.0%***	***63,315***	***100.0%***	***174,322***	***100.0%***

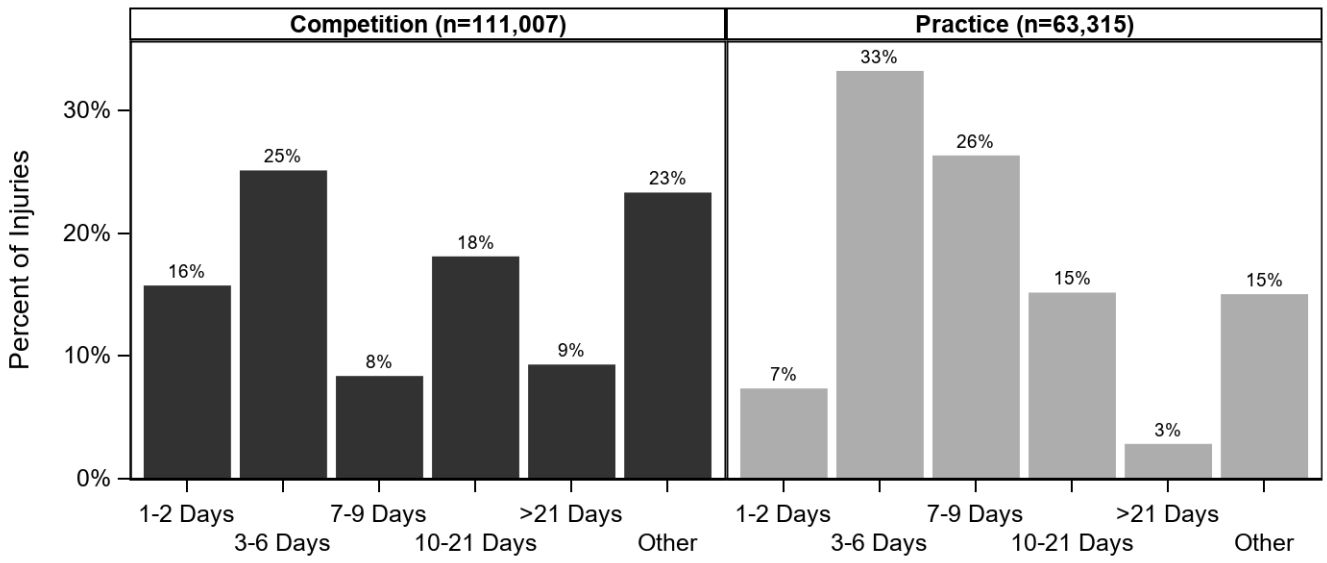
* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries. Totals and n's are not always equal due to slight rounding of the weighted number of injuries.

Table 4.4 Ten Most Common Boys' Soccer Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	Competition (n=111,005)		Practice (n=63,316)		Overall (n=174,324)	
Diagnosis	**n**	**%**	**n**	**%**	**n**	**%**
Ankle Strain/Sprain	13,254	11.9%	23,131	36.5%	36,385	20.9%
Hip/Thigh/Upper Leg Strain/Sprain	16,803	15.1%	9,709	15.3%	26,512	15.2%
Head/Face Concussion	13,895	12.5%	4,513	7.1%	18,409	10.6%
Knee Other	10,686	9.6%	1,017	1.6%	11,703	6.7%
Knee Strain/Sprain	8,095	7.3%	3,075	4.9%	11,170	6.4%
Foot Other	7,404	6.7%	1,644	2.6%	9,048	5.2%
Hip/Thigh/Upper Leg Other	5,985	5.4%	414	0.7%	6,400	3.7%
Hand/Wrist Fracture	4,322	3.9%	1,164	1.8%	5,486	3.1%
Hip/Thigh/Upper Leg Contusion	4,478	4.0%	527	0.8%	5,004	2.9%
Knee Contusion	4,030	3.6%	830	1.3%	4,860	2.8%

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries. Totals and n's are not always equal due to slight rounding of the weighted number of injuries.

Figure 4.2 Time Loss of Boys' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *



* Other category is made up of medical disqualification for season, medical disqualification for career, athlete chooses not to continue, and season ended before athlete returned to play.

Table 4.5 Boys' Soccer Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	Competition		Practice		Overall	
Need for Surgery	**n**	**%**	**n**	**%**	**n**	**%**
Required Surgery	9,311	8.5%	746	1.2%	10,057	5.8%
Did Not Require Surgery	100,420	91.5%	62,569	98.8%	162,990	94.2%
Total	***109,731***	***100.0%***	***63,315***	***100.0%***	***173,047***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Figure 4.3 History of Boys' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year

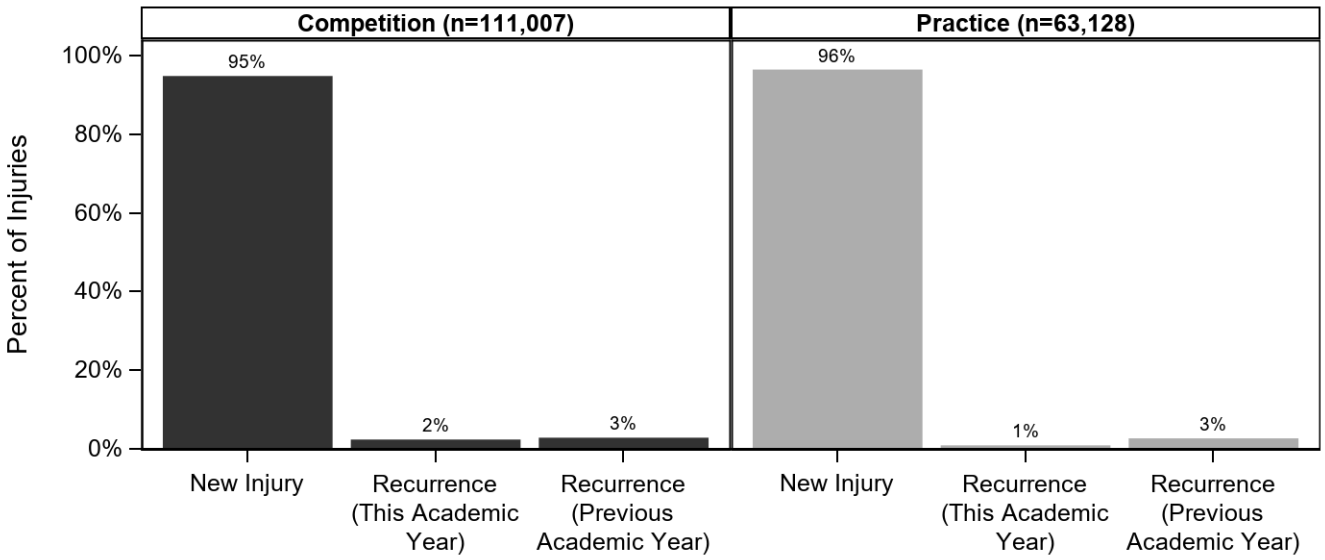


Table 4.6 Time during Season of Boys' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Time in Season	n	%
Preseason	33,458	19.2%
Regular Season	129,366	74.2%
Post Season	11,498	6.6%
Total	***174,322***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Table 4.7 Competition-Related Variables for Boys' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Time in Competition	n	%
Pre-competition/Warm-Ups	2,141	2.0%
First Half	23,405	22.2%
Second Half	57,033	54.0%
Overtime	76	0.1%
Unknown	22,975	21.8%
Total	***105,629***	***100.0%***

Field Location		
Goal Box (Defense)	14,811	14.1%
Goal Box (Offense)	7,105	6.8%
Side of Goal Box (Defense)	7,085	6.7%
Side of Goal Box (Offense)	7,529	7.2%
Top of Goal Box Extended to Center Line (Offense)	27,667	26.3%
Top of Goal Box Extended to Center Line (Defense)	5,941	5.7%
Off the Field	1,093	1.0%
Unknown	33,876	32.2%
Total	***105,107***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries. Totals and n's are not always equal due to slight rounding of the weighted number of injuries.

Table 4.8 Practice-Related Variables for Boys' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Time in Practice	n	%
First 1/2 Hour	2,408	3.8%
Second 1/2 Hour	10,695	17.0%
1-2 Hours into Practice	30,775	48.9%
>2 Hours into Practice	1,273	2.0%
Unknown	17,825	28.3%
Total	***62,977***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries. Totals and n's are not always equal due to slight rounding of the weighted number of injuries.

Figure 4.4 Player Position of Boys' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year

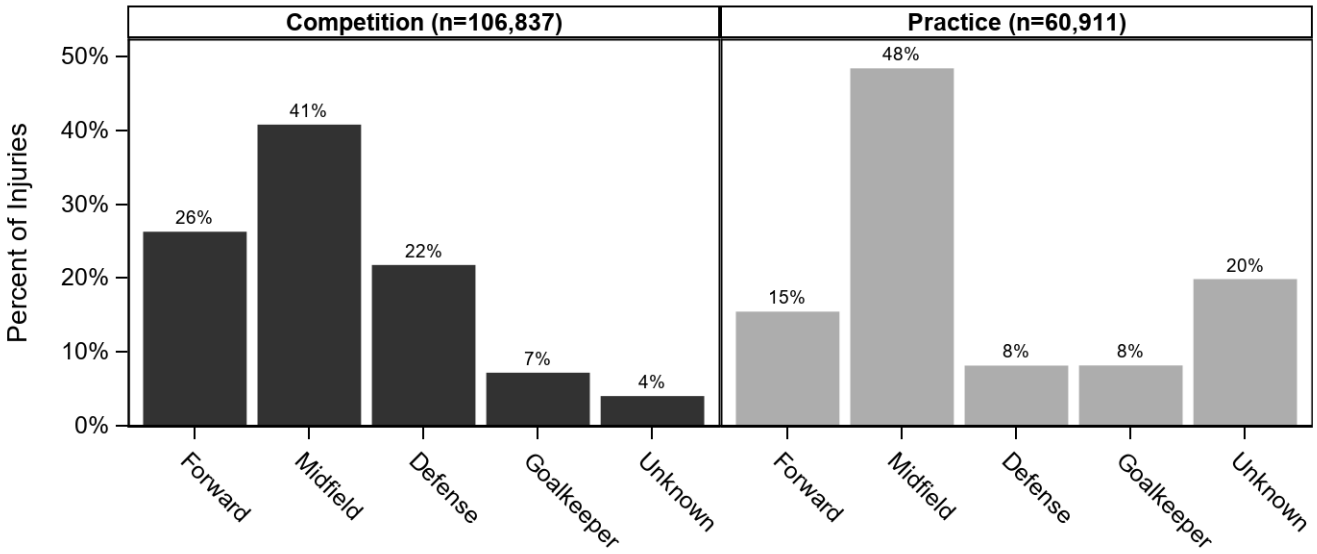


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Table 4.9 Activities Leading to Boys' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	Competition		Practice		Overall	
Activity	**n**	**%**	**n**	**%**	**n**	**%**
General Play	12,428	11.6%	16,598	27.3%	29,026	17.2%
Chasing Loose Ball	23,893	22.2%	3,720	6.1%	27,613	16.4%
Unknown	13,836	12.9%	7,241	11.9%	21,077	12.5%
Defending	11,886	11.1%	7,548	12.4%	19,434	11.5%
Shooting	9,801	9.1%	4,238	7.0%	14,039	8.3%
Passing	5,446	5.1%	7,593	12.5%	13,039	7.7%
Ball Handling/Dribbling	10,958	10.2%	825	1.4%	11,783	7.0%
Conditioning	0	0.0%	6,843	11.2%	6,843	4.1%
Goaltending	4,808	4.5%	1,727	2.8%	6,535	3.9%
Heading Ball	4,219	3.9%	1,647	2.7%	5,866	3.5%
Receiving Pass	3,154	2.9%	1,275	2.1%	4,429	2.6%
Receiving a Slide Tackle	3,765	3.5%	0	0.0%	3,765	2.2%
Blocking Shot	1,778	1.7%	0	0.0%	1,778	1.1%
Attempting a Slide Tackle	1,093	1.0%	566	0.9%	1,659	1.0%
Other	339	0.3%	1,088	1.8%	1,427	0.8%
Total	***107,404***	***100.0%***	***60,911***	***100.0%***	***168,315***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries. Totals and n's are not always equal due to slight rounding of the weighted number of injuries.

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Table 4.10 Activity Resulting in Boys' Soccer Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
Activity	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Attempting a Slide Tackle	263	0.3%	566	3.3%	0	0.0%	0	0.0%	830	2.1%
Ball Handling/Dribbling	6,898	8.1%	2,895	16.9%	714	7.5%	1,088	6.8%	187	0.5%
Blocking Shot	0	0.0%	0	0.0%	187	2.0%	0	0.0%	1,591	4.0%
Chasing Loose Ball	19,825	23.2%	2,743	16.0%	566	5.9%	1,320	8.3%	3,159	7.8%
Conditioning	4,175	4.9%	0	0.0%	76	0.8%	0	0.0%	2,592	6.4%
Defending	6,951	8.1%	1,619	9.5%	1,427	14.9%	5,781	36.2%	3,656	9.1%
General Play	17,251	20.2%	3,544	20.7%	490	5.1%	822	5.1%	6,920	17.2%
Goaltending	790	0.9%	527	3.1%	2,253	23.5%	1,427	8.9%	1,539	3.8%
Heading Ball	1,655	1.9%	0	0.0%	1,125	11.7%	2,747	17.2%	339	0.8%
Other	1,352	1.6%	0	0.0%	0	0.0%	0	0.0%	76	0.2%
Passing	8,342	9.8%	566	3.3%	0	0.0%	0	0.0%	4,131	10.3%
Receiving Pass	1,275	1.5%	0	0.0%	0	0.0%	0	0.0%	3,154	7.8%
Receiving a Slide Tackle	2,066	2.4%	1,133	6.6%	0	0.0%	0	0.0%	566	1.4%
Shooting	9,307	10.9%	1,088	6.4%	76	0.8%	76	0.5%	3,493	8.7%
Unknown	5,279	6.2%	2,420	14.1%	2,664	27.8%	2,708	17.0%	8,006	19.9%
Total	***85,428***	***100.0%***	***17,102***	***100.0%***	***9,578***	***100.0%***	***15,969***	***100.0%***	***40,238***	***100.0%***

Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of on-response, these totals are always similar but are not always equal to the total number of injuries. Totals and n's are not always equal due to slight ɔunding of the weighted number of injuries.

V. Girls' Soccer Injury Epidemiology

Table 5.1 Girls' Soccer Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	# Injuries	# Exposures	Injury Rate (per 1,000 AEs)	Nationally Estimated # Injuries
Total	***288***	***122,927***	***2.34***	***168,680***
Competition	198	38,917	5.09	118,572
Practice	90	84,010	1.07	50,108

* All remaining analyses in this chapter present data weighted to provide national injury estimates. COVID-19 may have affected these results.

Table 5.2 Demographic Characteristics of Injured Girls' Soccer Athletes, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Year in School	n	%
Freshman	30,775	18.9%
Sophomore	65,951	40.6%
Junior	23,861	14.7%
Senior	42,053	25.9%
Total	***162,640***	***100.0%***

Age (years)	
Minimum	13
Maximum	19
Mean (SD)	15.7 (1.2)
n	111,449

BMI	
Minimum	16.2
Maximum	32.5
Mean (SD)	22.1 (2.6)
n	97,875

* Throughout this chapter, totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Figure 5.1 Diagnosis of Girls' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year

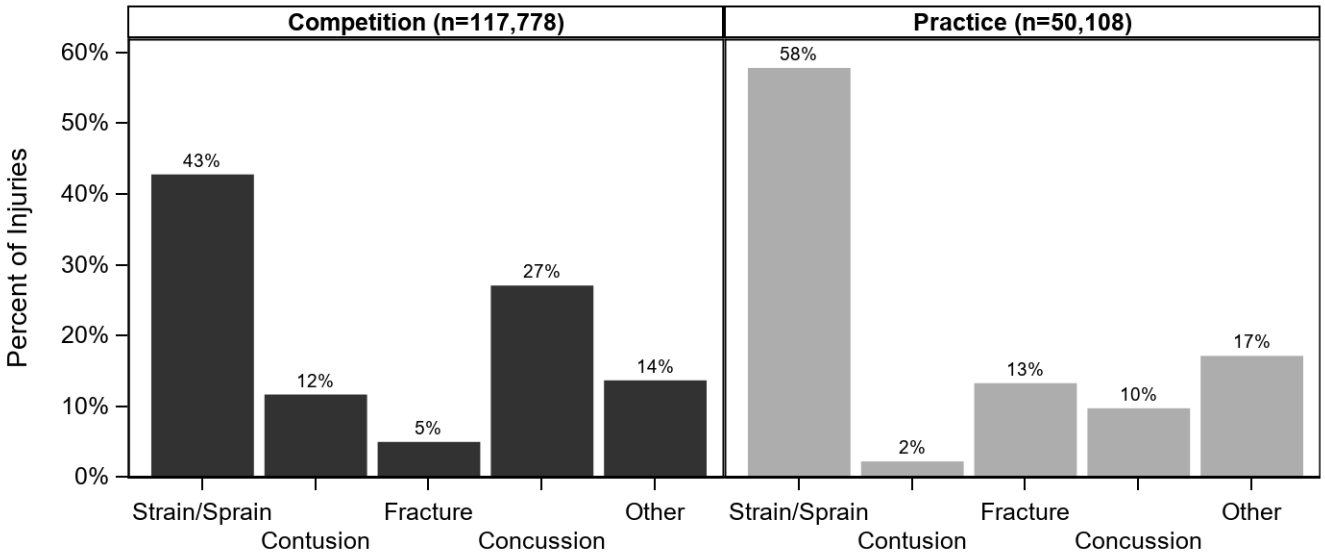


Table 5.3 Body Site of Girls' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	Competition		Practice		Overall	
Body Site	**n**	**%**	**n**	**%**	**n**	**%**
Head/Face	34,000	28.7%	5,867	11.7%	39,867	23.6%
Ankle	22,558	19.0%	12,403	24.8%	34,962	20.7%
Knee	18,521	15.6%	8,663	17.3%	27,184	16.1%
Hip/Thigh/Upper Leg	14,524	12.2%	8,322	16.6%	22,847	13.5%
Lower Leg	6,486	5.5%	3,940	7.9%	10,426	6.2%
Systemic	8,771	7.4%	934	1.9%	9,704	5.8%
Foot	2,941	2.5%	5,889	11.8%	8,831	5.2%
Trunk	4,027	3.4%	3,950	7.9%	7,977	4.7%
Shoulder	2,582	2.2%	70	0.1%	2,652	1.6%
Hand/Wrist	1,839	1.6%	0	0.0%	1,839	1.1%
Other	1,060	0.9%	70	0.1%	1,129	0.7%
Arm/Elbow	702	0.6%	0	0.0%	702	0.4%
Neck	562	0.5%	0	0.0%	562	0.3%
Total	***118,572***	***100.0%***	***50,108***	***100.0%***	***168,680***	***100.0%***

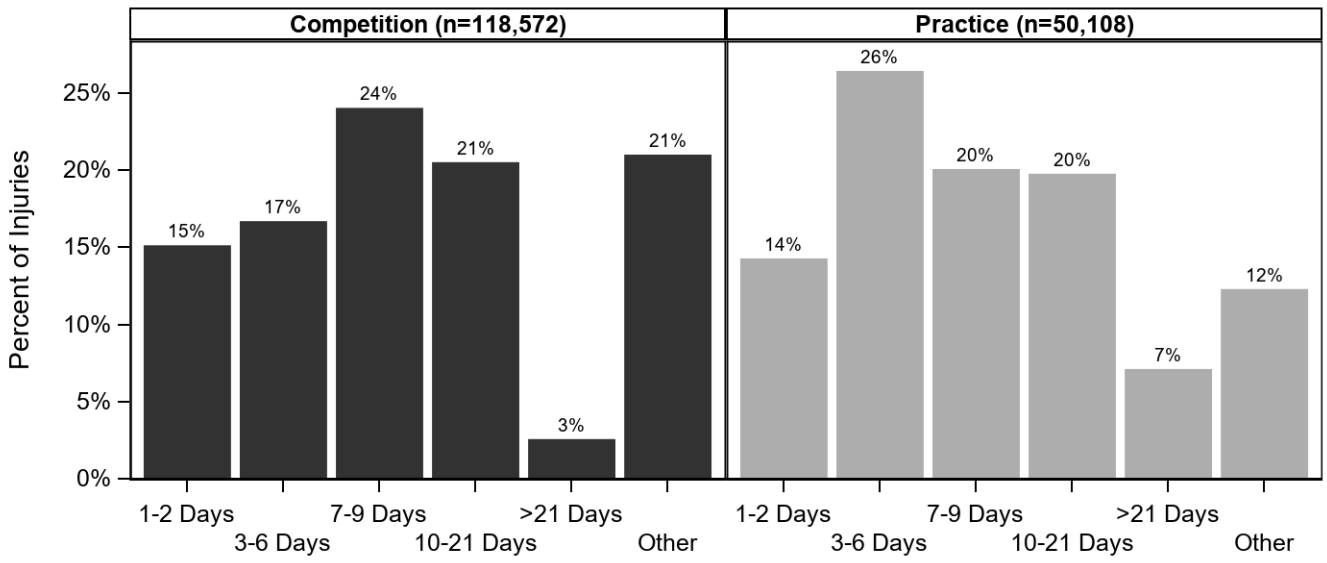
* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries. Totals and n's are not always equal due to slight rounding of the weighted number of injuries.

Table 5.4 Ten Most Common Girls' Soccer Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	Competition (n=117,776)		Practice (n=50,109)		Overall (n=167,883)	
Diagnosis	**n**	**%**	**n**	**%**	**n**	**%**
Head/Face Concussion	31,855	27.0%	4,852	9.7%	36,707	21.9%
Ankle Strain/Sprain	20,192	17.1%	11,546	23.0%	31,738	18.9%
Hip/Thigh/Upper Leg Strain/Sprain	10,328	8.8%	7,760	15.5%	18,088	10.8%
Knee Strain/Sprain	10,769	9.1%	5,529	11.0%	16,298	9.7%
Systemic Other	8,771	7.4%	934	1.9%	9,704	5.8%
Knee Other	3,455	2.9%	2,869	5.7%	6,324	3.8%
Foot Fracture	1,649	1.4%	2,956	5.9%	4,605	2.7%
Trunk Strain/Sprain	2,438	2.1%	1,556	3.1%	3,994	2.4%
Hip/Thigh/Upper Leg Contusion	3,634	3.1%	0	0.0%	3,634	2.2%
Lower Leg Strain/Sprain	1,686	1.4%	1,390	2.8%	3,076	1.8%

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries. Totals and n's are not always equal due to slight rounding of the weighted number of injuries.

Figure 5.2 Time Loss of Girls' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *



* Other category is made up of medical disqualification for season, medical disqualification for career, athlete chooses not to continue, and season ended before athlete returned to play.

Table 5.5 Girls' Soccer Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	Competition		Practice		Overall	
Need for Surgery	**n**	**%**	**n**	**%**	**n**	**%**
Required Surgery	5,050	4.3%	1,356	2.7%	6,406	3.8%
Did Not Require Surgery	113,257	95.7%	48,553	97.3%	161,809	96.2%
Total	***118,307***	***100.0%***	***49,909***	***100.0%***	***168,216***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries. Totals and n's are not always equal due to slight rounding of the weighted number of injuries.

Figure 5.3 History of Girls' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year

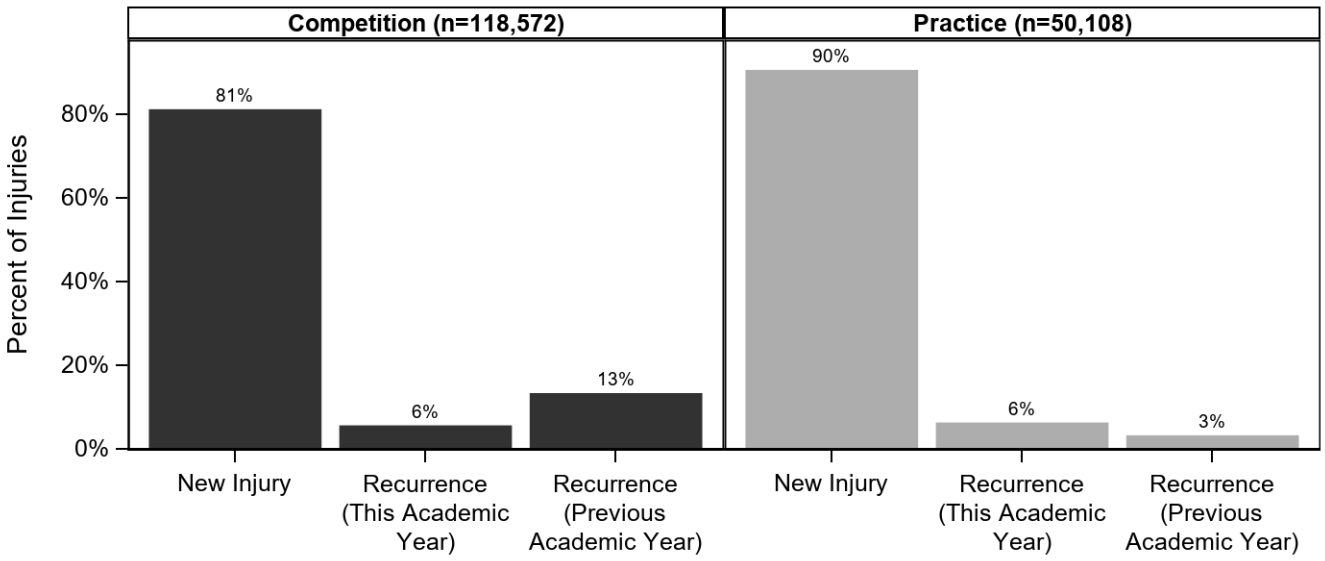


Table 5.6 Time during Season of Girls' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Time in Season	n	%
Preseason	22,993	13.7%
Regular Season	134,647	80.1%
Post Season	10,478	6.2%
Total	***168,118***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Table 5.7 Competition-Related Variables for Girls' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Time in Competition	n	%
Pre-competition/Warm-Ups	6,463	5.7%
First Half	41,791	36.8%
Second Half	33,141	29.2%
Overtime	562	0.5%
Unknown	31,478	27.7%
Total	***113,435***	***100.0%***

Field Location		
Goal Box (Defense)	17,396	15.5%
Goal Box (Offense)	4,727	4.2%
Side of Goal Box (Defense)	6,201	5.5%
Side of Goal Box (Offense)	3,908	3.5%
Top of Goal Box Extended to Center Line (Offense)	13,222	11.7%
Top of Goal Box Extended to Center Line (Defense)	16,982	15.1%
Off the Field	562	0.5%
Unknown	49,540	44.0%
Total	***112,538***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Table 5.8 Practice-Related Variables for Girls' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Time in Practice	n	%
First 1/2 Hour	762	1.6%
Second 1/2 Hour	4,763	10.1%
1-2 Hours into Practice	23,956	50.9%
>2 Hours into Practice	2,185	4.6%
Unknown	15,416	32.7%
Total	***47,082***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Figure 5.4 Player Position of Girls' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year

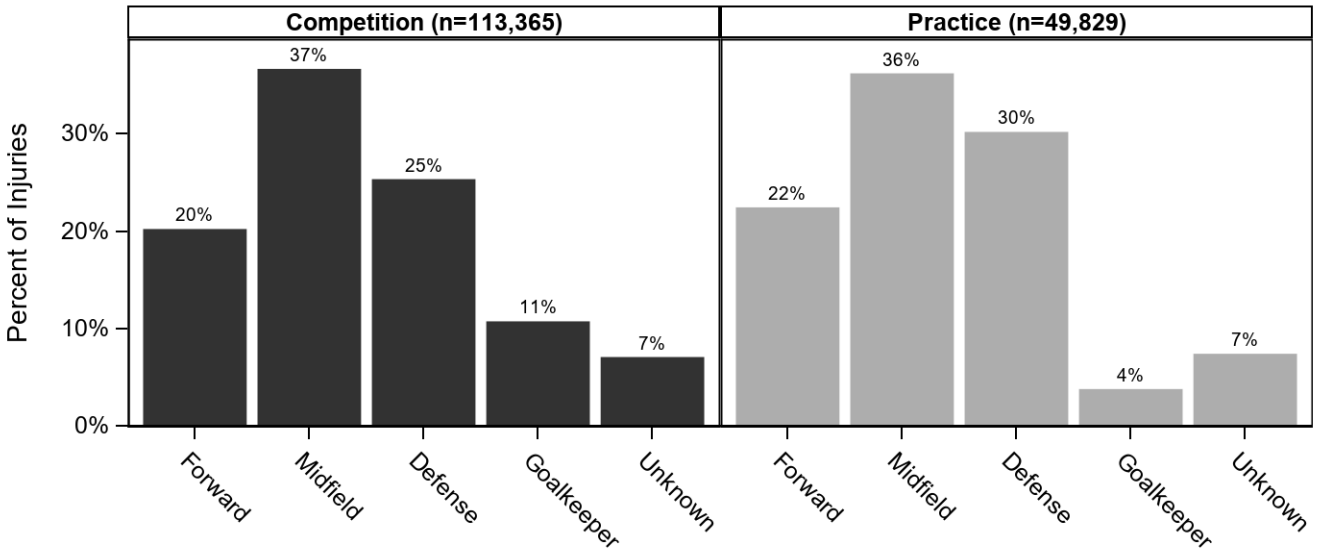


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Table 5.9 Activities Leading to Girls' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	Competition		Practice		Overall	
Activity	**n**	**%**	**n**	**%**	**n**	**%**
General Play	23,989	21.2%	21,441	43.0%	45,430	27.8%
Defending	27,185	24.0%	10,327	20.7%	37,512	23.0%
Chasing Loose Ball	13,320	11.7%	3,837	7.7%	17,157	10.5%
Unknown	11,260	9.9%	4,555	9.1%	15,814	9.7%
Ball Handling/Dribbling	7,983	7.0%	1,932	3.9%	9,915	6.1%
Heading Ball	7,776	6.9%	722	1.4%	8,497	5.2%
Goaltending	7,108	6.3%	522	1.0%	7,631	4.7%
Receiving Pass	4,881	4.3%	562	1.1%	5,443	3.3%
Shooting	3,937	3.5%	831	1.7%	4,769	2.9%
Blocking Shot	1,060	0.9%	3,188	6.4%	4,248	2.6%
Passing	2,462	2.2%	265	0.5%	2,727	1.7%
Conditioning	0	0.0%	1,716	3.4%	1,716	1.1%
Other	1,577	1.4%	0	0.0%	1,577	1.0%
Receiving a Slide Tackle	562	0.5%	0	0.0%	562	0.3%
Attempting a Slide Tackle	265	0.2%	0	0.0%	265	0.2%
Total	***113,365***	***100.0%***	***49,899***	***100.0%***	***163,265***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries. Totals and n's are not always equal due to slight rounding of the weighted number of injuries.

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Table 5.10 Activity Resulting in Girls' Soccer Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
Activity	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Attempting a Slide Tackle	265	0.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Ball Handling/Dribbling	8,436	10.7%	265	1.8%	1,015	8.3%	0	0.0%	199	1.0%
Blocking Shot	3,983	5.0%	265	1.8%	0	0.0%	0	0.0%	0	0.0%
Chasing Loose Ball	6,521	8.2%	4,270	29.0%	2,659	21.8%	2,350	6.4%	562	2.9%
Conditioning	1,577	2.0%	0	0.0%	0	0.0%	0	0.0%	139	0.7%
Defending	18,304	23.1%	1,458	9.9%	1,479	12.1%	15,475	42.2%	794	4.0%
General Play	18,274	23.1%	2,783	18.9%	5,951	48.7%	6,219	17.0%	12,205	62.0%
Goaltending	4,175	5.3%	1,015	6.9%	0	0.0%	1,160	3.2%	1,280	6.5%
Heading Ball	265	0.3%	453	3.1%	0	0.0%	7,779	21.2%	0	0.0%
Other	1,577	2.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Passing	1,679	2.1%	1,049	7.1%	0	0.0%	0	0.0%	0	0.0%
Receiving Pass	2,208	2.8%	199	1.4%	0	0.0%	994	2.7%	2,042	10.4%
Receiving a Slide Tackle	562	0.7%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Shooting	3,684	4.7%	70	0.5%	0	0.0%	0	0.0%	1,015	5.2%
Unknown	7,692	9.7%	2,885	19.6%	1,118	9.2%	2,659	7.3%	1,459	7.4%
Total	***79,203***	***100.0%***	***14,712***	***100.0%***	***12,222***	***100.0%***	***36,637***	***100.0%***	***19,696***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries. Totals and n's are not always equal due to slight rounding of the weighted number of injuries.

VI. Girls' Volleyball Injury Epidemiology

Table 6.1 Girls' Volleyball Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	# Injuries	# Exposures	Injury Rate (per 1,000 AEs)	Nationally Estimated # Injuries
Total	***160***	***127,676***	***1.25***	***68,994***
Competition	75	45,021	1.67	30,805
Practice	85	82,655	1.03	38,189

* All remaining analyses in this chapter present data weighted to provide national injury estimates. COVID-19 may have affected these results.

Table 6.2 Demographic Characteristics of Injured Girls' Volleyball Athletes, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Year in School	n	%
Freshman	19,745	29.0%
Sophomore	20,015	29.3%
Junior	13,553	19.9%
Senior	14,881	21.8%
Total	***68,194***	***100.0%***

Age (years)	
Minimum	14
Maximum	18
Mean (SD)	15.5 (1.3)
N	51,312

BMI	
Minimum	15.4
Maximum	34.3
Mean (SD)	22.8 (3.7)
N	36,058

* Throughout this chapter, totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Figure 6.1 Diagnosis of Girls' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year

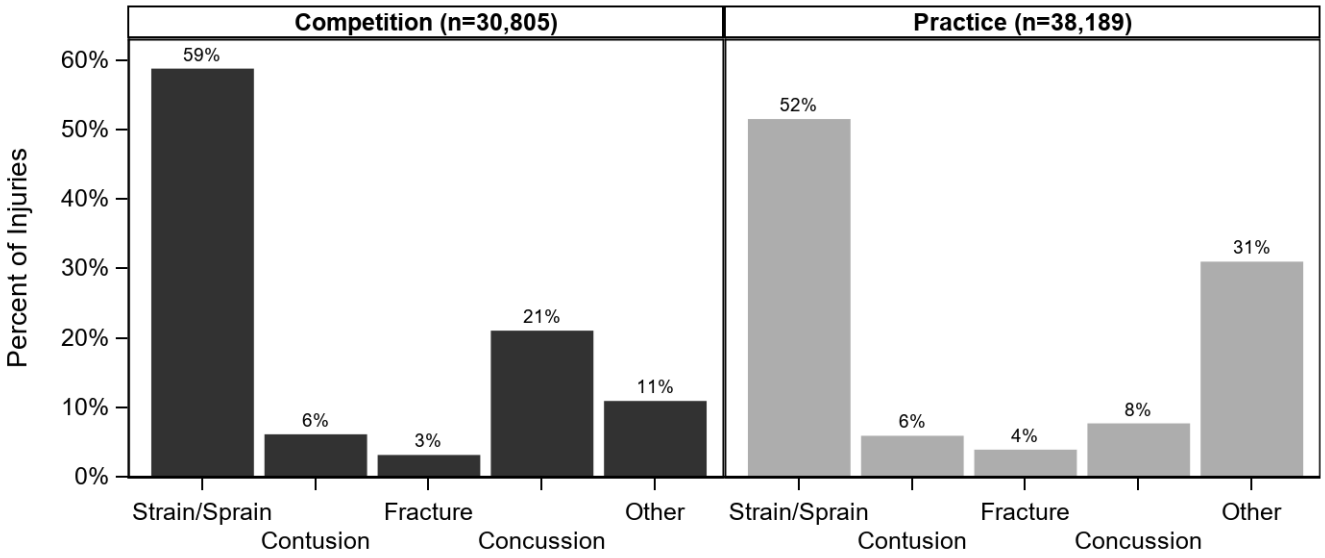


Table 6.3 Body Site of Girls' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	Competition		Practice		Overall	
Body Site	**n**	**%**	**n**	**%**	**n**	**%**
Ankle	11,937	38.7%	11,474	30.0%	23,410	33.9%
Head/Face	7,077	23.0%	3,657	9.6%	10,734	15.6%
Knee	2,837	9.2%	7,077	18.5%	9,915	14.4%
Hand/Wrist	4,036	13.1%	2,431	6.4%	6,467	9.4%
Systemic	0	0.0%	4,603	12.1%	4,603	6.7%
Shoulder	1,697	5.5%	2,773	7.3%	4,470	6.5%
Foot	1,938	6.3%	1,046	2.7%	2,984	4.3%
Trunk	93	0.3%	2,472	6.5%	2,565	3.7%
Lower Leg	1,190	3.9%	794	2.1%	1,984	2.9%
Arm/Elbow	0	0.0%	1,249	3.3%	1,249	1.8%
Hip/Thigh/Upper Leg	0	0.0%	613	1.6%	613	0.9%
Total	***30,805***	***100.0%***	***38,189***	***100.0%***	***68,994***	***100.0%***

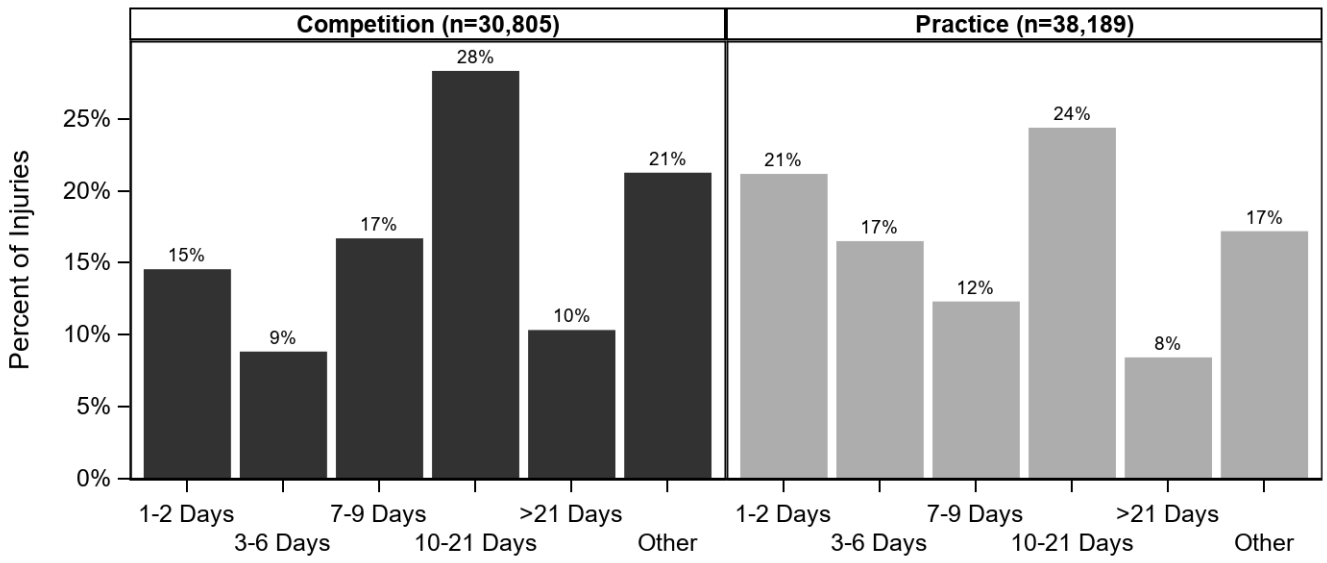
* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Table 6.4 Ten Most Common Girls' Volleyball Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	Competition (n=30,806)		Practice (n=38,190)		Overall (n=68,997)	
Diagnosis	**n**	**%**	**n**	**%**	**n**	**%**
Ankle Strain/Sprain	11,247	36.5%	11,106	29.1%	22,353	32.4%
Head/Face Concussion	6,483	21.0%	2,935	7.7%	9,418	13.6%
Knee Other	2,041	6.6%	3,870	10.1%	5,911	8.6%
Systemic Other	0	0.0%	4,603	12.1%	4,603	6.7%
Shoulder Strain/Sprain	1,697	5.5%	2,038	5.3%	3,735	5.4%
Hand/Wrist Strain/Sprain	1,842	6.0%	1,238	3.2%	3,080	4.5%
Trunk Strain/Sprain	93	0.3%	2,472	6.5%	2,565	3.7%
Knee Strain/Sprain	451	1.5%	1,584	4.1%	2,035	2.9%
Knee Contusion	345	1.1%	1,624	4.3%	1,969	2.9%
Foot Strain/Sprain	1,593	5.2%	0	0.0%	1,593	2.3%

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries. Totals and n's are not always equal due to slight rounding of the weighted number of injuries.

Figure 6.2 Time Loss of Girls' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *



* Other category is made up of medical disqualification for season, medical disqualification for career, athlete chooses not to continue, and season ended before athlete returned to play.

Table 6.5 Girls' Volleyball Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	Competition		Practice		Overall	
Need for Surgery	**n**	**%**	**n**	**%**	**n**	**%**
Required Surgery	506	1.7%	106	0.3%	613	0.9%
Did Not Require Surgery	29,393	98.3%	37,990	99.7%	67,382	99.1%
Total	***29,899***	***100.0%***	***38,096***	***100.0%***	***67,995***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Figure 6.3 History of Girls' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year

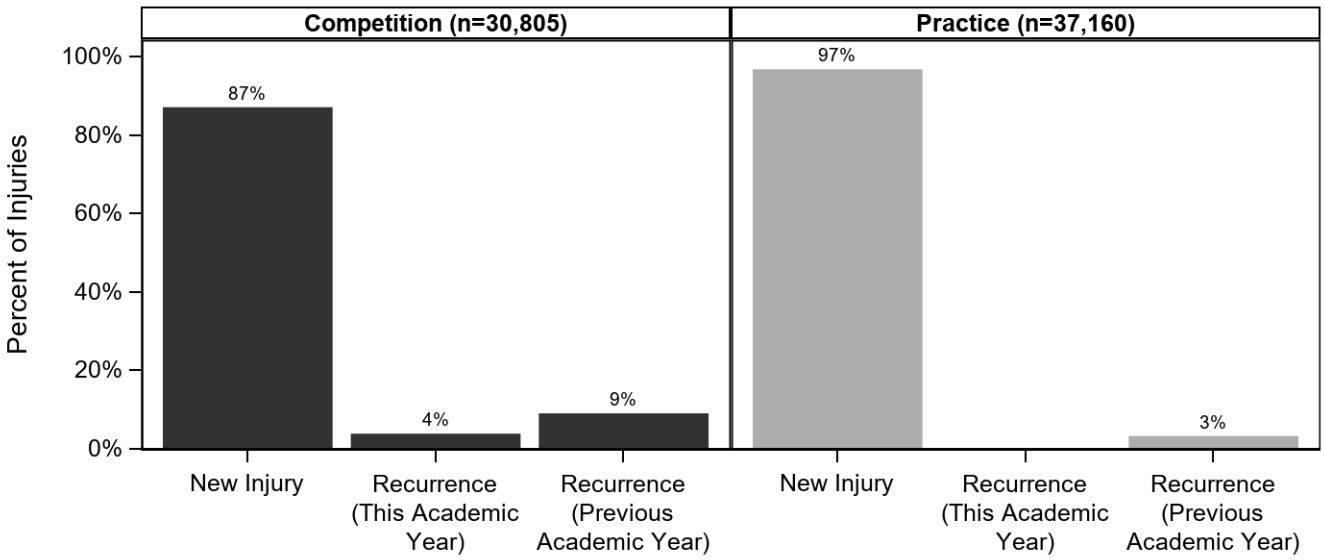


Table 6.6 Time during Season of Girls' Volleyball Injuries, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Time in Season	n	%
Preseason	10,448	15.1%
Regular Season	55,749	80.8%
Post Season	2,798	4.1%
Total	***68,994***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries. Totals and n's are not always equal due to slight rounding of the weighted number of injuries.

Table 6.7 Competition-Related Variables for Girls' Volleyball Injuries, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Time in Competition	n	%
Pre-competition/Warm-Ups	3,216	10.7%
First Game	3,522	11.7%
Second Game	4,827	16.0%
Third Game	4,373	14.5%
Fourth Game	1,593	5.3%
Unknown	12,661	41.9%
Total	***30,192***	***100.0%***

Court Location		
Right Back (Server)	1,248	4.1%
Right Forward	2,649	8.8%
Middle Forward	3,945	13.1%
Left Forward	3,129	10.4%
Left Back	906	3.0%
Outside the Playable Area	595	2.0%
At the Net	2,061	6.8%
Unknown	15,659	51.9%
Total	***30,192***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Table 6.8 Practice-Related Variables for Girls' Volleyball Injuries, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Time in Practice	n	%
First 1/2 Hour	6,567	17.2%
Second 1/2 Hour	4,340	11.4%
1-2 Hours into Practice	9,962	26.1%
>2 Hours into Practice	1,242	3.3%
Unknown	16,078	42.1%
Total	***38,189***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Figure 6.4 Player Position of Girls' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year

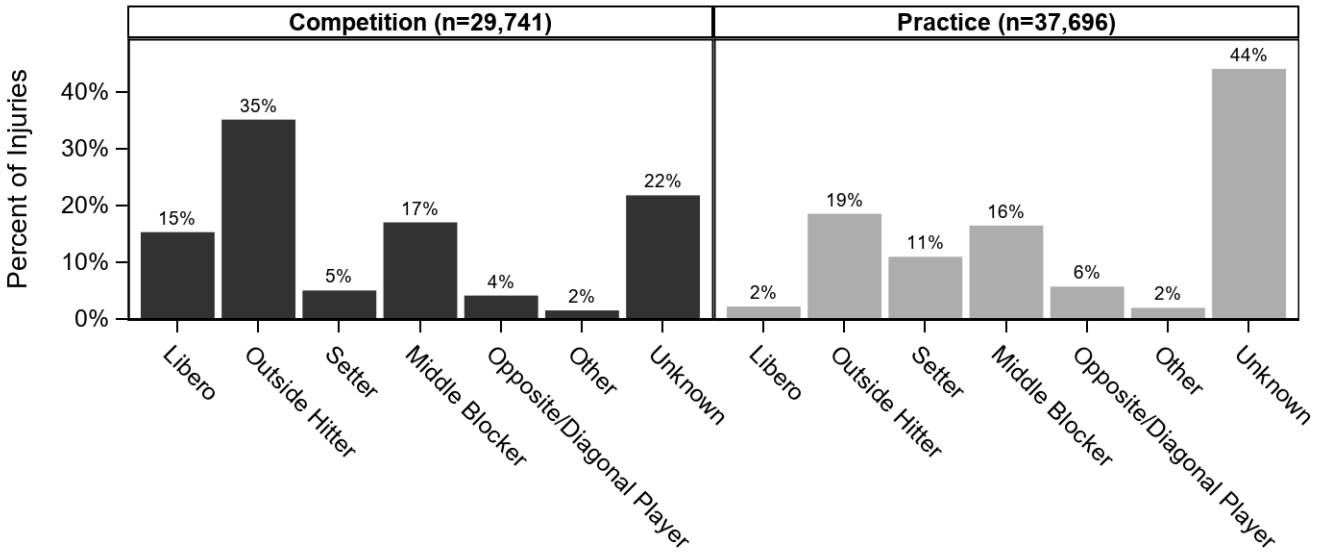


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Table 6.9 Activities Leading to Girls' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	Competition		Practice		Overall	
Activity	**n**	**%**	**n**	**%**	**n**	**%**
Unknown	4,047	13.4%	13,889	37.1%	17,936	26.5%
Blocking	6,948	23.0%	6,050	16.2%	12,998	19.2%
Digging	8,153	27.0%	3,104	8.3%	11,256	16.6%
General Play	3,992	13.2%	4,696	12.5%	8,688	12.8%
Spiking	3,726	12.3%	1,304	3.5%	5,030	7.4%
Passing	955	3.2%	3,377	9.0%	4,332	6.4%
Serving	106	0.4%	3,402	9.1%	3,509	5.2%
Setting	1,575	5.2%	800	2.1%	2,375	3.5%
Conditioning	0	0.0%	800	2.1%	800	1.2%
Other	690	2.3%	0	0.0%	690	1.0%
Total	***30,192***	***100.0%***	***37,421***	***100.0%***	***67,614***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries. Totals and n's are not always equal due to slight rounding of the weighted number of injuries.

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Table 6.10 Activity Resulting in Girls' Volleyball Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
Activity	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Blocking	10,454	28.3%	1,224	29.6%	940	43.1%	106	1.1%	275	1.8%
Conditioning	0	0.0%	0	0.0%	0	0.0%	0	0.0%	800	5.3%
Digging	2,479	6.7%	1,593	38.5%	345	15.8%	5,157	55.4%	1,682	11.1%
General Play	3,483	9.4%	629	15.2%	275	12.6%	1,538	16.5%	2,764	18.3%
Other	0	0.0%	0	0.0%	0	0.0%	690	7.4%	0	0.0%
Passing	2,923	7.9%	0	0.0%	345	15.8%	213	2.3%	851	5.6%
Serving	2,773	7.5%	0	0.0%	0	0.0%	106	1.1%	629	4.2%
Setting	1,469	4.0%	0	0.0%	0	0.0%	800	8.6%	106	0.7%
Spiking	3,995	10.8%	690	16.7%	0	0.0%	0	0.0%	345	2.3%
Unknown	9,310	25.2%	0	0.0%	275	12.6%	701	7.5%	7,650	50.7%
Total	***36,886***	***100.0%***	***4,136***	***100.0%***	***2,179***	***100.0%***	***9,311***	***100.0%***	***15,102***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries. Totals and n's are not always equal due to slight rounding of the weighted number of injuries.

VII. Boys' Basketball Injury Epidemiology

Table 7.1 Boys' Basketball Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	# Injuries	# Exposures	Injury Rate (per 1,000 AEs)	Nationally Estimated # Injuries
Total	***328***	***187,848***	***1.75***	***101,263***
Competition	181	59,043	3.07	53,165
Practice	147	128,805	1.14	48,098

* All remaining analyses in this chapter present data weighted to provide national injury estimates. COVID-19 may have affected these results.

Table 7.2 Demographic Characteristics of Injured Boys' Basketball Athletes, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Year in School	n	%
Freshman	20,933	21.1%
Sophomore	23,348	23.6%
Junior	28,150	28.4%
Senior	26,624	26.9%
Total	***99,055***	***100.0%***

Age (years)	
Minimum	13
Maximum	18
Mean (SD)	16.1 (1.2)
n	73,518

BMI	
Minimum	14.1
Maximum	33.4
Mean (SD)	23.0 (3.3)
n	51,920

* Throughout this chapter, totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Figure 7.1 Diagnosis of Boys' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year

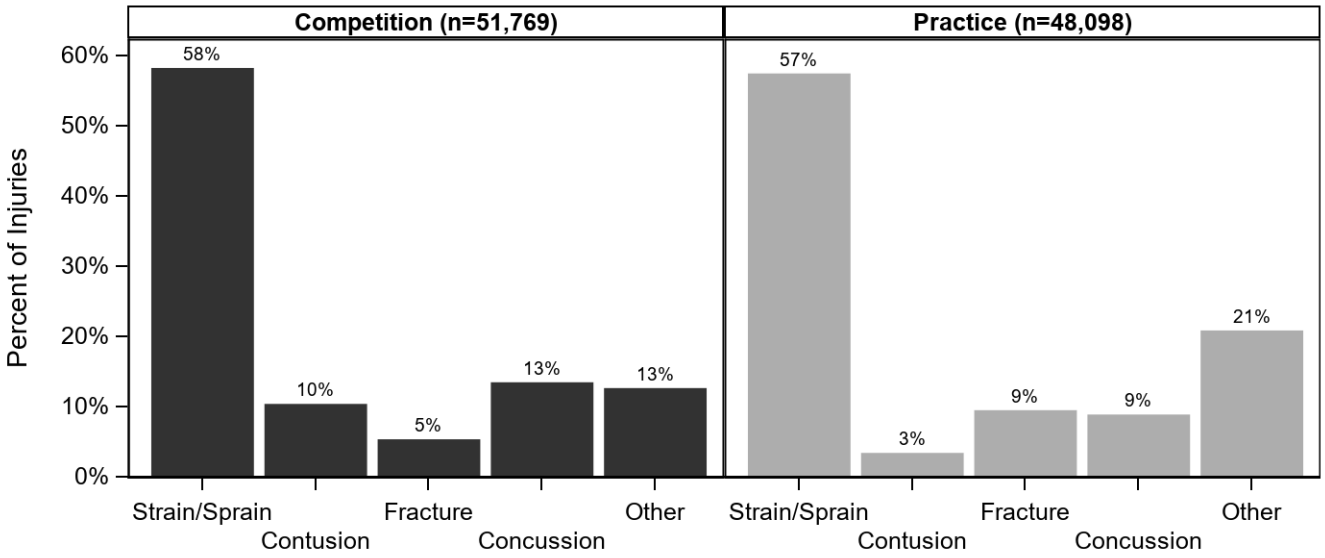


Table 7.3 Body Site of Boys' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	Competition		Practice		Overall	
Body Site	**n**	**%**	**n**	**%**	**n**	**%**
Ankle	19,404	36.5%	17,876	37.2%	37,280	36.8%
Head/Face	9,660	18.2%	4,958	10.3%	14,618	14.4%
Knee	8,608	16.2%	3,268	6.8%	11,876	11.7%
Hip/Thigh/Upper Leg	4,896	9.2%	5,150	10.7%	10,047	9.9%
Hand/Wrist	1,805	3.4%	5,716	11.9%	7,521	7.4%
Systemic	1,749	3.3%	3,697	7.7%	5,446	5.4%
Trunk	2,413	4.5%	1,968	4.1%	4,381	4.3%
Arm/Elbow	1,281	2.4%	1,914	4.0%	3,195	3.2%
Foot	1,567	2.9%	1,535	3.2%	3,102	3.1%
Lower Leg	863	1.6%	1,559	3.2%	2,422	2.4%
Shoulder	457	0.9%	457	0.9%	914	0.9%
Neck	462	0.9%	0	0.0%	462	0.5%
Total	***53,165***	***100.0%***	***48,098***	***100.0%***	***101,263***	***100.0%***

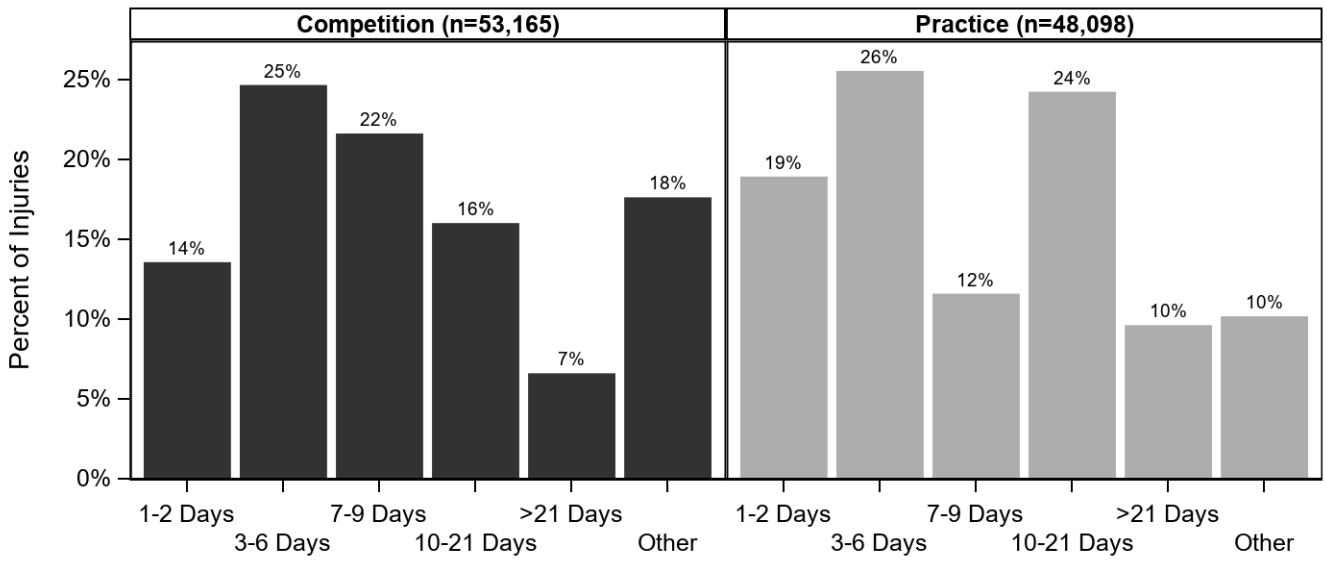
* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries. Totals and n's are not always equal due to slight rounding of the weighted number of injuries.

Table 7.4 Ten Most Common Boys' Basketball Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	Competition (n=51,769)		Practice (n=48,100)		Overall (n=99,866)	
Diagnosis	**n**	**%**	**n**	**%**	**n**	**%**
Ankle Strain/Sprain	18,244	35.2%	17,022	35.4%	35,266	35.3%
Head/Face Concussion	6,964	13.5%	4,261	8.9%	11,224	11.2%
Hip/Thigh/Upper Leg Strain/Sprain	4,084	7.9%	3,556	7.4%	7,640	7.7%
Systemic Other	1,749	3.4%	3,697	7.7%	5,446	5.5%
Knee Other	2,404	4.6%	2,169	4.5%	4,573	4.6%
Hand/Wrist Strain/Sprain	1,297	2.5%	2,798	5.8%	4,095	4.1%
Knee Strain/Sprain	3,063	5.9%	1,005	2.1%	4,067	4.1%
Trunk Strain/Sprain	1,058	2.0%	1,669	3.5%	2,727	2.7%
Hand/Wrist Fracture	457	0.9%	1,879	3.9%	2,336	2.3%
Knee Contusion	2,157	4.2%	0	0.0%	2,157	2.2%

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries. Totals and n's are not always equal due to slight rounding of the weighted number of injuries.

Figure 7.2 Time Loss of Boys' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *



* Other category is made up of medical disqualification for season, medical disqualification for career, athlete chooses not to continue, and season ended before athlete returned to play.

Table 7.5 Boys' Basketball Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	Competition		Practice		Overall	
Need for Surgery	**n**	**%**	**n**	**%**	**n**	**%**
Required Surgery	4,372	8.4%	963	2.1%	5,335	5.4%
Did Not Require Surgery	47,981	91.6%	45,949	97.9%	93,930	94.6%
Total	***52,353***	***100.0%***	***46,912***	***100.0%***	***99,265***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Figure 7.3 History of Boys' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year

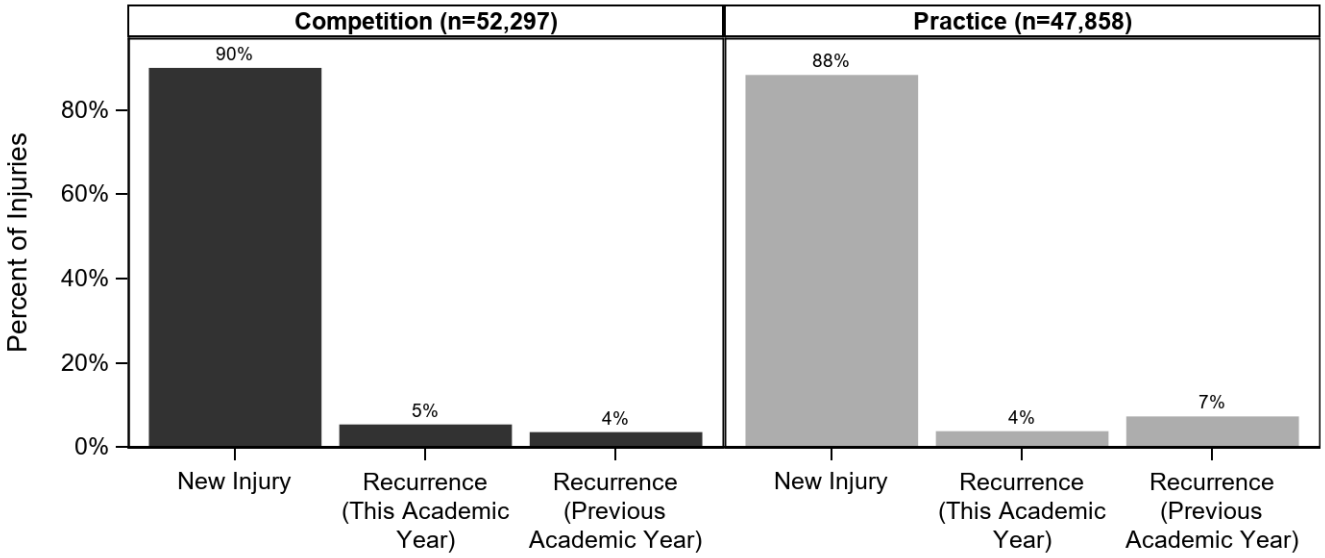


Table 7.6 Time during Season of Boys' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Time in Season	n	%
Preseason	23,073	22.8%
Regular Season	73,785	72.9%
Post Season	3,122	3.1%
Unknown/Other	1,233	1.2%
Total	***101,213***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Table 7.7 Competition-Related Variables for Boys' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Time in Competition	n	%
Pre-competition/Warm-Ups	914	1.9%
First Quarter	2,853	6.0%
Second Quarter	11,174	23.3%
Third Quarter	10,273	21.4%
Fourth Quarter	9,232	19.3%
Overtime	1,155	2.4%
Unknown	12,296	25.7%
Total	***47,897***	***100.0%***

Court Location		
Inside Lane (Offense)	8,336	17.4%
Inside Lane (Defense)	10,170	21.3%
Between 3 Point Arc and Lane (Offense)	2,654	5.5%
Between 3 Point Arc and Lane (Defense)	3,312	6.9%
Outside 3 Point Arc (Offense)	1,737	3.6%
Outside 3 Point Arc (Defense)	608	1.3%
Out of Bounds	1,165	2.4%
Off the Court	457	1.0%
Backcourt	1,167	2.4%
Unknown	18,240	38.1%
Total	***47,846***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Table 7.8 Practice-Related Variables for Boys' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Time in Practice	n	%
First 1/2 Hour	2,392	5.3%
Second 1/2 Hour	6,579	14.7%
1-2 Hours into Practice	19,120	42.7%
>2 Hours into Practice	2,230	5.0%
Unknown	14,436	32.3%
Total	***44,757***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Figure 7.4 Player Position of Boys' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year

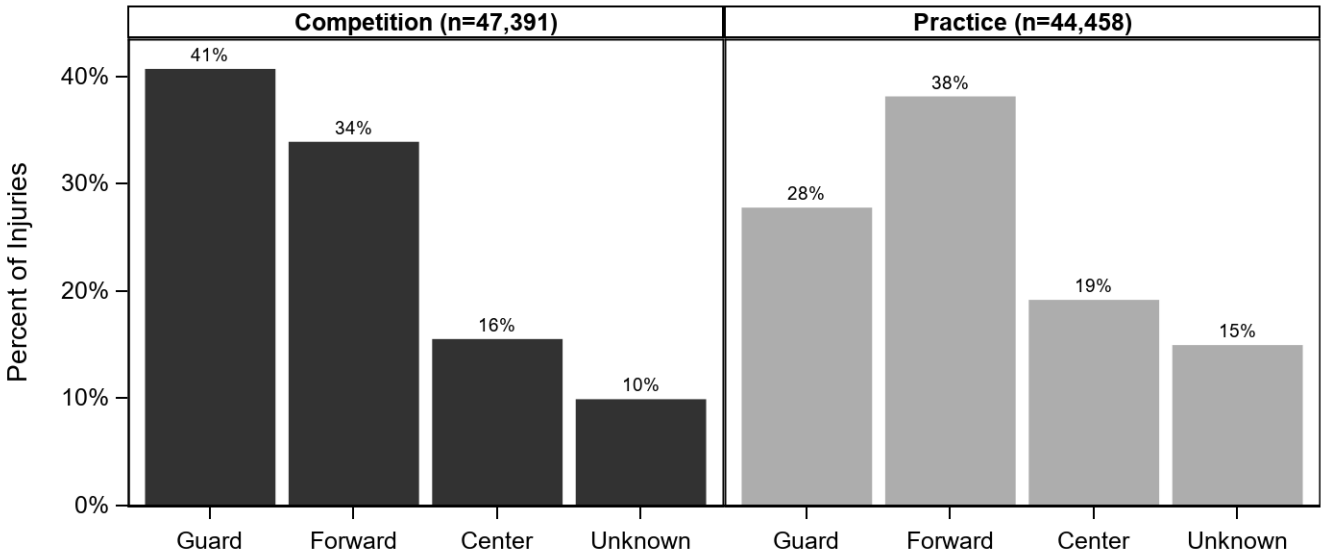


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Table 7.9 Activities Leading to Boys' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	Competition		Practice		Overall	
Activity	**n**	**%**	**n**	**%**	**n**	**%**
Rebounding	13,375	27.9%	7,990	18.0%	21,365	23.1%
General Play	8,347	17.4%	9,693	21.8%	18,040	19.5%
Unknown	6,154	12.8%	11,277	25.3%	17,431	18.8%
Defending	6,982	14.5%	2,545	5.7%	9,527	10.3%
Chasing Loose Ball	4,561	9.5%	1,872	4.2%	6,433	7.0%
Ball Handling/Dribbling	4,278	8.9%	1,408	3.2%	5,685	6.1%
Shooting	2,075	4.3%	2,863	6.4%	4,939	5.3%
Receiving Pass	970	2.0%	3,302	7.4%	4,272	4.6%
Conditioning	0	0.0%	1,877	4.2%	1,877	2.0%
Other	628	1.3%	812	1.8%	1,440	1.6%
Passing	623	1.3%	462	1.0%	1,085	1.2%
Screening	0	0.0%	406	0.9%	406	0.4%
Total	***47,992***	***100.0%***	***44,508***	***100.0%***	***92,500***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

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Table 7.10 Activity Resulting in Boys' Basketball Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
Activity	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Ball Handling/Dribbling	2,983	5.3%	457	8.1%	0	0.0%	0	0.0%	2,246	18.2%
Chasing Loose Ball	4,243	7.6%	1,206	21.4%	577	7.9%	0	0.0%	0	0.0%
Conditioning	1,216	2.2%	51	0.9%	0	0.0%	0	0.0%	610	5.0%
Defending	3,327	6.0%	1,120	19.8%	2,090	28.6%	2,184	20.6%	807	6.5%
General Play	10,523	18.9%	1,260	22.3%	1,559	21.3%	2,349	22.1%	2,349	19.1%
Other	1,034	1.9%	0	0.0%	0	0.0%	0	0.0%	406	3.3%
Passing	1,085	1.9%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Rebounding	15,248	27.3%	910	16.1%	1,888	25.8%	2,622	24.7%	335	2.7%
Receiving Pass	1,880	3.4%	0	0.0%	457	6.2%	448	4.2%	1,487	12.1%
Screening	0	0.0%	0	0.0%	0	0.0%	406	3.8%	0	0.0%
Shooting	3,923	7.0%	51	0.9%	0	0.0%	145	1.4%	768	6.2%
Unknown	10,303	18.5%	590	10.5%	747	10.2%	2,472	23.3%	3,320	26.9%
Total	***55,765***	***100.0%***	***5,644***	***100.0%***	***7,318***	***100.0%***	***10,626***	***100.0%***	***12,328***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

VIII. Girls' Basketball Injury Epidemiology

Table 8.1 Girls' Basketball Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	# Injuries	# Exposures	Injury Rate (per 1,000 AEs)	Nationally Estimated # Injuries
Total	***323***	***133,160***	***2.43***	***111,665***
Competition	165	41,691	3.96	51,976
Practice	158	91,469	1.73	59,689

* All remaining analyses in this chapter present data weighted to provide national injury estimates. COVID-19 may have affected these results.

Table 8.2 Demographic Characteristics of Injured Girls' Basketball Athletes, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Year in School	n	%
Freshman	27,395	24.8%
Sophomore	21,122	19.1%
Junior	31,388	28.4%
Senior	30,584	27.7%
Total	***110,488***	***100.0%***

Age (years)	
Minimum	13
Maximum	18
Mean (SD)	16.0 (1.2)
n	81,345

BMI	
Minimum	16.6
Maximum	51.9
Mean (SD)	22.5 (3.9)
n	54,633

* Throughout this chapter, totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Figure 8.1 Diagnosis of Girls' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year

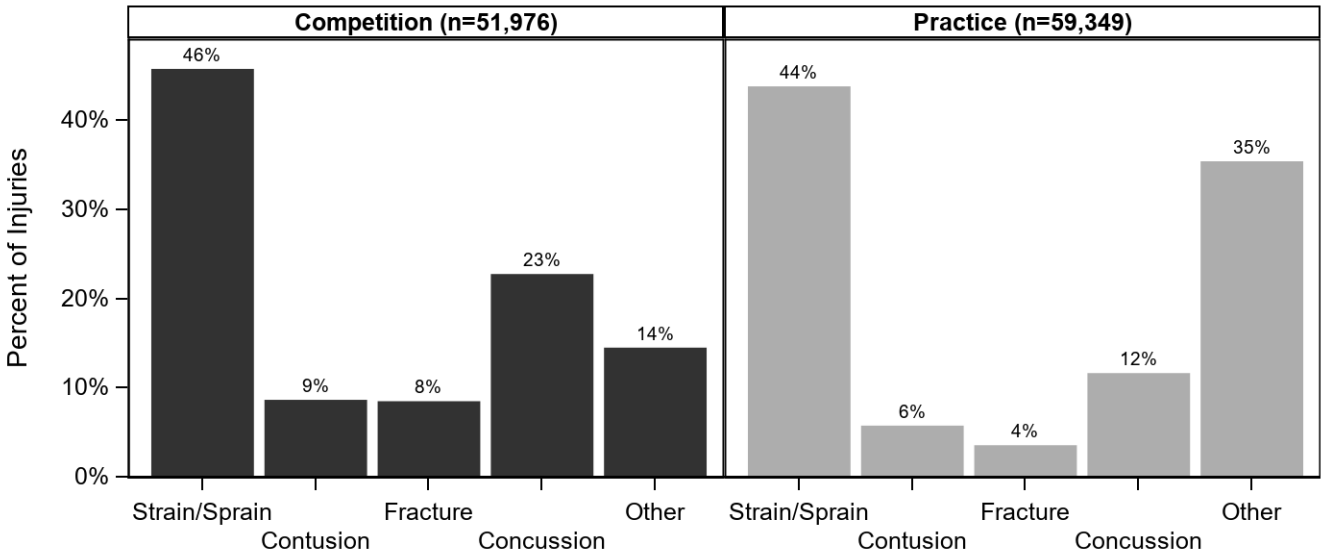


Table 8.3 Body Site of Girls' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	Competition		Practice		Overall	
Body Site	**n**	**%**	**n**	**%**	**n**	**%**
Ankle	14,683	28.2%	12,464	21.1%	27,147	24.4%
Head/Face	13,002	25.0%	8,278	14.0%	21,280	19.2%
Knee	10,185	19.6%	6,124	10.4%	16,309	14.7%
Systemic	1,043	2.0%	9,464	16.0%	10,507	9.5%
Hip/Thigh/Upper Leg	920	1.8%	9,426	15.9%	10,346	9.3%
Hand/Wrist	3,608	6.9%	3,736	6.3%	7,344	6.6%
Lower Leg	1,589	3.1%	5,643	9.5%	7,232	6.5%
Foot	1,567	3.0%	2,250	3.8%	3,816	3.4%
Trunk	1,983	3.8%	1,309	2.2%	3,291	3.0%
Shoulder	1,463	2.8%	340	0.6%	1,803	1.6%
Arm/Elbow	835	1.6%	109	0.2%	944	0.8%
Neck	784	1.5%	0	0.0%	784	0.7%
Other	314	0.6%	0	0.0%	314	0.3%
Total	***51,976***	***100.0%***	***59,143***	***100.0%***	***111,118***	***100.0%***

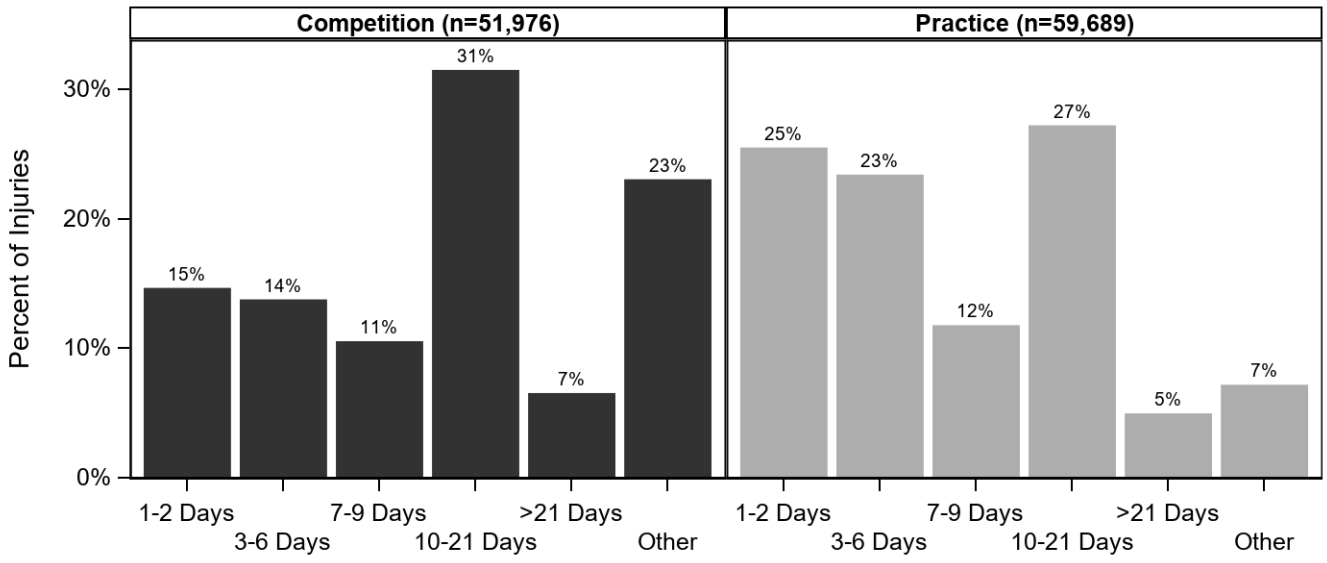
* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Table 8.4 Ten Most Common Girls' Basketball Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	Competition (n=51,971)		Practice (n=58,801)		Overall (n=110,776)	
Diagnosis	**n**	**%**	**n**	**%**	**n**	**%**
Ankle Strain/Sprain	14,520	27.9%	9,700	16.5%	24,220	21.9%
Head/Face Concussion	11,811	22.7%	6,895	11.7%	18,706	16.9%
Systemic Other	1,043	2.0%	9,464	16.1%	10,507	9.5%
Hip/Thigh/Upper Leg Strain/Sprain	0	0.0%	8,880	15.1%	8,880	8.0%
Knee Strain/Sprain	4,800	9.2%	1,436	2.4%	6,237	5.6%
Knee Other	2,664	5.1%	2,488	4.2%	5,152	4.7%
Lower Leg Other	443	0.9%	4,442	7.6%	4,885	4.4%
Knee Contusion	2,327	4.5%	2,200	3.7%	4,527	4.1%
Hand/Wrist Strain/Sprain	1,255	2.4%	2,637	4.5%	3,892	3.5%
Hand/Wrist Fracture	2,353	4.5%	1,099	1.9%	3,452	3.1%

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Figure 8.2 Time Loss of Girls' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *



* Other category is made up of medical disqualification for season, medical disqualification for career, athlete chooses not to continue, and season ended before athlete returned to play.

Table 8.5 Girls' Basketball Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	Competition		Practice		Overall	
Need for Surgery	**n**	**%**	**n**	**%**	**n**	**%**
Required Surgery	3,320	6.4%	600	1.0%	3,920	3.5%
Did Not Require Surgery	48,655	93.6%	58,749	99.0%	107,405	96.5%
Total	***51,976***	***100.0%***	***59,349***	***100.0%***	***111,324***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Figure 8.3 History of Girls' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year

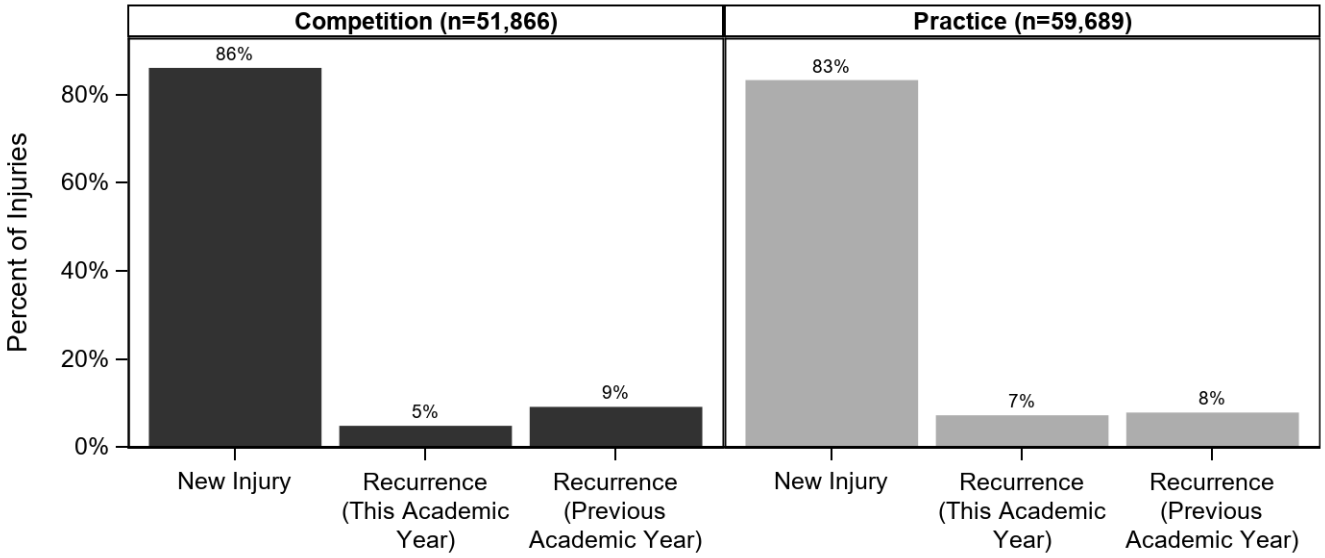


Table 8.6 Time during Season of Girls' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Time in Season	n	%
Preseason	27,891	25.1%
Regular Season	78,207	70.4%
Post Season	4,680	4.2%
Unknown/Other	340	0.3%
Total	***111,118***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Table 8.7 Competition-Related Variables for Girls' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Time in Competition	n	%
Pre-competition/Warm-Ups	556	1.1%
First Quarter	3,823	7.6%
Second Quarter	10,183	20.3%
Third Quarter	6,778	13.5%
Fourth Quarter	11,313	22.6%
Unknown	17,416	34.8%
Total	***50,067***	***100.0%***

Court Location		
Inside Lane (Offense)	7,824	15.9%
Inside Lane (Defense)	7,062	14.3%
Between 3 Point Arc and Lane (Offense)	4,602	9.3%
Between 3 Point Arc and Lane (Defense)	1,798	3.7%
Outside 3 Point Arc (Offense)	2,444	5.0%
Outside 3 Point Arc (Defense)	4,090	8.3%
Out of Bounds	681	1.4%
Backcourt	1,421	2.9%
Unknown	19,310	39.2%
Total	***49,231***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Table 8.8 Practice-Related Variables for Girls' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Time in Practice	n	%
First 1/2 Hour	3,214	5.6%
Second 1/2 Hour	7,142	12.4%
1-2 Hours into Practice	16,727	29.1%
>2 Hours into Practice	1,102	1.9%
Unknown	29,334	51.0%
Total	***57,518***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Figure 8.4 Player Position of Girls' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year

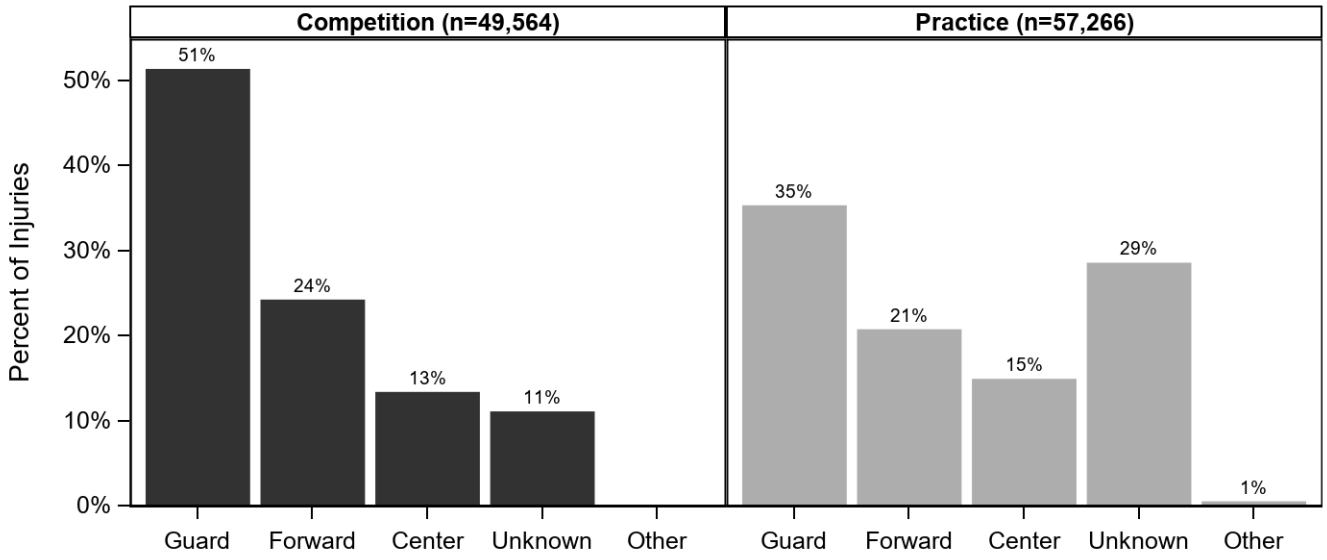


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Table 8.9 Activities Leading to Girls' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	Competition		Practice		Overall	
Activity	**n**	**%**	**n**	**%**	**n**	**%**
Unknown	9,945	20.0%	18,417	32.8%	28,362	26.8%
General Play	7,005	14.1%	14,075	25.1%	21,081	19.9%
Rebounding	7,475	15.1%	6,118	10.9%	13,593	12.8%
Defending	7,319	14.8%	2,402	4.3%	9,722	9.2%
Chasing Loose Ball	6,943	14.0%	1,309	2.3%	8,251	7.8%
Ball Handling/Dribbling	5,030	10.1%	1,960	3.5%	6,990	6.6%
Shooting	3,644	7.3%	2,632	4.7%	6,276	5.9%
Receiving Pass	1,702	3.4%	3,915	7.0%	5,617	5.3%
Conditioning	0	0.0%	4,795	8.5%	4,795	4.5%
Other	450	0.9%	546	1.0%	996	0.9%
Screening	109	0.2%	0	0.0%	109	0.1%
Total	***49,621***	***100.0%***	***56,170***	***100.0%***	***105,791***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries. Totals and n's are not always equal due to slight rounding of the weighted number of injuries.

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Table 8.10 Activity Resulting in Girls' Basketball Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
Activity	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Ball Handling/Dribbling	4,321	9.1%	1,043	13.2%	0	0.0%	109	0.6%	1,516	5.9%
Chasing Loose Ball	1,493	3.1%	1,357	17.2%	0	0.0%	4,460	24.7%	941	3.7%
Conditioning	2,189	4.6%	53	0.7%	0	0.0%	0	0.0%	2,553	10.0%
Defending	3,345	7.0%	712	9.0%	450	6.9%	3,852	21.3%	1,363	5.3%
General Play	10,721	22.6%	1,360	17.3%	288	4.4%	790	4.4%	7,921	31.0%
Other	996	2.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Rebounding	8,272	17.4%	757	9.6%	1,444	22.2%	1,709	9.5%	1,410	5.5%
Receiving Pass	2,821	5.9%	0	0.0%	1,466	22.6%	1,330	7.4%	0	0.0%
Screening	0	0.0%	109	1.4%	0	0.0%	0	0.0%	0	0.0%
Shooting	4,187	8.8%	288	3.7%	861	13.2%	53	0.3%	546	2.1%
Unknown	9,104	19.2%	2,200	27.9%	1,986	30.6%	5,772	31.9%	9,300	36.4%
Total	***47,448***	***100.0%***	***7,880***	***100.0%***	***6,495***	***100.0%***	***18,076***	***100.0%***	***25,552***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries. Totals and n's are not always equal due to slight rounding of the weighted number of injuries.

IX. Boys' Wrestling Injury Epidemiology

Table 9.1 Boys' Wrestling Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	# Injuries	# Exposures	Injury Rate (per 1,000 AEs)	Nationally Estimated # Injuries
Total	***355***	***120,131***	***2.96***	***142,959***
Competition	164	30,433	5.39	64,629
Practice	191	89,698	2.13	78,330

* All remaining analyses in this chapter present data weighted to provide national injury estimates. COVID-19 may have affected these results.

Table 9.2 Demographic Characteristics of Injured Boys' Wrestling Athletes, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Year in School	n	%
Freshman	33,089	23.6%
Sophomore	50,419	36.0%
Junior	33,867	24.2%
Senior	22,757	16.2%
Total	***140,132***	***100.0%***

Age (years)	
Minimum	13
Maximum	18
Mean (SD)	15.8 (1.2)
n	126,836

BMI	
Minimum	15.8
Maximum	50.8
Mean (SD)	24.8 (5.9)
n	92,513

* Throughout this chapter, totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Figure 9.1 Diagnosis of Boys' Wrestling Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year

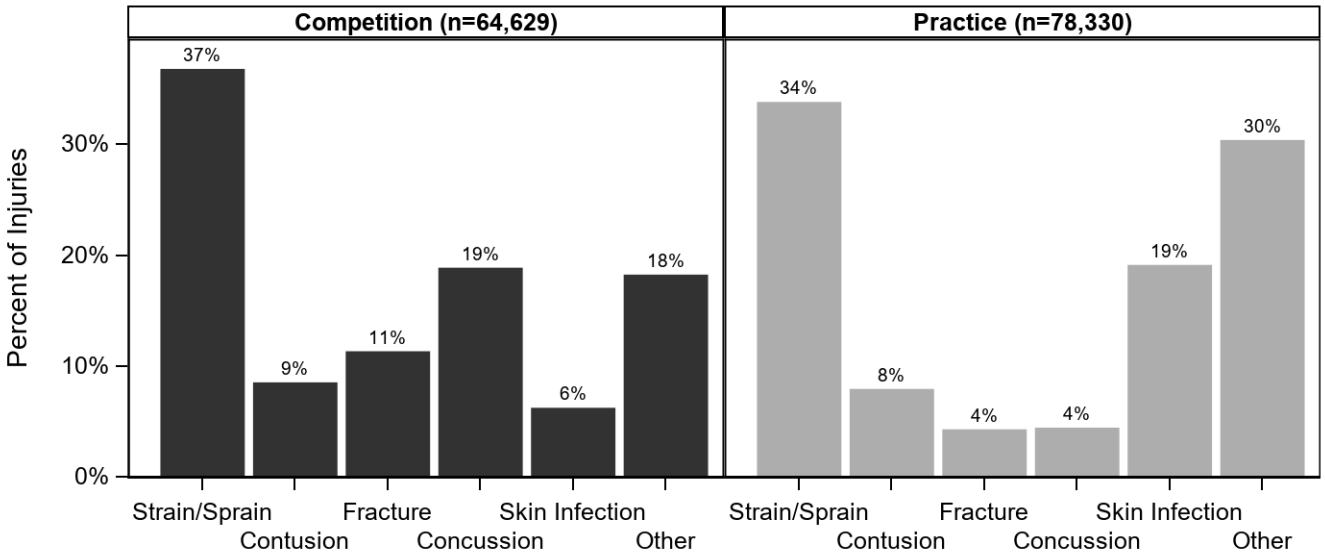


Table 9.3 Body Site of Boys' Wrestling Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	Competition		Practice		Overall	
Body Site	**n**	**%**	**n**	**%**	**n**	**%**
Head/Face	15,893	24.6%	12,652	16.2%	28,545	20.0%
Shoulder	10,196	15.8%	9,824	12.5%	20,020	14.0%
Knee	6,915	10.7%	9,046	11.5%	15,961	11.2%
Trunk	6,476	10.0%	8,888	11.3%	15,364	10.7%
Arm/Elbow	7,804	12.1%	5,980	7.6%	13,784	9.6%
Ankle	6,283	9.7%	6,216	7.9%	12,499	8.7%
Hand/Wrist	3,097	4.8%	7,795	10.0%	10,892	7.6%
Systemic	1,667	2.6%	7,746	9.9%	9,413	6.6%
Hip/Thigh/Upper Leg	1,044	1.6%	6,112	7.8%	7,156	5.0%
Other	1,531	2.4%	1,339	1.7%	2,870	2.0%
Neck	1,185	1.8%	1,541	2.0%	2,726	1.9%
Foot	2,102	3.3%	0	0.0%	2,102	1.5%
Lower Leg	436	0.7%	1,192	1.5%	1,628	1.1%
Total	***64,629***	***100.0%***	***78,330***	***100.0%***	***142,960***	***100.0%***

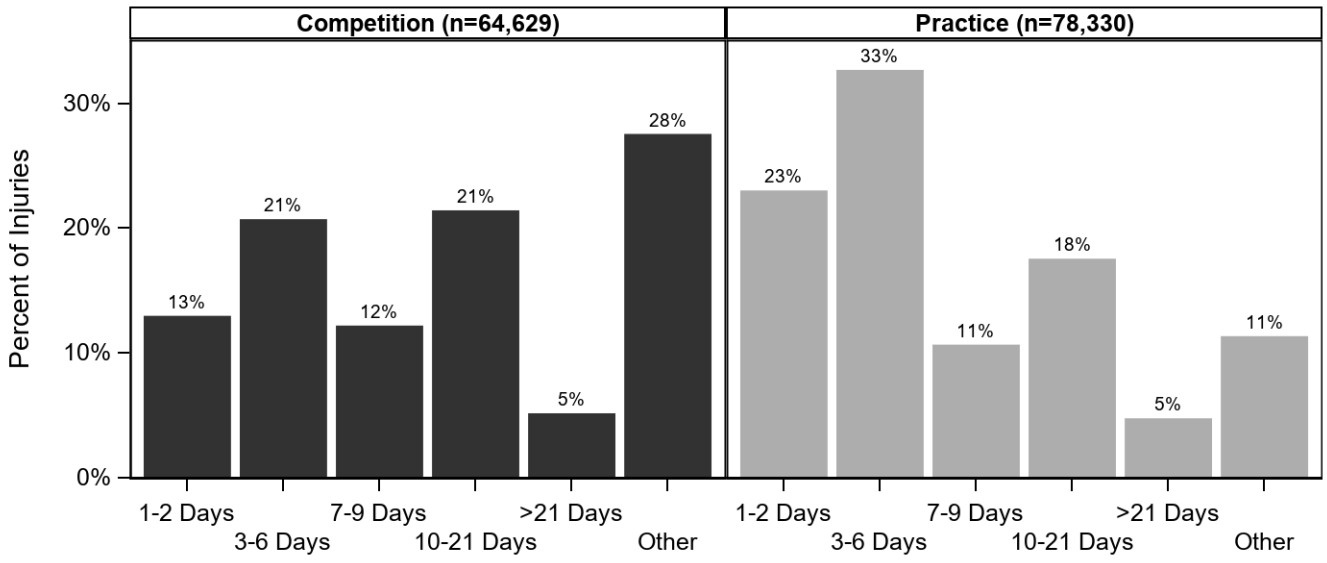
* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Table 9.4 Ten Most Common Boys' Wrestling Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	Competition (n=64,631)		Practice (n=78,329)		Overall (n=142,961)	
Diagnosis	**n**	**%**	**n**	**%**	**n**	**%**
Head/Face Concussion	12,195	18.9%	3,470	4.4%	15,664	11.0%
Shoulder Strain/Sprain	5,151	8.0%	5,629	7.2%	10,780	7.5%
Ankle Strain/Sprain	4,811	7.4%	5,409	6.9%	10,220	7.1%
Head/Face Other	2,302	3.6%	7,367	9.4%	9,669	6.8%
Systemic Other	1,667	2.6%	7,746	9.9%	9,413	6.6%
Shoulder Other	4,984	7.7%	4,194	5.4%	9,178	6.4%
Knee Other	2,598	4.0%	5,095	6.5%	7,693	5.4%
Arm/Elbow Other	2,120	3.3%	4,901	6.3%	7,021	4.9%
Hip/Thigh/Upper Leg Strain/Sprain	1,044	1.6%	5,676	7.2%	6,720	4.7%
Trunk Other	968	1.5%	5,713	7.3%	6,681	4.7%

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Figure 9.2 Time Loss of Boys' Wrestling Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *



* Other category is made up of medical disqualification for season, medical disqualification for career, athlete chooses not to continue, and season ended before athlete returned to play.

Table 9.5 Boys' Wrestling Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	Competition		Practice		Overall	
Need for Surgery	**n**	**%**	**n**	**%**	**n**	**%**
Required Surgery	4,819	7.5%	2,277	2.9%	7,096	5.0%
Did Not Require Surgery	59,471	92.5%	75,959	97.1%	135,431	95.0%
Total	***64,291***	***100.0%***	***78,236***	***100.0%***	***142,527***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Figure 9.3 History of Boys' Wrestling Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year

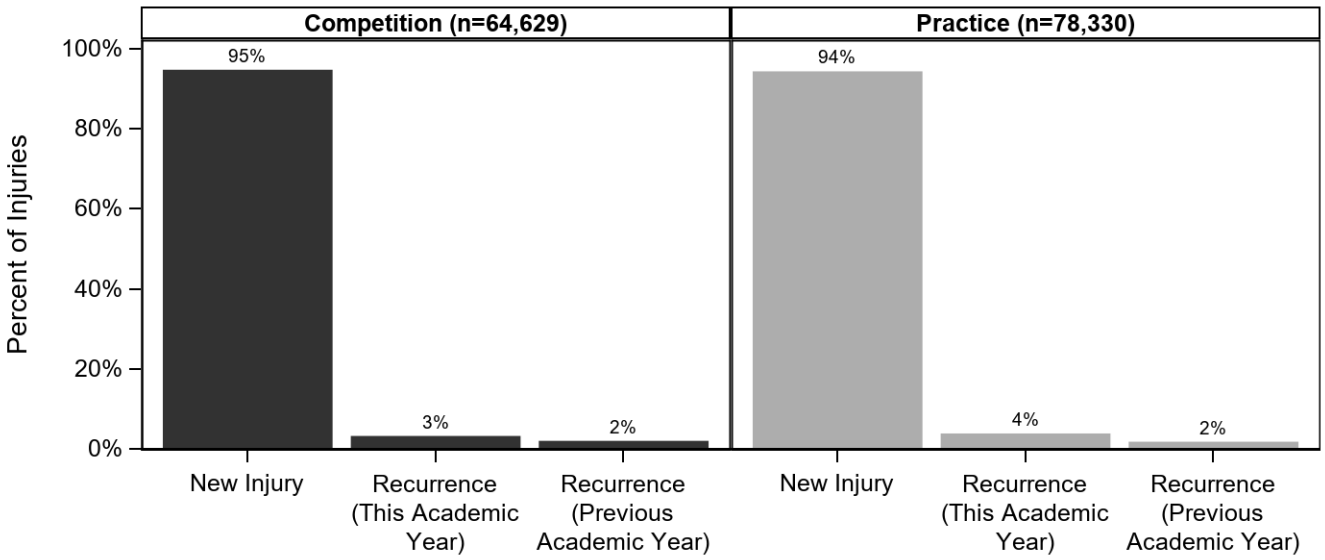


Table 9.6 Time during Season of Boys' Wrestling Injuries, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Time in Season	n	%
Preseason	23,417	16.4%
Regular Season	101,288	70.9%
Post Season	18,255	12.8%
Total	***142,960***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Table 9.7 Competition-Related Variables for Boys' Wrestling Injuries, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Time in Competition	n	%
Pre-competition/Warm-Ups	94	0.1%
First Period	4,748	7.4%
Second Period	15,168	23.6%
Third Period	9,239	14.4%
Overtime	374	0.6%
Unknown	34,663	53.9%
Total	***64,285***	***100.0%***

Mat Location		
Within 28ft Circle	46,371	72.4%
Off Mat	968	1.5%
Unknown	16,702	26.1%
Total	***64,041***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Table 9.8 Practice-Related Variables for Boys' Wrestling Injuries, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Time in Practice	n	%
First 1/2 Hour	4,908	6.4%
Second 1/2 Hour	7,722	10.0%
1-2 Hours into Practice	31,863	41.3%
>2 Hours into Practice	1,609	2.1%
Unknown	31,071	40.3%
Total	***77,172***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

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Table 9.9 Activities Leading to Boys' Wrestling Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	Competition		Practice		Overall	
Activity	**n**	**%**	**n**	**%**	**n**	**%**
Takedown	29,465	46.1%	14,115	18.3%	43,580	30.9%
Unknown	16,280	25.5%	22,056	28.6%	38,337	27.2%
Sparring	6,208	9.7%	11,596	15.0%	17,804	12.6%
N/A **	2,147	3.4%	10,148	13.1%	12,295	8.7%
Conditioning	0	0.0%	7,542	9.8%	7,542	5.3%
Fall	3,252	5.1%	3,073	4.0%	6,325	4.5%
Other	461	0.7%	5,590	7.2%	6,051	4.3%
Escape	2,788	4.4%	1,053	1.4%	3,841	2.7%
Near Fall	2,327	3.6%	1,240	1.6%	3,567	2.5%
Reversal	429	0.7%	774	1.0%	1,203	0.9%
Riding	541	0.8%	0	0.0%	541	0.4%
Total	***63,900***	***100.0%***	***77,187***	***100.0%***	***141,087***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.
** Includes overuse, heat illness, conditioning, etc.

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Table 9.10 Activity Resulting in Boys' Wrestling Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year

	Diagnosis									
	Strain Sprain		Contusion		Fracture		Concussion		Other	
Activity	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Conditioning	3,929	7.8%	748	6.4%	480	4.5%	0	0.0%	2,386	4.5%
Escape	2,024	4.0%	0	0.0%	760	7.1%	0	0.0%	1,056	2.0%
Fall	1,788	3.6%	1,167	10.0%	1,222	11.4%	1,607	10.3%	541	1.0%
N/A **	480	1.0%	0	0.0%	0	0.0%	0	0.0%	11,815	22.3%
Near Fall	2,339	4.7%	0	0.0%	374	3.5%	0	0.0%	854	1.6%
Other	3,490	7.0%	822	7.0%	62	0.6%	94	0.6%	1,583	3.0%
Reversal	461	0.9%	367	3.1%	374	3.5%	0	0.0%	0	0.0%
Riding	480	1.0%	0	0.0%	62	0.6%	0	0.0%	0	0.0%
Sparring	8,236	16.5%	2,324	19.8%	461	4.3%	1,677	10.7%	5,105	9.6%
Takedown	15,418	30.8%	5,713	48.8%	4,462	41.8%	7,163	45.7%	10,825	20.4%
Unknown	11,403	22.8%	574	4.9%	2,420	22.7%	5,123	32.7%	18,816	35.5%
Total	***50,049***	***100.0%***	***11,714***	***100.0%***	***10,676***	***100.0%***	***15,664***	***100.0%***	***52,982***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.
** Includes overuse, heat illness, conditioning, etc.

X. Boys' Baseball Injury Epidemiology

Table 10.1 Boys' Baseball Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	# Injuries	# Exposures	Injury Rate (per 1,000 AEs)	Nationally Estimated # Injuries
Total	***151***	***157,883***	***0.96***	***63,115***
Competition	80	58,771	1.36	29,855
Practice	71	99,112	0.72	33,260

* All remaining analyses in this chapter present data weighted to provide national injury estimates. COVID-19 may have affected these results.

Table 10.2 Demographic Characteristics of Injured Boys' Baseball Athletes, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Year in School	n	%
Freshman	17,713	28.3%
Sophomore	12,416	19.8%
Junior	15,506	24.7%
Senior	17,035	27.2%
Total	***62,670***	***100.0%***

Age (years)	
Minimum	13
Maximum	18
Mean (SD)	16.1 (1.2)
n	45,149

BMI	
Minimum	16.1
Maximum	32.8
Mean (SD)	23.4 (3.5)
n	32,251

* Throughout this chapter, totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Figure 10.1 Diagnosis of Boys' Baseball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year

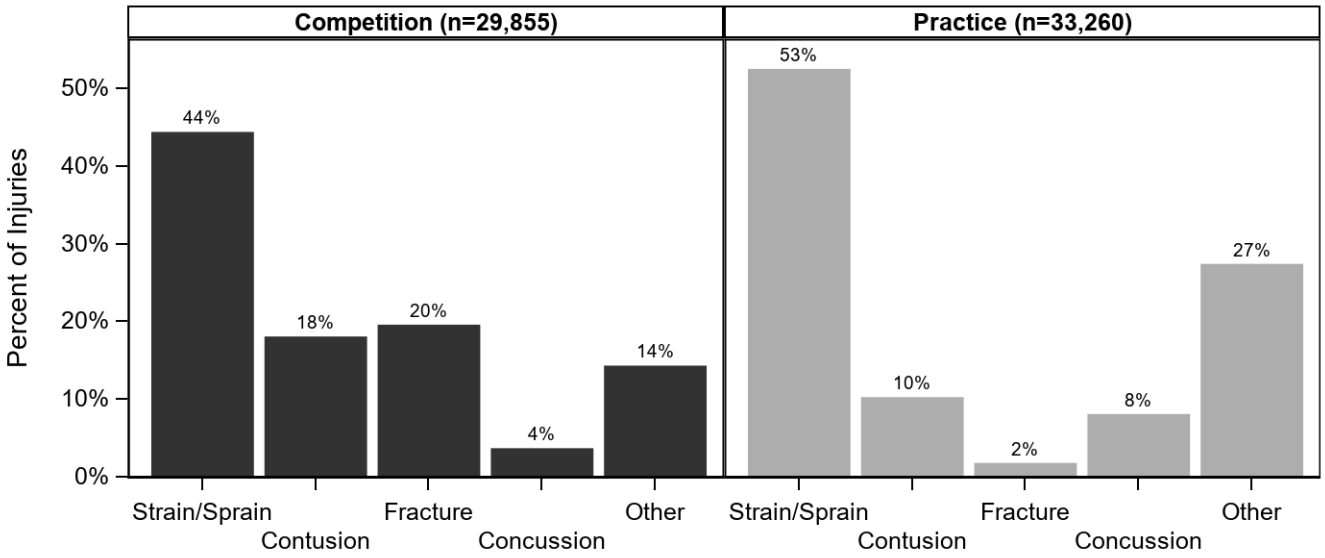


Table 10.3 Body Site of Boys' Baseball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	Competition		Practice		Overall	
Body Site	**n**	**%**	**n**	**%**	**n**	**%**
Arm/Elbow	4,704	15.8%	7,873	23.7%	12,577	19.9%
Trunk	2,519	8.4%	5,354	16.1%	7,873	12.5%
Hip/Thigh/Upper Leg	4,362	14.6%	3,245	9.8%	7,607	12.1%
Shoulder	1,576	5.3%	5,900	17.7%	7,476	11.8%
Ankle	2,866	9.6%	4,506	13.5%	7,371	11.7%
Hand/Wrist	5,597	18.7%	481	1.4%	6,078	9.6%
Head/Face	1,650	5.5%	3,871	11.6%	5,520	8.7%
Lower Leg	1,839	6.2%	1,658	5.0%	3,497	5.5%
Knee	2,711	9.1%	54	0.2%	2,765	4.4%
Foot	1,587	5.3%	318	1.0%	1,905	3.0%
Other	445	1.5%	0	0.0%	445	0.7%
Total	***29,855***	***100.0%***	***33,260***	***100.0%***	***63,115***	***100.0%***

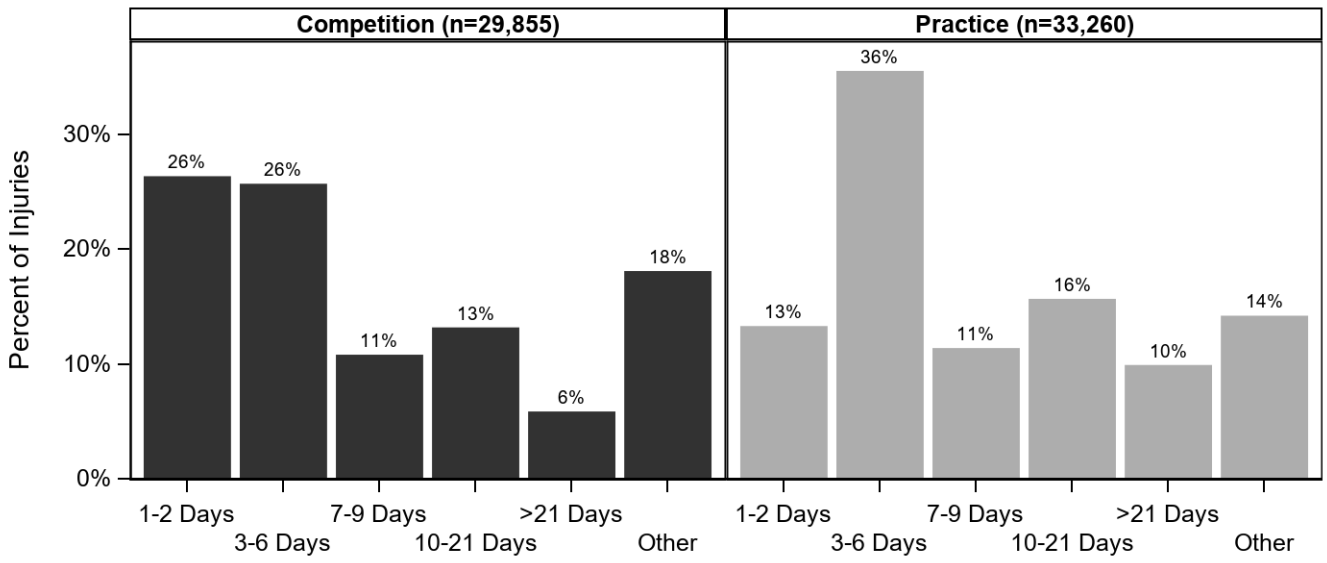
* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Table 10.4 Ten Most Common Boys' Baseball Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	Competition (n=29,852)		Practice (n=33,258)		Overall (n=63,113)	
Diagnosis	**n**	**%**	**n**	**%**	**n**	**%**
Arm/Elbow Strain/Sprain	3,089	10.3%	5,163	15.5%	8,252	13.1%
Hip/Thigh/Upper Leg Strain/Sprain	4,182	14.0%	2,872	8.6%	7,053	11.2%
Hand/Wrist Fracture	5,344	17.9%	163	0.5%	5,508	8.7%
Ankle Strain/Sprain	1,641	5.5%	3,814	11.5%	5,455	8.6%
Shoulder Other	878	2.9%	4,188	12.6%	5,066	8.0%
Trunk Strain/Sprain	1,306	4.4%	3,458	10.4%	4,763	7.5%
Head/Face Concussion	1,096	3.7%	2,685	8.1%	3,781	6.0%
Trunk Other	1,213	4.1%	1,896	5.7%	3,109	4.9%
Arm/Elbow Contusion	614	2.1%	1,713	5.2%	2,327	3.7%
Knee Strain/Sprain	2,284	7.7%	0	0.0%	2,284	3.6%

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries. Totals and n's are not always equal due to slight rounding of the weighted number of injuries.

Figure 10.2 Time Loss of Boys' Baseball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *



* Other category is made up of medical disqualification for season, medical disqualification for career, athlete chooses not to continue, and season ended before athlete returned to play.

Table 10.5 Boys' Baseball Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	Competition		Practice		Overall	
Need for Surgery	**n**	**%**	**n**	**%**	**n**	**%**
Required Surgery	1,059	3.6%	737	2.2%	1,796	2.8%
Did Not Require Surgery	28,741	96.4%	32,523	97.8%	61,264	97.2%
Total	***29,800***	***100.0%***	***33,260***	***100.0%***	***63,060***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Figure 10.3 History of Boys' Baseball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year

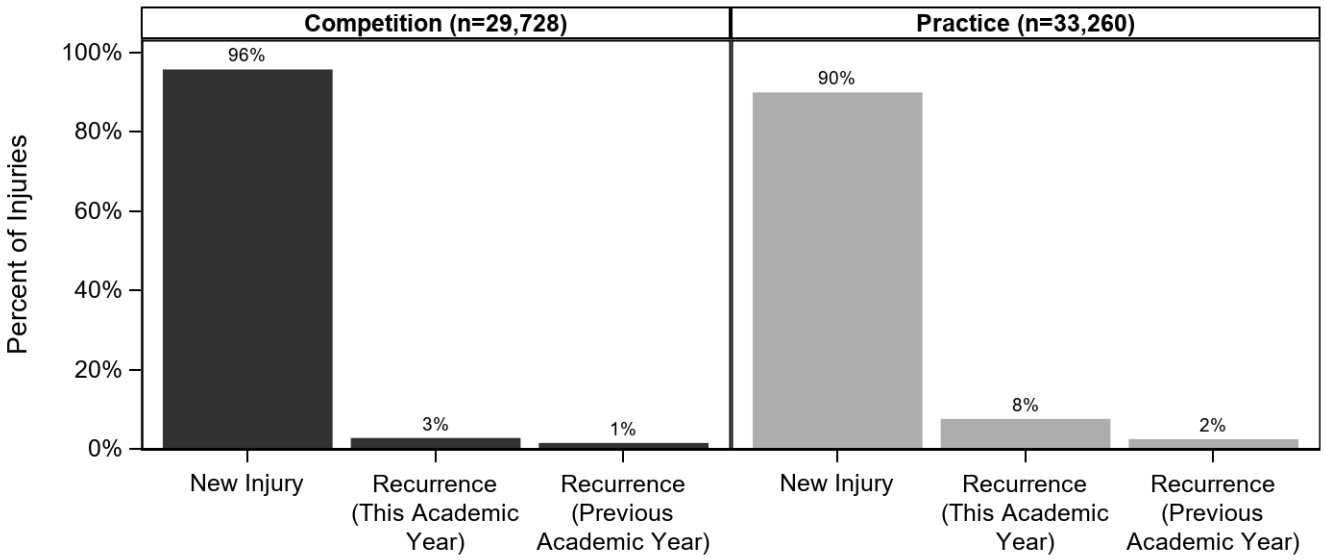


Table 10.6 Time during Season of Boys' Baseball Injuries, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Time in Season	n	%
Preseason	16,009	25.4%
Regular Season	45,505	72.1%
Post Season	1,156	1.8%
Unknown/Other	445	0.7%
Total	***63,115***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Table 10.7 Competition-Related Variables for Boys' Baseball Injuries, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Time in Competition	n	%
Pre-competition/Warm-Ups	697	2.4%
First Inning	1,233	4.3%
Second Inning	889	3.1%
Third Inning	2,645	9.3%
Fourth Inning	5,029	17.6%
Fifth Inning	2,780	9.7%
Sixth Inning	3,962	13.9%
Seventh Inning	3,391	11.9%
Unknown	7,888	27.7%
Total	***28,515***	***100.0%***

Field Location		
Pitchers Mound	5,121	18.0%
Home Plate	7,839	27.5%
First Base	6,495	22.8%
Second Base	980	3.4%
Third Base	1,343	4.7%
Infield	1,268	4.4%
Outfield	2,482	8.7%
Foul Territory	126	0.4%
Other	126	0.4%
Unknown	2,734	9.6%
Total	***28,515***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Table 10.8 Practice-Related Variables for Boys' Baseball Injuries, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Time in Practice	n	%
First 1/2 Hour	2,992	9.6%
Second 1/2 Hour	4,856	15.5%
1-2 Hours into Practice	12,854	41.1%
Unknown	10,607	33.9%
Total	***31,310***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Figure 10.4 Player Position of Boys' Baseball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year

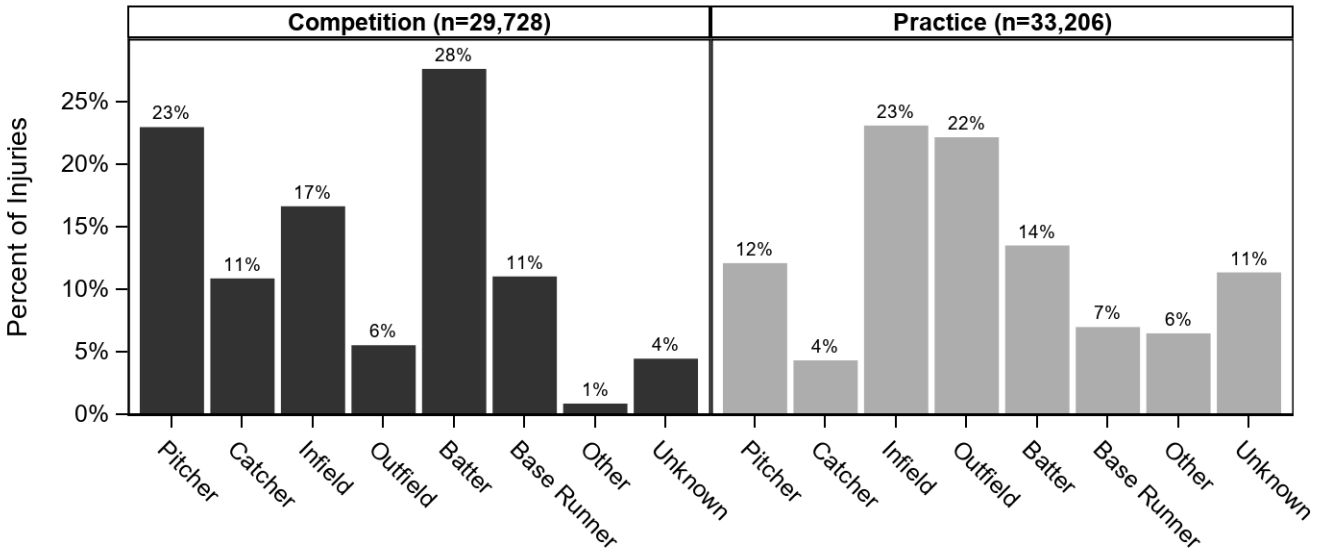


Table 10.9 Activities Leading to Boys' Baseball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	Competition		Practice		Overall	
Activity	**n**	**%**	**n**	**%**	**n**	**%**
Batting	7,966	26.7%	6,027	18.2%	13,994	22.2%
Throwing	2,275	7.6%	8,557	25.8%	10,832	17.2%
Running Bases	7,186	24.1%	2,982	9.0%	10,169	16.1%
Pitching	5,247	17.6%	2,237	6.7%	7,484	11.9%
Unknown	1,213	4.1%	3,389	10.2%	4,602	7.3%
Fielding a Batted Ball	1,570	5.3%	2,923	8.8%	4,492	7.1%
Fielding a Thrown Ball	1,695	5.7%	1,488	4.5%	3,183	5.0%
General Play	445	1.5%	2,186	6.6%	2,631	4.2%
Conditioning	126	0.4%	2,427	7.3%	2,553	4.0%
Catching	1,299	4.4%	737	2.2%	2,036	3.2%
Sliding	705	2.4%	126	0.4%	832	1.3%
Other	126	0.4%	126	0.4%	253	0.4%
Total	***29,855***	***100.0%***	***33,206***	***100.0%***	***63,060***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries. Totals and n's are not always equal due to slight rounding of the weighted number of injuries.

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Table 10.10 Activity Resulting in Boys' Baseball Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
Activity	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Batting	4,694	15.3%	3,508	39.9%	2,981	46.3%	488	12.9%	2,323	17.4%
Catching	809	2.6%	0	0.0%	427	6.6%	482	12.7%	318	2.4%
Conditioning	2,427	7.9%	0	0.0%	0	0.0%	126	3.3%	0	0.0%
Fielding a Batted Ball	1,627	5.3%	986	11.2%	625	9.7%	1,254	33.2%	0	0.0%
Fielding a Thrown Ball	1,319	4.3%	763	8.7%	488	7.6%	488	12.9%	126	0.9%
General Play	1,615	5.3%	0	0.0%	445	6.9%	571	15.1%	0	0.0%
Other	126	0.4%	0	0.0%	0	0.0%	0	0.0%	126	0.9%
Pitching	4,684	15.3%	1,340	15.2%	0	0.0%	0	0.0%	1,460	11.0%
Running Bases	6,987	22.7%	1,701	19.3%	855	13.3%	0	0.0%	625	4.7%
Sliding	181	0.6%	54	0.6%	488	7.6%	0	0.0%	109	0.8%
Throwing	5,502	17.9%	445	5.1%	126	2.0%	0	0.0%	4,759	35.7%
Unknown	746	2.4%	0	0.0%	0	0.0%	373	9.9%	3,483	26.1%
Total	***30,716***	***100.0%***	***8,798***	***100.0%***	***6,435***	***100.0%***	***3,781***	***100.0%***	***13,330***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

XI. Girls' Softball Injury Epidemiology

Table 11.1 Girls' Softball Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	# Injuries	# Exposures	Injury Rate (per 1,000 AEs)	Nationally Estimated # Injuries
Total	***157***	***101,600***	***1.55***	***76,031***
Competition	71	36,790	1.93	29,914
Practice	86	64,810	1.33	46,117

* All remaining analyses in this chapter present data weighted to provide national injury estimates. COVID-19 may have affected these results.

Table 11.2 Demographic Characteristics of Injured Girls' Softball Athletes, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Year in School	n	%
Freshman	21,662	28.9%
Sophomore	15,484	20.7%
Junior	18,946	25.3%
Senior	18,803	25.1%
Total	***74,896***	***100.0%***

Age (years)	
Minimum	12
Maximum	18
Mean (SD)	15.9 (1.3)
n	56,721

BMI	
Minimum	17.4
Maximum	45.0
Mean (SD)	25.4 (6.4)
n	39,453

* Throughout this chapter, totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Figure 11.1 Diagnosis of Girls' Softball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year

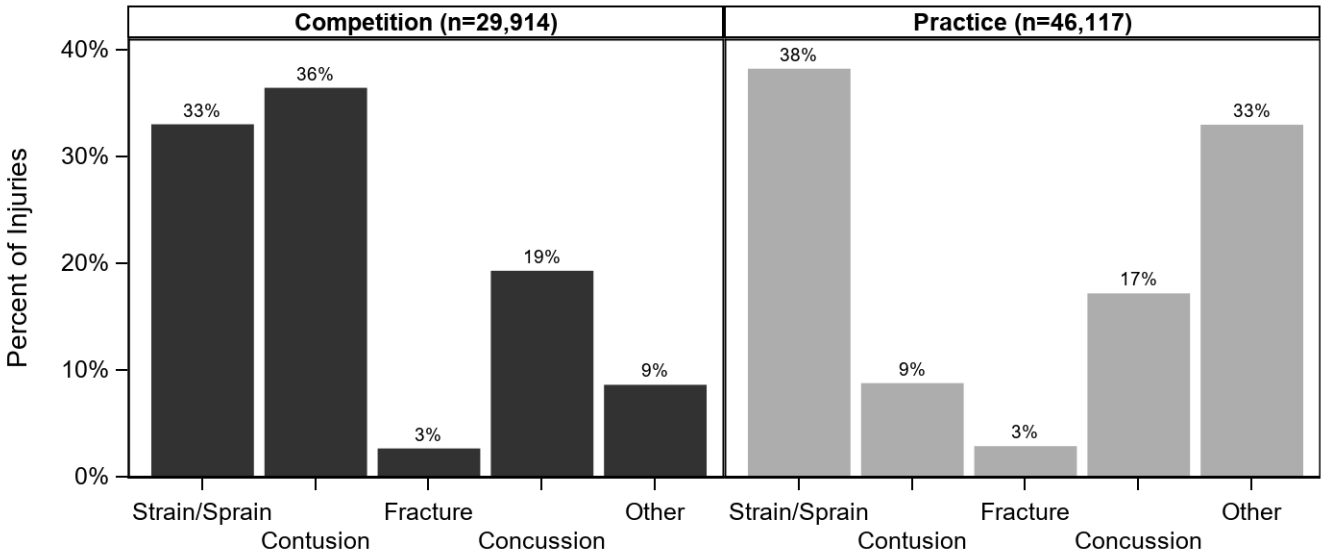


Table 11.3 Body Site of Girls' Softball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	Competition		Practice		Overall	
Body Site	**n**	**%**	**n**	**%**	**n**	**%**
Head/Face	6,667	22.3%	11,477	24.9%	18,144	23.9%
Knee	5,236	17.5%	4,776	10.4%	10,012	13.2%
Foot	4,976	16.6%	4,358	9.4%	9,334	12.3%
Shoulder	1,973	6.6%	6,404	13.9%	8,376	11.0%
Ankle	2,941	9.8%	5,355	11.6%	8,296	10.9%
Hand/Wrist	3,543	11.8%	3,456	7.5%	7,000	9.2%
Arm/Elbow	2,312	7.7%	3,967	8.6%	6,279	8.3%
Hip/Thigh/Upper Leg	690	2.3%	2,319	5.0%	3,009	4.0%
Lower Leg	558	1.9%	1,994	4.3%	2,552	3.4%
Trunk	869	2.9%	1,661	3.6%	2,529	3.3%
Systemic	0	0.0%	352	0.8%	352	0.5%
Neck	100	0.3%	0	0.0%	100	0.1%
Other	50	0.2%	0	0.0%	50	0.1%
Total	***29,914***	***100.0%***	***46,117***	***100.0%***	***76,031***	***100.0%***

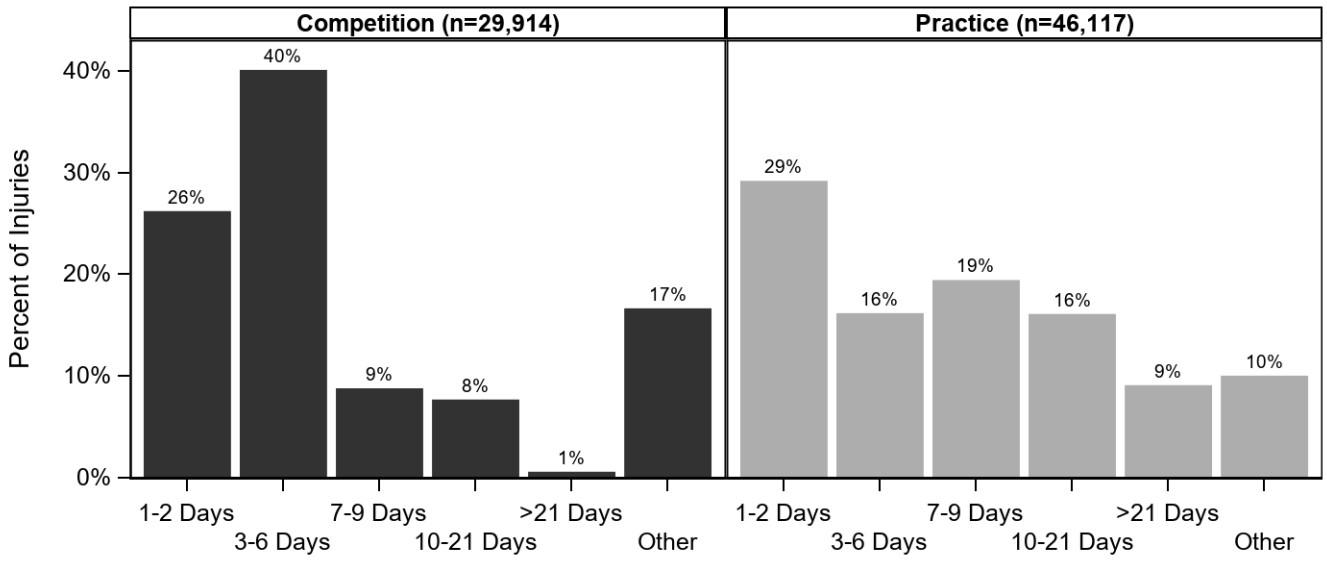
* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries. Totals and n's are not always equal due to slight rounding of the weighted number of injuries.

Table 11.4 Ten Most Common Girls' Softball Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	Competition (n=29,917)		Practice (n=46,118)		Overall (n=76,034)	
Diagnosis	**n**	**%**	**n**	**%**	**n**	**%**
Head/Face Concussion	5,771	19.3%	7,921	17.2%	13,692	18.0%
Ankle Strain/Sprain	2,251	7.5%	5,355	11.6%	7,606	10.0%
Shoulder Other	1,122	3.8%	5,367	11.6%	6,489	8.5%
Foot Strain/Sprain	1,661	5.6%	3,478	7.5%	5,138	6.8%
Knee Strain/Sprain	2,726	9.1%	1,526	3.3%	4,251	5.6%
Foot Contusion	3,266	10.9%	352	0.8%	3,618	4.8%
Hand/Wrist Strain/Sprain	892	3.0%	2,136	4.6%	3,028	4.0%
Hip/Thigh/Upper Leg Strain/Sprain	690	2.3%	2,269	4.9%	2,959	3.9%
Knee Contusion	1,443	4.8%	1,443	3.1%	2,887	3.8%
Knee Other	1,067	3.6%	1,807	3.9%	2,874	3.8%

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Figure 11.2 Time Loss of Girls' Softball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *



* Other category is made up of medical disqualification for season, medical disqualification for career, athlete chooses not to continue, and season ended before athlete returned to play.

Table 11.5 Girls' Softball Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	Competition		Practice		Overall	
Need for Surgery	**n**	**%**	**n**	**%**	**n**	**%**
Required Surgery	1,829	6.1%	1,721	3.7%	3,550	4.7%
Did Not Require Surgery	28,085	93.9%	44,396	96.3%	72,481	95.3%
Total	***29,914***	***100.0%***	***46,117***	***100.0%***	***76,031***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Figure 11.3 History of Girls' Softball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year

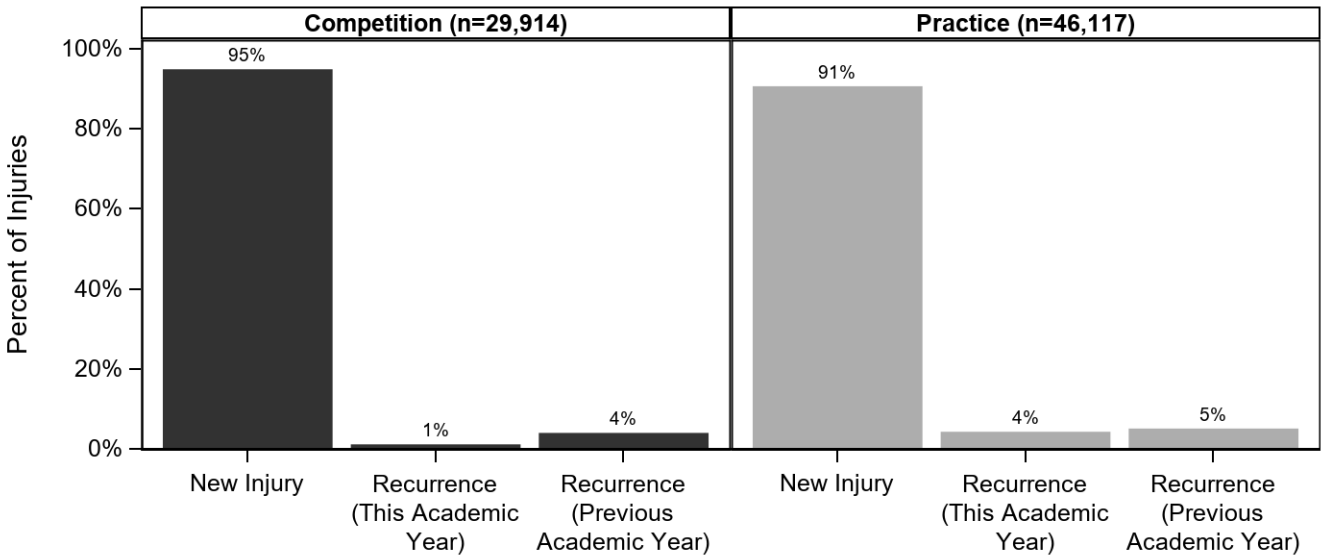


Table 11.6 Time during Season of Girls' Softball Injuries, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Time in Season	n	%
Preseason	19,557	25.7%
Regular Season	53,480	70.3%
Post Season	2,642	3.5%
Unknown/Other	352	0.5%
Total	***76,031***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Table 11.7 Competition-Related Variables for Girls' Softball Injuries, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Time in Competition	n	%
Pre-competition/Warm-Ups	2,669	9.0%
First Inning	2,290	7.7%
Second Inning	338	1.1%
Third Inning	3,593	12.1%
Fourth Inning	2,278	7.7%
Fifth Inning	6,778	22.9%
Sixth Inning	1,355	4.6%
Seventh Inning	509	1.7%
Unknown	9,780	33.1%
Total	***29,589***	***100.0%***

Field Location		
Unknown	734	2.5%
Other	2,048	6.9%
Foul Territory	2,461	8.3%
Outfield	4,134	13.9%
Third Base	1,557	5.3%
Second Base	3,291	11.1%
First Base	2,653	9.0%
Home Plate	6,632	22.4%
Pitchers Mound	6,127	20.7%
Total	***29,639***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Table 11.8 Practice-Related Variables for Girls' Softball Injuries, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Time in Practice	n	%
First 1/2 Hour	2,978	6.5%
Second 1/2 Hour	5,689	12.4%
1-2 Hours into Practice	21,086	45.8%
>2 Hours into Practice	1,781	3.9%
Unknown	14,484	31.5%
Total	***46,018***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Figure 11.4 Player Position of Girls' Softball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year

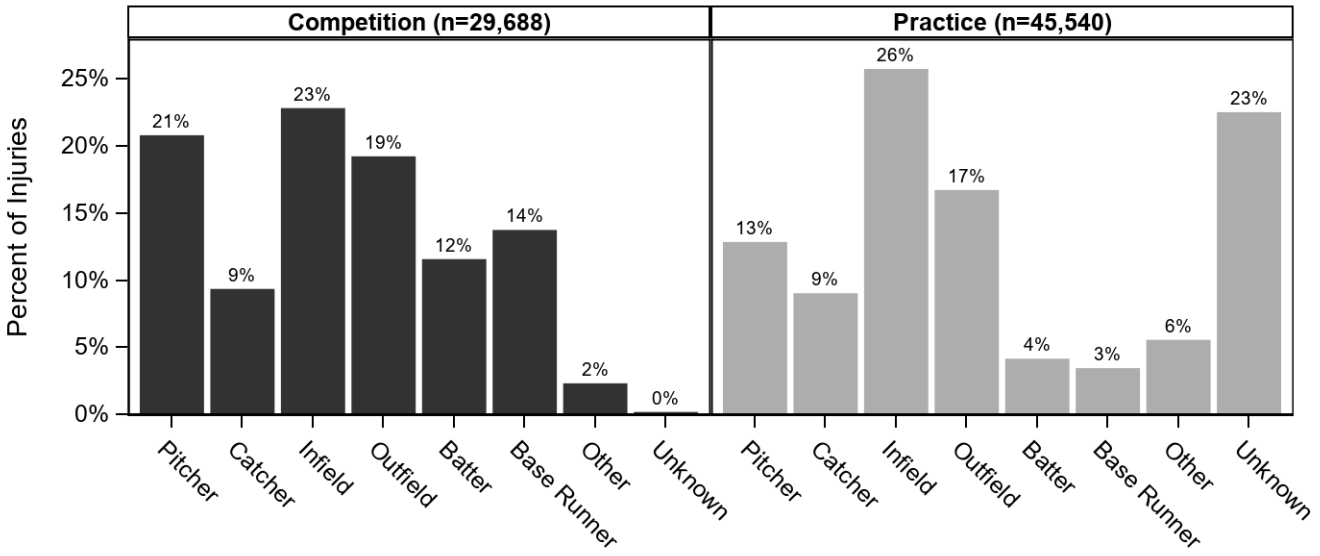


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Table 11.9 Activities Leading to Girls' Softball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	Competition		Practice		Overall	
Activity	**n**	**%**	**n**	**%**	**n**	**%**
Throwing	509	1.7%	11,688	25.6%	12,196	16.2%
Fielding a Batted Ball	5,075	17.1%	6,934	15.2%	12,010	16.0%
Running Bases	3,802	12.8%	5,613	12.3%	9,415	12.5%
Pitching	6,127	20.6%	3,104	6.8%	9,231	12.3%
Catching	5,328	17.9%	2,312	5.1%	7,640	10.1%
General Play	2,502	8.4%	4,231	9.3%	6,733	8.9%
Batting	2,692	9.1%	3,880	8.5%	6,571	8.7%
Conditioning	0	0.0%	3,132	6.9%	3,132	4.2%
Other	226	0.8%	2,873	6.3%	3,099	4.1%
Sliding	2,877	9.7%	0	0.0%	2,877	3.8%
Fielding a Thrown Ball	375	1.3%	1,485	3.3%	1,860	2.5%
Unknown	176	0.6%	338	0.7%	513	0.7%
Total	***29,688***	***100.0%***	***45,589***	***100.0%***	***75,278***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

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Table 11.10 Activity Resulting in Girls' Softball Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
Activity	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Batting	0	0.0%	2,290	15.4%	50	2.4%	1,213	9.2%	3,019	17.1%
Catching	1,221	4.4%	2,887	19.4%	0	0.0%	2,840	21.6%	693	3.9%
Conditioning	3,082	11.2%	0	0.0%	0	0.0%	0	0.0%	50	0.3%
Fielding a Batted Ball	2,882	10.5%	3,085	20.7%	918	43.5%	3,318	25.2%	1,807	10.3%
Fielding a Thrown Ball	176	0.6%	50	0.3%	50	2.4%	1,534	11.7%	50	0.3%
General Play	3,370	12.3%	0	0.0%	0	0.0%	1,201	9.1%	2,161	12.3%
Other	1,485	5.4%	352	2.4%	50	2.4%	1,212	9.2%	0	0.0%
Pitching	4,176	15.2%	1,831	12.3%	0	0.0%	1,443	11.0%	1,781	10.1%
Running Bases	6,832	24.8%	402	2.7%	1,045	49.5%	226	1.7%	911	5.2%
Sliding	658	2.4%	1,993	13.4%	0	0.0%	0	0.0%	226	1.3%
Throwing	3,445	12.5%	2,002	13.4%	0	0.0%	176	1.3%	6,573	37.3%
Unknown	176	0.6%	0	0.0%	0	0.0%	0	0.0%	338	1.9%
Total	***27,502***	***100.0%***	***14,891***	***100.0%***	***2,113***	***100.0%***	***13,164***	***100.0%***	***17,607***	***100.0%***

* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

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XII. Gender Differences within Sports

12.1 Boys' and Girls' Soccer

Table 12.1 Comparison of Boys' and Girls' Soccer Injury Rates, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year

	Boys' Soccer	Girls' Soccer *	RR (95% CI) **
Total	1.76	**2.34**	**1.33 (1.13-1.58)**
Competition	3.76	**5.09**	**1.35 (1.10-1.66)**
Practice	0.90	**1.07**	1.19 (0.89-1.59)

* Throughout this chapter, rate ratios (RR) and injury proportion ratios (IPR) compare the gender with a higher injury rate/proportion (bolded) to the gender with a lower injury rate/proportion. COVID-19 may have affected these results.
** Throughout this chapter, statistically significant RR and IPR are bolded.

Table 12.2 Comparison of Body Sites of Boys' and Girls' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Body Site	Boys' Soccer	Girls' Soccer	IPR (95% CI)
Head/Face	13.2%	**23.6%**	**1.80 (1.09-2.95)**
Neck	**0.6%**	0.3%	1.87 (0.18-19.06)
Shoulder	1.5%	**1.6%**	1.05 (0.16-6.84)
Trunk	2.8%	**4.7%**	1.71 (0.54-5.37)
Arm/Elbow	**0.7%**	0.4%	1.75 (0.17-18.05)
Hand/Wrist	**4.4%**	1.1%	**4.02 (1.07-15.06)**
Hip/Thigh/Upper Leg	**21.8%**	13.5%	1.60 (0.94-2.71)
Knee	15.9%	**16.1%**	1.01 (0.63-1.63)
Lower Leg	5.0%	**6.2%**	1.23 (0.51-2.96)
Ankle	**22.6%**	20.7%	1.09 (0.69-1.71)
Foot	**9.7%**	5.2%	1.85 (0.79-4.34)
Other	0.4%	**0.7%**	1.56 (0.27-8.85)
Systemic	1.2%	**5.8%**	4.76 (0.85-26.51)
Total	***100.0%***	***100.0%***	**--**

* Totals are not always equal to 100% due to slight rounding or missing responses.

Table 12.3 Comparison of Diagnoses of Boys' and Girls' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Diagnosis	Boys' Soccer	Girls' Soccer	IPR (95% CI)
Strain/Sprain	**50.2%**	47.3%	1.06 (0.84-1.34)
Contusion	**9.8%**	8.8%	1.11 (0.57-2.18)
Fracture	5.5%	**7.4%**	1.35 (0.55-3.31)
Concussion	10.6%	**21.9%**	**2.07 (1.20-3.57)**
Other	**23.9%**	14.7%	1.63 (0.99-2.67)
Total	***100.0%***	***100.0%***	**--**

* Totals are not always equal to 100% due to slight rounding or missing responses.

Table 12.4 Most Common Boys' and Girls' Soccer Injury Diagnoses, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Diagnosis	Boys' Soccer	Girls' Soccer	IPR (95% CI)
Ankle Strain/Sprain	**20.9%**	18.9%	1.10 (0.68-1.80)
Foot Other	**5.2%**	0.7%	**6.99 (1.38-35.34)**
Head/Face Concussion	10.6%	**21.9%**	**2.07 (1.20-3.57)**
Hip/Thigh/Upper Leg Strain/Sprain	**15.2%**	10.8%	1.41 (0.76-2.61)
Knee Other	**6.7%**	3.8%	1.78 (0.76-4.17)
Knee Strain/Sprain	6.4%	**9.7%**	1.52 (0.75-3.06)
Systemic Other	1.2%	**5.8%**	4.76 (0.85-26.51)

* Only includes diagnoses accounting for >5% of boys' or girls' soccer injuries.

Table 12.5 Comparison of Time Loss of Boys' and Girls' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Time Loss	Boys' Soccer	Girls' Soccer	IPR (95% CI)
1-2 Days	12.7%	**14.9%**	1.18 (0.66-2.10)
3-6 Days	**28.1%**	19.6%	1.43 (0.96-2.12)
7-9 Days	14.9%	**22.9%**	1.54 (0.93-2.56)
10-21 Days	17.0%	**20.3%**	1.17 (0.73-1.88)
>21 Days	**7.0%**	3.9%	1.77 (0.75-4.14)
Other	**20.3%**	18.4%	1.10 (0.68-1.78)
Total	***100.0%***	***100.0%***	**--**

* Totals are not always equal to 100% due to slight rounding or missing responses.

Table 12.6 Comparison of Mechanisms of Boys' and Girls' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Soccer Mechanism	Boys' Soccer	Girls' Soccer	IPR (95% CI)
Contact with Another Player	**25.7%**	21.9%	1.17 (0.77-1.78)
Contact with Ball	14.5%	**19.6%**	1.35 (0.76-2.39)
N/A **	15.0%	**16.2%**	1.08 (0.63-1.83)
Other	9.8%	**10.4%**	1.06 (0.53-2.13)
Rotation Around a Planted Foot/Inversion	**13.2%**	11.7%	1.13 (0.63-2.01)
Slide Tackle	**6.6%**	1.4%	**4.79 (1.75-13.16)**
Stepped On/Fell On/Kicked	8.0%	**12.2%**	1.53 (0.77-3.03)
Uneven Playing Surface	1.7%	**2.2%**	1.26 (0.22-7.08)
Unknown	**5.4%**	4.3%	1.24 (0.45-3.39)
Total	***100.0%***	***100.0%***	**--**

* Totals are not always equal to 100% due to slight rounding or missing responses.
** Includes overuse, heat illness, conditioning, etc.

Table 12.7 Comparison of Activities of Boys' and Girls' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Soccer Activity	Boys' Soccer	Girls' Soccer	IPR (95% CI)
Attempting a Slide Tackle	**1.0%**	0.2%	6.07 (0.65-56.58)
Ball Handling/Dribbling	**7.0%**	6.1%	1.15 (0.50-2.68)
Blocking Shot	1.1%	**2.6%**	2.46 (0.29-20.76)
Chasing Loose Ball	**16.4%**	10.5%	1.56 (0.81-3.00)
Conditioning	**4.1%**	1.1%	3.87 (0.99-15.07)
Defending	11.5%	**23.0%**	**1.99 (1.13-3.51)**
General Play	17.2%	**27.8%**	**1.61 (1.07-2.42)**
Goaltending	3.9%	**4.7%**	1.20 (0.47-3.11)
Heading Ball	3.5%	**5.2%**	1.49 (0.52-4.26)
Other	0.8%	**1.0%**	1.14 (0.17-7.74)
Passing	**7.7%**	1.7%	**4.64 (1.46-14.69)**
Receiving Pass	2.6%	**3.3%**	1.27 (0.34-4.77)
Receiving a Slide Tackle	**2.2%**	0.3%	6.50 (0.65-64.60)
Shooting	**8.3%**	2.9%	**2.86 (1.06-7.67)**
Unknown	**12.5%**	9.7%	1.29 (0.68-2.47)
Total	***100.0%***	***100.0%***	**--**

* Totals are not always equal to 100% due to slight rounding or missing responses.

12.2 Boys' and Girls' Basketball

Table 12.8 Comparison of Boys' and Girls' Basketball Injury Rates, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year

	Boys' Basketball	Girls' Basketball *	RR (95% CI) **
Total	1.75	**2.43**	**1.39 (1.19-1.62)**
Competition	3.07	**3.96**	**1.29 (1.05-1.59)**
Practice	1.14	**1.73**	**1.51 (1.21-1.89)**

* Throughout this chapter, rate ratios (RR) and injury proportion ratios (IPR) compare the gender with a higher injury rate/proportion (bolded) to the gender with a lower injury rate/proportion. COVID-19 may have affected these results.
** Throughout this chapter, statistically significant RR and IPR are bolded.

Table 12.9 Comparison of Body Sites of Boys' and Girls' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Body Site	Boys' Basketball	Girls' Basketball	IPR (95% CI)
Head/Face	14.4%	**19.2%**	1.32 (0.89-1.95)
Neck	0.5%	**0.7%**	1.53 (0.14-16.90)
Shoulder	0.9%	**1.6%**	1.78 (0.38-8.26)
Trunk	**4.3%**	3.0%	1.48 (0.59-3.68)
Arm/Elbow	**3.2%**	0.8%	3.39 (0.75-15.29)
Hand/Wrist	**7.4%**	6.6%	1.14 (0.59-2.18)
Hip/Thigh/Upper Leg	**9.9%**	9.3%	1.08 (0.62-1.86)
Knee	11.7%	**14.7%**	1.35 (0.85-2.14)
Lower Leg	2.4%	**6.5%**	**2.69 (1.08-6.71)**
Ankle	**36.8%**	24.4%	**1.54 (1.17-2.03)**
Foot	3.1%	**3.4%**	1.11 (0.42-2.91)
Other	0.0%	**0.3%**	--
Systemic	5.4%	**9.5%**	1.74 (0.93-3.26)
Total	***100.0%***	***100.0%***	**--**

* Totals are not always equal to 100% due to slight rounding or missing responses.

Table 12.10 Comparison of Diagnoses of Boys' and Girls' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Diagnosis	Boys' Basketball	Girls' Basketball	IPR (95% CI)
Strain/Sprain	**57.8%**	44.7%	**1.30 (1.09-1.55)**
Contusion	7.0%	**7.1%**	1.01 (0.55-1.89)
Fracture	**7.3%**	5.8%	1.25 (0.65-2.42)
Concussion	11.2%	**16.8%**	1.50 (0.96-2.35)
Other	16.6%	**25.6%**	**1.55 (1.10-2.20)**
Total	***100.0%***	***100.0%***	**--**

* Totals are not always equal to 100% due to slight rounding or missing responses.

Table 12.11 Most Common Boys' and Girls' Basketball Injury Diagnoses, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Diagnosis	Boys' Basketball	Girls' Basketball	IPR (95% CI)
Ankle Strain/Sprain	**35.3%**	21.9%	**1.62 (1.21-2.16)**
Head/Face Concussion	11.2%	**16.9%**	1.50 (0.96-2.35)
Hip/Thigh/Upper Leg Strain/Sprain	7.7%	**8.0%**	1.05 (0.56-1.95)
Knee Strain/Sprain	4.1%	**5.6%**	1.38 (0.62-3.08)
Systemic Other	5.5%	**9.5%**	1.74 (0.93-3.26)

* Only includes diagnoses accounting for >5% of boys' or girls' basketball injuries.

Table 12.12 Comparison of Time Loss of Boys' and Girls' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Time Loss	Boys' Basketball	Girls' Basketball	IPR (95% CI)
1-2 Days	16.1%	**20.4%**	1.23 (0.84-1.81)
3-6 Days	**25.1%**	18.9%	1.33 (0.96-1.85)
7-9 Days	**16.8%**	11.2%	1.50 (0.97-2.33)
10-21 Days	19.9%	**29.2%**	**1.44 (1.05-1.98)**
>21 Days	**8.0%**	5.7%	1.26 (0.64-2.48)
Other	14.1%	**14.6%**	1.06 (0.69-1.63)
Total	***100.0%***	***100.0%***	**--**

* Totals are not always equal to 100% due to slight rounding or missing responses.

Table 12.13 Comparison of Mechanisms of Boys' and Girls' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Basketball Mechanism	Boys' Basketball	Girls' Basketball	IPR (95% CI)
Collision with Another Player	**22.8%**	18.1%	1.26 (0.88-1.80)
Contact with Ball	5.7%	**8.0%**	1.41 (0.70-2.86)
Jumping/Landing	**27.1%**	16.0%	**1.70 (1.18-2.43)**
N/A **	11.6%	**24.4%**	**2.10 (1.37-3.21)**
Other	8.4%	**11.9%**	1.41 (0.82-2.40)
Rotation Around a Planted Foot/Inversion	11.6%	**11.9%**	1.03 (0.63-1.66)
Stepped On/Fell On/Kicked	**8.7%**	5.3%	1.64 (0.86-3.11)
Unknown	4.1%	**4.5%**	1.10 (0.46-2.65)
Total	***100.0%***	***100.0%***	**--**

* Totals are not always equal to 100% due to slight rounding or missing responses.
** Includes overuse, heat illness, conditioning, etc.

Table 12.14 Comparison of Activities of Boys' and Girls' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Basketball Activity	Boys' Basketball	Girls' Basketball	IPR (95% CI)
Ball Handling/Dribbling	6.1%	**6.6%**	1.07 (0.55-2.11)
Chasing Loose Ball	7.0%	**7.8%**	1.12 (0.58-2.15)
Conditioning	2.0%	**4.5%**	2.23 (0.78-6.37)
Defending	**10.3%**	9.2%	1.12 (0.66-1.92)
General Play	19.5%	**19.9%**	1.02 (0.71-1.48)
Other	**1.6%**	0.9%	1.65 (0.30-8.97)
Passing	**1.2%**	0.0%	--
Rebounding	**23.1%**	12.8%	**1.80 (1.20-2.69)**
Receiving Pass	4.6%	**5.3%**	1.15 (0.51-2.61)
Screening	**0.4%**	0.1%	4.25 (0.26-68.28)
Shooting	5.3%	**5.9%**	1.11 (0.53-2.34)
Unknown	18.8%	**26.8%**	**1.42 (1.00-2.02)**
Total	***100.0%***	***100.0%***	**--**

* Totals are not always equal to 100% due to slight rounding or missing responses.

12.3 Boys' Baseball and Girls' Softball

Table 12.15 Comparison of Baseball and Softball Injury Rates, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year

	Boys' Baseball	Girls' Softball *	RR (95% CI) **
Total	0.96	**1.55**	**1.62 (1.29-2.02)**
Competition	1.36	**1.93**	**1.42 (1.03-1.95)**
Practice	0.72	**1.33**	**1.85 (1.35-2.54)**

* Throughout this chapter, rate ratios (RR) and injury proportion ratios (IPR) compare the gender with a higher injury rate/proportion (bolded) to the gender with a lower injury rate/proportion. COVID-19 may have affected these results.
** Throughout this chapter, statistically significant RR and IPR are bolded.

Table 12.16 Comparison of Body Sites of Baseball and Softball Injuries, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Body Site	Boys' Baseball	Girls' Softball	IPR (95% CI)
Head/Face	8.7%	**23.9%**	**2.73 (1.42-5.24)**
Neck	0.0%	**0.1%**	--
Shoulder	**11.8%**	11.0%	1.08 (0.48-2.39)
Trunk	**12.5%**	3.3%	3.75 (0.94-14.92)
Arm/Elbow	**19.9%**	8.3%	2.41 (1.00-5.85)
Hand/Wrist	**9.6%**	9.2%	1.05 (0.41-2.67)
Hip/Thigh/Upper Leg	**12.1%**	4.0%	**3.05 (1.15-8.06)**
Knee	4.4%	**13.2%**	3.01 (0.97-9.28)
Lower Leg	**5.5%**	3.4%	1.65 (0.43-6.28)
Ankle	**11.7%**	10.9%	1.07 (0.46-2.48)
Foot	3.0%	**12.3%**	4.07 (0.93-17.76)
Other	**0.7%**	0.1%	10.76 (0.66-175.17)
Systemic	0.0%	**0.5%**	--
Total	***100.0%***	***100.0%***	**--**

* Totals are not always equal to 100% due to slight rounding or missing responses.

Table 12.17 Comparison of Diagnoses of Baseball and Softball Injuries, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Diagnosis	Boys' Baseball	Girls' Softball	IPR (95% CI)
Strain/Sprain	**48.7%**	36.2%	1.35 (0.94-1.93)
Contusion	13.9%	**19.7%**	1.41 (0.69-2.89)
Fracture	**10.2%**	2.8%	**3.67 (1.16-11.63)**
Concussion	6.0%	**18.0%**	**3.01 (1.35-6.69)**
Other	21.2%	**23.4%**	1.10 (0.62-1.95)
Total	***100.0%***	***100.0%***	**--**

* Totals are not always equal to 100% due to slight rounding or missing responses.

Table 12.18 Most Common Baseball and Softball Injury Diagnoses, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Diagnosis	Boys' Baseball	Girls' Softball	IPR (95% CI)
Ankle Strain/Sprain	8.6%	**10.0%**	1.16 (0.44-3.07)
Arm/Elbow Strain/Sprain	**13.1%**	2.2%	**5.96 (1.02-34.88)**
Foot Strain/Sprain	0.0%	**6.8%**	--
Hand/Wrist Fracture	**8.7%**	1.3%	**6.52 (1.37-30.90)**
Head/Face Concussion	6.0%	**18.0%**	**3.01 (1.35-6.69)**
Hip/Thigh/Upper Leg Strain/Sprain	**11.2%**	3.9%	**2.87 (1.05-7.83)**
Knee Strain/Sprain	3.6%	**5.6%**	1.55 (0.37-6.43)
Shoulder Other	8.0%	**8.5%**	1.06 (0.38-2.94)
Trunk Strain/Sprain	**7.5%**	1.4%	**5.49 (1.22-24.77)**

* Only includes diagnoses accounting for >5% of boys' baseball or girls' softball injuries.

Table 12.19 Comparison of Time Loss of Baseball and Softball Injuries, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Time Loss	Boys' Baseball	Girls' Softball	IPR (95% CI)
1-2 Days	19.5%	**28.0%**	1.44 (0.79-2.63)
3-6 Days	**30.9%**	25.6%	1.21 (0.74-1.96)
7-9 Days	11.1%	**15.2%**	1.37 (0.70-2.70)
10-21 Days	**14.5%**	12.8%	1.13 (0.59-2.18)
>21 Days	**8.0%**	5.7%	1.39 (0.50-3.84)
Other	**16.0%**	12.6%	1.27 (0.63-2.55)
Total	***100.0%***	***100.0%***	**--**

* Totals are not always equal to 100% due to slight rounding or missing responses.

Table 12.20 Comparison of Mechanisms of Baseball and Softball Injuries, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Baseball Mechanism	Boys' Baseball	Girls' Softball	IPR (95% CI)
Contact with Another Player	**7.3%**	3.7%	2.01 (0.77-5.22)
Contact with Bases	**8.9%**	8.8%	1.01 (0.39-2.59)
Contact with Thrown Ball (Non-Pitch)	3.9%	**9.5%**	2.41 (0.68-8.51)
Hit by Batted Ball	4.7%	**17.2%**	**3.69 (1.19-11.45)**
Hit by Pitch	**7.1%**	2.1%	3.36 (0.99-11.37)
N/A **	**18.7%**	9.7%	1.93 (0.93-3.99)
Other	15.9%	**21.8%**	1.37 (0.70-2.65)
Rotation Around a Planted Foot/Inversion	9.3%	**10.3%**	1.12 (0.46-2.72)
Throwing (Not Pitching)	**13.9%**	11.8%	1.18 (0.51-2.74)
Throwing (Pitching)	**7.3%**	3.8%	1.94 (0.57-6.59)
Unknown	**2.9%**	1.4%	2.17 (0.39-12.02)
Total	***100.0%***	***100.0%***	**--**

* Totals are not always equal to 100% due to slight rounding or missing responses.
** Includes overuse, heat illness, conditioning, etc.

Table 12.21 Comparison of Activities of Baseball and Softball Injuries, High School Sports-Related Injury Surveillance Study, US, 2021-22 School Year *

Baseball Activity	Boys' Baseball	Girls' Softball	IPR (95% CI)
Batting	**22.2%**	8.7%	**2.54 (1.06-6.08)**
Catching	3.2%	**10.1%**	**3.14 (1.05-9.41)**
Conditioning	4.0%	**4.2%**	1.03 (0.19-5.51)
Fielding a Batted Ball	7.1%	**16.0%**	**2.24 (1.05-4.77)**
Fielding a Thrown Ball	**5.0%**	2.5%	2.04 (0.36-11.62)
General Play	4.2%	**8.9%**	2.14 (0.73-6.26)
Other	0.4%	**4.1%**	**10.27 (1.81-58.22)**
Pitching	11.9%	**12.3%**	1.03 (0.45-2.37)
Running Bases	**16.1%**	12.5%	1.29 (0.66-2.50)
Sliding	1.3%	**3.8%**	2.90 (0.56-15.09)
Throwing	**17.2%**	16.2%	1.06 (0.54-2.09)
Unknown	**7.3%**	0.7%	**10.70 (2.02-56.66)**
Total	***100.0%***	***100.0%***	**--**

* Totals are not always equal to 100% due to slight rounding or missing responses.

REPORTING INFORMATION ONLINE

XIII. Trends Over Time

REPORTING INFORMATION ONLINE

Table 13.1 Injury Rates by Sport, Type of Exposure, and Year, High School Sports-Related Injury Surveillance Study, US, 2005-06 to 2021-22 School Years *

		2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	P-Value for Trend
Overall	Total	2.46	2.53	2.28	1.96	2.03	1.97	2.17	2.16	2.18	2.13	2.32	2.07	2.45	2.29	2.31	2.01	2.36	0.9092
	Competition	4.50	4.74	4.36	3.93	4.06	4.12	4.26	4.31	4.22	4.40	4.74	4.25	4.88	4.61	5.16	3.84	4.53	0.3520
	Practice	1.67	1.71	1.51	1.24	1.28	1.16	1.40	1.34	1.39	1.28	1.39	1.21	1.47	1.38	1.30	1.36	1.47	0.2176
Boys' Football	Total	4.25	4.33	4.09	3.41	3.64	3.50	3.78	3.87	3.74	3.73	4.08	3.56	4.33	3.85	3.84	3.39	4.12	0.5933
	Competition	11.72	13.12	12.45	10.94	12.30	12.30	12.41	12.53	11.38	11.97	12.68	11.55	14.13	12.09	13.07	12.11	13.27	0.2120
	Practice	**2.49**	**2.61**	**2.43**	**1.88**	**1.99**	**1.74**	**2.16**	**2.08**	**2.15**	**2.06**	**2.18**	**1.89**	**2.14**	**2.00**	**1.77**	**1.88**	**2.13**	**0.0303**
Boys' Soccer	Total	2.39	2.19	1.75	1.59	1.73	1.56	1.64	1.52	1.62	1.60	1.87	1.47	1.94	1.83	1.59	1.80	1.76	0.2066
	Competition	4.14	4.13	3.63	3.35	3.31	3.08	3.47	3.28	3.40	3.43	3.95	3.25	3.92	3.86	3.35	3.30	3.76	0.5742
	Practice	1.56	1.41	0.95	0.85	1.04	0.90	0.90	0.78	0.82	0.78	0.91	0.67	1.04	0.92	0.82	1.25	0.90	0.1199
Girls' Soccer	Total	2.32	2.44	2.31	2.00	1.96	1.93	2.42	2.29	2.47	2.64	2.59	2.46	2.82	2.72	2.22	2.06	2.34	0.2483
	Competition	5.14	5.22	5.06	4.44	4.63	4.13	5.68	5.54	5.72	6.11	5.93	5.91	5.83	5.70	5.12	4.38	5.09	0.3599
	Practice	1.08	1.29	1.15	0.96	0.81	0.93	1.09	0.92	1.04	1.09	1.09	0.85	1.48	1.34	1.06	1.16	1.07	0.4161
Girls' Volleyball	Total	1.59	1.34	1.21	0.83	0.97	0.96	1.00	0.89	0.99	1.11	1.19	1.09	1.54	1.34	1.25	1.02	1.25	0.8044
	Competition	1.88	1.34	1.38	0.82	0.99	1.18	1.27	1.08	1.15	1.39	1.52	1.61	2.18	1.58	1.84	1.40	1.67	0.0812
	Practice	1.42	1.34	1.13	0.84	0.97	0.85	0.85	0.78	0.91	0.97	1.02	0.83	1.20	1.23	0.95	0.86	1.03	0.2881
Boys' Basketball	Total	1.82	1.72	1.38	1.33	1.43	1.35	1.40	1.47	1.45	1.08	1.48	1.54	1.54	1.61	1.52	1.87	1.75	0.4086
	Competition	2.87	2.82	2.20	2.29	2.69	2.39	2.60	2.44	2.40	1.98	2.84	2.65	2.74	3.09	2.74	2.95	3.07	0.0891
	Practice	1.40	1.26	1.04	0.94	0.90	0.91	0.91	1.04	1.02	0.68	0.90	1.04	1.01	0.98	0.99	1.45	1.14	0.9279
Girls' Basketball	**Total**	**2.02**	**2.03**	**1.57**	**1.47**	**1.56**	**1.73**	**1.57**	**1.83**	**1.88**	**1.65**	**2.14**	**1.87**	**2.15**	**1.95**	**2.06**	**1.87**	**2.43**	**0.0259**
	Competition	**3.56**	**3.52**	**3.19**	**2.95**	**2.84**	**3.59**	**3.03**	**3.13**	**3.66**	**3.27**	**4.17**	**3.63**	**4.12**	**3.63**	**4.01**	**3.14**	**3.96**	**0.0452**
	Practice	1.40	1.39	0.88	0.86	0.99	0.92	0.98	1.24	1.08	0.94	1.24	1.03	1.26	1.21	1.22	1.37	1.73	0.0926
Boys' Wrestling	Total	2.47	2.45	2.30	2.14	1.92	2.01	2.50	2.33	2.48	2.12	2.23	1.92	2.65	2.52	2.38	1.70	2.96	0.6515
	Competition	3.73	3.70	3.68	3.22	3.00	3.32	3.56	3.54	3.95	3.76	3.43	3.64	4.30	4.46	4.08	2.75	5.39	0.0800
	Practice	2.07	2.00	1.80	1.75	1.52	1.55	2.10	1.88	1.95	1.61	1.83	1.32	2.04	1.84	1.81	1.41	2.13	0.6183

Boys' Baseball	Total	1.18	1.25	0.94	0.78	0.82	0.81	0.83	0.88	1.01	0.94	0.84	0.74	0.95	1.03	0.70	1.05	0.96	0.3333
	Competition	1.71	2.03	1.37	1.32	1.27	1.49	1.14	1.30	1.68	1.67	1.35	1.23	1.28	1.66	0.46	1.44	1.36	0.1150
	Practice	0.88	0.82	0.71	0.48	0.57	0.46	0.65	0.66	0.63	0.55	0.56	0.44	0.77	0.68	0.74	0.82	0.72	0.9387
Girls' Softball	Total	1.13	1.11	1.26	1.03	1.11	0.94	1.46	1.15	0.99	1.00	1.30	1.34	1.34	1.43	0.91	1.24	1.55	0.1402
	Competition	1.76	1.96	1.82	1.60	1.66	1.45	2.04	1.96	1.09	1.67	2.10	1.55	1.94	2.19	1.74	1.74	1.93	0.5281
	Practice	**0.79**	**0.65**	**0.95**	**0.72**	**0.82**	**0.69**	**1.16**	**0.73**	**0.93**	**0.65**	**0.87**	**1.21**	**1.01**	**1.01**	**0.69**	**0.96**	**1.33**	**0.0474**

* Statistically significant tests for trend are bolded. COVID-19 may have affected these results.

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Table 13.2 Nationally Estimated Number of Injuries by Sport, Type of Exposure, and Year, High School Sports-Related Injury Surveillance Study, US, 2005-06 to 2021-22 School Years

		2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Overall	Total	1,422,835	1,443,423	1,401,275	1,214,878	1,330,664	1,195,816	1,392,262	1,361,986	1,427,315	1,196,479	1,393,566	1,160,321	1,367,995	1,307,414	983,683	1,237,273	1,385,717
	Competition	746,284	748,874	748,558	668,031	738,454	711,642	740,493	779,055	790,966	708,150	801,156	699,410	798,725	748,085	551,249	619,712	766,617
	Practice	676,551	694,549	652,717	546,847	592,210	484,174	651,769	582,931	636,349	488,329	592,410	460,911	569,270	559,329	432,434	617,561	619,100
Boys' Football	Total	505,908	561,470	605,644	513,455	560,100	483,016	559,064	616,209	624,470	529,483	568,789	444,281	463,626	455,449	392,734	485,416	478,688
	Competition	274,446	285,252	304,470	279,816	310,130	296,199	287,710	344,097	324,354	286,421	316,308	252,462	281,790	259,317	236,338	248,398	276,694
	Practice	231,462	276,218	301,174	233,639	249,970	186,817	271,354	272,112	300,116	243,062	252,481	191,819	181,836	196,132	156,396	237,018	201,994
Boys' Soccer	Total	215,490	168,604	159,009	147,341	152,237	138,974	172,070	149,049	149,278	133,919	174,811	145,215	180,607	184,656	134,036	143,124	174,322
	Competition	116,987	90,461	99,785	85,837	82,737	81,238	97,540	89,429	90,683	89,091	111,720	98,031	113,655	120,217	77,322	71,425	111,007
	Practice	98,503	78,143	59,224	61,504	69,500	57,736	74,530	59,620	58,595	44,828	63,091	47,184	66,952	64,439	56,714	71,699	63,315
Girls' Soccer	Total	182,938	225,560	211,056	185,594	179,509	180,254	222,679	190,382	227,172	217,546	209,027	190,436	242,602	227,951	118,608	133,171	168,680
	Competition	121,437	145,173	141,924	118,804	129,463	124,674	145,469	141,339	167,975	158,078	142,722	146,696	152,993	140,542	73,390	77,138	118,572
	Practice	61,501	80,387	69,132	66,790	50,046	55,580	77,210	49,043	59,197	59,468	66,305	43,740	89,609	87,409	45,218	56,033	50,108
Girls' Volleyball	Total	78,298	79,592	71,791	53,413	67,204	50,711	52,662	44,064	45,144	46,807	58,127	46,601	67,163	59,370	54,665	61,279	68,994
	Competition	32,177	27,076	25,898	18,204	21,550	21,416	24,439	19,150	16,430	19,373	25,300	23,886	33,075	23,045	25,810	27,437	30,805
	Practice	46,121	52,516	45,893	35,209	45,654	29,295	28,223	24,914	28,714	27,434	32,827	22,715	34,088	36,325	28,855	33,842	38,189
Boys' Basketball	Total	96,966	94,482	82,580	77,897	84,102	79,762	75,872	85,819	84,455	55,980	81,240	88,927	93,773	87,521	84,828	129,429	101,263
	Competition	43,670	45,054	36,560	39,332	46,575	41,252	41,978	44,095	42,504	32,534	45,596	46,251	48,814	48,318	47,736	64,833	53,165
	Practice	53,296	49,428	46,020	38,565	37,527	38,510	33,894	41,724	41,951	23,446	35,644	42,676	44,959	39,203	37,092	64,596	48,098
Girls' Basketball	Total	105,355	99,779	71,568	60,673	78,328	83,033	67,280	83,107	89,451	64,491	99,598	70,700	91,059	82,383	76,317	79,278	111,665
	Competition	53,776	52,140	43,949	34,928	44,026	53,931	37,213	45,645	50,864	38,803	56,786	44,660	54,339	48,080	43,148	37,603	51,976
	Practice	51,579	47,639	27,619	25,745	34,302	29,102	30,067	37,462	38,587	25,688	42,812	26,040	36,720	34,303	33,169	41,675	59,689
Boys' Wrestling	Total	107,654	98,836	92,353	87,041	77,857	80,569	107,992	85,485	91,203	60,253	91,642	67,834	103,058	91,176	94,606	81,045	142,959
	Competition	36,238	37,781	40,260	37,074	36,704	36,536	40,235	35,016	39,378	32,728	38,430	34,405	48,770	44,433	41,914	29,360	64,629
	Practice	71,416	61,055	52,093	49,967	41,153	44,033	67,757	50,469	51,825	27,525	53,212	33,429	54,288	46,743	52,692	51,685	78,330

Boys' Baseball	Total	67,064	60,689	46,078	39,869	64,053	46,797	43,590	49,747	62,493	44,208	44,760	36,395	49,716	52,889	13,087	70,377	63,115
	Competition	33,009	33,746	22,803	25,584	36,502	29,789	20,818	24,807	37,682	27,129	25,581	21,458	26,844	30,158	833	36,233	29,855
	Practice	34,055	26,943	23,275	14,285	27,551	17,008	22,772	24,940	24,811	17,079	19,179	14,937	22,872	22,731	12,254	34,144	33,260
Girls' Softball	Total	63,162	54,411	61,196	49,595	67,274	52,700	91,053	58,124	53,649	43,792	65,572	69,932	76,391	66,019	14,802	54,154	76,031
	Competition	34,544	32,191	32,909	28,452	30,767	26,607	45,091	35,477	21,096	23,993	38,713	31,561	38,445	33,975	4,758	27,285	29,914
	Practice	28,618	22,220	28,287	21,143	36,507	26,093	45,962	22,647	32,553	19,799	26,859	38,371	37,946	32,044	10,044	26,869	46,117

* COVID-19 may have affected these results.

Table 13.3 Body Site of Injury by Year, High School Sports-Related Injury Surveillance Study, US, 2005-06 to 2021-22 School Years *

	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Body Site																	
Ankle	22.6%	19.8%	18.6%	16.3%	17.7%	17.7%	16.1%	15.5%	16.9%	15.1%	16.6%	17.8%	17.8%	18.3%	19.6%	19.9%	17.6%
Arm/Elbow	4.1%	3.9%	4.7%	4.2%	4.1%	3.1%	4.0%	3.5%	3.1%	3.7%	3.4%	3.7%	4.6%	3.5%	4.0%	4.2%	4.2%
Foot	4.4%	4.3%	4.2%	5.2%	4.2%	4.0%	3.4%	3.2%	2.8%	3.9%	3.6%	2.5%	3.9%	3.9%	3.6%	2.6%	4.7%
Hand/Wrist	9.2%	8.1%	10.2%	9.4%	10.2%	8.9%	8.6%	7.4%	7.8%	7.4%	7.8%	7.7%	9.1%	7.9%	8.4%	8.2%	7.0%
Head/Face	12.4%	12.6%	12.5%	15.1%	17.2%	23.3%	25.1%	25.7%	25.3%	27.4%	27.3%	27.2%	21.4%	21.4%	21.1%	16.2%	17.8%
Hip/Thigh/Upper Leg	10.9%	10.7%	10.3%	10.4%	9.2%	8.3%	9.8%	9.5%	8.7%	9.0%	8.0%	9.0%	10.3%	9.9%	9.9%	12.2%	10.5%
Knee	14.3%	16.4%	14.5%	14.7%	15.6%	14.2%	13.4%	14.8%	14.4%	13.7%	14.9%	13.4%	14.1%	13.8%	13.3%	16.1%	14.9%
Lower Leg	4.7%	5.4%	5.8%	5.9%	4.7%	5.0%	4.5%	3.9%	4.9%	4.0%	4.3%	4.4%	4.7%	4.2%	4.1%	5.4%	4.3%
Neck	2.1%	2.0%	1.8%	1.9%	1.9%	1.8%	1.7%	2.3%	1.2%	1.9%	1.3%	1.4%	0.9%	1.5%	1.5%	1.0%	1.1%
Other	1.0%	2.1%	2.1%	2.7%	2.2%	2.1%	2.0%	2.5%	2.4%	2.5%	2.1%	2.3%	2.0%	2.2%	2.3%	1.4%	5.5%
Shoulder	7.9%	7.9%	9.1%	8.5%	7.0%	7.0%	6.6%	6.5%	8.5%	7.2%	6.8%	6.4%	6.1%	7.7%	7.0%	7.8%	7.1%
Trunk	6.2%	6.9%	6.4%	5.6%	5.9%	4.7%	5.0%	5.2%	4.1%	4.3%	4.0%	4.3%	5.1%	5.7%	5.2%	4.9%	5.1%
Total	***100.0%***	***100.0%***	***100.0%***	***100.0%***	***100.0%***	***100.0%***	***100.0%***	***100.0%***	***100.0%***	***100.0%***	***100.0%***	***100.0%***	***100.0%***	***100.0%***	***100.0%***	***100.0%***	***100.0%***

* Throughout this chapter, n's represent the total number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries. Totals are not always equal to 100% due to slight rounding or missing responses. COVID-19 may have affected these results.

Table 13.4 Injury Diagnosis by Year, High School Sports-Related Injury Surveillance Study, US, 2005-06 to 2021-22 School Years *

	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Diagnosis																	
Strain/Sprain	52.2%	48.2%	48.3%	45.8%	44.9%	43.2%	42.2%	42.3%	41.7%	39.8%	40.4%	40.2%	45.1%	44.6%	45.3%	47.8%	44.2%
Contusion	12.3%	13.7%	12.7%	11.7%	14.2%	9.6%	10.8%	10.6%	9.4%	9.3%	9.2%	9.6%	10.2%	11.1%	8.1%	9.2%	10.3%
Fracture	9.7%	9.0%	10.2%	10.8%	9.6%	10.2%	7.7%	7.8%	7.6%	9.4%	8.6%	8.5%	8.0%	7.9%	7.6%	8.9%	7.7%
Concussion	9.3%	8.4%	9.2%	11.5%	14.0%	20.0%	22.2%	23.1%	21.9%	24.6%	24.6%	24.8%	18.8%	18.8%	18.0%	12.3%	15.2%
Other	16.5%	20.7%	19.6%	20.1%	17.3%	17.0%	17.1%	16.2%	19.4%	16.9%	17.1%	16.9%	17.9%	17.5%	21.0%	21.9%	22.7%
Total	***100.0%***	***100.0%***	***100.0%***	***100.0%***	***100.0%***	***100.0%***	***100.0%***	***100.0%***	***100.0%***	***100.0%***	***100.0%***	***100.0%***	***100.0%***	***100.0%***	***100.0%***	***100.0%***	***100.0%***

* Totals are not always equal to 100% due to slight rounding or missing responses. COVID-19 may have affected these results.

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Table 13.5 Most Common Injury Diagnoses by Year, High School Sports-Related Injury Surveillance Study, US, 2005-06 to 2021-22 School Years

	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Diagnosis																	
Ankle Strain/Sprain	20.6%	17.8%	17.4%	15.0%	16.1%	16.3%	14.7%	14.5%	15.6%	14.2%	15.7%	16.5%	16.4%	16.2%	17.7%	18.7%	15.9%
Hand/Wrist Fracture	3.5%	3.6%	4.0%	3.9%	4.2%	4.0%	3.7%	3.2%	3.3%	3.5%	3.6%	3.5%	3.4%	3.5%	3.4%	3.9%	3.1%
Hand/Wrist Strain/Sprain	3.6%	2.7%	4.0%	3.0%	2.8%	2.8%	3.0%	2.5%	2.8%	1.9%	2.5%	2.0%	3.5%	2.6%	3.3%	2.8%	2.3%
Head/Face Concussion	9.2%	8.4%	9.2%	11.5%	13.9%	20.0%	22.2%	23.1%	21.9%	24.5%	24.6%	24.8%	18.7%	18.8%	18.0%	12.9%	15.2%
Hip/Thigh/Upper Leg Strain/Sprain	8.0%	7.7%	7.3%	7.8%	6.5%	6.4%	6.9%	6.7%	6.6%	6.9%	5.7%	6.4%	8.1%	7.2%	7.5%	9.6%	8.2%
Knee Other	4.5%	4.8%	4.6%	4.4%	5.1%	4.8%	3.9%	4.1%	4.7%	4.5%	5.2%	4.9%	5.1%	4.9%	4.8%	6.3%	5.2%
Knee Strain/Sprain	7.6%	8.7%	7.7%	7.9%	7.9%	7.7%	7.6%	8.2%	7.8%	7.3%	8.1%	6.9%	6.6%	7.2%	6.5%	7.7%	7.0%
Shoulder Other	3.1%	3.6%	4.1%	4.0%	3.2%	3.7%	3.1%	3.4%	4.6%	4.0%	3.3%	3.4%	2.9%	3.4%	4.0%	4.1%	3.9%
Shoulder Strain/Sprain	3.4%	2.8%	3.5%	3.8%	2.9%	2.2%	2.9%	2.6%	3.3%	2.6%	2.9%	2.7%	2.8%	3.6%	2.6%	3.0%	3.0%
Trunk Strain/Sprain	2.9%	2.8%	3.2%	2.7%	2.6%	2.4%	1.9%	2.3%	1.7%	1.9%	1.5%	1.9%	2.6%	3.2%	2.3%	2.9%	2.2%

Table 13.6 Time Loss of Injuries by Year, High School Sports-Related Injury Surveillance Study, US, 2005-06 to 2021-22 School Years *

	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Time Loss																	
1-2 Days	21.8%	26.2%	22.1%	13.6%	14.7%	12.8%	15.9%	12.6%	14.9%	11.0%	16.3%	12.6%	21.2%	19.1%	17.5%	17.4%	16.6%
3-6 Days	29.2%	28.1%	28.1%	28.2%	27.3%	25.2%	23.3%	23.6%	21.8%	22.0%	21.9%	22.0%	20.9%	22.5%	22.4%	22.5%	22.7%
7-9 Days	14.9%	14.5%	15.4%	17.5%	16.1%	16.7%	16.1%	16.3%	16.7%	15.6%	12.9%	16.1%	12.8%	13.3%	15.3%	12.2%	14.8%
10-21 Days	14.7%	13.9%	16.2%	19.5%	16.9%	19.2%	19.6%	21.3%	21.1%	22.1%	21.1%	21.6%	18.8%	21.0%	20.2%	18.7%	20.4%
>21 Days	6.6%	6.9%	8.9%	13.6%	7.9%	6.9%	7.0%	7.7%	7.3%	8.9%	7.7%	7.8%	6.5%	5.6%	6.3%	5.0%	7.0%
Other	12.9%	10.4%	9.4%	7.5%	17.1%	19.2%	18.0%	18.5%	18.2%	20.5%	20.0%	20.0%	19.8%	18.6%	18.4%	24.2%	18.6%
Total	***100.0%***	***100.0%***	***100.0%***	***100.0%***	***100.0%***	***100.0%***	***100.0%***	***100.0%***	***100.0%***	***100.0%***	***100.0%***	***100.0%***	***100.0%***	***100.0%***	***100.0%***	***100.0%***	***100.0%***

* Totals are not always equal to 100% due to slight rounding or missing responses. COVID-19 may have affected these results.

Table 13.7 Injuries Requiring Surgery by Year, High School Sports-Related Injury Surveillance Study, US, 2005-06 to 2021-22 School Years *

	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Required Surgery	5.1%	6.4%	6.1%	6.7%	8.1%	8.2%	6.7%	7.3%	7.6%	7.3%	6.1%	7.1%	5.7%	6.4%	6.6%	8.3%	5.5%
Did Not Require Surgery	94.9%	93.6%	93.9%	93.3%	91.9%	91.8%	93.3%	92.7%	92.4%	92.7%	93.9%	92.9%	94.3%	93.6%	93.4%	91.7%	94.5%
Total	***100.0%***	***100.0%***	***100.0%***	***100.0%***	***100.0%***	***100.0%***	***100.0%***	***100.0%***	***100.0%***	***100.0%***	***100.0%***	***100.0%***	***100.0%***	***100.0%***	***100.0%***	***100.0%***	***100.0%***

* Totals are not always equal to 100% due to slight rounding or missing responses. COVID-19 may have affected these results.

REPORTING INFORMATION ONLINE

XIV. Reporter Demographics & Compliance

During the 2021-22 school year, 137 ATs enrolled to participate in the study (in both the original and convenience sample). ATs were expected to report for every week in which they were enrolled. For example, an AT who joined the study as a replacement school in week 10 was not expected to report for weeks 1-9. Overall, 120 enrolled ATs reported an average of 41 study weeks. The majority of ATs (91%) reported for more than 20 weeks of the study. Internal validity checks of a 5% randomly selected sample of the 175 schools participating in the convenience sample during the 2018-19 academic year yielded 76.7% sensitivity, 96.4% specificity, a positive predictive value of 74.2%, and a negative predictive value of 96.9%. Internal validity checks are typically completed every other year but were not conducted in 2020-21 due to the pandemic. The next internal validity check will occur using data from the 2022-23 academic year.

Prior to the start of the study, participating ATs were asked to complete a short demographics survey. Over three-quarters (82%) of participating high schools were public schools, with the remainder being private. All ATs except for three provided services to their athletes 5 or more days each week. 78% of ATs participating during the 2021-22 school year had previously participated in the National High School Sports-Related Injury Surveillance Study.

An online “End of Season” survey gave all participating ATs (both in the original study as well as in the expanded study including those ATs who did not report any data) the opportunity to provide feedback on their experiences with the study. This survey was completed by 76 ATs (55%). Average reporting time burdens were 17 minutes for the weekly exposure report and 8 minutes for the injury report form. Using a 5-point Likert scale, RIO was overwhelmingly reported to be either very easy (52%) or somewhat easy (44%) to use (5 and 4 on the Likert scale, respectively), with ATs being either very satisfied (65%) or somewhat satisfied (28%) with the system (5 and 4 on the Likert scale, respectively). Suggestions provided by ATs, such as the addition or clarification of questions or answer choices, will be used to improve the National High School Sports-Related Injury Surveillance Study for the 2022-23 school year.

REPORTING INFORMATION ONLINE

XV. SUMMARY

High school sports play an important role in the adoption and maintenance of a physically active lifestyle among millions of US adolescents. Too often, injury prevention in this population is overlooked as sports-related injuries are thought to be unavoidable. In reality, sports-related injuries are largely preventable through the application of evidence-based preventive interventions. Such preventive interventions can include educational campaigns, introduction of new or improved protective equipment, rule changes, other policy changes, etc. The morbidity, mortality, and disability caused by high school sports-related injuries can be reduced through the development and implementation of improved injury diagnosis and treatment modalities as well as through effective prevention strategies. However, surveillance of exposure-based injury rates in a nationally representative sample of high school athletes and subsequent epidemiologic analysis of patterns of injury are needed to drive evidence-based prevention practices.

Prior to the implementation of the National High School Sports-Related Injury Surveillance Study, the study of high school sports-related injuries had largely been limited by an inability to calculate injury rates due to a lack of exposure data (i.e., frequency of participation in athletic activities including practice and competition), an inability to compare findings across groups (i.e., sports/activities, genders, schools, and levels of competition), or an inability to generalize findings from small non-representative samples. The value of national injury surveillance studies that collect injury, exposure, and risk factor data from representative samples has been well demonstrated by the National Collegiate Athletic Association's Injury Surveillance System (NCAA ISS), now known as the Injury Surveillance Program (ISP). Data collected by the NCAA has been used to develop preventive interventions including increased use of protective equipment and rule changes that have had proven success in reducing injuries among collegiate athletes.

For example, NCAA ISP data has been used to develop several interventions intended to reduce the number of preseason heat-related football injuries including the elimination of consecutive days of multiple practices, daily time limitations, and a gradual increase in equipment for conditioning and heat acclimation. Additionally, several committees have considered NCAA ISP data when making recommendations including the NCAA Committee on Competitive Safeguards and Medical Aspects of Sports' recommendation for mandatory eye protection in women's lacrosse, the NCAA Men's Ice Hockey Rules Committee's recommendation for stricter penalties for hitting from behind, checking into the boards, and not wearing a mouthpiece, and the NCAA Men's Basketball Rules Committee's discussions of widening the free-throw lane to prevent injuries related to player contact. Unfortunately, because an equivalent injury surveillance system to collect injury and exposure data from a nationally representative sample of high school athletes had not previously existed, injury prevention efforts targeted to reduce injury rates in this population were based largely upon data collected from collegiate athletes. This is unacceptable because distinct biophysiological differences (e.g., lower muscle mass, immature growth plates, etc.) means high school athletes are not merely miniature versions of their collegiate counterparts.

The successful implementation and maintenance of the National High School Sports-Related Injury Surveillance Study demonstrates the value of a national injury surveillance system at the high school level. Dr. Collins and her research staff are committed to maintaining a permanent national high school sports injury surveillance system.

While the health benefits of a physically active lifestyle including sports participation are undeniable, participants are at risk of injury because a certain endemic level of injury can be expected during any physical activity, especially those with a competitive component. However, injury rates among high school athletes should be reduced to the lowest possible level without discouraging adolescents from engaging in this important form of physical activity. This goal can be best accomplished by monitoring injury rates and patterns of injury among high school athletes over time; investigating the etiology of preventable injuries; and developing, implementing, and evaluating evidence-based preventive interventions. Surveillance systems such as the model used for this study are critical in achieving these goals.