Original Sample Summary Report

NATIONAL HIGH SCHOOL SPORTS-RELATED INJURY SURVEILLANCE STUDY

2019-20 School Year

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High School RIO™

High School Sports-Related Injury Surveillance Study

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 National Federation of State High School Associations (NFHS), 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, Christy Collins, PhD, is happy to provide further information or to discuss research partnership opportunities upon request.

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REPORTING INFORMATION ONLINE

CONTENTS

REPORTING INFORMATION ONLINE

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 get up off the couch and 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 an over 7.9 million in 2018-19. 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 such 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 System 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. This surveillance has been conducted 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), the National High School Sports-Related Injury Surveillance System was able to be continued during the 2019-20 school year. Previous study years 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 System 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 System during the 2005-06 through 2013-14 school years and looks forward carrying on the important work of this surveillance system.

In March 2020, nearly all high school sports were suspended due to COVID-19. As a result, data reporting for winter and spring sports in the 2019-20 school year was incomplete. Furthermore, many ATs were unable to gain access to their records to complete retrospective data reporting; therefore,COVID-19 may have affected results for the entire 19-20 school year.

1.3 Specific Aims

The continuing objectives of this study are to maintain the National High School Sports- Related Injury Surveillance System 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 2019-20 school years.

1.4 Project Design

The National High School Sports-Related Injury Surveillance System 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 and
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 JV game, and 14 in a Varsity game, the number of athlete-competitions would equal 35.

1.5 Sample Recruitment

All eligible schools (i.e., all US high schools with a National Athletic Trainers' Association (NATA) affiliated certified athletic trainer (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. Due to lower participation this year, strata were first filled with schools reporting for all 9 sports followed by schools reporting for 5 or more sports. Strata were then filled with schools reporting for any one of the 9 original sports in an attempt to have 100 schools reporting for each of the 9 original sports to ensure equal distribution of schools between the 8 strata. Participating ATs were offered a $300-$350 honorarium depending on the number of sports reported along with individualized injury reports following the study's conclusion.

1.6 Data Collection

Each AT that enrolled their school in National High School Sports-Related Injury Surveillance System received an email every Monday throughout the study period reminding them to enter their school's data into the surveillance system. Each participating AT was asked to complete 44 weekly exposure reports: one for each week from July 29, 2019 through May 31, 2020. Exposure reports collected exposure information (number of athlete-competitions and athlete-practices) and the number of reportable injuries sustained by student athletes of each sport that was 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.). This 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 log on 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 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 (CI). 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 confidence intervals calculated using the Complex Samples module of SPSS in order 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. CI not including 1.00 were considered statistically significant. Injury rates over time were compared by running a 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, 2019-20 School Year*†

	Event Type	# Injuries	# Exposures	Injury Rate (per 1,000 AEs)	Nationally Estimated # Injuries
Overall	***Total***	***3,168***	***1,373,584***	***2.31***	***983,683***
	Competition	1,848	358,349	5.16	551,249
	Practice	1,320	1,015,235	1.30	432,434
Boys' Football	***Total***	***1,439***	***374,780***	***3.84***	***392,734***
	Competition	898	68,717	13.07	236,338
	Practice	541	306,063	1.77	156,396
Boys' Soccer	***Total***	***270***	***169,354***	***1.59***	***134,036***
	Competition	173	51,577	3.35	77,322
	Practice	97	117,777	0.82	56,714
Girls' Soccer	***Total***	***280***	***125,936***	***2.22***	***118,608***
	Competition	185	36,139	5.12	73,390
	Practice	95	89,797	1.06	45,218
Girls' Volleyball	***Total***	***198***	***159,017***	***1.25***	***54,665***
	Competition	97	52,777	1.84	25,810
	Practice	101	106,240	0.95	28,855
Boys' Basketball	***Total***	***312***	***205,732***	***1.52***	***84,828***
	Competition	169	61,727	2.74	47,736
	Practice	143	144,005	0.99	37,092
Girls' Basketball	***Total***	***291***	***141,299***	***2.06***	***76,317***
	Competition	171	42,604	4.01	43,148
	Practice	120	98,695	1.22	33,169
Boys' Wrestling	***Total***	***332***	***139,297***	***2.38***	***94,606***
	Competition	144	35,321	4.08	41,914
	Practice	188	103,976	1.81	52,692

Boys' Baseball	***Total***	***23***	***32,835***	***0.70***	***13,087***
	Competition	2	4,312	0.46	833
	Practice	21	28,523	0.74	12,254
Girls' Softball	***Total***	***23***	***25,334***	***0.91***	***14,802***
	Competition	9	5,175	1.74	4,758
	Practice	14	20,159	0.69	10,044

* Only includes injuries resulting in ≥1 day time loss.
†**The suspension of sports due to 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, 2019-20 School Year *†

	< 1 Day Time Loss	≥ 1 Day Time Loss	Time Loss Data Missing	Total
	%	%	%	%
Overall	***2.2%***	***93.8%***	***3.9%***	***100.0%***
Boys' Football	2.1%	94.5%	3.4%	100.0%
Boys' Soccer	3.1%	91.5%	5.4%	100.0%
Girls' Soccer	3.3%	92.1%	4.6%	100.0%
Girls' Volleyball	1.9%	95.2%	2.9%	100.0%
Boys' Basketball	2.4%	92.9%	4.8%	100.0%
Girls' Basketball	2.6%	93.0%	4.5%	100.0%
Boys' Wrestling	0.6%	95.7%	3.7%	100.0%
Boys' Baseball	3.8%	88.5%	7.7%	100.0%
Girls' Softball	4.2%	95.8%	0.0%	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. .

†**The suspension of sports due to 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, 2019-20 School Year *†

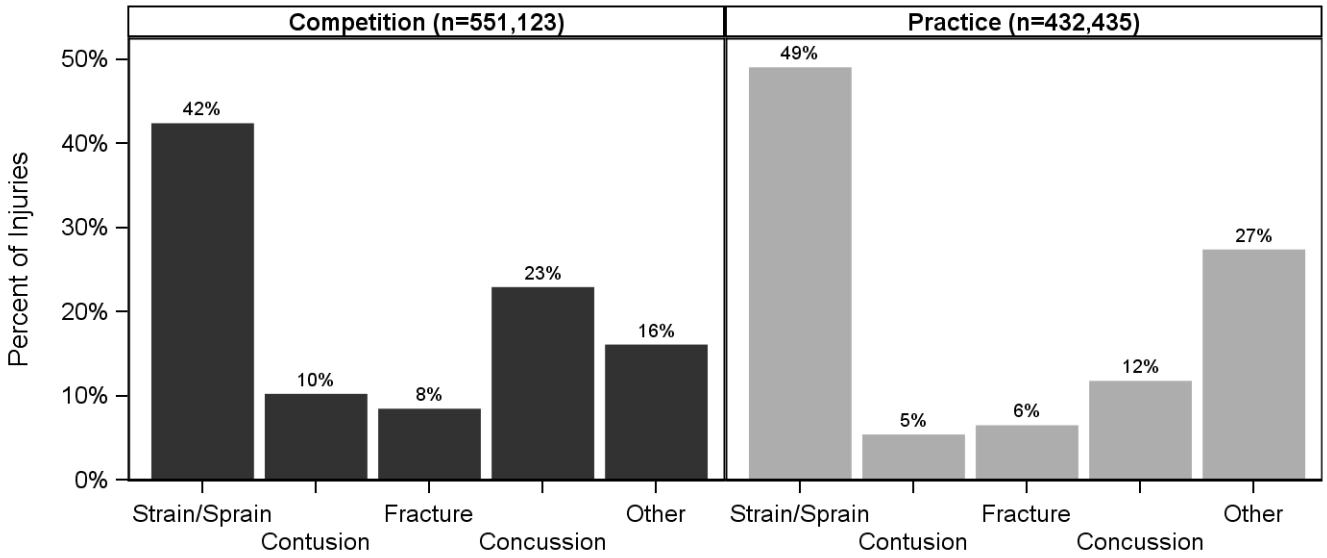
	Male		Female	
Year in School	**n**	**%**	**n**	**%**
Freshman	152,649	22.3%	62,464	24.9%
Sophomore	174,479	25.5%	63,764	25.5%
Junior	165,129	24.2%	58,279	23.3%
Senior	191,100	28.0%	65,932	26.3%
Total ***	***683,357***	***100.0%***	***250,439***	***100.0%***

Age (years)		
Minimum	12	13
Maximum	19	18
Mean (SD)	15.9 (1.2)	15.6 (1.2)
n	492,944	170,701

BMI		
Minimum	15.4	16.0
Maximum	45.7	39.0
Mean (SD)	24.9 (4.4)	22.3 (3.4)
n	338,406	110,688

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

Figure 2.1 Injury Diagnosis by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year†



†The suspension of sports due to COVID-19 may have affected these results.

Table 2.4 Body Site of Injury by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *†

	Competition		Practice		Overall	
Body Site	**n**	**%**	**n**	**%**	**n**	**%**
Head/Face	142,007	25.8%	64,835	15.0%	206,842	21.1%
Ankle	107,902	19.6%	84,330	19.5%	192,233	19.6%
Knee	80,189	14.6%	50,756	11.7%	130,945	13.3%
Hip/Thigh/Upper Leg	34,635	6.3%	62,891	14.6%	97,526	9.9%
Hand/Wrist	48,284	8.8%	34,139	7.9%	82,422	8.4%
Shoulder	40,801	7.4%	27,548	6.4%	68,348	7.0%
Trunk	22,883	4.2%	28,617	6.6%	51,500	5.2%
Lower Leg	14,928	2.7%	25,797	6.0%	40,725	4.1%
Arm/Elbow	18,939	3.4%	20,148	4.7%	39,087	4.0%
Foot	17,292	3.1%	17,819	4.1%	35,111	3.6%
Other	11,354	2.1%	11,533	2.7%	22,887	2.3%
Neck	10,881	2.0%	3,594	0.8%	14,475	1.5%
Total	***550,095***	***100.0%***	***432,006***	***100.0%***	***982,101***	***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.
†**The suspension of sports due to COVID-19 may have affected these results.**

Table 2.5 Most Commonly Injured Ankle Structures, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *†

	Male (n=114,347)		Female (n=73,162)		Overall (n=187,509)	
Ankle Ligament Injuries	**n**	**%**	**n**	**%**	**n**	**%**
Anterior Talofibular Ligament	83,675	73.2%	52,707	72.0%	136,382	72.7%
Calcaneofibular Ligament	27,572	24.1%	25,642	35.0%	53,214	28.4%
Anterior Tibiofibular Ligament	26,112	22.8%	12,405	17.0%	38,517	20.5%
Posterior Talofibular Ligament	13,935	12.2%	11,686	16.0%	25,621	13.7%
Posterior Tibiofibular Ligament	5,653	4.9%	5,201	7.1%	10,854	5.8%
Deltoid Ligament	7,917	6.9%	2,901	4.0%	10,818	5.8%

* 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.
†**The suspension of sports due to COVID-19 may have affected these results.**

Table 2.6 Most Commonly Injured Knee Structures, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *†

	Male (n=80,575)		Female (n=44,618)		Overall (n=125,193)	
Knee Ligament Injuries	**n**	**%**	**n**	**%**	**n**	**%**
Medial Collateral Ligament	21,502	26.7%	12,699	28.5%	34,201	27.3%
Patella and/or Patellar Tendon	18,463	22.9%	9,215	20.7%	27,678	22.1%
Anterior Cruciate Ligament	14,154	17.6%	11,164	25.0%	25,318	20.2%
Torn Cartilage (Meniscus)	13,342	16.6%	7,891	17.7%	21,233	17.0%
Lateral Collateral Ligament	4,546	5.6%	4,392	9.8%	8,938	7.1%
Posterior Cruciate Ligament	1,845	2.3%	580	1.3%	2,425	1.9%

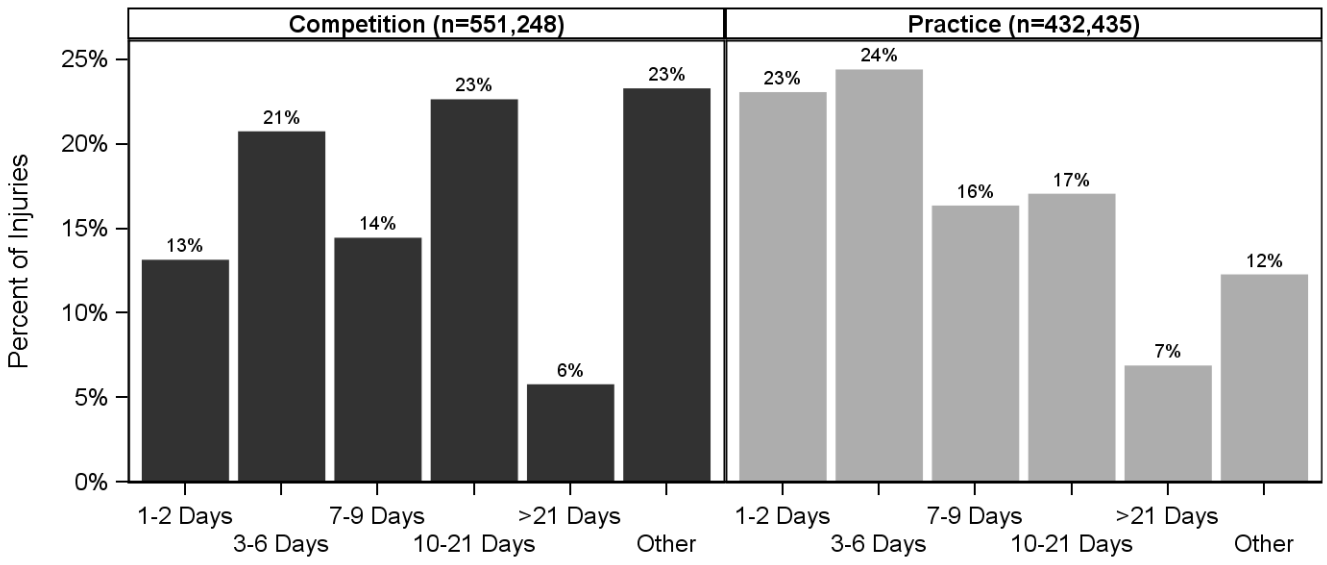
* Multiple ligament responses allowed per injury report. Totals and n's are not always equal due to slight rounding of the weighted number of injuries and missing responses. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.
†**The suspension of sports due to 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, 2019-20 School Year *†

	Competition (n=549,972)		Practice (n=432,006)		Overall (n=981,975)	
Diagnosis	**n**	**%**	**n**	**%**	**n**	**%**
Head/Face Concussion	125,737	22.9%	50,790	11.8%	176,526	18.0%
Ankle Strain/Sprain	98,832	18.0%	75,460	17.5%	174,292	17.7%
Hip/Thigh/Upper Leg Strain/Sprain	20,424	3.7%	53,679	12.4%	74,103	7.5%
Knee Strain/Sprain	44,148	8.0%	19,442	4.5%	63,589	6.5%
Knee Other	21,886	4.0%	25,352	5.9%	47,238	4.8%
Shoulder Other	25,674	4.7%	13,242	3.1%	38,915	4.0%
Hand/Wrist Fracture	20,407	3.7%	13,381	3.1%	33,787	3.4%
Hand/Wrist Strain/Sprain	18,405	3.3%	13,641	3.2%	32,047	3.3%
Shoulder Strain/Sprain	12,741	2.3%	13,254	3.1%	25,995	2.6%
Trunk Strain/Sprain	8,850	1.6%	13,491	3.1%	22,340	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.
†**The suspension of sports due to COVID-19 may have affected these results.**

Figure 2.2 Time Loss by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *†



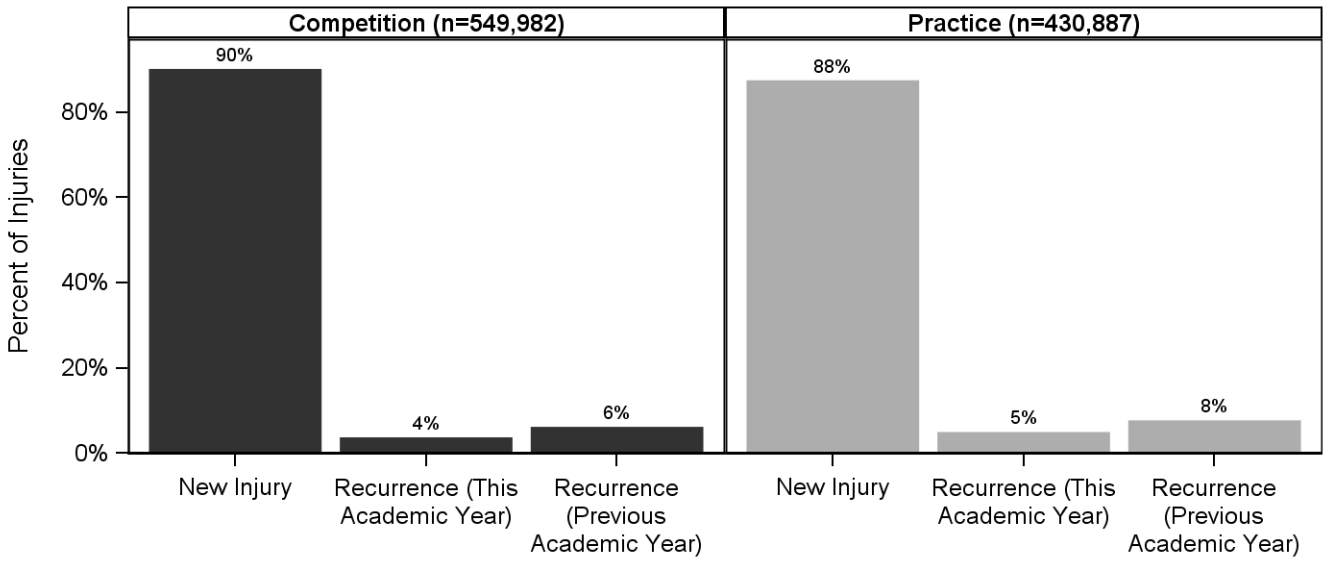
* Other category is made up of medical disqualification for season, medical disqualification for career, athlete chooses not to continue, and season ended before athlete returned to play
†**The suspension of sports due to COVID-19 may have affected these results.**

Table 2.8 Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *†

	Competition		Practice		Overall	
Need for Surgery	**n**	**%**	**n**	**%**	**n**	**%**
Required Surgery	45,378	8.3%	18,990	4.4%	64,368	6.6%
Did Not Require Surgery	501,880	91.7%	411,715	95.6%	913,595	93.4%
Total	***547,257***	***100.0%***	***430,706***	***100.0%***	***977,963***	***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.
†**The suspension of sports due to 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, 2019-20 School Year†



†**The suspension of sports due to COVID-19 may have affected these results.**

Table 2.9 Time during Season of Injury, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *†

Time in Season	n	%
Preseason	233,770	23.8%
Regular Season	701,740	71.4%
Post Season	44,963	4.6%
Unknown/Other	2,829	0.3%
Total	***983,302***	***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.
†**The suspension of sports due to COVID-19 may have affected these results.**

Table 2.10 Practice-Related Variables, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *†

Time in Practice	n	%
First 1/2 Hour	40,318	9.5%
Second 1/2 Hour	68,628	16.2%
1-2 Hours into Practice	200,817	47.5%
>2 Hours into Practice	15,618	3.7%
Unknown	97,637	23.1%
Total	***423,019***	***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.
†**The suspension of sports due to COVID-19 may have affected these results.**

Table 2.11 Methods for Injury Evaluation and Assessment, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *†

Injuries Evaluated By:	n=983,683	%
Certified Athletic Trainer	920,924	93.6%
Orthopedic Physician	181,530	18.5%
Physician/Pediatrician	176,943	18.0%
Other	12,786	1.3%
Physician's Assistant	9,528	1.0%
Chiropractor	6,024	0.6%
Nurse Practitioner	4,829	0.5%
Neurologist/Neuropsychologist	2,532	0.3%
Dentist/Oral Surgeon	336	0.0%

Assessment Method:	n=983,683	%
Evaluation	957,060	97.3%
X-Ray	333,476	33.9%
MRI	97,063	9.9%
CT-Scan	14,579	1.5%
Blood Work/Lab Test	7,385	0.8%
Other	6,785	0.7%

* Multiple responses allowed per injury report.
†**The suspension of sports due to 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, 2019-20 School Year *†

	# Injuries	# Exposures	Injury Rate (per 1,000 AEs)	Nationally Estimated # Injuries
Total	***1,439***	***374,780***	***3.84***	***392,734***
Competition	898	68,717	13.07	236,338
Practice	541	306,063	1.77	156,396

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

Table 3.2 Demographic Characteristics of Injured Football Athletes, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *

Year in School	n	%
Freshman	82,054	21.5%
Sophomore	95,700	25.1%
Junior	93,521	24.5%
Senior	109,735	28.8%
Total	***381,010***	***100.0%***

Age (years)	
Minimum	13
Maximum	18
Mean (SD)	15.9 (1.2)
n	278,756

BMI	
Minimum	15.4
Maximum	45.7
Mean (SD)	25.7 (4.6)
n	178,966

* 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, 2019-20 School Year

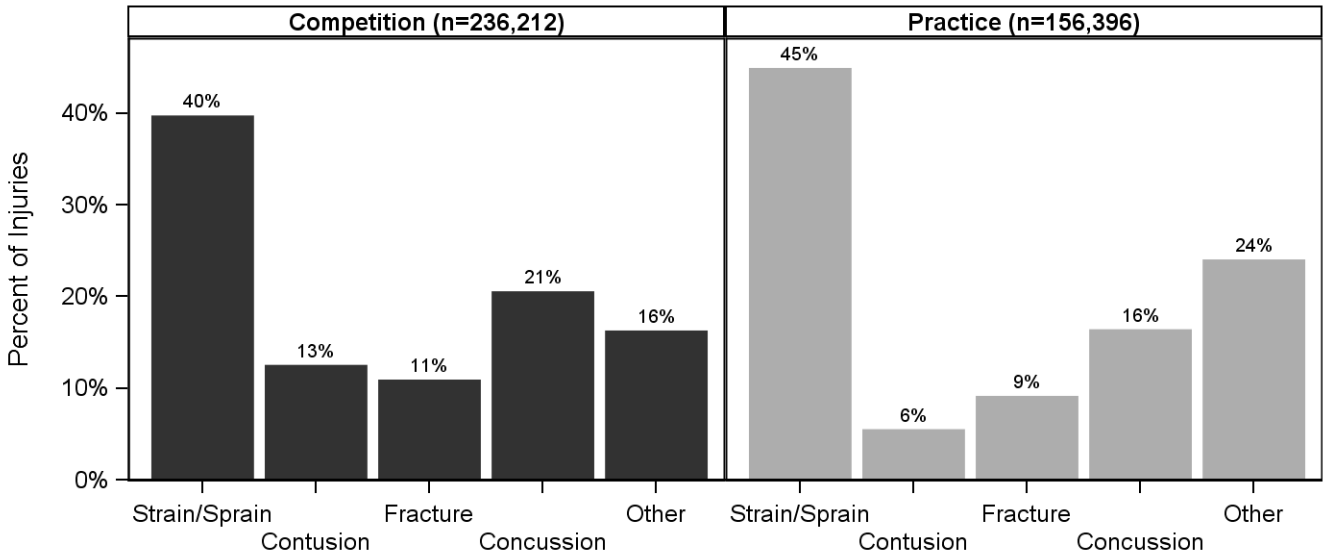


Table 3.3 Body Site of Football Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *

	Competition		Practice		Overall	
Body Site	**n**	**%**	**n**	**%**	**n**	**%**
Head/Face	49,294	20.9%	27,035	17.3%	76,328	19.4%
Knee	35,372	15.0%	20,358	13.0%	55,729	14.2%
Ankle	35,026	14.8%	19,094	12.2%	54,120	13.8%
Hand/Wrist	26,290	11.1%	19,753	12.6%	46,043	11.7%
Shoulder	27,353	11.6%	14,015	9.0%	41,367	10.5%
Hip/Thigh/Upper Leg	16,223	6.9%	18,638	11.9%	34,861	8.9%
Trunk	13,454	5.7%	10,191	6.5%	23,645	6.0%
Arm/Elbow	7,487	3.2%	6,624	4.2%	14,110	3.6%
Lower Leg	8,140	3.4%	5,807	3.7%	13,947	3.6%
Other	7,262	3.1%	6,508	4.2%	13,770	3.5%
Foot	3,917	1.7%	6,370	4.1%	10,287	2.6%
Neck	6,521	2.8%	1,879	1.2%	8,400	2.1%
Total	***236,338***	***100.0%***	***156,270***	***100.0%***	***392,608***	***100.0%***

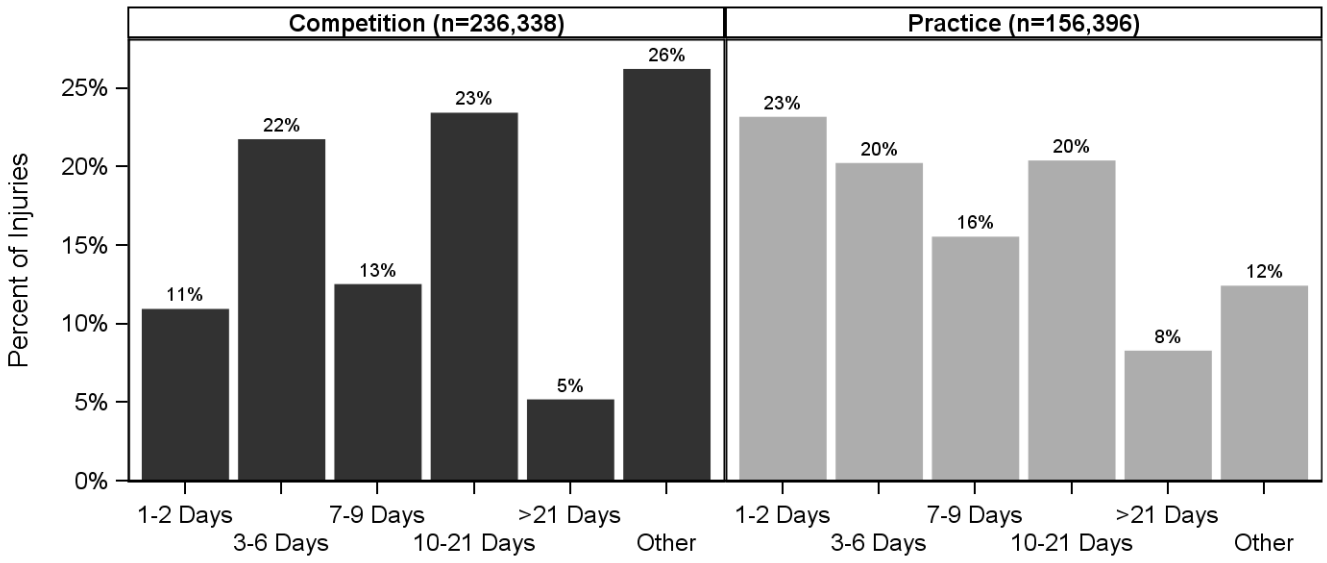
* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Table 3.4 Ten Most Common Football Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *

	Competition (n=236,214)		Practice (n=156,266)		Overall (n=392,485)	
Diagnosis	**n**	**%**	**n**	**%**	**n**	**%**
Head/Face Concussion	48,065	20.3%	25,663	16.4%	73,728	18.8%
Ankle Strain/Sprain	30,338	12.8%	17,751	11.4%	48,089	12.3%
Knee Strain/Sprain	19,539	8.3%	9,703	6.2%	29,242	7.5%
Hip/Thigh/Upper Leg Strain/Sprain	8,532	3.6%	17,492	11.2%	26,024	6.6%
Shoulder Other	16,354	6.9%	6,934	4.4%	23,289	5.9%
Hand/Wrist Fracture	11,583	4.9%	8,481	5.4%	20,064	5.1%
Hand/Wrist Strain/Sprain	9,146	3.9%	7,620	4.9%	16,766	4.3%
Shoulder Strain/Sprain	10,113	4.3%	6,557	4.2%	16,670	4.2%
Knee Other	7,549	3.2%	8,451	5.4%	15,999	4.1%
Trunk Other	3,737	1.6%	6,043	3.9%	9,780	2.5%

* 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 3.2 Time Loss of Football Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2019-20 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, 2019-20 School Year *

	Competition		Practice		Overall	
Need for Surgery	**n**	**%**	**n**	**%**	**n**	**%**
Required Surgery	22,794	9.7%	10,629	6.8%	33,423	8.6%
Did Not Require Surgery	211,948	90.3%	145,444	93.2%	357,391	91.4%
Total	***234,742***	***100.0%***	***156,072***	***100.0%***	***390,814***	***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 3.3 History of Football Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year

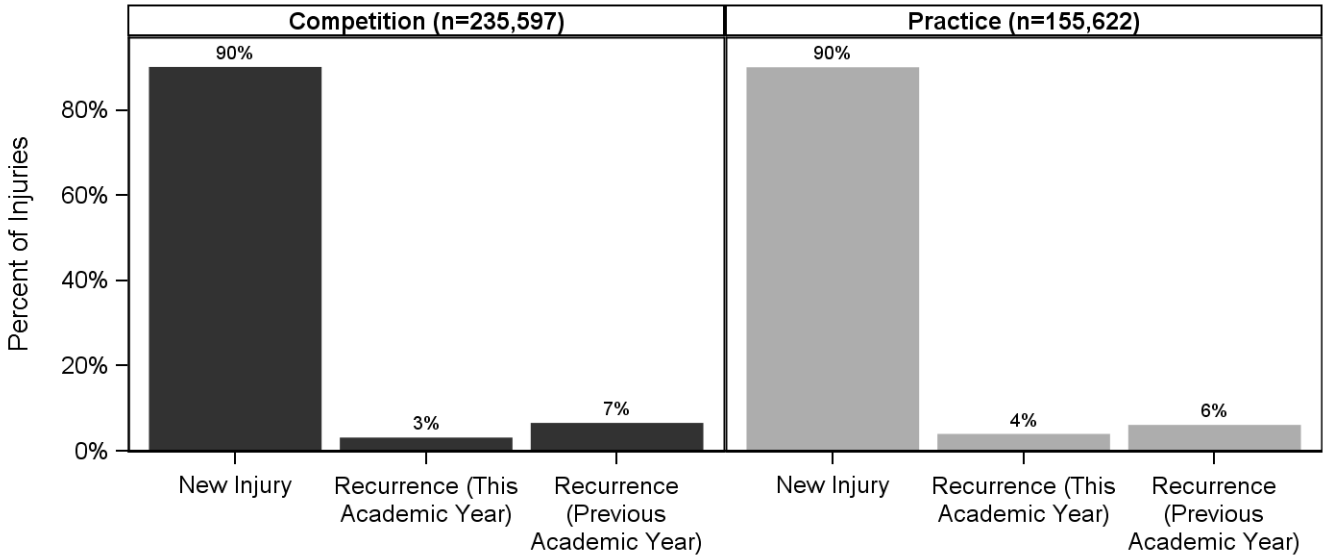


Table 3.6 Time during Season of Football Injuries, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *

Time in Season	n	%
Preseason	85,048	21.7%
Regular Season	290,419	74.0%
Post Season	16,335	4.2%
Unknown/Other	551	0.1%
Total	***392,352***	***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.

Table 3.7 Competition-Related Variables for Football Injuries, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *

Time in Competition	n	%
Pre-competition/Warm-Ups	1,629	0.8%
First Quarter	29,474	13.7%
Second Quarter	63,917	29.7%
Third Quarter	61,856	28.7%
Fourth Quarter	57,458	26.7%
Overtime	864	0.4%
Total	***215,198***	***100.0%***

Field Location		
End Zone	5,877	2.6%
Red Zone (20 Yard Line to Goal Line)	33,882	15.3%
Between the 20 Yard Lines	120,826	54.5%
Off the Field	2,502	1.1%
Unknown	58,802	26.5%
Total	***221,888***	***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 3.8 Practice-Related Variables for Football Injuries, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *

Time in Practice	n	%
First 1/2 Hour	10,608	6.9%
Second 1/2 Hour	24,922	16.3%
1-2 Hours into Practice	75,758	49.6%
>2 Hours into Practice	7,893	5.2%
Unknown	33,689	22.0%
Total	***152,871***	***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 3.4 Player Position of Football Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year

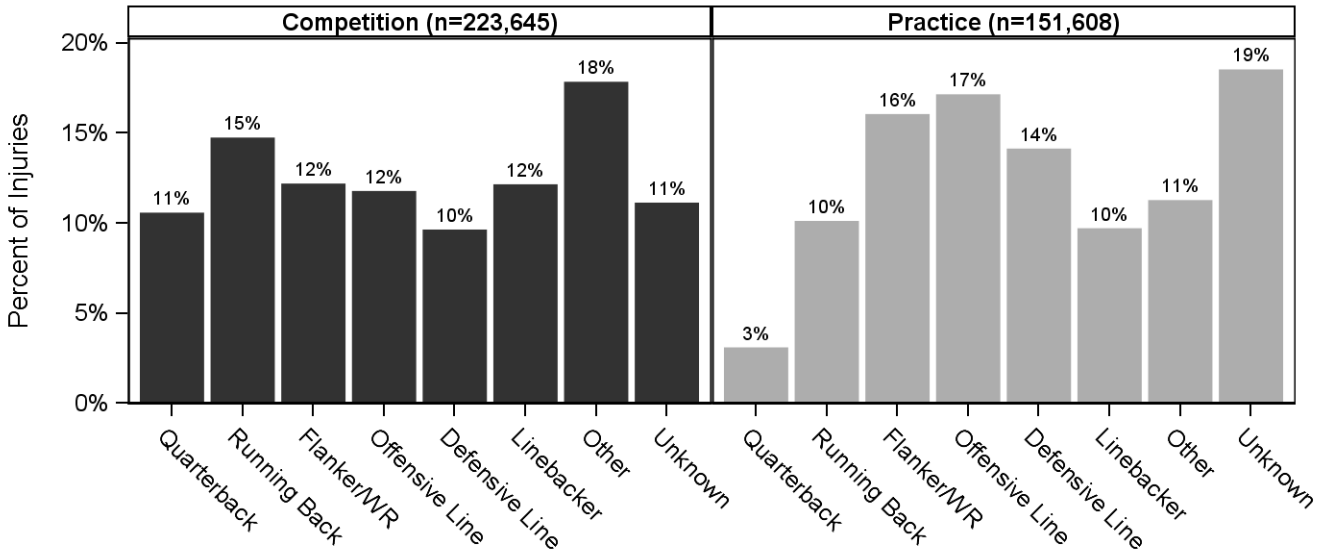


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Table 3.9 Activities Leading to Football Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *

	Competition		Practice		Overall	
Activity	**n**	**%**	**n**	**%**	**n**	**%**
Being Tackled	75,728	33.7%	21,404	14.1%	97,132	25.8%
Tackling	46,927	20.9%	18,094	11.9%	65,021	17.3%
Blocking	26,296	11.7%	21,180	14.0%	47,476	12.6%
Unknown	21,847	9.7%	21,171	14.0%	43,017	11.4%
N/A **	5,180	2.3%	25,074	16.5%	30,255	8.0%
Being Blocked	14,696	6.5%	11,000	7.3%	25,696	6.8%
Other	9,413	4.2%	10,376	6.8%	19,789	5.3%
Rotation Around a Planted Foot/Inversion	9,331	4.1%	9,933	6.5%	19,264	5.1%
Stepped On, Fell On or Kicked	10,375	4.6%	6,405	4.2%	16,781	4.5%
Contact with Ball	2,933	1.3%	3,416	2.3%	6,349	1.7%
Uneven Playing Surface	2,239	1.0%	3,017	2.0%	5,256	1.4%
Contact with Blocking Sled/Dummy	0	0.0%	647	0.4%	647	0.2%
Total	***224,967***	***100.0%***	***151,716***	***100.0%***	***376,682***	***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.

Table 3.10 Activity Resulting in Football Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
Activity	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Being Blocked	9,393	6.0%	3,817	10.0%	2,345	6.0%	6,835	9.5%	3,306	4.6%
Being Tackled	31,240	20.1%	15,404	40.4%	15,558	39.6%	21,337	29.7%	13,592	18.9%
Blocking	22,533	14.5%	3,564	9.3%	3,164	8.0%	11,869	16.5%	6,221	8.7%
Contact with Ball	2,352	1.5%	864	2.3%	1,133	2.9%	0	0.0%	2,000	2.8%
Contact with Blocking Sled/Dummy	323	0.2%	68	0.2%	0	0.0%	256	0.4%	0	0.0%
N/A **	15,981	10.3%	485	1.3%	0	0.0%	0	0.0%	13,789	19.2%
Other	9,152	5.9%	1,154	3.0%	4,156	10.6%	1,309	1.8%	4,018	5.6%
Rotation Around a Planted Foot/Inversion	14,144	9.1%	68	0.2%	251	0.6%	485	0.7%	4,317	6.0%
Stepped On, Fell On or Kicked	9,943	6.4%	2,767	7.3%	1,905	4.8%	0	0.0%	2,166	3.0%
Tackling	22,150	14.2%	5,641	14.8%	9,414	23.9%	15,576	21.7%	12,241	17.1%
Uneven Playing Surface	3,717	2.4%	568	1.5%	0	0.0%	0	0.0%	970	1.4%
Unknown	14,543	9.4%	3,721	9.8%	1,406	3.6%	14,234	19.8%	9,112	12.7%
Total	***155,471***	***100.0%***	***38,119***	***100.0%***	***39,333***	***100.0%***	***71,902***	***100.0%***	***71,731***	***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.

IV. Boys' Soccer Injury Epidemiology

Table 4.1 Boys' Soccer Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *†

	# Injuries	# Exposures	Injury Rate (per 1,000 AEs)	Nationally Estimated # Injuries
Total	***270***	***169,354***	***1.59***	***134,036***
Competition	173	51,577	3.35	77,322
Practice	97	117,777	0.82	56,714

* All remaining analyses in this chapter present data weighted to provide national injury estimates.
†**The suspension of sports due to 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, 2019-20 School Year *

Year in School	n	%
Freshman	25,766	19.9%
Sophomore	31,221	24.1%
Junior	33,449	25.8%
Senior	39,165	30.2%
Total	***129,600***	***100.0%***

Age (years)	
Minimum	13
Maximum	19
Mean (SD)	15.9 (1.3)
n	91,604

BMI	
Minimum	17.0
Maximum	32.5
Mean (SD)	22.6 (2.7)
n	70,369

* 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, 2019-20 School Year

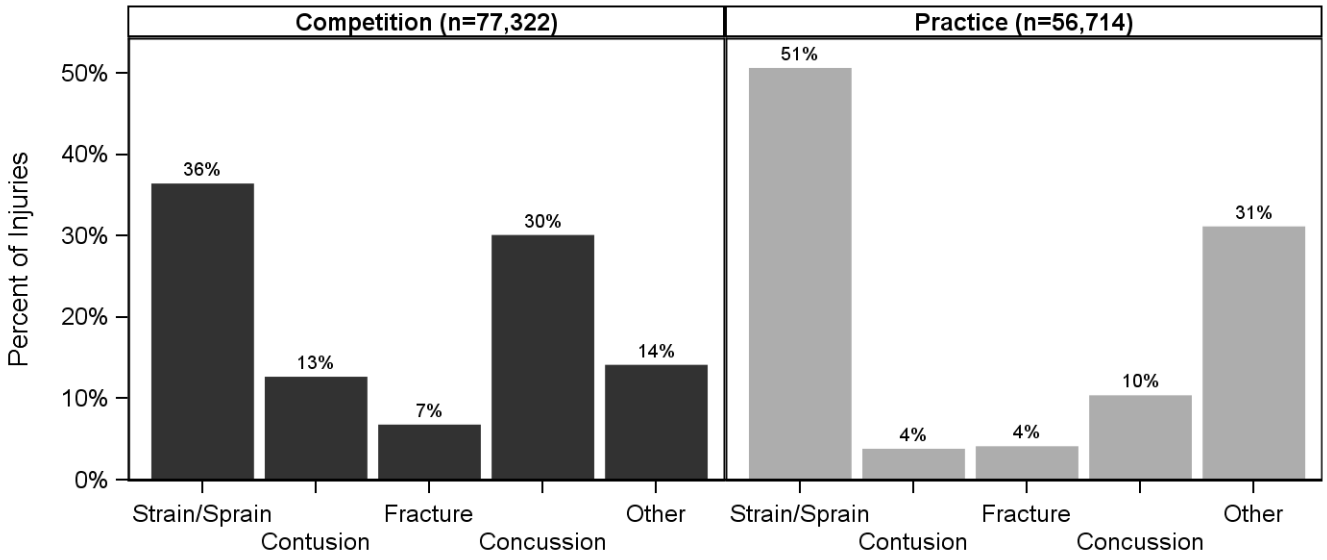


Table 4.3 Body Site of Boys' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *

	Competition		Practice		Overall	
Body Site	**n**	**%**	**n**	**%**	**n**	**%**
Head/Face	28,596	37.5%	7,032	12.4%	35,628	26.8%
Ankle	15,399	20.2%	10,464	18.5%	25,863	19.5%
Hip/Thigh/Upper Leg	7,670	10.1%	14,399	25.4%	22,069	16.6%
Lower Leg	3,862	5.1%	8,642	15.2%	12,504	9.4%
Foot	5,205	6.8%	3,987	7.0%	9,192	6.9%
Knee	5,602	7.4%	1,883	3.3%	7,485	5.6%
Trunk	1,986	2.6%	3,185	5.6%	5,171	3.9%
Shoulder	2,172	2.9%	2,787	4.9%	4,959	3.7%
Hand/Wrist	2,376	3.1%	1,710	3.0%	4,086	3.1%
Arm/Elbow	2,298	3.0%	1,206	2.1%	3,504	2.6%
Other	940	1.2%	1,420	2.5%	2,360	1.8%
Neck	62	0.1%	0	0.0%	62	0.0%
Total	***76,168***	***100.0%***	***56,714***	***100.0%***	***132,882***	***100.0%***

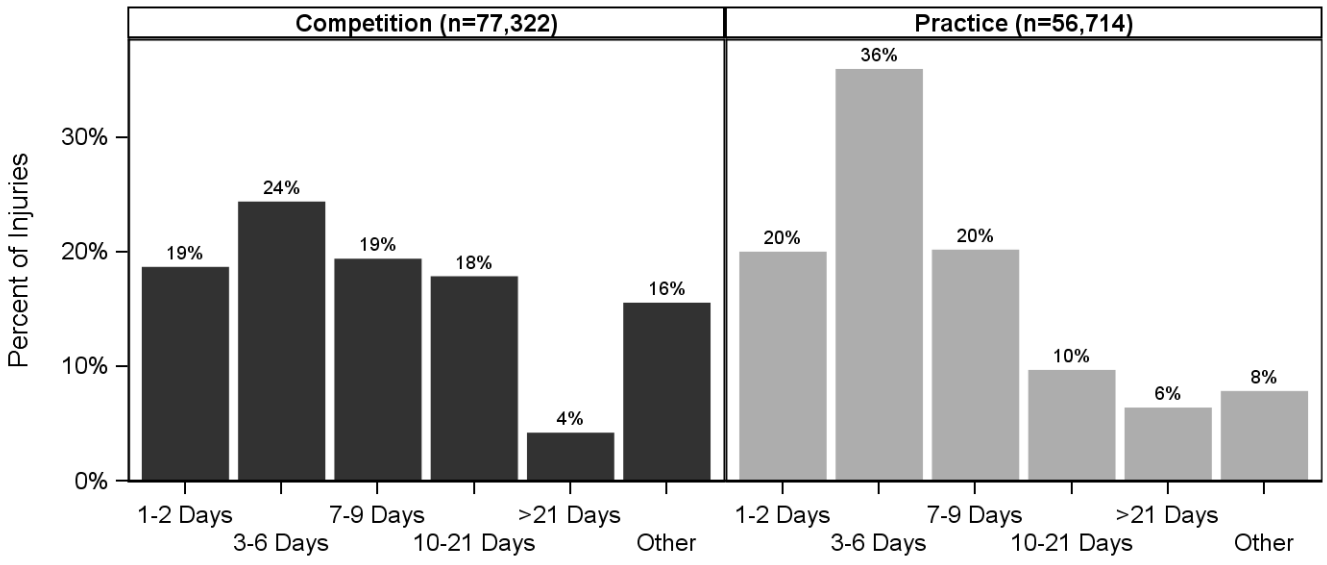
* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Table 4.4 Ten Most Common Boys' Soccer Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *

	Competition (n=76,167)		Practice (n=56,712)		Overall (n=132,882)	
Diagnosis	**n**	**%**	**n**	**%**	**n**	**%**
Head/Face Concussion	23,255	30.5%	5,878	10.4%	29,133	21.9%
Ankle Strain/Sprain	14,460	19.0%	8,308	14.6%	22,768	17.1%
Hip/Thigh/Upper Leg Strain/Sprain	4,946	6.5%	14,166	25.0%	19,111	14.4%
Lower Leg Other	171	0.2%	6,315	11.1%	6,486	4.9%
Head/Face Other	4,284	5.6%	1,154	2.0%	5,438	4.1%
Foot Other	0	0.0%	3,816	6.7%	3,816	2.9%
Lower Leg Strain/Sprain	1,324	1.7%	2,326	4.1%	3,651	2.7%
Shoulder Other	2,110	2.8%	1,446	2.5%	3,556	2.7%
Knee Other	2,865	3.8%	621	1.1%	3,486	2.6%
Trunk Strain/Sprain	1,154	1.5%	2,031	3.6%	3,185	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.

Figure 4.2 Time Loss of Boys' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2019-20 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, 2019-20 School Year *

	Competition		Practice		Overall	
Need for Surgery	**n**	**%**	**n**	**%**	**n**	**%**
Required Surgery	3,503	4.6%	171	0.3%	3,674	2.8%
Did Not Require Surgery	73,185	95.4%	56,543	99.7%	129,728	97.2%
Total	***76,688***	***100.0%***	***56,714***	***100.0%***	***133,402***	***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, 2019-20 School Year

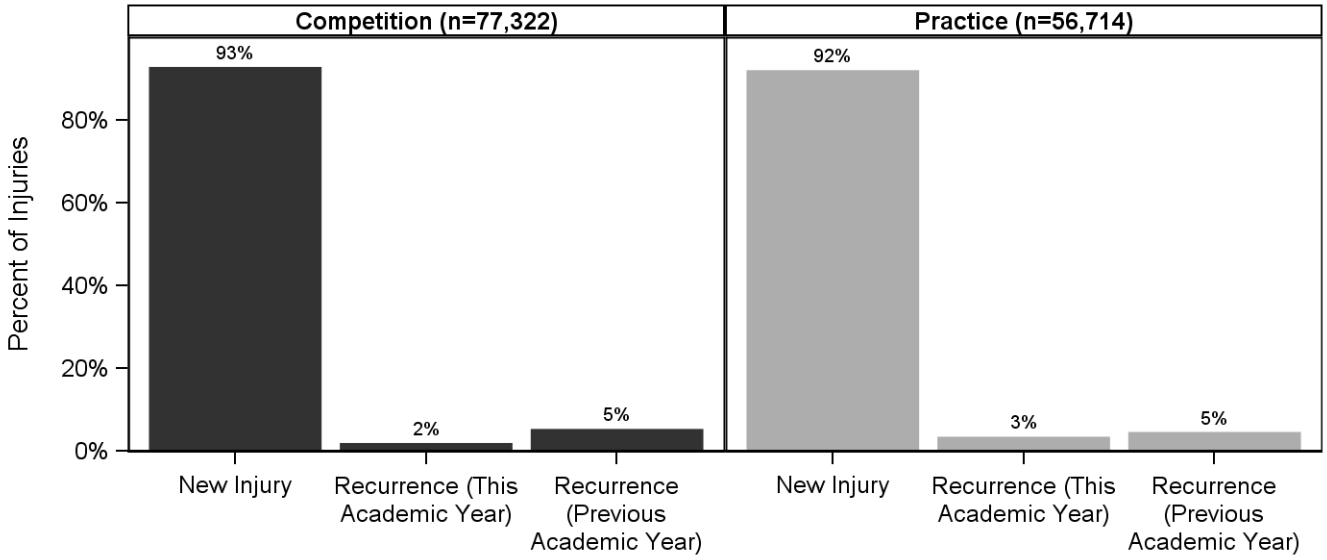


Table 4.6 Time during Season of Boys' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *

Time in Season	n	%
Preseason	42,378	31.6%
Regular Season	83,227	62.1%
Post Season	8,431	6.3%
Total	***134,036***	***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, 2019-20 School Year *

Time in Competition	n	%
Pre-competition/Warm-Ups	2,324	3.1%
First Half	22,977	31.0%
Second Half	37,694	50.8%
Unknown	11,224	15.1%
Total	***74,219***	***100.0%***

Field Location		
Goal Box (Defense)	12,899	17.3%
Goal Box (Offense)	9,429	12.7%
Side of Goal Box (Defense)	1,120	1.5%
Side of Goal Box (Offense)	2,451	3.3%
Top of Goal Box Extended to Center Line (Offense)	9,691	13.0%
Top of Goal Box Extended to Center Line (Defense)	11,974	16.1%
Off the Field	1,154	1.6%
Unknown	25,672	34.5%
Total	***74,389***	***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 4.8 Practice-Related Variables for Boys' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *

Time in Practice	n	%
First 1/2 Hour	7,731	13.8%
Second 1/2 Hour	9,501	17.0%
1-2 Hours into Practice	26,905	48.1%
>2 Hours into Practice	1,278	2.3%
Unknown	10,547	18.8%
Total	***55,962***	***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 4.4 Player Position of Boys' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year

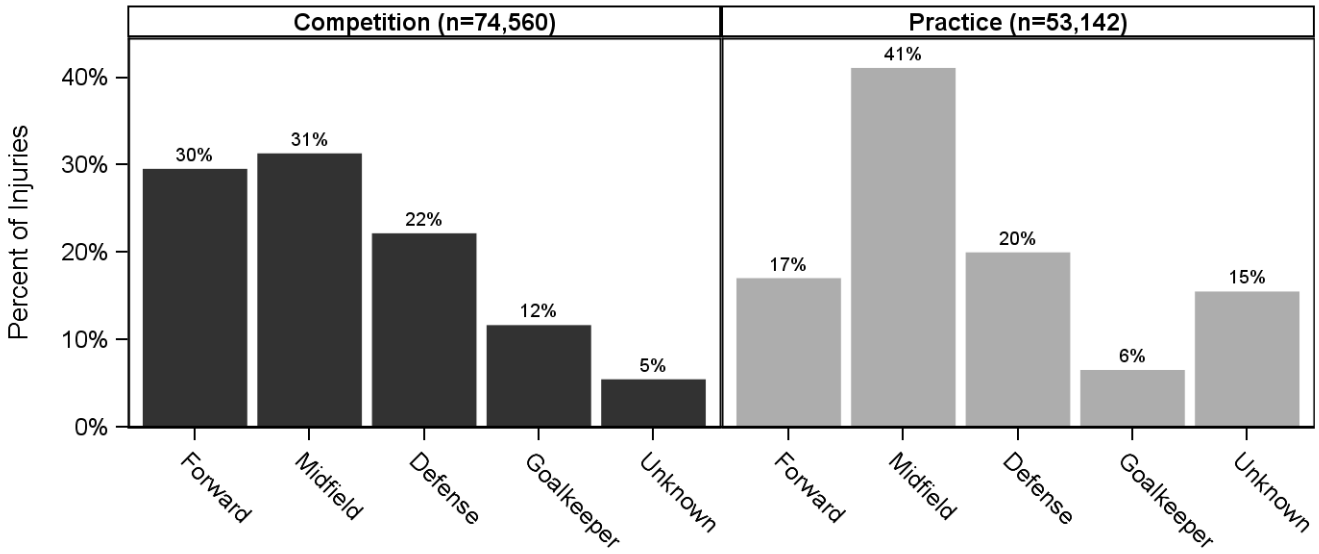


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Table 4.9 Activities Leading to Boys' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *

	Competition		Practice		Overall	
Activity	**n**	**%**	**n**	**%**	**n**	**%**
General Play	17,606	23.6%	25,696	48.3%	43,302	33.9%
Unknown	9,433	12.6%	5,889	11.1%	15,322	12.0%
Heading Ball	8,252	11.1%	4,151	7.8%	12,403	9.7%
Defending	10,281	13.8%	1,358	2.6%	11,639	9.1%
Goaltending	7,792	10.4%	1,154	2.2%	8,946	7.0%
Ball Handling/Dribbling	4,998	6.7%	1,170	2.2%	6,168	4.8%
Shooting	3,806	5.1%	1,925	3.6%	5,732	4.5%
Chasing Loose Ball	4,286	5.7%	1,403	2.6%	5,689	4.5%
Blocking Shot	2,094	2.8%	3,185	6.0%	5,279	4.1%
Receiving Pass	3,534	4.7%	171	0.3%	3,704	2.9%
Other	391	0.5%	2,931	5.5%	3,322	2.6%
Conditioning	0	0.0%	3,294	6.2%	3,294	2.6%
Passing	2,150	2.9%	877	1.6%	3,027	2.4%
Total	***74,622***	***100.0%***	***53,204***	***100.0%***	***127,826***	***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 4.10 Activity Resulting in Boys' Soccer Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
Activity	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Ball Handling/Dribbling	4,673	9.0%	171	1.4%	0	0.0%	0	0.0%	1,324	4.8%
Blocking Shot	2,909	5.6%	0	0.0%	0	0.0%	62	0.2%	2,308	8.4%
Chasing Loose Ball	1,853	3.6%	1,003	8.5%	171	2.3%	1,216	4.2%	1,446	5.2%
Conditioning	453	0.9%	266	2.2%	0	0.0%	0	0.0%	2,574	9.3%
Defending	1,760	3.4%	1,084	9.1%	689	9.1%	4,344	15.1%	3,761	13.6%
General Play	21,092	40.6%	4,658	39.3%	1,268	16.8%	3,570	12.4%	12,714	46.0%
Goaltending	266	0.5%	533	4.5%	62	0.8%	7,793	27.0%	292	1.1%
Heading Ball	62	0.1%	0	0.0%	2,545	33.7%	8,918	30.9%	877	3.2%
Other	2,807	5.4%	0	0.0%	62	0.8%	125	0.4%	329	1.2%
Passing	2,856	5.5%	0	0.0%	0	0.0%	171	0.6%	0	0.0%
Receiving Pass	2,219	4.3%	437	3.7%	877	11.6%	171	0.6%	0	0.0%
Shooting	4,684	9.0%	1,048	8.8%	0	0.0%	0	0.0%	0	0.0%
Unknown	6,305	12.1%	2,667	22.5%	1,880	24.9%	2,469	8.6%	2,001	7.2%
Total	***51,940***	***100.0%***	***11,866***	***100.0%***	***7,556***	***100.0%***	***28,838***	***100.0%***	***27,627***	***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.

V. Girls' Soccer Injury Epidemiology

Table 5.1 Girls' Soccer Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *†

	# Injuries	# Exposures	Injury Rate (per 1,000 AEs)	Nationally Estimated # Injuries
Total	***280***	***125,936***	***2.22***	***118,608***
Competition	185	36,139	5.12	73,390
Practice	95	89,797	1.06	45,218

* All remaining analyses in this chapter present data weighted to provide national injury estimates.
†**The suspension of sports due to 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, 2019-20 School Year *

Year in School	n	%
Freshman	24,535	21.3%
Sophomore	30,325	26.3%
Junior	29,805	25.9%
Senior	30,498	26.5%
Total	***115,163***	***100.0%***

Age (years)	
Minimum	13
Maximum	18
Mean (SD)	15.5 (1.2)
n	74,160

BMI	
Minimum	16.2
Maximum	32.1
Mean (SD)	21.9 (2.9)
n	46,476

* 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, 2019-20 School Year

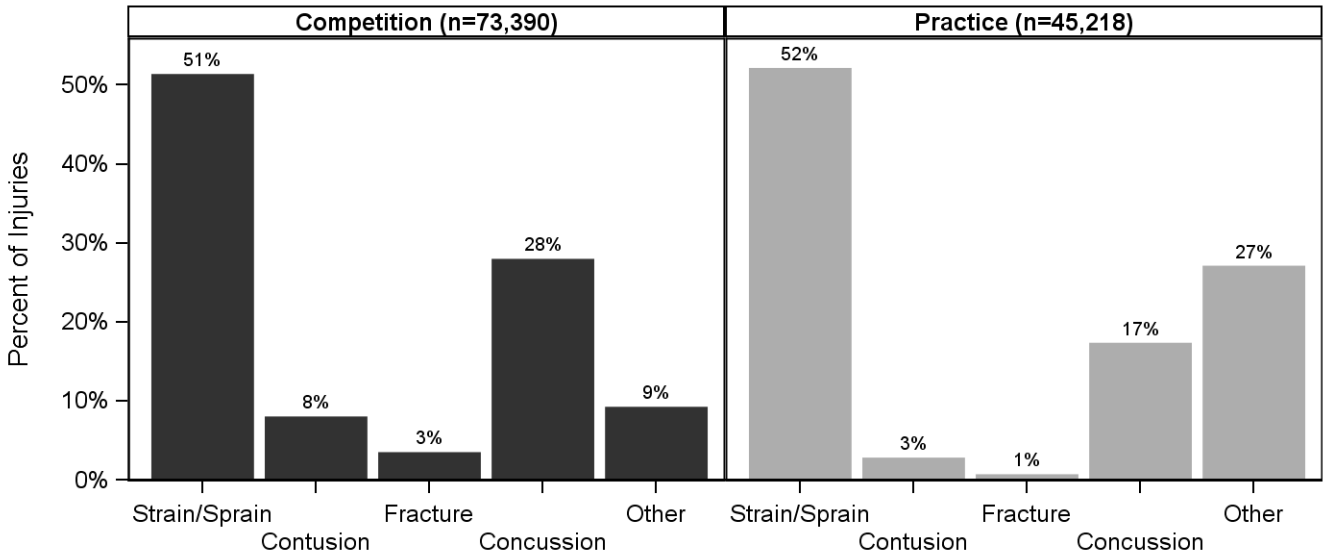


Table 5.3 Body Site of Girls' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *

	Competition		Practice		Overall	
Body Site	**n**	**%**	**n**	**%**	**n**	**%**
Head/Face	21,687	29.6%	7,835	17.4%	29,522	25.0%
Knee	18,850	25.7%	7,144	15.9%	25,994	22.0%
Ankle	14,167	19.3%	9,409	20.9%	23,576	19.9%
Hip/Thigh/Upper Leg	5,868	8.0%	10,403	23.2%	16,271	13.8%
Foot	4,314	5.9%	2,489	5.5%	6,803	5.8%
Lower Leg	384	0.5%	4,650	10.4%	5,033	4.3%
Trunk	1,948	2.7%	2,987	6.7%	4,935	4.2%
Hand/Wrist	2,489	3.4%	0	0.0%	2,489	2.1%
Neck	2,069	2.8%	0	0.0%	2,069	1.7%
Shoulder	969	1.3%	0	0.0%	969	0.8%
Other	645	0.9%	0	0.0%	645	0.5%
Total	***73,390***	***100.0%***	***44,915***	***100.0%***	***118,305***	***100.0%***

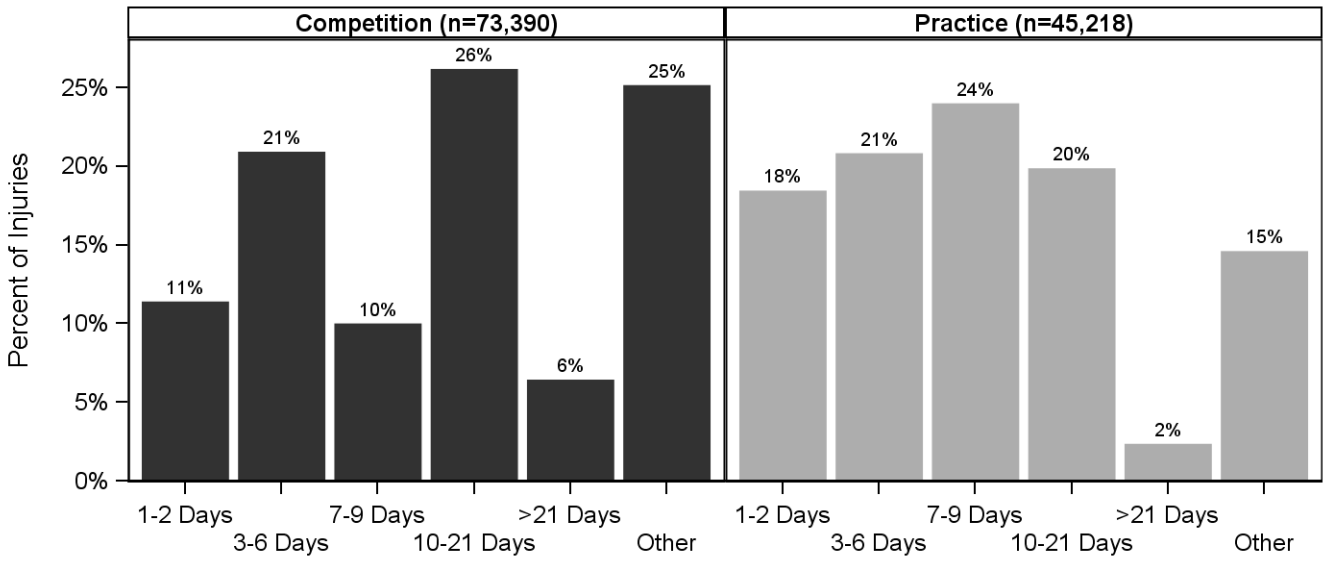
* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Table 5.4 Ten Most Common Girls' Soccer Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *

	Competition (n=73,389)		Practice (n=44,916)		Overall (n=118,307)	
Diagnosis	**n**	**%**	**n**	**%**	**n**	**%**
Head/Face Concussion	20,514	28.0%	7,835	17.4%	28,349	24.0%
Ankle Strain/Sprain	13,519	18.4%	8,031	17.9%	21,550	18.2%
Knee Strain/Sprain	13,280	18.1%	3,297	7.3%	16,577	14.0%
Hip/Thigh/Upper Leg Strain/Sprain	3,802	5.2%	9,554	21.3%	13,356	11.3%
Knee Other	4,013	5.5%	3,540	7.9%	7,554	6.4%
Foot Strain/Sprain	2,495	3.4%	585	1.3%	3,080	2.6%
Lower Leg Other	0	0.0%	2,443	5.4%	2,443	2.1%
Hip/Thigh/Upper Leg Other	1,537	2.1%	849	1.9%	2,386	2.0%
Trunk Other	0	0.0%	2,096	4.7%	2,096	1.8%
Neck Strain/Sprain	2,069	2.8%	0	0.0%	2,069	1.7%

* 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 5.2 Time Loss of Girls' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2019-20 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, 2019-20 School Year *

	Competition		Practice		Overall	
Need for Surgery	**n**	**%**	**n**	**%**	**n**	**%**
Required Surgery	4,569	6.3%	1,508	3.3%	6,077	5.2%
Did Not Require Surgery	67,826	93.7%	43,711	96.7%	111,537	94.8%
Total	***72,395***	***100.0%***	***45,218***	***100.0%***	***117,613***	***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 5.3 History of Girls' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year

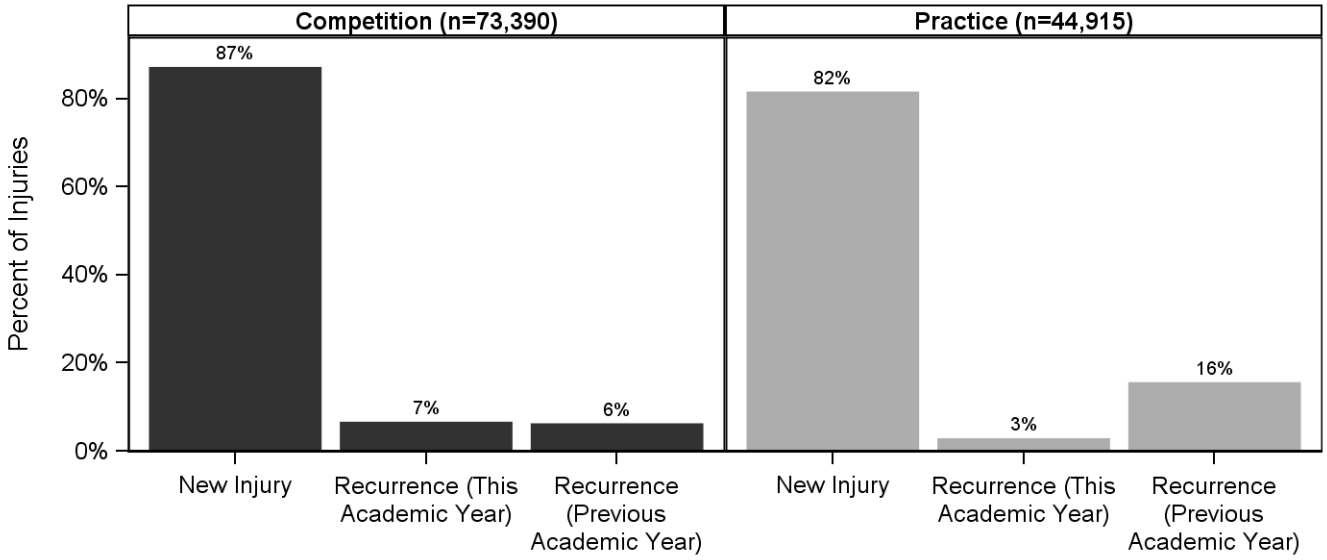


Table 5.6 Time during Season of Girls' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *

Time in Season	n	%
Preseason	28,382	23.9%
Regular Season	80,730	68.1%
Post Season	7,400	6.2%
Unknown/Other	2,096	1.8%
Total	***118,608***	***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.

Table 5.7 Competition-Related Variables for Girls' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *

Time in Competition	n	%
Pre-competition/Warm-Ups	1,173	1.6%
First Half	26,361	36.6%
Second Half	35,338	49.1%
Overtime	688	1.0%
Unknown	8,477	11.8%
Total	***72,037***	***100.0%***

Field Location		
Goal Box (Defense)	9,706	13.7%
Goal Box (Offense)	7,245	10.2%
Side of Goal Box (Defense)	3,396	4.8%
Side of Goal Box (Offense)	1,948	2.8%
Top of Goal Box Extended to Center Line (Offense)	13,135	18.6%
Top of Goal Box Extended to Center Line (Defense)	11,300	16.0%
Off the Field	2,987	4.2%
Unknown	21,047	29.7%
Total	***70,764***	***100.0%***

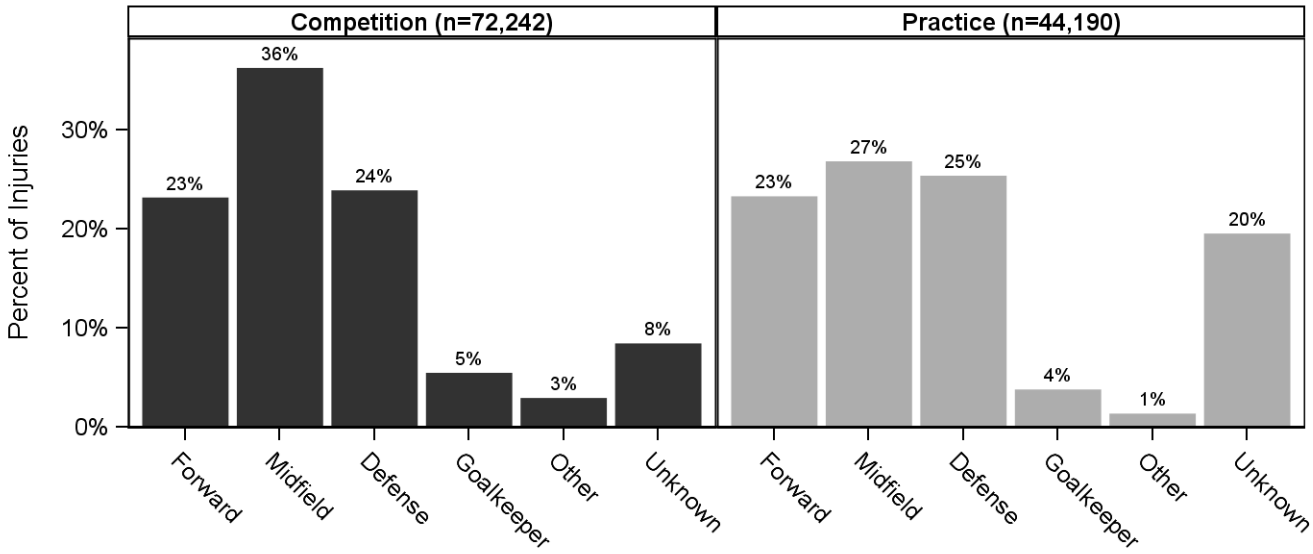
* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Table 5.8 Practice-Related Variables for Girls' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *

Time in Practice	n	%
First 1/2 Hour	2,938	6.8%
Second 1/2 Hour	7,869	18.3%
1-2 Hours into Practice	21,771	50.7%
>2 Hours into Practice	2,680	6.2%
Unknown	7,684	17.9%
Total	***42,943***	***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, 2019-20 School Year



REPORTING INFORMATION ONLINE

Table 5.9 Activities Leading to Girls' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *

	Competition		Practice		Overall	
Activity	**n**	**%**	**n**	**%**	**n**	**%**
General Play	10,883	15.1%	19,578	44.9%	30,461	26.4%
Defending	16,610	23.1%	3,056	7.0%	19,666	17.0%
Unknown	6,987	9.7%	5,423	12.4%	12,410	10.7%
Heading Ball	6,760	9.4%	2,360	5.4%	9,120	7.9%
Ball Handling/Dribbling	5,372	7.5%	2,666	6.1%	8,039	7.0%
Passing	7,203	10.0%	324	0.7%	7,527	6.5%
Chasing Loose Ball	4,294	6.0%	1,814	4.2%	6,108	5.3%
Receiving Pass	4,558	6.3%	1,259	2.9%	5,817	5.0%
Conditioning	0	0.0%	4,673	10.7%	4,673	4.0%
Goaltending	3,991	5.6%	669	1.5%	4,660	4.0%
Other	2,666	3.7%	585	1.3%	3,251	2.8%
Shooting	2,393	3.3%	307	0.7%	2,700	2.3%
Blocking Shot	120	0.2%	891	2.0%	1,011	0.9%
Total	***71,836***	***100.0%***	***43,605***	***100.0%***	***115,441***	***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.

REPORTING INFORMATION ONLINE

Table 5.10 Activity Resulting in Girls' Soccer Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
Activity	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Ball Handling/Dribbling	4,815	8.1%	690	9.7%	0	0.0%	1,420	5.2%	1,113	5.9%
Blocking Shot	951	1.6%	60	0.8%	0	0.0%	0	0.0%	0	0.0%
Chasing Loose Ball	2,580	4.3%	0	0.0%	264	9.2%	1,698	6.2%	1,566	8.4%
Conditioning	2,975	5.0%	0	0.0%	0	0.0%	0	0.0%	1,698	9.1%
Defending	10,568	17.8%	2,975	41.7%	307	10.7%	4,558	16.6%	1,259	6.7%
General Play	14,580	24.6%	1,113	15.6%	1,393	48.7%	5,414	19.8%	7,961	42.5%
Goaltending	2,376	4.0%	648	9.1%	0	0.0%	948	3.5%	688	3.7%
Heading Ball	264	0.4%	303	4.3%	0	0.0%	8,552	31.2%	0	0.0%
Other	0	0.0%	264	3.7%	0	0.0%	2,987	10.9%	0	0.0%
Passing	7,467	12.6%	0	0.0%	0	0.0%	60	0.2%	0	0.0%
Receiving Pass	4,661	7.9%	0	0.0%	264	9.2%	891	3.3%	0	0.0%
Shooting	2,640	4.4%	0	0.0%	0	0.0%	60	0.2%	0	0.0%
Unknown	5,450	9.2%	1,072	15.0%	631	22.1%	793	2.9%	4,465	23.8%
Total	***59,327***	***100.0%***	***7,126***	***100.0%***	***2,858***	***100.0%***	***27,380***	***100.0%***	***18,750***	***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.

VI. Girls' Volleyball Injury Epidemiology

Table 6.1 Girls' Volleyball Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *†

	# Injuries	# Exposures	Injury Rate (per 1,000 AEs)	Nationally Estimated # Injuries
Total	***198***	***159,017***	***1.25***	***54,665***
Competition	97	52,777	1.84	25,810
Practice	101	106,240	0.95	28,855

* All remaining analyses in this chapter present data weighted to provide national injury estimates.
†**The suspension of sports due to 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, 2019-20 School Year *

Year in School	n	%
Freshman	11,341	20.9%
Sophomore	12,376	22.8%
Junior	15,217	28.0%
Senior	15,446	28.4%
Total	***54,380***	***100.0%***

Age (years)	
Minimum	13
Maximum	18
Mean (SD)	15.6 (1.2)
n	39,069

BMI	
Minimum	16.0
Maximum	34.3
Mean (SD)	22.5 (3.5)
n	26,338

* 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, 2019-20 School Year

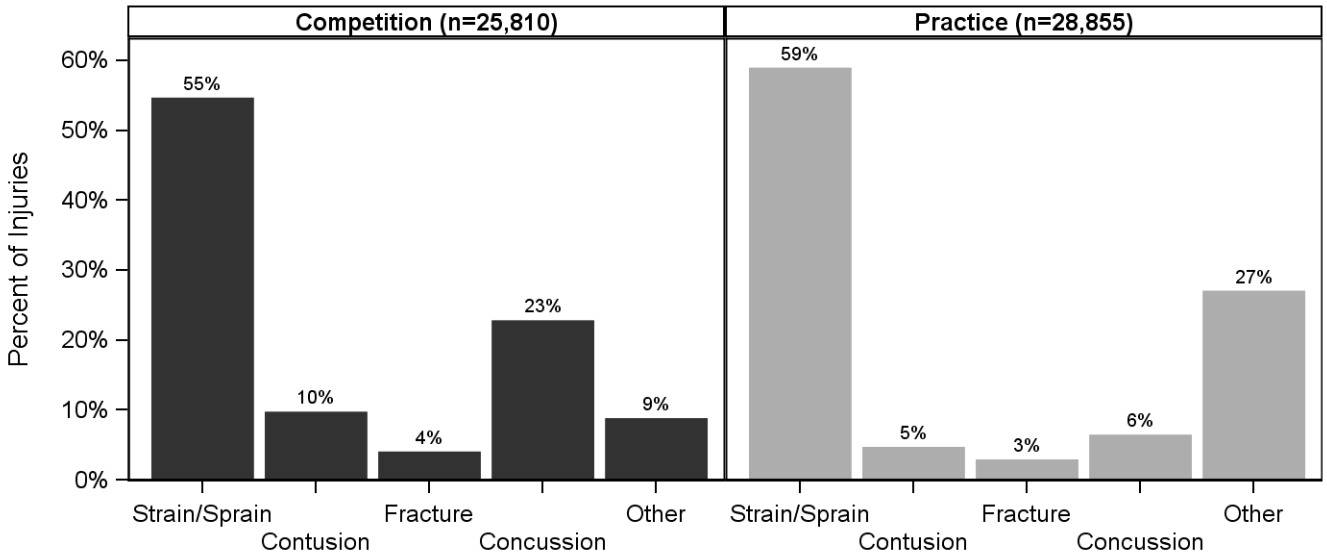


Table 6.3 Body Site of Girls' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *

	Competition		Practice		Overall	
Body Site	**n**	**%**	**n**	**%**	**n**	**%**
Ankle	9,226	35.7%	10,010	34.7%	19,236	35.2%
Head/Face	6,963	27.0%	2,655	9.2%	9,618	17.6%
Knee	2,834	11.0%	4,333	15.0%	7,167	13.1%
Hand/Wrist	3,133	12.1%	2,097	7.3%	5,230	9.6%
Trunk	1,581	6.1%	2,571	8.9%	4,152	7.6%
Shoulder	1,435	5.6%	2,004	6.9%	3,439	6.3%
Foot	319	1.2%	1,542	5.3%	1,861	3.4%
Hip/Thigh/Upper Leg	0	0.0%	1,729	6.0%	1,729	3.2%
Lower Leg	319	1.2%	619	2.1%	938	1.7%
Other	0	0.0%	570	2.0%	570	1.0%
Arm/Elbow	0	0.0%	510	1.8%	510	0.9%
Neck	0	0.0%	217	0.8%	217	0.4%
Total	***25,810***	***100.0%***	***28,855***	***100.0%***	***54,666***	***100.0%***

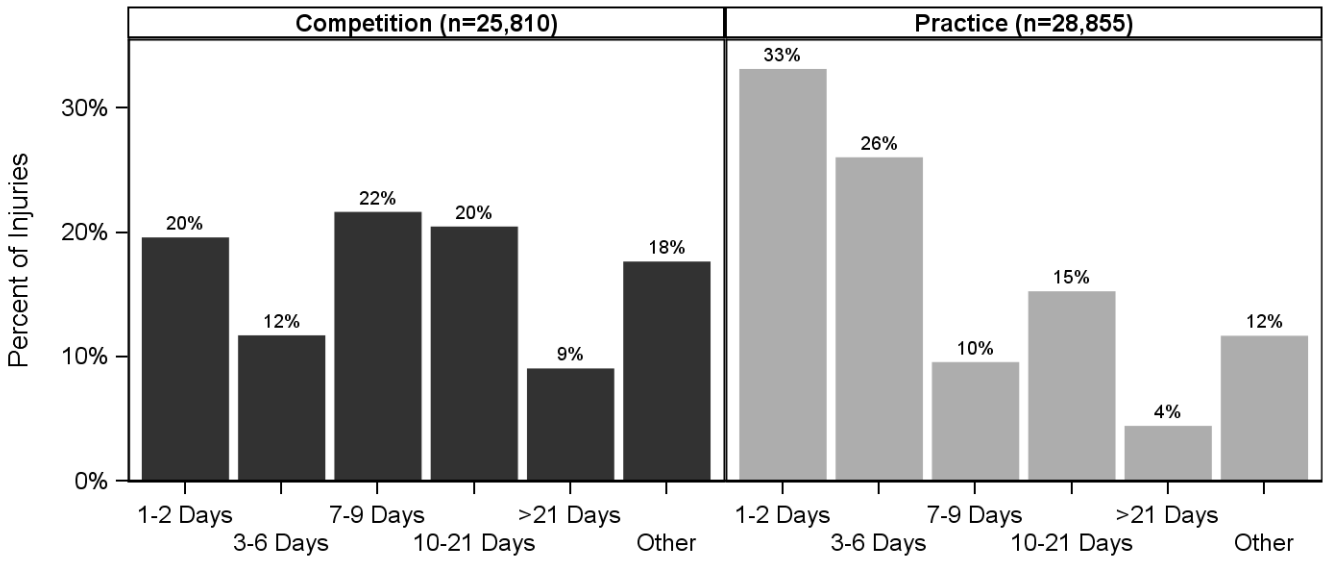
* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Table 6.4 Ten Most Common Girls' Volleyball Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *

	Competition (n=25,811)		Practice (n=28,856)		Overall (n=54,667)	
Diagnosis	**n**	**%**	**n**	**%**	**n**	**%**
Ankle Strain/Sprain	8,534	33.1%	8,921	30.9%	17,455	31.9%
Head/Face Concussion	5,884	22.8%	1,859	6.4%	7,743	14.2%
Knee Other	827	3.2%	3,258	11.3%	4,085	7.5%
Hand/Wrist Strain/Sprain	1,982	7.7%	1,589	5.5%	3,571	6.5%
Trunk Strain/Sprain	1,071	4.1%	1,650	5.7%	2,721	5.0%
Shoulder Strain/Sprain	752	2.9%	1,713	5.9%	2,465	4.5%
Knee Strain/Sprain	1,450	5.6%	897	3.1%	2,347	4.3%
Ankle Other	510	2.0%	1,089	3.8%	1,599	2.9%
Head/Face Contusion	1,079	4.2%	217	0.8%	1,296	2.4%
Trunk Other	0	0.0%	921	3.2%	921	1.7%

* 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 6.2 Time Loss of Girls' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2019-20 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, 2019-20 School Year *

	Competition		Practice		Overall	
Need for Surgery	**n**	**%**	**n**	**%**	**n**	**%**
Required Surgery	1,587	6.2%	601	2.1%	2,189	4.0%
Did Not Require Surgery	24,223	93.8%	28,145	97.9%	52,368	96.0%
Total	***25,810***	***100.0%***	***28,747***	***100.0%***	***54,557***	***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, 2019-20 School Year

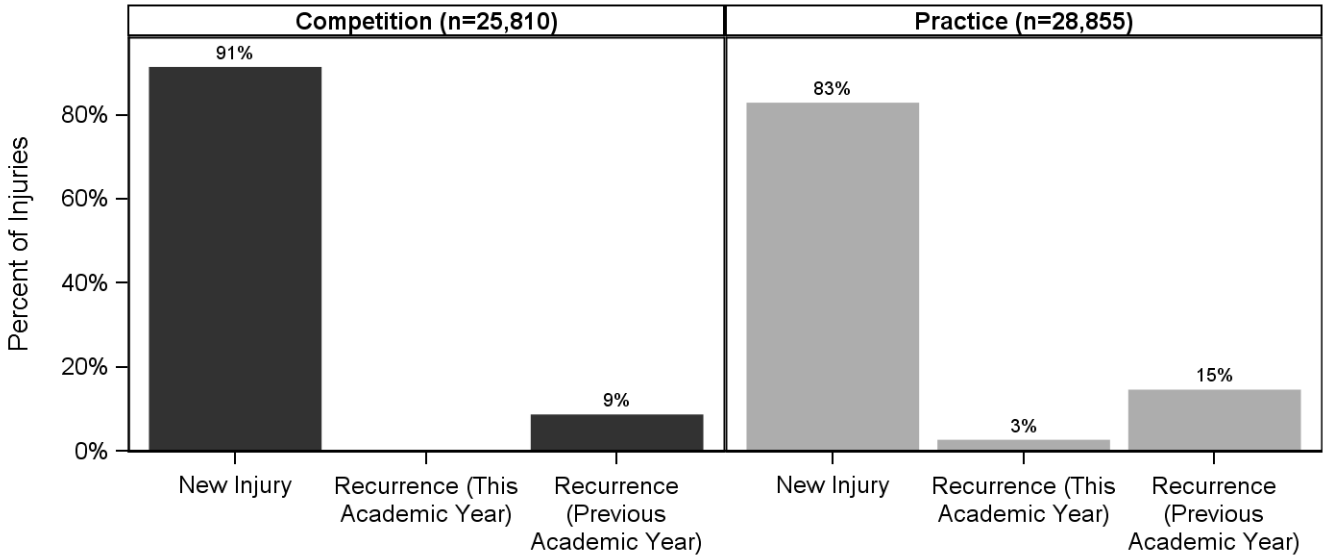


Table 6.6 Time during Season of Girls' Volleyball Injuries, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *

Time in Season	n	%
Preseason	9,029	16.5%
Regular Season	44,418	81.3%
Post Season	1,037	1.9%
Unknown/Other	182	0.3%
Total	***54,666***	***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 6.7 Competition-Related Variables for Girls' Volleyball Injuries, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *

Time in Competition	n	%
Pre-competition/Warm-Ups	4,022	15.8%
First Game	1,193	4.7%
Second Game	5,822	22.8%
Third Game	3,259	12.8%
Fourth Game	1,090	4.3%
Fifth Game	570	2.2%
Unknown	9,578	37.5%
Total	***25,534***	***100.0%***

Court Location		
Right Back (Server)	1,208	4.7%
Right Forward	2,587	10.1%
Outside Court (Your Side)	1,017	4.0%
Outside Court (Opponents Side)	109	0.4%
Middle Forward	1,399	5.5%
Left Forward	2,914	11.4%
Left Back	1,914	7.5%
Outside the Playable Area	109	0.4%
At the Net	2,510	9.8%
Unknown	11,768	46.1%
Total	***25,534***	***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, 2019-20 School Year *

Time in Practice	n	%
First 1/2 Hour	3,967	14.1%
Second 1/2 Hour	3,511	12.5%
1-2 Hours into Practice	11,732	41.8%
>2 Hours into Practice	1,154	4.1%
Unknown	7,734	27.5%
Total	***28,099***	***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, 2019-20 School Year

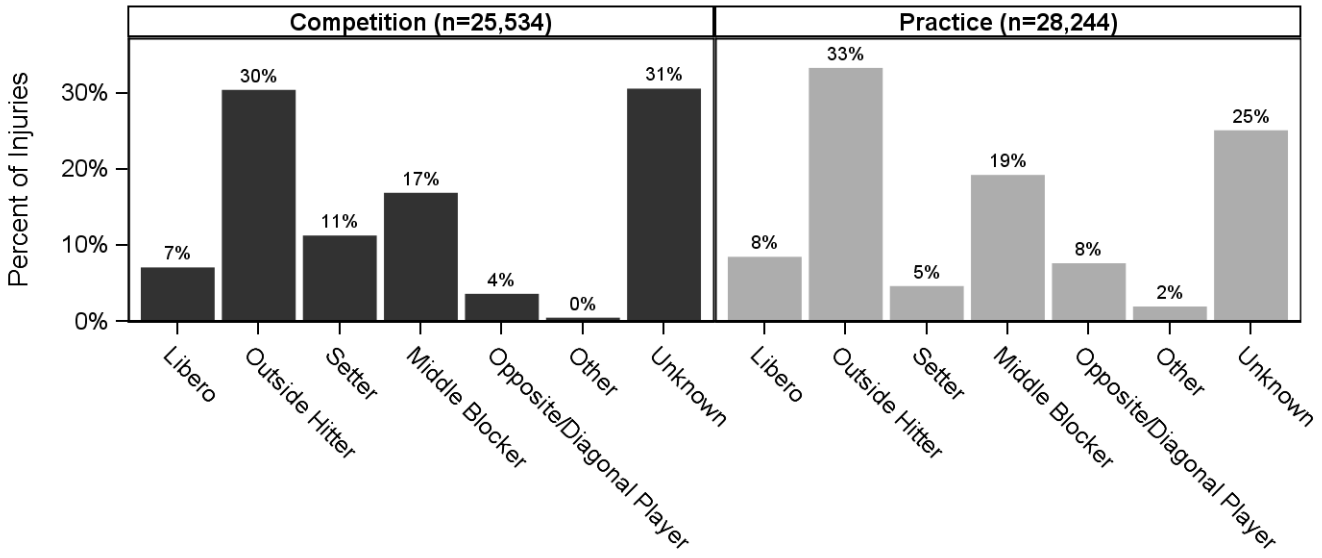


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Table 6.9 Activities Leading to Girls' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *

	Competition		Practice		Overall	
Activity	**n**	**%**	**n**	**%**	**n**	**%**
General Play	4,727	18.5%	5,457	19.3%	10,184	18.9%
Unknown	4,119	16.1%	5,170	18.3%	9,289	17.3%
Blocking	4,532	17.7%	4,600	16.3%	9,132	17.0%
Digging	5,576	21.8%	3,210	11.4%	8,786	16.3%
Spiking	4,568	17.8%	3,234	11.4%	7,802	14.5%
Conditioning	0	0.0%	3,312	11.7%	3,312	6.2%
Serving	678	2.6%	1,685	6.0%	2,363	4.4%
Passing	109	0.4%	1,067	3.8%	1,175	2.2%
Setting	616	2.4%	510	1.8%	1,126	2.1%
Other	678	2.6%	0	0.0%	678	1.3%
Total	***25,603***	***100.0%***	***28,244***	***100.0%***	***53,848***	***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 6.10 Activity Resulting in Girls' Volleyball Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
Activity	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Blocking	7,227	23.6%	0	0.0%	820	43.8%	251	3.4%	833	8.3%
Conditioning	2,357	7.7%	0	0.0%	217	11.6%	0	0.0%	739	7.3%
Digging	1,703	5.6%	1,307	33.9%	619	33.0%	4,041	54.7%	1,116	11.1%
General Play	5,533	18.1%	178	4.6%	0	0.0%	1,870	25.3%	2,603	25.8%
Other	0	0.0%	570	14.8%	0	0.0%	109	1.5%	0	0.0%
Passing	69	0.2%	0	0.0%	109	5.8%	109	1.5%	889	8.8%
Serving	2,073	6.8%	0	0.0%	0	0.0%	109	1.5%	182	1.8%
Setting	944	3.1%	0	0.0%	0	0.0%	182	2.5%	0	0.0%
Spiking	6,532	21.3%	182	4.7%	0	0.0%	0	0.0%	1,088	10.8%
Unknown	4,216	13.8%	1,624	42.1%	109	5.8%	718	9.7%	2,623	26.0%
Total	***30,653***	***100.0%***	***3,860***	***100.0%***	***1,873***	***100.0%***	***7,389***	***100.0%***	***10,073***	***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.

VII. Boys' Basketball Injury Epidemiology

Table 7.1 Boys' Basketball Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *†

	# Injuries	# Exposures	Injury Rate (per 1,000 AEs)	Nationally Estimated # Injuries
Total	***312***	***205,732***	***1.52***	***84,828***
Competition	169	61,727	2.74	47,736
Practice	143	144,005	0.99	37,092

* All remaining analyses in this chapter present data weighted to provide national injury estimates.
†**The suspension of sports due to 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, 2019-20 School Year *

Year in School	n	%
Freshman	19,096	22.9%
Sophomore	22,511	27.0%
Junior	19,017	22.8%
Senior	22,880	27.4%
Total	***83,503***	***100.0%***

Age (years)	
Minimum	13
Maximum	18
Mean (SD)	15.9 (1.3)
n	62,437

BMI	
Minimum	15.4
Maximum	35.8
Mean (SD)	23.0 (2.9)
n	42,500

* 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, 2019-20 School Year

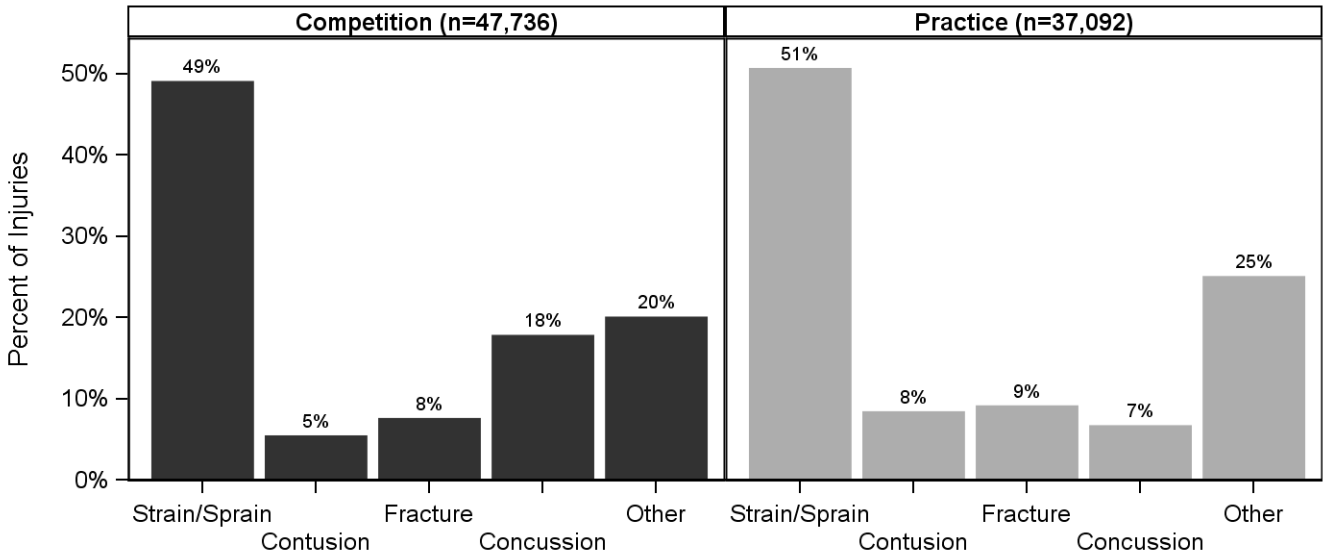


Table 7.3 Body Site of Boys' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *

	Competition		Practice		Overall	
Body Site	**n**	**%**	**n**	**%**	**n**	**%**
Ankle	18,638	39.0%	10,867	29.3%	29,505	34.8%
Head/Face	12,889	27.0%	6,181	16.7%	19,070	22.5%
Knee	3,447	7.2%	5,613	15.1%	9,060	10.7%
Hand/Wrist	4,962	10.4%	3,251	8.8%	8,213	9.7%
Hip/Thigh/Upper Leg	2,531	5.3%	2,449	6.6%	4,980	5.9%
Trunk	969	2.0%	3,313	8.9%	4,283	5.0%
Lower Leg	352	0.7%	2,647	7.1%	2,999	3.5%
Foot	1,022	2.1%	1,390	3.7%	2,412	2.8%
Arm/Elbow	1,200	2.5%	509	1.4%	1,709	2.0%
Shoulder	908	1.9%	617	1.7%	1,526	1.8%
Other	536	1.1%	254	0.7%	790	0.9%
Neck	281	0.6%	0	0.0%	281	0.3%
Total	***47,736***	***100.0%***	***37,092***	***100.0%***	***84,828***	***100.0%***

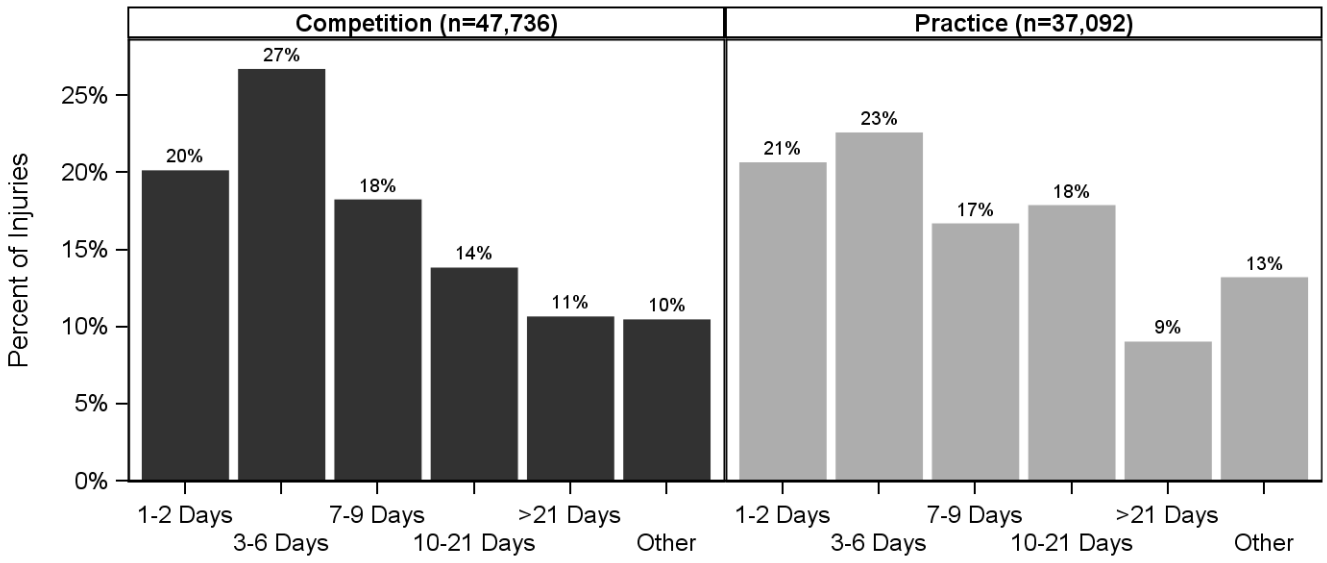
* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Table 7.4 Ten Most Common Boys' Basketball Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *

	Competition (n=47,731)		Practice (n=37,092)		Overall (n=84,825)	
Diagnosis	**n**	**%**	**n**	**%**	**n**	**%**
Ankle Strain/Sprain	17,750	37.2%	9,982	26.9%	27,731	32.7%
Head/Face Concussion	8,506	17.8%	2,486	6.7%	10,992	13.0%
Head/Face Other	3,981	8.3%	2,250	6.1%	6,231	7.3%
Knee Other	1,722	3.6%	3,714	10.0%	5,436	6.4%
Hand/Wrist Strain/Sprain	2,530	5.3%	1,750	4.7%	4,281	5.0%
Trunk Strain/Sprain	443	0.9%	2,636	7.1%	3,080	3.6%
Hand/Wrist Fracture	1,997	4.2%	1,054	2.8%	3,051	3.6%
Hip/Thigh/Upper Leg Contusion	1,126	2.4%	1,244	3.4%	2,370	2.8%
Hip/Thigh/Upper Leg Strain/Sprain	1,405	2.9%	771	2.1%	2,176	2.6%
Knee Contusion	1,052	2.2%	935	2.5%	1,987	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.

Figure 7.2 Time Loss of Boys' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2019-20 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, 2019-20 School Year *

	Competition		Practice		Overall	
Need for Surgery	**n**	**%**	**n**	**%**	**n**	**%**
Required Surgery	2,826	6.0%	2,616	7.1%	5,442	6.4%
Did Not Require Surgery	44,475	94.0%	34,476	92.9%	78,951	93.6%
Total	***47,301***	***100.0%***	***37,092***	***100.0%***	***84,393***	***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, 2019-20 School Year

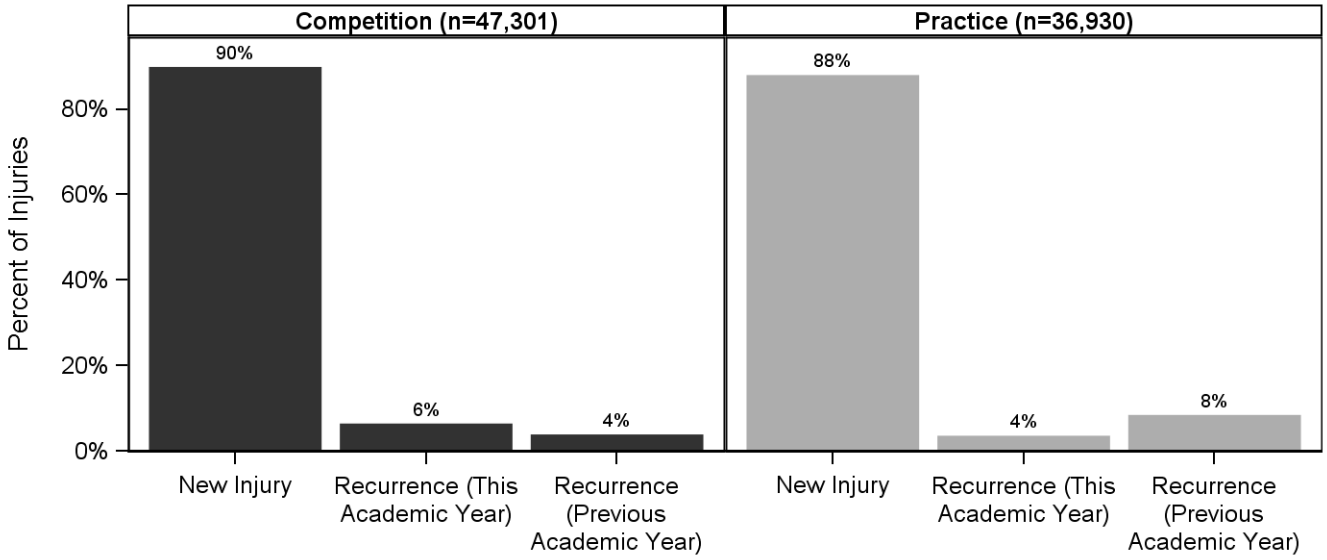


Table 7.6 Time during Season of Boys' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *

Time in Season	n	%
Preseason	17,609	20.8%
Regular Season	65,383	77.1%
Post Season	1,835	2.2%
Total	***84,828***	***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, 2019-20 School Year *

Time in Competition	n	%
Pre-competition/Warm-Ups	1,161	2.6%
First Quarter	3,058	6.7%
Second Quarter	13,011	28.7%
Third Quarter	11,042	24.3%
Fourth Quarter	10,088	22.2%
Overtime	336	0.7%
Unknown	6,689	14.7%
Total	***45,385***	***100.0%***

Court Location		
Inside Lane (Offense)	12,059	26.6%
Inside Lane (Defense)	7,555	16.6%
Between 3 Point Arc and Lane (Offense)	5,427	12.0%
Between 3 Point Arc and Lane (Defense)	1,599	3.5%
Outside 3 Point Arc (Offense)	2,208	4.9%
Outside 3 Point Arc (Defense)	1,998	4.4%
Out of Bounds	92	0.2%
Off the Court	888	2.0%
Backcourt	1,052	2.3%
Unknown	12,507	27.6%
Total	***45,385***	***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, 2019-20 School Year *

Time in Practice	n	%
First 1/2 Hour	3,543	9.7%
Second 1/2 Hour	9,418	25.8%
1-2 Hours into Practice	17,591	48.2%
>2 Hours into Practice	677	1.9%
Unknown	5,303	14.5%
Total	***36,532***	***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, 2019-20 School Year

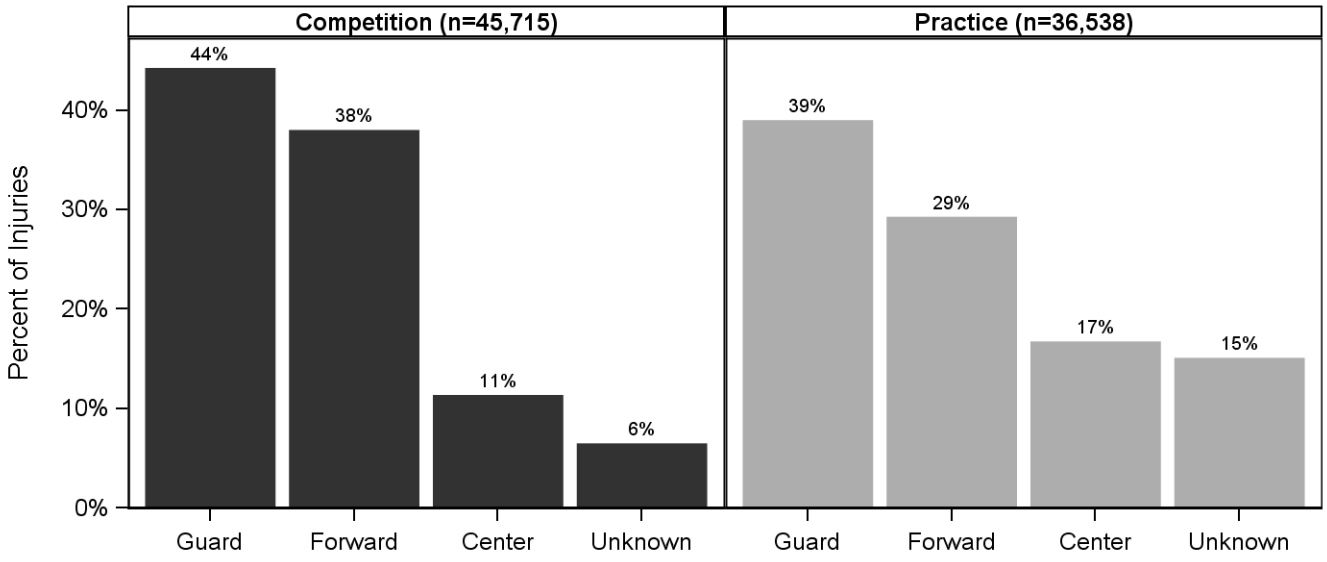


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Table 7.9 Activities Leading to Boys' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *

	Competition		Practice		Overall	
Activity	**n**	**%**	**n**	**%**	**n**	**%**
General Play	7,849	17.2%	10,946	30.0%	18,794	22.9%
Rebounding	10,743	23.6%	7,945	21.7%	18,688	22.8%
Unknown	7,003	15.4%	5,026	13.8%	12,029	14.6%
Defending	5,963	13.1%	4,352	11.9%	10,315	12.6%
Chasing Loose Ball	6,250	13.7%	2,649	7.3%	8,899	10.8%
Shooting	3,825	8.4%	1,835	5.0%	5,660	6.9%
Receiving Pass	1,374	3.0%	1,821	5.0%	3,194	3.9%
Ball Handling/Dribbling	1,984	4.4%	1,144	3.1%	3,128	3.8%
Conditioning	166	0.4%	750	2.1%	916	1.1%
Other	373	0.8%	70	0.2%	443	0.5%
Screening	70	0.2%	0	0.0%	70	0.1%
Total	***45,599***	***100.0%***	***36,538***	***100.0%***	***82,137***	***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, 2019-20 School Year *

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
Activity	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Ball Handling/Dribbling	2,426	5.9%	275	4.8%	0	0.0%	0	0.0%	428	2.4%
Chasing Loose Ball	2,651	6.4%	1,456	25.4%	1,362	19.4%	1,125	11.2%	2,305	12.7%
Conditioning	443	1.1%	70	1.2%	0	0.0%	0	0.0%	402	2.2%
Defending	5,551	13.5%	860	15.0%	413	5.9%	2,243	22.2%	1,248	6.9%
General Play	9,493	23.0%	1,560	27.2%	849	12.1%	1,286	12.7%	5,607	31.0%
Other	373	0.9%	0	0.0%	70	1.0%	0	0.0%	0	0.0%
Rebounding	11,658	28.3%	0	0.0%	909	13.0%	2,112	20.9%	4,009	22.1%
Receiving Pass	1,536	3.7%	0	0.0%	600	8.6%	777	7.7%	281	1.6%
Screening	0	0.0%	0	0.0%	0	0.0%	70	0.7%	0	0.0%
Shooting	2,772	6.7%	709	12.4%	873	12.4%	536	5.3%	771	4.3%
Unknown	4,300	10.4%	794	13.9%	1,937	27.6%	1,937	19.2%	3,061	16.9%
Total	***41,201***	***100.0%***	***5,724***	***100.0%***	***7,014***	***100.0%***	***10,087***	***100.0%***	***18,112***	***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, 2019-20 School Year *†

	# Injuries	# Exposures	Injury Rate (per 1,000 AEs)	Nationally Estimated # Injuries
Total	***291***	***141,299***	***2.06***	***76,317***
Competition	171	42,604	4.01	43,148
Practice	120	98,695	1.22	33,169

* All remaining analyses in this chapter present data weighted to provide national injury estimates.
†**The suspension of sports due to 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, 2019-20 School Year *

Year in School	n	%
Freshman	22,915	30.5%
Sophomore	22,966	30.6%
Junior	13,297	17.7%
Senior	15,943	21.2%
Total	***75,121***	***100.0%***

Age (years)	
Minimum	13
Maximum	18
Mean (SD)	15.6 (1.2)
n	52,159

BMI	
Minimum	16.1
Maximum	39.0
Mean (SD)	22.3 (3.6)
n	32,778

* 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, 2019-20 School Year

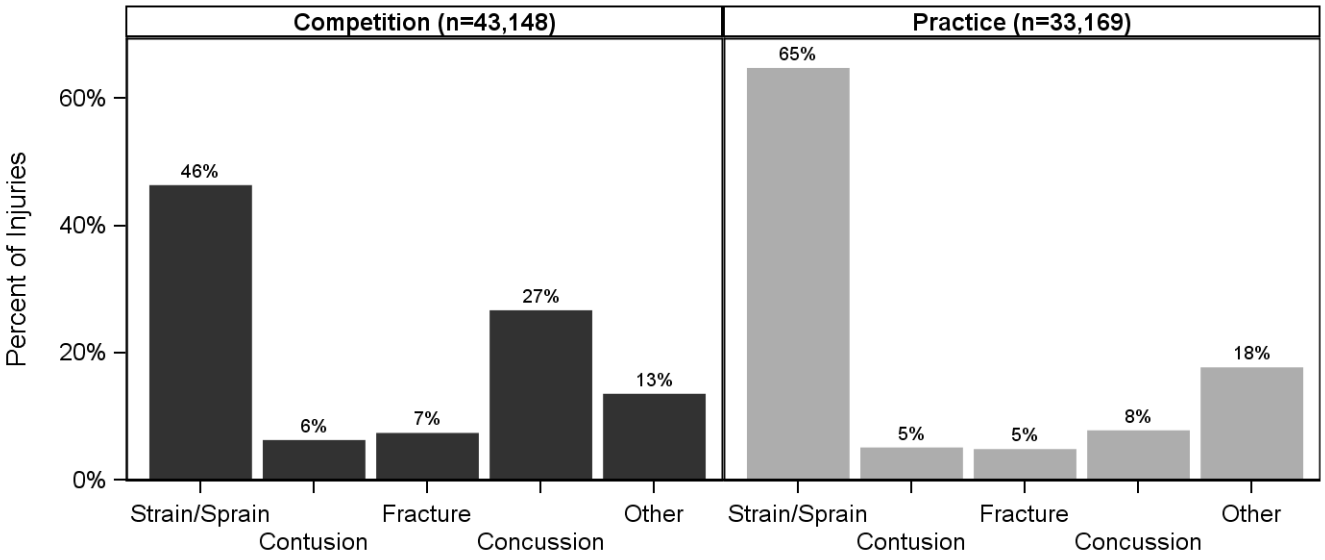


Table 8.3 Body Site of Girls' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *

	Competition		Practice		Overall	
Body Site	**n**	**%**	**n**	**%**	**n**	**%**
Ankle	12,061	28.0%	15,247	46.0%	27,308	35.8%
Head/Face	12,521	29.0%	2,570	7.7%	15,092	19.8%
Knee	7,792	18.1%	3,800	11.5%	11,592	15.2%
Hand/Wrist	3,741	8.7%	2,564	7.7%	6,305	8.3%
Hip/Thigh/Upper Leg	862	2.0%	4,064	12.3%	4,926	6.5%
Shoulder	2,296	5.3%	1,385	4.2%	3,681	4.8%
Foot	939	2.2%	1,352	4.1%	2,291	3.0%
Lower Leg	1,067	2.5%	973	2.9%	2,040	2.7%
Trunk	1,099	2.5%	568	1.7%	1,667	2.2%
Other	0	0.0%	645	1.9%	645	0.8%
Neck	513	1.2%	0	0.0%	513	0.7%
Arm/Elbow	255	0.6%	0	0.0%	255	0.3%
Total	***43,148***	***100.0%***	***33,169***	***100.0%***	***76,317***	***100.0%***

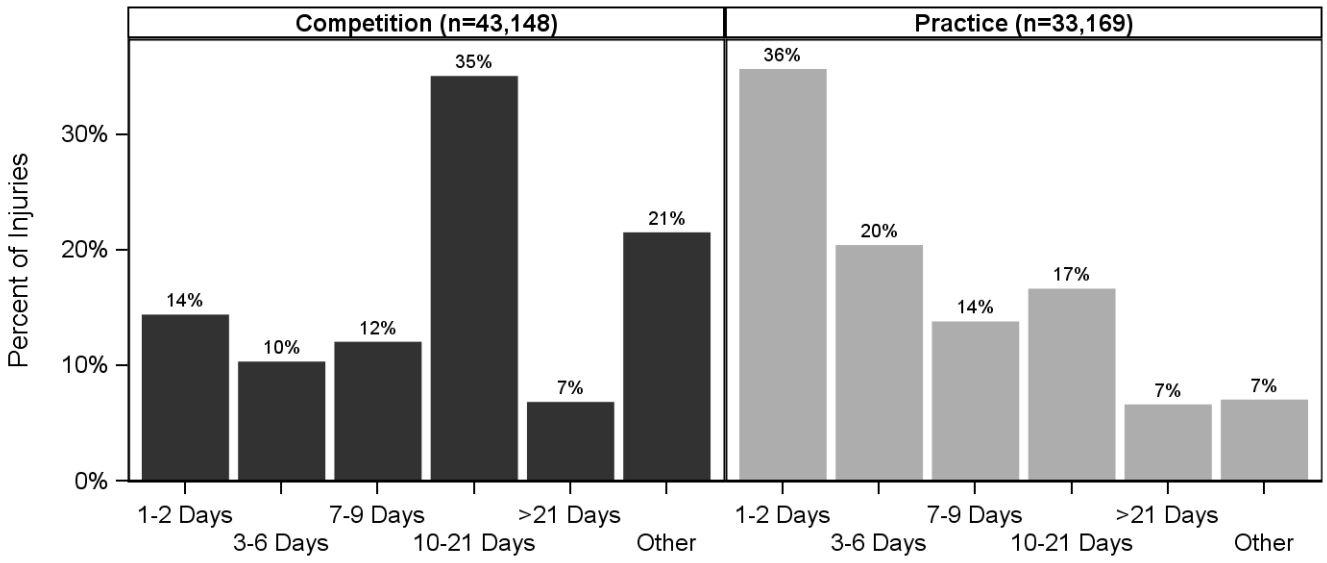
* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Table 8.4 Ten Most Common Girls' Basketball Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *

	Competition (n=43,147)		Practice (n=33,169)		Overall (n=76,317)	
Diagnosis	**n**	**%**	**n**	**%**	**n**	**%**
Ankle Strain/Sprain	11,155	25.9%	13,536	40.8%	24,691	32.4%
Head/Face Concussion	11,491	26.6%	2,570	7.7%	14,061	18.4%
Knee Strain/Sprain	4,994	11.6%	1,404	4.2%	6,398	8.4%
Hip/Thigh/Upper Leg Strain/Sprain	417	1.0%	3,297	9.9%	3,714	4.9%
Shoulder Other	2,296	5.3%	831	2.5%	3,127	4.1%
Hand/Wrist Strain/Sprain	1,160	2.7%	1,911	5.8%	3,071	4.0%
Knee Other	1,398	3.2%	1,659	5.0%	3,058	4.0%
Hand/Wrist Fracture	1,646	3.8%	653	2.0%	2,299	3.0%
Knee Contusion	1,399	3.2%	737	2.2%	2,136	2.8%
Ankle Fracture	906	2.1%	939	2.8%	1,846	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.

Figure 8.2 Time Loss of Girls' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2019-20 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, 2019-20 School Year *

	Competition		Practice		Overall	
Need for Surgery	**n**	**%**	**n**	**%**	**n**	**%**
Required Surgery	3,820	8.9%	823	2.5%	4,644	6.1%
Did Not Require Surgery	39,327	91.1%	31,960	97.5%	71,288	93.9%
Total	***43,148***	***100.0%***	***32,784***	***100.0%***	***75,931***	***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, 2019-20 School Year

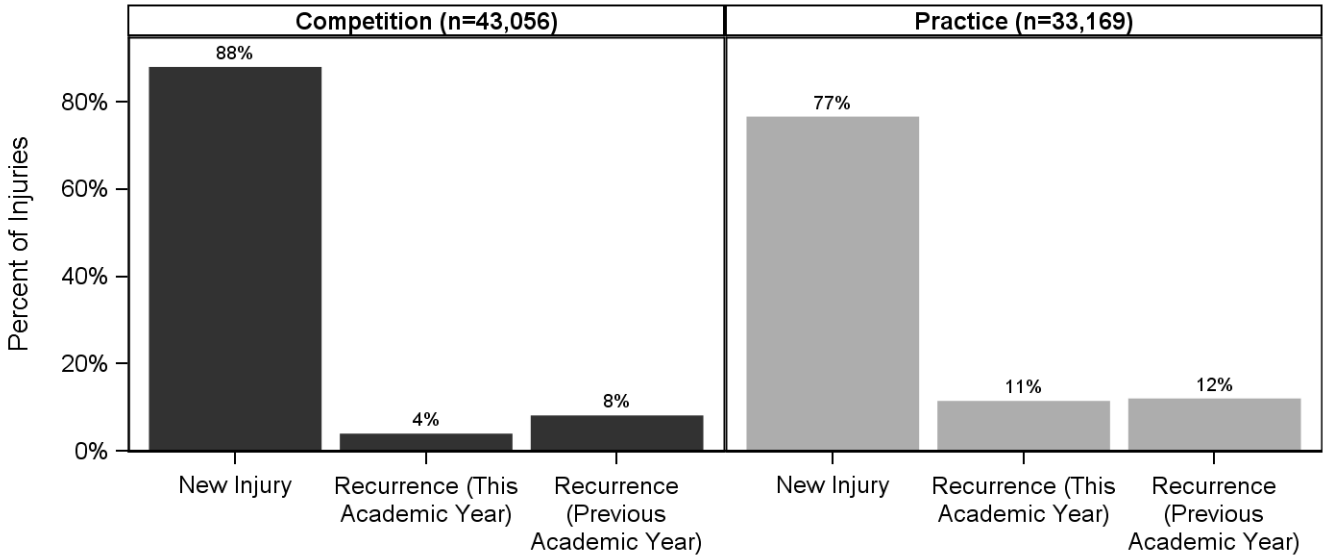


Table 8.6 Time during Season of Girls' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *

Time in Season	n	%
Preseason	15,676	20.5%
Regular Season	58,734	77.0%
Post Season	1,907	2.5%
Total	***76,317***	***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, 2019-20 School Year *

Time in Competition	n	%
Pre-competition/Warm-Ups	1,767	4.2%
First Quarter	2,428	5.7%
Second Quarter	10,442	24.7%
Third Quarter	10,486	24.8%
Fourth Quarter	6,788	16.0%
Unknown	10,405	24.6%
Total	***42,317***	***100.0%***

Court Location		
Inside Lane (Offense)	6,366	15.1%
Inside Lane (Defense)	8,016	19.0%
Between 3 Point Arc and Lane (Offense)	1,502	3.6%
Between 3 Point Arc and Lane (Defense)	4,013	9.5%
Outside 3 Point Arc (Offense)	1,633	3.9%
Outside 3 Point Arc (Defense)	4,664	11.1%
Out of Bounds	935	2.2%
Backcourt	521	1.2%
Unknown	14,548	34.5%
Total	***42,197***	***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, 2019-20 School Year *

Time in Practice	n	%
First 1/2 Hour	3,887	11.8%
Second 1/2 Hour	3,656	11.1%
1-2 Hours into Practice	14,528	44.3%
>2 Hours into Practice	224	0.7%
Unknown	10,525	32.1%
Total	***32,820***	***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, 2019-20 School Year

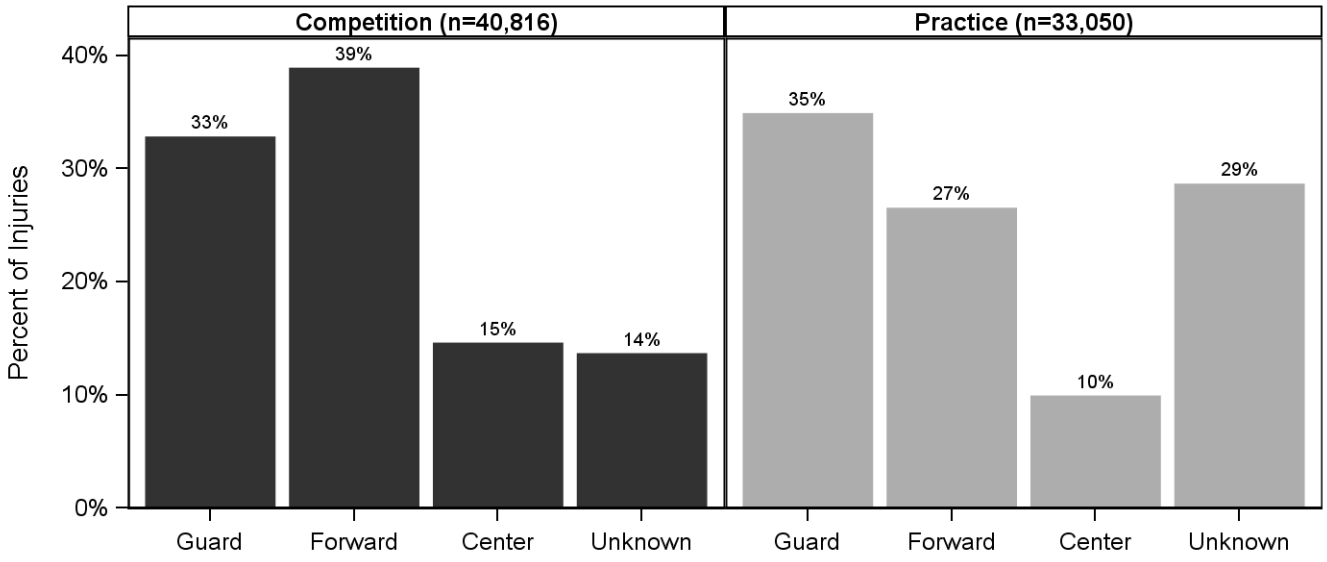


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Table 8.9 Activities Leading to Girls' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *

	Competition		Practice		Overall	
Activity	**n**	**%**	**n**	**%**	**n**	**%**
Unknown	5,349	12.5%	9,270	28.0%	14,618	19.3%
Defending	9,645	22.6%	4,167	12.6%	13,812	18.2%
Rebounding	6,836	16.0%	4,887	14.8%	11,723	15.5%
General Play	5,495	12.9%	5,531	16.7%	11,026	14.5%
Chasing Loose Ball	6,842	16.0%	1,516	4.6%	8,358	11.0%
Conditioning	0	0.0%	4,068	12.3%	4,068	5.4%
Receiving Pass	2,515	5.9%	1,022	3.1%	3,536	4.7%
Shooting	2,636	6.2%	891	2.7%	3,526	4.7%
Other	1,947	4.6%	0	0.0%	1,947	2.6%
Ball Handling/Dribbling	651	1.5%	1,209	3.7%	1,860	2.5%
Passing	521	1.2%	489	1.5%	1,010	1.3%
Screening	326	0.8%	0	0.0%	326	0.4%
Total	***42,762***	***100.0%***	***33,050***	***100.0%***	***75,812***	***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 8.10 Activity Resulting in Girls' Basketball Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
Activity	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Ball Handling/Dribbling	1,383	3.4%	0	0.0%	0	0.0%	326	2.3%	151	1.3%
Chasing Loose Ball	2,758	6.7%	823	18.9%	326	6.8%	4,105	29.2%	346	3.0%
Conditioning	3,036	7.4%	0	0.0%	0	0.0%	0	0.0%	1,033	8.8%
Defending	4,837	11.8%	1,279	29.3%	1,877	39.5%	3,268	23.2%	2,551	21.8%
General Play	7,291	17.8%	60	1.4%	614	12.9%	549	3.9%	2,513	21.5%
Other	844	2.1%	0	0.0%	554	11.6%	386	2.7%	164	1.4%
Passing	846	2.1%	0	0.0%	164	3.4%	0	0.0%	0	0.0%
Rebounding	9,095	22.2%	151	3.5%	326	6.8%	871	6.2%	1,281	11.0%
Receiving Pass	1,244	3.0%	0	0.0%	615	12.9%	417	3.0%	1,260	10.8%
Screening	0	0.0%	0	0.0%	0	0.0%	326	2.3%	0	0.0%
Shooting	3,081	7.5%	386	8.8%	60	1.3%	0	0.0%	0	0.0%
Unknown	6,537	16.0%	1,662	38.1%	224	4.7%	3,815	27.1%	2,380	20.4%
Total	***40,951***	***100.0%***	***4,361***	***100.0%***	***4,759***	***100.0%***	***14,061***	***100.0%***	***11,680***	***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.

IX. Boys' Wrestling Injury Epidemiology

Table 9.1 Boys' Wrestling Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *†

	# Injuries	# Exposures	Injury Rate (per 1,000 AEs)	Nationally Estimated # Injuries
Total	***332***	***139,297***	***2.38***	***94,606***
Competition	144	35,321	4.08	41,914
Practice	188	103,976	1.81	52,692

* All remaining analyses in this chapter present data weighted to provide national injury estimates.
†**The suspension of sports due to 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, 2019-20 School Year *

Year in School	n	%
Freshman	24,605	26.4%
Sophomore	24,307	26.0%
Junior	24,388	26.1%
Senior	20,030	21.5%
Total	***93,331***	***100.0%***

Age (years)	
Minimum	12
Maximum	18
Mean (SD)	15.8 (1.3)
n	66,166

BMI	
Minimum	17.5
Maximum	40.9
Mean (SD)	24.2 (4.5)
n	52,141

* 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, 2019-20 School Year

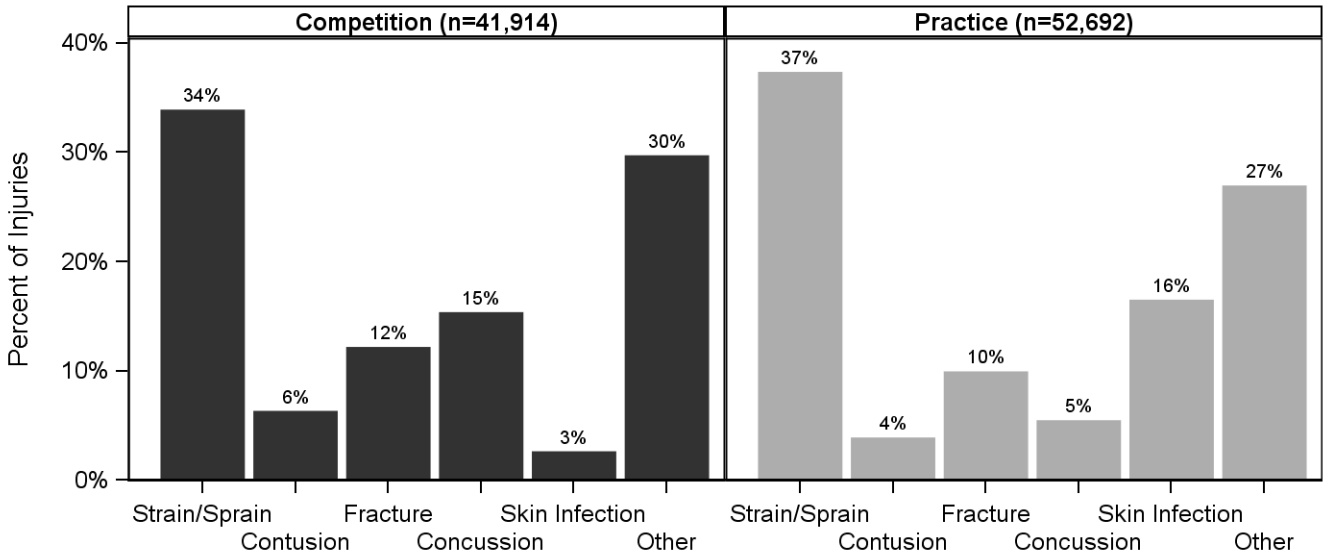


Table 9.3 Body Site of Boys' Wrestling Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *

	Competition		Practice		Overall	
Body Site	**n**	**%**	**n**	**%**	**n**	**%**
Head/Face	8,465	20.2%	8,480	16.1%	16,945	17.9%
Arm/Elbow	7,133	17.0%	6,832	13.0%	13,965	14.8%
Knee	5,874	14.0%	7,058	13.4%	12,933	13.7%
Shoulder	5,668	13.5%	6,740	12.8%	12,408	13.1%
Hand/Wrist	3,516	8.4%	4,019	7.6%	7,534	8.0%
Trunk	1,846	4.4%	5,342	10.1%	7,187	7.6%
Ankle	2,715	6.5%	4,448	8.4%	7,164	7.6%
Hip/Thigh/Upper Leg	1,480	3.5%	4,030	7.6%	5,509	5.8%
Other	1,971	4.7%	2,136	4.1%	4,108	4.3%
Lower Leg	804	1.9%	1,713	3.3%	2,517	2.7%
Neck	867	2.1%	1,499	2.8%	2,366	2.5%
Foot	1,575	3.8%	395	0.7%	1,970	2.1%
Total	***41,914***	***100.0%***	***52,692***	***100.0%***	***94,606***	***100.0%***

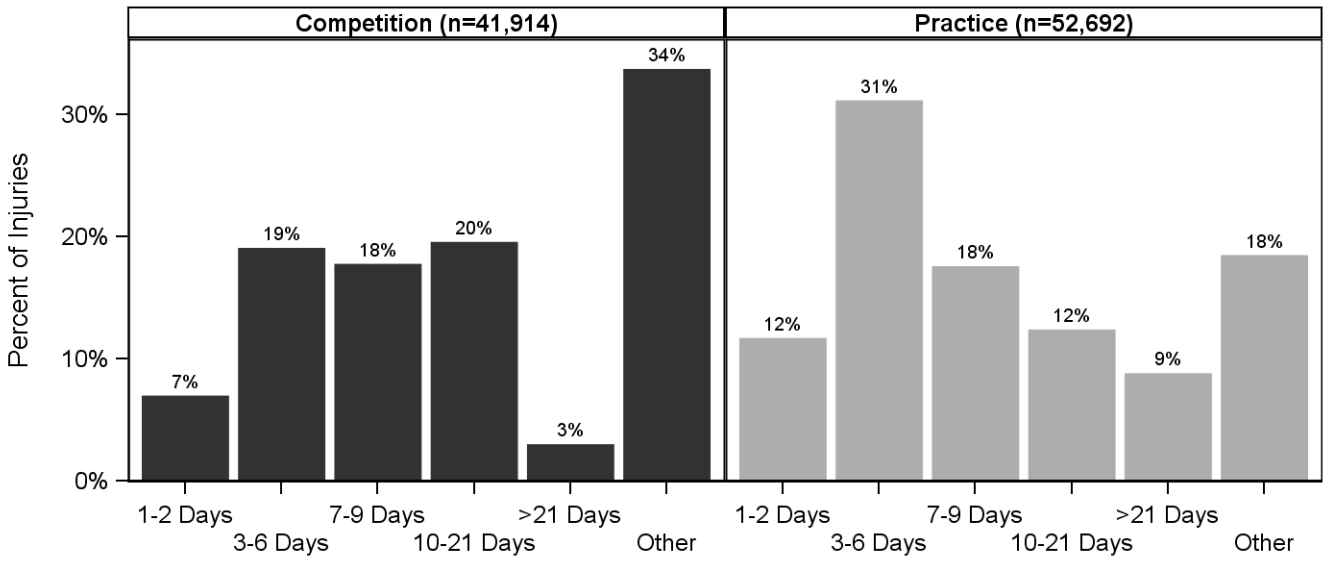
* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Table 9.4 Ten Most Common Boys' Wrestling Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *

	Competition (n=41,915)		Practice (n=52,695)		Overall (n=94,605)	
Diagnosis	**n**	**%**	**n**	**%**	**n**	**%**
Head/Face Concussion	6,431	15.3%	2,867	5.4%	9,298	9.8%
Arm/Elbow Other	3,508	8.4%	5,535	10.5%	9,044	9.6%
Knee Other	3,511	8.4%	4,109	7.8%	7,620	8.1%
Shoulder Other	3,504	8.4%	3,122	5.9%	6,625	7.0%
Ankle Strain/Sprain	2,407	5.7%	4,140	7.9%	6,546	6.9%
Head/Face Other	1,630	3.9%	4,533	8.6%	6,163	6.5%
Knee Strain/Sprain	1,751	4.2%	2,618	5.0%	4,369	4.6%
Shoulder Strain/Sprain	846	2.0%	3,381	6.4%	4,227	4.5%
Trunk Strain/Sprain	1,325	3.2%	2,850	5.4%	4,175	4.4%
Hip/Thigh/Upper Leg Strain/Sprain	1,322	3.2%	2,646	5.0%	3,968	4.2%

* 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.

Figure 9.2 Time Loss of Boys' Wrestling Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2019-20 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, 2019-20 School Year *

	Competition		Practice		Overall	
Need for Surgery	**n**	**%**	**n**	**%**	**n**	**%**
Required Surgery	5,439	13.1%	2,642	5.1%	8,082	8.7%
Did Not Require Surgery	36,143	86.9%	49,138	94.9%	85,281	91.3%
Total	***41,582***	***100.0%***	***51,781***	***100.0%***	***93,363***	***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, 2019-20 School Year

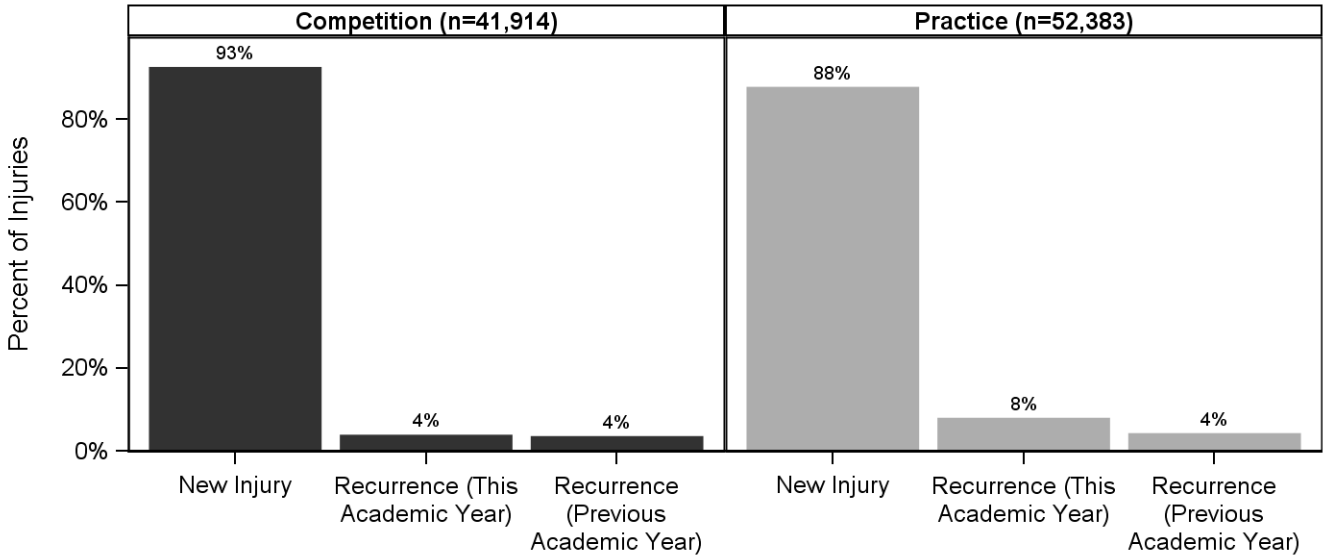


Table 9.6 Time during Season of Boys' Wrestling Injuries, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *

Time in Season	n	%
Preseason	15,505	16.4%
Regular Season	71,085	75.1%
Post Season	8,017	8.5%
Total	***94,606***	***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, 2019-20 School Year *

Time in Competition	n	%
Pre-competition/Warm-Ups	865	2.1%
First Period	6,045	14.5%
Second Period	10,167	24.5%
Third Period	11,257	27.1%
Unknown	13,234	31.8%
Total	***41,568***	***100.0%***

Mat Location		
Within 28ft Circle	32,117	77.1%
Off Mat	372	0.9%
Unknown	9,142	22.0%
Total	***41,631***	***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, 2019-20 School Year *

Time in Practice	n	%
First 1/2 Hour	4,243	8.2%
Second 1/2 Hour	8,326	16.2%
1-2 Hours into Practice	20,599	40.0%
>2 Hours into Practice	1,711	3.3%
Unknown	16,615	32.3%
Total	***51,494***	***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 9.9 Activities Leading to Boys' Wrestling Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *

	Competition		Practice		Overall	
Activity	**n**	**%**	**n**	**%**	**n**	**%**
Takedown	21,766	52.2%	11,965	23.4%	33,731	36.3%
Unknown	6,013	14.4%	10,977	21.5%	16,990	18.3%
Sparring	4,841	11.6%	9,449	18.5%	14,290	15.4%
N/A **	1,088	2.6%	8,983	17.6%	10,072	10.8%
Conditioning	0	0.0%	4,678	9.1%	4,678	5.0%
Escape	2,059	4.9%	1,374	2.7%	3,432	3.7%
Near Fall	2,234	5.4%	237	0.5%	2,471	2.7%
Reversal	1,577	3.8%	612	1.2%	2,188	2.4%
Other	675	1.6%	1,091	2.1%	1,766	1.9%
Fall	704	1.7%	964	1.9%	1,668	1.8%
Riding	769	1.8%	804	1.6%	1,573	1.7%
Total	***41,725***	***100.0%***	***51,133***	***100.0%***	***92,859***	***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, 2019-20 School Year

	Diagnosis									
	Strain Sprain		Contusion		Fracture		Concussion		Other	
Activity	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Conditioning	2,931	8.6%	95	2.0%	0	0.0%	0	0.0%	1,652	4.6%
Escape	2,075	6.1%	0	0.0%	0	0.0%	158	1.8%	1,199	3.4%
Fall	537	1.6%	190	4.1%	309	3.2%	158	1.8%	474	1.3%
N/A **	0	0.0%	0	0.0%	0	0.0%	0	0.0%	10,072	28.2%
Near Fall	1,322	3.9%	300	6.4%	0	0.0%	0	0.0%	850	2.4%
Other	309	0.9%	0	0.0%	237	2.4%	309	3.5%	911	2.6%
Reversal	790	2.3%	0	0.0%	550	5.6%	237	2.7%	612	1.7%
Riding	158	0.5%	95	2.0%	0	0.0%	0	0.0%	1,321	3.7%
Sparring	8,754	25.8%	675	14.4%	1,658	17.0%	1,397	15.7%	1,806	5.1%
Takedown	10,373	30.6%	3,162	67.6%	5,440	55.7%	5,168	58.3%	9,589	26.9%
Unknown	6,641	19.6%	158	3.4%	1,576	16.1%	1,444	16.3%	7,170	20.1%
Total	***33,889***	***100.0%***	***4,673***	***100.0%***	***9,770***	***100.0%***	***8,872***	***100.0%***	***35,655***	***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, 2019-20 School Year *†

	# Injuries	# Exposures	Injury Rate (per 1,000 AEs)	Nationally Estimated # Injuries
Total	***23***	***32,835***	***0.70***	***13,087***
Competition	2	4,312	0.46	833
Practice	21	28,523	0.74	12,254

* All remaining analyses in this chapter present data weighted to provide national injury estimates.
†**The suspension of sports due to 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, 2019-20 School Year *

Year in School	n	%
Freshman	4,337	33.1%
Sophomore	3,531	27.0%
Junior	1,119	8.5%
Senior	4,101	31.3%
Total	***13,088***	***100.0%***

Age (years)	
Minimum	14
Maximum	18
Mean (SD)	15.6 (1.2)
n	7,684

BMI	
Minimum	19.6
Maximum	35.3
Mean (SD)	24.8 (4.5)
n	5,170

* 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, 2019-20 School Year

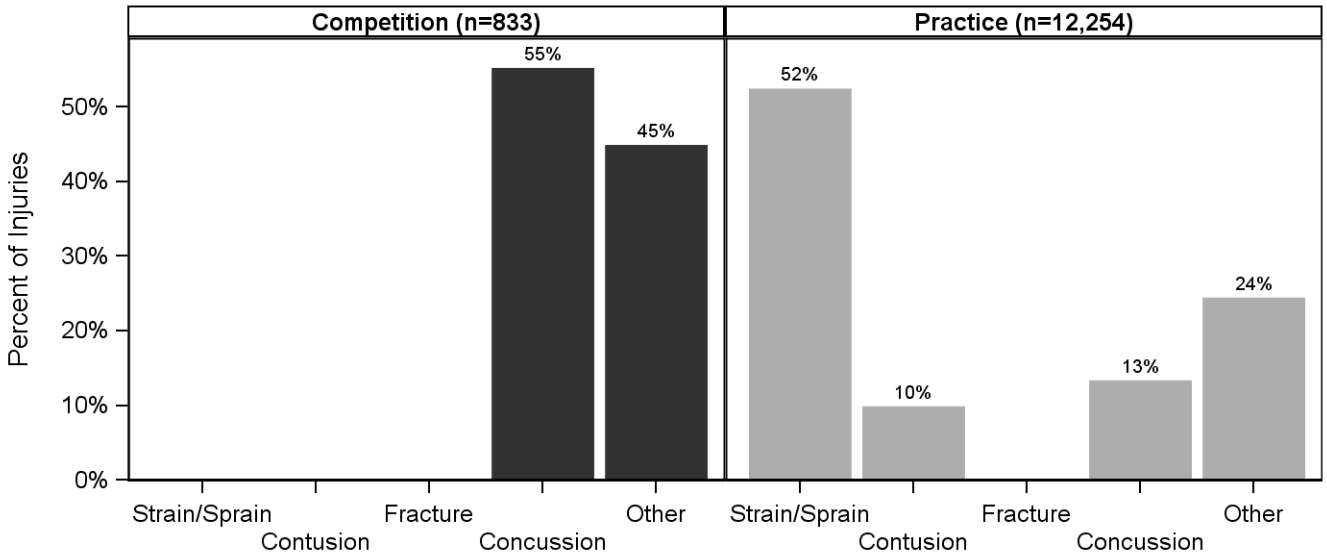


Table 10.3 Body Site of Boys' Baseball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *

	Competition		Practice		Overall	
Body Site	**n**	**%**	**n**	**%**	**n**	**%**
Arm/Elbow	0	0.0%	4,049	33.0%	4,049	30.9%
Head/Face	460	55.2%	2,376	19.4%	2,835	21.7%
Hip/Thigh/Upper Leg	0	0.0%	2,378	19.4%	2,378	18.2%
Ankle	0	0.0%	1,205	9.8%	1,205	9.2%
Hand/Wrist	374	44.8%	745	6.1%	1,119	8.5%
Lower Leg	0	0.0%	747	6.1%	747	5.7%
Trunk	0	0.0%	460	3.8%	460	3.5%
Foot	0	0.0%	295	2.4%	295	2.3%
Total	***833***	***100.0%***	***12,254***	***100.0%***	***13,088***	***100.0%***

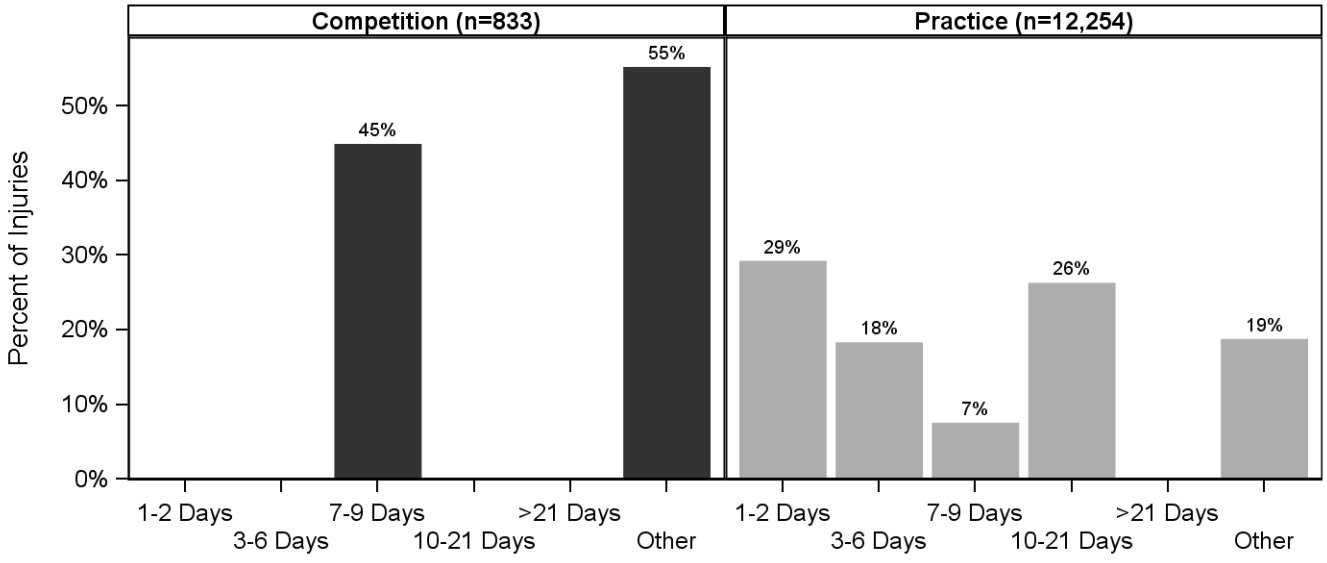
* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Table 10.4 Ten Most Common Boys' Baseball Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *

	Competition (n=834)		Practice (n=12,256)		Overall (n=13,089)	
Diagnosis	**n**	**%**	**n**	**%**	**n**	**%**
Hip/Thigh/Upper Leg Strain/Sprain	0	0.0%	2,378	19.4%	2,378	18.2%
Arm/Elbow Strain/Sprain	0	0.0%	2,176	17.8%	2,176	16.6%
Head/Face Concussion	460	55.2%	1,631	13.3%	2,090	16.0%
Arm/Elbow Other	0	0.0%	1,873	15.3%	1,873	14.3%
Ankle Strain/Sprain	0	0.0%	1,205	9.8%	1,205	9.2%
Hand/Wrist Contusion	0	0.0%	745	6.1%	745	5.7%
Head/Face Other	0	0.0%	745	6.1%	745	5.7%
Trunk Contusion	0	0.0%	460	3.8%	460	3.5%
Hand/Wrist Other	374	44.8%	0	0.0%	374	2.9%
Lower Leg Other	0	0.0%	374	3.1%	374	2.9%
Lower Leg Strain/Sprain	0	0.0%	374	3.1%	374	2.9%

* 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 10.2 Time Loss of Boys' Baseball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2019-20 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, 2019-20 School Year *

	Competition		Practice		Overall	
Need for Surgery	**n**	**%**	**n**	**%**	**n**	**%**
Did Not Require Surgery	833	100.0%	12,254	100.0%	13,088	100.0%
Total	***833***	***100.0%***	***12,254***	***100.0%***	***13,088***	***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, 2019-20 School Year

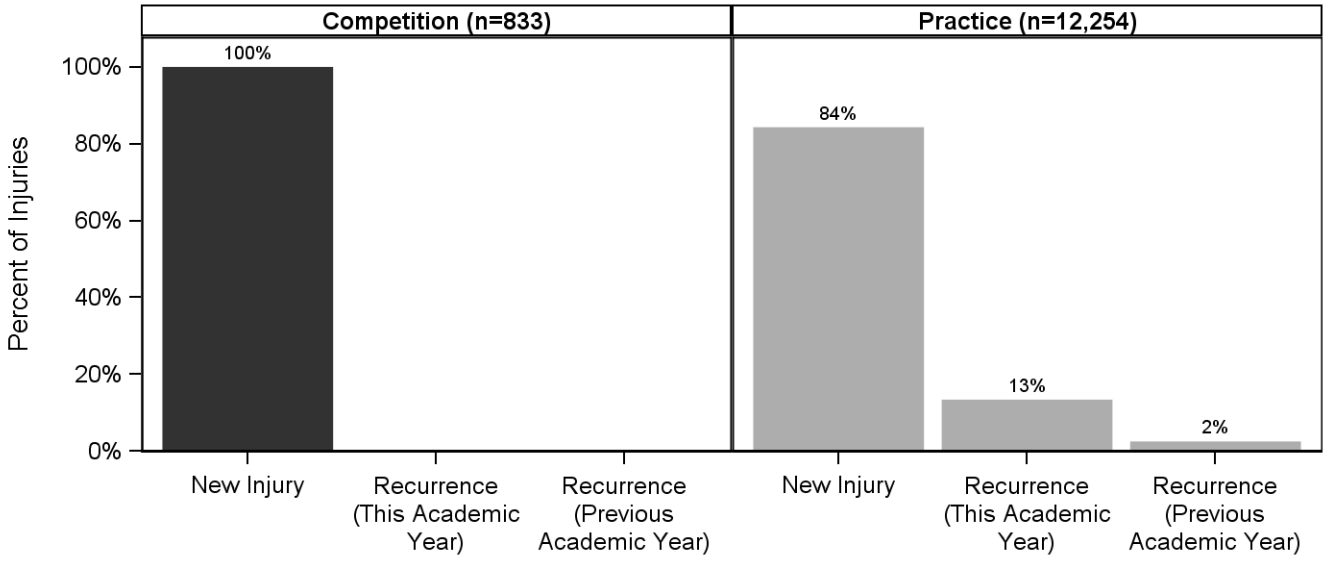


Table 10.6 Time during Season of Boys' Baseball Injuries, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *

Time in Season	n	%
Preseason	10,624	81.2%
Regular Season	2,464	18.8%
Total	***13,088***	***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, 2019-20 School Year *

Time in Competition	n	%
Pre-competition/Warm-Ups	460	55.2%
Fifth Inning	374	44.8%
Total	***833***	***100.0%***

Field Location		
Second Base	374	44.8%
Unknown	460	55.2%
Total	***833***	***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, 2019-20 School Year *

Time in Practice	n	%
First 1/2 Hour	2,299	18.8%
Second 1/2 Hour	754	6.2%
1-2 Hours into Practice	6,964	56.8%
Unknown	2,237	18.3%
Total	***12,254***	***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, 2019-20 School Year

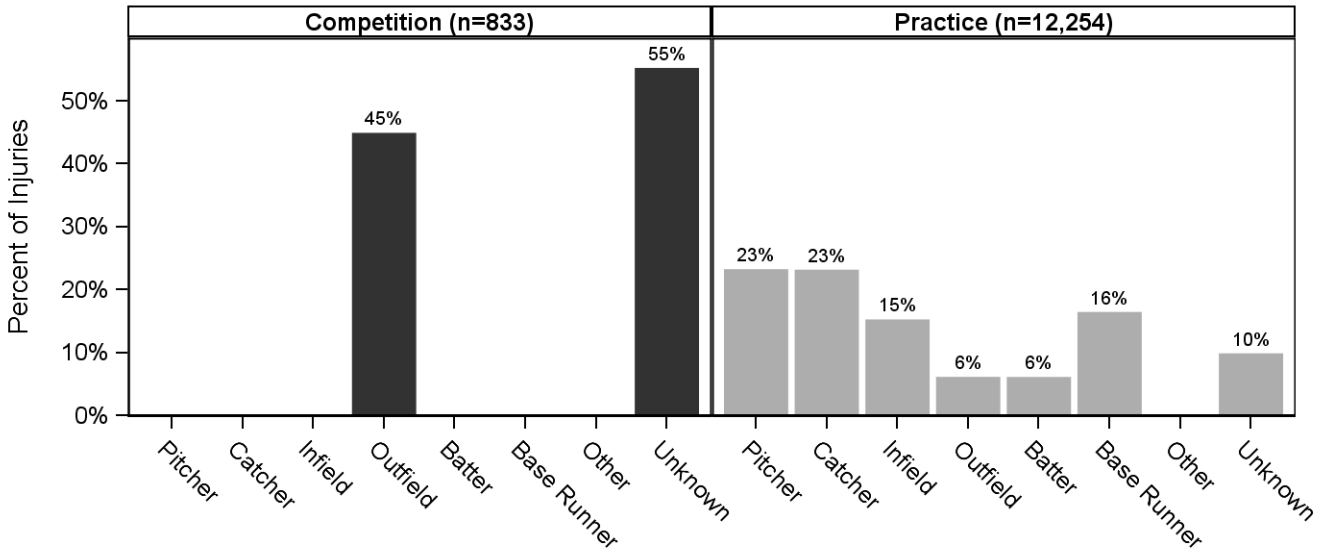


Table 10.9 Activities Leading to Boys' Baseball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *

	Competition		Practice		Overall	
Activity	**n**	**%**	**n**	**%**	**n**	**%**
Running Bases	0	0.0%	3,268	26.7%	3,268	25.0%
Pitching	0	0.0%	2,471	20.2%	2,471	18.9%
Throwing	0	0.0%	1,578	12.9%	1,578	12.1%
General Play	0	0.0%	1,492	12.2%	1,492	11.4%
Catching	0	0.0%	1,119	9.1%	1,119	8.5%
Conditioning	0	0.0%	833	6.8%	833	6.4%
Unknown	0	0.0%	747	6.1%	747	5.7%
Fielding a Batted Ball	0	0.0%	745	6.1%	745	5.7%
Other	460	55.2%	0	0.0%	460	3.5%
Sliding	374	44.8%	0	0.0%	374	2.9%
Total	***833***	***100.0%***	***12,254***	***100.0%***	***13,088***	***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 10.10 Activity Resulting in Boys' Baseball Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *

	Diagnosis							
	Strain/Sprain		Contusion		Concussion		Other	
Activity	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Catching	0	0.0%	745	61.8%	374	17.9%	0	0.0%
Conditioning	833	13.0%	0	0.0%	0	0.0%	0	0.0%
Fielding a Batted Ball	0	0.0%	0	0.0%	0	0.0%	745	22.1%
General Play	1,492	23.2%	0	0.0%	0	0.0%	0	0.0%
Other	0	0.0%	0	0.0%	460	22.0%	0	0.0%
Pitching	2,176	33.9%	0	0.0%	0	0.0%	295	8.8%
Running Bases	1,551	24.1%	460	38.2%	1,257	60.1%	0	0.0%
Sliding	0	0.0%	0	0.0%	0	0.0%	374	11.1%
Throwing	0	0.0%	0	0.0%	0	0.0%	1,578	46.9%
Unknown	374	5.8%	0	0.0%	0	0.0%	374	11.1%
Total	***6,427***	***100.0%***	***1,205***	***100.0%***	***2,090***	***100.0%***	***3,365***	***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, 2019-20 School Year *†

	# Injuries	# Exposures	Injury Rate (per 1,000 AEs)	Nationally Estimated # Injuries
Total	***23***	***25,334***	***0.91***	***14,802***
Competition	9	5,175	1.74	4,758
Practice	14	20,159	0.69	10,044

* All remaining analyses in this chapter present data weighted to provide national injury estimates.
†**The suspension of sports due to 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, 2019-20 School Year *

Year in School	n	%
Freshman	5,221	35.3%
Sophomore	3,060	20.7%
Junior	1,668	11.3%
Senior	4,853	32.8%
Total	***14,801***	***100.0%***

Age (years)	
Minimum	14
Maximum	17
Mean (SD)	15.3 (1.1)
n	6,605

BMI	
Minimum	19.9
Maximum	29.9
Mean (SD)	23.9 (3.4)
n	5,239

* 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, 2019-20 School Year

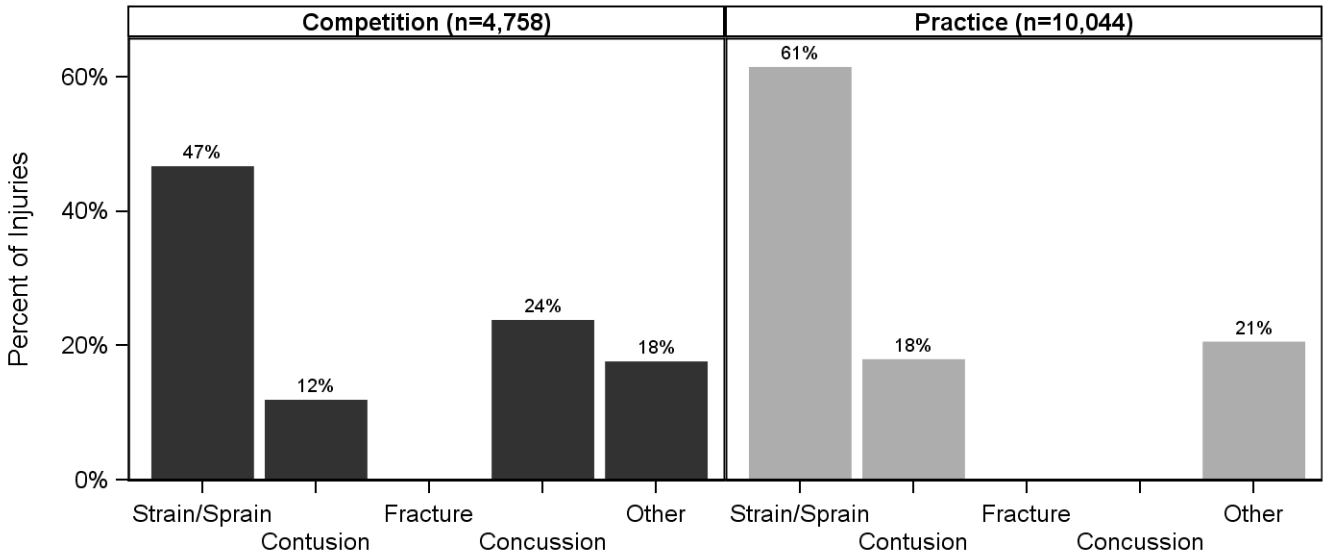


Table 11.3 Body Site of Girls' Softball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *

	Competition		Practice		Overall	
Body Site	**n**	**%**	**n**	**%**	**n**	**%**
Hip/Thigh/Upper Leg	0	0.0%	4,802	47.8%	4,802	32.4%
Ankle	671	14.1%	3,586	35.7%	4,257	28.8%
Head/Face	1,132	23.8%	671	6.7%	1,802	12.2%
Hand/Wrist	1,404	29.5%	0	0.0%	1,404	9.5%
Arm/Elbow	566	11.9%	419	4.2%	985	6.7%
Knee	419	8.8%	566	5.6%	985	6.7%
Neck	566	11.9%	0	0.0%	566	3.8%
Total	***4,758***	***100.0%***	***10,044***	***100.0%***	***14,801***	***100.0%***

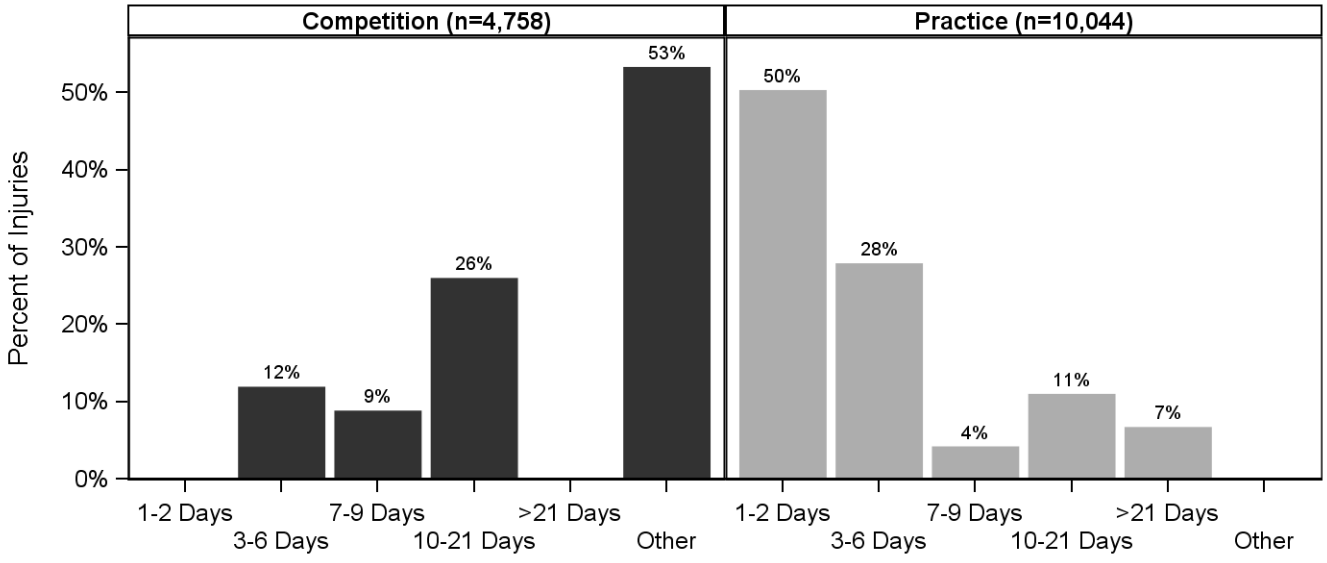
* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

Table 11.4 Ten Most Common Girls' Softball Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *

	Competition (n=4,758)		Practice (n=10,044)		Overall (n=14,802)	
Diagnosis	**n**	**%**	**n**	**%**	**n**	**%**
Ankle Strain/Sprain	671	14.1%	3,586	35.7%	4,257	28.8%
Hip/Thigh/Upper Leg Strain/Sprain	0	0.0%	2,590	25.8%	2,590	17.5%
Hip/Thigh/Upper Leg Other	0	0.0%	1,646	16.4%	1,646	11.1%
Head/Face Concussion	1,132	23.8%	0	0.0%	1,132	7.6%
Hand/Wrist Other	838	17.6%	0	0.0%	838	5.7%
Head/Face Contusion	0	0.0%	671	6.7%	671	4.5%
Arm/Elbow Strain/Sprain	566	11.9%	0	0.0%	566	3.8%
Hand/Wrist Strain/Sprain	566	11.9%	0	0.0%	566	3.8%
Hip/Thigh/Upper Leg Contusion	0	0.0%	566	5.6%	566	3.8%
Knee Contusion	0	0.0%	566	5.6%	566	3.8%
Neck Contusion	566	11.9%	0	0.0%	566	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, 2019-20 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, 2019-20 School Year *

	Competition		Practice		Overall	
Need for Surgery	**n**	**%**	**n**	**%**	**n**	**%**
Required Surgery	838	17.6%	0	0.0%	838	5.7%
Did Not Require Surgery	3,919	82.4%	10,044	100.0%	13,963	94.3%
Total	***4,758***	***100.0%***	***10,044***	***100.0%***	***14,801***	***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, 2019-20 School Year

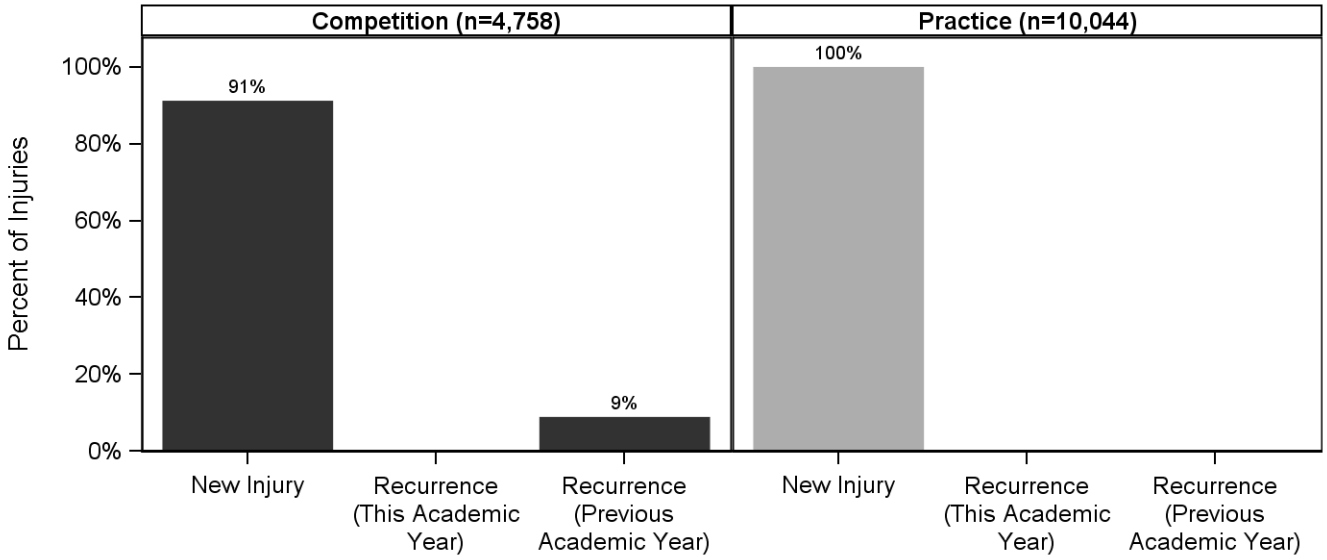


Table 11.6 Time during Season of Girls' Softball Injuries, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *

Time in Season	n	%
Preseason	9,520	64.3%
Regular Season	5,281	35.7%
Total	***14,801***	***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, 2019-20 School Year *

Time in Competition	n	%
Second Inning	419	8.8%
Third Inning	985	20.7%
Fourth Inning	566	11.9%
Fifth Inning	1,090	22.9%
Sixth Inning	566	11.9%
Unknown	1,132	23.8%
Total	***4,758***	***100.0%***

Field Location		
Outfield	566	11.9%
Third Base	985	20.7%
Second Base	1,551	32.6%
Home Plate	1,656	34.8%
Total	***4,758***	***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, 2019-20 School Year *

Time in Practice	n	%
First 1/2 Hour	1,102	11.0%
Second 1/2 Hour	671	6.7%
1-2 Hours into Practice	4,970	49.5%
Unknown	3,302	32.9%
Total	***10,044***	***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, 2019-20 School Year

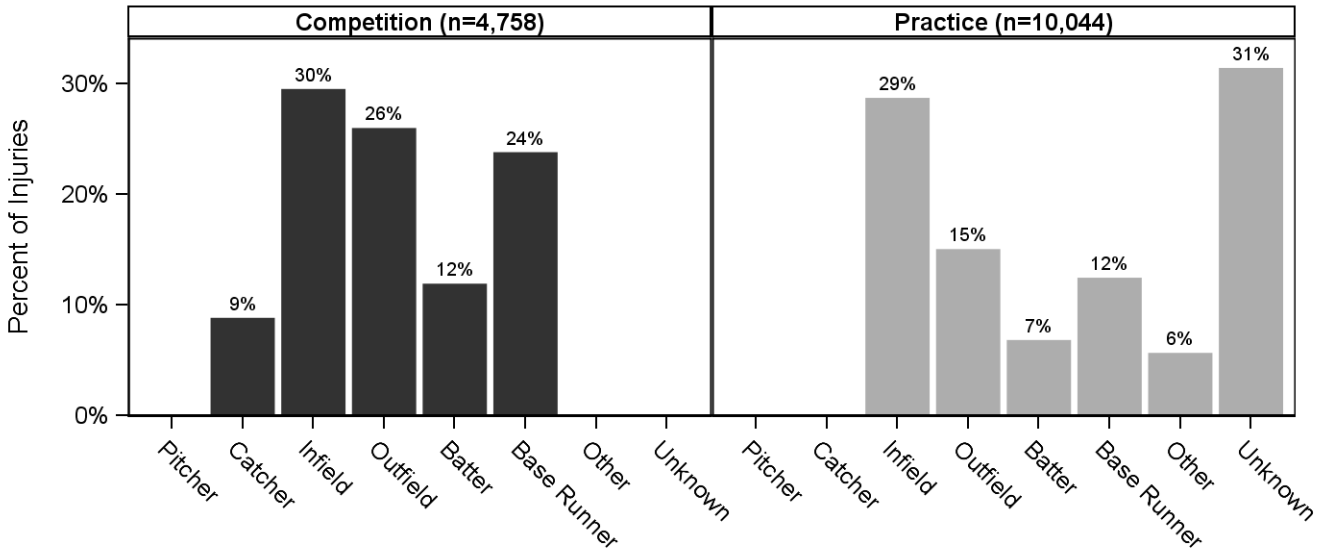


Table 11.9 Activities Leading to Girls' Softball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *

	Competition		Practice		Overall	
Activity	**n**	**%**	**n**	**%**	**n**	**%**
Fielding a Batted Ball	985	20.7%	2,317	24.1%	3,302	23.0%
Sliding	2,368	49.8%	566	5.9%	2,934	20.4%
Running Bases	566	11.9%	2,204	22.9%	2,770	19.3%
Unknown	0	0.0%	1,646	17.1%	1,646	11.4%
Fielding a Thrown Ball	0	0.0%	1,236	12.8%	1,236	8.6%
General Play	419	8.8%	671	7.0%	1,090	7.6%
Conditioning	0	0.0%	985	10.2%	985	6.8%
Catching	419	8.8%	0	0.0%	419	2.9%
Total	***4,758***	***100.0%***	***9,625***	***100.0%***	***14,382***	***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 11.10 Activity Resulting in Girls' Softball Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *

	Diagnosis							
	Strain/Sprain		Contusion		Concussion		Other	
Activity	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Catching	0	0.0%	0	0.0%	0	0.0%	419	16.9%
Conditioning	985	11.7%	0	0.0%	0	0.0%	0	0.0%
Fielding a Batted Ball	2,065	24.6%	671	28.3%	566	50.0%	0	0.0%
Fielding a Thrown Ball	671	8.0%	566	23.9%	0	0.0%	0	0.0%
General Play	671	8.0%	0	0.0%	0	0.0%	419	16.9%
Running Bases	2,204	26.2%	0	0.0%	566	50.0%	0	0.0%
Sliding	1,802	21.5%	1,132	47.8%	0	0.0%	0	0.0%
Unknown	0	0.0%	0	0.0%	0	0.0%	1,646	66.3%
Total	***8,398***	***100.0%***	***2,368***	***100.0%***	***1,132***	***100.0%***	***2,484***	***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, 2019-20 School Year†

	Boys' Soccer	Girls' Soccer *	RR (95% CI) **
Total	1.59	**2.22**	**1.39 (1.18-1.65)**
Competition	3.35	**5.12**	**1.53 (1.24-1.88)**
Practice	0.82	**1.06**	1.28 (0.97-1.70)

* 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.
** Throughout this chapter, statistically significant RR and IPR are bolded.
†**The suspension of sports due to COVID-19 may have affected these results.**

Table 12.2 Comparison of Body Sites of Boys' and Girls' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *

Body Site	Boys' Soccer	Girls' Soccer	IPR (95% CI)
Head/Face	**26.8%**	25.0%	1.07 (0.73-1.59)
Neck	0.0%	**1.7%**	--
Shoulder	**3.7%**	0.8%	4.56 (0.98-21.21)
Trunk	3.9%	**4.2%**	1.07 (0.30-3.77)
Arm/Elbow	**2.6%**	0.0%	--
Hand/Wrist	**3.1%**	2.1%	1.46 (0.43-4.92)
Hip/Thigh/Upper Leg	**16.6%**	13.8%	1.21 (0.72-2.02)
Knee	5.6%	**22.0%**	**3.90 (2.14-7.12)**
Lower Leg	**9.4%**	4.3%	2.21 (0.99-4.95)
Ankle	19.5%	**19.9%**	1.02 (0.63-1.68)
Foot	**6.9%**	5.8%	1.20 (0.47-3.10)
Other	**1.8%**	0.5%	3.26 (0.37-28.63)
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, 2019-20 School Year *

Diagnosis	Boys' Soccer	Girls' Soccer	IPR (95% CI)
Strain/Sprain	42.4%	**51.6%**	1.24 (0.97-1.58)
Contusion	**8.9%**	6.0%	1.49 (0.76-2.91)
Fracture	**5.6%**	2.4%	2.35 (0.88-6.29)
Concussion	21.7%	**23.9%**	1.09 (0.71-1.68)
Other	**21.3%**	16.0%	1.36 (0.83-2.23)
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, 2019-20 School Year *

Diagnosis	Boys' Soccer	Girls' Soccer	IPR (95% CI)
Ankle Strain/Sprain	17.1%	**18.2%**	1.06 (0.62-1.81)
Head/Face Concussion	21.9%	**24.0%**	1.09 (0.71-1.68)
Hip/Thigh/Upper Leg Strain/Sprain	**14.4%**	11.3%	1.27 (0.72-2.27)
Knee Other	2.6%	**6.4%**	2.43 (0.82-7.26)
Knee Strain/Sprain	2.0%	**14.0%**	**7.16 (2.87-17.89)**

* 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, 2019-20 School Year *

Time Loss	Boys' Soccer	Girls' Soccer	IPR (95% CI)
1-2 Days	**19.2%**	14.1%	1.31 (0.77-2.23)
3-6 Days	**29.3%**	20.9%	1.41 (0.92-2.16)
7-9 Days	**19.7%**	15.3%	1.29 (0.74-2.27)
10-21 Days	14.4%	**23.8%**	1.64 (0.98-2.74)
>21 Days	**5.1%**	4.9%	1.06 (0.38-2.92)
Other	12.3%	**21.1%**	**1.69 (1.05-2.72)**
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, 2019-20 School Year *

Soccer Mechanism	Boys' Soccer	Girls' Soccer	IPR (95% CI)
Contact with Another Player	26.6%	**32.0%**	1.20 (0.83-1.74)
Contact with Ball	10.9%	**11.5%**	1.05 (0.54-2.02)
Contact with Goal	**1.7%**	0.1%	--
N/A **	**18.5%**	15.5%	1.20 (0.76-1.88)
Other	**6.9%**	6.6%	1.04 (0.50-2.17)
Rotation Around a Planted Foot/Inversion	8.1%	**11.7%**	1.45 (0.72-2.90)
Slide Tackle	**4.0%**	2.2%	1.84 (0.55-6.13)
Stepped On/Fell On/Kicked	**13.1%**	4.9%	**2.68 (1.08-6.64)**
Uneven Playing Surface	5.0%	**6.7%**	1.34 (0.41-4.42)
Unknown	5.0%	**8.9%**	1.76 (0.65-4.79)
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, 2019-20 School Year *

Soccer Activity	Boys' Soccer	Girls' Soccer	IPR (95% CI)
Ball Handling/Dribbling	4.8%	**7.0%**	1.44 (0.57-3.68)
Blocking Shot	**4.1%**	0.9%	4.72 (1.00-22.30)
Chasing Loose Ball	4.5%	**5.3%**	1.19 (0.49-2.90)
Conditioning	2.6%	**4.0%**	1.57 (0.48-5.10)
Defending	9.1%	**17.0%**	**1.87 (1.04-3.36)**
General Play	**33.9%**	26.4%	1.28 (0.89-1.86)
Goaltending	**7.0%**	4.0%	1.73 (0.76-3.95)
Heading Ball	**9.7%**	7.9%	1.23 (0.52-2.88)
Other	2.6%	**2.8%**	1.08 (0.21-5.66)
Passing	2.4%	**6.5%**	2.75 (0.73-10.43)
Receiving Pass	2.9%	**5.0%**	1.74 (0.51-5.93)
Shooting	**4.5%**	2.3%	1.92 (0.36-10.30)
Unknown	**12.0%**	10.7%	1.12 (0.60-2.06)
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, 2019-20 School Year†

	Boys' Basketball	Girls' Basketball *	RR (95% CI) **
Total	1.52	**2.06**	**1.36 (1.16-1.59)**
Competition	2.74	**4.01**	**1.47 (1.19-1.81)**
Practice	0.99	**1.22**	1.22 (0.96-1.56)

* 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.
** Throughout this chapter, statistically significant RR and IPR are bolded.
†**The suspension of sports due to COVID-19 may have affected these results.**

Table 12.9 Comparison of Body Sites of Boys' and Girls' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *

Body Site	Boys' Basketball	Girls' Basketball	IPR (95% CI)
Head/Face	**22.5%**	19.8%	1.14 (0.79-1.64)
Neck	0.3%	**0.7%**	2.03 (0.19-21.60)
Shoulder	1.8%	**4.8%**	2.68 (0.92-7.84)
Trunk	**5.0%**	2.2%	2.31 (0.80-6.68)
Arm/Elbow	**2.0%**	0.3%	**6.03 (1.14-31.85)**
Hand/Wrist	**9.7%**	8.3%	1.17 (0.65-2.12)
Hip/Thigh/Upper Leg	5.9%	**6.5%**	1.10 (0.52-2.31)
Knee	10.7%	**15.2%**	1.42 (0.87-2.33)
Lower Leg	**3.5%**	2.7%	1.32 (0.45-3.88)
Ankle	34.8%	**35.8%**	1.03 (0.79-1.33)
Foot	2.8%	**3.0%**	1.06 (0.34-3.28)
Other	**0.9%**	0.8%	1.10 (0.12-9.95)
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, 2019-20 School Year *

Diagnosis	Boys' Basketball	Girls' Basketball	IPR (95% CI)
Strain/Sprain	49.8%	**54.3%**	1.09 (0.91-1.31)
Contusion	**6.7%**	5.7%	1.18 (0.57-2.43)
Fracture	**8.3%**	6.2%	1.33 (0.66-2.67)
Concussion	13.0%	**18.4%**	1.42 (0.91-2.21)
Other	**22.3%**	15.3%	1.45 (0.97-2.17)
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, 2019-20 School Year *

Diagnosis	Boys' Basketball	Girls' Basketball	IPR (95% CI)
Ankle Strain/Sprain	**32.7%**	32.4%	1.01 (0.77-1.33)
Hand/Wrist Strain/Sprain	**5.0%**	4.0%	1.25 (0.53-2.96)
Head/Face Concussion	13.0%	**18.4%**	1.42 (0.91-2.21)
Head/Face Other	**7.3%**	0.7%	--
Knee Other	**6.4%**	4.0%	1.60 (0.73-3.51)
Knee Strain/Sprain	1.9%	**8.4%**	**4.35 (1.52-12.40)**

* 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, 2019-20 School Year *

Time Loss	Boys' Basketball	Girls' Basketball	IPR (95% CI)
1-2 Days	20.4%	**23.6%**	1.16 (0.80-1.68)
3-6 Days	**24.9%**	14.7%	**1.70 (1.13-2.54)**
7-9 Days	**17.6%**	12.8%	1.37 (0.88-2.15)
10-21 Days	15.6%	**27.0%**	**1.73 (1.20-2.51)**
>21 Days	**9.9%**	6.7%	1.48 (0.77-2.86)
Other	11.7%	**15.2%**	1.30 (0.81-2.09)
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, 2019-20 School Year *

Basketball Mechanism	Boys' Basketball	Girls' Basketball	IPR (95% CI)
Collision with Another Player	**26.6%**	21.9%	1.22 (0.87-1.71)
Contact with Ball	5.5%	**6.8%**	1.24 (0.61-2.54)
Jumping/Landing	**24.1%**	15.2%	**1.58 (1.06-2.35)**
N/A **	7.6%	**11.7%**	1.54 (0.83-2.85)
Other	9.7%	**11.0%**	1.13 (0.66-1.96)
Rotation Around a Planted Foot/Inversion	11.8%	**17.1%**	1.45 (0.91-2.31)
Stepped On/Fell On/Kicked	**9.5%**	7.8%	1.21 (0.64-2.30)
Unknown	5.3%	**8.5%**	1.60 (0.79-3.26)
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, 2019-20 School Year *

Basketball Activity	Boys' Basketball	Girls' Basketball	IPR (95% CI)
Ball Handling/Dribbling	**3.8%**	2.5%	1.55 (0.58-4.15)
Chasing Loose Ball	10.8%	**11.0%**	1.02 (0.59-1.74)
Conditioning	1.1%	**5.4%**	**4.81 (1.70-13.65)**
Defending	12.6%	**18.2%**	1.45 (0.92-2.30)
General Play	**22.9%**	14.5%	**1.57 (1.06-2.34)**
Other	0.5%	**2.6%**	4.76 (0.93-24.48)
Passing	0.0%	**1.3%**	--
Rebounding	**22.8%**	15.5%	1.47 (0.98-2.20)
Receiving Pass	3.9%	**4.7%**	1.20 (0.52-2.77)
Screening	0.1%	**0.4%**	5.01 (0.31-80.47)
Shooting	**6.9%**	4.7%	1.48 (0.68-3.22)
Unknown	14.6%	**19.3%**	1.32 (0.83-2.08)
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, 2019-20 School Year†

	Boys' Baseball	Girls' Softball *	RR (95% CI) **
Total	0.70	**0.91**	1.30 (0.73-2.31)
Competition	0.46	**1.74**	3.75 (0.81-17.35)
Practice	**0.74**	0.69	1.06 (0.54-2.08)

* 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.
** Throughout this chapter, statistically significant RR and IPR are bolded.
†**The suspension of sports due to COVID-19 may have affected these results.**

Table 12.16 Comparison of Body Sites of Baseball and Softball Injuries, High School Sports-Related Injury Surveillance Study, US, 2019-20 School Year *

Body Site	Boys' Baseball	Girls' Softball	IPR (95% CI)
Head/Face	**21.7%**	12.2%	1.78 (0.39-8.13)
Neck	0.0%	**3.8%**	--
Trunk	**3.5%**	0.0%	--
Arm/Elbow	**30.9%**	6.7%	4.65 (0.91-23.81)
Hand/Wrist	8.5%	**9.5%**	1.11 (0.17-7.29)
Hip/Thigh/Upper Leg	18.2%	**32.4%**	1.79 (0.46-6.92)
Knee	0.0%	**6.7%**	--
Lower Leg	**5.7%**	0.0%	--
Ankle	9.2%	**28.8%**	3.12 (0.61-16.12)
Foot	**2.3%**	0.0%	--
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, 2019-20 School Year *

Diagnosis	Boys' Baseball	Girls' Softball	IPR (95% CI)
Strain/Sprain	49.1%	**56.7%**	1.16 (0.60-2.24)
Contusion	9.2%	**16.0%**	1.74 (0.30-10.06)
Concussion	**16.0%**	7.6%	2.09 (0.33-13.25)
Other	**25.7%**	19.6%	1.31 (0.39-4.45)
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, 2019-20 School Year *

Diagnosis	Boys' Baseball	Girls' Softball	IPR (95% CI)
Ankle Strain/Sprain	9.2%	**28.8%**	3.12 (0.61-16.12)
Arm/Elbow Other	**14.3%**	2.8%	5.05 (0.49-52.08)
Arm/Elbow Strain/Sprain	**16.6%**	3.8%	4.35 (0.43-44.37)
Hand/Wrist Contusion	**5.7%**	0.0%	--
Hand/Wrist Other	2.9%	**5.7%**	1.98 (0.17-22.84)
Head/Face Concussion	**16.0%**	7.6%	2.09 (0.33-13.25)
Head/Face Other	**5.7%**	0.0%	--
Hip/Thigh/Upper Leg Other	0.0%	**11.1%**	--
Hip/Thigh/Upper Leg Strain/Sprain	**18.2%**	17.5%	1.04 (0.27-4.07)

* 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, 2019-20 School Year *

Time Loss	Boys' Baseball	Girls' Softball	IPR (95% CI)
1-2 Days	27.4%	**34.1%**	1.25 (0.40-3.91)
3-6 Days	17.1%	**22.7%**	1.33 (0.39-4.49)
7-9 Days	**9.9%**	5.7%	1.74 (0.29-10.40)
10-21 Days	**24.6%**	15.8%	1.56 (0.42-5.79)
>21 Days	0.0%	**4.5%**	--
Other	**21.1%**	17.1%	1.23 (0.33-4.62)
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, 2019-20 School Year *

Baseball Mechanism	Boys' Baseball	Girls' Softball	IPR (95% CI)
Contact with Another Player	6.4%	**13.3%**	2.09 (0.35-12.54)
Contact with Bases	0.0%	**12.3%**	--
Contact with Thrown Ball (Non-Pitch)	**13.1%**	7.6%	1.72 (0.24-12.44)
Hit by Batted Ball	5.7%	**8.4%**	1.47 (0.12-18.41)
N/A **	**23.9%**	15.7%	1.53 (0.29-8.15)
Other	16.5%	**18.6%**	1.13 (0.29-4.39)
Rotation Around a Planted Foot/Inversion	3.5%	**21.3%**	6.07 (0.65-57.06)
Throwing (Not Pitching)	**9.2%**	2.8%	3.25 (0.27-39.71)
Throwing (Pitching)	**18.9%**	0.0%	--
Unknown	**2.9%**	0.0%	--
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, 2019-20 School Year *

Baseball Activity	Boys' Baseball	Girls' Softball	IPR (95% CI)
Catching	**8.5%**	2.9%	2.93 (0.24-36.30)
Conditioning	6.4%	**6.8%**	1.08 (0.13-8.66)
Fielding a Batted Ball	5.7%	**23.0%**	4.03 (0.44-37.06)
Fielding a Thrown Ball	0.0%	**8.6%**	--
General Play	**11.4%**	7.6%	1.51 (0.21-10.55)
Other	**3.5%**	0.0%	--
Pitching	**18.9%**	0.0%	--
Running Bases	**25.0%**	19.3%	1.30 (0.41-4.06)
Sliding	2.9%	**20.4%**	7.15 (0.75-68.18)
Throwing	**12.1%**	0.0%	--
Unknown	5.7%	**11.4%**	2.00 (0.22-18.43)
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

Table 13.1 Injury Rates by Sport, Type of Exposure and Year, High School Sports-Related Injury Surveillance Study, US, 2005-06 to 2019-20 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	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	0.9924
	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	0.0656
	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	0.0991
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	0.6725
	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	0.3179
	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**	**0.0281**
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	0.1213
	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	0.5612
	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**	**0.0160**
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**	**0.0465**
	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**	**0.0337**
	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	0.4486
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	0.7542
	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	0.0931
	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	0.3640
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	0.6140
	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	0.4109
	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	0.0924
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	0.1062
	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**	**0.0231**

	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	0.7263
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	0.6459
	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**	**0.0211**
	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	0.5453
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	0.1000
	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	0.0699
	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	0.4729
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	0.4763
	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	0.6148
	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	0.2514

* Statistically significant tests for trend are bolded.
†**The suspension of sports in 2019-20 due to COVID-19 may have affected these results.**

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 2019-20 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
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
	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
	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
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
	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
	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
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
	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
	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
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
	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
	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
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
	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
	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
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
	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
	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
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
	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
	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
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
	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
	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

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
	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
	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
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
	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
	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

[†]The suspension of sports in 2019-20 due to 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 2019-20 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
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%
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%
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%
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%
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%
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%
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%
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%
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%
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%
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%
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%
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%***

* 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.

†**The suspension of sports in 2019-20 due to 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 2019-20 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
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%
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%
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%
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%
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%
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%***

* Totals are not always equal to 100% due to slight rounding or missing responses.
†**The suspension of sports in 2019-20 due to COVID-19 may have affected these results.**

Table 13.5 Most Common Injury Diagnoses by Year, High School Sports-Related Injury Surveillance Study, US, 2005-06 to 2019-20 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
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%
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%
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%
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%
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%
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%
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%
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%
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%
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%

†**The suspension of sports in 2019-20 due to COVID-19 may have affected these results.**

REPORTING INFORMATION ONLINE

Table 13.6 Time Loss of Injuries by Year, High School Sports-Related Injury Surveillance Study, US, 2005-06 to 2019-20 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
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%
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%
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%
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%
>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%
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%
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%***

* Totals are not always equal to 100% due to slight rounding or missing responses.
†**The suspension of sports in 2019-20 due to 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 2019-20 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
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%
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%
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%***

* Totals are not always equal to 100% due to slight rounding or missing responses.
†**The suspension of sports in 2019-20 due to COVID-19 may have affected these results.**

REPORTING INFORMATION ONLINE

XIV. Reporter Demographics & Compliance

During the 2010-20 school year, ATs were invited to participate in the study at the beginning of the school year. 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, 99 enrolled ATs reported an average of 34 study weeks (**NOTE: COVID-19 resulted in high school sports being suspended in March 2020**). 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 completed every other year, so the next will occur using data from the 2020-21 school year.

Prior to the start of the 2019-20 High School RIO™ study, participating ATs were asked to complete a short demographics survey. Over three-quarters (80.2%) of participating high schools (both in the original study as well as in the expanded convenience study) were public schools, with the remainder being private. Over 80% of ATs participating during the 2019-20 study year had previously participated in the High School RIO™ study.

An online 'End of Season' survey gave all participating ATs (both in the original study as well as in the expanded convenience study including those ATs who did not report any data) the opportunity to provide feedback on their experiences with High School RIO™. This survey was completed by 96 ATs (57.5%). Average reporting time burdens were 27 minutes for the weekly exposure report and 11 minutes for the injury report form. Using a 5 point Likert scale, RIO™ was overwhelmingly reported to be either very easy (56.3%) or somewhat easy (38.5%) to use (5 and 4 on the Likert scale, respectively), with ATs being either very satisfied (59.4%) or somewhat satisfied (35.4%) with the study (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 2020-21 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/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 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 training, 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). Data collected by the NCAA ISS since 1982 has been used to develop preventive interventions including changes in coaching habits, increased use of protective equipment, and rule changes which have had proven success in reducing injuries among collegiate athletes.

For example, NCAA ISS 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 hour limitations, and a gradual increase in equipment for conditioning and heat acclimation. Additionally, several committees have considered NCAA ISS 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 recent 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 best be 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.