CONVENIENCE SAMPLE SUMMARY REPORT

NATIONAL HIGH SCHOOL SPORTS-RELATED INJURY SURVEILLANCE STUDY

2017-18 School Year

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Note

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

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I. Introduction & Methodology

1.1 Project Overview

To combat the epidemic of obesity among youth in the United States (US), adolescents must be encouraged to 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 over 7.9 million in 2017-18. 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, Dr. R. Dawn Comstock has conducted the National High School Sports-Related Injury Surveillance System to monitor injuries among US high school athletes participating in boys' football, boys' and girls' soccer, boys' and girls' volleyball, boys' and girls' basketball, boys' wrestling, boys' baseball, girls' softball, girls' field hockey, girls' gymnastics, boys' ice hockey, boys' and girls' lacrosse, boys' and girls' swimming & diving, boys' and girls' track & field, boys' and girls' cross country, boys' and girls' tennis, and cheerleading. Due to decreasing numbers of high school participants across the US, boys' volleyball and girls' gymnastics have been dropped from the surveillance. This surveillance has been conducted using the time- and cost-efficient RIO^{TM} (Reporting Information Online) surveillance system. This study during the 2017-18 academic year was funded by the Centers for Disease Control and Prevention (CDC), National Operating Committee on Standards for Athletic Equipment (NOCSAE), and the National Federation of State High School Associations (NFHS).

1.3 Specific Aims

The continuing objectives of this study are to continue 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, girls' softball, girls' field hockey, boys' ice hockey, boys' and girls' lacrosse, boys' and girls' swimming & diving, boys' and girls' track & field, boys' and girls' cross country, boys' and girls' tennis, and cheerleading 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 22 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.

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, practice, or performance 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, heat illness, or dental injury 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, competition or performance where he or she is exposed to the possibility of athletic injury. Exposure was expressed in three 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.

C) Number of athlete-performances = the sum of the number of cheerleading athletes at each performance during the past week. For example, if 9 cheerleading athletes performed 3 times in one weekend, the number of athlete-performances would equal 27.

1.5 Sample Recruitment

The National Athletic Trainers' Association (NATA) membership list was used to identify eligible reporters - certified athletic trainers (AT) who provide care for high school athletes and who have a valid e-mail address. Each eligible reporter received an e-mail introducing the study and inviting them to participate. A three stage sampling methodology was used to select study schools from all schools with ATs who expressed an interest in participating as reporters.

1) All schools 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 report for each of the 9 sports included in the original National High School Sports-Related Injury Surveillance Study (boys' football, soccer, basketball, wrestling, and baseball and girls' soccer, volleyball, basketball, and softball). This subset of 100 study schools were the randomly selected, nationally representative sample.

2) All schools not selected in step 1 who offered any of the more rarely offered 9 sports included in the expansion of the National High School Sports-Related Injury Surveillance Study (girls' field hockey, and lacrosse and boys' ice hockey and lacrosse) were selected for the convenience sample in an attempt to obtain as large a sample as possible reporting for these more rarely offered sports.
3) A random sample of all schools not selected in step 1 or step 2 who offered the remaining sports of interest in the expansion of the National High School Sports-Related Injury Surveillance Study (boys' and girls' track & field, swimming & diving, cross country, and cheerleading) were selected in an attempt to ensure at least 100 schools were reporting for each of the 22 sports of interest.

This three step sampling methodology resulted in a large, nationally disperse convenience sample of US high schools. Participating ATs were offered a $300-$400 honorarium depending on the number of sports reported along with individualized injury reports following the study's conclusion.

As a result of the convenience sample methodology, different schools reported for the different sports of interest. See table below:

School Participation by Sport, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year.*

	# Schools in Random Sample	# Schools in Convenience Sample	# Schools Total
Original Sports			
Football	99	60	159
Boys' Soccer	100	55	155
Girls' Soccer	100	50	150
Girls' Volleyball	97	60	157
Boys' Basketball	102	59	161
Girls' Basketball	100	61	161
Wrestling	91	49	140
Baseball	96	44	140
Softball	95	48	143
New Sports			
Field Hockey	21	28	49
Ice hockey	12	21	33
Boys' Lacrosse	36	35	71
Girls' Lacrosse	31	37	68
Boys' Swimming and Diving	45	44	89
Girls' Swimming and Diving	45	47	92
Boys' Track and Field	66	61	127
Girls' Track and Field	67	63	130
Boys' Cross Country	59	70	129
Girls' Cross Country	57	71	128
Boys' Tennis	46	40	86
Girls' Tennis	48	38	86
Cheerleading	67	59	126
Total	**104**	**96**	**200**

*Numbers only include schools who actually reported data for the 2017-18 school year.

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 43 weekly exposure reports: one for each week from July 25, 2017 through June 4, 2018. 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 and SPSS, version 22.0. Although fractures, concussions, heat illnesses and dental injuries resulting in <1 day time loss were collected, unless otherwise noted, analyses in this report excluded these injuries.

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:

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

Injury proportions were compared using injury proportion ratios (IPR) and corresponding confidence intervals. Following is an example of the IPR calculation comparing the proportion of male soccer concussions to the proportion of female soccer concussions:

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

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

II. Overall Injury Epidemiology

Table 2.1 Injury Rates by Sport and Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year*

	# Injuries	# Exposures	Injury rate (per 1,000 AEs)
Overall total	**8,682**	**4,442,822**	**1.95**
Competition	**4,576**	**1,102,670**	**4.15**
Practice	**4,075**	**3,297,599**	**1.24**
Performance	**31**	**42,553**	**0.73**
Boys' football total	3,066	703,327	4.36
Competition	1,806	124,146	14.55
Practice	1,260	579,181	2.18
Boys' soccer total	589	300,226	1.96
Competition	370	89,004	4.16
Practice	219	211,222	1.04
Girls' soccer total	664	243,188	2.73
Competition	413	72,197	5.72
Practice	251	170,991	1.47
Girls' volleyball total	413	260,198	1.59
Competition	181	88,284	2.05
Practice	232	171,914	1.35
Boys' basketball total	584	329,310	1.77
Competition	312	101,184	3.08
Practice	272	228,126	1.19
Girls' basketball total	529	238,934	2.21
Competition	308	75,434	4.08
Practice	221	163,500	1.35
Boys' wrestling total	590	203,464	2.90
Competition	260	54,973	4.73
Practice	330	148,491	2.22
Boys' baseball total	263	239,316	1.10
Competition	129	84,480	1.53
Practice	134	154,836	0.87
Girls' softball total	268	180,462	1.49
Competition	131	61,577	2.13
Practice	137	118,885	1.15
Girls' Field Hockey total	124	70,954	1.75
Competition	62	23,054	2.69
Practice	62	47,900	1.29

Table 2.1 (Continued) Injury Rates by Sport and Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year*

	# Injuries	# Exposures	Injury rate (per 1,000 AEs)
Boys' Ice Hockey total	116	69,737	1.66
Competition	106	23,587	4.49
Practice	10	46,150	0.22
Boys' Lacrosse total	317	140,768	2.25
Competition	191	42,219	4.52
Practice	126	98,549	1.28
Girls' Lacrosse total	146	108,606	1.34
Competition	90	32,965	2.73
Practice	56	75,641	0.74
Boys' Swimming total	17	98,660	0.17
Competition	2	17,542	0.11
Practice	15	81,118	0.18
Girls' Swimming total	40	107,033	0.37
Competition	4	20,293	0.20
Practice	36	86,740	0.42
Boys' Track total	283	277,419	1.02
Competition	85	49,091	1.73
Practice	198	228,328	0.87
Girls' Track total	245	239,186	1.02
Competition	55	43,806	1.26
Practice	190	195,380	0.97
Cheerleading total	189	233,657	0.81
Competition	13	14,108	0.92
Practice	145	176,996	0.82
Performance	31	42,553	0.73
Boys' Cross Country total	92	145,521	0.63
Competition	17	24,424	0.70
Practice	75	121,097	0.62
Girls' Cross Country total	98	114,111	0.86
Competition	18	18,596	0.97
Practice	80	95,515	0.84

Boys' Tennis total	23	65,703	0.35
Competition	8	20,060	0.40
Practice	15	45,643	0.33
Girls' Tennis total	26	73,042	0.36
Competition	15	21,646	0.69
Practice	11	51,396	0.21

*Only includes injuries resulting in ≥1 days' time loss.

Table 2.2 Proportion of Injuries Resulting in Time Loss, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year*

	<1 day time loss	≥1 day time loss	Time loss data missing	Total
Overall				
Boys' football	1.2%	94.2%	4.6%	**100.0%**
Boys' soccer	0.7%	95.9%	3.4%	**100.0%**
Girls' soccer	1.7%	93.9%	4.4%	**100.0%**
Girls' volleyball	0.9%	95.6%	3.5%	**100.0%**
Boys' basketball	1.6%	93.0%	5.4%	**100.0%**
Girls' basketball	1.2%	93.0%	5.8%	**100.0%**
Boys' wrestling	0.6%	94.9%	4.5%	**100.0%**
Boys' baseball	0.4%	95.3%	4.3%	**100.0%**
Girls' softball	1.8%	96.1%	2.2%	**100.0%**
Girls' field hockey	0.8%	95.4%	3.8%	**100.0%**
Boys' ice hockey	1.6%	91.3%	7.1%	**100.0%**
Boys' lacrosse	0.6%	93.5%	5.9%	**100.0%**
Girls' lacrosse	0.6%	91.3%	8.1%	**100.0%**
Boys' swimming	0.0%	100.0%	0.0%	**100.0%**
Girls' swimming	0.0%	100.0%	0.0%	**100.0%**
Boys' track	0.0%	99.0%	1.0%	**100.0%**
Girls' track	0.0%	96.1%	3.9%	**100.0%**
Cheerleading	1.5%	91.7%	6.8%	**100.0%**
Boys' cross country	0.0%	95.8%	4.2%	**100.0%**
Girls' cross country	0.0%	93.3%	6.7%	**100.0%**
Boys' tennis	0.0%	100.0%	0.0%	**100.0%**
Girls' tennis	3.3%	86.7%	10.0%	**100.0%**
Total	**1.0%**	**94.4%**	**4.5%**	**100.0%**

*By study definition, non-time loss injuries were fractures, concussions, heat illnesses and dental injuries. Because they accounted for 1% of all injuries, they are not included in any other analyses.

Table 2.3 Demographic Characteristics of Injured Athletes by Sex, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year*

	Male	Female
Year in School	**n=5,739**	**n=2,703**
Freshman	21.1%	26.3%
Sophomore	23.9%	27.6%
Junior	26.0%	24.3%
Senior	28.9%	21.8%
Total†	**100.0%**	**100.0%**
Age (years)		
Minimum	12	12
Maximum	20	19
Mean (St. Dev.)	16.0 (1.3)	15.7 (1.3)
BMI		
Minimum	15.2	14.0
Maximum	53.0	46.5
Mean (St. Dev.)	24.8 (4.7)	22.2 (3.6)

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

Figure 2.1 Injury Diagnosis by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

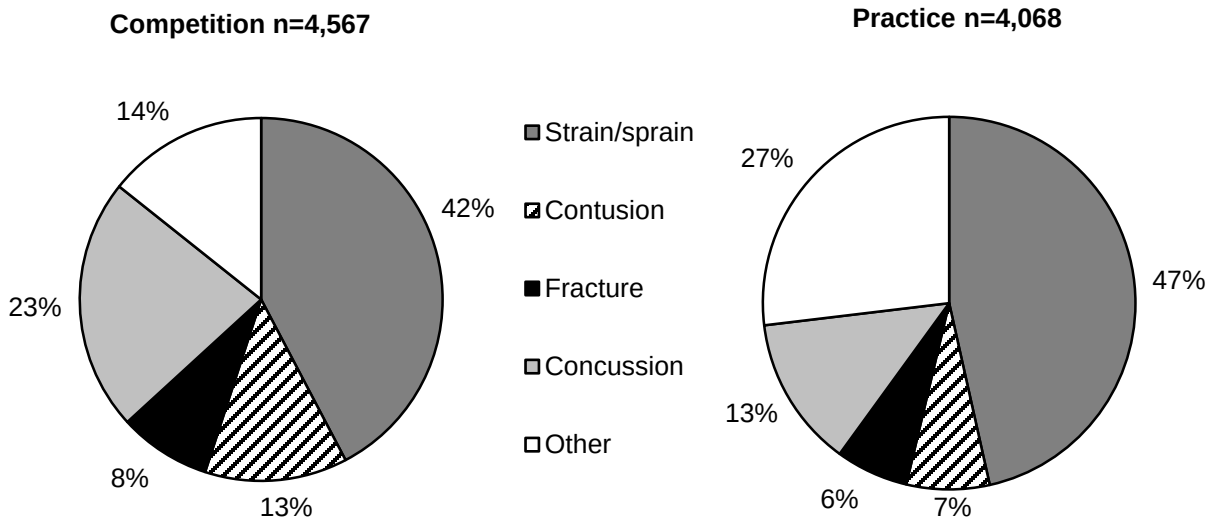


Table 2.4 Body Site of Injury by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition		Practice		Overall*	
	n	**%**	**n**	**%**	**n**	**%**
Body Site						
Head/face	1,164	25.5%	634	15.6%	1,809	20.8%
Ankle	802	17.5%	678	16.6%	1,486	17.1%
Knee	665	14.5%	539	13.2%	1,207	13.9%
Hip/thigh/upper leg	394	8.6%	564	13.8%	959	11.1%
Hand/wrist	397	8.7%	329	8.1%	728	8.4%
Shoulder	314	6.9%	272	6.7%	587	6.8%
Lower leg	193	4.2%	313	7.7%	507	5.8%
Trunk	191	4.2%	283	6.9%	478	5.5%
Arm/elbow	162	3.5%	160	3.9%	322	3.7%
Foot	136	3.0%	160	3.9%	296	3.4%
Other	102	2.2%	99	2.4%	203	2.3%
Neck	52	1.1%	44	1.1%	96	1.1%
Total	**4,572**	**100.0%**	**4,075**	**100.0%**	**8,678**	**100.0%**

*Overall includes cheerleading performance related injuries however performance injuries do not have an individual column due to them totaling less than 1.0% of all injuries.
†Totals and n's are not always equal due to slight rounding or missing responses.

Table 2.5 Most Commonly Injured Ankle Structures, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Male		Female		Total	
	n	% of ankle injuries	n	% of ankle injuries	n	% of ankle injuries
Ankle Ligament						
Anterior talofibular ligament	605	69.9%	417	74.7%	1,022	71.8%
Calcaneofibular ligament	233	26.9%	165	29.6%	398	27.9%
Anterior tibiofibular ligament	157	18.1%	86	15.4%	243	17.1%
Posterior talofibular ligament	67	7.7%	73	13.1%	140	9.8%
Deltoid ligament	63	7.3%	27	4.8%	90	6.3%
Posterior tibiofibular ligament	27	3.1%	26	4.7%	53	3.7%
Total Ankle Injuries	**866**		**558**		**1,424**	

*Multiple responses allowed per injury report.
†Totals and n's are not always equal due to slight rounding or missing responses.

Table 2.6 Most Commonly Injured Knee Structures, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Male		Female		Total	
	n	% of knee injuries	n	% of knee injuries	n	% of knee injuries
Knee Ligament						
Medial collateral ligament	222	26.9%	50	14.0%	272	23.0%
Patella/patellar tendon	211	25.6%	121	33.8%	332	28.1%
Anterior cruciate ligament	144	17.5%	79	22.1%	223	18.9%
Torn cartilage (meniscus)	149	18.1%	62	17.3%	211	17.8%
Lateral collateral ligament	49	5.9%	14	3.9%	63	5.3%
Posterior cruciate ligament	19	2.3%	4	1.1%	23	1.9%
Total Knee Injuries	**825**		**358**		**1,183**	

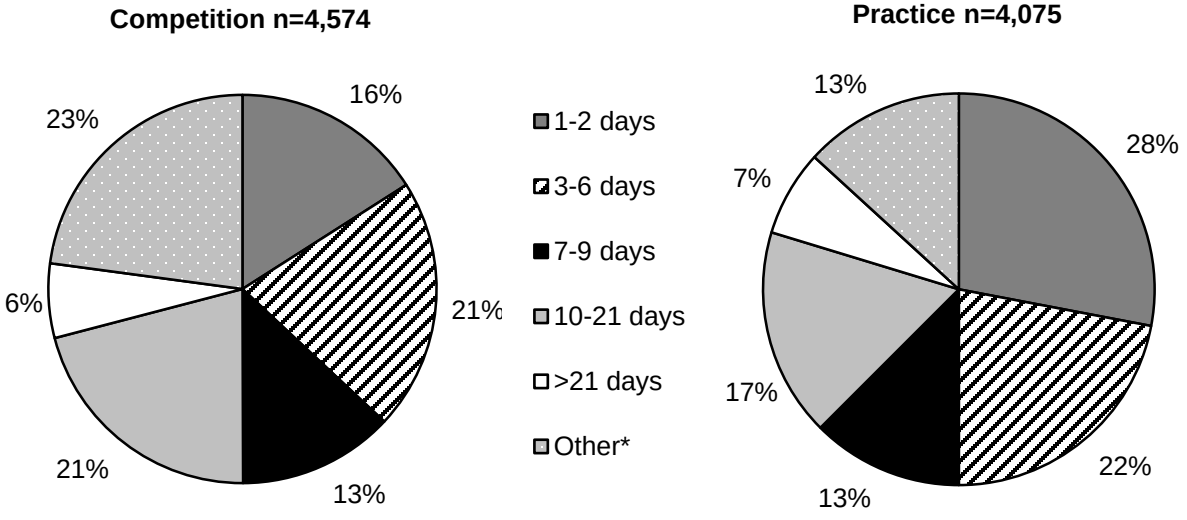
*Multiple responses allowed per injury report.
†Totals and n's are not always equal due to slight rounding or missing responses.

Table 2.7 Ten Most Common Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition n=4,565		Practice n=4,068		Overall n=8,664	
	n	%	n	%	n	%
Diagnosis						
Head/face concussion	1,026	22.5%	532	13.1%	1,569	18.1%
Ankle strain/sprain	742	16.3%	618	15.2%	1,365	15.8%
Hip/thigh/upper leg strain/sprain	275	6.0%	461	11.3%	737	8.5%
Knee strain/sprain	366	8.0%	185	4.5%	552	6.4%
Knee other	172	3.8%	285	7.0%	459	5.3%
Hand/wrist fracture	154	3.4%	117	2.9%	272	3.1%
Shoulder other	144	3.2%	123	3.0%	267	3.1%
Shoulder sprain/strain	138	3.0%	127	3.1%	266	3.1%
Hand wrist strain/sprain	137	3.0%	123	3.0%	261	3.0%
Lower Leg other	40	0.9%	206	5.1%	246	2.8%

†Totals and n's are not always equal due to slight rounding or missing responses.

Figure 2.2 Time Loss by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 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 2.8 Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	320	7.1%	174	4.3%	494	5.7%
Did not require surgery	4,206	92.9%	3,875	95.7%	8,112	94.3%
Total	**4,526**		**4,049**		**8,606**	

†Totals and n's are not always equal due to slight rounding or missing responses.

Figure 2.3 New and Recurring Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

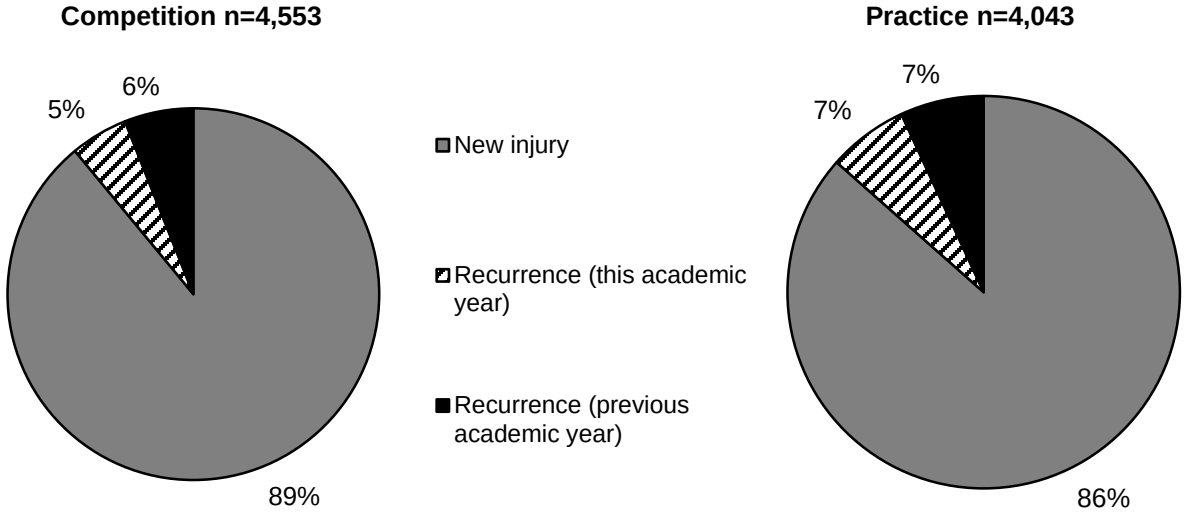


Table 2.9 Time during Season of Injury, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Season		
Preseason	1,840	21.2%
Regular season	6,507	75.1%
Post season	306	3.5%
Unknown	11	0.1%
Total	**8,664**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 2.10 Practice-Related Variables, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Practice		
First ½ hour	324	8.1%
Second ½ hour	570	14.3%
1-2 hours into practice	1,877	47.2%
> 2 hours into practice	224	5.6%
Unknown	984	24.7%
Total	**3,979**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 2.11 Methods for Injury Evaluation and Assessment, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
% of Injuries Evaluated by:*		
Certified athletic trainer	8,081	93.1%
General physician	1,685	19.4%
Orthopedic physician	1,470	16.9%
Chiropractor	45	0.5%
Physician's assistant	83	1.0%
Neurologist	42	0.5%
Nurse practitioner	30	0.3%
Dentist/oral surgeon	8	0.1%
Other	180	2.1%
Total	**8,682**	
% of Injuries Assessed by:*		
Evaluation	8,411	96.9%
X-ray	2,752	31.7%
MRI	806	9.3%
CT-scan	154	1.8%
Blood work/lab test	69	0.8%
Other	60	0.7%
Total	**8,682**	**100.0%**

*Multiple responses allowed per injury report.
†Totals and n's are not always equal due to slight rounding or missing responses.

III. Boys' Football Injury Epidemiology

Table 3.1 Football Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	**3,066**	**703,327**	**4.36**
Competition	1,806	124,146	14.55
Practice	1,260	579,181	2.18

Table 3.2 Demographic Characteristics of Injured Football Athletes, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year*

Year in School	**n=3,013**
Freshman	20.9%
Sophomore	24.2%
Junior	25.6%
Senior	29.3%
Total†	**100.0%**
Age (years)	
Minimum	12
Maximum	19
Mean (St. Dev.)	15.9 (1.2)
BMI	
Minimum	15.6
Maximum	53.0
Mean (SE)	27.0 (6.1)

*All analyses in this report present un-weighted data
†Throughout this report, totals and n's represent the total un-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, 2017-18 School Year

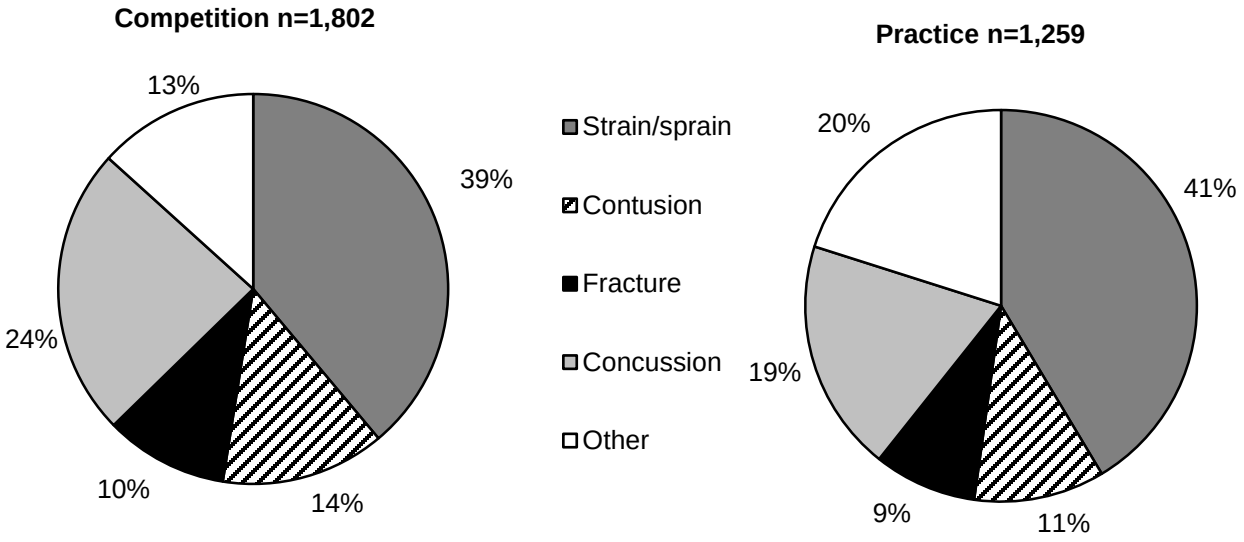


Table 3.3 Body Site of Football Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition		Practice		Overall	
	n	**%**	**n**	**%**	**n**	**%**
Body Site						
Head/face	458	25.4%	260	20.6%	718	23.4%
Knee	275	15.2%	179	14.2%	454	14.8%
Ankle	265	14.7%	167	13.3%	432	14.1%
Hand/wrist	178	9.9%	147	11.7%	325	10.6%
Shoulder	178	9.9%	111	8.8%	289	9.4%
Hip/thigh/upper leg	98	5.4%	127	10.1%	225	7.3%
Trunk	79	4.4%	80	6.3%	159	5.2%
Lower leg	76	4.2%	51	4.0%	127	4.1%
Arm/elbow	67	3.7%	44	3.5%	111	3.6%
Foot	47	2.6%	39	3.1%	86	2.8%
Neck	27	1.5%	14	1.1%	41	1.3%
Other	56	3.1%	41	3.3%	97	3.2%
Total	**1,804**	**100.0%**	**1,260**	**100.0%**	**3,064**	**100.0%**

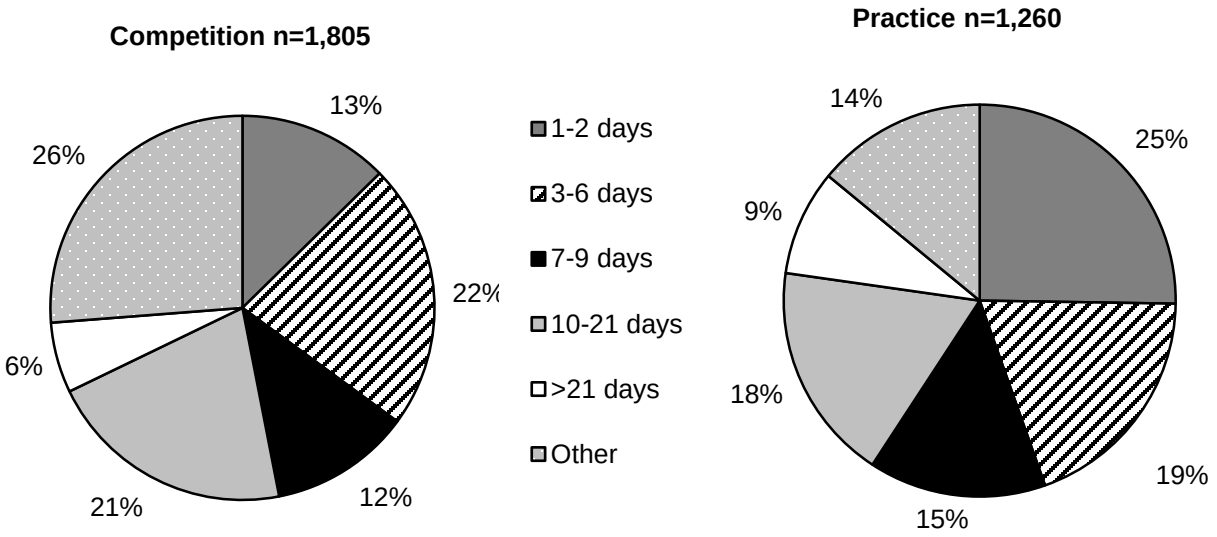
†Totals and n's are not always equal due to slight rounding or missing responses.

Table 3.4 Ten Most Common Football Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition n=1,801		Practice n=1,259		Total n=3,060	
	n	%	n	%	n	%
Diagnosis						
Head/face concussion	433	24.0%	240	19.1%	673	22.0%
Ankle strain/sprain	244	13.5%	153	12.2%	397	13.0%
Knee strain/sprain	165	9.2%	81	6.4%	246	8.0%
Hip/thigh/upper leg strain/sprain	60	3.3%	100	7.9%	160	5.2%
Hand/wrist fracture	79	4.4%	51	4.1%	130	4.2%
Shoulder other	74	4.1%	54	4.3%	128	4.2%
Knee other	56	3.1%	68	5.4%	124	4.1%
Shoulder strain/sprain	83	4.6%	41	3.3%	124	4.1%
Hand/wrist strain/sprain	47	2.6%	52	4.1%	99	3.2%
Knee contusion	50	2.8%	25	2.0%	75	2.5%

†Totals and n's are not always equal due to slight rounding or missing responses.

Figure 3.2 Time Loss of Football Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year



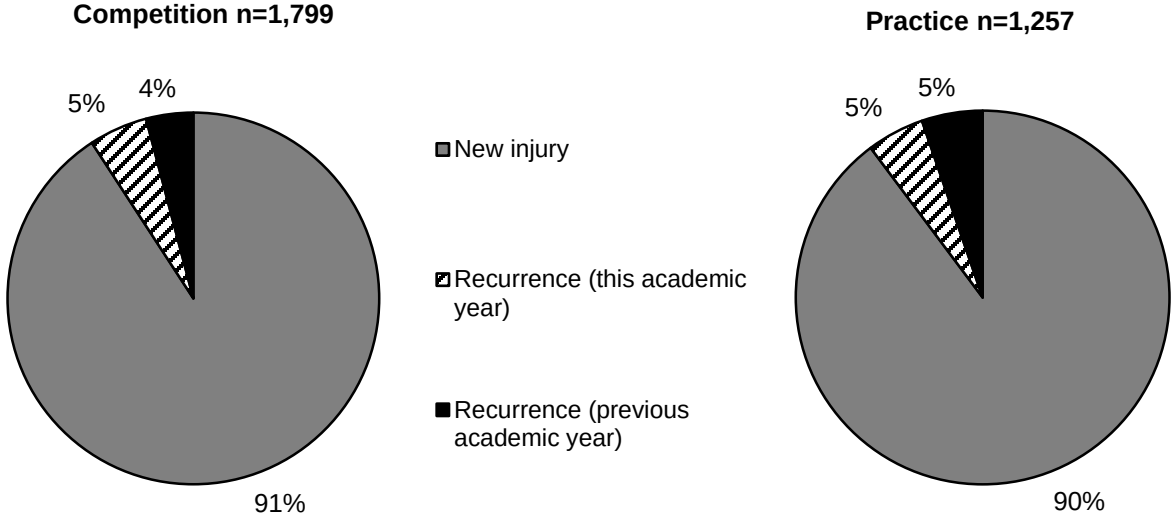
*Other category is made up of medical disqualification for season, medical disqualification for career, athlete chooses not to continue, and season ended before athlete returned to play

Table 3.5 Football Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	136	7.6%	70	5.4%	206	6.8%
Did not require surgery	1,651	92.4%	1,184	94.4%	2,835	93.2%
Total	**1,787**	**100.0%**	**1,254**	**100.0%**	**3,041**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Figure 3.3 History of Football Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year



† An answer of "unknown" was selected 0.1%.

Table 3.6 Time during Season of Football Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Season		
Preseason	674	22.0%
Regular season	2290	74.8%
Post season	94	3.1%
Unknown	3	0.1%
Total	**3,061**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 3.7 Competition-Related Variables for Football Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Competition		
Pre-competition/warm-ups	19	1.2%
First quarter	188	11.6%
Second quarter	473	29.3%
Third quarter	538	33.3%
Fourth quarter	397	24.6%
Overtime	2	0.1%
Total	**1,617**	**100.0%**
Field Location		
Between the 20 yard lines	1,019	61.3%
Red zone (20 yard line to goal line)	243	14.6%
End zone	24	1.4%
Off the field	8	0.5%
Unknown	369	22.2%
Total	**1,663**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 3.8 Practice-Related Variables for Football Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Practice		
First 1/2 hour	88	7.2%
Second 1/2 hour	177	14.4%
1-2 hours into practice	632	51.5%
>2 hours into practice	109	8.9%
Unknown	222	18.1%
Total	**1,228**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Figure 3.4 Player Position of Football Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

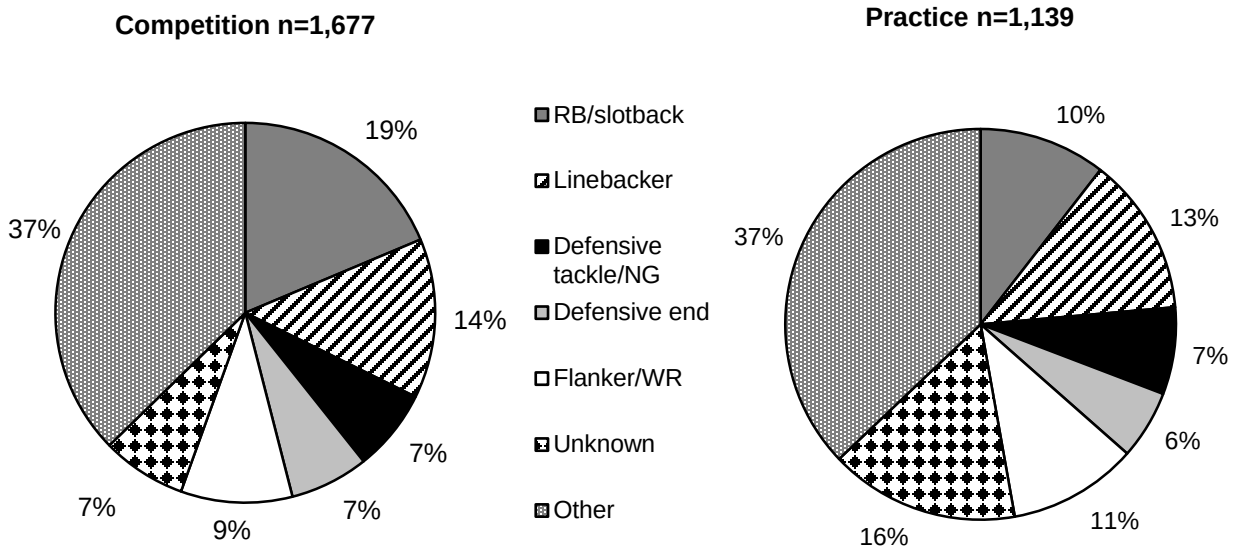


Table 3.9 Activities Leading to Football Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Activity						
Being tackled	559	33.1%	191	16.6%	750	26.4%
Tackling	417	24.7%	196	17.0%	613	21.6%
Blocking	218	12.9%	173	15.0%	391	13.8%
Being blocked	121	7.2%	77	6.7%	198	7.0%
Stepped on/fell on/kicked	87	5.2%	70	6.1%	157	5.5%
N/a (e.g., overuse, heat illness, conditioning, etc.)	22	1.3%	108	9.4%	130	4.6%
Rotation around a planted foot/inversion	48	2.8%	52	4.5%	100	3.5%
Uneven playing surface	4	0.2%	28	2.4%	32	1.1%
Contact with ball	10	0.6%	17	1.5%	27	1.0%
Contact with blocking sled/dummy	0	0.0%	12	1.0%	12	0.4%
Other	40	2.4%	79	6.9%	119	4.2%
Unknown	163	9.7%	149	12.9%	312	11.0%
Total	**1,689**	**100.0%**	**1,152**	**100.0%**	**2,841**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 3.10 Activity Resulting in Football Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
	n	%	n	%	n	%	n	%	n	%
Activity										
Being tackled	289	25.8%	117	32.9%	86	31.9%	176	28.0%	81	17.6%
Tackling	179	16.0%	73	20.5%	65	24.1%	182	28.9%	114	24.8%
Blocking	173	15.4%	43	12.1%	30	11.1%	95	15.1%	49	10.7%
Being blocked	58	5.2%	41	11.5%	11	4.1%	64	10.2%	24	5.2%
Stepped on/fell on/kicked	79	7.0%	35	9.8%	24	8.9%	3	0.5%	15	3.3%
Other	224	20.0%	13	3.7%	32	11.9%	20	3.2%	130	28.3%
Unknown	120	10.7%	34	9.6%	22	8.1%	89	14.1%	47	10.2%
Total	**1,122**	**100.0%**	**356**	**100.0%**	**270**	**100.0%**	**629**	**100.0%**	**460**	**100.0%**

IV. Boys' Soccer Injury Epidemiology

Table 4.1 Boys' Soccer Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	**589**	**300,226**	**1.96**
Competition	370	89,004	4.16
Practice	219	211,222	1.04

Table 4.2 Demographic Characteristics of Injured Boys' Soccer Athletes, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year*

Year in School	**n=563**
Freshman	22.0%
Sophomore	22.0%
Junior	25.2%
Senior	30.7%
Total†	**100.0%**
Age (years)	
Minimum	13
Maximum	19
Mean (St. Dev.)	15.9 (1.3)
BMI	
Minimum	15.2
Maximum	32.1
Mean (St. Dev.)	22.8 (3.4)

*All analyses in this report present data un-weighted
†Throughout this report, totals and n's represent the total un-weighted numbers 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, 2017-18 School Year

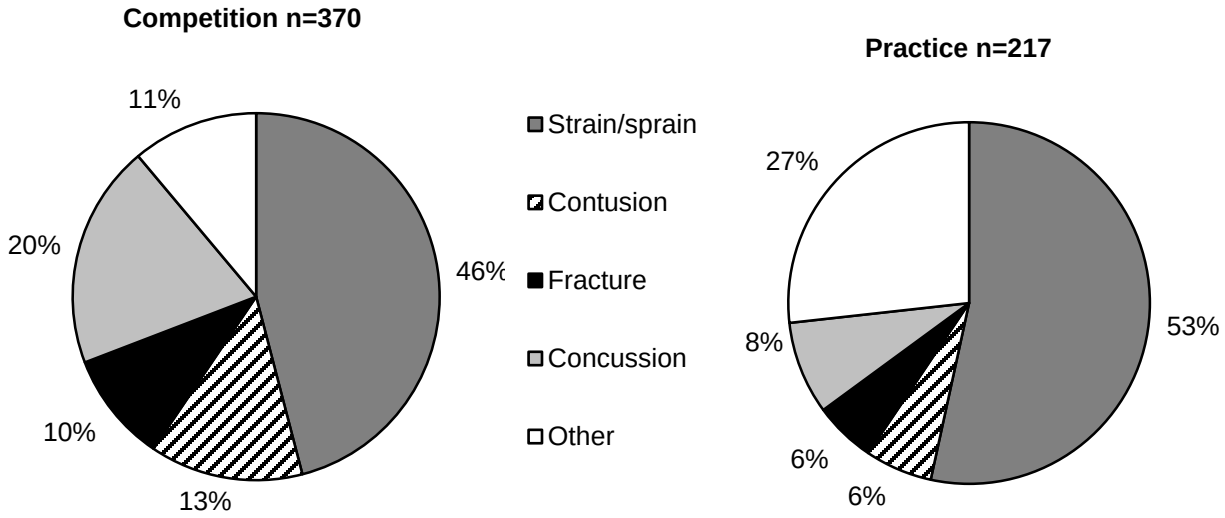


Table 4.3 Body Site of Boys' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition		Practice		Overall	
	n	**%**	**n**	**%**	**n**	**%**
Body Site						
Hip/thigh/upper leg	69	18.6%	55	25.1%	124	21.1%
Head/face	91	24.6%	21	9.6%	112	19.0%
Ankle	69	18.6%	42	19.2%	111	18.8%
Knee	44	11.9%	39	17.8%	83	14.1%
Lower leg	27	7.3%	20	9.1%	47	8.0%
Hand/wrist	20	5.4%	6	2.7%	26	4.4%
Foot	14	3.8%	12	5.5%	26	4.4%
Trunk	13	3.5%	11	5.0%	24	4.1%
Arm/elbow	7	1.9%	6	2.7%	13	2.2%
Shoulder	8	2.2%	3	1.4%	11	1.9%
Neck	1	0.3%	0	0.0%	1	0.2%
Other	7	1.9%	4	1.8%	11	1.9%
Total	**370**	**100.0%**	**219**	**100.0%**	**589**	**100.0%**

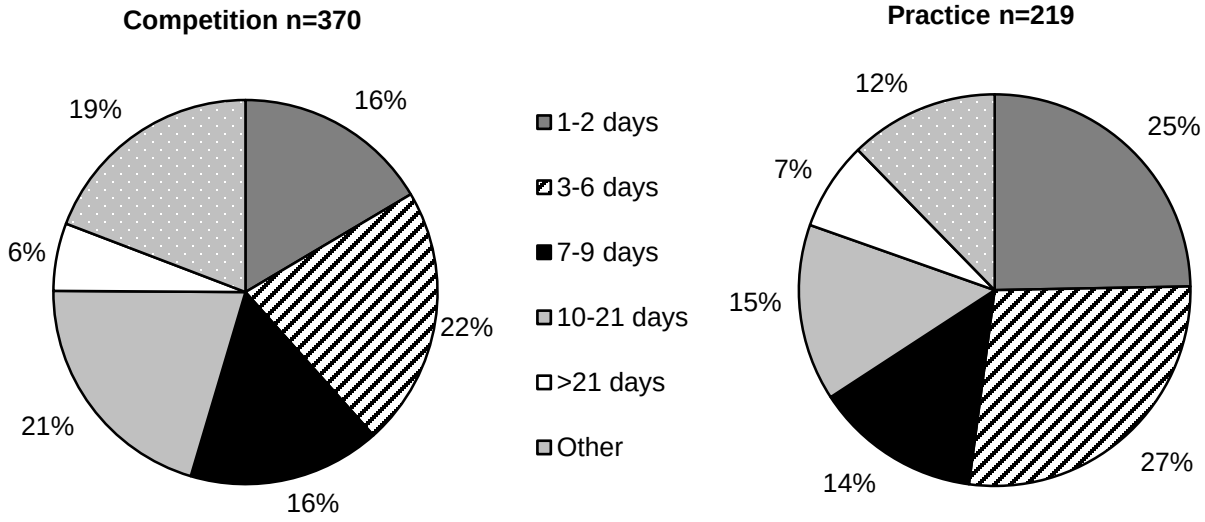
†Totals and n's are not always equal due to slight rounding or missing responses.

Table 4.4 Ten Most Common Boys' Soccer Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition n=387		Practice n=225		Total n=612	
	n	%	n	%	n	%
Diagnosis						
Hip/thigh/upper leg strain/sprain	53	13.7%	49	21.8%	102	16.7%
Ankle strain/sprain	62	16.0%	39	17.3%	101	16.5%
Head/face concussion	76	19.6%	19	8.4%	95	15.5%
Knee strain/sprain	25	6.5%	10	4.4%	35	5.7%
Knee other	12	3.1%	23	10.2%	35	5.7%
Lower leg other	7	1.8%	11	4.9%	18	2.9%
Hip/thigh/upper leg contusion	16	4.1%	2	0.9%	18	2.9%
Lower leg strain/sprain	8	2.1%	8	3.6%	16	2.6%
Trunk strain/sprain	12	3.1%	4	1.8%	16	2.6%
Hand/wrist fracture	13	3.4%	2	0.9%	15	2.5%

†Totals and n's are not always equal due to slight rounding or missing responses.

Figure 4.2 Time Loss of Boys' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 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, 2017-18 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	24	6.5%	6	2.8%	30	5.1%
Did not require surgery	343	93.5%	210	97.2%	553	94.9%
Total	**367**	**100.0%**	**216**	**100.0%**	**583**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Figure 4.3 History of Boys' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

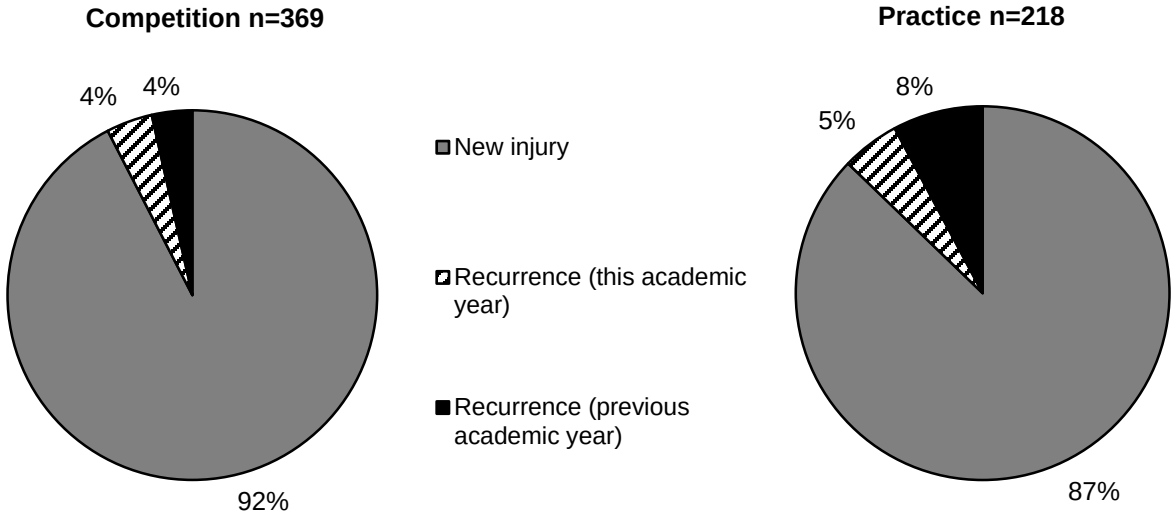


Table 4.6 Time during Season of Boys' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Season		
Preseason	128	21.7%
Regular season	439	74.5%
Post season	20	3.4%
Unknown	2	0.3%
Total	**589**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 4.7 Competition-Related Variables for Boys' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Competition		
Pre-competition/warm-ups	9	2.7%
First half	70	20.8%
Second half	179	53.3%
Overtime	2	0.6%
Unknown	76	22.6%
Total	**336**	**100.0%**
Field Location		
Top of goal box extended to center line (offense)	57	17.2%
Top of goal box extended to center line (defense)	50	15.1%
Goal box (defense)	44	13.3%
Goal box (offense)	29	8.7%
Side of goal box (defense)	15	4.5%
Side of goal box (offense)	14	4.2%
Off the field	6	1.8%
Unknown	117	35.2%
Total	**332**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 4.8 Practice-Related Variables for Boys' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Practice		
First 1/2 hour	16	7.5%
Second 1/2 hour	35	16.4%
1-2 hours into practice	97	45.5%
>2 hours into practice	10	4.7%
Unknown	55	25.8%
Total	**213**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Figure 4.4 Player Position of Boys' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

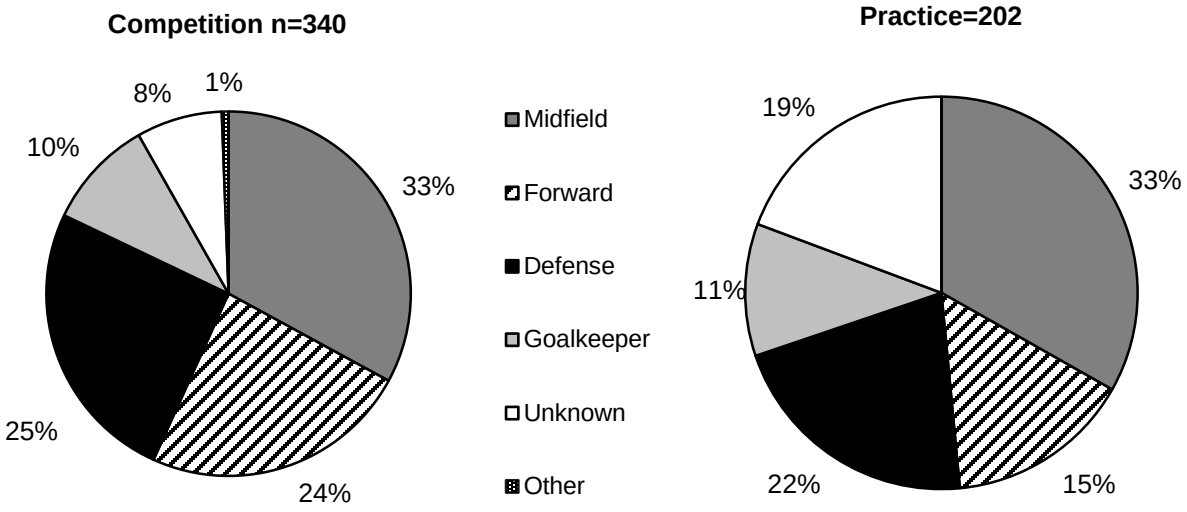


Table 4.9 Activities Leading to Boys' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition		Practice		Overall	
	n	**%**	**n**	**%**	**n**	**%**
Activity						
General play	65	19.2%	71	35.1%	136	25.2%
Defending	49	14.5%	14	6.9%	63	11.7%
Ball handling/dribbling	34	10.1%	15	7.4%	49	9.1%
Chasing loose ball	39	11.5%	8	4.0%	47	8.7%
Goaltending	30	8.9%	15	7.4%	45	8.3%
Shooting (foot)	20	5.9%	13	6.4%	33	6.1%
Heading ball	23	6.8%	4	2.0%	27	5.0%
Conditioning	0	0.0%	19	9.4%	19	3.5%
Passing (foot)	15	4.4%	3	1.5%	18	3.3%
Receiving pass	12	3.6%	5	2.5%	17	3.1%
Blocking shot	5	1.5%	2	1.0%	7	1.3%
Receiving a slide tackle	6	1.8%	0	0.0%	6	1.1%
Attempting a slide tackle	3	0.9%	2	1.0%	5	0.9%
Other	1	0.3%	4	2.0%	5	0.9%
Unknown	36	10.7%	27	13.4%	63	11.7%
Total	**338**	**100.0%**	**202**	**100.0%**	**540**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 4.10 Activity Resulting in Boys' Soccer Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
	n	%	n	%	n	%	n	%	n	%
Activity										
General play	72	27.3%	9	15.8%	10	21.7%	9	11.1%	34	37.8%
Defending	31	11.7%	7	12.3%	7	15.2%	14	17.3%	4	4.4%
Ball handling/dribbling	30	11.4%	4	7.0%	8	17.4%	2	2.5%	5	5.6%
Chasing loose ball	26	9.8%	8	14.0%	2	4.3%	6	7.4%	5	5.6%
Goaltending	13	4.9%	7	12.3%	5	10.9%	15	18.5%	5	5.6%
Other	61	23.1%	14	24.6%	9	19.6%	26	32.1%	27	30.0%
Unknown	31	11.7%	8	14.0%	5	10.9%	9	11.1%	10	11.1%
Total	**264**	**100.0%**	**57**	**100.0%**	**46**	**100.0%**	**81**	**100.0%**	**90**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

V. Girls' Soccer Injury Epidemiology

Table 5.1 Girls' Soccer Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	**664**	**243,188**	**2.73**
Competition	413	72,197	5.72
Practice	251	170,991	1.47

Table 5.2 Demographic Characteristics of Injured Girls' Soccer Athletes, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year*

Year in School	**n=650**
Freshman	26.3%
Sophomore	26.6%
Junior	24.9%
Senior	22.2%
Total†	**100.0%**
Age (years)	
Minimum	13
Maximum	19
Mean (St. Dev.)	15.8 (1.2)
BMI	
Minimum	16.0
Maximum	40.7
Mean (St. Dev.)	22.9 (4.0)

*All analyses in this report present un-weighted data
†Throughout this report, totals and n's represent the total un-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, 2017-18 School Year

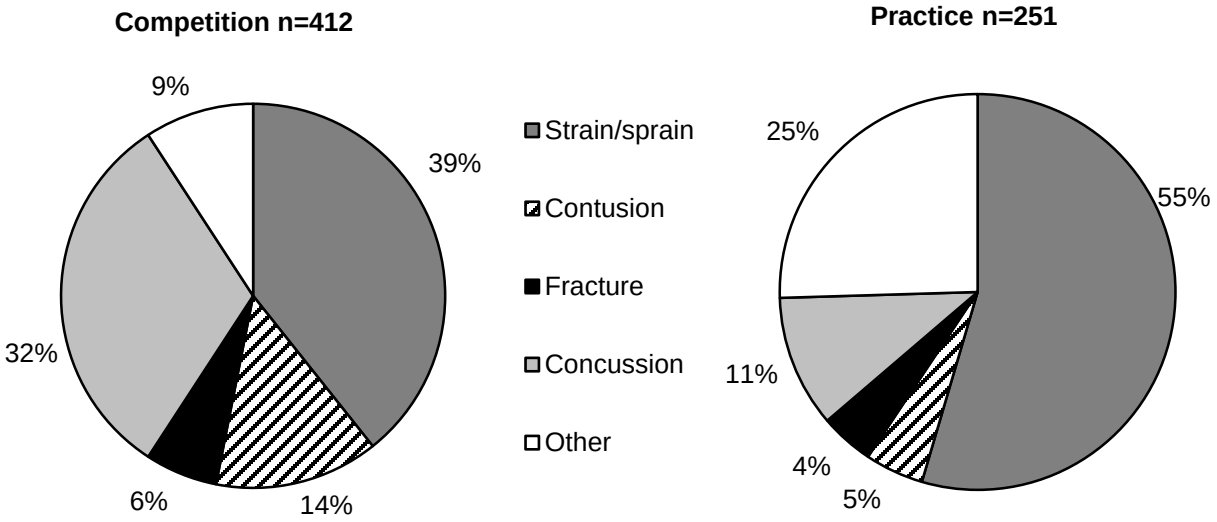


Table 5.3 Body Site of Girls' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition		Practice		Overall	
	n	**%**	**n**	**%**	**n**	**%**
Body Site						
Head/face	145	35.2%	28	11.2%	173	26.1%
Ankle	77	18.7%	55	21.9%	132	19.9%
Knee	70	17.0%	29	11.6%	99	14.9%
Hip/thigh/upper leg	34	8.3%	63	25.1%	97	14.6%
Lower leg	21	5.1%	24	9.6%	45	6.8%
Foot	27	6.6%	17	6.8%	44	6.6%
Hand/wrist	14	3.4%	10	4.0%	24	3.6%
Trunk	10	2.4%	11	4.4%	21	3.2%
Shoulder	3	0.7%	7	2.8%	10	1.5%
Arm/elbow	6	1.5%	1	0.4%	7	1.1%
Neck	3	0.7%	2	0.8%	5	0.8%
Other	2	0.5%	4	1.6%	6	0.9%
Total	**412**	**100.0%**	**251**	**100.0%**	**663**	**100.0%**

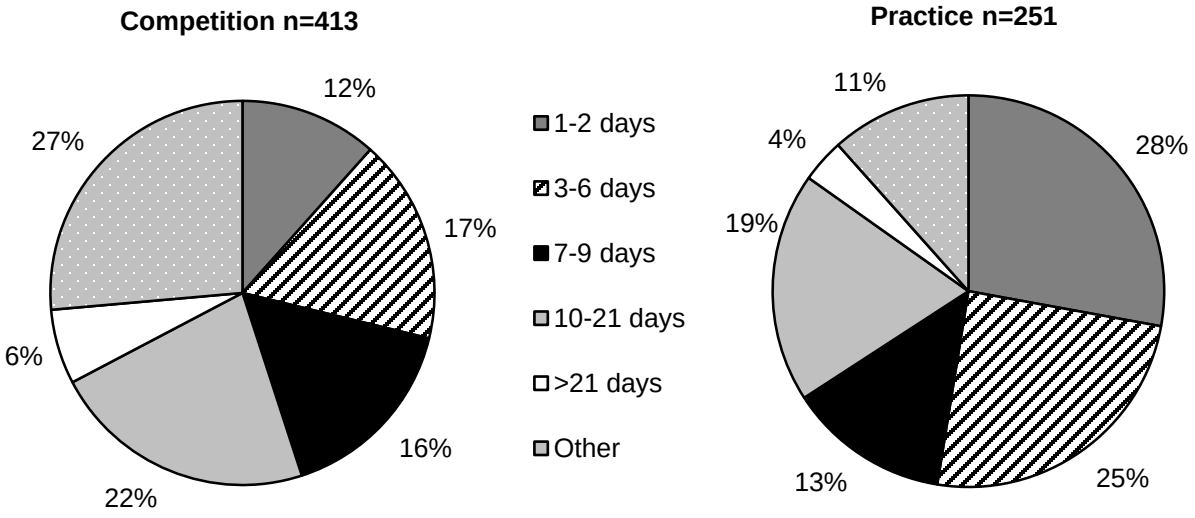
†Totals and n's are not always equal due to slight rounding or missing responses.

Table 5.4 Ten Most Common Girls' Soccer Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition n=411		Practice n=251		Total n=662	
	n	%	n	%	n	%
Diagnosis						
Head/face concussion	130	31.6%	27	10.8%	157	23.7%
Ankle strain/sprain	69	16.8%	51	20.3%	120	18.1%
Hip/thigh/upper leg strain/sprain	27	6.6%	53	21.1%	80	12.1%
Knee strain/sprain	39	9.5%	12	4.8%	51	7.7%
Knee other	19	4.6%	15	6.0%	34	5.1%
Lower leg other	3	0.7%	17	6.8%	20	3.0%
Foot contusion	17	4.1%	2	0.8%	19	2.9%
Knee contusion	10	2.4%	2	0.8%	12	1.8%
Hand/wrist strain/sprain	7	1.7%	5	2.0%	12	1.8%
Hand/wrist fracture	6	1.5%	5	2.0%	11	1.7%

†Totals and n's are not always equal due to slight rounding or missing responses.

Figure 5.2 Time Loss of Girls' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 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, 2017-18 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	27	6.6%	8	3.2%	35	5.3%
Did not require surgery	381	93.4%	241	96.8%	622	94.7%
Total	**408**	**100.0%**	**249**	**100.0%**	**657**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Figure 5.3 History of Girls' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

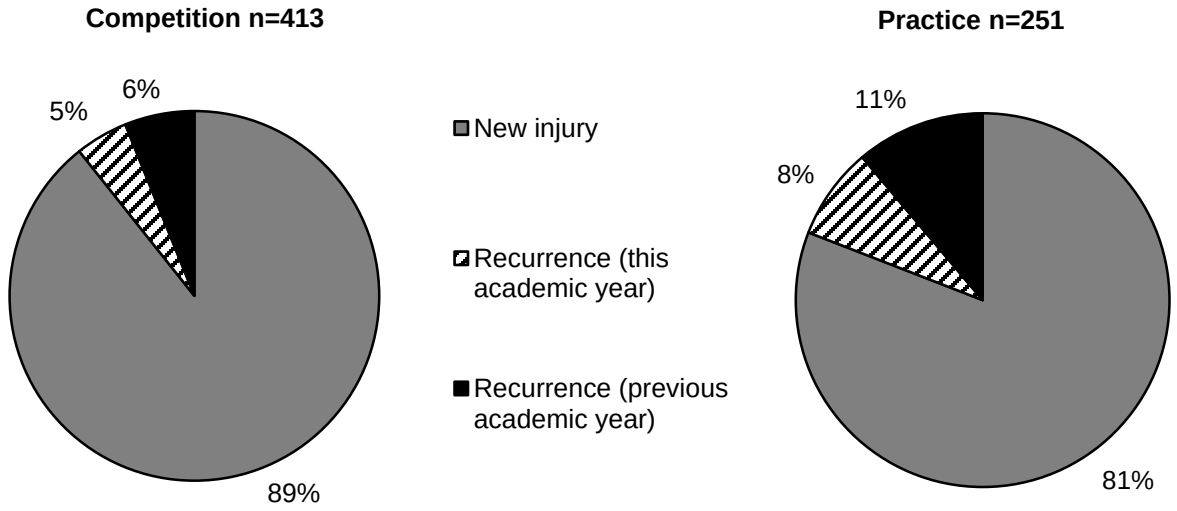


Table 5.6 Time during Season of Girls' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Season		
Preseason	145	21.9%
Regular season	486	73.3%
Post season	31	4.7%
Unknown	1	0.2%
Total	**663**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 5.7 Competition-Related Variables for Girls' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Competition		
Pre-competition/warm-ups	9	2.3%
First half	82	21.0%
Second half	210	53.7%
Overtime	2	0.5%
Unknown	88	22.5%
Total	**391**	**100.0%**
Field Location		
Top of goal box extended to center line (offense)	62	16.0%
Goal box (defense)	55	14.2%
Top of goal box extended to center line (defense)	43	11.1%
Goal box (offense)	27	7.0%
Side of goal box (offense)	19	4.9%
Side of goal box (defense)	15	3.9%
Off the field	5	1.3%
Unknown	161	41.6%
Total	**387**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 5.8 Practice-Related Variables for Girls' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Practice		
First 1/2 hour	22	8.9%
Second 1/2 hour	39	15.9%
1-2 hours into practice	102	41.5%
>2 hours into practice	9	3.7%
Unknown	74	30.1%
Total	**246**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Figure 5.4 Player Position of Girls' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

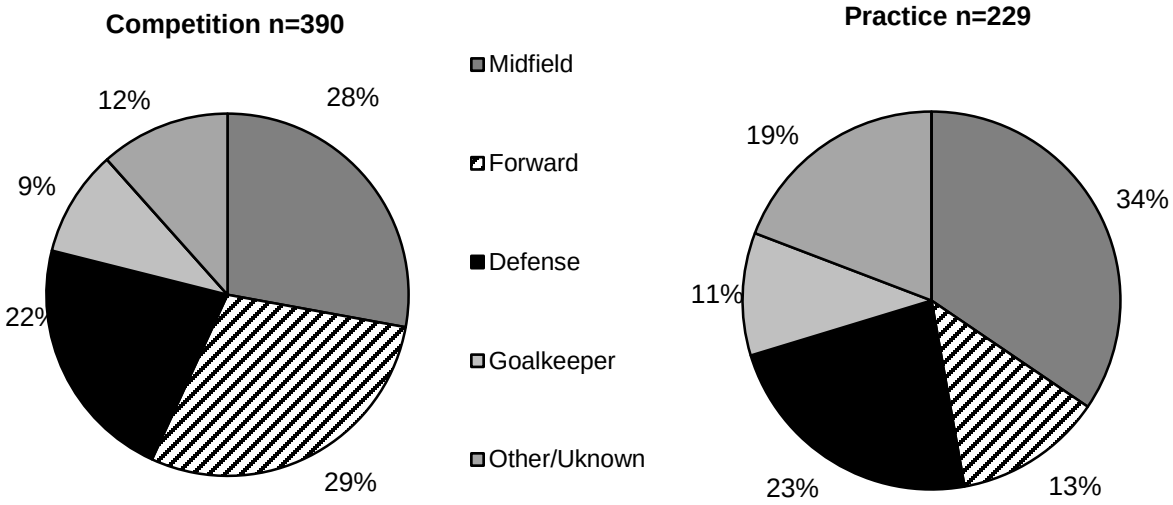


Table 5.9 Activities Leading to Girls' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Activity						
General play	75	19.2%	72	31.4%	147	23.7%
Defending	52	13.3%	20	8.7%	72	11.6%
Ball handling/dribbling	41	10.5%	12	5.2%	53	8.5%
Chasing loose ball	39	10.0%	11	4.8%	50	8.1%
Goaltending	26	6.6%	16	7.0%	42	6.8%
Heading ball	30	7.7%	1	0.4%	31	5.0%
Shooting (foot)	15	3.8%	15	6.6%	30	4.8%
Conditioning	1	0.3%	27	11.8%	28	4.5%
Passing (foot)	12	3.1%	7	3.1%	19	3.1%
Receiving pass	10	2.6%	7	3.1%	17	2.7%
Blocking shot	8	2.0%	7	3.1%	15	2.4%
Receiving a slide tackle	5	1.3%	1	0.4%	6	1.0%
Attempting a slide tackle	2	0.5%	0	0.0%	2	0.3%
Other	10	2.6%	2	0.9%	12	1.9%
Unknown	65	16.6%	31	13.5%	96	15.5%
Total	**391**	**100.0%**	**229**	**100.0%**	**620**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 5.10 Activity Resulting in Girls' Soccer Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
	n	%	n	%	n	%	n	%	n	%
Activity										
General play	67	24.2%	8	12.7%	9	25.7%	26	17.2%	37	39.4%
Defending	33	11.9%	8	12.7%	1	2.9%	24	15.9%	6	6.4%
Ball handling/dribbling	31	11.2%	7	11.1%	2	5.7%	8	5.3%	5	5.3%
Chasing loose ball	30	10.8%	5	7.9%	4	11.4%	9	6.0%	2	2.1%
Goaltending	17	6.1%	5	7.9%	5	14.3%	11	7.3%	4	4.3%
Other	61	22.0%	19	30.2%	11	31.4%	44	29.1%	25	26.6%
Unknown	38	13.7%	11	17.5%	3	8.6%	29	19.2%	15	16.0%
Total	**277**	**100.0%**	**63**	**100.0%**	**35**	**100.0%**	**151**	**100.0%**	**94**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

VI. Girls' Volleyball Injury Epidemiology

Table 6.1 Girls' Volleyball Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	**413**	**260,198**	**1.59**
Competition	181	88,284	2.05
Practice	232	171,914	1.35

Table 6.2 Demographic Characteristics of Injured Girls' Volleyball Athletes, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year*

Year in School	**n=390**
Freshman	26.7%
Sophomore	28.5%
Junior	21.3%
Senior	23.6%
Total†	**100.0%**
Age (years)	
Minimum	12
Maximum	18
Mean (St. Dev.)	15.6 (1.3)
BMI	
Minimum	16.7
Maximum	40.2
Mean (St. Dev.)	22.6 (3.7)

*All analyses in this report present un-weighted data.
†Throughout this report, totals and n's represent the total un-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, 2017-18 School Year

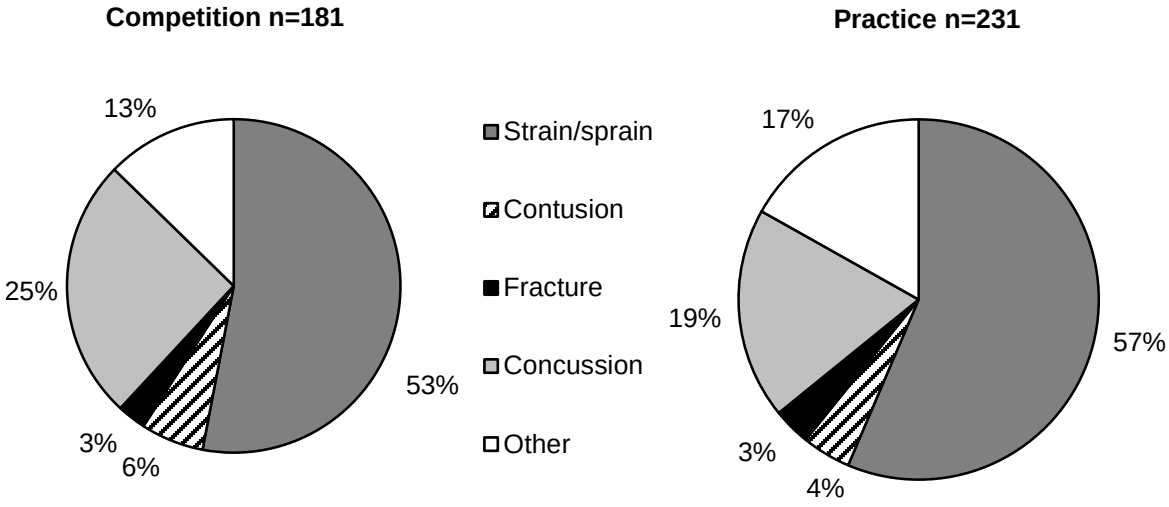


Table 6.3 Body Site of Girls' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

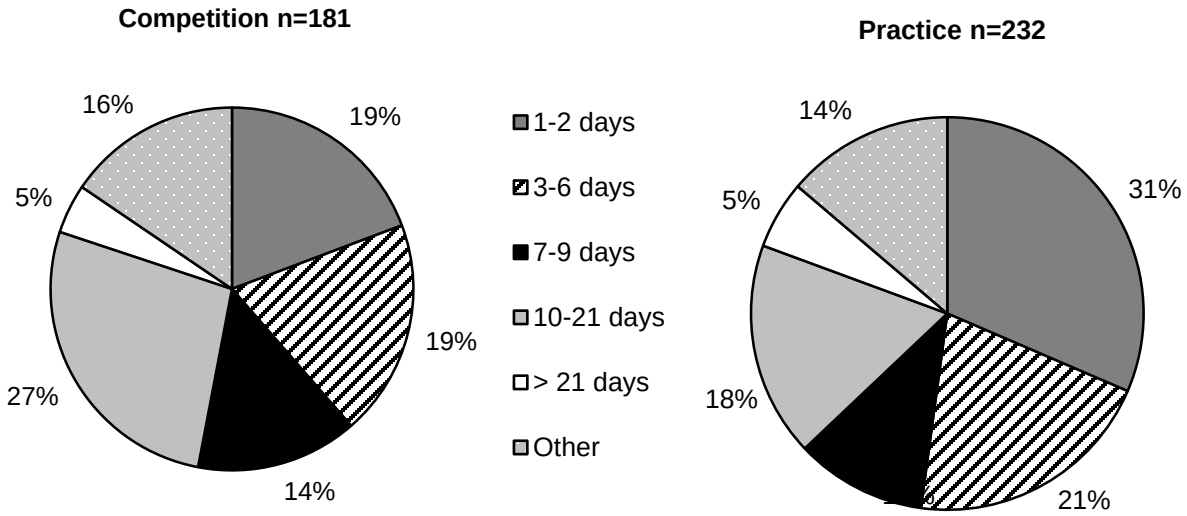
	Competition		Practice		Overall	
	n	**%**	**n**	**%**	**n**	**%**
Body Site						
Ankle	58	32.0%	69	29.7%	127	30.8%
Head/face	48	26.5%	44	19.0%	92	22.3%
Knee	19	10.5%	29	12.5%	48	11.6%
Hand/wrist	21	11.6%	21	9.1%	42	10.2%
Shoulder	7	3.9%	22	9.5%	29	7.0%
Trunk	9	5.0%	19	8.2%	28	6.8%
Hip/thigh/upper leg	8	4.4%	7	3.0%	15	3.6%
Lower leg	3	1.7%	5	2.2%	8	1.9%
Foot	3	1.7%	5	2.2%	8	1.9%
Arm/elbow	3	1.7%	4	1.7%	7	1.7%
Neck	0	0.0%	2	0.9%	2	0.5%
Other	2	1.1%	5	2.2%	7	1.7%
Total	**181**	**100.0%**	**232**	**100.0%**	**413**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 6.4 Ten Most Common Girls' Volleyball Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition n=181		Practice n=231		Total n=412	
	n	%	n	%	n	%
Diagnosis						
Ankle strain/sprain	54	29.8%	67	29.0%	121	29.4%
Head/face concussion	46	25.4%	39	16.9%	85	20.6%
Hand/wrist strain/sprain	15	8.3%	11	4.8%	26	6.3%
Knee other	7	3.9%	18	7.8%	25	6.1%
Knee strain/sprain	10	5.5%	10	4.3%	20	4.9%
Shoulder other	5	2.8%	13	5.6%	18	4.4%
Trunk strain/sprain	6	3.3%	8	3.5%	14	3.4%
Trunk other	3	1.7%	10	4.3%	13	3.2%
Shoulder strain/sprain	1	0.6%	9	3.9%	10	2.4%
Hip/thigh/upper leg strain/sprain	6	3.3%	4	1.7%	10	2.4%

Figure 6.2 Time Loss of Girls' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 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, 2017-18 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	7	3.9%	5	2.2%	12	2.9%
Did not require surgery	173	96.1%	223	97.8%	396	97.1%
Total	**180**	**100.0%**	**228**	**100.0%**	**408**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Figure 6.3 History of Girls' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

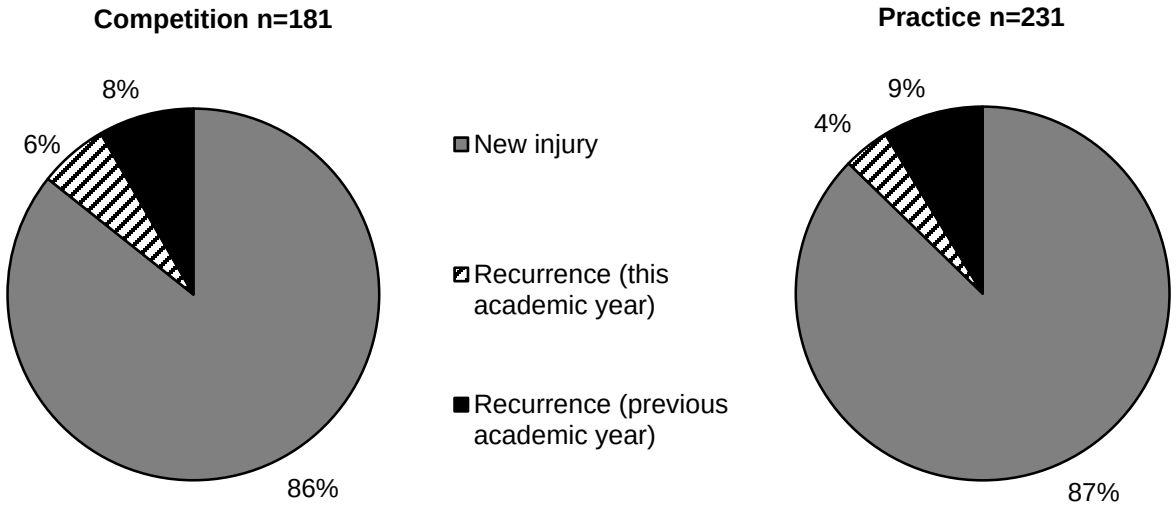


Table 6.6 Time during Season of Girls' Volleyball Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Season		
Preseason	94	22.8%
Regular season	310	75.1%
Post season	8	1.9%
Unknown	4	0.2%
Total	**413**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 6.7 Competition-Related Variables for Girls' Volleyball Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Competition		
Pre-competition/warm-ups	22	13.1%
First set	7	4.2%
Second set	44	26.2%
Third set	31	18.5%
Fourth set	9	5.4%
Fifth set	2	1.2%
Unknown	53	31.5%
Total	**168**	**100.0%**
Court Location		
middle forward	27	16.7%
right forward	22	13.6%
left forward	14	8.6%
at the net	10	6.2%
right back (server)	8	4.9%
left back	8	4.9%
outside the playable area	5	3.1%
outside court (opponents side)	3	1.9%
outside court (your side)	2	1.2%
Unknown	63	38.9%
Total	**162**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 6.8 Practice-Related Variables for Girls' Volleyball Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Practice		
First 1/2 hour	19	8.6%
Second 1/2 hour	31	14.0%
1-2 hours into practice	100	45.0%
>2 hours into practice	21	9.5%
Unknown	51	23.0%
Total	**222**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Figure 6.4 Player Position of Girls' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

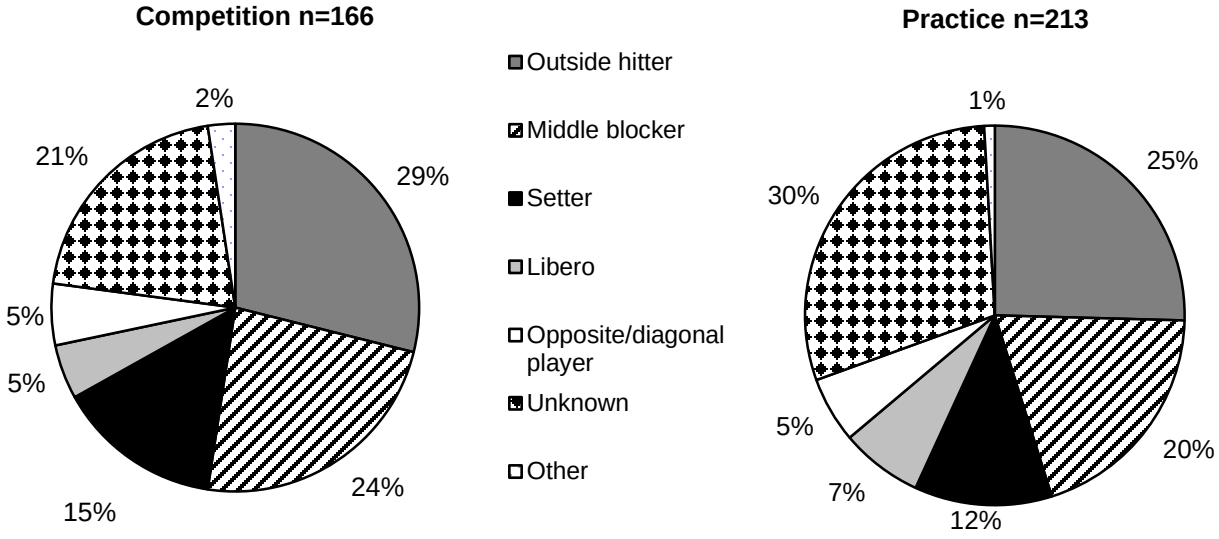


Table 6.9 Activities Leading to Girls' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Activity						
General play	31	18.3%	58	27.8%	89	23.5%
Blocking	35	20.7%	28	13.4%	63	16.7%
Digging	30	17.8%	28	13.4%	58	15.3%
Spiking	17	10.1%	12	5.7%	29	7.7%
Passing	8	4.7%	11	5.3%	19	5.0%
Serving	4	2.4%	14	6.7%	18	4.8%
Setting	8	4.7%	8	3.8%	16	4.2%
Conditioning	0	0.0%	7	3.3%	7	1.9%
Other	9	5.3%	9	4.3%	18	4.8%
Unknown	27	16.0%	34	16.3%	61	16.1%
Total	**169**	**100.0%**	**209**	**100.0%**	**378**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 6.10 Activity Resulting in Girls' Volleyball Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
	n	%	n	%	n	%	n	%	n	%
Activity										
General play	40	20.6%	4	23.5%	2	16.7%	20	25.0%	23	31.1%
Blocking	53	27.3%	0	0.0%	3	25.0%	4	5.0%	3	4.1%
Digging	22	11.3%	9	52.9%	1	8.3%	20	25.0%	6	8.1%
Spiking	19	9.8%	0	0.0%	1	8.3%	2	2.5%	7	9.5%
Serving	12	6.2%	0	0.0%	0	0.0%	3	3.8%	3	4.1%
Passing	10	5.2%	0	0.0%	3	25.0%	3	3.8%	2	2.7%
Other	17	8.8%	3	17.6%	1	8.3%	12	15.0%	8	10.8%
Unknown	21	10.8%	1	5.9%	1	8.3%	16	20.0%	22	29.7%
Total	**194**	**100.0%**	**17**	**100.0%**	**12**	**100.0%**	**80**	**100.0%**	**74**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

VII. Boys' Basketball Injury Epidemiology

Table 7.1 Boys' Basketball Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	**584**	**329,310**	**1.77**
Competition	312	101,184	3.08
Practice	272	228,126	1.19

Table 7.2 Demographic Characteristics of Injured Boys' Basketball Athletes, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year*

Year in School	**n=561**
Freshman	21.2%
Sophomore	26.9%
Junior	26.4%
Senior	25.5%
Total†	**100.0%**
Age (years)	
Minimum	13
Maximum	20
Mean (St. Dev.)	16.1 (1.3)
BMI	
Minimum	15.6
Maximum	37.9
Mean (St. Dev.)	23.0 (3.5)

*All analyses in this report present un-weighted data.
†Throughout this report, totals and n's represent the total un-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, 2017-18 School Year

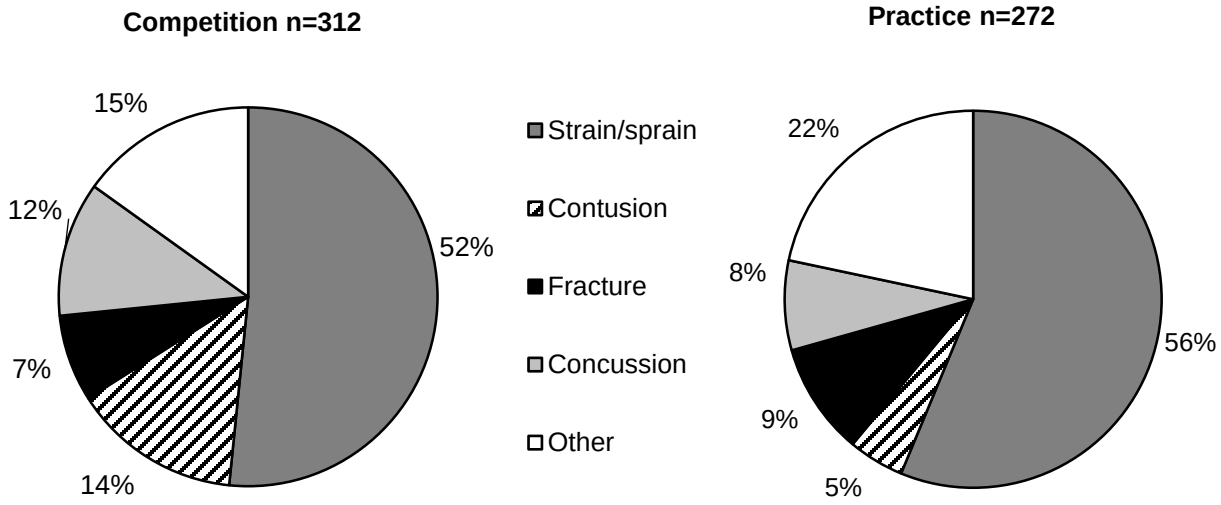


Table 7.3 Body Site of Boys' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition		Practice		Overall	
	n	**%**	**n**	**%**	**n**	**%**
Body Site						
Ankle	103	33.0%	98	36.0%	201	34.4%
Head/face	62	19.9%	35	12.9%	97	16.6%
Knee	47	15.1%	33	12.1%	80	13.7%
Hand/wrist	29	9.3%	30	11.0%	59	10.1%
Hip/thigh/upper leg	24	7.7%	22	8.1%	46	7.9%
Trunk	13	4.2%	15	5.5%	28	4.8%
Lower leg	9	2.9%	14	5.1%	23	3.9%
Foot	7	2.2%	10	3.7%	17	2.9%
Shoulder	6	1.9%	5	1.8%	11	1.9%
Arm/elbow	7	2.2%	3	1.1%	10	1.7%
Neck	3	1.0%	1	0.4%	4	0.7%
Other	2	0.6%	6	2.2%	8	1.4%
Total	**312**	**100.0%**	**272**	**100.0%**	**584**	**100.0%**

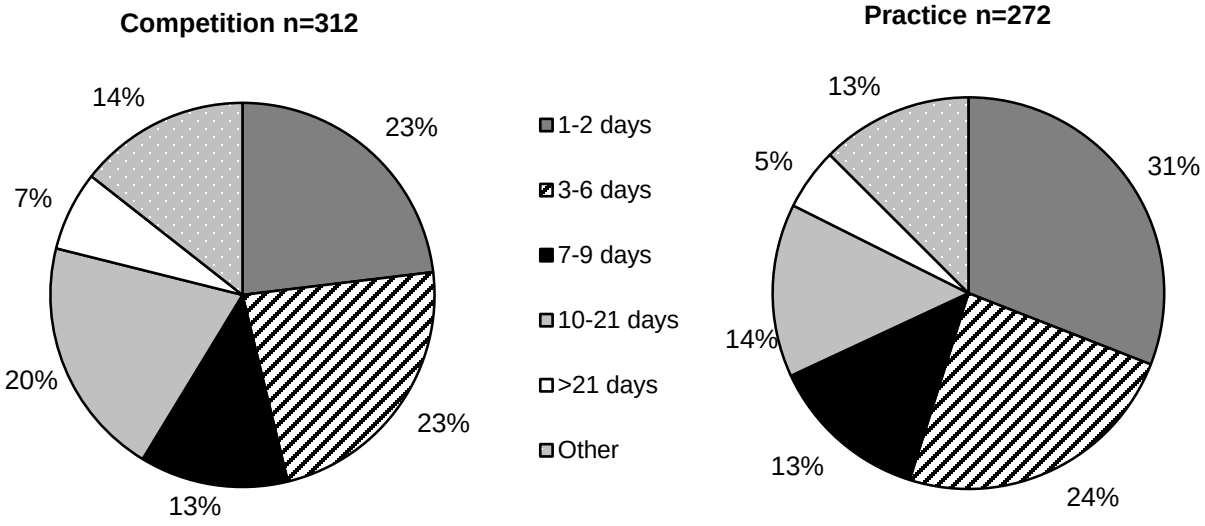
†Totals and n's are not always equal due to slight rounding or missing responses.

Table 7.4 Ten Most Common Boys' Basketball Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition n=312		Practice n=272		Total n=584	
	n	%	n	%	n	%
Diagnosis						
Ankle strain/sprain	102	32.7%	93	34.2%	195	33.4%
Head/face Concussion	36	11.5%	21	7.7%	57	9.8%
Knee strain/sprain	23	7.4%	12	4.4%	35	6.0%
Knee other	12	3.8%	16	5.9%	28	4.8%
Hand/wrist fracture	10	3.2%	12	4.4%	22	3.8%
Head/face other	14	4.5%	8	2.9%	22	3.8%
Hip/thigh/upper leg strain/sprain	6	1.9%	15	5.5%	21	3.6%
Hand/wrist strain/sprain	10	3.2%	11	4.0%	21	3.6%
Hip/thigh/upper leg contusion	17	5.4%	3	1.1%	20	3.4%
Knee contusion	11	3.5%	4	1.5%	15	2.6%

†Totals and n's are not always equal due to slight rounding or missing responses.

Figure 7.2 Time Loss of Boys' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 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, 2017-18 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	22	7.2%	12	4.5%	34	5.9%
Did not require surgery	285	92.8%	257	95.5%	542	94.1%
Total	**307**	**100.0%**	**269**	**100.0%**	**576**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Figure 7.3 History of Boys' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

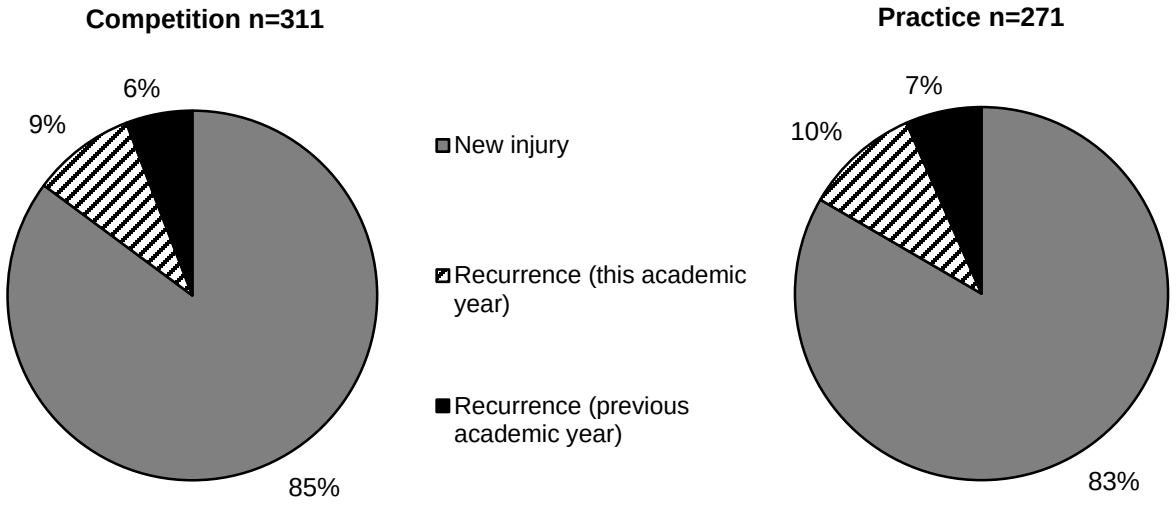


Table 7.6 Time during Season of Boys' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Season		
Preseason	105	18.0%
Regular season	462	79.1%
Post season	17	2.9%
Total	**584**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 7.7 Competition-Related Variables for Boys' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Competition		
Pre-competition-warm-ups	9	3.1%
First quarter	26	8.8%
Second quarter	76	25.8%
Third quarter	64	21.7%
Fourth quarter	47	15.9%
Overtime	0	0.0%
Unknown	73	24.7%
Total	**295**	**100.0%**
Court Location		
Inside lane (defense)	66	22.4%
Inside lane (offense)	49	16.6%
Between 3 pt arc and lane (offense)	25	8.5%
Outside 3 point arc - defense	13	4.4%
Between 3 pt arc and lane (defense)	12	4.1%
Outside 3 point arc - offense	11	3.7%
Out of bounds	9	3.1%
Backcourt	5	1.7%
Off the court	4	1.4%
Unknown	101	34.2%
Total	**295**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 7.8 Practice-Related Variables for Boys' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Practice		
First 1/2 hour	21	7.8%
Second 1/2 hour	43	16.0%
1-2 hours into practice	128	47.6%
>2 hours into practice	16	5.9%
Unknown	61	22.7%
Total	**269**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Figure 7.4 Player Position of Boys' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

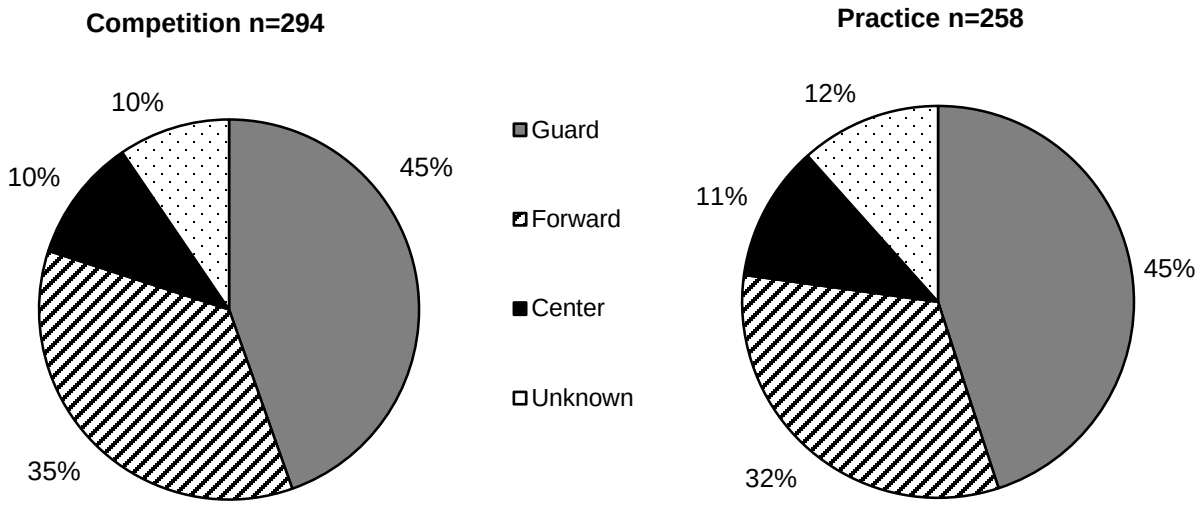


Table 7.9 Activities Leading to Boys' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Activity						
Rebounding	72	24.2%	51	19.8%	123	22.2%
General play	38	12.8%	74	28.8%	112	20.2%
Defending	42	14.1%	21	8.2%	63	11.4%
Shooting	32	10.8%	24	9.3%	56	10.1%
Chasing loose ball	30	10.1%	20	7.8%	50	9.0%
Ball Handling/dribbling	19	6.4%	7	2.7%	26	4.7%
Receiving pass	11	3.7%	10	3.9%	21	3.8%
Conditioning	0	0.0%	7	2.7%	7	1.3%
Passing	1	0.3%	1	0.4%	2	0.4%
Screening	1	0.3%	0	0.0%	1	0.2%
Other	4	1.3%	6	2.3%	10	1.8%
Unknown	47	15.8%	36	14.0%	83	15.0%
Total	**297**	**100.0%**	**257**	**100.0%**	**554**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 7.10 Activity Resulting in Boys' Basketball Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
	n	%	n	%	n	%	n	%	n	%
Activity										
Rebounding	75	25.3%	12	20.7%	13	28.3%	8	14.8%	15	15.2%
General play	59	19.9%	9	15.5%	5	10.9%	9	16.7%	30	30.3%
Defending	34	11.4%	5	8.6%	5	10.9%	8	14.8%	11	11.1%
Shooting	29	9.8%	8	13.8%	7	15.2%	3	5.6%	9	9.1%
Chasing loose ball	21	7.1%	7	12.1%	5	10.9%	10	18.5%	7	7.1%
Ball handling/dribbling	15	5.1%	3	5.2%	1	2.2%	2	3.7%	5	5.1%
Receiving pass	8	2.7%	2	3.4%	5	10.9%	0	0.0%	6	6.1%
Conditioning	3	1.0%	0	0.0%	1	2.2%	0	0.0%	3	3.0%
Passing	0	0.0%	1	1.7%	1	2.2%	0	0.0%	0	0.0%
Screening	0	0.0%	0	0.0%	0	0.0%	1	1.9%	0	0.0%
Other	8	2.7%	0	0.0%	0	0.0%	1	1.9%	1	1.0%
Unknown	45	15.2%	11	19.0%	3	6.5%	12	22.2%	12	12.1%
Total	**297**	**100.0%**	**58**	**100.0%**	**46**	**100.0%**	**54**	**100.0%**	**99**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

VIII. Girls' Basketball Injury Epidemiology

Table 8.1 Girls' Basketball Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	**529**	**238,934**	**2.21**
Competition	308	75,434	4.08
Practice	221	163,500	1.35

Table 8.2 Demographic Characteristics of Injured Girls' Basketball Athletes, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year*

Year in School	**n=505**
Freshman	24.0%
Sophomore	29.3%
Junior	25.1%
Senior	21.6%
Total†	**100.0%**
Age (years)	
Minimum	12
Maximum	119
Mean (St. Dev.)	15.7 (1.3)
BMI	
Minimum	14.8
Maximum	43.0
Mean (St. Dev.)	22.7 (3.8)

*All analyses in this report present un-weighted data.
†Throughout this report, totals and n's represent the total un-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, 2017-18 School Year

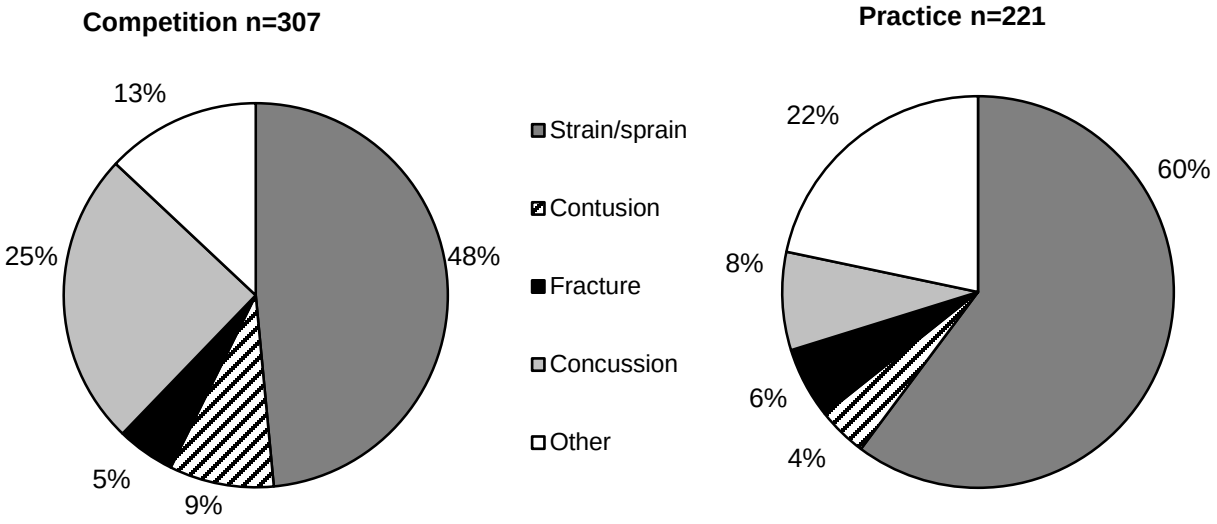


Table 8.3 Body Site of Girls' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

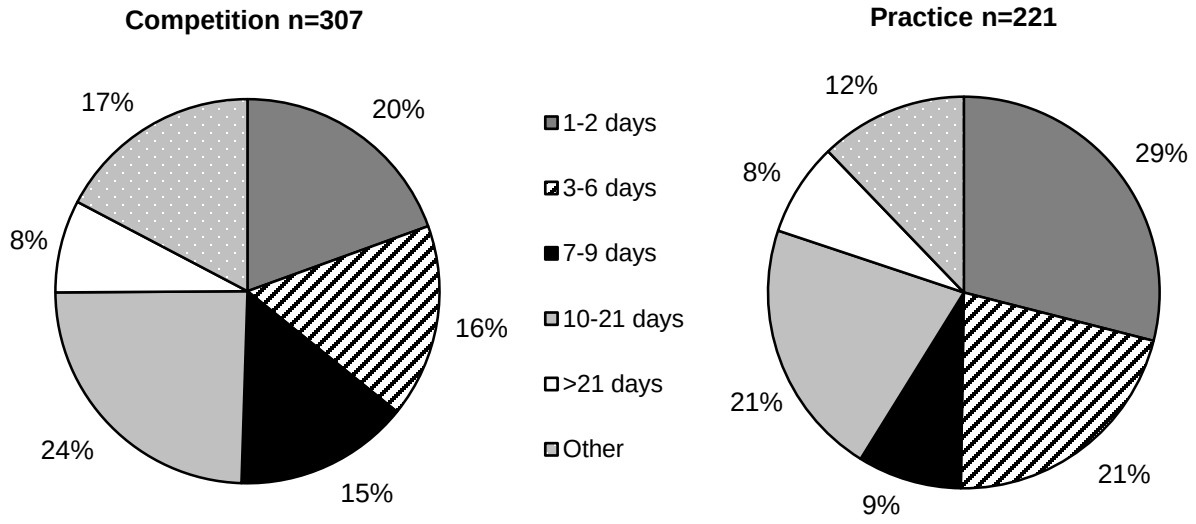
	Competition		Practice		Overall	
	n	%	n	%	n	%
Body Site						
Ankle	95	30.9%	74	33.5%	169	32.0%
Head/face	82	26.7%	22	10.0%	104	19.7%
Knee	43	14.0%	39	17.6%	82	15.5%
Hand/wrist	30	9.8%	17	7.7%	47	8.9%
Hip/thigh/upper leg	6	2.0%	24	10.9%	30	5.7%
Trunk	7	2.3%	20	9.0%	27	5.1%
Lower leg	9	2.9%	14	6.3%	23	4.4%
Shoulder	11	3.6%	4	1.8%	15	2.8%
Foot	9	2.9%	4	1.8%	13	2.5%
Arm/elbow	7	2.3%	2	0.9%	9	1.7%
Neck	2	0.7%	0	0.0%	2	0.4%
Other	6	2.0%	1	0.5%	7	1.3%
Total	**307**	**100.0%**	**221**	**100.0%**	**528**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 8.4 Ten Most Common Girls' Basketball Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition n=307		Practice n=221		Total n=528	
	n	%	n	%	n	%
Diagnosis						
Ankle strain/sprain	93	30.3%	68	30.8%	161	30.5%
Head/face concussion	74	24.1%	18	8.1%	92	17.4%
Knee strain/sprain	23	7.5%	16	7.2%	39	7.4%
Knee other	14	4.6%	18	8.1%	32	6.1%
Hip/thigh/upper leg strain/sprain	2	0.7%	22	10.0%	24	4.5%
Hand/wrist strain/sprain	17	5.5%	7	3.2%	24	4.5%
Hand/wrist fracture	7	2.3%	9	4.1%	16	3.0%
Lower leg other	6	2.0%	10	4.5%	16	3.0%
Trunk strain/sprain	3	1.0%	12	5.4%	15	2.8%
Knee contusion	5	1.6%	4	1.8%	9	1.7%

Figure 8.2 Time Loss of Girls' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 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, 2017-18 School Year

	Competition		Practice		Overall	
	n	%	n	%	N	%
Need for surgery						
Required surgery	19	6.2%	11	5.0%	30	5.7%
Did not require surgery	285	93.8%	210	95.0%	495	94.3%
Total	**304**	**100.0%**	**221**	**100.0%**	**525**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Figure 8.3 History of Girls' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

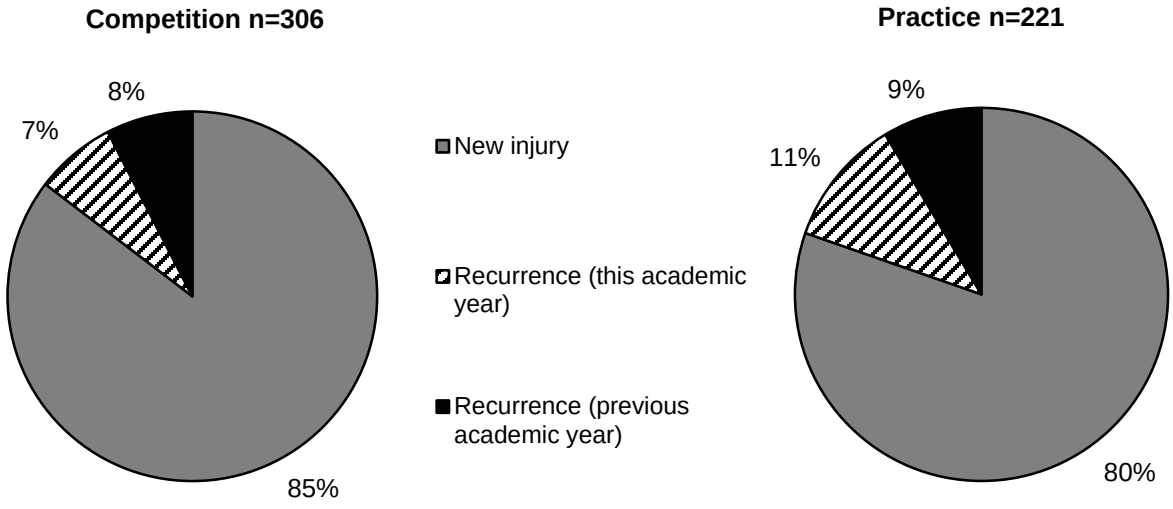


Table 8.6 Time during Season of Girls' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Season		
Preseason	104	19.8%
Regular season	398	75.7%
Post season	24	4.6%
Total	**526**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 8.7 Competition-Related Variables for Girls' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Competition		
Pre-competition/Warm-ups	10	3.5%
First quarter	23	8.2%
Second quarter	52	18.4%
Third quarter	71	25.2%
Fourth quarter	76	27.0%
Unknown	50	17.7%
Total	**282**	**100.0%**
Court Location		
Inside lane (defense)	62	21.9%
Inside lane (offense)	37	13.1%
Between 3 pt arc and lane (offense)	25	8.8%
Outside 3 point arc - defense	22	7.8%
Between 3 pt arc and lane (defense)	20	7.1%
Outside 3 point arc - offense	17	6.0%
Backcourt	12	4.2%
Out of bounds	4	1.4%
Off the court	3	1.1%
Unknown	81	28.6%
Total	**283**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 8.8 Practice-Related Variables for Girls' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Practice		
First 1/2 hour	21	9.7%
Second 1/2 hour	36	16.6%
1-2 hours into practice	103	47.5%
>2 hours into practice	14	6.5%
Unknown	43	19.8%
Total	**217**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Figure 8.4 Player Position of Girls' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

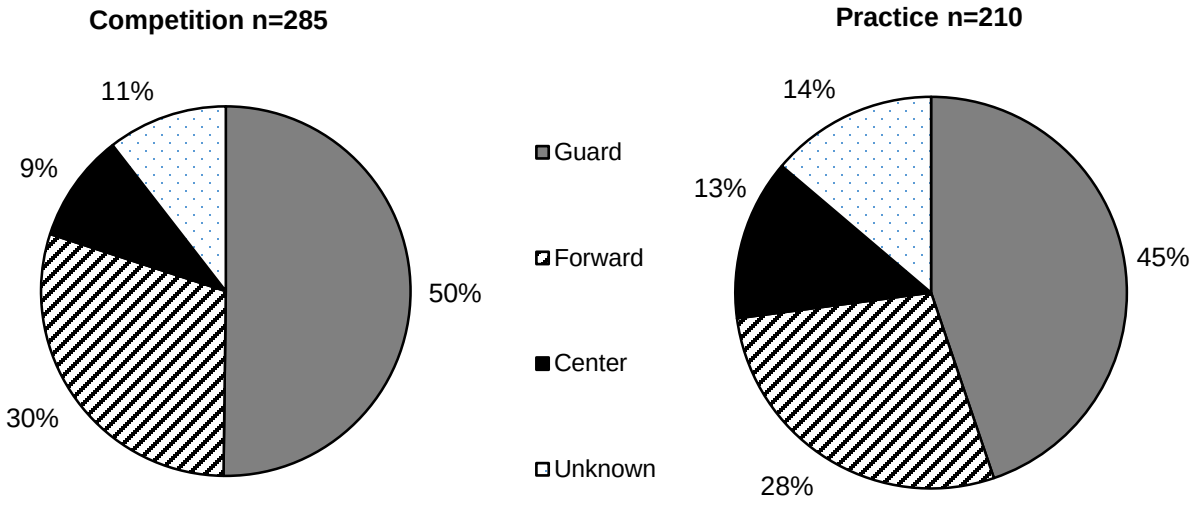


Table 8.9 Activities Leading to Girls' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Activity						
General play	36	12.7%	70	33.5%	106	21.5%
Rebounding	59	20.8%	24	11.5%	83	16.9%
Defending	58	20.5%	24	11.5%	82	16.7%
Chasing loose ball	40	14.1%	6	2.9%	46	9.3%
Shooting	17	6.0%	18	8.6%	35	7.1%
Ball handling/dribbling	14	4.9%	12	5.7%	26	5.3%
Receiving pass	12	4.2%	10	4.8%	22	4.5%
Conditioning	0	0.0%	18	8.6%	18	3.7%
Passing	4	1.4%	2	1.0%	6	1.2%
Other	1	0.4%	3	1.4%	4	0.8%
Unknown	42	14.8%	22	10.5%	64	13.0%
Total	**283**	**100.0%**	**209**	**100.0%**	**492**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 8.10 Activity Resulting in Girls' Basketball Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
	n	%	n	%	n	%	n	%	n	%
Activity										
General play	51	19.8%	6	17.1%	2	7.7%	11	12.1%	36	43.4%
Rebounding	48	18.7%	8	22.9%	5	19.2%	15	16.5%	7	8.4%
Defending	45	17.5%	7	20.0%	7	26.9%	19	20.9%	4	4.8%
Chasing loose ball	15	5.8%	5	14.3%	3	11.5%	16	17.6%	7	8.4%
Shooting	26	10.1%	1	2.9%	2	7.7%	3	3.3%	3	3.6%
Ball handling/dribbling	18	7.0%	1	2.9%	0	0.0%	4	4.4%	3	3.6%
Receiving pass	9	3.5%	0	0.0%	6	23.1%	3	3.3%	4	4.8%
Conditioning	11	4.3%	0	0.0%	1	3.8%	1	1.1%	5	6.0%
Passing	5	1.9%	0	0.0%	0	0.0%	1	1.1%	0	0.0%
Other	2	0.8%	0	0.0%	0	0.0%	1	1.1%	1	1.2%
Unknown	27	10.5%	7	20.0%	0	0.0%	17	18.7%	13	15.7%
Total	**257**	**100.0%**	**35**	**100.0%**	**26**	**100.0%**	**91**	**100.0%**	**83**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

IX. Wrestling Injury Epidemiology

Table 9.1 Wrestling Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	**590**	**203,464**	**2.90**
Competition	260	54,973	4.73
Practice	330	148,491	2.22

Table 9.2 Demographic Characteristics of Injured Wrestlers, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year*

Year in School	**n=560**
Freshman	24.5%
Sophomore	24.3%
Junior	25.7%
Senior	25.5%
Total†	**100.0%**
Age (years)	
Minimum	13
Maximum	19
Mean (St. Dev.)	15.9 (1.2)
BMI	
Minimum	14.4
Maximum	49.6
Mean (St. Dev.)	25.1 (6.0)

*All analyses in this chapter present un-weighted data.
†Throughout this report, totals and n's represent the total un-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 Wrestling Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

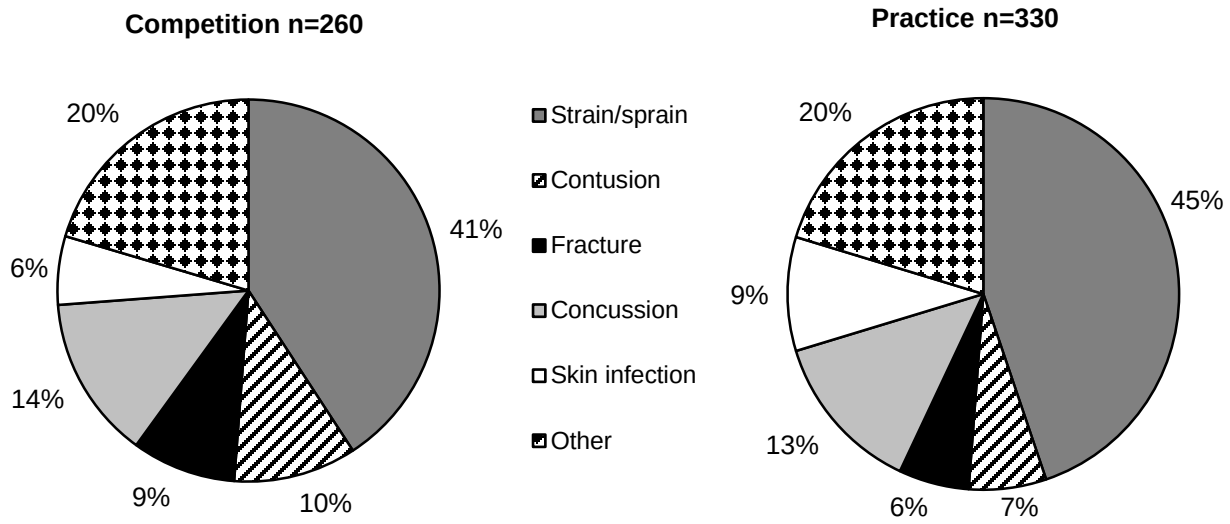


Table 9.3 Body Site of Wrestling Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Body Site						
Head/face	49	18.8%	67	20.3%	116	19.7%
Knee	54	20.8%	47	14.2%	101	17.1%
Shoulder	43	16.5%	31	9.4%	74	12.5%
Arm/elbow	26	10.0%	34	10.3%	60	10.2%
Ankle	15	5.8%	40	12.1%	55	9.3%
Hand/wrist	22	8.5%	23	7.0%	45	7.6%
Trunk	16	6.2%	23	7.0%	39	6.6%
Hip/thigh/upper leg	11	4.2%	18	5.5%	29	4.9%
Lower leg	6	2.3%	12	3.6%	18	3.1%
Foot	2	0.8%	7	2.1%	9	1.5%
Other	7	2.7%	13	3.9%	20	3.4%
Neck	9	3.5%	15	4.5%	24	4.1%
Total	**260**	**100.0%**	**330**	**100.0%**	**590**	**100.0%**

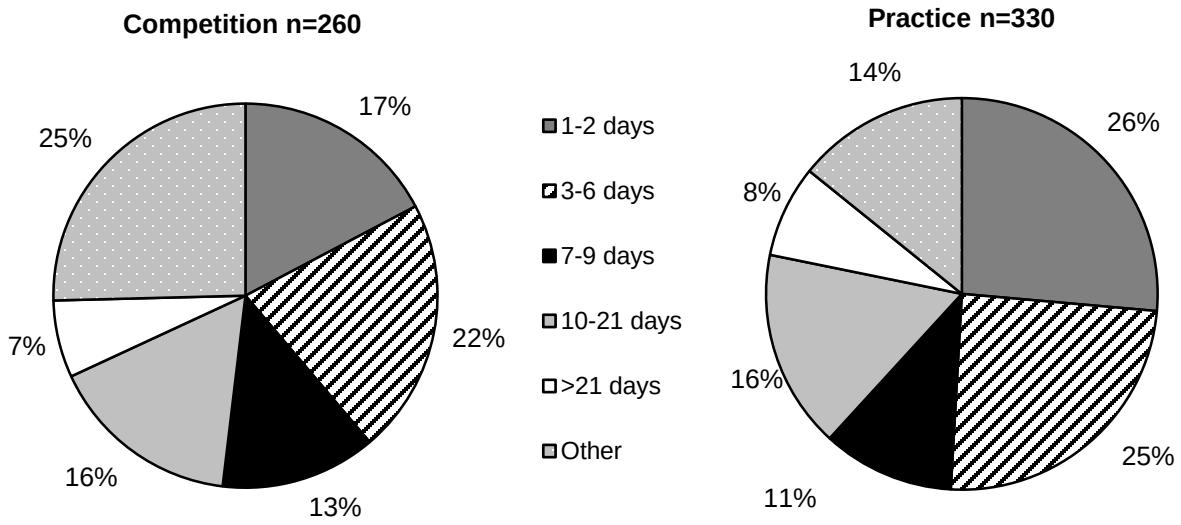
†Totals and n's are not always equal due to slight rounding or missing responses.

Table 9.4 Ten Most Common Wrestling Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition n=260		Practice n=330		Total n=590	
	n	%	n	%	n	%
Diagnosis						
Head/face concussion	36	13.8%	44	13.3%	80	13.6%
Knee strain/sprain	30	11.5%	21	6.4%	51	8.6%
Ankle strain/sprain	12	4.6%	37	11.2%	49	8.3%
Shoulder strain/sprain	16	6.2%	20	6.1%	36	6.1%
Shoulder other	25	9.6%	8	2.4%	33	5.6%
Knee other	12	4.6%	19	5.8%	31	5.3%
Arm/elbow strain/sprain	11	4.2%	15	4.5%	26	4.4%
Hip/thigh/upper leg strain/sprain	8	3.1%	14	4.2%	22	3.7%
Trunk strain/sprain	9	3.5%	12	3.6%	21	3.6%
Hand/wrist strain/sprain	9	3.5%	9	2.7%	18	3.1%

†Totals and n's are not always equal due to slight rounding or missing responses.

Figure 9.2 Time Loss of Wrestling Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year



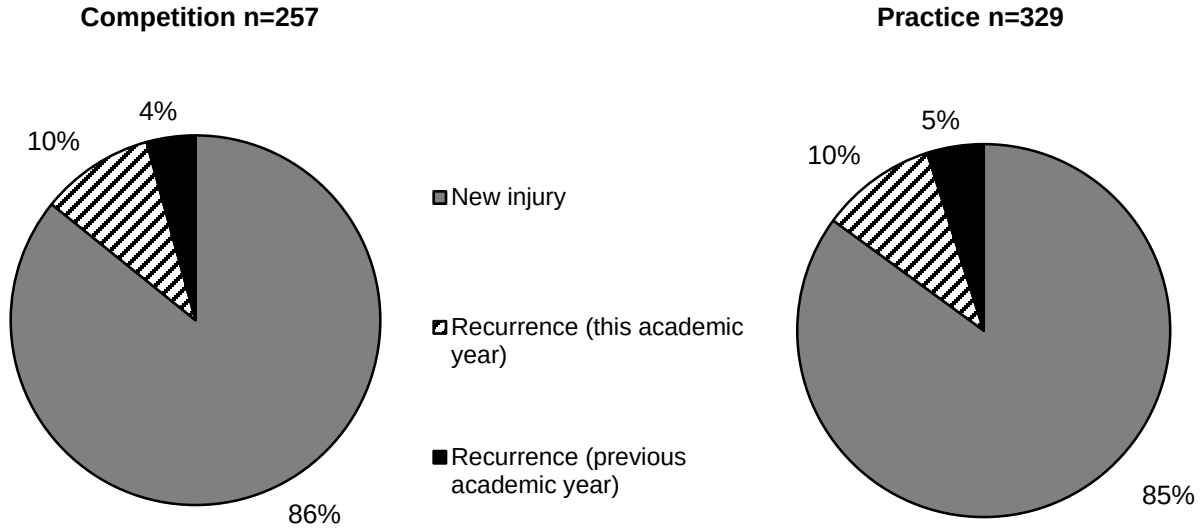
*Other category is made up of medical disqualification for season, medical disqualification for career, athlete chooses not to continue, and season ended before athlete returned to play

Table 9.5 Wrestling Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	26	10.1%	18	5.5%	44	7.5%
Did not require surgery	232	89.9%	310	94.5%	542	92.5%
Total	**258**	**100.0%**	**328**	**100.0%**	**586**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Figure 9.3 History of Wrestling Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year



† An answer of "unknown" was selected in 0.0% of competition and in 0.4% of practice injuries.

Table 9.6 Time during Season of Wrestling Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Season		
Preseason	106	18.0%
Regular season	444	75.5%
Post season	37	6.3%
Unknown	1	0.2%
Total	**588**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 9.7 Competition-Related Variables for Wrestling Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Competition		
Pre-competition/warm-ups	4	1.6%
First period	26	10.4%
Second period	64	25.7%
Third period	27	10.8%
Overtime	1	0.4%
Unknown	127	51.0%
Total	**249**	**100.0%**
Mat Location*		
Within 28 ft. circle	354	63.9%
Out of bounds	6	1.1%
Off the mat	15	2.7%
Unknown	179	32.3%
Total	**554**	**100.0%**

*Mat location question consists of competition and practice related injuries.
†Totals and n's are not always equal due to slight rounding or missing responses.

Table 9.8 Practice-Related Variables for Wrestling Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Practice		
First 1/2 hour	25	7.8%
Second 1/2 hour	41	12.8%
1-2 hours into practice	159	49.5%
>2 hours into practice	18	5.6%
Unknown	78	24.3%
Total	**321**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 9.9 Activities Leading to Wrestling Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Activity						
Takedown	113	45.4%	89	28.7%	202	36.1%
Sparring	19	7.6%	62	20.0%	81	14.5%
Conditioning	4	1.6%	42	13.5%	46	8.2%
N/a (e.g., skin infection, overuse, heat illness, etc.)	12	4.8%	34	11.0%	46	8.2%
Fall	17	6.8%	11	3.5%	28	5.0%
Reversal	5	2.0%	10	3.2%	15	2.7%
Escape	10	4.0%	5	1.6%	15	2.7%
Near fall	5	2.0%	5	1.6%	10	1.8%
Riding	6	2.4%	4	1.3%	10	1.8%
Other	10	4.0%	6	1.9%	16	2.9%
Unknown	48	19.3%	42	13.5%	90	16.1%
Total	**249**	**100.0%**	**310**	**100.0%**	**559**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 9.10 Activities Resulting in Wrestling Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Diagnosis											
	Strain/Sprain		Contusion		Fracture		Concussion		Skin Infection		Other	
	n	%	n	%	n	%	n	%	n	%	n	%
Activity												
Takedown	81	33.3%	25	54.3%	17	40.5%	41	55.4%	0	0.0%	38	32.8%
Sparring	37	15.2%	8	17.4%	5	11.9%	12	16.2%	0	0.0%	19	16.4%
Conditioning	31	12.8%	5	10.9%	2	4.8%	2	2.7%	0	0.0%	6	5.2%
N/A*	1	0.4%	0	0.0%	0	0.0%	0	0.0%	37	97.4%	8	6.9%
Fall	9	3.7%	2	4.3%	4	9.5%	3	4.1%	0	0.0%	10	8.6%
Reversal	7	2.9%	1	2.2%	4	9.5%	0	0.0%	0	0.0%	3	2.6%
Escape	7	2.9%	1	2.2%	2	4.8%	0	0.0%	0	0.0%	5	4.3%
Near fall	5	2.1%	1	2.2%	1	2.4%	1	1.4%	0	0.0%	2	1.7%
Riding	5	2.1%	0	0.0%	2	4.8%	1	1.4%	0	0.0%	2	1.7%
Other	6	2.5%	3	6.5%	2	4.8%	3	4.1%	0	0.0%	2	1.7%
Unknown	54	22.2%	0	0.0%	3	7.1%	11	14.9%	1	2.6%	21	18.1%
Total	**243**	**100.0%**	**46**	**100.0%**	**42**	**100.0%**	**74**	**100.0%**	**38**	**100.0%**	**116**	**100.0%**

* Skin infection, overuse, heat illness, etc.

†Totals and n's are not always equal due to slight rounding or missing responses.

X. Baseball Injury Epidemiology

Table 10.1 Baseball Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	**263**	**239,316**	**1.10**
Competition	129	84,480	1.53
Practice	134	154,836	0.87

Table 10.2 Demographic Characteristics of Injured Baseball Athletes, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year*

Year in School	**n=254**
Freshman	23.2%
Sophomore	24.0%
Junior	23.2%
Senior	29.5%
Total†	**100.0%**
Age (years)	
Minimum	13
Maximum	18
Mean (St. Dev.)	16.2 (1.3)
BMI	
Minimum	16.9
Maximum	37.2
Mean (St. Dev.)	24.3 (4.0)

*All analyses in this chapter present un-weighted data.
†Throughout this report, totals and n's represent the total un-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 Baseball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

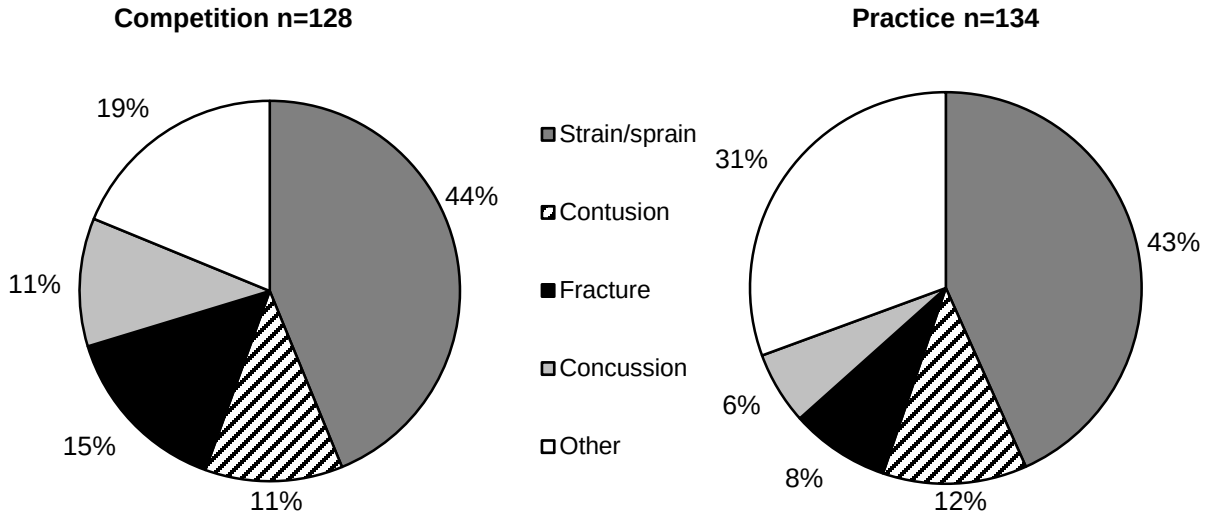


Table 10.3 Body Site of Baseball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

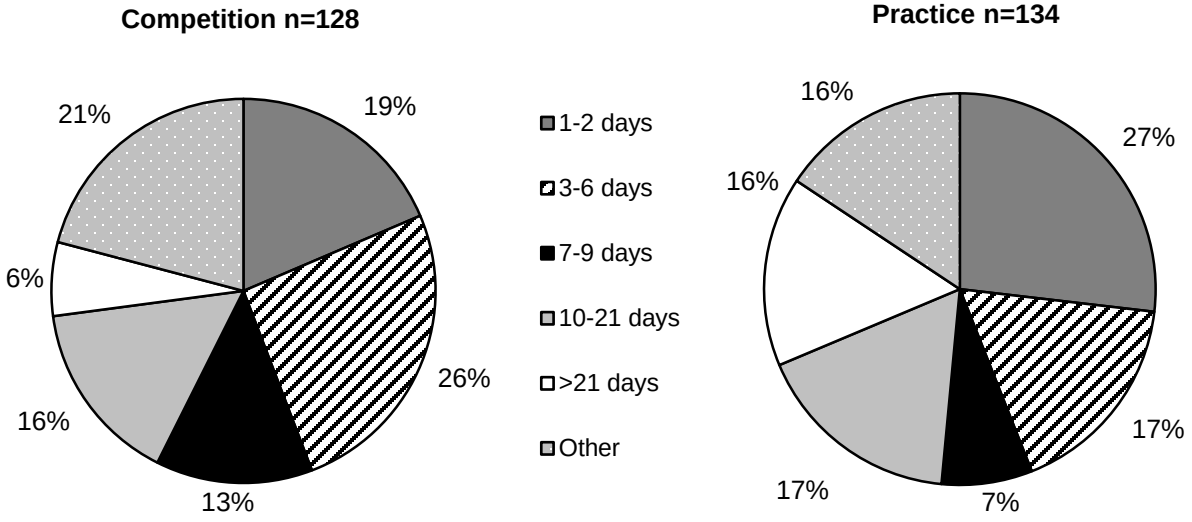
	Competition		Practice		Overall	
	n	**%**	**n**	**%**	**n**	**%**
Body Site						
Head/face	24	18.6%	21	15.7%	45	17.1%
Arm/elbow	13	10.1%	25	18.7%	38	14.4%
Shoulder	17	13.2%	21	15.7%	38	14.4%
Hand/wrist	23	17.8%	13	9.7%	36	13.7%
Hip/thigh/upper leg	20	15.5%	15	11.2%	35	13.3%
Ankle	14	10.9%	12	9.0%	26	9.9%
Knee	8	6.2%	9	6.7%	17	6.5%
Trunk	3	2.3%	9	6.7%	12	4.6%
Lower leg	3	2.3%	3	2.2%	6	2.3%
Foot	1	0.8%	4	3.0%	5	1.9%
Neck	1	0.8%	1	0.7%	2	0.8%
Other	2	1.6%	1	0.7%	3	1.1%
Total	**129**	**100.0%**	**134**	**100.0%**	**263**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 10.4 Ten Most Common Baseball Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition n=128		Practice n=134		Total n=262	
	n	%	n	%	n	%
Diagnosis						
Hip/thigh/upper leg strain/sprain	18	14.1%	11	8.2%	29	11.1%
Head/face concussion	14	10.9%	8	6.0%	22	8.4%
Shoulder strain/sprain	9	7.0%	13	9.7%	22	8.4%
Ankle strain/sprain	12	9.4%	9	6.7%	21	8.0%
Arm/elbow strain/sprain	4	3.1%	15	11.2%	19	7.3%
Hand/wrist fracture	10	7.8%	6	4.5%	16	6.1%
Shoulder other	5	3.9%	8	6.0%	13	5.0%
Arm/elbow other	4	3.1%	6	4.5%	10	3.8%
Knee other	3	2.3%	7	5.2%	10	3.8%
Hand/wrist strain/sprain	8	6.3%	2	1.5%	10	3.8%

Figure 10.2 Time Loss of Baseball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 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 Baseball Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	13	10.2%	10	7.5%	23	8.8%
Did not require surgery	115	89.8%	124	92.5%	239	91.2%
Total	**128**	**100.0%**	**134**	**100.0%**	**262**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Figure 10.3 History of Baseball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

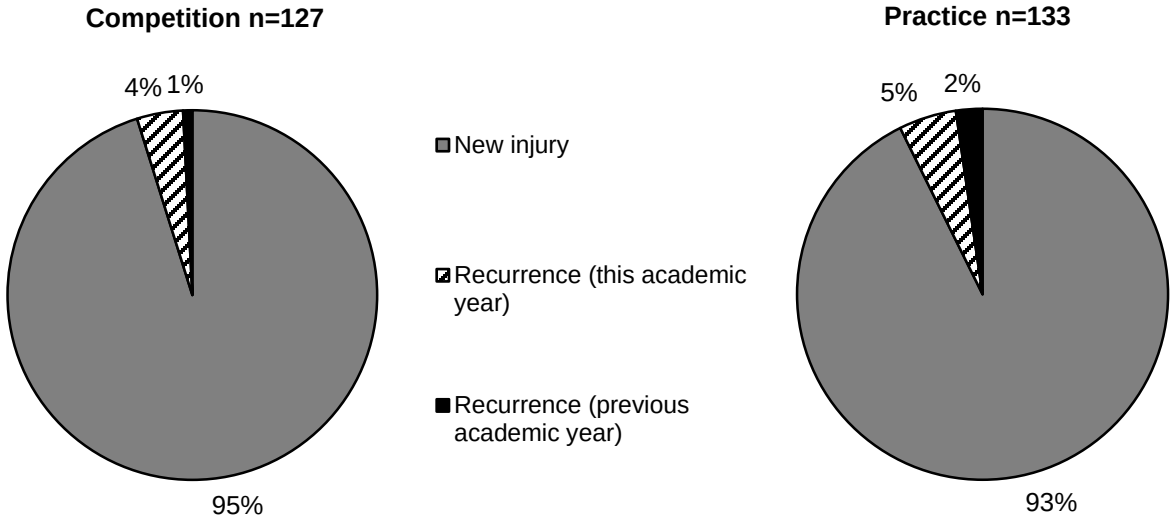


Table 10.6 Time during Season of Baseball Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Season		
Preseason	72	27.5%
Regular season	179	68.3%
Post season	11	4.2%
Total	**262**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 10.7 Competition-Related Variables for Baseball Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Competition		
Pre-competition/warm-ups	7	5.8%
First inning	8	6.7%
Second inning	8	6.7%
Third inning	12	10.0%
Fourth inning	16	13.3%
Fifth inning	12	10.0%
Sixth inning	8	6.7%
Seventh inning	10	8.3%
Extra innings	1	0.8%
Unknown	38	31.7%
Total	**120**	**100.0%**
Field Location		
Home plate	25	20.8%
First base	16	13.3%
Second base	19	15.8%
Third base	13	10.8%
Infield	6	5.0%
Pitcher's mound	10	8.3%
Outfield	15	12.5%
Foul territory	5	4.2%
Other	3	2.5%
Unknown	8	6.7%
Total	**120**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 10.8 Practice-Related Variables for Baseball Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Practice		
First 1/2 hour	13	10.0%
Second 1/2 hour	14	10.8%
1-2 hours into practice	67	51.5%
>2 hours into practice	3	2.3%
Unknown	33	25.4%
Total	**130**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Figure 10.4 Player Position of Baseball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

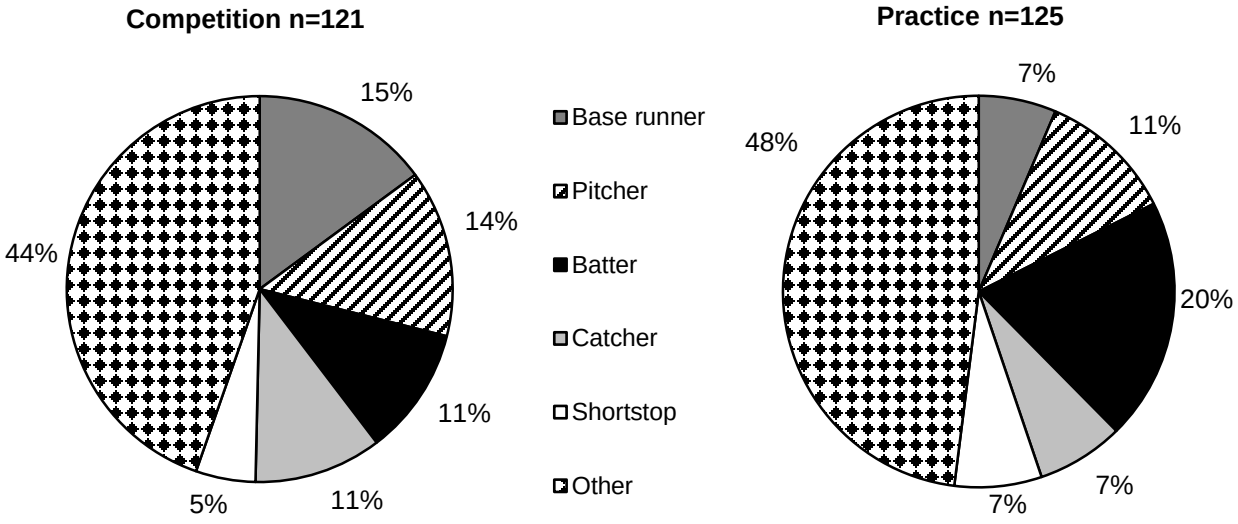


Table 10.9 Activities Leading to Baseball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Activity						
Fielding a batted ball	25	20.5%	21	16.8%	46	18.6%
Running bases	22	18.0%	10	8.0%	32	13.0%
Throwing (not pitching)	6	4.9%	24	19.2%	30	12.1%
Batting	13	10.7%	17	13.6%	30	12.1%
Pitching	10	8.2%	18	14.4%	28	11.3%
Sliding	15	12.3%	6	4.8%	21	8.5%
Catching	12	9.8%	5	4.0%	17	6.9%
Fielding a thrown ball	8	6.6%	6	4.8%	14	5.7%
General play	3	2.5%	9	7.2%	12	4.9%
Conditioning	1	0.8%	5	4.0%	6	2.4%
Other	5	4.1%	2	1.6%	7	2.8%
Unknown	2	1.6%	2	1.6%	4	1.6%
Total	**122**	**100.0%**	**125**	**100.0%**	**247**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 10.10 Activity Resulting in Baseball Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
	n	%	n	%	n	%	n	%	n	%
Activity										
Fielding a batted ball	10	9.3%	5	17.2%	10	34.5%	10	47.6%	11	18.6%
Running bases	20	18.5%	1	3.4%	3	10.3%	1	4.8%	7	11.9%
Throwing (not pitching)	18	16.7%	1	3.4%	2	6.9%	0	0.0%	9	15.3%
Batting	8	7.4%	11	37.9%	4	13.8%	2	9.5%	5	8.5%
Pitching	18	16.7%	1	3.4%	1	3.4%	0	0.0%	8	13.6%
Sliding	11	10.2%	1	3.4%	4	13.8%	0	0.0%	5	8.5%
Catching	5	4.6%	6	20.7%	3	10.3%	1	4.8%	2	3.4%
Fielding a thrown ball	4	3.7%	3	10.3%	1	3.4%	5	23.8%	1	1.7%
General play	5	4.6%	0	0.0%	0	0.0%	0	0.0%	7	11.9%
Conditioning	3	2.8%	0	0.0%	0	0.0%	1	4.8%	2	3.4%
Other	3	2.8%	0	0.0%	0	0.0%	1	4.8%	2	3.4%
Unknown	3	2.8%	0	0.0%	1	3.4%	0	0.0%	0	0.0%
Total	**108**	**100.0%**	**29**	**100.0%**	**29**	**100.0%**	**21**	**100.0%**	**59**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

XI. Softball Injury Epidemiology

Table 11.1 Softball Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	**268**	**180,462**	**1.49**
Competition	131	61,577	2.13
Practice	137	118,885	1.15

Table 11.2 Demographic Characteristics of Injured Softball Athletes, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year*

Year in School	**n=259**
Freshman	25.9%
Sophomore	29.0%
Junior	23.9%
Senior	21.2%
Total†	**100.0%**
Age (years)	
Minimum	13
Maximum	19
Mean (St. Dev.)	15.9 (1.3)
BMI	
Minimum	14.8
Maximum	39.2
Mean (St. Dev.)	23.5 (4.2)

*All analyses in this chapter present un-weighted data.
†Throughout this report, totals and n's represent the total un-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 Softball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

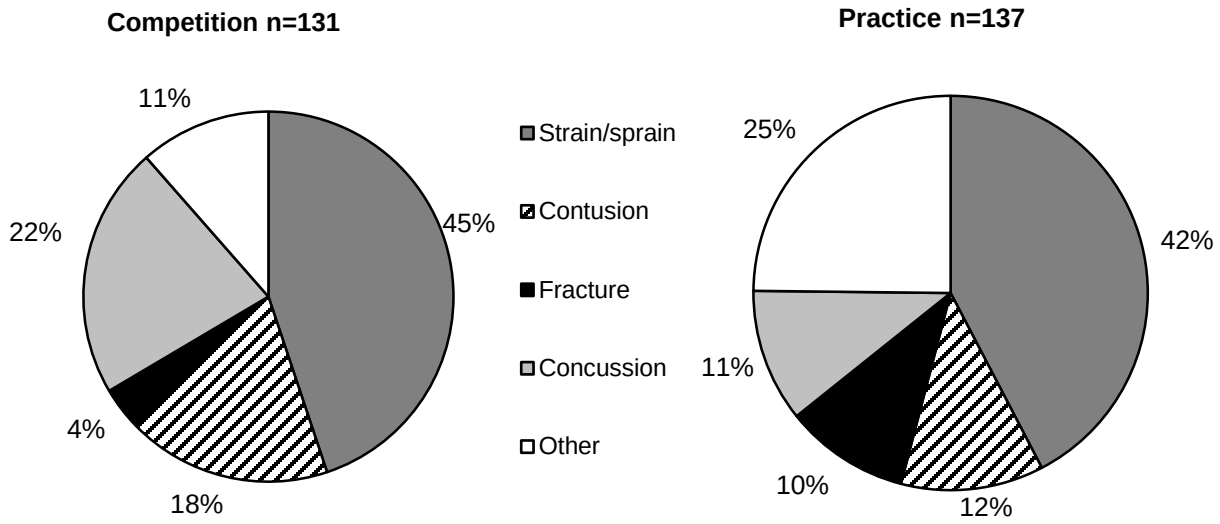


Table 11.3 Body Site of Softball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

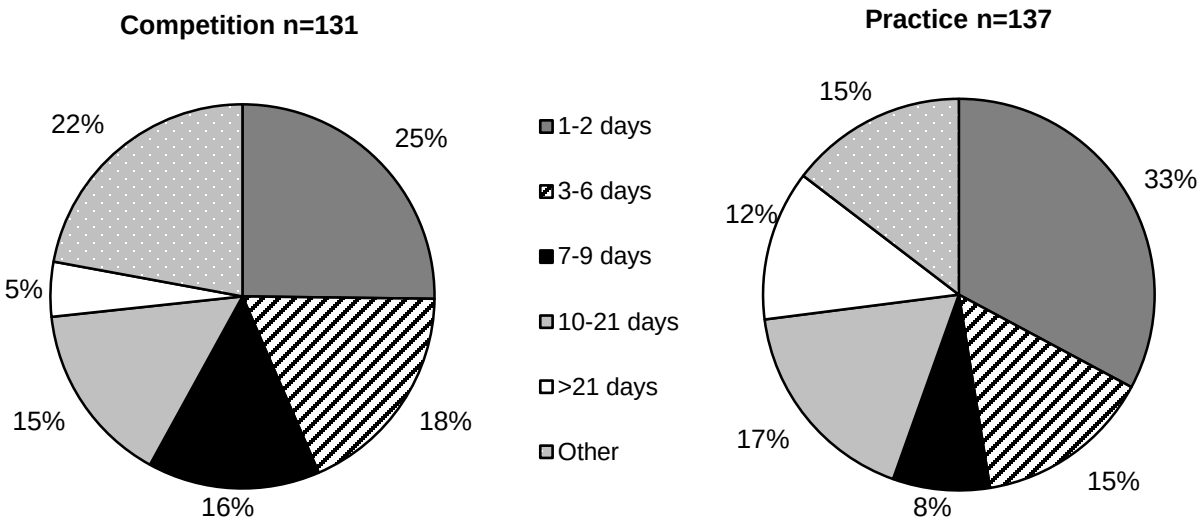
	Competition		Practice		Overall	
	n	**%**	**n**	**%**	**n**	**%**
Body Site						
Head/face	32	24.4%	24	17.5%	56	20.9%
Ankle	21	16.0%	18	13.1%	39	14.6%
Hand/wrist	16	12.2%	18	13.1%	34	12.7%
Knee	20	15.3%	12	8.8%	32	11.9%
Shoulder	9	6.9%	18	13.1%	27	10.1%
Arm/elbow	9	6.9%	15	10.9%	24	9.0%
Trunk	8	6.1%	11	8.0%	19	7.1%
Hip/thigh/upper leg	10	7.6%	8	5.8%	18	6.7%
Lower leg	3	2.3%	7	5.1%	10	3.7%
Foot	3	2.3%	4	2.9%	7	2.6%
Other	0	0.0%	2	1.5%	2	0.7%
Total	**131**	**100.0%**	**137**	**100.0%**	**268**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 11.4 Ten Most Common Softball Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition n=131		Practice n=137		Total n=268	
	n	%	n	%	n	%
Diagnosis						
Head/face concussion	29	22.1%	15	10.9%	44	16.4%
Ankle strain/sprain	20	15.3%	16	11.7%	36	13.4%
Shoulder strain/sprain	6	4.6%	10	7.3%	16	6.0%
Hip/thigh/upper leg strain/sprain	7	5.3%	8	5.8%	15	5.6%
Arm/elbow strain/sprain	5	3.8%	10	7.3%	15	5.6%
Knee other	5	3.8%	8	5.8%	13	4.9%
Trunk strain/sprain	5	3.8%	7	5.1%	12	4.5%
Hand/wrist contusion	7	5.3%	5	3.6%	12	4.5%
Hand/wrist fracture	2	1.5%	9	6.6%	11	4.1%
Knee strain/sprain	9	6.9%	1	0.7%	10	3.7%

Figure 11.2 Time Loss of Softball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year



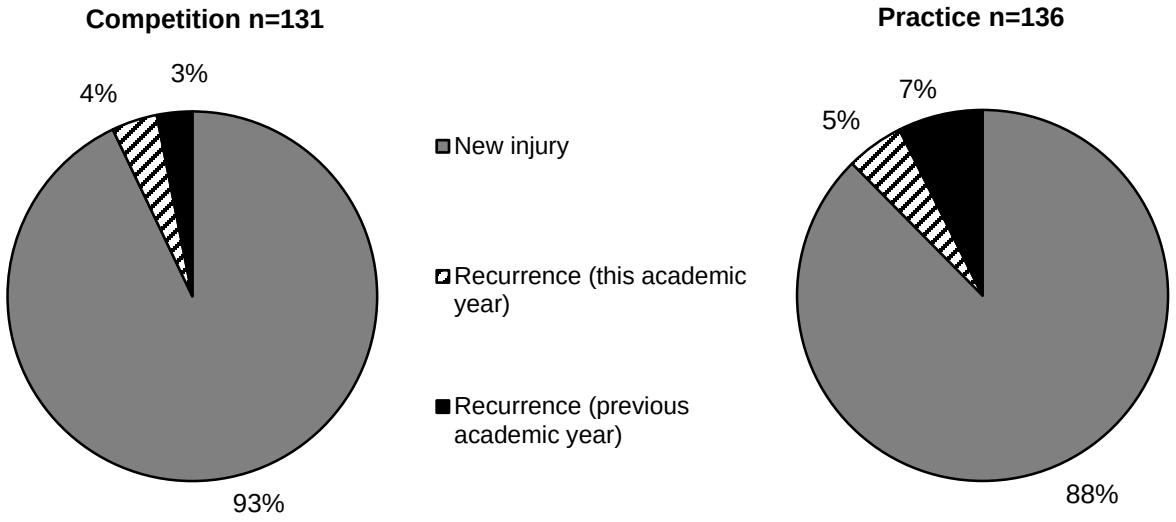
*Other category is made up of medical disqualification for season, medical disqualification for career, athlete chooses not to continue, and season ended before athlete returned to play

Table 11.5 Softball Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	4	3.1%	6	4.4%	10	3.7%
Did not require surgery	126	96.9%	131	95.6%	257	96.3%
Total	**130**	**100.0%**	**137**	**100.0%**	**267**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Figure 11.3 History of Softball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year



† An answer of "unknown" was selected in 0.0% of competition and in 0.9% of practice injuries.

Table 11.6 Time during Season of Softball Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Season		
Preseason	65	24.3%
Regular season	196	73.4%
Post season	5	1.9%
Unknown	1	0.4%
Total	**267**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 11.7 Competition-Related Variables for Softball Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Competition		
Pre-competition/warm-ups	19	15.1%
First inning	5	4.0%
Second inning	7	5.6%
Third inning	15	11.9%
Fourth inning	15	11.9%
Fifth inning	7	5.6%
Sixth inning	9	7.1%
Seventh inning	4	3.2%
Extra innings	0	0.0%
Unknown	45	35.7%
Total	**126**	**100.0%**
Field Location		
Home plate	31	24.6%
First base	9	7.1%
Second base	19	15.1%
Third base	13	10.3%
Outfield	15	11.9%
Pitcher's mound	10	7.9%
Infield	6	4.8%
Foul territory	4	3.2%
Other	5	4.0%
Unknown	14	11.1%
Total	**126**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 11.8 Practice-Related Variables for Softball Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Practice		
First 1/2 hour	5	3.8%
Second 1/2 hour	19	14.3%
1-2 hours into practice	77	57.9%
>2 hours into practice	4	3.0%
Unknown	28	21.1%
Total	**133**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Figure 11.4 Player Position of Softball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

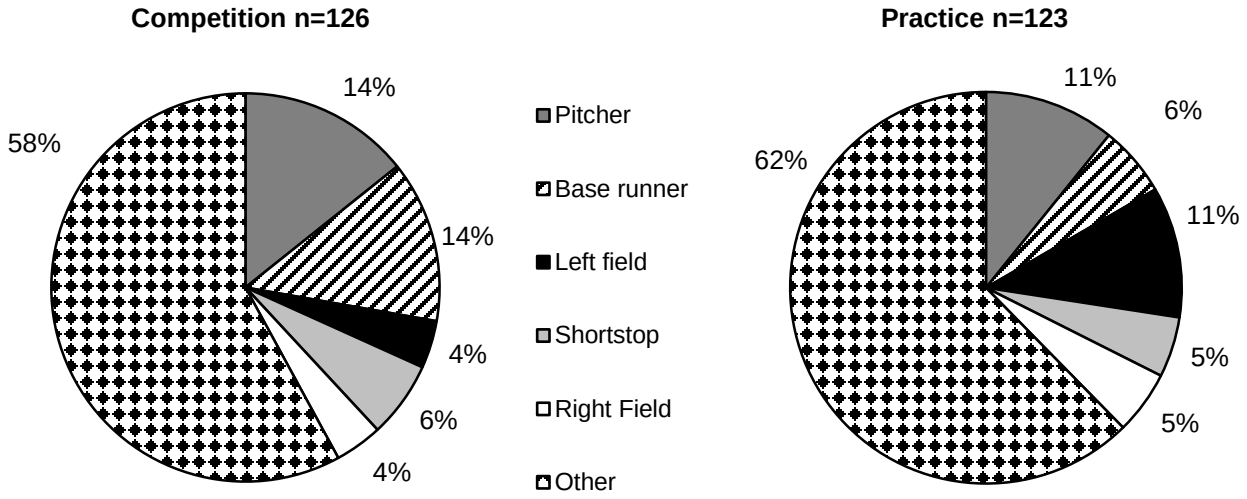


Table 11.9 Activities Leading to Softball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Activity						
Fielding a batted ball	29	23.0%	18	14.3%	47	18.7%
Running bases	25	19.8%	18	14.3%	43	17.1%
Throwing (not pitching)	4	3.2%	20	15.9%	24	9.5%
Batting	14	11.1%	10	7.9%	24	9.5%
Catching	14	11.1%	10	7.9%	24	9.5%
Pitching	10	7.9%	10	7.9%	20	7.9%
General play	4	3.2%	15	11.9%	19	7.5%
Sliding	14	11.1%	4	3.2%	18	7.1%
Conditioning	0	0.0%	1	0.8%	1	0.4%
Other	5	4.0%	5	4.0%	10	4.0%
Unknown	3	2.4%	6	4.8%	9	3.6%
Total	**126**	**100.0%**	**126**	**100.0%**	**252**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 11.10 Activity Resulting in Softball Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
	n	%	n	%	n	%	n	%	n	%
Activity										
Fielding a batted ball	18	16.7%	10	26.3%	4	21.1%	12	29.3%	3	6.5%
Running bases	25	23.1%	9	23.7%	3	15.8%	3	7.3%	3	6.5%
Throwing (not pitching)	15	13.9%	2	5.3%	0	0.0%	2	4.9%	5	10.9%
Batting	11	10.2%	6	15.8%	2	10.5%	2	4.9%	3	6.5%
Catching	8	7.4%	4	10.5%	1	5.3%	9	22.0%	2	4.3%
Pitching	9	8.3%	2	5.3%	2	10.5%	1	2.4%	6	13.0%
General play	7	6.5%	0	0.0%	1	5.3%	2	4.9%	9	19.6%
Sliding	10	9.3%	2	5.3%	1	5.3%	3	7.3%	2	4.3%
Fielding a thrown ball	2	1.9%	2	5.3%	3	15.8%	3	7.3%	3	6.5%
Conditioning	1	0.9%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Other	1	0.9%	1	2.6%	1	5.3%	3	7.3%	4	8.7%
Unknown	1	0.9%	0	0.0%	1	5.3%	1	2.4%	6	13.0%
Total	**108**	**100.0%**	**38**	**100.0%**	**19**	**100.0%**	**41**	**100.0%**	**46**	**100.0%**

XII. Girls' Field Hockey Injury Epidemiology

Table 12.1 Girls' Field Hockey Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	**124**	**70,954**	**1.75**
Competition	62	23,054	2.69
Practice	62	47,900	1.29

Table 12.2 Demographic Characteristics of Injured Girls' Field Hockey Athletes, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year*

Year in School	**n=120**
Freshman	12.5%
Sophomore	32.5%
Junior	23.3%
Senior	31.7%
Total†	**100.0%**
Age (years)	
Minimum	13
Maximum	18
Mean (St. Dev.)	15.8 (1.2)
BMI	
Minimum	15.5
Maximum	46.5
Mean (St. Dev.)	23.0 (5.2)

*All analyses in this chapter present un-weighted data.
†Throughout this report, totals and n's represent the total un-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 12.1 Diagnosis of Girls' Field Hockey Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

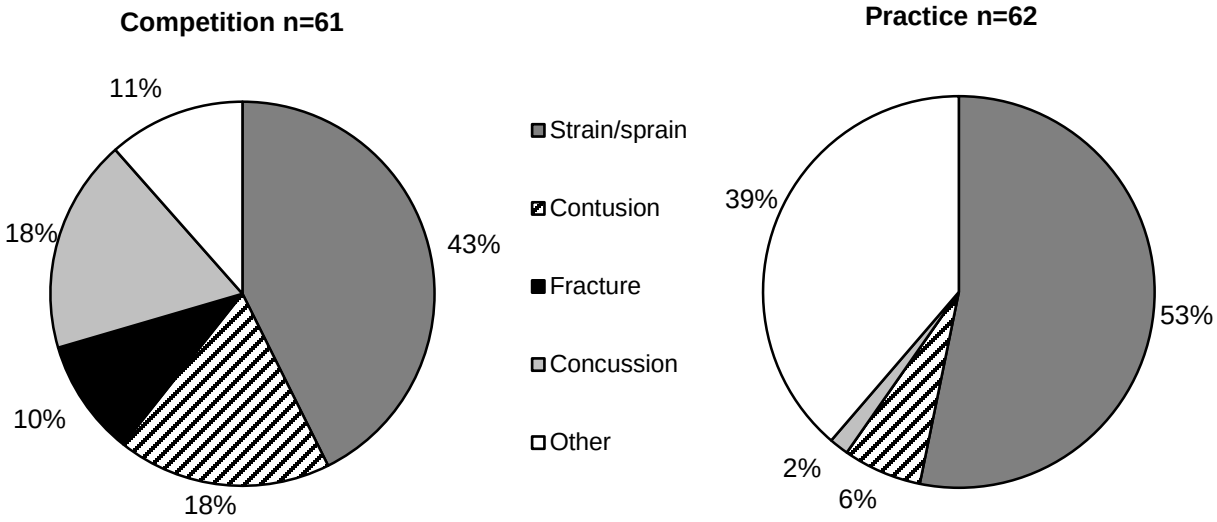


Table 12.3 Body Site of Girls' Field Hockey Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

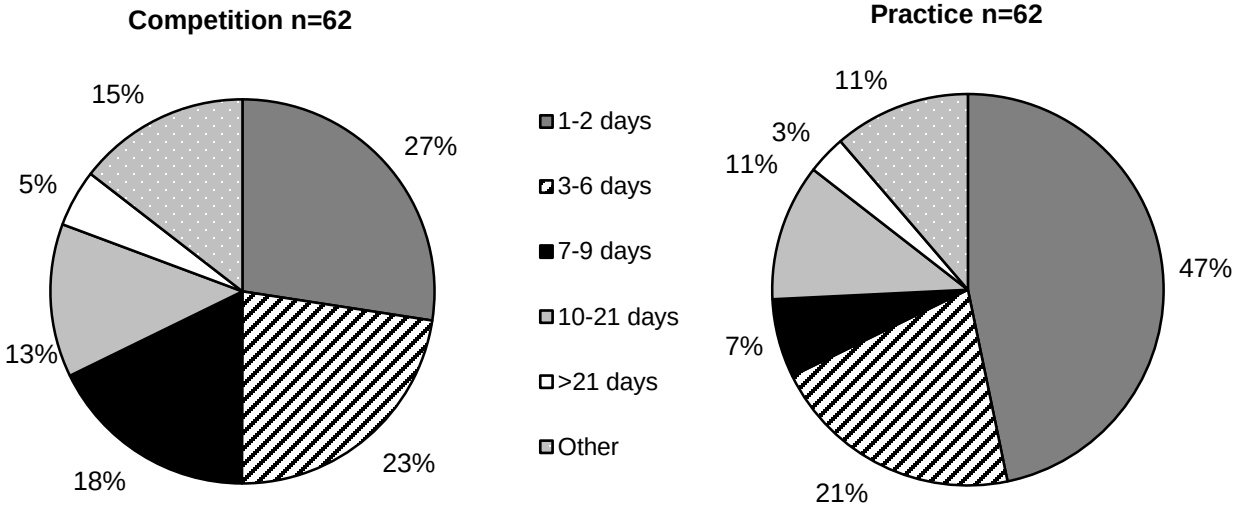
	Competition		Practice		Overall	
	n	**%**	**n**	**%**	**n**	**%**
Body Site						
Hip/thigh/upper leg	8	12.9%	16	25.8%	24	19.4%
Knee	8	12.9%	12	19.4%	20	16.1%
Ankle	13	21.0%	6	9.7%	19	15.3%
Head/face	16	25.8%	1	1.6%	17	13.7%
Hand/wrist	9	14.5%	2	3.2%	11	8.9%
Trunk	2	3.2%	9	14.5%	11	8.9%
Lower leg	1	1.6%	9	14.5%	10	8.1%
Foot	2	3.2%	3	4.8%	5	4.0%
Shoulder	0	0.0%	2	3.2%	2	1.6%
Arm/elbow	1	1.6%	0	0.0%	1	0.8%
Neck	1	1.6%	0	0.0%	1	0.8%
Other	1	1.6%	2	3.2%	3	2.4%
Total	**62**	**100.0%**	**62**	**100.0%**	**124**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 12.4 Ten Most Common Girls' Field Hockey Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition n=61		Practice n=62		Total n=123	
	n	%	n	%	n	%
Diagnosis						
Hip/thigh/upper leg strain/sprain	7	11.5%	15	24.2%	22	17.9%
Ankle strain/sprain	11	18.0%	6	9.7%	17	13.8%
Head/face concussion	11	18.0%	1	1.6%	12	9.8%
Knee other	2	3.3%	9	14.5%	11	8.9%
Lower leg other	1	1.6%	7	11.3%	8	6.5%
Knee strain/sprain	4	6.6%	2	3.2%	6	4.9%
Trunk other	3	4.9%	3	4.8%	6	4.9%
Hand/wrist fracture	4	6.6%	0	0.0%	4	3.3%
Hand/wrist contusion	4	6.6%	0	0.0%	4	3.3%
Trunk strain/sprain	1	1.6%	3	4.8%	4	3.3%

Figure 12.2 Time Loss of Girls' Field Hockey Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 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 12.5 Girls' Field Hockey Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	3	4.8%	2	3.3%	5	4.1%
Did not require surgery	59	95.2%	59	96.7%	118	95.9%
Total	**62**	**100.0%**	**61**	**100.0%**	**123**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Figure 12.3 History of Girls' Field Hockey Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

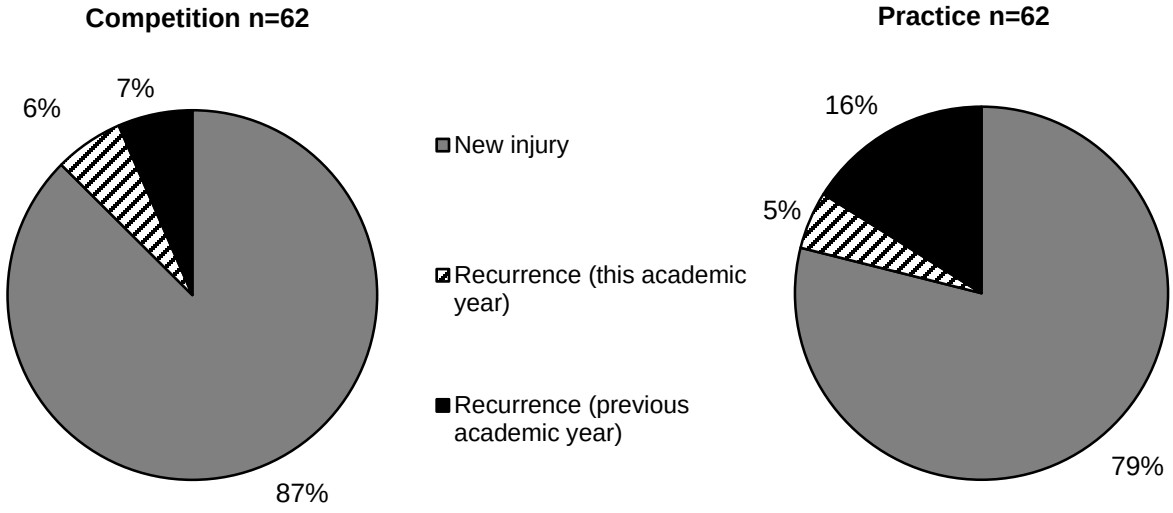


Table 12.6 Time during Season of Girls' Field Hockey Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Season		
Preseason	38	30.6%
Regular season	84	67.7%
Post season	2	1.6%
Total	**124**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 12.7 Competition-Related Variables for Girls' Field Hockey Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Competition		
Pre-competition/warm-ups	2	3.3%
First half	11	18.0%
Second half	36	59.0%
Overtime	1	1.6%
Unknown	11	18.0%
Total	**61**	**100.0%**
Field Location		
Between 25-yard line and center line	12	19.7%
Within 25-yard line	9	14.8%
Within 16-yard arc	8	13.1%
Goal area/circle	7	11.5%
Sideline	2	3.3%
Unknown	23	37.7%
Total	**61**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 12.8 Practice-Related Variables for Girls' Field Hockey Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Practice		
First 1/2 hour	11	18.3%
Second 1/2 hour	3	5.0%
1-2 hours into practice	26	43.3%
>2 hours into practice	3	5.0%
Unknown	17	28.3%
Total	**60**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Figure 12.4 Player Position of Girls' Field Hockey Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

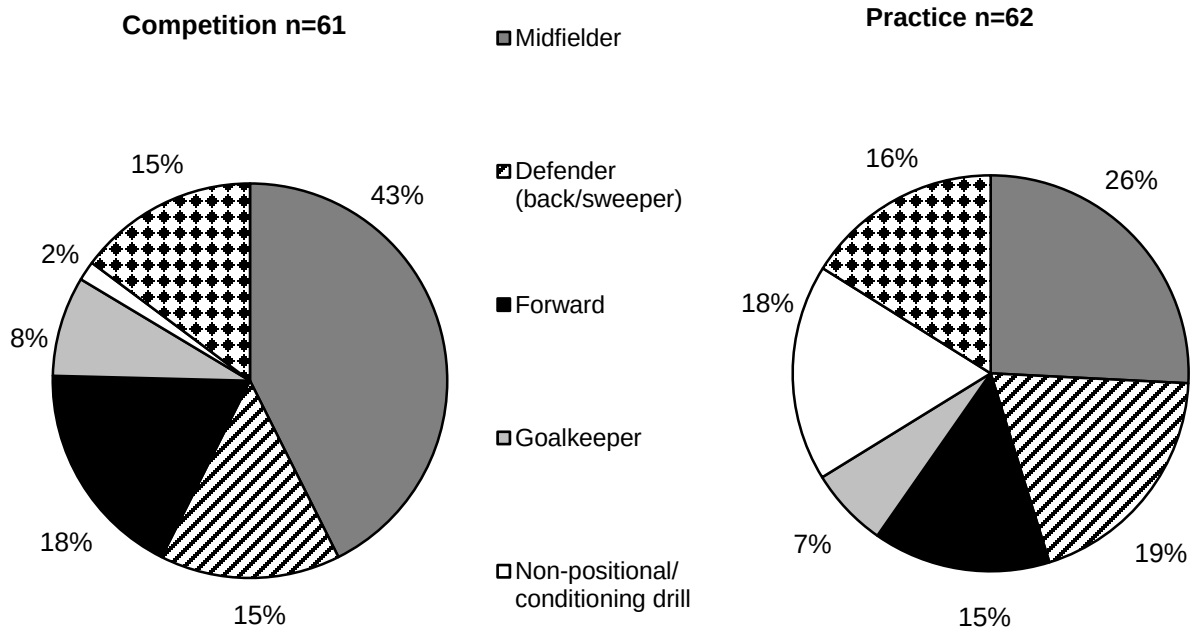


Table 12.9 Activities Leading to Girls' Field Hockey Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Activity						
General play	8	12.9%	20	32.8%	28	22.8%
Defending	23	37.1%	2	3.3%	25	20.3%
Conditioning	0	0.0%	22	36.1%	22	17.9%
Ball handling/dribbling	2	3.2%	5	8.2%	7	5.7%
Goaltending	5	8.1%	2	3.3%	7	5.7%
Shooting	3	4.8%	1	1.6%	4	3.3%
Chasing a loose ball	4	6.5%	0	0.0%	4	3.3%
Passing	2	3.2%	0	0.0%	2	1.6%
Receiving pass	1	1.6%	1	1.6%	2	1.6%
Other	0	0.0%	1	1.6%	1	0.8%
Unknown	14	22.6%	7	11.5%	21	17.1%
Total	**62**	**100.0%**	**61**	**100.0%**	**123**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 12.10 Activity Resulting in Girls' Field Hockey Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
	n	%	n	%	n	%	n	%	n	%
Activity										
General play	18	31.0%	1	6.7%	0	0.0%	0	0.0%	9	29.0%
Defending	6	10.3%	7	46.7%	4	66.7%	6	50.0%	2	6.5%
Conditioning	8	13.8%	0	0.0%	0	0.0%	0	0.0%	14	45.2%
Goaltending	4	6.9%	2	13.3%	0	0.0%	0	0.0%	1	3.2%
Ball handling/dribbling	3	5.2%	1	6.7%	0	0.0%	1	8.3%	1	3.2%
Shooting	4	6.9%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Chasing a loose ball	2	3.4%	1	6.7%	0	0.0%	1	8.3%	0	0.0%
Passing	2	3.4%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Receiving pass	0	0.0%	0	0.0%	0	0.0%	2	16.7%	0	0.0%
Other	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	3.2%
Unknown	11	19.0%	3	20.0%	2	33.3%	2	16.7%	3	9.7%
Total	**58**	**100.0%**	**15**	**100.0%**	**6**	**100.0%**	**12**	**100.0%**	**31**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

XIII. Boys' Ice Hockey Injury Epidemiology

Table 13.1 Boys' Ice Hockey Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	**116**	**69,737**	**1.66**
Competition	106	23,587	4.49
Practice	10	46,150	0.22

Table 13.2 Demographic Characteristics of Injured Boys' Ice Hockey Athletes, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year*

Year in School	**n=115**
Freshman	16.5%
Sophomore	29.6%
Junior	20.0%
Senior	33.9%
Total†	**100.0%**
Age (years)	
Minimum	14
Maximum	18
Mean (St. Dev.)	16.2 (1.1)
BMI	
Minimum	16.8
Maximum	30.2
Mean (St. Dev.)	23.4 (2.7)

*All analyses in this chapter present un-weighted data.
†Throughout this report, totals and n's represent the total un-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 13.1 Diagnosis of Boys' Ice Hockey Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

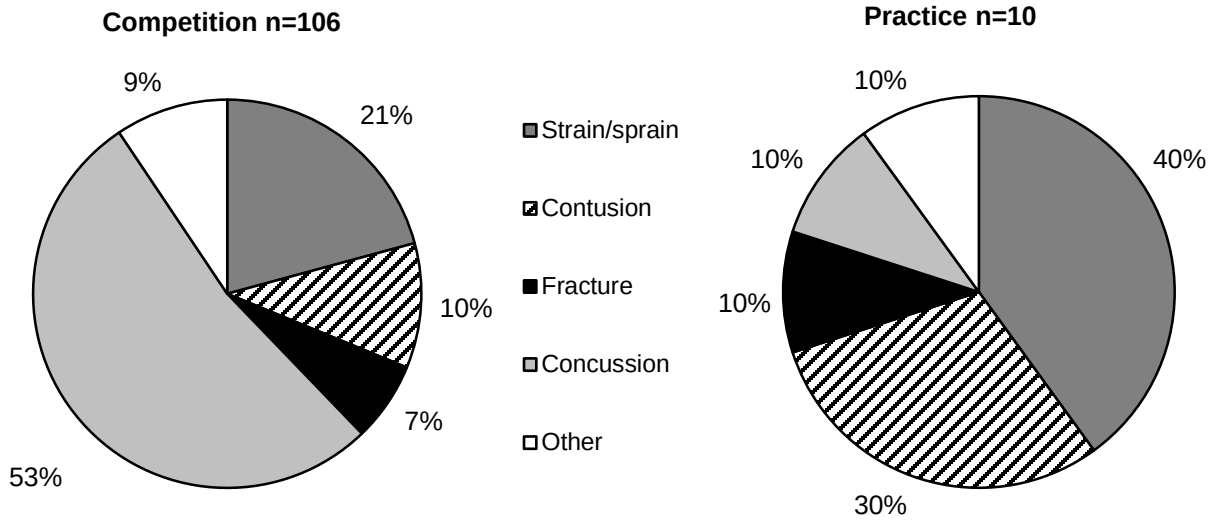


Table 13.3 Body Site of Boys' Ice Hockey Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition		Practice		Overall	
	n	**%**	**n**	**%**	**n**	**%**
Body Site						
Head/face	56	52.8%	1	10.0%	57	49.1%
Shoulder	12	11.3%	1	10.0%	13	11.2%
Hip/thigh/upper leg	6	5.7%	3	30.0%	9	7.8%
Knee	7	6.6%	2	20.0%	9	7.8%
Hand/wrist	7	6.6%	1	10.0%	8	6.9%
Trunk	6	5.7%	1	10.0%	7	6.0%
Ankle	2	1.9%	0	0.0%	2	1.7%
Lower leg	2	1.9%	0	0.0%	2	1.7%
Foot	0	0.0%	1	10.0%	1	0.9%
Neck	1	0.9%	0	0.0%	1	0.9%
Other	7	6.6%	0	0.0%	7	6.0%
Total	**106**	**100.0%**	**10**	**100.0%**	**116**	**100.0%**

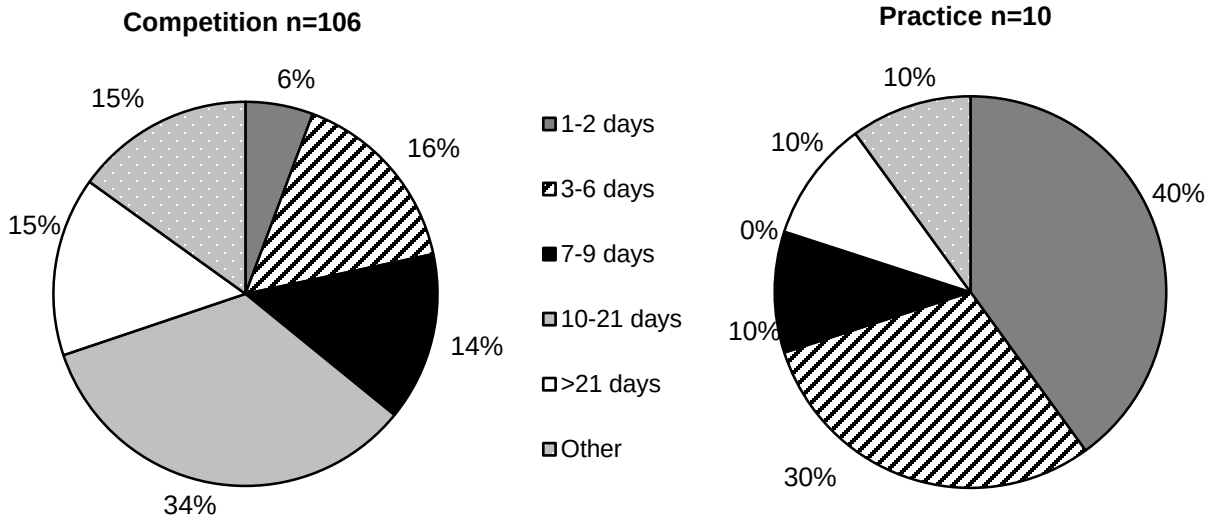
†Totals and n's are not always equal due to slight rounding or missing responses.

Table 13.4 Ten Most Common Boys' Ice Hockey Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition n=106		Practice n=10		Total n=116	
	n	%	n	%	n	%
Diagnosis						
Head/face concussion	56	52.8%	1	10.0%	57	49.1%
Shoulder other	5	4.7%	1	10.0%	6	5.2%
Hip/thigh/upper leg strain/sprain	3	2.8%	3	30.0%	6	5.2%
Knee strain/sprain	5	4.7%	0	0.0%	5	4.3%
Hand/wrist fracture	4	3.8%	1	10.0%	5	4.3%
Shoulder strain/sprain	5	4.7%	0	0.0%	5	4.3%
Trunk strain/sprain	3	2.8%	1	10.0%	4	3.4%
Hip/thigh/upper leg contusion	3	2.8%	0	0.0%	3	2.6%
Knee contusion	1	0.9%	2	20.0%	3	2.6%
Other fracture	3	2.8%	0	0.0%	3	2.6%

†Totals and n's are not always equal due to slight rounding or missing responses.

Figure 13.2 Time Loss of Boys' Ice Hockey Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 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 13.5 Boys' Ice Hockey Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	5	4.8%	2	20.0%	7	6.1%
Did not require surgery	99	95.2%	8	80.0%	107	93.9%
Total	**104**	**100.0%**	**10**	**100.0%**	**114**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Figure 13.3 History of Boys' Ice Hockey Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

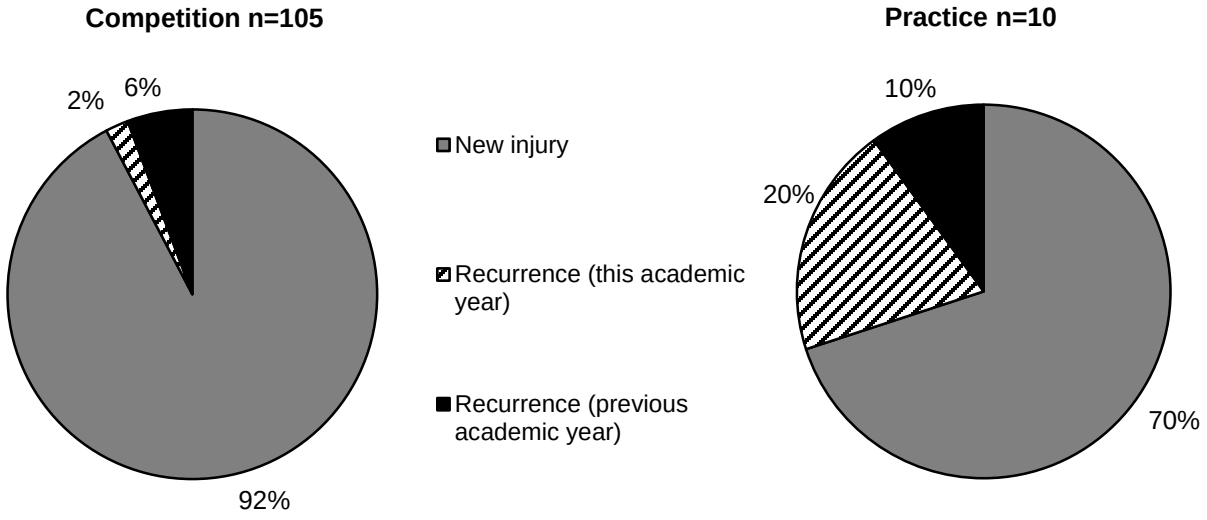


Table 13.6 Time during Season of Boys' Ice Hockey Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Season		
Preseason	2	1.7%
Regular season	104	89.7%
Post season	10	8.6%
Total	**116**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 13.7 Competition-Related Variables for Boys' Ice Hockey Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Competition		
Warm-ups	0	0.0%
First period	11	10.8%
Second period	38	37.3%
Third period	34	33.3%
Overtime	1	1.0%
Unknown	18	17.6%
Total	**102**	**100.0%**
Rink Location		
Between goal line and blue line	33	32.0%
Neutral zone	18	17.5%
Corner	12	11.7%
Goal area	7	6.8%
Bench	2	1.9%
Behind goal	1	1.0%
Face-off circle	1	1.0%
Unknown	29	28.2%
Total	**103**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 13.8 Practice-Related Variables for Boys' Ice Hockey Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Practice		
First 1/2 hour	4	40.0%
Second 1/2 hour	0	0.0%
1-2 hours into practice	5	50.0%
>2 hours into practice	0	0.0%
Unknown	1	10.0%
Total	**10**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Figure 13.4 Player Position of Boys' Ice Hockey Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

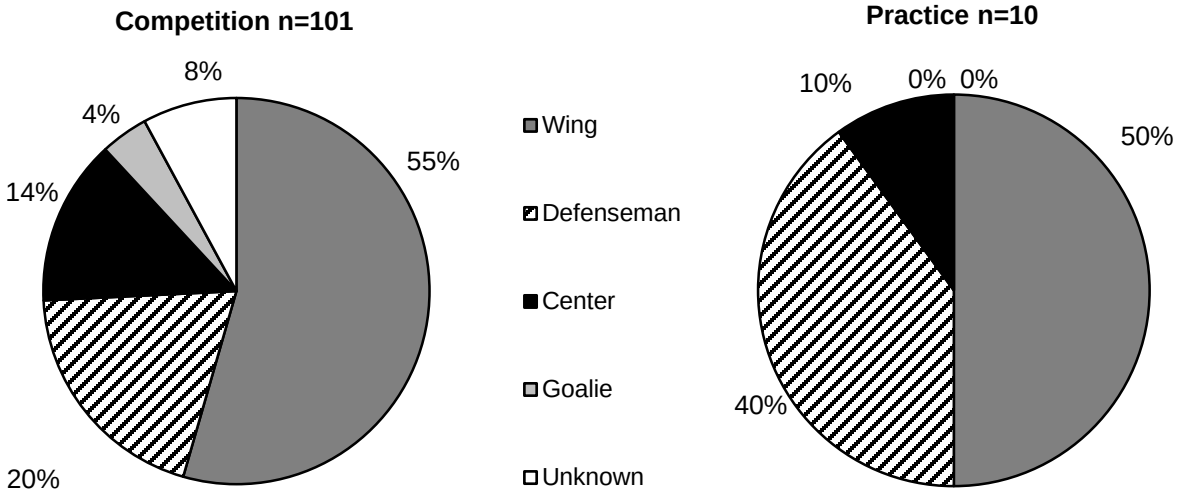


Table 13.9 Activities Leading to Boys' Ice Hockey Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Activity						
Being checked	33	32.0%	1	10.0%	34	30.1%
Skating	23	22.3%	7	70.0%	30	26.5%
Chasing loose puck	7	6.8%	2	20.0%	9	8.0%
Checking	8	7.8%	0	0.0%	8	7.1%
Receiving pass	7	6.8%	0	0.0%	7	6.2%
Passing	4	3.9%	0	0.0%	4	3.5%
Goaltending	4	3.9%	0	0.0%	4	3.5%
Shooting	2	1.9%	0	0.0%	2	1.8%
Other	5	4.9%	0	0.0%	5	4.4%
Unknown	10	9.7%	0	0.0%	10	8.8%
Total	**103**	**100.0%**	**10**	**100.0%**	**113**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 13.10 Activity Resulting in Boys' Ice Hockey Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
	n	%	n	%	n	%	n	%	n	%
Activity										
Being checked	8	30.8%	2	15.4%	4	50.0%	18	32.1%	2	20.0%
Skating	8	30.8%	7	53.8%	0	0.0%	14	25.0%	1	10.0%
Chasing loose puck	2	7.7%	0	0.0%	1	12.5%	6	10.7%	0	0.0%
Checking	2	7.7%	1	7.7%	2	25.0%	2	3.6%	1	10.0%
Receiving pass	2	7.7%	0	0.0%	0	0.0%	5	8.9%	0	0.0%
Passing	2	7.7%	0	0.0%	0	0.0%	1	1.8%	1	10.0%
Goaltending	0	0.0%	0	0.0%	0	0.0%	4	7.1%	0	0.0%
Shooting	0	0.0%	0	0.0%	0	0.0%	1	1.8%	1	10.0%
Other	0	0.0%	2	15.4%	1	12.5%	0	0.0%	2	20.0%
Unknown	2	7.7%	1	7.7%	0	0.0%	5	8.9%	2	20.0%
Total	**26**	**100.0%**	**13**	**100.0%**	**8**	**100.0%**	**56**	**100.0%**	**10**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

XIV. Boys' Lacrosse Injury Epidemiology

Table 14.1 Boys' Lacrosse Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	**317**	**140,768**	**2.25**
Competition	191	42,219	4.52
Practice	126	98,549	1.28

Table 14.2 Demographic Characteristics of Injured Boys' Lacrosse Athletes, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year*

Year in School	**n=312**
Freshman	20.5%
Sophomore	18.9%
Junior	30.1%
Senior	30.4%
Total†	**100.0%**
Age (years)	
Minimum	12
Maximum	18
Mean (St. Dev.)	16.3 (1.3)
BMI	
Minimum	17.0
Maximum	47.9
Mean (St. Dev.)	23.6 (4.4)

*All analyses in this chapter present un-weighted data.
†Throughout this report, totals and n's represent the total un-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 14.1 Diagnosis of Boys' Lacrosse Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

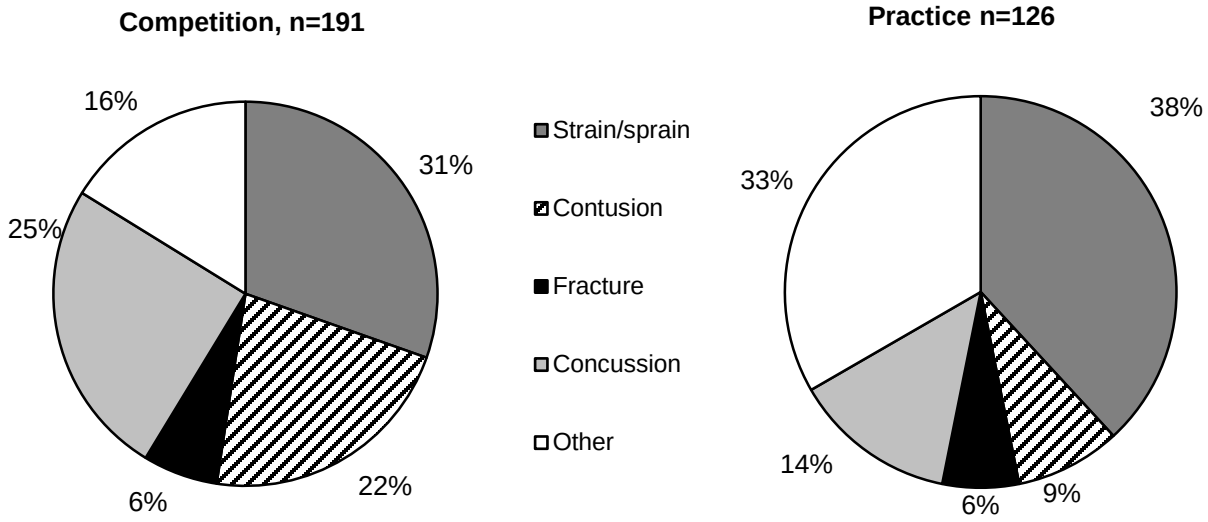


Table 14.3 Body Site of Boys' Lacrosse Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

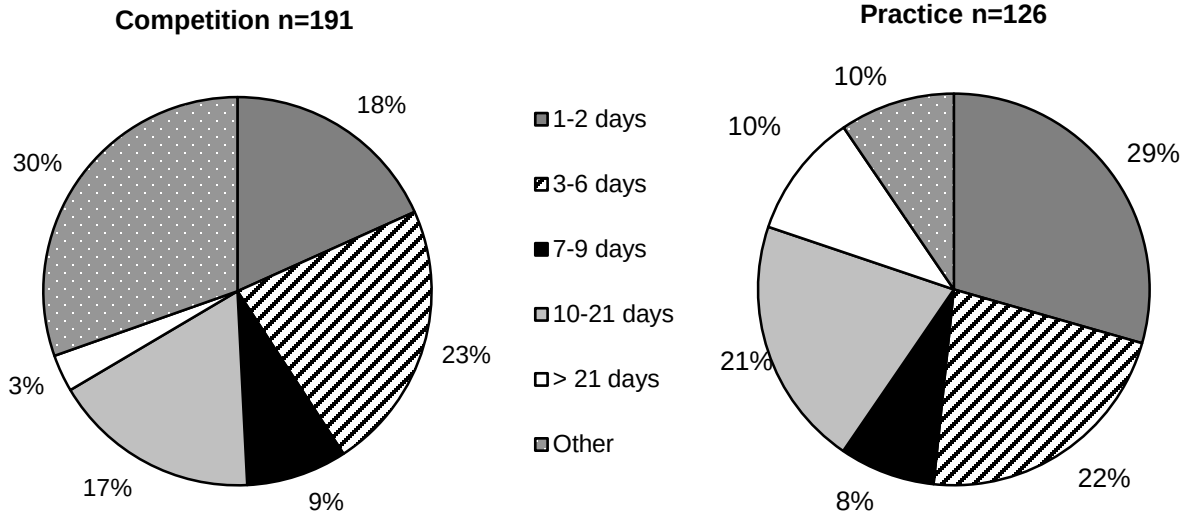
	Competition		Practice		Overall	
	n	%	n	%	n	%
Body Site						
Head/face	52	27.2%	19	15.1%	71	22.4%
Hip/thigh/upper leg	31	16.2%	13	10.3%	44	13.9%
Knee	19	9.9%	10	7.9%	29	9.1%
Hand/wrist	11	5.8%	17	13.5%	28	8.8%
Ankle	13	6.8%	15	11.9%	28	8.8%
Shoulder	17	8.9%	10	7.9%	27	8.5%
Trunk	10	5.2%	17	13.5%	27	8.5%
Arm/elbow	14	7.3%	6	4.8%	20	6.3%
Lower leg	9	4.7%	8	6.3%	17	5.4%
Foot	6	3.1%	5	4.0%	11	3.5%
Neck	4	2.1%	2	1.6%	6	1.9%
Other	5	2.6%	4	3.2%	9	2.8%
Total	**191**	**100.0%**	**126**	**100.0%**	**317**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 14.4 Ten Most Common Boys' Lacrosse Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition n=191		Practice n=126		Total n=317	
	n	%	n	%	n	%
Diagnosis						
Head/face concussion	48	25.1%	17	13.5%	65	20.5%
Ankle strain/sprain	18	9.4%	8	6.3%	26	8.2%
Knee other	12	6.3%	9	7.1%	21	6.6%
Hip/thigh/upper leg strain/sprain	6	3.1%	13	10.3%	19	6.0%
Knee strain/sprain	15	7.9%	4	3.2%	19	6.0%
Lower leg other	2	1.0%	12	9.5%	14	4.4%
Shoulder other	9	4.7%	4	3.2%	13	4.1%
Trunk Strain/sprain	5	2.6%	11	8.7%	12	3.8%
Trunk contusion	11	5.8%	0	0.0%	11	3.5%
Arm/elbow contusion	8	4.2%	3	2.4%	11	3.5%

Figure 14.2 Time Loss of Boys' Lacrosse Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 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 14.5 Boys' Lacrosse Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	15	8.0%	6	4.8%	21	6.7%
Did not require surgery	172	92.0%	120	95.2%	292	93.3%
Total	**187**	**100.0%**	**126**	**100.0%**	**313**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Figure 14.3 History of Boys' Lacrosse Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

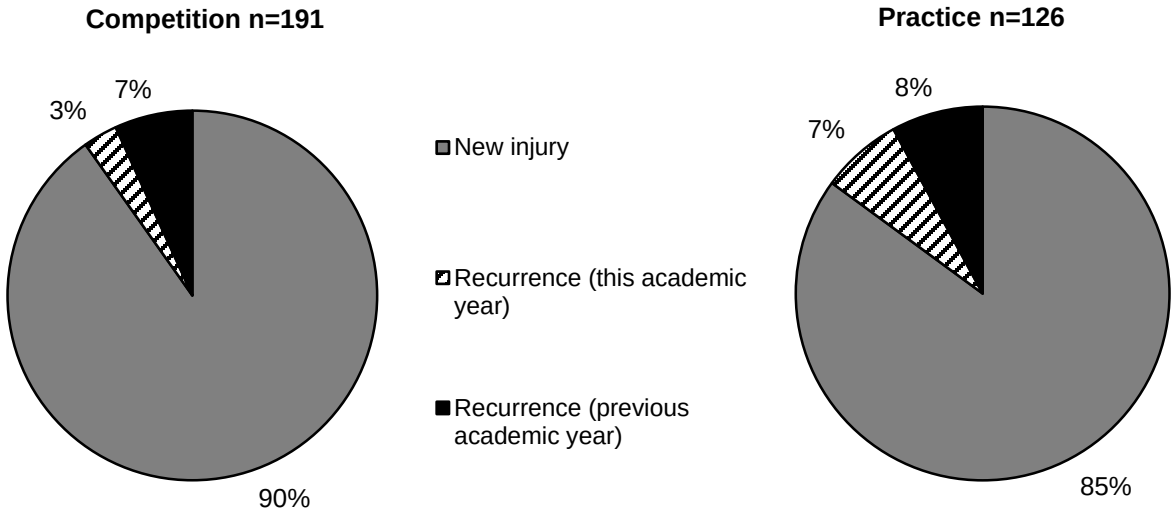


Table 14.6 Time during Season of Boys' Lacrosse Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18School Year

	n	%
Time in Season		
Preseason	53	16.8%
Regular season	254	80.4%
Post season	9	2.8%
Total	**316**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 14.7 Competition-Related Variables for Boys' Lacrosse Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Competition		
Pre-competition/warm-ups	2	1.1%
First quarter	17	9.4%
Second quarter	26	14.4%
Third quarter	48	26.7%
Fourth quarter	47	26.1%
Unknown	40	22.2%
Total	**180**	**100.0%**
Field Location		
Goal area	44	24.6%
Midfield	38	21.2%
Defensive area	32	17.9%
Wing area	7	3.9%
Sideline	6	3.4%
Crease area	5	2.8%
Unknown	47	26.3%
Total	**179**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 14.8 Practice-Related Variables for Boys' Lacrosse Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Practice		
First ½ hour	2	1.6%
Second ½ hour	16	13.0%
1-2 hours into practice	66	53.7%
> 2 hours into practice	2	1.6%
Unknown	37	30.1%
Total	**123**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Figure 14.4 Player Position of Boys' Lacrosse Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

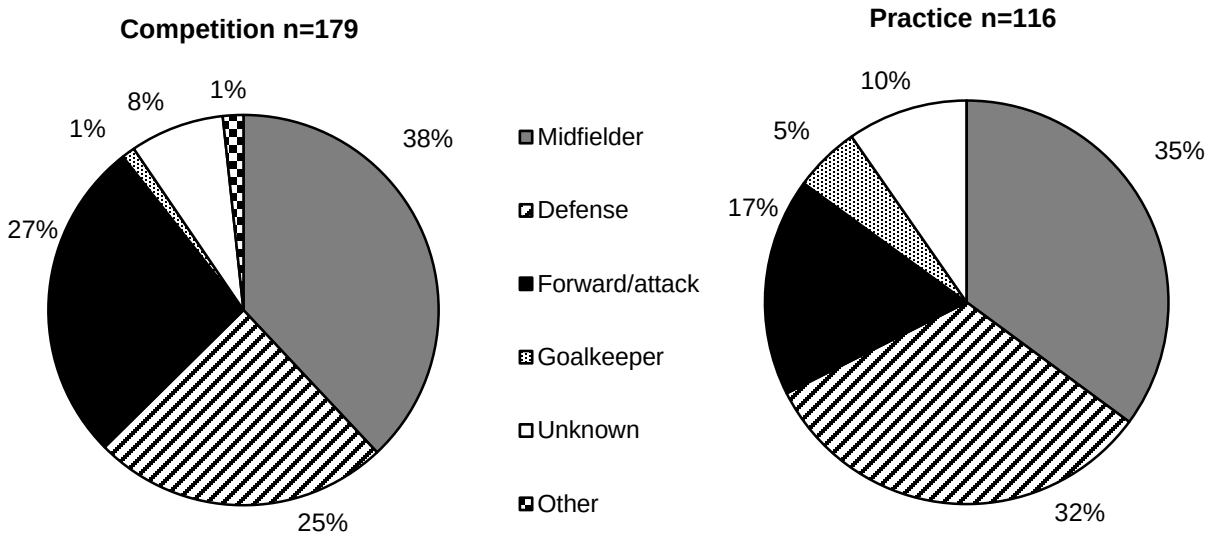


Table 14.9 Activities Leading to Boys' Lacrosse Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Activity						
General play	27	14.9%	40	34.5%	67	22.6%
Defending	20	11.0%	11	9.5%	31	10.4%
Chasing loose ball	18	9.9%	7	6.0%	25	8.4%
Being body checked	16	8.8%	6	5.2%	22	7.4%
Shooting	15	8.3%	4	3.4%	19	6.4%
Body checking	13	7.2%	6	5.2%	19	6.4%
Being crosse/stick checked	12	6.6%	4	3.4%	16	5.4%
Ball handling/cradling	9	5.0%	6	5.2%	15	5.1%
Receiving pass	7	3.9%	3	2.6%	10	3.4%
Crosse/stick checking	7	3.9%	2	1.7%	9	3.0%
Goaltending	2	1.1%	5	4.3%	7	2.4%
Face-off	7	3.9%	0	0.0%	7	2.4%
Conditioning	0	0.0%	7	6.0%	7	2.4%
Passing	3	1.7%	0	0.0%	3	1.0%
Blocking shot	3	1.7%	0	0.0%	3	1.0%
Other	1	0.6%	3	2.6%	4	1.3%
Unknown	21	11.6%	12	10.3%	33	11.1%
Total	**181**	**100.0%**	**116**	**100.0%**	**297**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 14.10 Activity Resulting in Boys' Lacrosse Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
	n	%	n	%	n	%	n	%	n	%
Activity										
General Play	27	27.8%	5	9.8%	3	15.0%	3	4.7%	29	44.6%
Being Body Checked	13	13.4%	6	11.8%	0	0.0%	9	14.1%	3	4.6%
Shooting	9	9.3%	2	3.9%	3	15.0%	6	9.4%	5	7.7%
Being Crosse/Stick Checked	5	5.2%	5	9.8%	1	5.0%	10	15.6%	1	1.5%
Chasing Loose Ball	2	2.1%	7	13.7%	0	0.0%	5	7.8%	5	7.7%
Other	30	30.9%	22	43.1%	12	60.0%	20	31.3%	16	24.6%
Unknown	11	11.3%	4	7.8%	1	5.0%	11	17.2%	6	9.2%
Total	**97**	**100.0%**	**51**	**100.0%**	**20**	**100.0%**	**64**	**100.0%**	**65**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

XV. Girls' Lacrosse Injury Epidemiology

Table 15.1 Girls' Lacrosse Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	**146**	**108,606**	**1.34**
Competition	90	32,965	2.73
Practice	56	75,641	0.74

Table 15.2 Demographic Characteristics of Injured Girls' Lacrosse Athletes, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year*

Year in School	**n=139**
Freshman	27.3%
Sophomore	26.6%
Junior	24.5%
Senior	21.6%
Total	**100.0%**
Age (years)	
Minimum	12
Maximum	18
Mean (St. Dev.)	15.8 (1.3)
BMI	
Minimum	17.2
Maximum	33.3
Mean (St. Dev.)	22.3 (3.4)

*All analyses in this chapter present un-weighted data.
†Throughout this report, totals and n's represent the total un-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 15.1 Diagnosis of Girls' Lacrosse Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

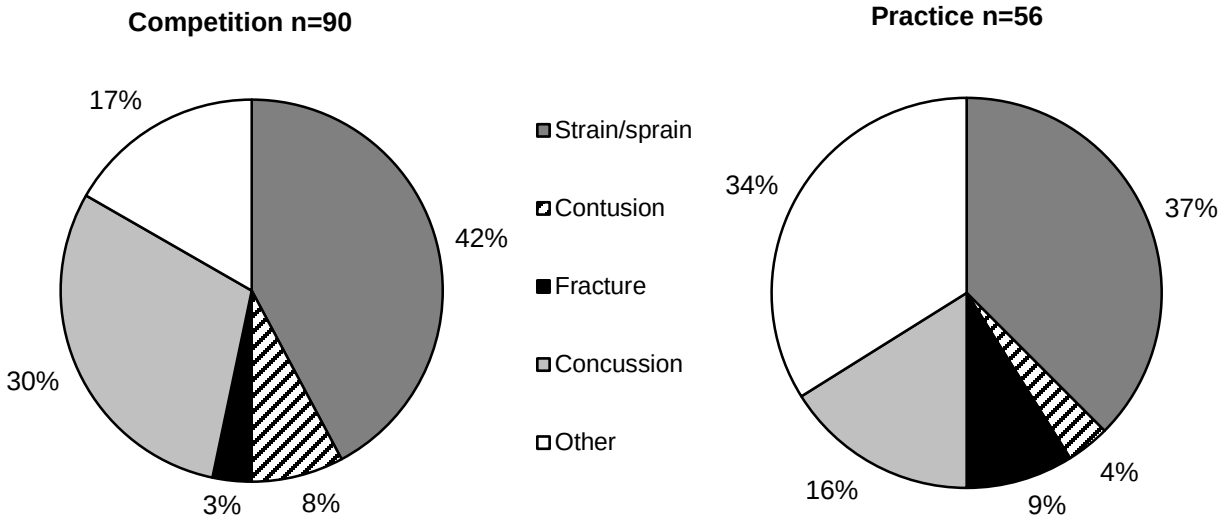


Table 15.3 Body Site of Girls' Lacrosse Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

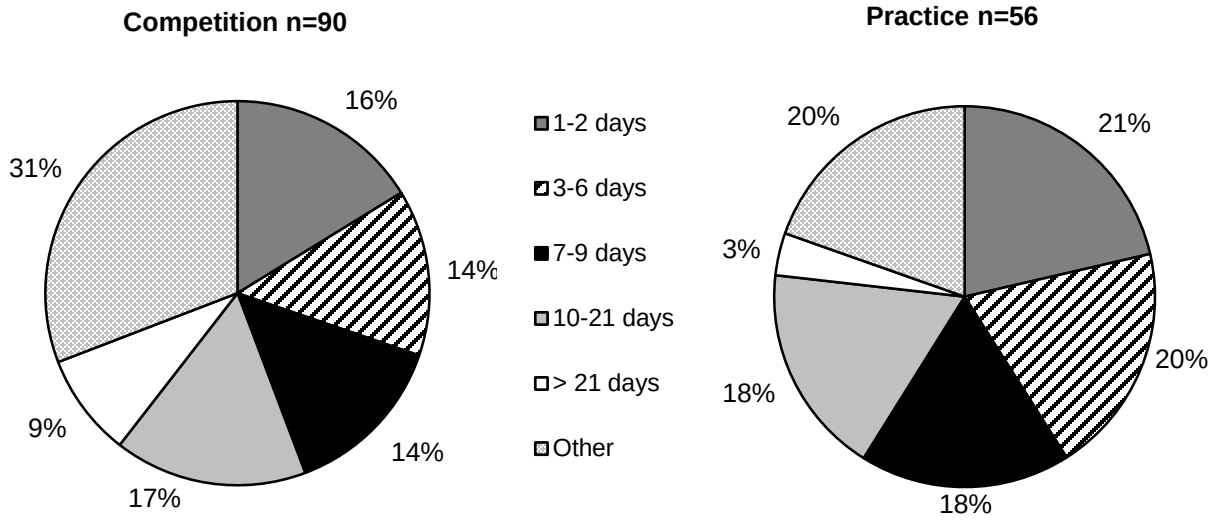
	Competition		Practice		Overall	
	n	%	n	%	n	%
Body Site						
Head/face	34	37.8%	11	19.6%	45	30.8%
Ankle	18	20.0%	10	17.9%	28	19.2%
Knee	20	22.2%	3	5.4%	23	15.8%
Lower leg	2	2.2%	13	23.2%	15	10.3%
Hip/thigh/upper leg	6	6.7%	7	12.5%	13	8.9%
Trunk	2	2.2%	4	7.1%	6	4.1%
Hand/wrist	3	3.3%	2	3.6%	5	3.4%
Foot	2	2.2%	3	5.4%	5	3.4%
Shoulder	1	1.1%	2	3.6%	3	2.1%
Arm/elbow	2	2.2%	0	0.0%	2	1.4%
Other	0	0.0%	1	1.8%	1	0.7%
Total	**90**	**100.0%**	**56**	**100.0%**	**146**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 15.4 Ten Most Common Girls' Lacrosse Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition n=82		Practice n=50		Total n=146	
	n	%	n	%	n	%
Diagnosis						
Head/face concussion	27	30.0%	9	16.1%	36	24.7%
Ankle strain/sprain	17	18.9%	8	14.3%	25	17.1%
Knee strain/sprain	13	14.4%	0	0.0%	13	8.9%
Lower leg other	1	1.1%	10	17.9%	11	7.5%
Hip/thigh/upper leg strain/sprain	4	4.4%	6	10.7%	10	6.8%
Knee other	6	6.7%	3	5.4%	9	6.2%
Head/face contusion	3	3.3%	1	1.8%	4	2.7%
Head/face other	4	4.4%	0	0.0%	4	2.7%
Trunk strain/sprain	2	2.2%	2	3.6%	4	2.7%
Foot strain/sprain	1	1.1%	2	3.6%	3	2.1%

Figure 15.2 Time Loss of Girls' Lacrosse Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 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 15.5 Girls' Lacrosse Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	12	13.6%	1	1.8%	14	9.0%
Did not require surgery	76	86.4%	55	98.2%	131	91.0%
Total	**88**	**100.0%**	**56**	**100.0%**	**144**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Figure 15.3 History of Girls' Lacrosse Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

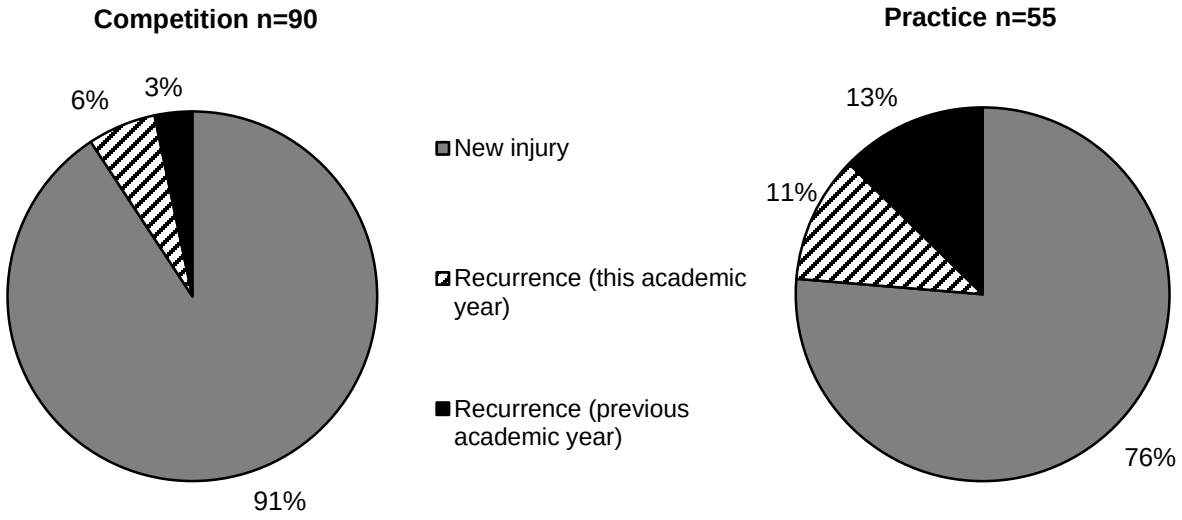


Table 15.6 Time during Season of Girls' Lacrosse Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Season		
Preseason	25	17.4%
Regular season	111	77.1%
Post season	8	5.6%
Total	**144**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 15.7 Competition-Related Variables for Girls' Lacrosse Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Competition		
Pre-Competition-Warm-ups	3	3.5%
First half	23	26.7%
Second half	43	50.0%
Overtime	0	0.0%
Unknown	17	19.8%
Total	**86**	**100.0%**
Field Location		
Midfield (between restraining lines)	22	25.9%
Critical scoring area (including the fan and arc)	14	16.5%
Goal circle	9	10.6%
Sideline	3	3.5%
Center circle	2	2.4%
Endline	2	2.4%
Unknown	33	38.8%
Total	**85**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 15.8 Practice-Related Variables for Girls' Lacrosse Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Practice		
First 1/2 hour	6	11.1%
Second 1/2 hour	6	11.1%
1-2 hours into practice	22	40.7%
>2 hours into practice	1	1.9%
Unknown	19	35.2%
Total	**54**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Figure 15.4 Player Position of Girls' Lacrosse Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

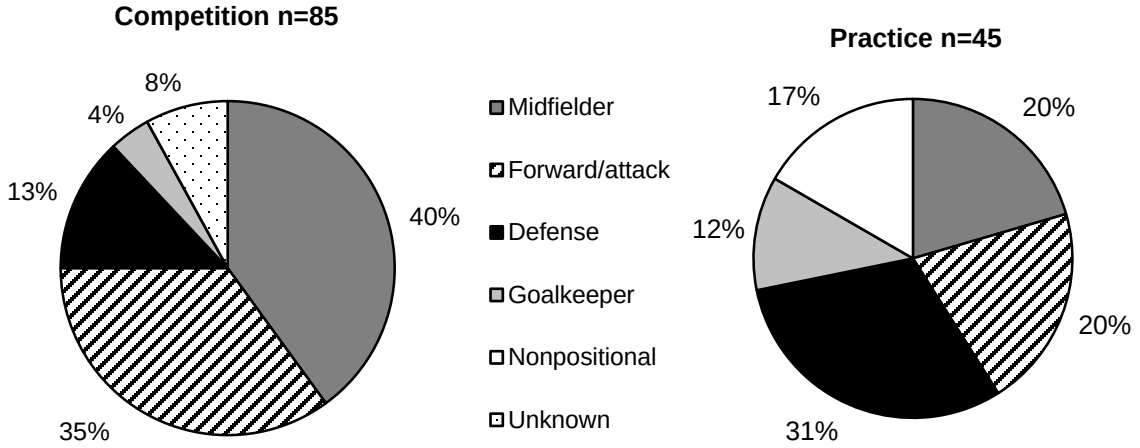


Table 15.9 Activities Leading to Girls' Lacrosse Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition		Practice		Overall	
	n	**%**	**n**	**%**	**n**	**%**
Activity						
General play	17	19.8%	14	31.1%	31	23.7%
Ball handling/cradling	14	16.3%	2	4.4%	16	12.2%
Receiving pass	9	10.5%	4	8.9%	13	9.9%
Defending	7	8.1%	6	13.3%	13	9.9%
Chasing loose ball	7	8.1%	2	4.4%	9	6.9%
Conditioning	0	0.0%	6	13.3%	6	4.6%
Shooting	5	5.8%	0	0.0%	5	3.8%
Being crosse/stick checked	5	5.8%	0	0.0%	5	3.8%
Passing	2	2.3%	1	2.2%	3	2.3%
Blocking shot	1	1.2%	2	4.4%	3	2.3%
Crosse/stick checking	2	2.3%	0	0.0%	2	1.5%
Goaltending	2	2.3%	0	0.0%	2	1.5%
Being body checked	1	1.2%	0	0.0%	1	0.8%
Draw	1	1.2%	0	0.0%	1	0.8%
Unknown	13	15.1%	8	17.8%	21	16.0%
Total	**86**	**100.0%**	**45**	**100.0%**	**131**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 15.10 Activity Resulting in Girls' Lacrosse Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
	n	%	n	%	n	%	n	%	n	%
Activity										
General play	17	32.1%	1	12.5%	2	25.0%	1	2.9%	10	37.0%
Ball handling/cradling	7	13.2%	0	0.0%	1	12.5%	5	14.3%	3	11.1%
Receiving pass	1	1.9%	3	37.5%	0	0.0%	6	17.1%	3	11.1%
Defending	6	11.3%	0	0.0%	0	0.0%	5	14.3%	2	7.4%
Chasing loose ball	5	9.4%	1	12.5%	1	12.5%	0	0.0%	2	7.4%
Conditioning	5	9.4%	0	0.0%	1	12.5%	0	0.0%	0	0.0%
Shooting	2	3.8%	0	0.0%	1	12.5%	1	2.9%	1	3.7%
Being crosse/stick checked	0	0.0%	2	25.0%	0	0.0%	2	5.7%	1	3.7%
Passing	0	0.0%	0	0.0%	1	12.5%	1	2.9%	1	3.7%
Blocking shot	0	0.0%	0	0.0%	0	0.0%	3	8.6%	0	0.0%
Crosse/stick checking	0	0.0%	0	0.0%	0	0.0%	2	5.7%	0	0.0%
Goaltending	1	1.9%	0	0.0%	0	0.0%	1	2.9%	0	0.0%
Being body checked	1	1.9%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Draw	0	0.0%	0	0.0%	0	0.0%	1	2.9%	0	0.0%
Unknown	8	15.1%	1	12.5%	1	12.5%	7	20.0%	4	14.8%
Total	**53**	**100.0%**	**8**	**100.0%**	**8**	**100.0%**	**35**	**100.0%**	**27**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

XVI. Boys' Swimming and Diving Injury Epidemiology

Table 16.1 Boys' Swimming and Diving Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	**17**	**98,660**	**0.17**
Competition	2	17,542	0.11
Practice	15	81,118	0.18

Table 16.2 Demographic Characteristics of Injured Boys' Swimming and Diving Athletes, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year*

Year in School	**n=16**
Freshman	6.3%
Sophomore	18.8%
Junior	37.5%
Senior	37.5%
Total†	**100.0%**
Age (years)	
Minimum	14
Maximum	18
Mean (St. Dev.)	16.4 (1.0)
BMI	
Minimum	18.8
Maximum	26.3
Mean (St. Dev.)	23.0 (2.5)

*All analyses in this chapter present un-weighted data.
†Throughout this report, totals and n's represent the total un-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 16.1 Diagnosis of Boys' Swimming and Diving Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

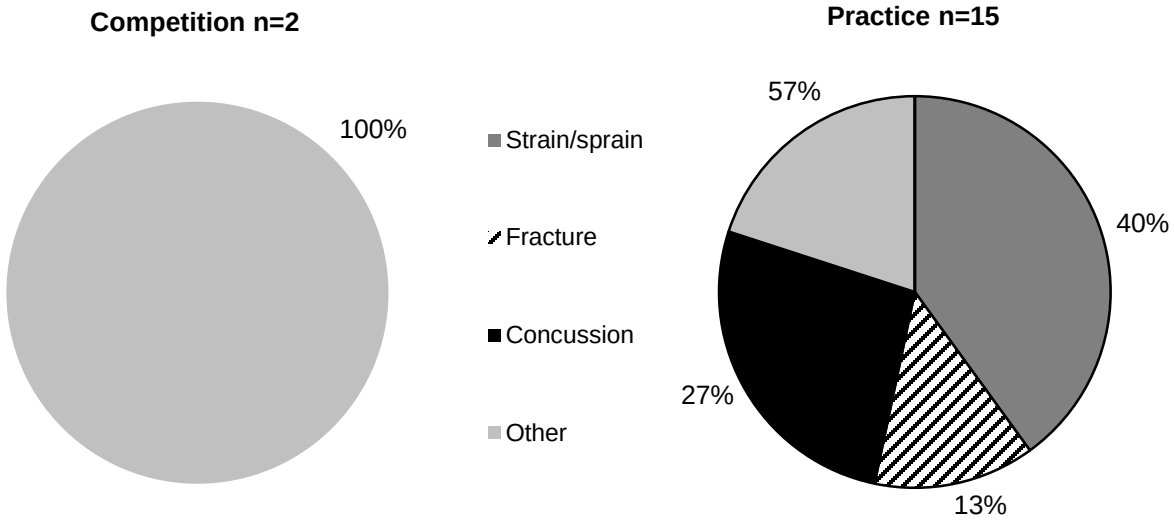


Table 16.3 Body Site of Boys' Swimming and Diving Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

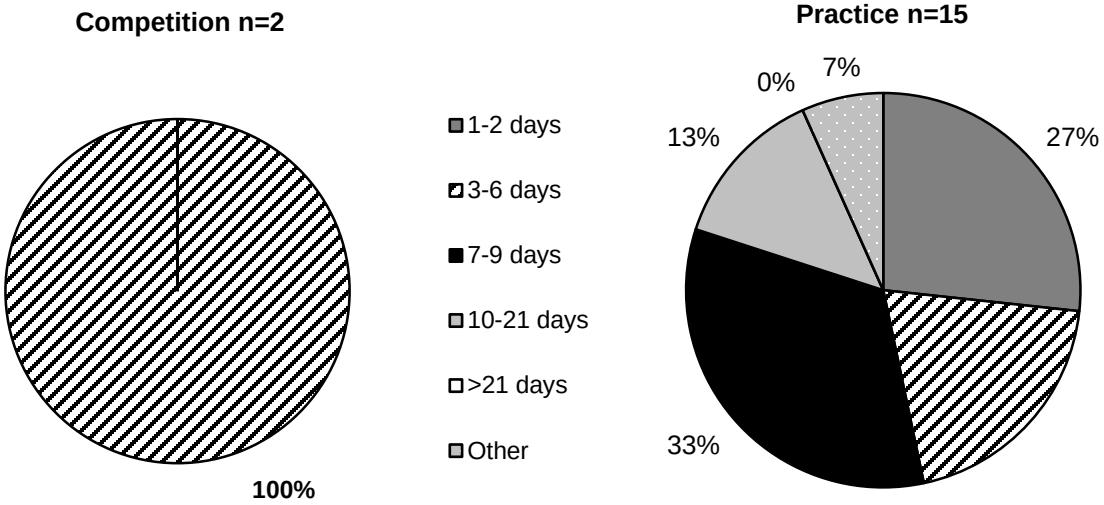
	Competition		Practice		Overall	
	n	**%**	**n**	**%**	**n**	**%**
Body Site						
Shoulder	1	50.0%	5	33.3%	6	35.3%
Head/face	0	0.0%	5	33.3%	5	29.4%
Foot	1	50.0%	1	6.7%	2	11.8%
Arm/elbow	0	0.0%	2	13.3%	2	11.8%
Hip/thigh/upper leg	0	0.0%	1	6.7%	1	5.9%
Trunk	0	0.0%	1	6.7%	1	5.9%
Total	**2**	**100.0%**	**15**	**100.0%**	**17**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 16.4 Ten Most Common Boys' Swimming and Diving Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition n=2		Practice n=15		Total n=17	
	n	%	n	%	n	%
Diagnosis						
Head/face concussion	0	0.0%	4	26.7%	4	23.5%
Shoulder strain/sprain	0	0.0%	4	26.7%	4	23.5%
Shoulder other	1	50.0%	1	6.7%	2	11.8%
Hip/thigh/upper leg strain/sprain	0	0.0%	1	6.7%	1	5.9%
Arm/elbow strain/sprain	0	0.0%	1	6.7%	1	5.9%
Foot contusion	0	50.0%	1	6.7%	1	5.9%
Head/face contusion	0	0.0%	1	6.7%	1	5.9%
Trunk other	0	0.0%	1	6.7%	1	5.9%
Foot other	1	0.0%	0	0.0%	1	5.9%
Arm/elbow other	0	0.0%	1	6.7%	1	5.9%

Figure 16.2 Time Loss of Boys' Swimming and Diving Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 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 16.5 Boys' Swimming and Diving Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	0	0.0%	1	6.7%	1	5.9%
Did not require surgery	2	100.0%	14	93.3%	16	94.1%
Total	**2**	**100.0%**	**15**	**100.0%**	**17**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Figure 16.3 History of Boys' Swimming and Diving Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

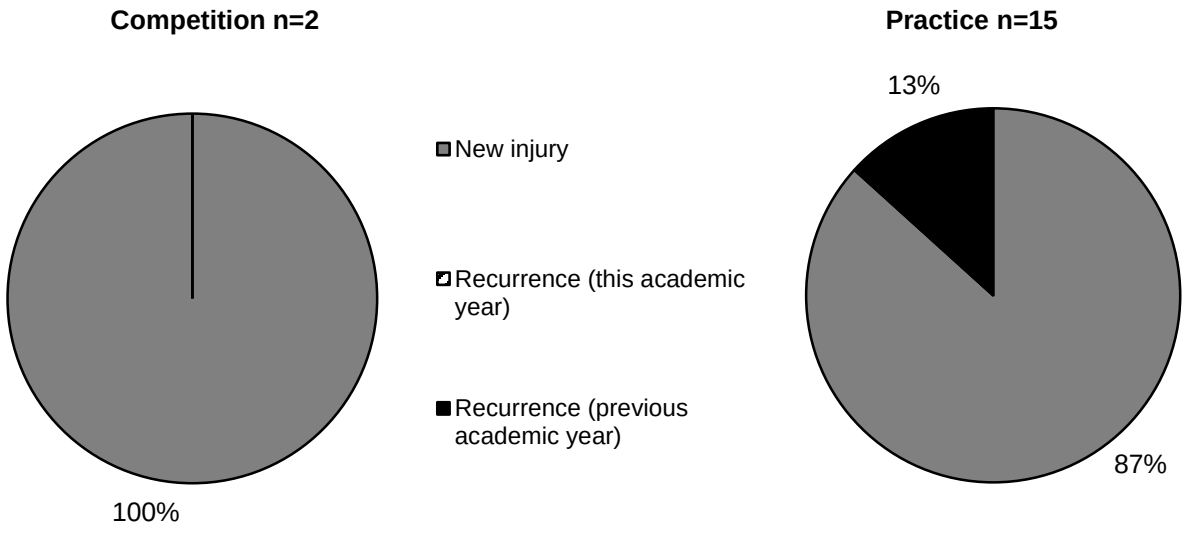


Table 16.6 Time during Season of Boys' Swimming and Diving Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Season		
Preseason	0	0.0%
Regular season	16	94.1%
Post season	1	5.9%
Total	**17**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 16.7 Pool Location for Boys' Swimming and Diving Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Pool Location		
In pool	12	75.0%
Poolside	2	12.5%
Unknown	2	12.5%
Total	**16**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 16.8 Practice-Related Variables for Boys' Swimming and Diving Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Practice		
First 1/2 hour	1	6.7%
Second 1/2 hour	1	6.7%
1-2 hours into practice	5	33.3%
>2 hours into practice	0	0.0%
Unknown	8	53.3%
Total	**15**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 16.9 Activities Leading to Boys' Swimming and Diving Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Activity						
Swimming	1	50.0%	6	42.9%	7	43.8%
Flip turn off wall	0	0.0%	3	21.4%	3	18.8%
Conditioning	0	0.0%	3	21.4%	3	18.8%
Other	1	50.0%	0	0.0%	1	6.3%
Unknown	0	0.0%	2	14.3%	2	12.5%
Total	**2**	**100.0%**	**14**	**100.0%**	**16**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 16.10 Activity Resulting in Boys' Swimming and Diving Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
	n	%	n	%	n	%	n	%	n	%
Activity										
Swimming	3	50.0%	1	50.0%	0	0.0%	1	33.3%	2	40.0%
Flip turn off wall	1	16.7%	0	0.0%	0	0.0%	2	66.7%	0	0.0%
Conditioning	1	16.7%	0	0.0%	0	0.0%	0	0.0%	2	40.0%
Other	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	20.0%
Unknown	1	16.7%	1	50.0%	0	0.0%	0	0.0%	0	0.0%
Total	**6**	**100.0%**	**2**	**100.0%**	**0**	**0.0%**	**3**	**100.0%**	**5**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

XVII. Girls' Swimming and Diving Injury Epidemiology

Table 17.1 Girls' Swimming and Diving Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	**40**	**107,033**	**0.37**
Competition	4	20,293	0.20
Practice	36	86,740	0.42

Table 17.2 Demographic Characteristics of Injured Girls' Swimming and Diving Athletes, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year*

Year in School	**n=39**
Freshman	33.3%
Sophomore	17.9%
Junior	33.3%
Senior	15.4%
Total†	**100.0%**
Age (years)	
Minimum	13
Maximum	17
Mean (St. Dev.)	15.4 (1.1)
BMI	
Minimum	16.7
Maximum	24.3
Mean (St. Dev.)	20.7 (2.3)

*All analyses in this chapter present un-weighted data.
†Throughout this report, totals and n's represent the total un-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 17.1 Diagnosis of Girls' Swimming and Diving Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

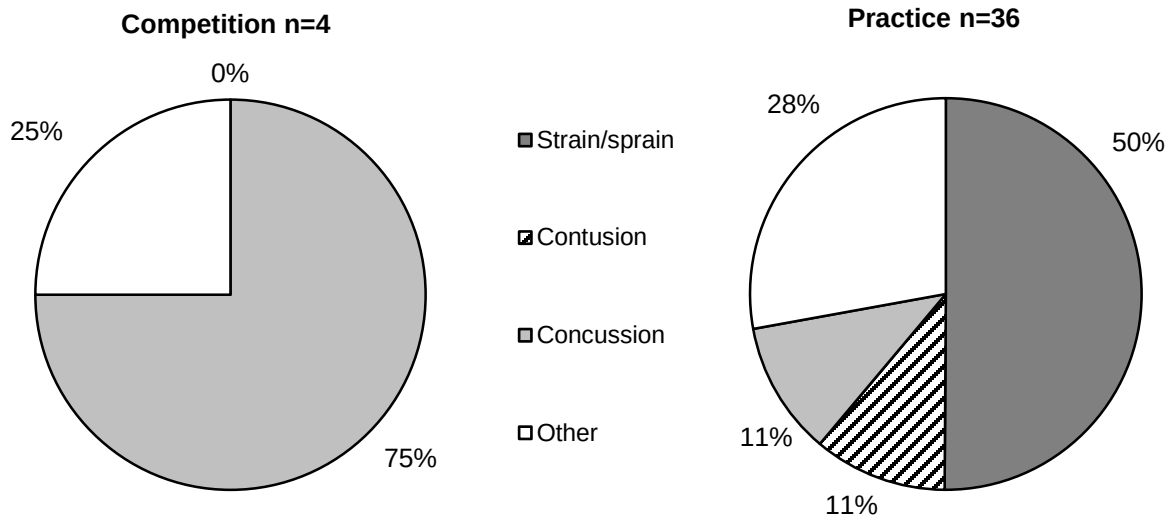


Table 17.3 Body Site of Girls' Swimming and Diving Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

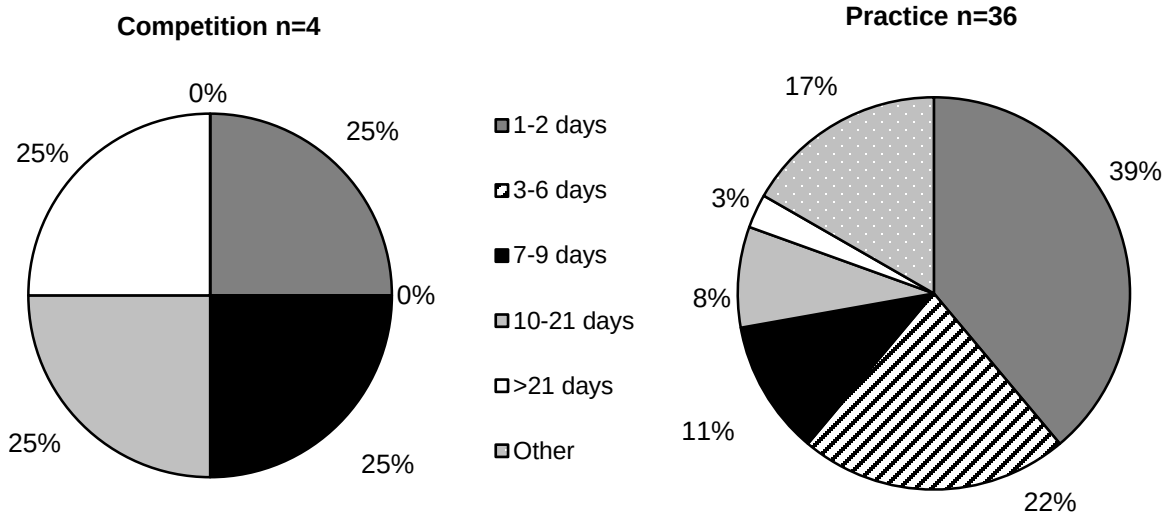
	Competition		Practice		Overall	
	n	**%**	**n**	**%**	**n**	**%**
Body Site						
Shoulder	0	0.0%	15	41.7%	15	37.5%
Trunk	1	25.0%	7	19.4%	8	20.0%
Head/face	3	75.0%	4	11.1%	7	17.5%
Hip/thigh/upper leg	0	0.0%	2	5.6%	2	5.0%
Hand/wrist	0	0.0%	2	5.6%	2	5.0%
Foot	0	0.0%	2	5.6%	2	5.0%
Knee	0	0.0%	1	2.8%	1	2.5%
Ankle	0	0.0%	1	2.8%	1	2.5%
Other	0	0.0%	2	5.6%	2	5.0%
Total	**4**	**100.0%**	**36**	**100.0%**	**40**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 17.4 Ten Most Common Girls' Swimming and Diving Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition n=4		Practice n=36		Total n=40	
	n	%	n	%	n	%
Diagnosis						
Shoulder strain/sprain	0	0.0%	9	25.0%	9	22.5%
Head/face concussion	3	75.0%	4	11.1%	7	17.5%
Shoulder other	0	0.0%	6	16.7%	6	15.0%
Trunk strain/sprain	0	0.0%	5	13.9%	5	12.5%
Trunk other	1	25.0%	2	5.6%	3	7.5%
Hip/thigh/upper leg strain/sprain	0	0.0%	2	5.6%	2	5.0%
Foot contusion	0	0.0%	2	5.6%	2	5.0%
Knee contusion	0	0.0%	1	2.8%	1	2.5%
Ankle strain/sprain	0	0.0%	1	2.8%	1	2.5%

Figure 17.2 Time Loss of Girls' Swimming and Diving Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 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 17.5 Girls' Swimming and Diving Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	0	0.0%	1	2.8%	1	2.5%
Did not require surgery	4	100.0%	35	97.2%	39	97.5%
Total	**4**	**100.0%**	**36**	**100.0%**	**40**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Figure 17.3 History of Girls' Swimming and Diving Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

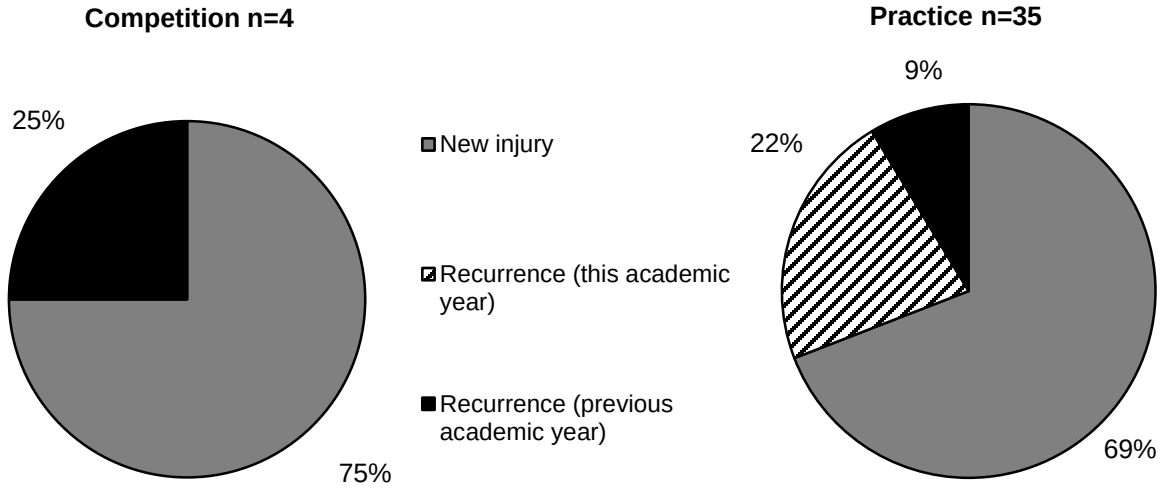


Table 17.6 Time during Season of Girls' Swimming and Diving Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Season		
Preseason	9	22.5%
Regular season	31	77.5%
Post season	0	0.0%
Total	**40**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 17.7 Competition-Related Variables for Girls' Swimming and Diving Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Pool Location		
In pool	28	70.0%
Poolside	4	10.0%
Starting platform/board/block	1	2.5%
Other	1	2.5%
Unknown	6	15.0%
Total	**40**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 17.8 Practice-Related Variables for Girls' Swimming and Diving Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Practice		
First 1/2 hour	3	8.3%
Second 1/2 hour	2	5.6%
1-2 hours into practice	18	50.0%
>2 hours into practice	0	0.0%
Unknown	13	36.1%
Total	**36**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 17.9 Activities Leading to Girls' Swimming and Diving Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Activity						
Swimming	1	25.0%	15	42.9%	16	41.0%
Conditioning	0	0.0%	7	20.0%	7	17.9%
Flip turn off wall	1	25.0%	2	5.7%	3	7.7%
Diving off board/platform/block	0	0.0%	2	5.7%	2	5.1%
Touch turn off wall	1	25.0%	0	0.0%	1	2.6%
Other	1	25.0%	3	8.6%	4	10.3%
Unknown	0	0.0%	6	17.1%	6	15.4%
Total	**4**	**100.0%**	**35**	**100.0%**	**39**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 17.10 Activity Resulting in Girls' Swimming and Diving Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
	n	%	n	%	n	%	n	%	n	%
Activity										
Swimming	9	52.9%	0	0.0%	0	0.0%	0	0.0%	7	63.6%
Conditioning	4	23.5%	2	50.0%	0	0.0%	0	0.0%	1	9.1%
Flip turn off wall	1	5.9%	0	0.0%	0	0.0%	2	28.6%	0	0.0%
Diving off board/platform/block	0	0.0%	1	25.0%	0	0.0%	1	14.3%	0	0.0%
Touch turn off wall	0	0.0%	0	0.0%	0	0.0%	1	14.3%	0	0.0%
Other	0	0.0%	0	0.0%	0	0.0%	3	42.9%	1	9.1%
Unknown	3	17.6%	1	25.0%	0	0.0%	0	0.0%	2	18.2%
Total	**17**	**100.0%**	**4**	**100.0%**	**0**	**0.0%**	**7**	**100.0%**	**11**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

XVIII. Boys' Track and Field Injury Epidemiology

Table 18.1 Boys' Track and Field Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	**283**	**277,419**	**1.02**
Competition	85	49,091	1.73
Practice	198	228,328	0.87

Table 18.2 Demographic Characteristics of Injured Boys' Track and Field Athletes, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year*

Year in School	**n=279**
Freshman	18.3%
Sophomore	24.0%
Junior	33.7%
Senior	24.0%
Total†	**100.0%**
Age (years)	
Minimum	14
Maximum	19
Mean (St. Dev.)	16.1 (1.2)
BMI	
Minimum	17.0
Maximum	39.5
Mean (St. Dev.)	22.7 (3.5)

*All analyses in this chapter present un-weighted data.
†Throughout this report, totals and n's represent the total un-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 18.1 Diagnosis of Boys' Track and Field Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

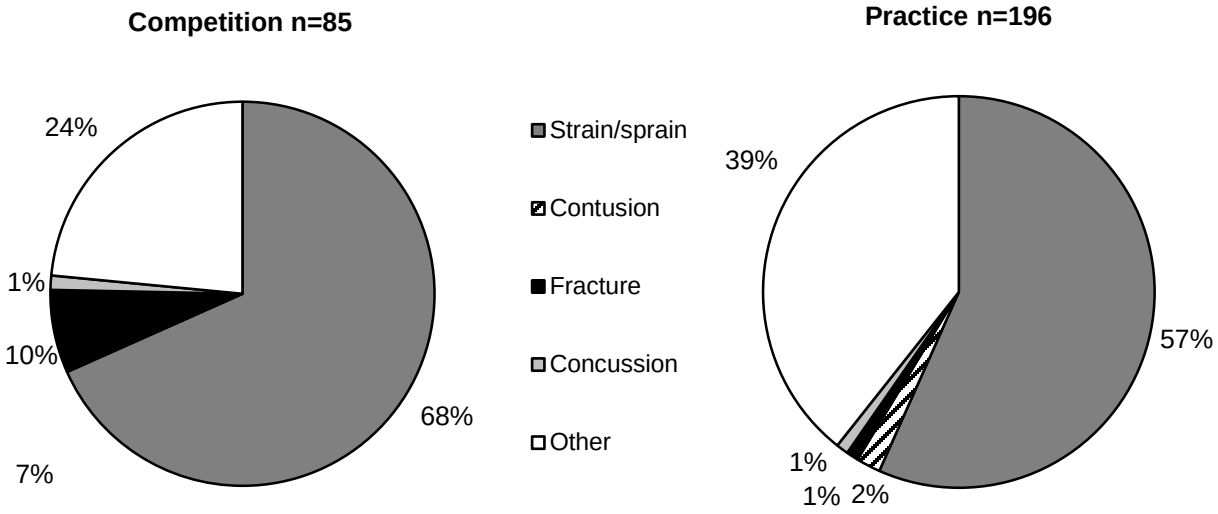


Table 18.3 Body Site of Boys' Track and Field Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

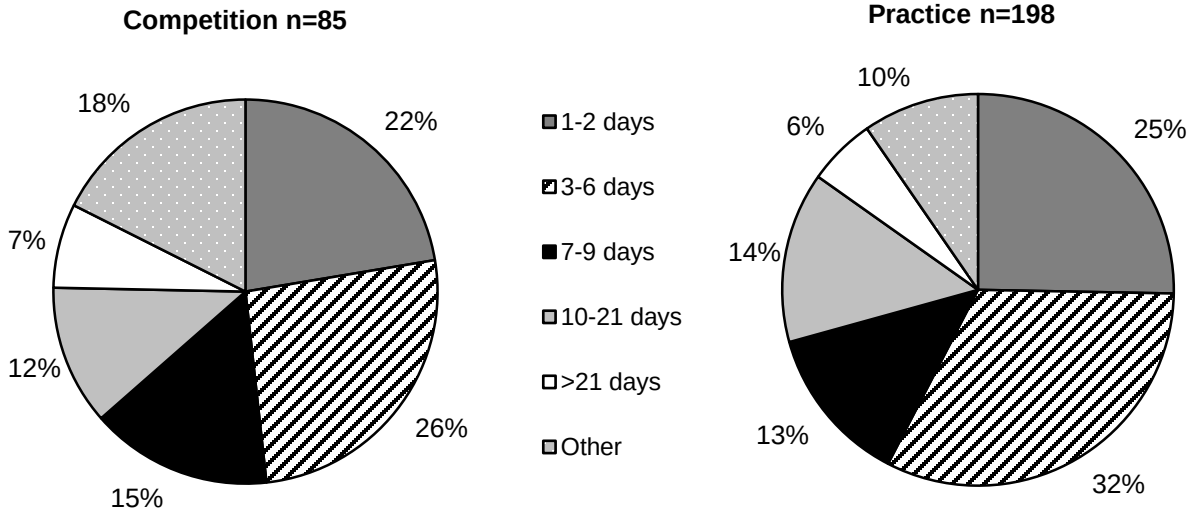
	Competition		Practice		Overall	
	n	%	n	%	n	%
Body Site						
Hip/thigh/upper leg	48	56.5%	74	37.4%	122	43.1%
Lower leg	9	10.6%	44	22.2%	53	18.7%
Knee	9	10.6%	29	14.6%	38	13.4%
Ankle	8	9.4%	17	8.6%	25	8.8%
Trunk	5	5.9%	10	5.1%	15	5.3%
Foot	1	1.2%	13	6.6%	14	4.9%
Head/face	2	2.4%	2	1.0%	4	1.4%
Shoulder	2	2.4%	2	1.0%	4	1.4%
Arm/elbow	0	0.0%	3	1.5%	3	1.1%
Hand/wrist	0	0.0%	2	1.0%	2	0.7%
Other	1	1.2%	2	1.0%	3	1.1%
Total	**85**	**100.0%**	**198**	**100.0%**	**283**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 18.4 Ten Most Common Boys' Track and Field Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition n=85		Practice n=196		Total n=281	
	n	%	n	%	n	%
Diagnosis						
Hip/thigh/upper leg strain/sprain	43	50.6%	68	34.7%	111	39.5%
Lower leg other	5	5.9%	32	16.3%	37	13.2%
Knee other	5	5.9%	24	12.2%	29	10.3%
Ankle strain/sprain	7	8.2%	13	6.6%	20	7.1%
Lower leg strain/sprain	2	2.4%	12	6.1%	14	5.0%
Hip/thigh/upper leg other	4	4.7%	5	2.6%	9	3.2%
Foot other	1	1.2%	7	3.6%	8	2.8%
Knee strain/sprain	2	2.4%	5	2.6%	7	2.5%
Trunk strain/sprain	2	2.4%	5	2.6%	7	2.5%
Trunk other	3	3.5%	3	1.5%	6	2.1%

Figure 18.2 Time Loss of Boys' Track and Field Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 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 18.5 Boys' Track and Field Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	3	3.5%	4	2.0%	7	2.5%
Did not require surgery	82	96.5%	192	98.0%	274	97.5%
Total	**85**	**100.0%**	**196**	**100.0%**	**281**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Figure 18.3 History of Boys' Track and Field Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

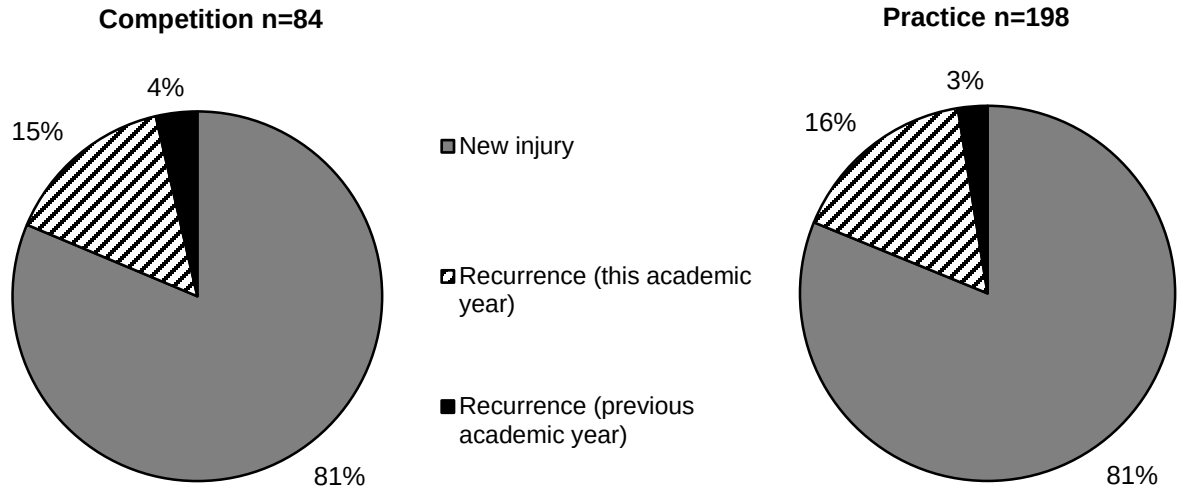


Table 18.6 Time during Season of Boys' Track and Field Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Season		
Preseason	73	26.0%
Regular season	194	69.0%
Post season	14	5.0%
Total	**281**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 18.7 Practice-Related Variables for Boys' Track and Field Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Practice		
First 1/2 hour	27	13.9%
Second 1/2 hour	35	18.0%
1-2 hours into practice	74	38.1%
>2 hours into practice	3	1.5%
Unknown	55	28.4%
Total	**194**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 18.8 Activities Leading to Boys' Track and Field Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Activity						
Running	44	56.4%	127	67.6%	171	64.3%
Jumping/landing	11	14.1%	21	11.2%	32	12.0%
Running hurdles	7	9.0%	11	5.9%	18	6.8%
Throwing	3	3.8%	10	5.3%	13	4.9%
Warming up	6	7.7%	1	0.5%	7	2.6%
Conditioning	0	0.0%	7	3.7%	7	2.6%
Leaving block	3	3.8%	3	1.6%	6	2.3%
Baton hand off	1	1.3%	1	0.5%	2	0.8%
Other	0	0.0%	6	3.2%	6	2.3%
Unknown	3	3.8%	1	0.5%	4	1.5%
Total	**78**	**100.0%**	**188**	**100.0%**	**266**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 18.10 Activity Resulting in Boys' Track and Field Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
	n	%	n	%	n	%	n	%	n	%
Activity										
Running	108	67.9%	0	0.0%	3	42.9%	0	0.0%	60	65.9%
Jumping/landing	15	9.4%	2	50.0%	3	42.9%	1	33.3%	11	12.1%
Running hurdles	12	7.5%	0	0.0%	1	14.3%	0	0.0%	5	5.5%
Throwing	10	6.3%	0	0.0%	0	0.0%	1	33.3%	1	1.1%
Warming up	4	2.5%	0	0.0%	0	0.0%	0	0.0%	3	3.3%
Conditioning	2	1.3%	1	25.0%	0	0.0%	0	0.0%	4	4.4%
Leaving block	5	3.1%	0	0.0%	0	0.0%	0	0.0%	1	1.1%
Baton hand off	1	0.6%	0	0.0%	0	0.0%	0	0.0%	1	1.1%
Other	1	0.6%	1	25.0%	0	0.0%	1	33.3%	3	3.3%
Unknown	1	0.6%	0	0.0%	0	0.0%	0	0.0%	2	2.2%
Total	**159**	**100.0%**	**4**	**100.0%**	**7**	**100.0%**	**3**	**100.0%**	**91**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

XIX. Girls' Track and Field Injury Epidemiology

Table 19.1 Girls' Track and Field Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	**245**	**239,186**	**1.02**
Competition	55	43,806	1.26
Practice	190	195,380	0.97

Table 19.2 Demographic Characteristics of Injured Girls' Track and Field Athletes, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year*

Year in School	**n=240**
Freshman	31.7%
Sophomore	29.2%
Junior	22.9%
Senior	16.3%
Total†	**100.0%**
Age (years)	
Minimum	14
Maximum	19
Mean (St. Dev.)	15.6 (1.1)
BMI	
Minimum	16.3
Maximum	29.6
Mean (St. Dev.)	21.4 (2.6)

*All analyses in this chapter present un-weighted data.
†Throughout this report, totals and n's represent the total un-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 19.1 Diagnosis of Girls' Track and Field Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

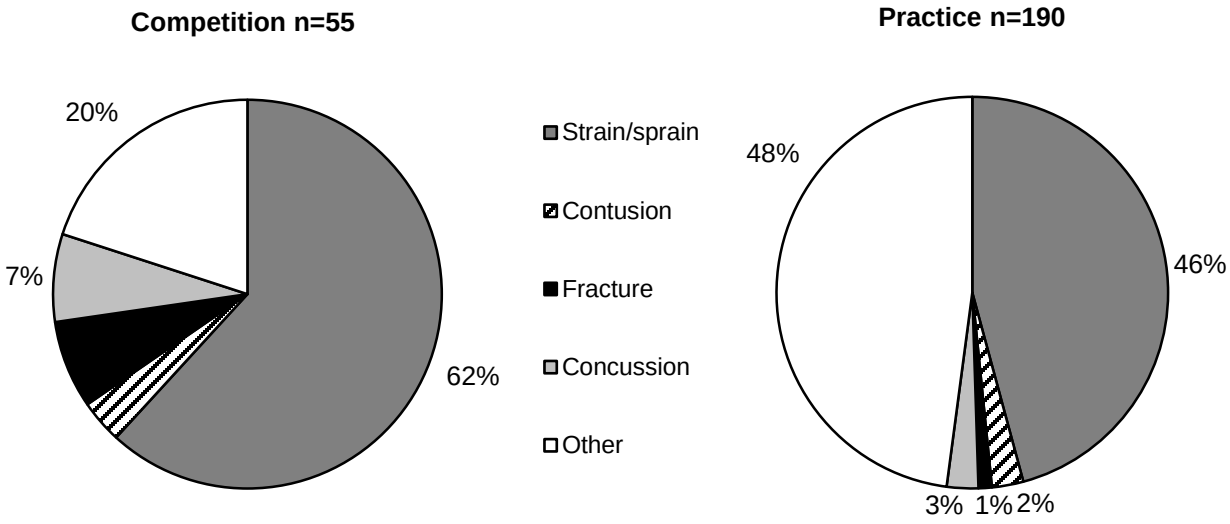


Table 19.3 Body Site of Girls' Track and Field Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

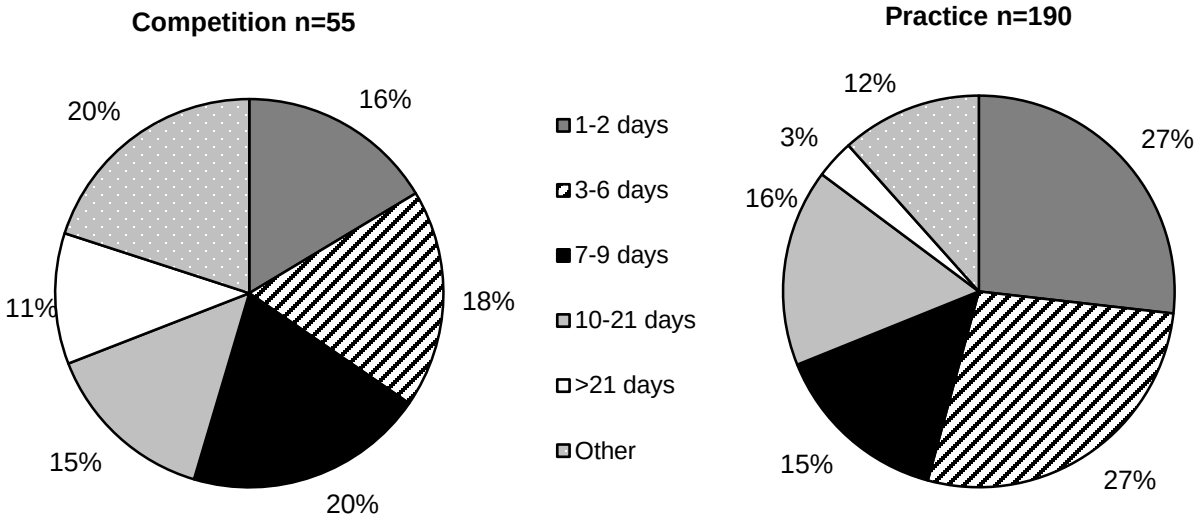
	Competition		Practice		Overall	
	n	**%**	**n**	**%**	**n**	**%**
Body Site						
Hip/thigh/upper leg	25	45.5%	61	32.1%	86	35.1%
Lower leg	4	7.3%	38	20.0%	42	17.1%
Knee	4	7.3%	25	13.2%	29	11.8%
Ankle	8	14.5%	17	8.9%	25	10.2%
Trunk	3	5.5%	21	11.1%	24	9.8%
Foot	3	5.5%	11	5.8%	14	5.7%
Head/face	4	7.3%	6	3.2%	10	4.1%
Hand/wrist	3	5.5%	1	0.5%	4	1.6%
Shoulder	0	0.0%	3	1.6%	3	1.2%
Arm/elbow	1	1.8%	1	0.5%	2	0.8%
Neck	0	0.0%	1	0.5%	1	0.4%
Other	0	0.0%	5	2.6%	5	2.0%
Total	**55**	**100.0%**	**190**	**100.0%**	**245**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 19.4 Ten Most Common Girls' Track and Field Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition n=55		Practice n=190		Total n=245	
	n	%	n	%	n	%
Diagnosis						
Hip/thigh/upper leg strain/sprain	20	36.4%	48	25.3%	68	27.8%
Lower leg other	1	1.8%	30	15.8%	31	12.7%
Knee other	1	1.8%	21	11.1%	22	9.0%
Ankle strain/sprain	8	14.5%	12	6.3%	20	8.2%
Hip/thigh/upper leg other	3	5.5%	13	6.8%	16	6.5%
Trunk strain/sprain	1	1.8%	12	6.3%	13	5.3%
Foot other	3	5.5%	9	4.7%	12	4.9%
Trunk other	2	3.6%	8	4.2%	10	4.1%
Lower leg strain/sprain	3	5.5%	7	3.7%	10	4.1%
Head/face concussion	4	7.3%	5	2.6%	9	3.7%

Figure 19.2 Time Loss of Girls' Track and Field Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 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 19.5 Girls' Track and Field Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	2	3.6%	0	0.0%	2	0.8%
Did not require surgery	53	96.4%	190	100.0%	243	99.2%
Total	**55**	**100.0%**	**190**	**100.0%**	**245**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Figure 19.3 History of Girls' Track and Field Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

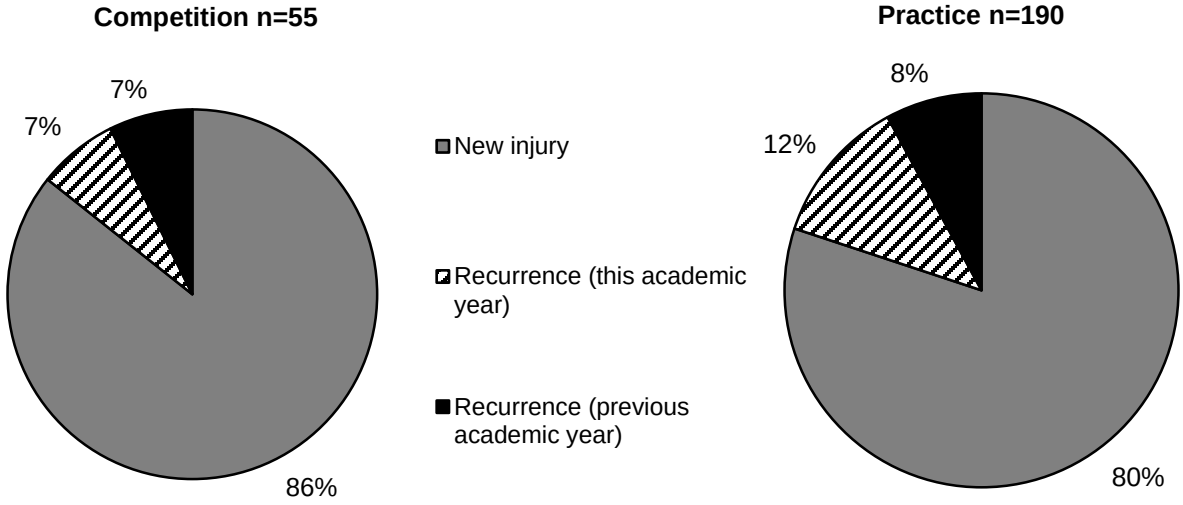


Table 19.6 Time during Season of Girls' Track and Field Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Season		
Preseason	82	33.5%
Regular season	153	62.4%
Post season	9	3.7%
Unknown	1	0.4%
Total	**245**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 19.7 Practice-Related Variables for Girls' Track and Field Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Practice		
First 1/2 hour	19	10.2%
Second 1/2 hour	23	12.3%
1-2 hours into practice	85	45.5%
>2 hours into practice	2	1.1%
Unknown	58	31.0%
Total	**187**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 19.8 Activities Leading to Girls' Track and Field Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Activity						
Running	28	52.8%	117	67.2%	145	63.9%
Jumping/landing	10	18.9%	17	9.8%	27	11.9%
Throwing	2	3.8%	9	5.2%	11	4.8%
Conditioning	0	0.0%	11	6.3%	11	4.8%
Running hurdles	3	5.7%	5	2.9%	8	3.5%
Warming up	3	5.7%	4	2.3%	7	3.1%
Leaving block	2	3.8%	1	0.6%	3	1.3%
Baton hand off	1	1.9%	0	0.0%	1	0.4%
Other	3	5.7%	3	1.7%	6	2.6%
Unknown	1	1.9%	7	4.0%	8	3.5%
Total	**53**	**100.0%**	**174**	**100.0%**	**227**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 19.10 Activity Resulting in Girls' Track and Field Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
	n	%	n	%	n	%	n	%	n	%
Activity										
Running	71	62.8%	3	42.9%	2	33.3%	2	25.0%	67	72.0%
Jumping/landing	19	16.8%	1	14.3%	0	0.0%	1	12.5%	6	6.5%
Throwing	6	5.3%	0	0.0%	0	0.0%	0	0.0%	5	5.4%
Conditioning	3	2.7%	1	14.3%	0	0.0%	1	12.5%	6	6.5%
Running hurdles	3	2.7%	2	28.6%	3	50.0%	0	0.0%	0	0.0%
Warming up	3	2.7%	0	0.0%	0	0.0%	0	0.0%	4	4.3%
Leaving block	2	1.8%	0	0.0%	0	0.0%	1	12.5%	0	0.0%
Baton hand off	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	1.1%
Other	2	1.8%	0	0.0%	0	0.0%	3	37.5%	1	1.1%
Unknown	4	3.5%	0	0.0%	1	16.7%	0	0.0%	3	3.2%
Total	**113**	**100.0%**	**7**	**100.0%**	**6**	**100.0%**	**8**	**100.0%**	**93**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

XX. Boys' Cross Country Injury Epidemiology

Table 20.1 Boys' Cross Country Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	**92**	**145,521**	**0.63**
Competition	17	24,424	0.70
Practice	75	121,097	0.62

Table 20.2 Demographic Characteristics of Injured Boys' Cross Country Athletes, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year*

Year in School	**n=85**
Freshman	20.0%
Sophomore	30.6%
Junior	23.5%
Senior	25.9%
Total†	**100.0%**
Age (years)	
Minimum	12
Maximum	18
Mean (St. Dev.)	15.7 (1.3)
BMI	
Minimum	15.6
Maximum	28.0
Mean (St. Dev.)	20.3 (2.5)

*All analyses in this chapter present un-weighted data.
†Throughout this report, totals and n's represent the total un-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 20.1 Diagnosis of Boys' Cross Country Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

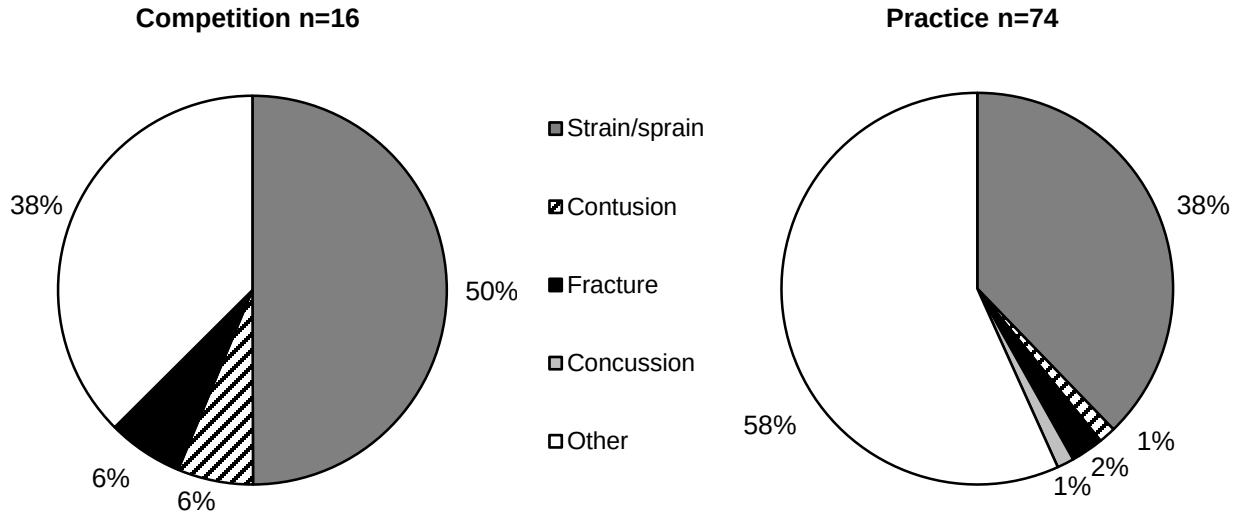


Table 20.3 Body Site of Boys' Cross Country Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

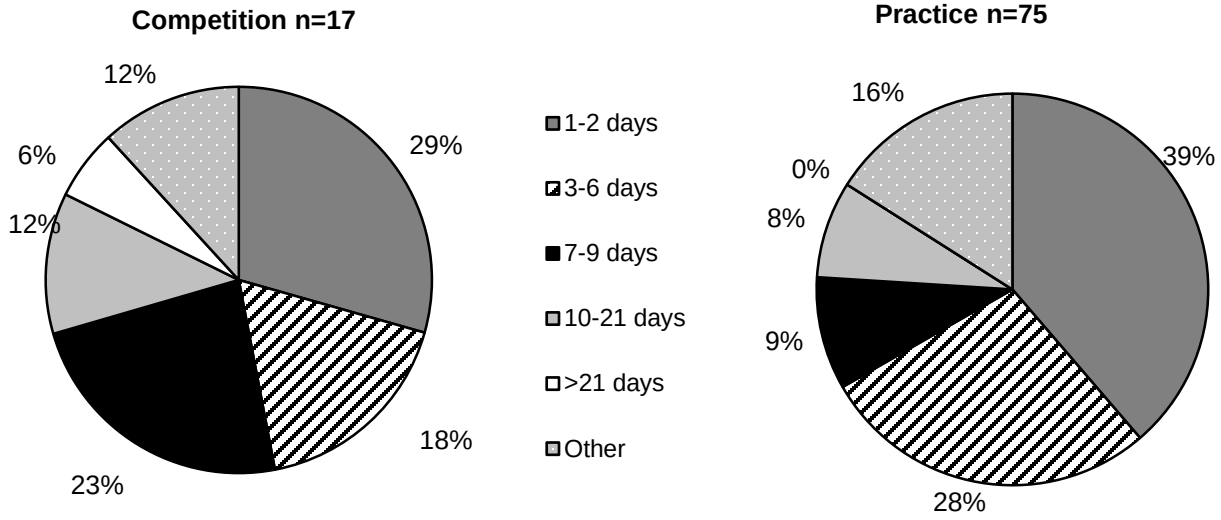
	Competition		Practice		Overall	
	n	%	n	%	n	%
Body Site						
Knee	3	17.6%	16	21.3%	19	20.7%
Ankle	4	23.5%	13	17.3%	17	18.5%
Lower leg	3	17.6%	13	17.3%	16	17.4%
Foot	3	17.6%	12	16.0%	15	16.3%
Hip/thigh/upper leg	1	5.9%	12	16.0%	13	14.1%
Trunk	1	5.9%	1	1.3%	2	2.2%
Shoulder	0	0.0%	2	2.7%	2	2.2%
Head/face	0	0.0%	1	1.3%	1	1.1%
Hand/wrist	0	0.0%	1	1.3%	1	1.1%
Arm/elbow	0	0.0%	1	1.3%	1	1.1%
Other	2	11.8%	3	4.0%	5	5.4%
Total	**17**	**100.0%**	**75**	**100.0%**	**92**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 20.4 Ten Most Common Boys' Cross Country Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition n=16		Practice n=74		Total n=90	
	n	%	n	%	n	%
Diagnosis						
Ankle strain/sprain	4	25.0%	10	13.5%	14	15.6%
Lower leg other	2	12.5%	11	14.9%	13	14.4%
Knee other	2	12.5%	11	14.9%	13	14.4%
Hip/thigh/upper leg strain/sprain	1	6.3%	8	10.8%	9	10.0%
Foot other	0	0.0%	9	12.2%	9	10.0%
Hip/thigh/upper leg other	0	0.0%	4	5.4%	4	4.4%
Other	2	12.5%	2	2.7%	4	4.4%
Knee sprain/strain	0	0.0%	4	5.4%	4	4.4%
Lower leg strain/sprain	1	6.3%	2	2.7%	3	3.3%
Ankle other	0	0.0%	3	4.1%	3	3.3%

Figure 20.2 Time Loss of Boys' Cross Country Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 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 20.5 Boys' Cross Country Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	0	0.0%	1	1.3%	1	1.1%
Did not require surgery	17	100.0%	74	98.7%	91	100.0%
Total	**17**	**100.0%**	**75**	**100.0%**	**92**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Figure 20.3 History of Boys' Cross Country Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

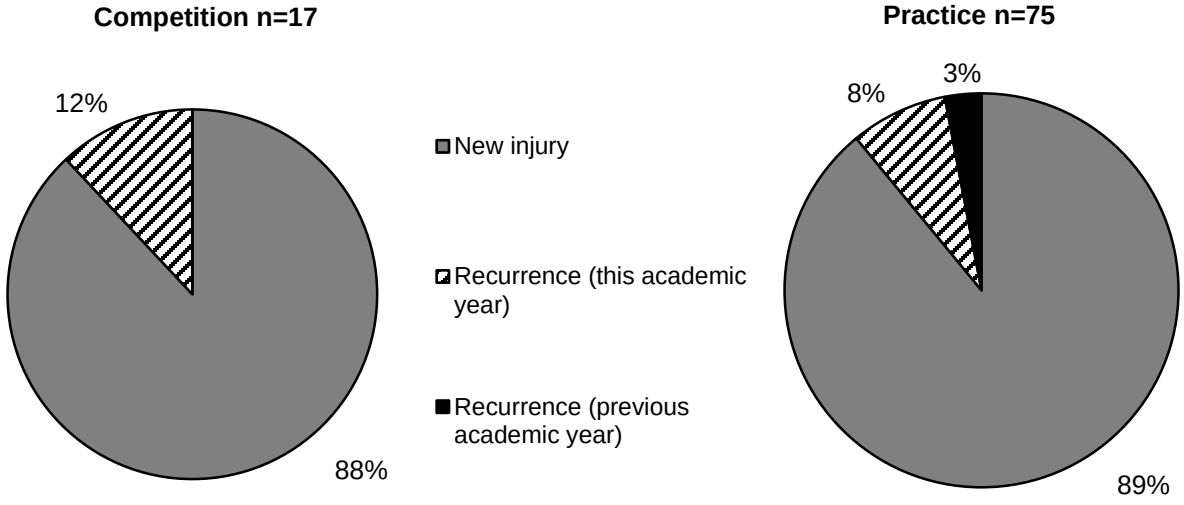


Table 20.6 Time during Season of Boys' Cross Country Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Season		
Preseason	16	17.4%
Regular season	75	81.5%
Unknown	1	1.1%
Total	**92**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 20.7 Practice-Related Variables for Boys' Cross Country Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Practice		
First 1/2 hour	5	6.8%
Second 1/2 hour	9	12.2%
1-2 hours into practice	24	32.4%
>2 hours into practice	2	2.7%
Unknown	34	45.9%
Total	**74**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 20.8 Activities Leading to Boys' Cross Country Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Activity						
Running	11	68.8%	41	58.6%	52	60.5%
Conditioning	0	0.0%	6	8.6%	6	7.0%
Cooling down	2	12.5%	1	1.4%	3	3.5%
Warming up	1	6.3%	1	1.4%	2	2.3%
Other	0	0.0%	2	2.9%	2	2.3%
Unknown	2	12.5%	19	27.1%	21	24.4%
Total	**16**	**100.0%**	**70**	**100.0%**	**86**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 20.10 Activity Resulting in Boys' Cross Country Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
	n	%	n	%	n	%	n	%	n	%
Activity										
Running	24	70.6%	2	100.0%	1	33.3%	0	0.0%	25	54.3%
Conditioning	1	2.9%	0	0.0%	0	0.0%	0	0.0%	5	10.9%
Cooling down	0	0.0%	0	0.0%	0	0.0%	0	0.0%	3	6.5%
Warming up	2	5.9%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Other	0	0.0%	0	0.0%	1	33.3%	0	0.0%	1	2.2%
Unknown	7	20.6%	0	0.0%	1	33.3%	0	0.0%	12	26.1%
Total	**34**	**100.0%**	**2**	**100.0%**	**3**	**100.0%**	**0**	**0.0%**	**46**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

XXI. Girls' Cross Country Injury Epidemiology

Table 21.1 Girls' Cross Country Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	**98**	**114,111**	**0.86**
Competition	18	18,596	0.97
Practice	80	95,515	0.84

Table 21.2 Demographic Characteristics of Injured Girls' Cross Country Athletes, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year*

Year in School	**n=92**
Freshman	30.4%
Sophomore	19.6%
Junior	27.2%
Senior	22.8%
Total†	**100.0%**
Age (years)	
Minimum	12
Maximum	18
Mean (St. Dev.)	15.3 (1.3)
BMI	
Minimum	16.6
Maximum	27.5
Mean (St. Dev.)	20.4 (2.3)

*All analyses in this chapter present un-weighted data.
†Throughout this report, totals and n's represent the total un-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 21.1 Diagnosis of Girls' Cross Country Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

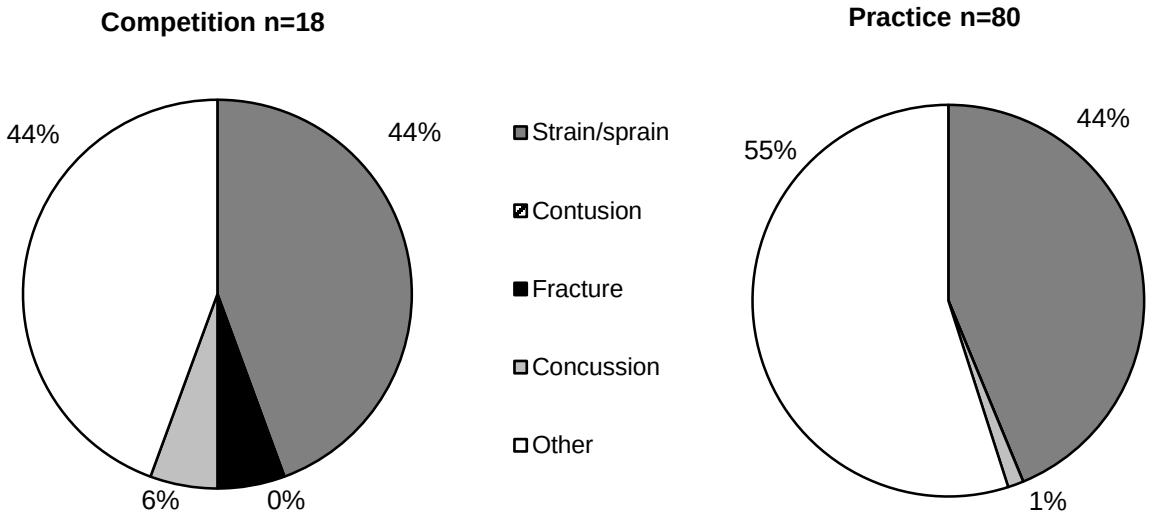


Table 21.3 Body Site of Girls' Cross Country Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

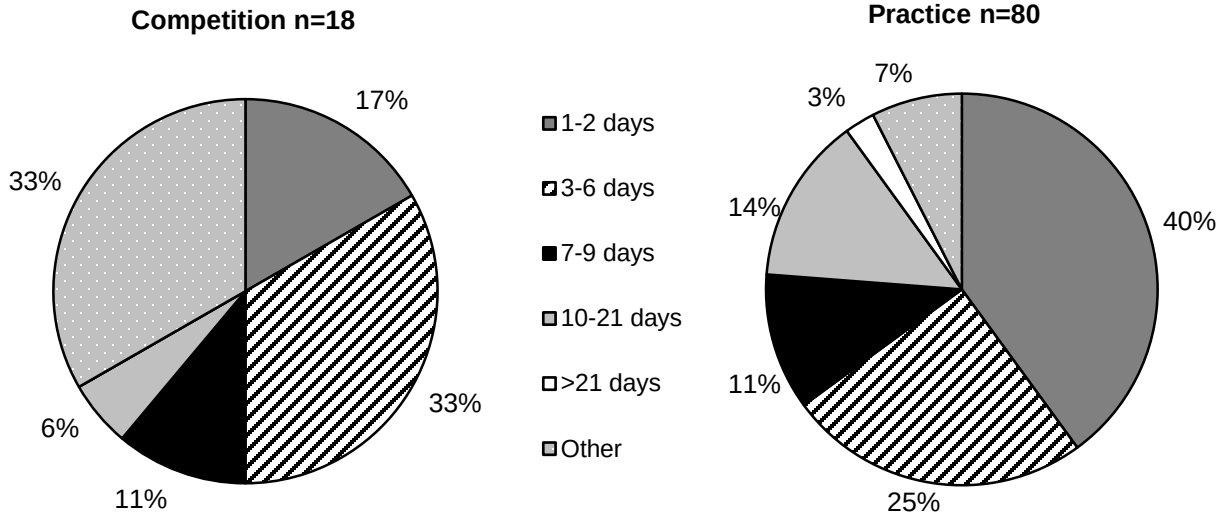
	Competition		Practice		Overall	
	n	**%**	**n**	**%**	**n**	**%**
Body Site						
Hip/thigh/upper leg	6	33.3%	23	28.8%	29	29.6%
Lower leg	4	22.2%	24	30.0%	28	28.6%
Ankle	4	22.2%	12	15.0%	16	16.3%
Knee	1	5.6%	9	11.3%	10	10.2%
Foot	2	11.1%	5	6.3%	7	7.1%
Trunk	0	0.0%	4	5.0%	4	4.1%
Head/face	1	5.6%	1	1.3%	2	2.0%
Neck	0	0.0%	1	1.3%	1	1.0%
Other	0	0.0%	1	1.3%	1	1.0%
Total	**18**	**100.0%**	**80**	**100.0%**	**98**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 21.4 Ten Most Common Girls' Cross Country Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition n=18		Practice n=80		Total n=98	
	n	%	n	%	n	%
Diagnosis						
Lower leg other	4	22.2%	21	26.3%	25	25.5%
Hip/thigh/upper leg strain/sprain	3	16.7%	16	20.0%	19	19.4%
Ankle strain/sprain	4	22.2%	12	15.0%	16	16.3%
Hip/thigh/upper leg other	3	16.7%	7	8.8%	10	10.2%
Knee other	1	5.6%	9	11.3%	10	10.2%
Lower leg strain/sprain	0	0.0%	3	3.8%	3	3.1%
Foot strain/sprain	1	5.6%	2	2.5%	3	3.1%
Trunk other	0	0.0%	3	3.8%	3	3.1%
Foot other	0	0.0%	3	3.8%	3	3.1%
Head/face concussion	1	5.6%	1	1.3%	2	2.0%

Figure 21.2 Time Loss of Girls' Cross Country Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 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 21.5 Girls' Cross Country Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	1	5.6%	0	0.0%	1	1.0%
Did not require surgery	17	94.4%	80	100.%	97	99.0%
Total	**18**	**100.0%**	**80**	**100.0%**	**98**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Figure 21.3 History of Girls' Cross Country Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

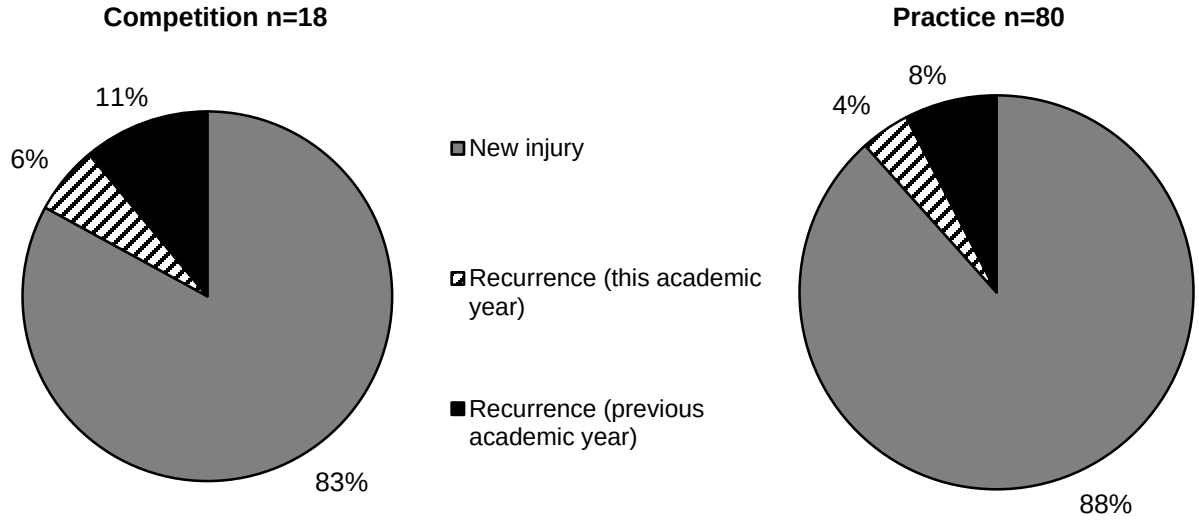


Table 21.6 Time during Season of Girls' Cross Country Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Season		
Preseason	14	14.3%
Regular season	83	84.7%
Post season	1	1.0%
Total	**98**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 21.7 Practice-Related Variables for Girls' Cross Country Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Practice		
First 1/2 hour	9	11.4%
Second 1/2 hour	9	11.4%
1-2 hours into practice	20	25.3%
>2 hours into practice	0	0.0%
Unknown	41	51.9%
Total	**79**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 21.8 Activities Leading to Girls' Cross Country Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Activity						
Running	14	77.8%	43	55.8%	57	60.0%
Conditioning	1	5.6%	10	13.0%	11	11.6%
Warming up	0	0.0%	1	1.3%	1	1.1%
Other	1	5.6%	5	6.5%	6	6.3%
Unknown	2	11.1%	18	23.4%	20	21.1%
Total	**18**	**100.0%**	**77**	**100.0%**	**95**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 21.9 Activity Resulting in Girls' Cross Country Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
	n	%	n	%	n	%	n	%	n	%
Activity										
Running	29	70.7%	0	0.0%	1	100.0%	2	100.0%	25	49.0%
Conditioning	5	12.2%	0	0.0%	0	0.0%	0	0.0%	6	11.8%
Warming up	1	2.4%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Other	3	7.3%	0	0.0%	0	0.0%	0	0.0%	3	5.9%
Unknown	3	7.3%	0	0.0%	0	0.0%	0	0.0%	17	33.3%
Total	**41**	**100.0%**	**0**	**0.0%**	**1**	**100.0%**	**2**	**100.0%**	**51**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

XXII. Boys' Tennis Injury Epidemiology

Table 22.1 Boys' Tennis Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	**23**	**65,703**	**0.35**
Competition	8	20,060	0.40
Practice	15	45,643	0.33

Table 22.2 Demographic Characteristics of Injured Boys' Tennis Athletes, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year*

Year in School	**n=23**
Freshman	13.0%
Sophomore	34.8%
Junior	17.4%
Senior	34.8%
Total†	**100.0%**
Age (years)	
Minimum	14
Maximum	18
Mean (St. Dev.)	16.2 (1.3)
BMI	
Minimum	19.4
Maximum	28.5
Mean (St. Dev.)	23.4 (3.2)

*All analyses in this chapter present un-weighted data.
†Throughout this report, totals and n's represent the total un-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 22.1 Diagnosis of Boys' Tennis Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

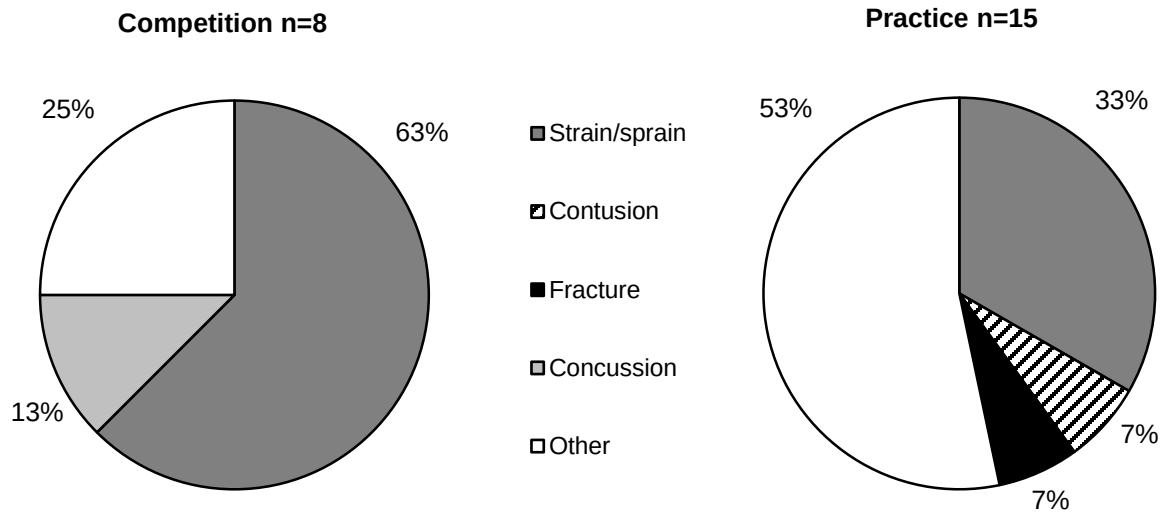


Table 22.3 Body Site of Boys' Tennis Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

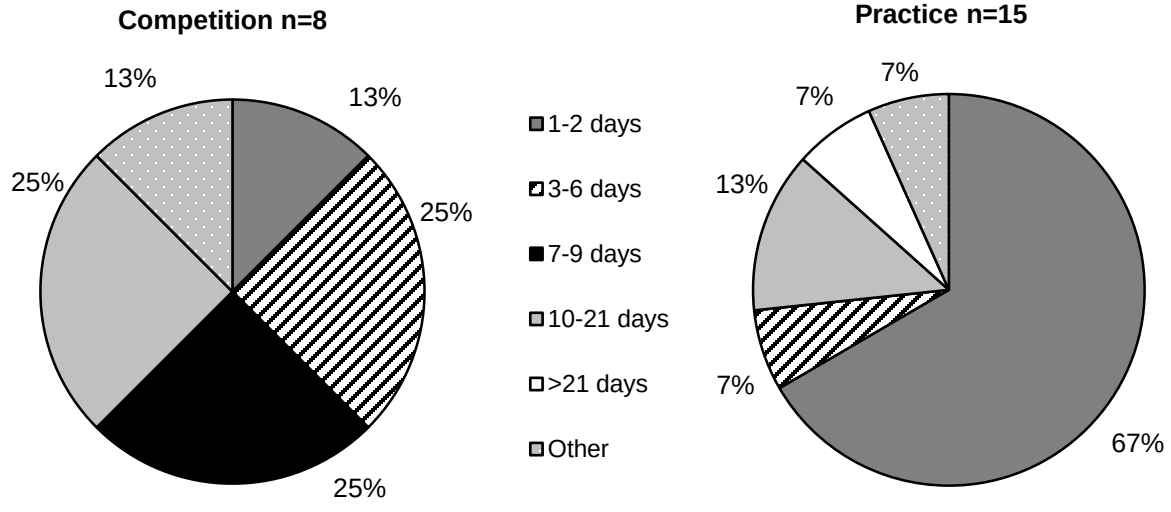
	Competition		Practice		Overall	
	n	%	n	%	n	%
Body Site						
Ankle	3	37.5%	4	26.7%	7	30.4%
Arm/elbow	1	12.5%	3	20.0%	4	17.4%
Lower leg	0	0.0%	3	20.0%	3	13.0%
Hip/thigh/upper leg	0	0.0%	2	13.3%	2	8.7%
Hand/wrist	1	12.5%	1	6.7%	2	8.7%
Foot	1	12.5%	1	6.7%	2	8.7%
Head/face	1	12.5%	0	0.0%	1	4.3%
Knee	0	0.0%	1	6.7%	1	4.3%
Shoulder	1	12.5%	0	0.0%	1	4.3%
Total	**8**	**100.0%**	**15**	**100.0%**	**23**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 22.4 Ten Most Common Boys' Tennis Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition n=8		Practice n=15		Total n=23	
	n	%	n	%	n	%
Diagnosis						
Ankle strain/sprain	2	25.0%	4	26.7%	6	26.1%
Lower leg other	0	0.0%	3	20.0%	3	13.0%
Arm/elbow strain/sprain	1	12.5%	1	6.7%	2	8.7%
Arm/elbow other	0	0.0%	2	13.3%	2	8.7%
Hip/thigh/upper leg contusion	0	0.0%	1	6.7%	1	4.3%
Head/face concussion	1	12.5%	0	0.0%	1	4.3%
Knee other	0	0.0%	1	6.7%	1	4.3%
Ankle other	1	12.5%	0	0.0%	1	4.3%
Shoulder other	1	12.5%	0	0.0%	1	4.3%
Foot other	0	0.0%	1	6.7%	1	4.3%

Figure 22.2 Time Loss of Boys' Tennis Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 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 22.5 Boys' Tennis Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	0	0.0%	0	0.0%	0	0.0%
Did not require surgery	8	100.0%	15	100.0%	23	100.0%
Total	**8**	**100.0%**	**15**	**100.0%**	**23**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Figure 22.3 History of Boys' Tennis Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

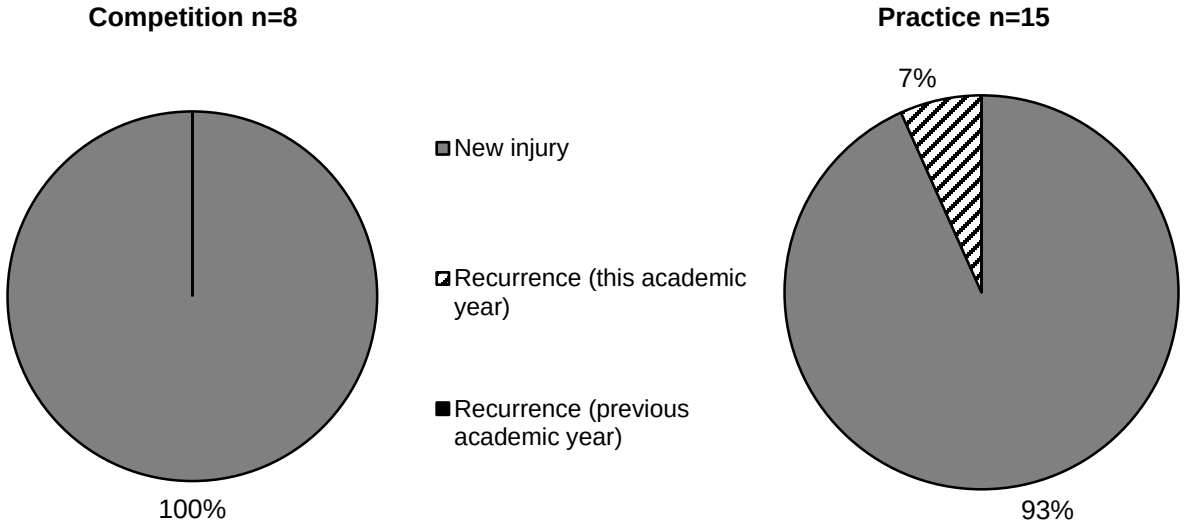


Table 22.6 Time during Season of Boys' Tennis Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Season		
Preseason	6	26.1%
Regular season	17	73.9%
Post season	0	0.0%
Total	**23**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 22.7 Practice-Related Variables for Boys' Tennis Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Practice		
First 1/2 hour	1	6.7%
Second 1/2 hour	5	33.3%
1-2 hours into practice	4	26.7%
>2 hours into practice	1	6.7%
Unknown	4	26.7%
Total	**15**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 22.8 Activities Leading to Boys' Tennis Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Activity						
General play	1	16.7%	7	53.8%	8	42.1%
Chasing-running after-to hit ball	3	50.0%	1	7.7%	4	21.1%
Conditioning	0	0.0%	1	7.7%	1	5.3%
One-handed backhand ground stroke-service return	0	0.0%	1	7.7%	1	5.3%
Serve	0	0.0%	1	7.7%	1	5.3%
Other	0	0.0%	1	7.7%	1	5.3%
Unknown	2	33.3%	1	7.7%	3	15.8%
Total	**6**	**100.0%**	**13**	**100.0%**	**19**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 22.9 Activity Resulting in Boys' Tennis Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
	n	%	n	%	n	%	n	%	n	%
Activity										
General play	3	30.0%	0	0.0%	1	100.0%	0	0.0%	4	57.1%
Chasing-running after-to hit ball	4	40.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Conditioning	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	14.3%
One-handed backhand ground stroke-service return	1	10.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Serve	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	14.3%
Other	1	10.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Unknown	1	10.0%	1	100.0%	0	0.0%	0	0.0%	1	14.3%
Total	**10**	**100.0%**	**1**	**100.0%**	**1**	**100.0%**	**0**	**0.0%**	**7**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

XXIII. Girls' Tennis Injury Epidemiology

Table 23.1 Girls' Tennis Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	**26**	**73,042**	**0.36**
Competition	15	21,646	0.69
Practice	11	51,396	0.21

Table 23.2 Demographic Characteristics of Injured Girls' Tennis Athletes, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year*

Year in School	**n=25**
Freshman	20.0%
Sophomore	28.0%
Junior	36.0%
Senior	16.0%
Total†	**100.0%**
Age (years)	
Minimum	14
Maximum	18
Mean (St. Dev.)	15.9 (0.9)
BMI	
Minimum	18.0
Maximum	30.4
Mean (St. Dev.)	22.5 (3.9)

*All analyses in this chapter present un-weighted data.
†Throughout this report, totals and n's represent the total un-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 23.1 Diagnosis of Girls' Tennis Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

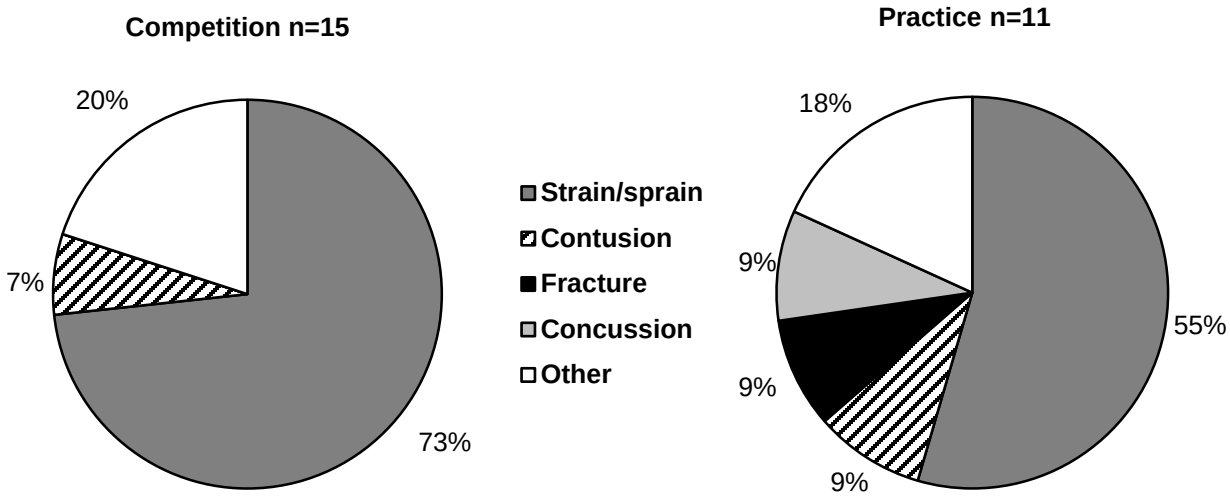


Table 23.3 Body Site of Girls' Tennis Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

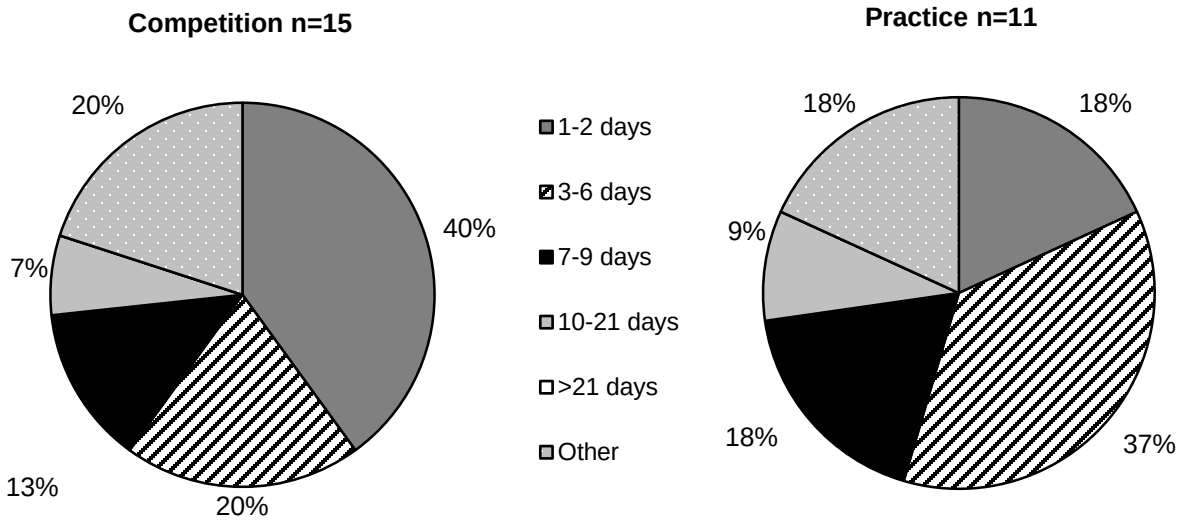
	Competition		Practice		Overall	
	n	**%**	**n**	**%**	**n**	**%**
Body Site						
Ankle	3	20.0%	4	36.4%	7	26.9%
Hand/wrist	3	20.0%	2	18.2%	5	19.2%
Hip/thigh/upper leg	2	13.3%	1	9.1%	3	11.5%
Head/face	1	6.7%	1	9.1%	2	7.7%
Knee	1	6.7%	1	9.1%	2	7.7%
Shoulder	1	6.7%	1	9.1%	2	7.7%
Trunk	0	0.0%	1	9.1%	1	3.8%
Lower leg	1	6.7%	0	0.0%	1	3.8%
Foot	1	6.7%	0	0.0%	1	3.8%
Arm/elbow	1	6.7%	0	0.0%	1	3.8%
Other	1	6.7%	0	0.0%	1	3.8%
Total	**15**	**100.0%**	**11**	**100.0%**	**26**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 23.4 Ten Most Common Girls' Tennis Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition n=15		Practice n=11		Total n=26	
	n	%	n	%	n	%
Diagnosis						
Ankle strain/sprain	3	20.0%	4	36.4%	7	26.9%
Hand/wrist strain/sprain	3	20.0%	0	0.0%	3	11.5%
Hip/thigh/upper leg strain/sprain	2	13.3%	1	9.1%	3	11.5%
Trunk strain/sprain	0	0.0%	1	9.1%	1	3.8%
Lower leg strain/sprain	1	6.7%	0	0.0%	1	3.8%
Arm elbow strain/sprain	1	6.7%	0	0.0%	1	3.8%
Shoulder strain/sprain	1	6.7%	0	0.0%	1	3.8%
Knee contusion	0	0.0%	1	9.1%	1	3.8%
Head/face contusion	1	6.7%	0	0.0%	1	3.8%
Head/face concussion	0	0.0%	1	9.1%	1	3.8%

Figure 23.2 Time Loss of Girls' Tennis Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 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 23.5 Girls' Tennis Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	1	7.1%	0	0.0%	1	4.0%
Did not require surgery	13	92.9%	11	100.0%	24	96.0%
Total	**14**	**100.0%**	**11**	**100.0%**	**25**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Figure 23.3 History of Girls' Tennis Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

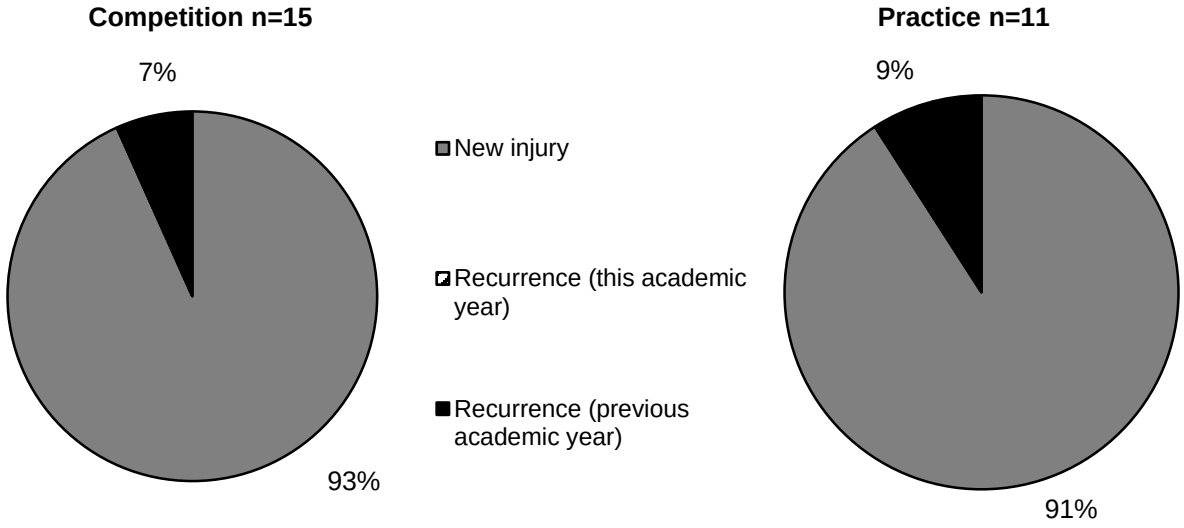


Table 23.6 Time during Season of Girls' Tennis Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Season		
Preseason	4	15.4%
Regular season	20	76.9%
Post season	2	7.7%
Total	**26**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 23.7 Practice-Related Variables for Girls' Tennis Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Practice		
First 1/2 hour	3	27.3%
Second 1/2 hour	2	18.2%
1-2 hours into practice	3	27.3%
>2 hours into practice	0	0.0%
Unknown	3	27.3%
Total	**11**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 23.8 Activities Leading to Girls' Tennis Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Activity						
General play	4	26.7%	5	45.5%	9	34.6%
Chasing-running after-to hit ball	5	33.3%	1	9.1%	6	23.1%
Serve	1	6.7%	1	9.1%	2	7.7%
Conditioning	0	0.0%	1	9.1%	1	3.8%
Two-handed backhand ground stroke-service return	1	6.7%	0	0.0%	1	3.8%
Unknown	4	26.7%	3	27.3%	7	26.9%
Total	**15**	**100.0%**	**11**	**100.0%**	**26**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 23.9 Activity Resulting in Girl' Tennis Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Strain/Sprain		Contusion		Fracture		Concussion		Other	
	n	%	n	%	n	%	n	%	n	%
Activity										
General play	4	23.5%	0	0.0%	0	0.0%	1	100.0%	4	80.0%
Chasing-running after-to hit ball	4	23.5%	2	100.0%	0	0.0%	0	0.0%	0	0.0%
Serve	1	5.9%	0	0.0%	0	0.0%	0	0.0%	1	20.0%
Conditioning	0	0.0%	0	0.0%	1	100.0%	0	0.0%	0	0.0%
Two-handed backhand ground stroke-service return	1	5.9%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Unknown	7	41.2%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Total	**17**	**100.0%**	**2**	**100.0%**	**1**	**100.0%**	**1**	**100.0%**	**5**	**100.0%**

XXIV. Cheerleading Injury Epidemiology

Table 24.1 Cheerleading Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	**189**	**233,657**	**0.81**
Competition	13	14,108	0.92
Practice	145	176,996	0.82
Performance	31	42,553	0.73

Table 24.2 Demographic Characteristics of Injured Cheerleading Athletes, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year*

Year in School	**n=177**
Freshman	33.9%
Sophomore	20.9%
Junior	21.5%
Senior	23.7%
Total†	**100.0%**
Age (years)	
Minimum	13
Maximum	18
Mean (St. Dev.)	15.5 (1.3)
BMI	
Minimum	14.0
Maximum	41.9
Mean (St. Dev.)	22.3 (4.5)

*All analyses in this chapter present un-weighted data.
†Throughout this report, totals and n's represent the total un-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 24.1 Diagnosis of Cheerleading Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

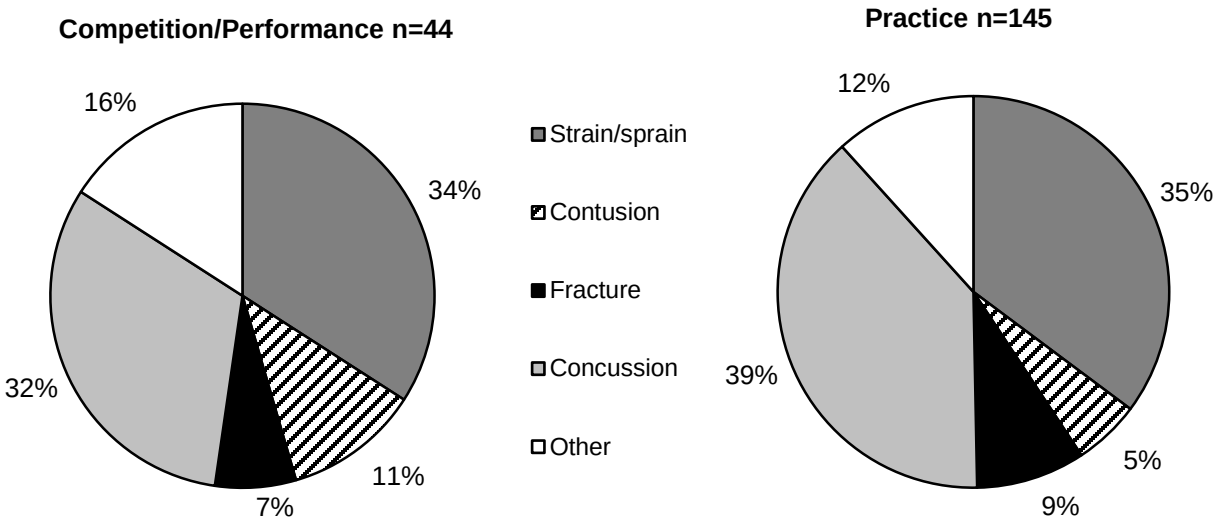


Table 24.3 Body Site of Cheerleading Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

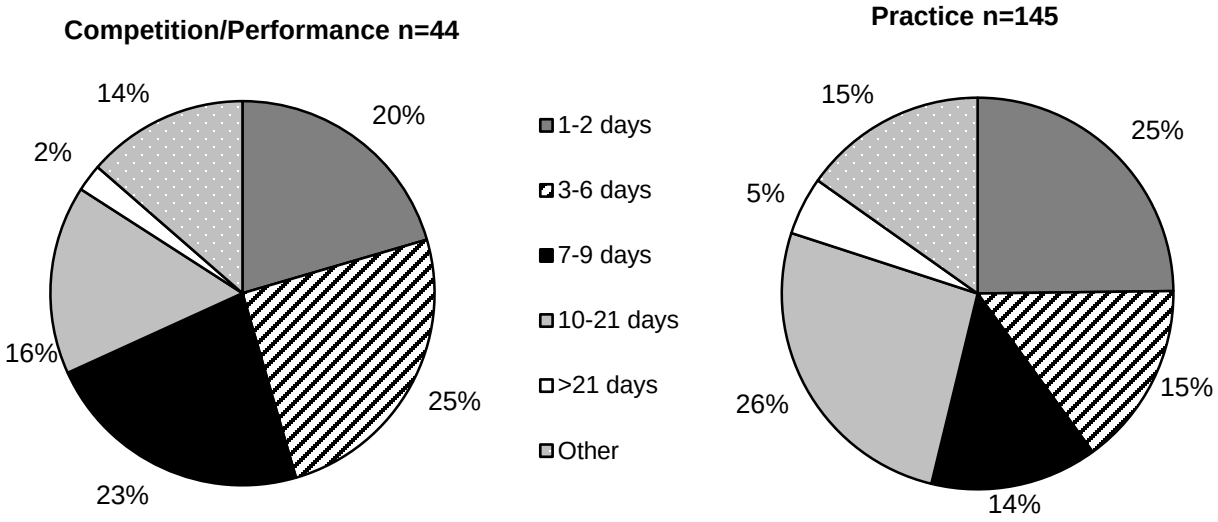
	Competition		Practice		Performance		Overall	
	n	%	n	%	n	%	n	%
Body Site								
Head/face	3	23.1%	60	41.4%	11	35.5%	74	39.2%
Hand/wrist	1	7.7%	20	13.8%	2	6.5%	23	12.2%
Ankle	3	23.1%	9	6.2%	6	19.4%	18	9.5%
Knee	1	7.7%	11	7.6%	3	9.7%	15	7.9%
Trunk	0	0.0%	10	6.9%	4	12.9%	14	7.4%
Shoulder	0	0.0%	11	7.6%	1	3.2%	12	6.3%
Arm/elbow	2	15.4%	8	5.5%	0	0.0%	10	5.3%
Hip/thigh/upper leg	1	7.7%	6	4.1%	1	3.2%	8	4.2%
Neck	0	0.0%	5	3.4%	0	0.0%	5	2.6%
Lower leg	0	0.0%	2	1.4%	1	3.2%	3	1.6%
Foot	1	7.7%	1	0.7%	0	0.0%	2	1.1%
Other	1	7.7%	2	1.4%	2	6.5%	5	2.6%
Total	**13**	**100.0%**	**145**	**100.0%**	**31**	**100.0%**	**189**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 24.4 Ten Most Common Cheerleading Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition n=13		Practice n=145		Performance n=31		Total n=189	
	n	%	n	%	n	%	n	%
Diagnosis								
Head/face concussion	3	23.1%	56	38.6%	11	35.5%	70	37.0%
Ankle strain/sprain	2	15.4%	8	5.5%	5	16.1%	15	7.9%
Hand/wrist strain/sprain	1	7.7%	12	8.3%	1	3.2%	14	7.4%
Hip/thigh/upper leg strain/sprain	1	7.7%	6	4.1%	1	3.2%	8	4.2%
Trunk strain/sprain	0	0.0%	7	4.8%	1	3.2%	8	4.2%
Knee other	0	0.0%	5	3.4%	2	6.5%	7	3.7%
Hand/wrist fracture	0	0.0%	6	4.1%	1	3.2%	7	3.7%
Shoulder other	0	0.0%	6	4.1%	0	0.0%	6	3.2%
Knee strain/sprain	0	0.0%	4	2.8%	1	3.2%	5	2.6%
Trunk contusion	0	0.0%	3	2.1%	2	6.5%	5	2.6%

Figure 24.2 Time Loss of Cheerleading Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 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 24.5 Cheerleading Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition		Practice		Performance		Overall	
	n	%	n	%	n	%	n	%
Need for surgery								
Required surgery	0	0.0%	10	7.0%	0	0.0%	10	5.4%
Did not require surgery	13	100.0%	132	93.0%	31	100.0%	176	94.6%
Total	**13**	**100.0%**	**142**	**100.0%**	**31**	**100.0%**	**186**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Figure 24.3 History of Cheerleading Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

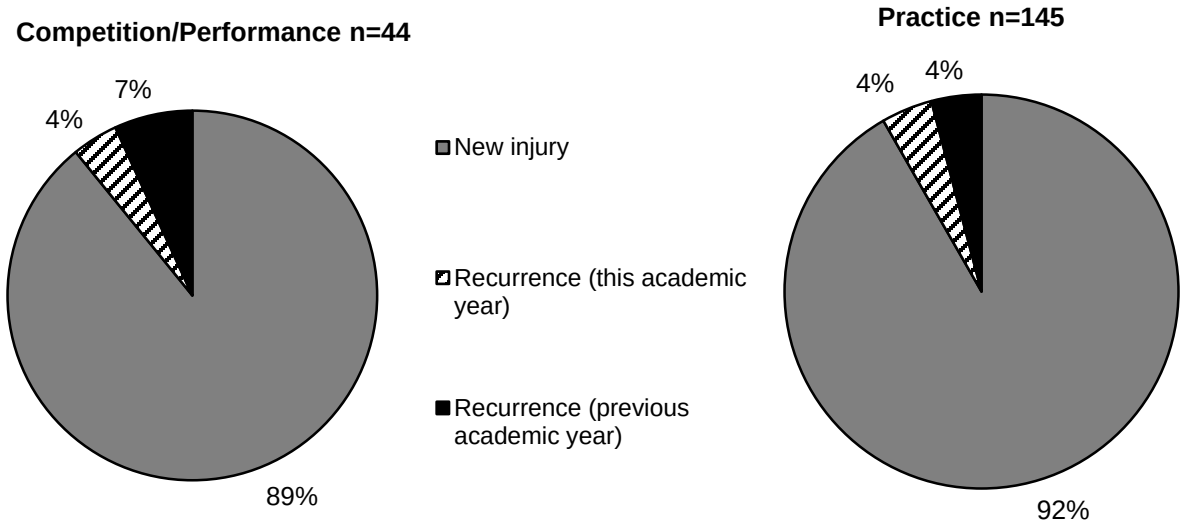


Table 24.6 Time during Season of Cheerleading Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Season		
Preseason	25	13.2%
Regular season	161	85.2%
Post season	3	1.6%
Total	**189**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 24.7 Practice-Related Variables for Cheerleading Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	n	%
Time in Practice		
First 1/2 hour	7	4.9%
Second 1/2 hour	20	14.1%
1-2 hours into practice	60	42.3%
>2 hours into practice	6	4.2%
Unknown	49	34.5%
Total	**142**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 24.8 Activities Leading to Cheerleading Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Competition		Practice		Performance		Overall	
	n	%	n	%	n	%	n	%
Activity								
Toss	2	15.4%	30	22.2%	10	33.3%	42	23.6%
Partner stunt	2	15.4%	31	23.0%	3	10.0%	36	20.2%
Moving tumbling	5	38.5%	17	12.6%	6	20.0%	28	15.7%
Pyramid	0	0.0%	16	11.9%	0	0.0%	16	9.0%
Standing tumbling	0	0.0%	9	6.7%	2	6.7%	11	6.2%
Warm-up	2	15.4%	4	3.0%	1	3.3%	7	3.9%
Jump	0	0.0%	3	2.2%	3	10.0%	6	3.4%
Other	2	15.4%	4	3.0%	3	10.0%	9	5.1%
Unknown	0	0.0%	21	15.6%	2	6.7%	23	12.9%
Total	**13**	**100.0%**	**135**	**100.0%**	**30**	**100.0%**	**178**	**100.0%**

†Totals and n's are not always equal due to slight rounding or missing responses.

Table 24.10 Activity Resulting in Cheerleading Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
	n	%	n	%	n	%	n	%	n	%
Activity										
Toss	12	19.4%	2	15.4%	6	42.9%	20	29.9%	2	9.1%
Partner stunt	10	16.1%	3	23.1%	4	28.6%	15	22.4%	4	18.2%
Moving tumbling	15	24.2%	2	15.4%	2	14.3%	4	6.0%	5	22.7%
Pyramid	3	4.8%	2	15.4%	0	0.0%	11	16.4%	0	0.0%
Standing tumbling	5	8.1%	2	15.4%	0	0.0%	3	4.5%	1	4.5%
Warm-up	2	3.2%	0	0.0%	0	0.0%	3	4.5%	2	9.1%
Jump	4	6.5%	0	0.0%	0	0.0%	1	1.5%	1	4.5%
Other	1	1.6%	2	15.4%	0	0.0%	3	4.5%	3	13.6%
Unknown	10	16.1%	0	0.0%	2	14.3%	7	10.4%	4	18.2%
Total	**62**	**100.0%**	**13**	**100.0%**	**14**	**100.0%**	**67**	**100.0%**	**22**	**100.0%**

XXIII. Gender Differences within Sports

25.1 Boys' and Girls' Soccer

Table 25.1 Comparison of Boys' and Girls' Soccer Injury Rates, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Boys' soccer	Girls' soccer*	RR (95% CI)†
Total	1.96	**2.73**	**1.39 (1.25-1.56)**
Competition	4.16	**5.72**	**1.38 (1.20-1.58)**
Practice	1.04	**1.47**	**1.42 (1.18-1.70)**

*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.

Table 25.10 Comparison of Body Sites of Boys' and Girls' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Boys' soccer	Girls' soccer	IPR (95% CI)
Body Site			
Head/face	19.0%	**26.1%**	**1.37 (1.11-1.69)**
Hip/thigh/upper leg	**21.1%**	14.6%	**1.44 (1.13-1.83)**
Ankle	18.8%	**19.9%**	1.06 (0.84-1.33)
Knee	14.4%	**14.9%**	1.06 (0.81-1.39)
Foot	4.4%	**6.6%**	1.49 (0.93-2.33)
Lower leg	**8.0%**	6.8%	1.18 (0.79-1.74)
Hand/wrist	**4.4%**	3.6%	1.22 (0.71-2.10)
Trunk	**4.1%**	3.2%	1.29 (0.72-2.29)
Shoulder	**1.9%**	1.5%	1.24 (0.53-2.89)
Arm/elbow	**2.2%**	1.1%	2.09 (0.84-5.20)
Neck	0.2%	**0.8%**	4.44 (0.52-37.91)
Other	**1.9%**	0.9%	2.06 (0.77-5.55)
Total	**100.0%**	**100.0%**	--

†Totals do not always equal 100.0% due to slight rounding.

Table 25.11 Comparison of Diagnoses of Boys' and Girls' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Boys' soccer	Girls' soccer	IPR (95% CI)
Diagnosis			
Strain/sprain	**48.7%**	45.1%	1.08 (0.96-1.22)
Concussion	15.5%	**23.7%**	**1.53 (1.21-1.93)**
Contusion	**10.7%**	10.4%	1.03 (0.75-1.42)
Fracture	**8.2%**	5.4%	1.51 (0.99-2.39)
Other	**16.9%**	15.4%	1.10 (0.85-1.41)
Total	**100.0%**	**100.0%**	---

†Totals do not always equal 100.0% due to slight rounding.

Table 25.12 Most Common Boys' and Girls' Soccer Injury Diagnoses*, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Boys' soccer	Girls' soccer	IPR (95% CI)
Diagnosis			
Head/face concussion	15.4%	**23.6%**	**1.53 (1.21-1.93)**
Hip/thigh/upper leg strain/sprain	**16.6%**	12.0%	**1.38 (1.05-1.82)**
Ankle strain/sprain	16.5%	**18.1%**	1.10 (0.86-1.40)
Knee strain/sprain	5.8%	**7.7%**	1.33 (0.88-2.02)
Knee other	**5.8%**	5.1%	1.12 (0.71-1.79)

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

Table 25.13 Comparison of Time Loss of Boys' and Girls' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Boys' soccer	Girls' soccer	IPR (95% CI)
Time Loss			
1-2 days	**19.5%**	17.8%	1.10 (0.87-1.39)
3-6 days	20.0%	**23.9%**	1.20 (0.97-1.47)
7-9 days	**15.3%**	15.1%	1.01 (0.78-1.32)
10-21 days	18.3%	**21.1%**	1.15 (0.92-1.44)
22 days or more	**6.3%**	5.3%	1.19 (0.76-1.85)
Other	16.6%	**20.8%**	1.25 (0.99-1.58)
Total	**100.0%**	**100.0%**	--

†Totals do not always equal 100.0% due to slight rounding.

Table 25.14 Comparison of Mechanisms of Boys' and Girls' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Boys' soccer	Girls' soccer	IPR (95% CI)
Soccer Mechanism			
Contact with another player	**24.8%**	22.5%	1.10 (0.90-1.35)
N/A (overuse, heat illness, conditioning, etc.)	**14.9%**	14.6%	1.02 (0.77-1.34)
Stepped on/fell on/kicked	**11.0%**	10.5%	1.05 (0.76-1.47)
Contact with ball	11.2%	**15.9%**	**1.42 (1.06-1.92)**
Rotation around planted foot/inversion	**13.0%**	12.1%	1.08 (0.80-1.47)
Slide tackle	**5.0%**	2.4%	**2.05 (1.10-3.82)**
Uneven playing surface	1.8%	**2.4%**	1.31 (0.60-2.90)
Contact with goal	**0.6%**	0.5%	1.14 (0.23-5.63)
Other	**11.0%**	10.6%	1.04 (0.75-1.44)
Total	**100.0%**	**100.0%**	--

†Totals do not always equal 100.0% due to slight rounding.

Table 25.15 Comparison of Activities of Boys' and Girls' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Boys' soccer	Girls' soccer	IPR (95% CI)
Soccer Activity			
General play	**25.2%**	23.7%	1.06 (0.87-1.30)
Defending	**11.7%**	11.6%	1.00 (0.72-1.37)
Heading ball	5.0%	5.0%	1.00 (0.60-1.65)
Chasing loose ball	**8.7%**	8.1%	1.08 (0.74-1.59)
Ball handling/dribbling	**9.1%**	8.5%	1.06 (0.73-1.54)
Goaltending	**8.3%**	6.8%	1.23 (0.82-1.84)
Shooting (foot)	**6.1%**	4.8%	1.26 (0.78-2.04)
Passing (foot)	**3.3%**	3.1%	1.09 (0.58-2.04)
Conditioning	3.5%	**4.5%**	1.28 (0.72-2.27)
Receiving pass	**3.1%**	2.7%	1.15 (0.59-2.22)
Blocking shot	1.3%	**2.4%**	1.87(0.77-4.54)
Attempting slide tackle	**0.9%**	0.3%	2.86 (0.56-14.29)
Receiving slide tackle	**1.1%**	1.0%	1.15 (0.37-3.54)
Other	0.9%	**1.9%**	2.08 (0.74-5.88)
Total	**100.0%**	**100.0%**	--

†Totals do not always equal 100.0% due to slight rounding.

25.2 Boys' and Girls' Basketball

Table 25.2 Comparison of Boys' and Girls' Basketball Injury Rates, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Boys' basketball	Girls' basketball	RR (95% CI)
Total	1.77	**2.21**	**1.25 (1.11-1.40)**
Competition	3.08	**4.08**	**1.32 (1.13-1.55)**
Practice	1.19	**1.35**	1.13 (0.95-1.35)

Table 25.20 Comparison of Body Sites of Boys' and Girls' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Boys' basketball	Girls' basketball	IPR (95% CI)
Body Site			
Ankle	**34.4%**	32.0%	1.08 (0.91-1.27)
Head/face	16.6%	**19.7%**	1.19 (0.92-1.52)
Knee	13.7%	**15.5%**	1.13 (0.85-1.51)
Hand/wrist	**10.1%**	8.9%	1.14 (0.79-1.64)
Hip/thigh/upper leg	**7.9%**	5.7%	1.39 (0.89-2.16)
Trunk	4.8%	**5.1%**	1.07 (0.64-1.79)
Lower leg	3.9%	**4.4%**	1.11 (0.63-1.96)
Foot	**2.9%**	2.5%	1.18 (0.58-2.41)
Shoulder	1.9%	**2.8%**	1.52 (0.70-3.23)
Arm/elbow	1.7%	1.7%	1.00 (0.41-2.45)
Neck	**0.7%**	0.4%	1.82 (0.33-10.00)
Other	**1.4%**	1.3%	1.03 (0.38-2.86)
Total	**100.0%**	**100.0%**	--

†Totals do not always equal 100.0% due to slight rounding.

Table 25.21 Comparison of Diagnoses of Boys' and Girls' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Boys' basketball	Girls' basketball	IPR (95% CI)
Diagnosis			
Strain/sprain	**53.8%**	53.4%	1.01 (0.90-1.12)
Concussion	9.8%	**17.8%**	**1.82 (1.34-2.48)**
Fracture	**8.4%**	5.3%	**1.58 (1.01-2.48)**
Contusion	**9.9%**	6.8%	1.46 (0.98-2.17)
Other	**18.2%**	16.7%	1.09 (0.84-1.41)
Total	**100.0%**	**100.0%**	--

†Totals do not always equal 100.0% due to slight rounding.

Table 25.22 Most Common Boys' and Girls' Basketball Injury Diagnoses*, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Boys' basketball	Girls' basketball	IPR (95% CI)
Diagnosis			
Ankle strain/sprain	**33.4%**	30.5%	1.10 (0.92-1.30)
Head/face concussion	9.8%	**17.4%**	**1.79 (1.31-2.43)**
Knee strain/sprain	6.0%	**7.4%**	1.23 (0.79-1.92)
Knee other	4.8%	**6.1%**	1.26 (0.77-2.07)

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

Table 25.23 Comparison of Time Loss of Boys' and Girls' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Boys' basketball	Girls' basketball	IPR (95% CI)
Time Loss			
1-2 days	**26.7%**	23.5%	1.14 (0.93-1.40)
3-6 days	**23.5%**	18.4%	**1.28 (1.01-1.61)**
7-9 days	**12.8%**	12.1%	1.06 (0.78-1.45)
10-21 days	17.5%	**23.1%**	**1.32 (1.05-1.67)**
22 days or more	6.0%	**7.8%**	1.30 (0.84-2.00)
Other	13.5%	**15.2%**	1.12 (0.84-1.49)
Total	**100.0%**	**100.0%**	--

†Totals do not always equal 100.0% due to slight rounding.

Table 25.24 Comparison of Mechanisms of Boys' and Girls' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Boys' basketball	Girls' basketball	IPR (95% CI)
Basketball Mechanism			
Collision with another player	**25.6%**	24.6%	1.04 (0.84-1.28)
Jumping/landing	**23.1%**	18.4%	1.25 (0.99-1.59)
Stepped on/fell on/kicked	**11.5%**	10.3%	1.12 (0.79-1.58)
Rotation around a planted foot/inversion	11.4%	**13.1%**	1.16 (0.84-1.60)
N/A (e.g., overuse, heat illness, etc.)	7.7%	**11.9%**	**1.54 (1.06-2.24)**
Contact with ball	3.6%	**6.9%**	**1.91 (1.11-3.27)**
Other	**12.1%**	10.7%	1.12 (0.80-1.59)
Total	**100.0%**	**100.0%**	--

†Totals do not always equal 100.0% due to slight rounding.

Table 25.35 Comparison of Activities of Boys' and Girls' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Boys' basketball	Girls' basketball	IPR (95% CI)
Basketball Activity			
Rebounding	**22.2%**	16.9%	**1.32 (1.02-1.69)**
General play	20.2%	**21.5%**	1.07 (0.84-1.35)
Defending	11.4%	**16.7%**	**1.47 (1.08-1.99)**
Shooting	**10.1%**	7.1%	1.42 (0.95-2.13)
Chasing loose ball	9.0%	**9.3%**	1.04 (0.71-1.52)
Ball handling/dribbling	4.7%	**5.3%**	1.13 (0.66-1.91)
Receiving pass	3.8%	**4.5%**	1.18 (0.66-2.12)
Conditioning	1.3%	**3.7%**	**2.90 (1.22-6.87)**
Other	**2.3%**	2.0%	1.15 (0.51-2.63)
Total	**100.0%**	**100.0%**	--

†Totals do not always equal 100.0% due to slight rounding.

25.3 Boys' Baseball and Girls' Softball

Table 25.3 Comparison of Baseball and Softball Injury Rates, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Baseball	Softball	RR (95% CI)
Total	1.10	**1.49**	**1.35 (1.14-1.60)**
Competition	1.53	**2.13**	**1.39 (1.09-1.78)**
Practice	0.87	**1.15**	**1.33 (1.05-1.69)**

Table 25.30 Comparison of Body Sites of Baseball and Softball Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Baseball	Softball	IPR (95% CI)
Body Site			
Head/face	17.1%	**20.9%**	1.22 (0.86-1.74)
Shoulder	**14.4%**	10.1%	1.43 (0.90-2.28)
Arm/elbow	**14.4%**	9.0%	**1.61 (1.00-2.61)**
Hand/wrist	**13.7%**	12.7%	1.08 (0.70-1.67)
Hip/thigh/upper leg	**13.3%**	6.7%	**1.98 (1.15-3.41)**
Ankle	9.9%	**14.6%**	1.47 (0.92-2.35)
Knee	6.5%	**11.9%**	**1.85 (1.05-3.24)**
Trunk	4.6%	**7.1%**	1.55 (0.77-3.14)
Lower leg	2.3%	**3.7%**	1.64 (0.60-4.35)
Foot	1.9%	**2.6%**	1.37 (0.44-4.35)
Neck	**0.8%**	0.0%	--
Other	**1.1%**	0.7%	1.54 (0.26-9.09)
Total	**100.0%**	**100.0%**	--

†Totals do not always equal 100.0% due to slight rounding.

Table 25.31 Comparison of Diagnoses of Baseball and Softball Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Baseball	Softball	IPR (95% CI)
Diagnosis			
Strain/sprain	**43.5%**	43.7%	1.00 (0.82-1.21)
Contusion	11.8%	**14.6%**	1.23 (0.79-1.92)
Concussion	8.4%	**16.4%**	**1.96 (1.21-3.17)**
Fracture	**11.5%**	7.1%	1.62 (0.93-2.80)
Other	**24.8%**	18.3%	1.36 (0.98-1.89)
Total	**100.0%**	**100.0%**	--

†Totals do not always equal 100.0% due to slight rounding.

Table 25.32 Most Common Baseball and Softball Injury Diagnoses*, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Baseball	Softball	IPR (95% CI)
Diagnosis			
Head/face concussion	8.4%	**16.4%**	**1.96 (1.21-3.18)**
Hip/thigh/upper leg strain/sprain	**11.0%**	5.6%	**1.97 (1.08-3.59)**
Ankle strain/sprain	8.0%	**13.4%**	**1.68 (1.01-2.80)**
Shoulder other	**4.9%**	3.7%	1.32 (0.59-2.97)
Hand/wrist fracture	**6.1%**	4.1%	1.48 (0.70-3.13)

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

Table 25.33 Comparison of Time Loss of Baseball and Softball Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Baseball	Softball	IPR (95% CI)
Time Loss			
1-2 days	22.8%	**29.1%**	1.28 (0.95-1.71)
3-6 days	**21.3%**	16.4%	1.30 (0.91-1.85)
7-9 days	10.3%	**11.2%**	1.09 (0.67-1.79)
10-21 days	16.3%	**16.4%**	1.00 (0.68-1.47)
22 days or more	**11.0%**	8.6%	1.28 (0.76-2.16)
Other	18.3%	18.3%	1.00 (0.70-1.43)
Total	**100.0%**	**100.0%**	--

†Totals do not always equal 100.0% due to slight rounding.

Table 25.34 Comparison of Mechanisms of Baseball and Softball Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Baseball	Softball	IPR (95% CI)
Baseball/Softball Mechanism			
Contact with another player	**11.7%**	10.0%	1.17 (0.71-1.95)
Throwing - pitching	**8.9%**	3.6%	**2.47 (1.16-5.27)**
N/A (overuse, heat illness, conditioning, etc.)	10.5%	**12.0%**	1.14 (0.69-1.87)
Hit by batted ball	6.5%	**10.0%**	1.54 (0.85-2.82)
Hit by pitch	**7.3%**	3.2%	**2.27 (1.01-5.26)**
Contact with bases	10.1%	**10.8%**	1.06 (0.64-1.79)
Contact with thrown ball (non-pitch)	6.0%	**11.2%**	**1.84 (1.01-3.37)**
Throwing - not pitching	**11.7%**	7.2%	1.63 (0.93-2.86)
Rotation around a planted foot/inversion	4.4%	**9.6%**	**2.16 (1.08-4.31)**
Other	**21.0%**	19.9%	1.05 (0.74-1.49)
Unknown	1.9%	**2.5%**	--
Total*	**100.0%**	**100.0%**	--

†Totals do not always equal 100.0% due to slight rounding.

Table 25.35 Comparison of Activities of Baseball and Softball Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Baseball	Softball	IPR (95% CI)
Baseball/Softball Activity			
Pitching	**11.3%**	7.9%	1.43 (0.83-2.47)
Fielding a batted ball	18.6%	**18.7%**	1.00 (0.69-1.45)
Running bases	13.0%	**17.1%**	1.32 (0.86-2.00)
Batting	**12.1%**	9.5%	1.28 (0.77-2.12)
Throwing (not pitching)	**12.1%**	9.5%	1.28 (0.77-2.12)
Fielding a thrown ball	**5.7%**	5.2%	1.10 (0.53-2.27)
General play	4.9%	**7.5%**	1.55 (0.77-3.13)
Sliding	**8.5%**	7.1%	1.19 (0.65-2.18)
Catching	6.9%	**9.5%**	1.38 (0.76-2.51)
Conditioning	**2.4%**	0.4%	6.12 (0.74-50.48)
Other	2.8%	**4.0%**	1.41 (0.54-3.57)
Unknown	4.5%	**7.6%**	--
Total*	**100.0%**	**100.0%**	--

†Totals do not always equal 100.0% due to slight rounding.

25.4 Boys' and Girls' Swimming

Table 25.4 Comparison of Boys' and Girls' Swimming Injury Rates, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Boys' swimming	Girls' swimming	RR (95% CI)
Total	0.17	**0.37**	**2.17 (1.23-3.83)**
Competition	0.11	**0.20**	1.73 (0.32-9.44)
Practice	0.18	**0.42**	**2.24 (1.23-4.10)**

Table 25.40 Comparison of Body Sites of Boys' and Girls' Swimming and Diving Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Boys' swimming	Girls' swimming	IPR (95% CI)
Body Site			
Ankle	0.0%	**2.5%**	--
Knee	0.0%	**2.5%**	--
Head/face	**29.4%**	17.5%	1.68 (0.62-4.56)
Hand/wrist	0.0%	**5.0%**	--
Shoulder	35.3%	**37.5%**	1.06 (0.50-2.27)
Trunk	5.9%	**20.0%**	3.45 (0.46-25.00)
Lower leg	0.0%	0.0%	--
Arm/elbow	**11.8%**	0.0%	--
Foot	**11.8%**	5.0%	2.33 (0.36-14.29)
Hip/thigh/upper leg	**5.9%**	5.0%	1.18 (0.11-12.12)
Neck	0.0%	0.0%	--
Other	0.0%	**5.0%**	--
Total	**100.0%**	**100.0%**	**--**

†Totals do not always equal 100.0% due to slight rounding.

Table 25.41 Comparison of Diagnoses of Boys' and Girls' Swimming Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Boys' swimming	Girls' swimming	IPR (95% CI)
Diagnosis			
Strain/sprain	35.3%	**45.0%**	1.28 (0.61-2.63)
Concussion	**23.5%**	17.5%	1.34 (0.45-4.00)
Fracture	--	--	--
Contusion	**11.8%**	10.0%	1.18 (0.24-5.83)
Other	**29.4%**	27.5%	1.06 (0.44-2.63)
Total	**100.0%**	**100.0%**	--

†Totals do not always equal 100.0% due to slight rounding.

Table 25.42 Most Common Boys' and Girls' Swimming Injury Diagnoses, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Boys' swimming	Girls' swimming	IPR (95% CI)
Diagnosis			
Shoulder other	11.8%	**15.0%**	1.28 (0.29-5.69)
Head/face concussion	**23.5%**	17.5%	1.34 (0.45-4.00)
Trunk other	5.9%	**7.5%**	1.28 (0.14-11.40)
Trunk strain/sprain	0.0%	**12.5%**	--
Shoulder strain/sprain	**23.5%**	22.5%	1.04 (0.37-2.94)

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

Table 25.43 Comparison of Time Loss of Boys' and Girls' Swimming Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Boys' swimming	Girls' swimming	IPR (95% CI)
Time Loss			
1-2 days	23.5%	**37.5%**	1.59 (0.62-4.17)
3-6 days	**29.4%**	20.0%	1.47 (0.56-3.85)
7-9 days	**29.4%**	12.5%	2.35 (0.78-7.08)
10-21 days	**11.8%**	10.0%	1.18 (0.24-5.83)
22 days or more	0.0%	**5.0%**	--
Other	5.9%	**15.0%**	2.55 (0.33-19.60)
Total	**100.0%**	**100.0%**	--

†Totals do not always equal 100.0% due to slight rounding.

Table 25.44 Comparison of Mechanisms of Boys' and Girls' Swimming and Diving Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Boys' swimming	Girls' swimming	IPR (95% CI)
Swimming Mechanism			
N/A (overuse, heat illness, conditioning, etc.)	46.7%	**52.5%**	1.13 (0.61-2.08)
Contact with wall	**20.0%**	12.5%	1.59 (0.43-5.88)
Contact with another person	0.0%	0.0%	--
Other	20.0%	**22.5%**	1.12 (0.35-3.57)
Unknown	**13.3%**	12.5%	--
Total*	**100.0%**	**100.0%**	**--**

Table 25.45 Comparison of Activities of Boys' and Girls' Swimming and Diving Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Boys' swimming	Girls' swimming	IPR (95% CI)
Swimming Activity			
Swimming	**43.8%**	41.0%	1.07 (0.55-2.09)
Flip turn off wall	**18.8%**	7.7%	2.44 (0.55-11.11)
Diving off board/platform/starting platform	0.0%	**5.1%**	--
Other	6.3%	**12.8%**	2.04 (0.26-16.67)
Total	**100.0%**	**100.0%**	--

†Totals do not always equal 100.0% due to slight rounding.

25.5 Boys' and Girls' Track and Field

Table 25.5 Comparison of Boys' and Girls' Track and Field Injury Rates, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Boys' track	Girls' track	RR (95% CI)
Total	1.02	1.02	1.00 (0.85-1.91)
Competition	**1.73**	1.26	1.37 (0.98-1.92)
Practice	0.87	**0.97**	1.12 (0.92-1.37)

Table 25.50 Comparison of Body Sites of Boys' and Girls' Track and Field Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Boys' track	Girls' track	IPR (95% CI)
Body Site			
Hip/thigh/upper leg	43.1%	**35.1%**	1.23 (0.99-1.53)
Lower leg	**18.7%**	17.1%	1.09 (0.76-1.59)
Knee	**13.4%**	11.8%	1.13 (0.72-1.78)
Ankle	8.8%	**10.2%**	1.16 (0.68-1.96)
Trunk	5.3%	**9.8%**	1.85 (0.99-3.44)
Foot	4.9%	**5.7%**	1.15 (0.56-2.38)
Head/face	1.4%	**4.1%**	2.89 (0.92-9.09)
Shoulder	**1.4%**	1.2%	1.15 (0.26-5.00)
Arm/elbow	**1.1%**	0.8%	1.30 (0.22-7.71)
Other	1.1%	**2.0%**	1.92 (0.47-7.69)
Hand/wrist	0.7%	**1.6%**	2.33 (0.43-12.50)
Neck	0.0%	**0.4%**	--
Total	**100.0%**	**100.0%**	--

†Totals do not always equal 100.0% due to slight rounding.

Table 25.51 Comparison of Diagnoses of Boys' and Girls' Track and Field Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Boys' track	Girls' track	IPR (95% CI)
Diagnosis			
Strain/sprain	**60.1%**	49.4%	**1.22 (1.04-1.43)**
Contusion	1.4%	**2.9%**	2.00 (0.60-6.67)
Fracture	**2.8%**	2.4%	1.16 (0.41-3.30)
Concussion	1.1%	**3.7%**	3.44 (0.94-12.57)
Other	34.5%	**41.6%**	1.21 (0.97-1.50)
Total	**100.0%**	**100.0%**	--

†Totals do not always equal 100.0% due to slight rounding.

Table 25.52 Most Common Boys' and Girls' Track and Field Injury Diagnoses, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Boys' track	Girls' track	IPR (95% CI)
Diagnosis			
Hip/thigh/upper leg strain/sprain	**39.2%**	27.8%	**1.41 (1.10-1.81)**
Lower leg other	**13.1%**	12.7%	1.03 (0.66-1.61)
Hip/thigh/upper leg other	3.2%	**6.5%**	2.05 (0.92-4.56)
Ankle strain/sprain	7.1%	**8.2%**	1.16 (0.64-2.10)
Knee other	**10.2%**	9.0%	1.14 (0.68-1.92)

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

Table 25.53 Comparison of Time Loss of Boys' and Girls' Track and Field Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Boys' track	Girls' track	IPR (95% CI)
Time Loss			
1-2 days	24.4%	**24.5%**	1.00 (0.74-1.36)
3-6 days	**30.4%**	25.3%	1.20 (0.91-1.59)
7-9 days	13.8%	**15.9%**	1.16 (0.77-1.74)
10-21 days	13.4%	**15.9%**	1.19 (0.83-1.79)
22 days or more	**6.0%**	4.9%	1.23 (0.60-2.52)
Other	12.0%	**13.5%**	1.12 (0.71-1.75)
Total	**100.0%**	**100.0%**	--

†Totals do not always equal 100.0% due to slight rounding.

Table 25.54 Comparison of Mechanisms of Boys' and Girls' Track and Field Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Boys' track	Girls' track	IPR (95% CI)
Track Mechanism			
N/A (e.g., overuse, heat illness, conditioning, etc.)	55.6%	**58.3%**	1.05 (0.90-1.22)
Contact with ground/track/surface	**14.3%**	10.1%	1.42 (0.87-2.30)
Fall/trip	4.5%	**6.6%**	1.46 (0.70-3.05)
Rotation around planted foot/inversion	**4.9%**	3.9%	1.24 (0.54-2.84)
Contact with field equipment	3.0%	**3.9%**	1.31 (0.51-3.35)
Uneven playing surface	0.0%	**2.6%**	--
Stepped on/kicked	0.4%	**0.9%**	2.33 (0.21-25.0)
Contact with another person	0.8%	**1.3%**	1.75 (0.29-10.38)
Other	**10.9%**	7.9%	1.38 (0.79-2.42)
Unknown	**5.6%**	4.4%	--
Total	**100.0%**	**100.0%**	--

†Totals do not always equal 100.0% due to slight rounding.

Table 25.55 Comparison of Activities of Boys' and Girls' Track and Field Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Boys' track	Girls' track	IPR (95% CI)
Track Activity			
Running	**64.3%**	63.9%	1.01 (0.88-1.15)
Jumping/landing	**12.0%**	11.9%	1.01 (0.63-1.64)
Conditioning	2.6%	**4.8%**	1.84 (0.73-4.67)
Throwing	**4.9%**	4.8%	1.01 (0.48-2.22)
Running hurdles	**6.8%**	3.5%	1.92 (0.85-4.33)
Warming up	2.6%	**3.1%**	1.17 (0.42-3.29)
Leaving block	**2.3%**	1.3%	1.71 (0.43-6.75)
Hit by shot put/discus/javelin/hammer	0.0%	0.0%	--
Other	3.0%	**3.1%**	1.03 (0.38-2.78)
Unknown	1.5%	**3.5%**	--
Total	**100.0%**	**100.0%**	--

†Totals do not always equal 100.0% due to slight rounding.

25.6 Boys' and Girls' Cross Country

Table 25.6 Comparison of Boys' and Girls' Cross Country Injury Rates, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Boys' cross country	Girls' cross country	RR (95% CI)
Total	0.63	**0.86**	**1.36 (1.02-1.81)**
Competition	0.70	**0.97**	1.39 (0.72-2.70)
Practice	0.62	**0.84**	1.35 (0.99-1.85)

Table 25.60 Comparison of Body Sites of Boys' and Girls' Cross Country Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Boys' cross country	Girls' cross country	IPR (95% CI)
Body Site			
Knee	**20.7%**	10.2%	2.02 (0.99-4.12)
Ankle	**18.5%**	16.3%	1.14 (0.63-2.08)
Lower leg	17.4%	**28.6%**	1.64 (0.95-2.83)
Foot	**16.3%**	7.1%	2.28 (0.97-5.34)
Hip/thigh/upper leg	14.1%	**29.6%**	**2.09 (1.16-3.77)**
Shoulder	**2.2%**	0.0%	--
Trunk	2.2%	**4.1%**	1.88 (0.35-10.01)
Head/face	1.1%	**2.0%**	1.89 (0.18-20.00)
Hand/wrist	**1.1%**	0.0%	--
Arm/elbow	**1.1%**	0.0%	--
Neck	0.0%	**1.0%**	--
Other	**5.4%**	1.0%	5.26 (0.67-50.00)
Total	**100.0%**	**100.0%**	--

†Totals do not always equal 100.0% due to slight rounding.

Table 25.61 Comparison of Diagnoses of Boys' and Girls' Cross Country Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Boys' cross country	Girls' cross country	IPR (95% CI)
Diagnosis			
Strain/sprain	40.0%	**43.9%**	1.10 (0.83-1.54)
Contusion	**2.2%**	0.0%	--
Fracture	**3.3%**	1.0%	3.27 (0.35-30.84)
Concussion	1.1%	**2.0%**	1.85 (0.17-20.00)
Other	**53.3%**	53.1%	1.01 (0.77-1.32)
Total	**100.0%**	**100.0%**	--

†Totals do not always equal 100.0% due to slight rounding.

Table 25.62 Most Common Boys' and Girls' Cross Country Injury Diagnoses, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Boys' cross country	Girls' cross country	IPR (95% CI)
Diagnosis			
Lower leg other	14.1%	**25.5%**	1.81 (0.98-3.31)
Ankle strain/sprain	15.2%	**16.3%**	1.08 (0.56-2.08)
Hip/thigh/upper leg strain/sprain	9.8%	**19.4%**	1.98 (0.95-4.16)
Lower leg strain/sprain	**3.3%**	3.1%	1.07 (0.22-5.14)
Hip/thigh/upper leg other	4.3%	**10.2%**	2.35 (0.76-7.22)
Knee other	**14.1%**	10.2%	1.39 (0.67-3.03)

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

Table 25.63 Comparison of Time Loss of Boys' and Girls' Cross Country Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Boys' cross country	Girls' cross country	IPR (95% CI)
Time Loss			
1-2 days	**37.0%**	35.7%	1.03 (0.71-1.52)
3-6 days	26.1%	**26.5%**	1.02 (0.63-1.64)
7-9 days	**12.0%**	11.2%	1.07 (0.49-2.34)
10-21 days	8.7%	**12.2%**	1.41 (0.63-3.33)
22 days or more	1.1%	**2.0%**	1.89 (0.18-20.00)
Other	**15.2%**	12.2%	1.25 (0.63-2.56)
Total	**100.0%**	**100.0%**	--

†Totals do not always equal 100.0% due to slight rounding.

Table 25.64 Comparison of Mechanisms of Boys' and Girls' Cross Country Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Boys' cross country	Girls' cross country	IPR (95% CI)
Track Mechanism			
Overuse	**52.3%**	51.6%	1.01 (0.77-1.35)
Contact with ground/track/surface	4.7%	**6.3%**	1.35 (0.40-4.55)
Fall/trip	**5.8%**	3.2%	1.84 (0.45-7.48)
Rotation around planted foot/inversion	**5.8%**	4.2%	1.38 (0.38-4.98)
Contact with obstacle	**3.5%**	3.2%	1.10 (0.23-5.33)
Uneven surface	9.3%	**16.8%**	1.81 (0.82-4.02)
N/A (e.g., heat illness, conditioning, etc.)	4.7%	**5.3%**	1.13 (0.31-4.08)
Contact with another person	**1.2%**	0.0%	--
Other	**4.7%**	3.2%	1.47 (0.34-6.39)
Total	**100.0%**	**100.0%**	--

†Totals do not always equal 100.0% due to slight rounding.

Table 25.65 Comparison of Activities of Boys' and Girls' Cross Country Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Boys' cross country	Girls' cross country	IPR (95% CI)
Track Activity			
Running	**60.5%**	60.0%	1.01 (0.80-1.28)
Conditioning	7.0%	**11.6%**	1.66 (0.64-4.30)
Warming up	**2.3%**	1.1%	2.21 (0.20-23.93)
Cooldown	**3.5%**	0.0%	--
Other	2.3%	**6.3%**	2.72 (0.56-13.10)
Total	**100.0%**	**100.0%**	--

†Totals do not always equal 100.0% due to slight rounding.

25.7 Boys' and Girls' Tennis

Table 25.7 Comparison of Boys' and Girls' Tennis Injury Rates, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Boys' tennis	Girls' tennis	RR (95% CI)
Total	0.35	**0.36**	1.02 (0.58-1.78)
Competition	0.40	**0.69**	1.74 (0.74-4.10)
Practice	**0.33**	0.21	1.54 (0.71-3.33)

Table 25.70 Comparison of Body Sites of Boys' and Girls' Tennis Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Boys' tennis	Girls' tennis	IPR (95% CI)
Body Site			
Ankle	**30.4%**	26.9%	1.14 (0.48-2.70)
Lower leg	**13.0%**	3.8%	3.39 (0.38-30.38)
Hand/wrist	8.7%	**19.2%**	2.21 (0.47-10.32)
Foot	**8.7%**	3.8%	2.26 (0.22-23.33)
Hip/thigh/upper leg	8.7%	**11.5%**	1.33 (0.24-7.26)
Knee	4.3%	**7.7%**	1.77 (0.17-18.26)
Head/face	4.3%	**7.7%**	1.75 (0.17-20.0)
Shoulder	4.3%	**7.7%**	1.77 (0.17-18.26)
Arm/elbow	3.8%	**17.4%**	4.52 (0.54-37.61)
Trunk	0.0%	**3.8%**	--
Neck	0.0%	0.0%	--
Other	0.0%	**3.8%**	--
Total	**100.0%**	**100.0%**	--

†Totals do not always equal 100.0% due to slight rounding.

Table 25.71 Comparison of Diagnoses of Boys' and Girls' Tennis Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Boys' tennis	Girls' tennis	IPR (95% CI)
Diagnosis			
Strain/sprain	43.5%	**65.4%**	1.52 (0.91-2.56)
Contusion	4.3%	**7.7%**	1.75 (0.17-20.0)
Fracture	**4.3%**	3.8%	1.13 (0.07-17.07)
Concussion	**4.3%**	3.8%	1.13 (0.07-17.07)
Other	**43.5%**	19.2%	2.27 (0.91-5.56)
Total	**100.0%**	**100.0%**	--

†Totals do not always equal 100.0% due to slight rounding.

Table 25.72 Most Common Boys' and Girls' Tennis Injury Diagnoses, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Boys' tennis	Girls' tennis	IPR (95% CI)
Diagnosis			
Ankle strain/sprain	26.1%	**26.9%**	1.03 (0.41-2.63)
Hip/thigh/upper leg strain/sprain	0.0%	**11.5%**	--
Lower leg strain/sprain	**4.3%**	0.0%	--
Knee other	**4.3%**	3.8%	1.12 (0.08-16.7)

*Only includes diagnoses accounting for >5% of tennis injuries.

Table 25.73 Comparison of Time Loss of Boys' and Girls' Tennis Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Boys' tennis	Girls' tennis	IPR (95% CI)
Time Loss			
1-2 days	**47.8%**	30.8%	1.55 (0.76-3.18)
3-6 days	13.0%	**26.9%**	2.06 (0.60-7.07)
7-9 days	8.7%	**15.4%**	1.75 (0.36-9.09)
10-21 days	**17.4%**	7.7%	2.27 (0.45-11.10)
22 days or more	**4.3%**	0.0%	--
Other	8.7%	**19.2%**	2.22 (0.47-10.00)
Total	**100.0%**	**100.0%**	--

†Totals do not always equal 100.0% due to slight rounding.

Table 25.74 Comparison of Mechanisms of Boys' and Girls' Tennis Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Boys' tennis	Girls' tennis	IPR (95% CI)
Tennis Mechanism			
Rotation around a planted foot	**31.6%**	23.1%	1.37 (0.52-3.59)
Non-contact	26.3%	**38.5%**	1.46 (0.60-3.58)
Contact with racquet	0.0%	**3.8%**	--
Contact with player	**5.3%**	0.0%	--
Stuck by ball	0.0%	**3.8%**	--
Contact with surface	**10.5%**	3.8%	2.70 (0.27-25.00)
Contact with net	0.0%	0.0%	--
Stepped on ball	0.0%	**11.5%**	--
Contact with out of bounds object	**5.3%**	0.0%	--
Other	**5.3%**	0.0%	--
Total	**100.0%**	**100.0%**	--

†Totals do not always equal 100.0% due to slight rounding.

Table 25.75 Comparison of Activities of Boys' and Girls' Tennis Injuries, High School Sports-Related Injury Surveillance Study, US, 2017-18 School Year

	Boys' tennis	Girls' tennis	IPR (95% CI)
Tennis Activity			
General Play	**42.1%**	34.6%	1.22 (0.58-2.56)
Chasing/running to hit ball	21.1%	**23.1%**	1.10 (0.36-3.33)
Conditioning	**5.3%**	3.8%	1.37 (0.09-20.00)
Forehand ground stroke	0.0%	0.0%	--
One-handed backhand ground stroke	**5.3%**	0.0%	--
Serve	26.3%	**38.5%**	1.46 (0.60-3.58)
Two-handed backhand	0.0%	**3.8%**	--
Overhead	0.0%	0.0%	--
Warm up	0.0%	0.0%	--
Other	**5.3%**	0.0%	--
Total	**100.0%**	**100.0%**	--

†Totals do not always equal 100.0% due to slight rounding.

XXVII. Reporter Demographics & Compliance

During the 2017-18 school year, 249 ATs initially enrolled 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, 200 enrolled ATs reported an average of 39 study weeks. The majority of ATs (90.5%) reported for more than 20 weeks of the study. Because internal validity checks conducted during the first six years of the study consistently found high sensitivity, specificity, positive predictive values, and negative predictive values, internal validity checks will be conducted every other year. Internal validity checks during the 2016-17 academic year yielded 82.6% sensitivity, 98.2% specificity, a positive predictive value of 90.5%, and a negative predictive value of 96.4%.

Prior to the start of the 2017-18 High School RIO™ study, participating ATs were asked to complete a short demographics survey. Over three-quarters (80.5%) of participating high schools were public schools, with the remainder being private. All ATs except for 3 provided services to athletes of their high school on 5 or more days each week. Over 64% of ATs participating during the 2017-18 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 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 58 ATs (27.9%). Average reporting time burdens were 31 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 (47.4%) or somewhat easy (43.9%) to use (5

and 4 on the Likert scale, respectively), with ATs being either very satisfied (56.9%) or somewhat satisfied (34.5%) 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 2018-19 school year.

XXV. 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 large nationally disperse 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 by Dr. Comstock, 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. Comstock 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.