

CONVENIENCE SAMPLE SUMMARY REPORT

NATIONAL HIGH SCHOOL SPORTS-RELATED INJURY SURVEILLANCE STUDY

2010-2011 School Year

Compiled by:

R. Dawn Comstock, PhD

Christy L. Collins, MA

Natalie M. McIlvain, BS



Acknowledgements

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

Note

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

For reprints/further information contact:
R. Dawn Comstock, PhD
Center for Injury Research and Policy
The Research Institute at Nationwide Children's Hospital
700 Children's Drive
Columbus, OH 43205
(614) 722-2400
Dawn.Comstock@NationwideChildrens.org

Chapter	Page
I. Introduction and Methodology	14
1.1 Project Overview	15
1.2 Background and Significance	15
1.3 Specific Aims	16
1.4 Project Design	17
1.5 Sample Recruitment	18
1.6 Data Collection	20
1.7 Data Management	21
1.8 Data Analysis	21
II. Overall Injury Epidemiology	23
3. Boys' Football Injury Epidemiology	33
4. Boys' Soccer Injury Epidemiology	41
5. Girls' Soccer Injury Epidemiology	49
6. Boys' Volleyball Injury Epidemiology	57
7. Girls' Volleyball Injury Epidemiology	65
8. Boys' Basketball Injury Epidemiology	73
9. Girls' Basketball Injury Epidemiology	81
10. Boys' Wrestling Injury Epidemiology	89
11. Boys' Baseball Injury Epidemiology	96
12. Girls' Softball Injury Epidemiology	104
13. Girls' Field Hockey Injury Epidemiology	112
14. Girls' Gymnastics Injury Epidemiology	120
15. Boys' Ice Hockey Injury Epidemiology	127
16. Boys' Lacrosse Injury Epidemiology	135
17. Girls' Lacrosse Injury Epidemiology	143
18. Boys' Swimming Injury Epidemiology	151
19. Girls' Swimming Injury Epidemiology	158
20. Boys' Track Injury Epidemiology	165

21.	Girls' Track Injury Epidemiology	173
22.	Cheerleading Injury Epidemiology	180
23.	Gender Differences within Sports	186
23.1	Boys' and Girls' Soccer	187
23.2	Boys' and Girls' Volleyball	190
23.3	Boys' and Girls' Basketball	193
23.4	Boys' Baseball and Girls' Softball	196
23.5	Boys' Swimming and Girls' Swimming	199
23.6	Boys' Track and Girls' Track	202
24.	Reporter Demographics & Compliance	204
25.	Summary	206

List of Tables and Figures

Tables	Page
<u>Overall Injury Epidemiology</u>	
2.1 Injury Rates by Sport and Type of Exposure	25
2.2 Proportion of Injuries Resulting in Time Loss	26
2.3 Demographic Characteristics of Injured Athletes by Sex	27
2.4 Body Site of Injury by Type of Exposure	28
2.5 Most Commonly Injured Ankle Structures	28
2.6 Most Commonly Injured Knee Structures	29
2.7 Ten Most Common Injury Diagnoses by Type of Exposure	30
2.8 Injuries Requiring Surgery by Type of Exposure	31
2.9 Time during Season of Injury	31
2.10 Competition-Related Variables	32
2.11 Practice-Related Variables	32
2.12 Methods for Injury Evaluation and Assessment	32
<u>Boys' Football Injury Epidemiology</u>	
3.1 Football Injury Rates by Type of Exposure	33
3.2 Demographic Characteristics of Injured Football Athletes	35
3.3 Body Site of Football Injuries by Type of Exposure	36
3.4 Ten Most Common Football Injury Diagnoses by Type of Exposure	37
3.5 Football Injuries Requiring Surgery by Type of Exposure	38
3.6 Time during Season of Football Injuries	38
3.7 Competition-Related Variables for Football Injuries	39
3.8 Practice-Related Variables for Football Injuries	40
3.9 Activities Leading to Football Injuries by Type of Exposure	41
<u>Boys' Soccer Injury Epidemiology</u>	
4.1 Boys' Soccer Injury Rates by Type of Exposure	43
4.2 Demographic Characteristics of Injured Boys' Soccer Athletes	43
4.3 Body Site of Boys' Soccer Injuries by Type of Exposure	44
4.4 Ten Most Common Boys' Soccer Injury Diagnoses by Type of Exposure	45
4.5 Boys' Soccer Injuries Requiring Surgery by Type of Exposure	46
4.6 Time during Season of Boys' Soccer Injuries	46
4.7 Competition-Related Variables for Boys' Soccer Injuries	47
4.8 Practice-Related Variables for Boys' Soccer Injuries	48
4.9 Activities Leading to Boys' Soccer Injuries by Type of Exposure	49
<u>Girls' Soccer Injury Epidemiology</u>	
5.1 Girls' Soccer Injury Rates by Type of Exposure	51
5.2 Demographic Characteristics of Injured Girls' Soccer Athletes	51
5.3 Body Site of Girls' Soccer Injuries by Type of Exposure	52
5.4 Ten Most Common Girls' Soccer Injury Diagnoses by Type of Exposure	53
5.5 Girls' Soccer Injuries Requiring Surgery by Type of Exposure	54
5.6 Time during Season of Girls' Soccer Injuries	54
5.7 Competition-Related Variables for Girls' Soccer Injuries	55

5.8	Practice-Related Variables for Girls' Soccer Injuries	56
5.9	Activities Leading to Girls' Soccer Injuries by Type of Exposure	57

Boys' Volleyball Injury Epidemiology

6.1	Volleyball Injury Rates by Type of Exposure	59
6.2	Demographic Characteristics of Injured Volleyball Athletes	59
6.3	Body Site of Volleyball Injuries by Type of Exposure	60
6.4	Ten Most Common Volleyball Injury Diagnoses by Type of Exposure	61
6.5	Volleyball Injuries Requiring Surgery by Type of Exposure	62
6.6	Time during Season of Volleyball Injuries	62
6.7	Competition-Related Variables for Volleyball Injuries	63
6.8	Practice-Related Variables for Volleyball Injuries	63
6.9	Activities Leading to Volleyball Injuries by Type of Exposure	64

Girls' Volleyball Injury Epidemiology

7.1	Volleyball Injury Rates by Type of Exposure	67
7.2	Demographic Characteristics of Injured Volleyball Athletes	67
7.3	Body Site of Volleyball Injuries by Type of Exposure	68
7.4	Ten Most Common Volleyball Injury Diagnoses by Type of Exposure	69
7.5	Volleyball Injuries Requiring Surgery by Type of Exposure	70
7.6	Time during Season of Volleyball Injuries	70
7.7	Competition-Related Variables for Volleyball Injuries	71
7.8	Practice-Related Variables for Volleyball Injuries	72
7.9	Activities Leading to Volleyball Injuries by Type of Exposure	73

Boys' Basketball Injury Epidemiology

8.1	Boys' Basketball Injury Rates by Type of Exposure	75
8.2	Demographic Characteristics of Injured Boys' Basketball Athletes	75
8.3	Body Site of Boys' Basketball Injuries by Type of Exposure	76
8.4	Ten Most Common Boys' Basketball Injury Diagnoses by Type of Exposure	77
8.5	Boys' Basketball Injuries Requiring Surgery by Type of Exposure	78
8.6	Time during Season of Boys' Basketball Injuries	78
8.7	Competition-Related Variables for Boys' Basketball Injuries	79
8.8	Practice-Related Variables for Boys' Basketball Injuries	80
8.9	Activities Leading to Boys' Basketball Injuries by Type of Exposure	81

Girls' Basketball Injury Epidemiology

9.1	Girls' Basketball Injury Rates by Type of Exposure	83
9.2	Demographic Characteristics of Injured Girls' Basketball Athletes	83
9.3	Body Site of Girls' Basketball Injuries by Type of Exposure	84
9.4	Ten Most Common Girls' Basketball Injury Diagnoses by Type of Exposure	85
9.5	Girls' Basketball Injuries Requiring Surgery by Type of Exposure	86
9.6	Time during Season of Girls' Basketball Injuries	86
9.7	Competition-Related Variables for Girls' Basketball Injuries	87
9.8	Practice-Related Variables for Girls' Basketball Injuries	88
9.9	Activities Leading to Girls' Basketball Injuries by Type of Exposure	89

Boys' Wrestling Injury Epidemiology

10.1	Wrestling Injury Rates by Type of Exposure	91
10.2	Demographic Characteristics of Injured Wrestlers	91
10.3	Body Site of Wrestling Injuries by Type of Exposure	92
10.4	Ten Most Common Wrestling Injury Diagnoses by Type of Exposure	93
10.5	Wrestling Injuries Requiring Surgery by Type of Exposure	94
10.6	Time during Season of Wrestling Injuries	94
10.7	Competition-Related Variables for Wrestling Injuries	95
10.8	Practice-Related Variables for Wrestling Injuries	95
10.9	Activities Leading to Wrestling Injuries by Type of Exposure	96

Boys' Baseball Injury Epidemiology

11.1	Baseball Injury Rates by Type of Exposure	98
11.2	Demographic Characteristics of Injured Baseball Athletes	98
11.3	Body Site of Baseball Injuries by Type of Exposure	99
11.4	Ten Most Common Baseball Injury Diagnoses by Type of Exposure	100
11.5	Baseball Injuries Requiring Surgery by Type of Exposure	101
11.6	Time during Season of Baseball Injuries	101
11.7	Competition-Related Variables for Baseball Injuries	102
11.8	Practice-Related Variables for Baseball Injuries	103
11.9	Activities Leading to Baseball Injuries by Type of Exposure	104

Girls' Softball Injury Epidemiology

12.1	Softball Injury Rates by Type of Exposure	106
12.2	Demographic Characteristics of Injured Softball Athletes	106
12.3	Body Site of Softball Injuries by Type of Exposure	107
12.4	Ten Most Common Softball Injury Diagnoses by Type of Exposure	108
12.5	Softball Injuries Requiring Surgery by Type of Exposure	109
12.6	Time during Season of Softball Injuries	109
12.7	Competition-Related Variables for Softball Injuries	110
12.8	Practice-Related Variables for Softball Injuries	111
12.9	Activities Leading to Softball Injuries by Type of Exposure	112

Girls' Field Hockey Injury Epidemiology

13.1	Field Hockey Injury Rates by Type of Exposure	114
13.2	Demographic Characteristics of Injured Field Hockey Athletes	114
13.3	Body Site of Field Hockey Injuries by Type of Exposure	115
13.4	Ten Most Common Field Hockey Injury Diagnoses by Type of Exposure	116
13.5	Field Hockey Injuries Requiring Surgery by Type of Exposure	117
13.6	Time during Season of Field Hockey Injuries	117
13.7	Competition-Related Variables for Field Hockey Injuries	118
13.8	Practice-Related Variables for Field Hockey Injuries	119
13.9	Activities Leading to Field Hockey Injuries by Type of Exposure	120

Girls' Gymnastics Injury Epidemiology

14.1	Gymnastics Injury Rates by Type of Exposure	122
14.2	Demographic Characteristics of Injured Gymnastic Athletes	122

13.3	Body Site of Gymnastics Injuries by Type of Exposure	123
13.4	Ten Most Common Gymnastics Injury Diagnoses by Type of Exposure	124
13.5	Gymnastics Injuries Requiring Surgery by Type of Exposure	125
13.6	Time during Season of Gymnastics Injuries	125
13.7	Event or Apparatus for Gymnastics Injuries	126
13.8	Practice-Related Variables for Gymnastics Injuries	126
13.9	Activities Leading to Gymnastics Injuries by Type of Exposure	127

Boys' Ice Hockey Injury Epidemiology

15.1	Ice Hockey Injury Rates by Type of Exposure	129
15.2	Demographic Characteristics of Injured Ice Hockey Athletes	129
15.3	Body Site of Ice Hockey Injuries by Type of Exposure	130
15.4	Ten Most Common Ice Hockey Injury Diagnoses by Type of Exposure	131
15.5	Ice Hockey Injuries Requiring Surgery by Type of Exposure	132
15.6	Time during Season of Ice Hockey Injuries	132
15.7	Competition-Related Variables for Ice Hockey Injuries	133
15.8	Practice-Related Variables for Ice Hockey Injuries	134
15.9	Activities Leading to Ice Hockey Injuries by Type of Exposure	135

Boys' Lacrosse Injury Epidemiology

16.1	Boys' Lacrosse Injury Rates by Type of Exposure	137
16.2	Demographic Characteristics of Injured Boys' Lacrosse Athletes	137
16.3	Body Site of Boys' Lacrosse Injuries by Type of Exposure	138
16.4	Ten Most Common Boys' Lacrosse Injury Diagnoses by Type of Exposure	139
16.5	Boys' Lacrosse Injuries Requiring Surgery by Type of Exposure	140
16.6	Time during Season of Boys' Lacrosse Injuries	140
16.7	Competition-Related Variables for Boys' Lacrosse Injuries	141
16.8	Practice-Related Variables for Boys' Lacrosse Injuries	142
16.9	Activities Leading to Boys' Lacrosse Injuries by Type of Exposure	143

Girls' Lacrosse Injury Epidemiology

17.1	Girls' Lacrosse Injury Rates by Type of Exposure	145
17.2	Demographic Characteristics of Injured Girls' Lacrosse Athletes	145
17.3	Body Site of Girls' Lacrosse Injuries by Type of Exposure	146
17.4	Ten Most Common Girls' Lacrosse Injury Diagnoses by Type of Exposure	147
17.5	Girls' Lacrosse Injuries Requiring Surgery by Type of Exposure	148
17.6	Time during Season of Girls' Lacrosse Injuries	148
17.7	Competition-Related Variables for Girls' Lacrosse Injuries	149
17.8	Practice-Related Variables for Girls' Lacrosse Injuries	150
17.9	Activities Leading to Girls' Lacrosse Injuries by Type of Exposure	151

Boys' Swimming Injury Epidemiology

18.1	Boys' Swimming Injury Rates by Type of Exposure	153
18.2	Demographic Characteristics of Injured Boys' Swimming Athletes	153
18.3	Body Site of Boys' Swimming Injuries by Type of Exposure	154
18.4	Ten Most Common Boys' Swimming Injury Diagnoses by Type of Exposure	155
18.5	Boys' Swimming Injuries Requiring Surgery by Type of Exposure	156

18.6	Time during Season of Boys' Swimming Injuries	156
18.7	Pool Location for Boys' Swimming Injuries	157
18.8	Practice-Related Variables for Boys' Swimming Injuries	157
18.9	Activities Leading to Boys' Swimming Injuries by Type of Exposure	158

Girls' Swimming Injury Epidemiology

19.1	Girls' Swimming Injury Rates by Type of Exposure	160
19.2	Demographic Characteristics of Injured Girls' Swimming Athletes	160
19.3	Body Site of Girls' Swimming Injuries by Type of Exposure	161
19.4	Ten Most Common Girls' Swimming Injury Diagnoses by Type of Exposure	162
19.5	Girls' Swimming Injuries Requiring Surgery by Type of Exposure	163
19.6	Time during Season of Girls' Swimming Injuries	163
19.7	Pool Location for Girls' Swimming Injuries	164
19.8	Practice-Related Variables for Girls' Swimming Injuries	164
19.9	Activities Leading to Girls' Swimming Injuries by Type of Exposure	165

Boys' Track Injury Epidemiology

20.1	Boys' Track Injury Rates by Type of Exposure	167
20.2	Demographic Characteristics of Injured Boys' Track Athletes	167
20.3	Body Site of Boys' Track Injuries by Type of Exposure	168
20.4	Ten Most Common Boys' Track Injury Diagnoses by Type of Exposure	169
20.5	Boys' Track Injuries Requiring Surgery by Type of Exposure	170
20.6	Time during Season of Boys' Track Injuries	170
20.7	Practice-Related Variables for Boys' Track Injuries	171
20.8	Activities Leading to Boys' Track Injuries by Type of Exposure	172

Girls' Track Injury Epidemiology

21.1	Girls' Track Injury Rates by Type of Exposure	174
21.2	Demographic Characteristics of Injured Girls' Track Athletes	174
21.3	Body Site of Girls' Track Injuries by Type of Exposure	175
21.4	Ten Most Common Girls' Track Injury Diagnoses by Type of Exposure	176
21.5	Girls' Track Injuries Requiring Surgery by Type of Exposure	177
21.6	Time during Season of Girls' Track Injuries	177
21.7	Practice-Related Variables for Girls' Track Injuries	178
21.8	Activities Leading to Girls' Track Injuries by Type of Exposure	179

Cheerleading Injury Epidemiology

22.1	Cheerleading Injury Rates by Type of Exposure	181
22.2	Demographic Characteristics of Injured Cheerleading Athletes	181
22.3	Body Site of Cheerleading Injuries by Type of Exposure	182
22.4	Ten Most Common Cheerleading Injury Diagnoses by Type of Exposure	183
22.5	Cheerleading Injuries Requiring Surgery by Type of Exposure	184
22.6	Time during Season of Cheerleading Injuries	184
22.7	Practice-Related Variables for Cheerleading Injuries	185
22.8	Activities Leading to Cheerleading Injuries by Type of Exposure	185

Gender Differences within Sports

23.1	Comparison of Boys' and Girls' Soccer Injury Rates	187
23.10	Comparison of Body Sites of Boys' and Girls' Soccer Injuries	187
23.11	Comparison of Diagnoses of Boys' and Girls' Soccer Injuries	188
23.12	Most Common Boys' and Girls' Soccer Injury Diagnoses	188
23.13	Comparison of Time Loss of Boys' and Girls' Soccer Injuries	188
23.14	Comparison of Mechanisms of Boys' and Girls' Soccer Injuries	189
23.15	Comparison of Activities of Boys' and Girls' Soccer Injuries	189
23.2	Comparison of Boys' and Girls' Volleyball Injury Rates	190
23.20	Comparison of Body Sites of Boys' and Girls' Volleyball Injuries	190
23.21	Comparison of Diagnoses of Boys' and Girls' Volleyball Injuries	191
23.22	Most Common Boys' and Girls' Volleyball Injury Diagnoses	191
23.23	Comparison of Time Loss of Boys' and Girls' Volleyball Injuries	191
23.24	Comparison of Mechanisms of Boys' and Girls' Volleyball Injuries	192
23.25	Comparison of Activities of Boys' and Girls' Volleyball Injuries	192
23.3	Comparison of Boys' and Girls' Basketball Injury Rates	193
23.30	Comparison of Body Sites of Boys' and Girls' Basketball Injuries	193
23.31	Comparison of Diagnoses of Boys' and Girls' Basketball Injuries	194
23.32	Most Common Boys' and Girls' Basketball Injury Diagnoses	194
23.33	Comparison of Time Loss of Boys' and Girls' Basketball Injuries	194
23.34	Comparison of Mechanisms of Boys' and Girls' Basketball Injuries	195
23.35	Comparison of Activities of Boys' and Girls' Basketball Injuries	195
23.4	Comparison of Boys' Baseball and Girls' Softball Injury Rates	196
23.40	Comparison of Body Sites of Boys' Baseball and Girls' Softball Injuries	196
23.41	Comparison of Diagnoses of Boys' Baseball and Girls' Softball Injuries	197
23.42	Most Common Boys' Baseball and Girls' Softball Injury Diagnoses	197
23.43	Comparison of Time Loss of Boys' Baseball and Girls' Softball Injuries	197
23.44	Comparison of Mechanisms of Boys' Baseball and Girls' Softball Injuries	198
23.45	Comparison of Activities of Boys' Baseball and Girls' Softball Injuries	198
23.5	Comparison of Boys' and Girls' Swimming Injury Rates	199
23.50	Comparison of Body Sites of Boys' and Girls' Swimming Injuries	199
23.51	Comparison of Diagnoses of Boys' and Girls' Swimming Injuries	200
23.52	Most Common Boys' and Girls' Swimming Injury Diagnoses	200
23.53	Comparison of Time Loss of Boys' and Girls' Swimming Injuries	200
23.54	Comparison of Mechanisms of Boys' and Girls' Swimming Injuries	201
23.55	Comparison of Activities of Boys' and Girls' Swimming Injuries	201
23.6	Comparison of Boys' and Girls' Track Injury Rates	202
23.60	Comparison of Body Sites of Boys' and Girls' Track Injuries	202
23.61	Comparison of Diagnoses of Boys' and Girls' Track Injuries	203
23.62	Most Common Boys' and Girls' Track Injury Diagnoses	203
23.63	Comparison of Time Loss of Boys' and Girls' Track Injuries	203
23.64	Comparison of Mechanisms of Boys' and Girls' Track Injuries	204
23.65	Comparison of Activities of Boys' and Girls' Track Injuries	204

Figures

Overall Injury Epidemiology

2.1	Injury Diagnosis by Type of Exposure	28
2.2	Time Loss by Type of Exposure	30
2.3	New and Recurring Injuries by Type of Exposure	31

Boys' Football Injury Epidemiology

3.1	Diagnosis of Football Injuries by Type of Exposure	36
3.2	Time Loss of Football Injuries by Type of Exposure	37
3.3	History of Football Injuries by Type of Exposure	38
3.4	Player Position of Football Injuries by Type of Exposure	40
3.5	Activity Resulting in Football Injuries by Injury Diagnosis	41

Boys' Soccer Injury Epidemiology

4.1	Type of Boys' Soccer Injuries by Type of Exposure	44
4.2	Time Loss of Boys' Soccer Injuries by Type of Exposure	45
4.3	History of Boys' Soccer Injuries by Type of Exposure	46
4.4	Player Position of Boys' Soccer Injuries by Type of Exposure	48
4.5	Activity Resulting in Boys' Soccer Injuries by Injury Diagnosis	49

Girls' Soccer Injury Epidemiology

5.1	Diagnosis of Girls' Soccer Injuries by Type of Exposure	52
5.2	Time Loss of Girls' Soccer Injuries by Type of Exposure	53
5.3	History of Girls' Soccer Injuries by Type of Exposure	54
5.4	Player Position of Girls' Soccer Injuries by Type of Exposure	56
5.5	Activity Resulting in Girls' Soccer Injuries by Injury Diagnosis	57

Boy' Volleyball Injury Epidemiology

6.1	Diagnosis of Volleyball Injuries by Type of Exposure	60
6.2	Time Loss of Volleyball Injuries by Type of Exposure	61
6.3	History of Volleyball Injuries by Type of Exposure	62
6.4	Player Position of Volleyball Injuries by Type of Exposure	64
6.5	Activity Resulting in Volleyball Injuries by Injury Diagnosis	65

Girls' Volleyball Injury Epidemiology

7.1	Diagnosis of Volleyball Injuries by Type of Exposure	68
7.2	Time Loss of Volleyball Injuries by Type of Exposure	69
7.3	History of Volleyball Injuries by Type of Exposure	70
7.4	Player Position of Volleyball Injuries by Type of Exposure	72
7.5	Activity Resulting in Volleyball Injuries by Injury Diagnosis	73

Boys' Basketball Injury Epidemiology

8.1	Diagnosis of Boys' Basketball Injuries by Type of Exposure	76
8.2	Time Loss of Boys' Basketball Injuries by Type of Exposure	77
8.3	History of Boys' Basketball Injuries by Type of Exposure	78
8.4	Player Position of Boys' Basketball Injuries by Type of Exposure	80

8.5	Activity Resulting in Boys' Basketball Injuries by Injury Diagnosis	81
<u>Girls' Basketball Injury Epidemiology</u>		
9.1	Diagnosis of Girls' Basketball Injuries by Type of Exposure	84
9.2	Time Loss of Girls' Basketball Injuries by Type of Exposure	85
9.3	History of Girls' Basketball Injuries by Type of Exposure	86
9.4	Player Position of Girls' Basketball Injuries by Type of Exposure	88
9.5	Activity Resulting in Girls' Basketball Injuries by Injury Diagnosis	90
<u>Boys' Wrestling Injury Epidemiology</u>		
10.1	Diagnosis of Wrestling Injuries by Type of Exposure	92
10.2	Time Loss of Wrestling Injuries by Type of Exposure	93
10.3	History of Wrestling Injuries by Type of Exposure	94
10.4	Activity Resulting in Wrestling Injuries by Injury Diagnosis	96
<u>Boys' Baseball Injury Epidemiology</u>		
11.1	Diagnosis of Baseball Injuries by Type of Exposure	99
11.2	Time Loss of Baseball Injuries by Type of Exposure	100
11.3	History of Baseball Injuries by Type of Exposure	101
11.4	Player Position of Baseball Injuries by Type of Exposure	103
11.5	Activity Resulting in Baseball Injuries by Injury Diagnosis	104
<u>Girls' Softball Injury Epidemiology</u>		
12.1	Diagnosis of Softball Injuries by Type of Exposure	107
12.2	Time Loss of Softball Injuries by Type of Exposure	108
12.3	History of Softball Injuries by Type of Exposure	109
12.4	Player Position of Softball Injuries by Type of Exposure	111
12.5	Activity Resulting in Softball Injuries by Injury Diagnosis	112
<u>Girls' Field Hockey Injury Epidemiology</u>		
13.1	Diagnosis of Girls' Field Hockey Injuries by Type of Exposure	115
13.2	Time Loss of Girls' Field Hockey Injuries by Type of Exposure	116
13.3	History of Girls' Field Hockey Injuries by Type of Exposure	117
13.4	Player Position of Girls' Field Hockey Injuries by Type of Exposure	119
13.5	Activity Resulting in Girls' Field Hockey Injuries by Injury Diagnosis	120
<u>Girls' Gymnastics Injury Epidemiology</u>		
14.1	Diagnosis of Girls' Gymnastics Injuries by Type of Exposure	123
14.2	Time Loss of Girls' Gymnastics Injuries by Type of Exposure	124
14.3	History of Girls' Gymnastics Injuries by Type of Exposure	125
14.4	Activity Resulting in Girls' Gymnastics Injuries by Injury Diagnosis	127
<u>Boys' Ice Hockey Injury Epidemiology</u>		
15.1	Diagnosis of Boys' Ice Hockey Injuries by Type of Exposure	130
15.2	Time Loss of Boys' Ice Hockey Injuries by Type of Exposure	131
15.3	History of Boys' Ice Hockey Injuries by Type of Exposure	132

15.4	Player Position of Boys' Ice Hockey Injuries by Type of Exposure	134
15.5	Activity Resulting in Boys' Ice Hockey Injuries by Injury Diagnosis	135

Boys' Lacrosse Injury Epidemiology

16.1	Diagnosis of Boys' Lacrosse Injuries by Type of Exposure	138
16.2	Time Loss of Boys' Lacrosse Injuries by Type of Exposure	139
16.3	History of Boys' Lacrosse Injuries by Type of Exposure	140
16.4	Player Position of Boys' Lacrosse Injuries by Type of Exposure	142
16.5	Activity Resulting in Boys' Lacrosse Injuries by Injury Diagnosis	143

Girls' Lacrosse Injury Epidemiology

17.1	Diagnosis of Girls' Lacrosse Injuries by Type of Exposure	146
17.2	Time Loss of Girls' Lacrosse Injuries by Type of Exposure	147
17.3	History of Girls' Lacrosse Injuries by Type of Exposure	148
17.4	Player Position of Girls' Lacrosse Injuries by Type of Exposure	150
17.5	Activity Resulting in Girls' Lacrosse Injuries by Injury Diagnosis	151

Boys' Swimming Injury Epidemiology

18.1	Diagnosis of Boys' Swimming Injuries by Type of Exposure	154
18.2	Time Loss of Boys' Swimming Injuries by Type of Exposure	155
18.3	History of Boys' Swimming Injuries by Type of Exposure	156
18.4	Activity Resulting in Boys' Swimming Injuries by Injury Diagnosis	158

Girls' Swimming Injury Epidemiology

19.1	Diagnosis of Girls' Swimming Injuries by Type of Exposure	161
19.2	Time Loss of Girls' Swimming Injuries by Type of Exposure	162
19.3	History of Girls' Swimming Injuries by Type of Exposure	163
19.4	Activity Resulting in Girls' Swimming Injuries by Injury Diagnosis	165

Boys' Track Injury Epidemiology

20.1	Diagnosis of Boys' Track Injuries by Type of Exposure	168
20.2	Time Loss of Boys' Track Injuries by Type of Exposure	169
20.3	History of Boys' Track Injuries by Type of Exposure	170
20.4	Activity Resulting in Boys' Track Injuries by Injury Diagnosis	172

Girls' Track Injury Epidemiology

21.1	Diagnosis of Girls' Track Injuries by Type of Exposure	175
21.2	Time Loss of Girls' Track Injuries by Type of Exposure	176
21.3	History of Girls' Track Injuries by Type of Exposure	177
21.4	Activity Resulting in Girls' Track Injuries by Injury Diagnosis	179

Cheerleading Injury Epidemiology

22.1	Diagnosis of Cheerleading Injuries by Type of Exposure	182
22.2	Time Loss of Cheerleading Injuries by Type of Exposure	183
22.3	History of Cheerleading Injuries by Type of Exposure	184
22.4	Activity Resulting in Cheerleading Injuries by Injury Diagnosis	184

I. Introduction & Methodology

1.1 Project Overview

To combat the epidemic of obesity among youth in the United States (US), adolescents must be encouraged to get up off the couch and participate in physically active sports, recreation, and leisure activities. Participation in high school sports, one of the most popular physical activities among adolescents, has grown rapidly from an estimated 4.0 million participants in 1971-72 to an estimated 7.4 million in 2010-11. 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 2008-09 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 and cheerleading. This surveillance has been conducted using the time- and cost-efficient RIOTM (Reporting Information One) surveillance system. This study was funded by the Centers for Disease Control, the Research Institute at Nationwide Children's Hospital, The Ohio State University, the National Federation of State High School Associations (NFHS), and the National Operating Committee on Standards for Athletic Equipment (NOCSAE).

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, 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 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 18 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, 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 $\leq 1,000$ 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' gymnastics, field hockey, and lacrosse and boys' ice hockey, volleyball 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 of the 9 sports of interest in the expansion of the National High School Sports-Related Injury Surveillance Study (boys' and girls' track & field, swimming & diving and cheerleading) were selected in an attempt to ensure at least 100 schools were reporting for each of the 20 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, 2010-11 School Year.*

	# Schools in Random Sample	# Schools in Convenience Sample	# Schools Total
Original Sports			
Football	84	35	119
Boys' Soccer	79	48	127
Girls' Soccer	77	46	123
Girls' Volleyball	83	45	128
Boys' Basketball	87	54	141
Girls' Basketball	87	54	141
Wrestling	79	42	121
Baseball	84	37	121
Softball	87	35	122
New Sports			
Boys' Volleyball	7	10	17
Field Hockey	23	33	56
Gymnastics	8	14	22
Ice Hockey	14	18	32
Boys' Lacrosse	20	27	47
Girls' Lacrosse	22	26	48
Boys' Swimming and Diving	33	26	59
Girls' Swimming and Diving	33	35	68
Boys' Track and Field	59	36	95
Girls' Track and Field	60	53	113
Cheerleading	39	40	79
Total	93	75	168

*Numbers only include schools who actually reported data for the 2010-11 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 45 weekly exposure reports: one for each week from August 2, 2010 through June 12, 2011. 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 9.1 and SPSS, version 19.0. Although fractures, concussions, 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:

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

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:

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

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, 2010-11 School Year*

	# Injuries	# Exposures	Injury rate (per 1,000 AEs)
Overall total	6,347	3,710,087	1.71
Competition	3,444	945,400	3.64
Practice	2,892	2,735,000	1.06
Performance	11	29,687	0.37
Boys' football total	2,346	649,696	3.61
Competition	1,317	107,752	12.22
Practice	1,029	541,944	1.90
Boys' soccer total	469	281,155	1.67
Competition	292	82,927	3.52
Practice	177	198,228	0.89
Girls' soccer total	466	221,339	2.11
Competition	314	69,337	4.53
Practice	152	152,002	1.00
Boys' volleyball total	16	19,775	0.81
Competition	3	6,620	0.45
Practice	13	13,155	0.99
Girls' volleyball total	209	225,305	0.93
Competition	90	77,348	1.16
Practice	119	147,957	0.80
Boys' basketball total	443	322,972	1.37
Competition	228	97,788	2.33
Practice	215	225,184	0.95
Girls' basketball total	454	251,244	1.81
Competition	277	77,174	3.59
Practice	177	174,070	1.02
Boys' wrestling total	493	226,432	2.18
Competition	213	56,509	3.77
Practice	280	169,923	1.65
Boys' baseball total	189	228,648	0.83
Competition	111	77,267	1.44
Practice	78	151,381	0.52
Girls' softball total	167	172,340	0.97
Competition	86	56,738	1.52
Practice	81	115,602	0.70

Table 2.1 (Continued) Injury Rates by Sport and Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year*

	# Injuries	# Exposures	Injury rate (per 1,000 AEs)
Girls' Field Hockey total	164	92,528	1.77
Competition	87	30,000	2.90
Practice	77	62,528	1.23
Girls' Gymnastics total	26	17,180	1.51
Competition	8	3,317	2.41
Practice	18	13,863	1.30
Boys' Ice Hockey total	163	73,699	2.21
Competition	134	23,794	5.63
Practice	29	49,905	0.58
Boys' Lacrosse total	205	108,001	1.90
Competition	124	32,344	3.83
Practice	81	75,657	1.07
Girls' Lacrosse total	104	74,545	1.40
Competition	50	22,727	2.20
Practice	54	51,818	1.04
Boys' Swimming total	14	75,979	0.18
Competition	1	15,269	0.07
Practice	13	60,710	0.21
Girls' Swimming total	22	81,334	0.27
Competition	6	15,864	0.38
Practice	16	65,470	0.24
Boys' Track total	135	237,419	0.57
Competition	49	45,036	1.09
Practice	86	192,383	0.45
Girls' Track total	164	183,147	0.90
Competition	47	34,723	1.35
Practice	117	148,424	0.79
Cheerleading total	98	167,349	0.59
Competition	7	12,866	0.54
Practice	80	124,796	0.64
Performance	11	29,687	0.37

*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, 2010-11 School Year*

	≥1 days time loss	<1 day time loss	Total
Overall	99.0%	1.0%	100%
Boys' football	98.9%	1.1%	100%
Boys' soccer	98.1%	1.9%	100%
Girls' soccer	99.6%	0.4%	100%
Boys' volleyball	100.0%	0.0%	100%
Girls' volleyball	98.6%	1.4%	100%
Boys' basketball	98.7%	1.3%	100%
Girls' basketball	99.3%	0.7%	100%
Boys' wrestling	99.6%	0.4%	100%
Boys' baseball	99.0%	1.0%	100%
Girls' softball	99.4%	0.6%	100%
Girls' field hockey	98.8%	1.2%	100%
Girls' gymnastics	100.0%	0.0%	100%
Boys' ice hockey	99.4%	0.6%	100%
Boys' lacrosse	99.0%	1.0%	100%
Girls' lacrosse	100.0%	0.0%	100%
Boys' swimming	100.0%	0.0%	100%
Girls' swimming	100.0%	0.0%	100%
Boys' track	99.3%	0.7%	100%
Girls' track	99.4%	0.6%	100%
Cheerleading	100.0%	0.0%	100%

*By study definition, non-time loss injuries were fractures, concussions, and dental injuries. Because they accounted for less than 2% 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, 2010-11 School Year*

	Male	Female
Year in School	n=4,410	n=1,840
Freshman	20.4%	26.1%
Sophomore	24.4%	28.7%
Junior	26.4%	23.0%
Senior	28.8%	22.1%
Total[†]	100%	100%
Age (years)		
Minimum	12	12
Maximum	19	19
Mean (St. Dev.)	16.1 (1.3)	15.8 (1.3)
BMI		
Minimum	9.1	10.2
Maximum	55.7	45.0
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, 2010-11 School Year

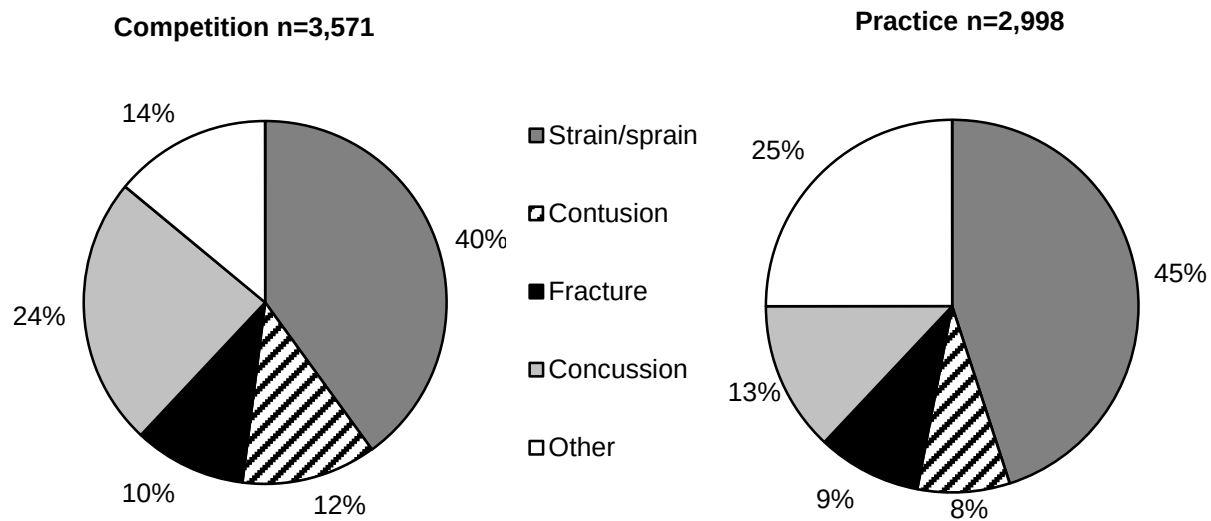


Table 2.4 Body Site of Injury by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Competition		Practice		Overall*	
	n	%	n	%	n	%
Body Site						
Head/face	974	27.2%	518	17.2%	1,492	22.6%
Ankle	598	16.7%	465	15.5%	1,063	16.1%
Knee	515	14.4%	375	12.5%	890	13.5%
Hip/thigh/upper leg	275	7.7%	381	12.7%	656	10.0%
Hand/wrist	323	9.0%	281	9.4%	604	9.2%
Shoulder	261	7.3%	210	7.0%	471	7.1%
Lower leg	146	4.1%	204	6.8%	350	5.3%
Trunk	154	4.3%	181	6.0%	335	5.1%
Arm/elbow	117	3.3%	107	3.6%	224	3.4%
Foot	95	2.6%	119	4.0%	214	3.2%
Neck	58	1.6%	61	2.0%	119	1.8%
Other	71	2.0%	103	3.4%	174	2.6%
Total	3,587	100%	3,005	100%	6,592	100%

*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

Table 2.5 Most Commonly Injured Ankle Structures, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Male		Female		Total	
	n	%	n	%	n	%
Ankle Ligament						
Anterior talofibular ligament	454	72.4%	300	75.9%	754	73.8%
Calcaneofibular ligament	169	27.0%	108	27.3%	277	27.1%
Anterior tibiofibular ligament	151	24.1%	81	20.5%	232	22.7%
Posterior talofibular ligament	44	7.0%	41	10.4%	85	8.3%
Deltoid ligament	42	6.7%	23	5.8%	65	6.4%
Posterior tibiofibular ligament	19	3.0%	14	3.5%	33	3.2%
Total	627	100%	395	100%	1,022	100%

*Multiple responses allowed per injury report.

Table 2.6 Most Commonly Injured Knee Structures, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

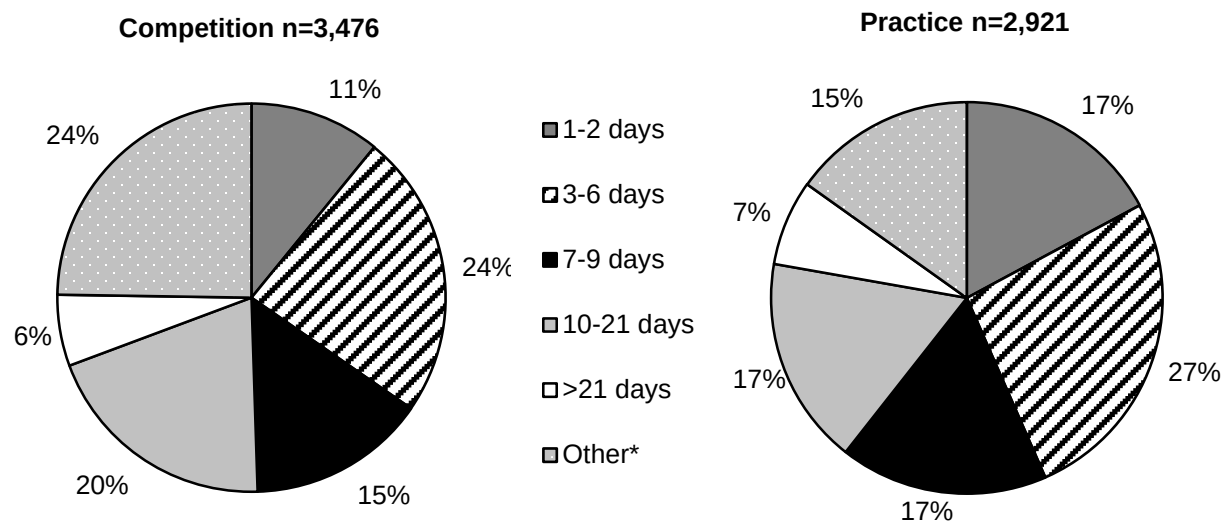
	Male		Female		Total	
	n	%	n	%	n	%
Knee Ligament						
Medial collateral ligament	173	30.1%	49	17.7%	222	26.1%
Patella/patellar tendon	135	23.5%	64	23.1%	199	23.4%
Anterior cruciate ligament	110	19.2%	80	28.9%	190	22.3%
Torn cartilage (meniscus)	98	17.0%	46	16.6%	144	16.9%
Lateral collateral ligament	40	7.0%	20	7.2%	60	7.1%
Posterior cruciate ligament	13	2.3%	4	1.4%	17	2.0%
Total	574	100%	277	100%	851	100%

*Multiple responses allowed per injury report.

Table 2.7 Ten Most Common Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

Diagnosis	Competition n=3,431		Practice n=2,882		Overall n=6,326	
	n	%	n	%	n	%
Head/face concussion	802	23.4%	375	13.0%	1,178	18.6%
Ankle strain/sprain	537	15.7%	403	14.0%	941	14.9%
Hip/thigh/upper leg strain/sprain	177	5.2%	320	11.1%	497	7.9%
Knee strain/sprain	288	8.4%	163	5.7%	451	7.1%
Knee other	130	3.8%	146	5.1%	277	4.4%
Hand/wrist fracture	130	3.8%	114	4.0%	246	3.9%
Shoulder other	131	3.8%	101	3.5%	233	3.7%
Hand/wrist strain/sprain	95	2.8%	84	2.9%	179	2.8%
Shoulder strain/sprain	89	2.6%	83	2.9%	173	2.7%
Trunk strain/sprain	45	1.3%	92	3.2%	137	2.2%

Figure 2.2 Time Loss by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 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, 2010-11 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	281	8.1%	163	5.6%	444	6.9%
Did not require surgery	3,203	91.9%	2,764	94.4%	5,967	93.1%
Total	3,484	100%	2,927	100%	6,411	100%

Figure 2.3 New and Recurring Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

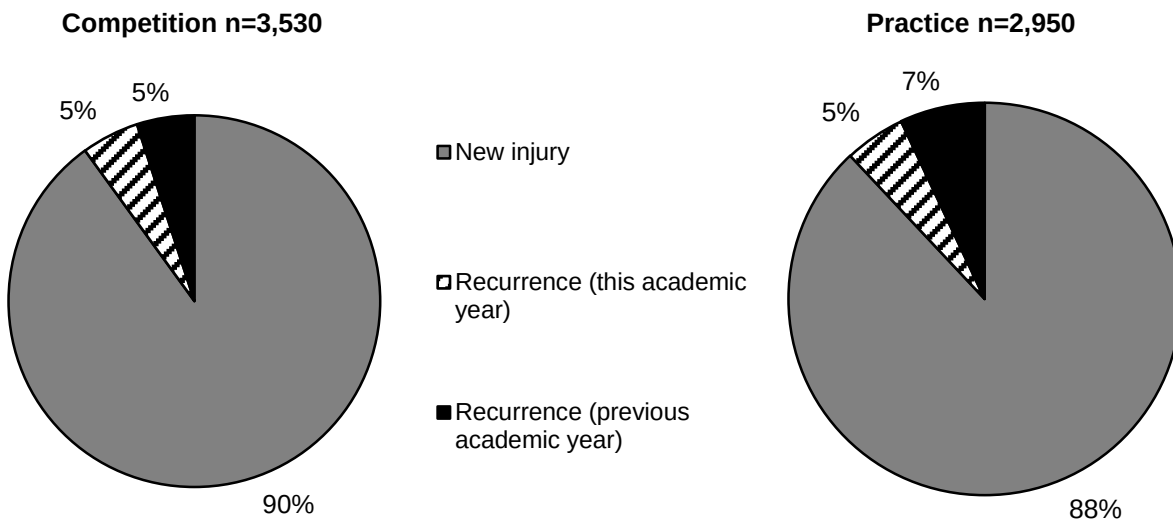


Table 2.9 Time during Season of Injury, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Season		
Preseason	1,400	21.3%
Regular season	4,949	75.2%
Post season	234	3.6%
Total	6,583	100%

Table 2.10 Practice-Related Variables, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Practice		
First ½ hour	342	11.8%
Second ½ hour	601	20.8%
1-2 hours into practice	1,637	56.7%
> 2 hours into practice	309	10.7%
Total	2,889	100%

Table 2.11 Methods for Injury Evaluation and Assessment, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
% of Injuries Evaluated by:*		
Certified athletic trainer	5,861	92.5%
General physician	2,267	35.8%
Orthopedic physician	1,886	29.8%
Chiropractor	81	1.3%
Physician's assistant	87	1.4%
Nurse practitioner	83	1.3%
Neurologist	67	1.1%
Dentist/oral surgeon	25	0.4%
Other	252	4.0%
Total	6,336	100%
% of Injuries Assessed by:*		
Evaluation	6,129	96.7%
X-ray	2,247	35.5%
MRI	638	10.1%
CT-scan	285	4.5%
Surgery	46	0.7%
Blood work/lab test	69	1.1%
Other	75	1.2%
Total		100%

*Multiple responses allowed per injury report.

III. Boys' Football Injury Epidemiology

Table 3.1 Football Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete- exposures)
Total	2,346	649,696	3.61
Competition	1,317	107,752	12.22
Practice	1,029	541,944	1.90

Table 3.2 Demographic Characteristics of Injured Football Athletes, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year*

Year in School	n=2,321
Freshman	22.4%
Sophomore	22.8%
Junior	26.3%
Senior	28.5%
Total†	100%
Age (years)	
Minimum	12
Maximum	19
Mean (St. Dev.)	16.0 (1.25)
BMI	
Minimum	11.2
Maximum	52.7
Mean (St. Dev.)	26.0 (5.0)

*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 3.1 Diagnosis of Football Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

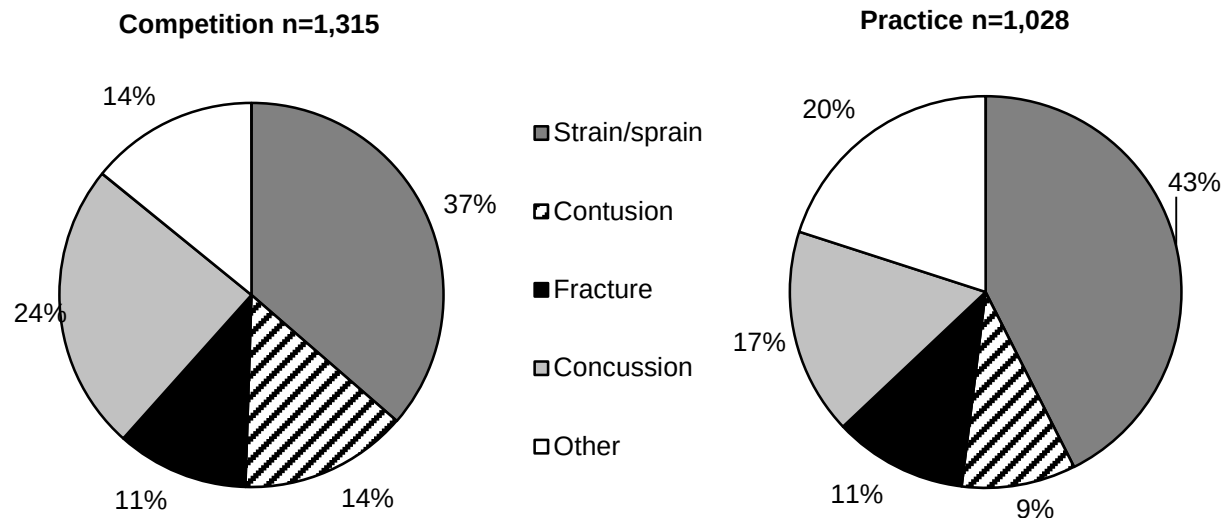


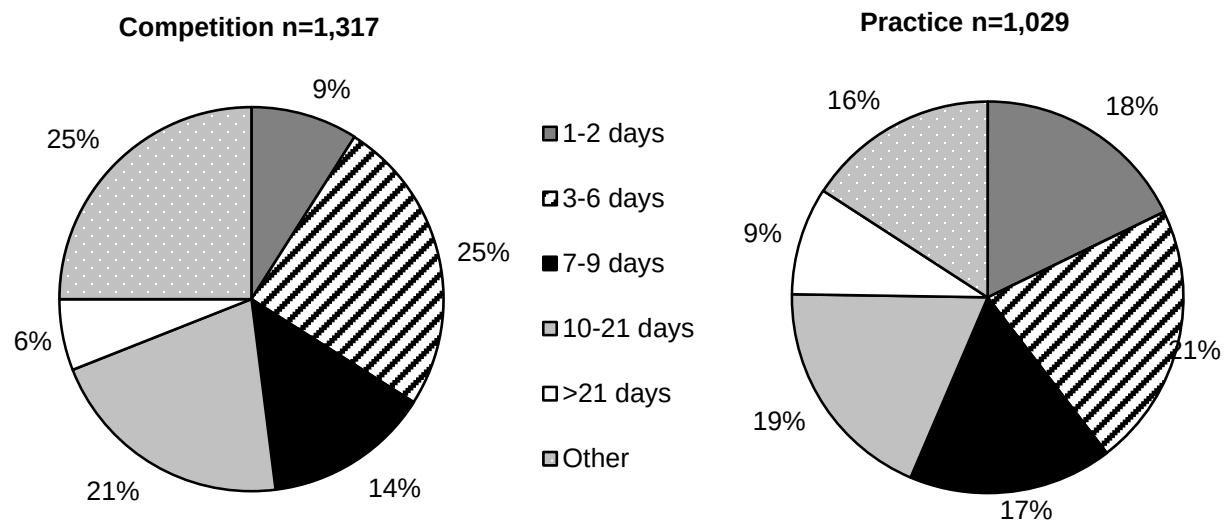
Table 3.3 Body Site of Football Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Body Site						
Head/face	321	24.4%	184	18.0%	505	21.6%
Knee	209	15.9%	144	14.0%	353	15.1%
Ankle	174	13.2%	121	11.8%	295	12.6%
Hand/wrist	135	10.3%	122	11.9%	257	11.0%
Shoulder	138	10.5%	93	9.1%	231	9.9%
Hip/thigh/upper leg	88	6.7%	117	11.4%	205	8.8%
Trunk	60	4.6%	59	5.8%	119	5.1%
Lower leg	57	4.3%	47	4.6%	104	4.4%
Arm/elbow	39	3.0%	35	3.4%	74	3.2%
Neck	32	2.4%	34	3.3%	66	2.8%
Foot	31	2.4%	25	2.4%	56	2.4%
Other	33	2.5%	44	4.3%	77	3.3%
Total	1317	100%	1025	100%	2342	100%

Table 3.4 Ten Most Common Football Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

Diagnosis	Competition n=1,315		Practice n=1,024		Total n=2,339	
	n	%	n	%	n	%
Head/face concussion	317	24.1%	173	16.9%	490	20.9%
Ankle strain/sprain	159	12.1%	111	10.8%	270	11.5%
Knee strain/sprain	123	9.4%	79	7.7%	202	8.6%
Hip/thigh/upper leg strain/sprain	46	3.5%	91	8.9%	137	5.9%
Shoulder other	78	5.9%	49	4.8%	127	5.4%
Hand/wrist fracture	60	4.6%	51	5.0%	111	4.7%
Knee other	47	3.6%	43	4.2%	90	3.8%
Hand/wrist strain/sprain	37	2.8%	41	4.0%	78	3.3%
Shoulder strain/sprain	41	3.1%	29	2.8%	70	3.0%
Trunk contusion	34	2.6%	13	1.3%	47	2.0%
Trunk strain/sprain	10	0.8%	30	2.9%	40	1.7%

Figure 3.2 Time Loss of Football Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 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, 2010-11 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	117	9.1%	75	7.5%	192	8.4%
Did not require surgery	1,166	90.9%	923	92.5%	2,089	91.6%
Total	1,283	100%	998	100%	2,281	100%

Figure 3.3 History of Football Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

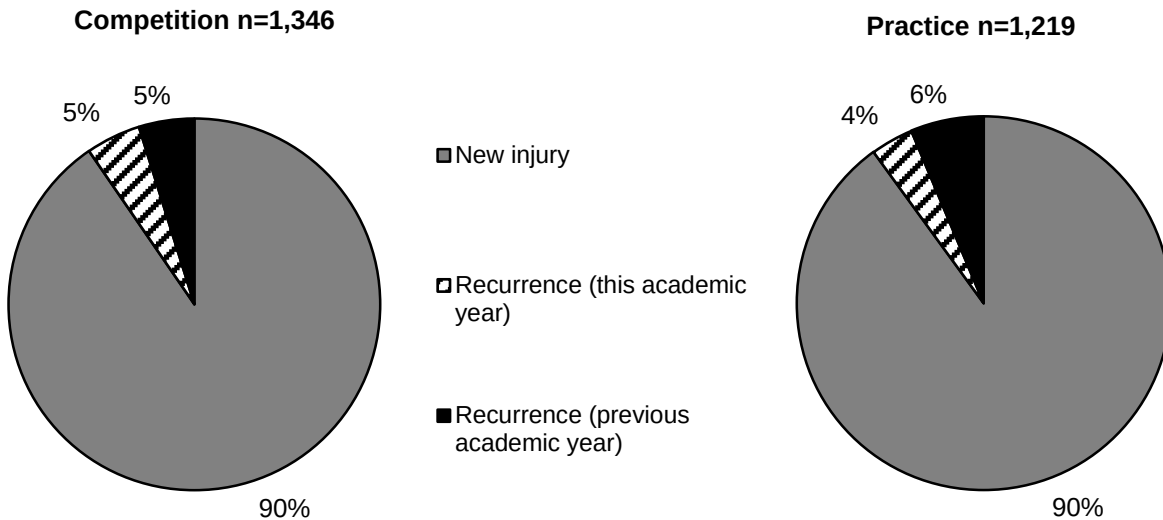


Table 3.6 Time during Season of Football Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Season		
Preseason	575	24.6%
Regular season	1,682	71.9%
Post season	83	3.5%
Total	2,340	100%

Table 3.7 Competition-Related Variables for Football Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Competition		
Pre-competition/warm-ups	20	1.6%
First quarter	150	12.1%
Second quarter	370	29.9%
Third quarter	391	31.6%
Fourth quarter	305	24.7%
Overtime	1	0.1%
Total	1,237	100%
Field Location		
Between the 20 yard lines	950	78.4%
Red zone (20 yard line to goal line)	229	18.9%
End zone	19	1.6%
Off the field	13	1.1%
Total	1,211	100%

Table 3.8 Practice-Related Variables for Football Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Practice		
First 1/2 hour	82	8.1%
Second 1/2 hour	186	18.5%
1-2 hours into practice	600	59.6%
>2 hours into practice	139	13.8%
Total	1,007	100%

Figure 3.4 Player Position of Football Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

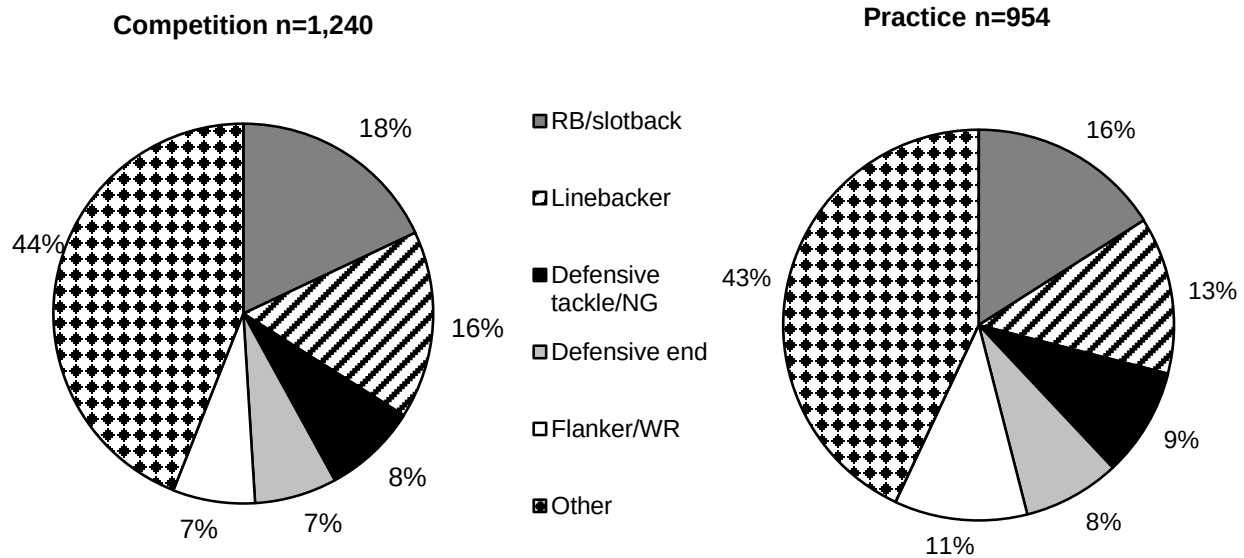
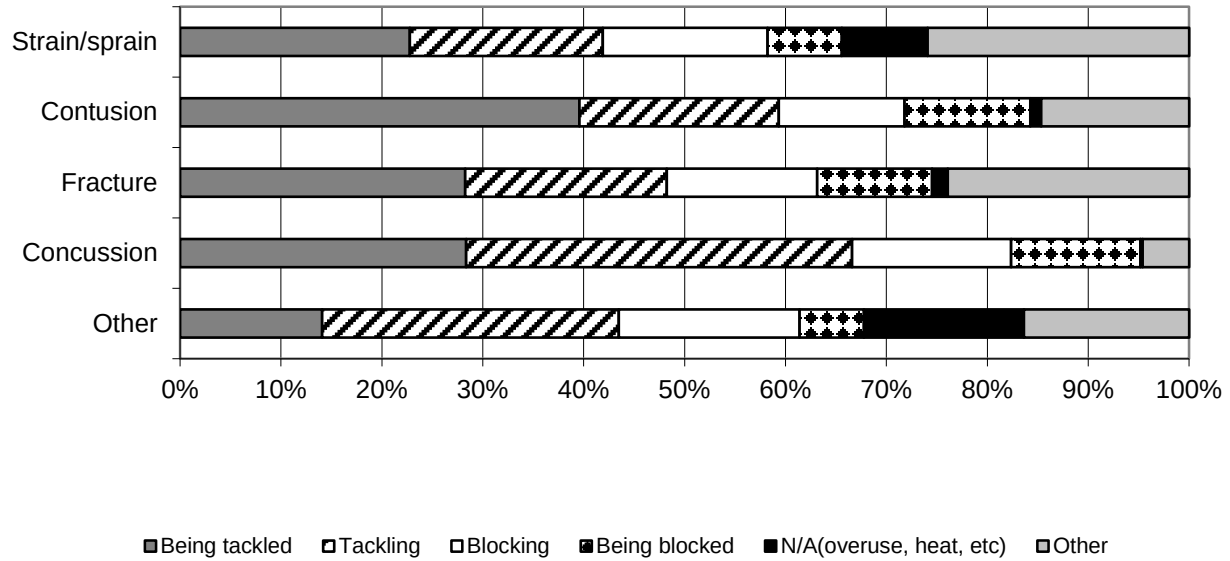


Table 3.9 Activities Leading to Football Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

Activity	Competition		Practice		Overall	
	n	%	n	%	n	%
Tackling	353	27.6%	220	21.9%	573	25.1%
Being tackled	395	30.9%	176	17.5%	571	25.0%
Blocking	188	14.7%	173	17.2%	361	15.8%
Being blocked	144	11.3%	70	7.0%	214	9.4%
N/A (e.g., overuse, heat illness, etc.)	18	1.4%	127	12.6%	145	6.4%
Stepped on/fell on/kicked	58	4.5%	57	5.7%	115	5.0%
Rotation around a planted foot/inversion	60	4.7%	55	5.5%	115	5.0%
Contact with ball	6	0.5%	20	2.0%	26	1.1%
Contact with blocking sled/dummy	0	0.0%	16	1.6%	16	0.7%
Uneven playing surface	2	0.2%	9	0.9%	11	0.5%
Contact with goal posts/yard marker/etc.	0	0.0%	2	0.2%	2	0.1%
Other	53	4.2%	79	7.9%	132	5.8%
Total	1,277	100%	1,004	100%	2,281	100%

Figure 3.5 Activity Resulting in Football Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year



IV. Boys' Soccer Injury Epidemiology

Table 4.1 Boys' Soccer Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete- exposures)
Total	469	281,155	1.67
Competition	292	82,927	3.52
Practice	177	198,228	0.89

Table 4.2 Demographic Characteristics of Injured Boys' Soccer Athletes, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year*

Year in School	n=463
Freshman	16.4%
Sophomore	23.1%
Junior	26.8%
Senior	33.7%
Total†	100%
Age (years)	
Minimum	13
Maximum	19
Mean (St. Dev.)	16.1 (1.3)
BMI	
Minimum	12.2
Maximum	38.1
Mean (St. Dev.)	22.5 (2.8)

*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, 2010-11 School Year

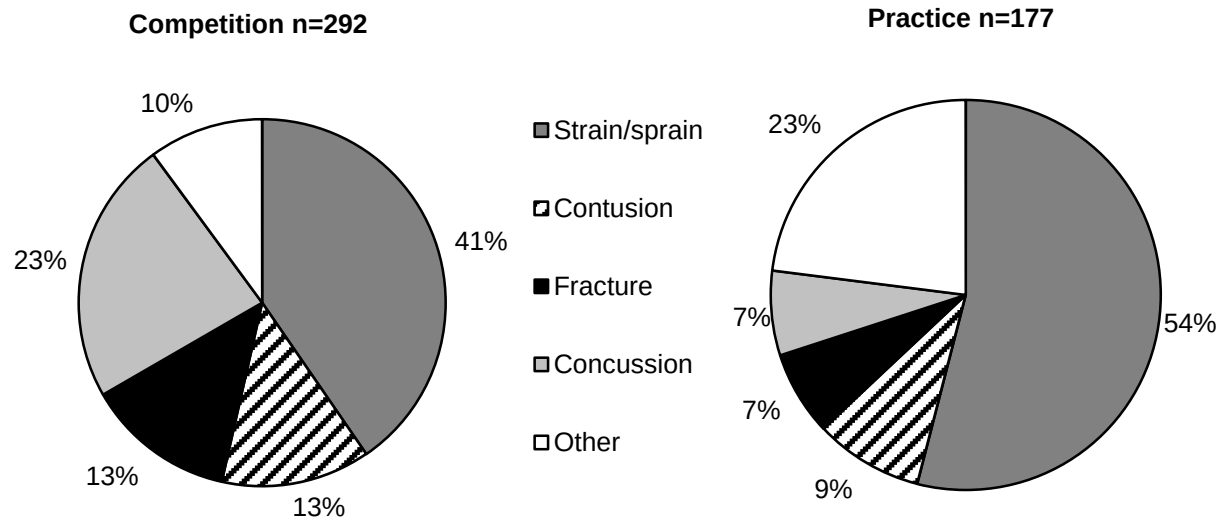


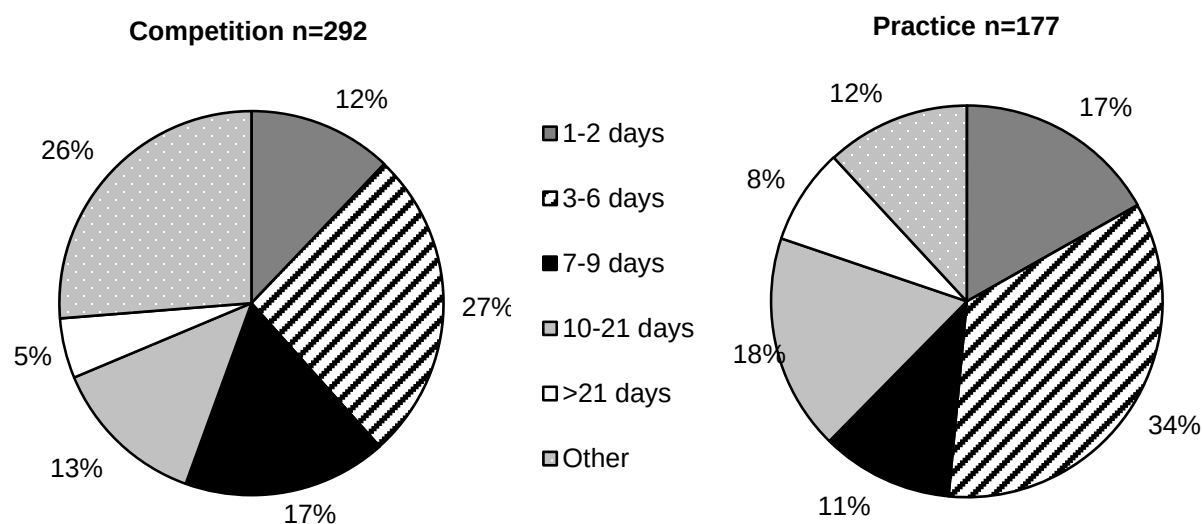
Table 4.3 Body Site of Boys' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Body Site						
Head/face	86	29.5%	18	10.2%	104	22.2%
Ankle	60	20.5%	32	18.2%	92	19.7%
Hip/thigh/upper leg	32	11.0%	41	23.3%	73	15.6%
Knee	36	12.3%	25	14.2%	61	13.0%
Lower leg	18	6.2%	19	10.8%	37	7.9%
Foot	21	7.2%	14	8.0%	35	7.5%
Hand/wrist	14	4.8%	10	5.7%	24	5.1%
Trunk	14	4.8%	7	4.0%	21	4.5%
Shoulder	6	2.1%	3	1.7%	9	1.9%
Arm/elbow	1	0.3%	1	0.6%	2	0.4%
Neck	0	0.0%	1	0.6%	1	0.2%
Other	4	1.4%	5	2.8%	9	1.9%
Total	292	100%	176	100%	468	100%

Table 4.4 Ten Most Common Boys' Soccer Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Competition n=292		Practice n=176		Total n=468	
	n	%	n	%	n	%
Diagnosis						
Head/face concussion	68	23.3%	13	7.4%	81	17.3%
Ankle strain/sprain	54	18.5%	26	14.8%	80	17.1%
Hip/thigh/upper leg strain/sprain	21	7.2%	37	21.0%	58	12.4%
Knee strain/sprain	25	8.6%	9	5.1%	34	7.3%
Knee other	10	3.4%	13	7.4%	23	4.9%
Foot contusion	13	4.5%	4	2.3%	17	3.6%
Hand/wrist fracture	10	3.4%	3	1.7%	13	2.8%
Trunk strain/sprain	5	1.7%	6	3.4%	11	2.4%
Head/face other	6	2.1%	3	1.7%	9	1.9%
Lower leg contusion	5	1.7%	3	1.7%	8	1.7%

Figure 4.2 Time Loss of Boys' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 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, 2010-11 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	26	9.1%	7	4.0%	33	7.2%
Did not require surgery	259	90.9%	166	96.0%	425	92.8%
Total	285	100%	173	100%	458	100%

Figure 4.3 History of Boys' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

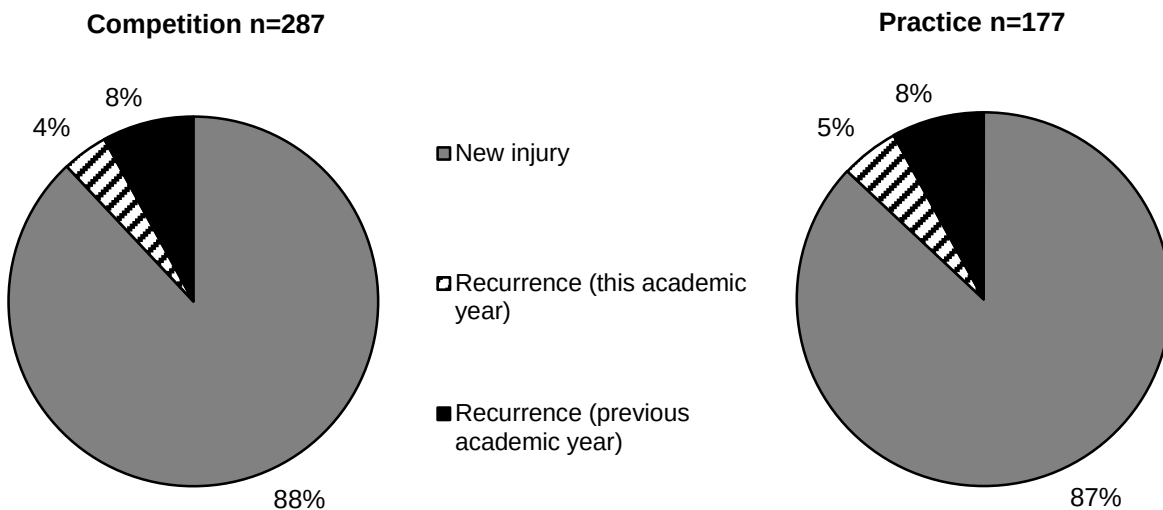


Table 4.6 Time during Season of Boys' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Season		
Preseason	108	23.1%
Regular season	336	71.8%
Post season	24	5.1%
Total	468	100%

Table 4.7 Competition-Related Variables for Boys' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Competition		
Pre-competition/warm-ups	7	2.5%
First half	75	26.9%
Second half	197	70.6%
Overtime	-	0.0%
Total	279	100%
Field Location		
Top of goal box extended to center line (offense)	95	34.8%
Top of goal box extended to center line (defense)	54	19.8%
Side of goal box (offense)	21	7.7%
Goal box (defense)	45	16.5%
Goal box (offense)	24	8.8%
Side of goal box (defense)	31	11.4%
Off the field	3	1.1%
Total	273	100%

Table 4.8 Practice-Related Variables for Boys' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Practice		
First 1/2 hour	17	9.9%
Second 1/2 hour	43	25.0%
1-2 hours into practice	97	56.4%
>2 hours into practice	15	8.7%
Total	172	100%

Figure 4.4 Player Position of Boys' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

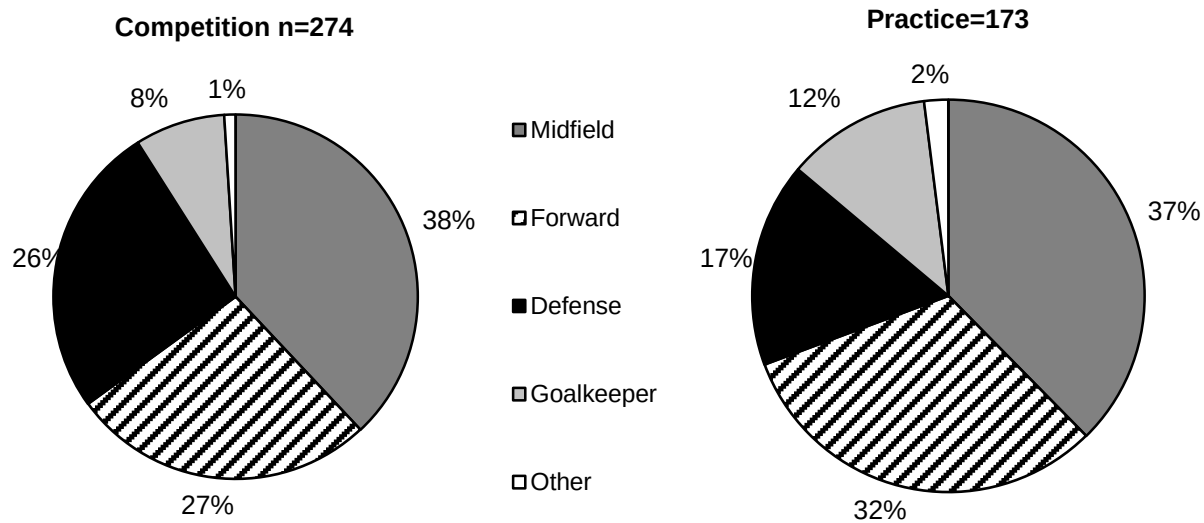
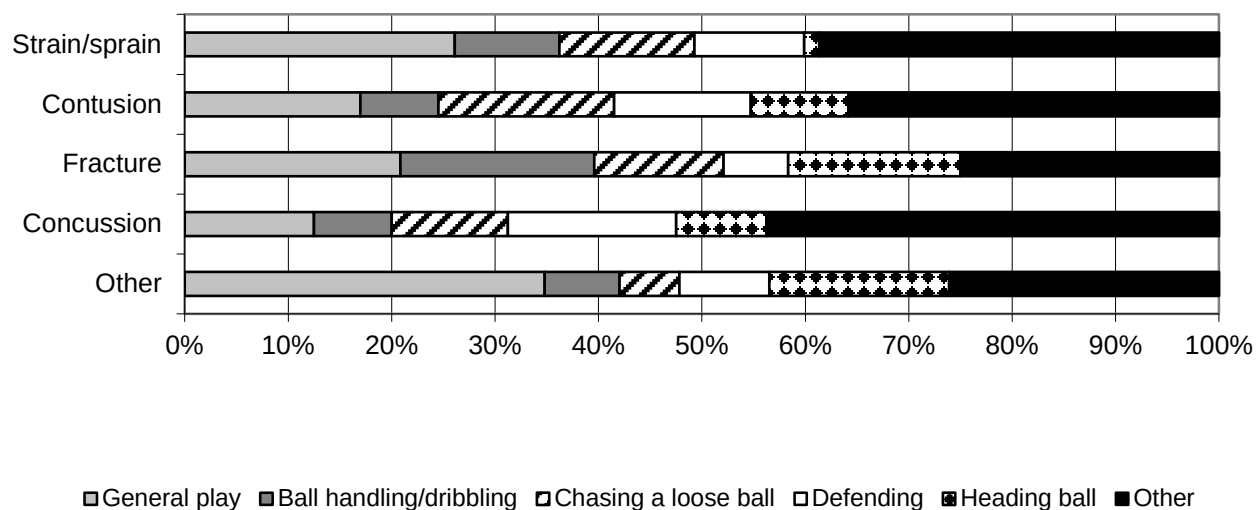


Table 4.9 Activities Leading to Boys' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Activity						
General play	50	17.7%	57	32.8%	107	23.4%
Chasing loose ball	35	12.4%	20	11.5%	55	12.0%
Defending	41	14.5%	10	5.7%	51	11.2%
Ball handling/dribbling	34	12.0%	11	6.3%	45	9.8%
Heading ball	34	12.0%	8	4.6%	42	9.2%
Goaltending	21	7.4%	18	10.3%	39	8.5%
Shooting (foot)	14	4.9%	15	8.6%	29	6.3%
Passing (foot)	19	6.7%	8	4.6%	27	5.9%
Receiving pass	14	4.9%	7	4.0%	21	4.6%
Conditioning	0	0.0%	15	8.6%	15	3.3%
Receiving a slide tackle	9	3.2%	1	0.6%	10	2.2%
Attempting a slide tackle	5	1.8%	0	0.0%	5	1.1%
Blocking shot	4	1.4%	0	0.0%	4	0.9%
Other	3	1.1%	4	2.3%	7	1.5%
Total	283	100%	174	100%	457	100%

Figure 4.5 Activity Resulting in Boys' Soccer Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year



V. Girls' Soccer Injury Epidemiology

Table 5.1 Girls' Soccer Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	466	221,339	2.11
Competition	314	69,337	4.53
Practice	152	152,002	1.00

Table 5.2 Demographic Characteristics of Injured Girls' Soccer Athletes, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year*

Year in School	n=456
Freshman	23.5%
Sophomore	29.6%
Junior	23.2%
Senior	23.7%
Total[†]	100%
Age (years)	
Minimum	13
Maximum	18
Mean (St. Dev.)	15.8 (1.3)
BMI	
Minimum	13.8
Maximum	36.6
Mean (St. Dev.)	21.8 (2.9)

*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, 2010-11 School Year

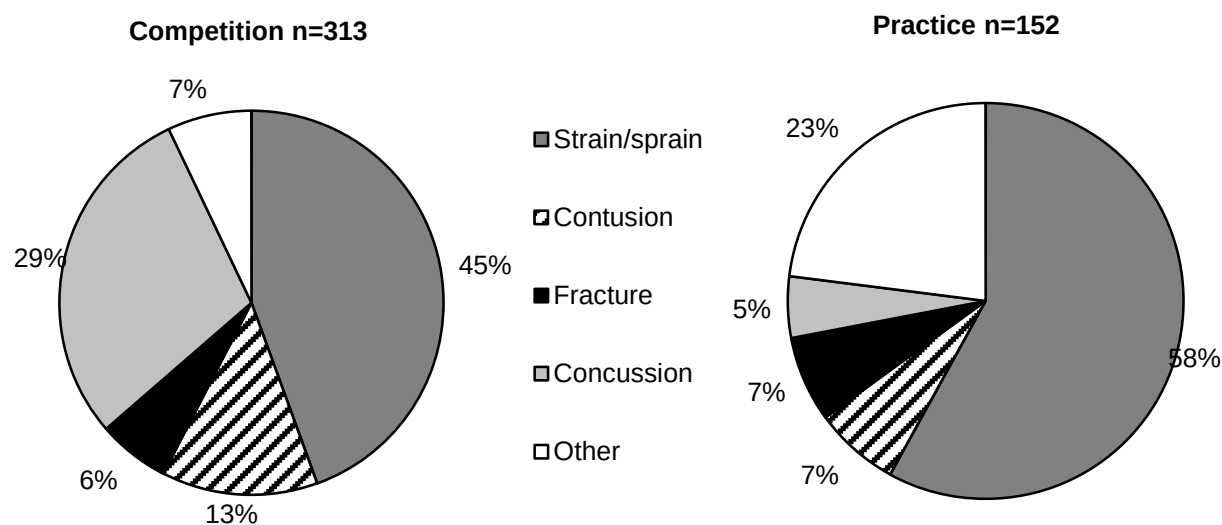


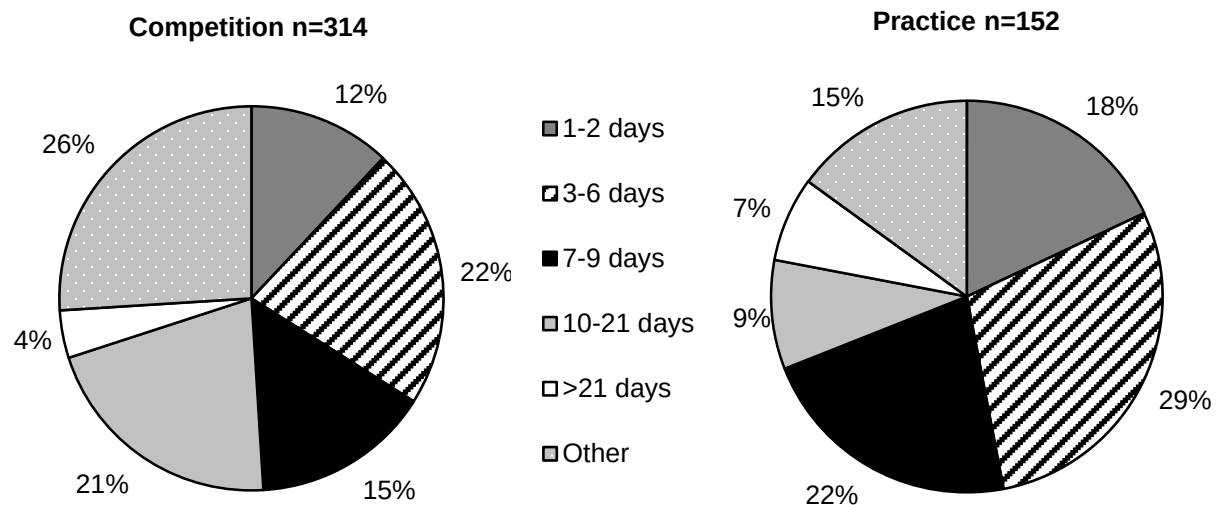
Table 5.3 Body Site of Girls' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Body Site						
Head/face	106	33.8%	11	7.2%	117	25.1%
Ankle	74	23.6%	39	25.7%	113	24.2%
Knee	55	17.5%	24	15.8%	79	17.0%
Hip/thigh/upper leg	29	9.2%	32	21.1%	61	13.1%
Lower leg	17	5.4%	15	9.9%	32	6.9%
Foot	11	3.5%	14	9.2%	25	5.4%
Hand/wrist	7	2.2%	7	4.6%	14	3.0%
Trunk	7	2.2%	5	3.3%	12	2.6%
Arm/elbow	3	1.0%	2	1.3%	5	1.1%
Shoulder	3	1.0%	0	0.0%	3	0.6%
Neck	1	0.3%	1	0.7%	2	0.4%
Other	1	0.3%	2	1.3%	3	0.6%
Total	314	100%	152	100%	466	100%

Table 5.4 Ten Most Common Girls' Soccer Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Competition n=313		Practice n=152		Total n=465	
	n	%	n	%	n	%
Diagnosis						
Ankle strain/sprain	67	21.4%	34	22.4%	101	21.7%
Head/face concussion	92	29.4%	8	5.3%	100	21.5%
Hip/thigh/upper leg strain/sprain	21	6.7%	30	19.7%	51	11.0%
Knee strain/sprain	37	11.8%	11	7.2%	48	10.3%
Knee other	10	3.2%	12	7.9%	22	4.7%
Lower leg other	3	1.0%	9	5.9%	12	2.6%
Lower leg contusions	10	3.2%	2	1.3%	12	2.6%
Knee contusion	8	2.6%	1	0.1%	9	1.9%
Hip/thigh/upper leg contusion	8	2.6%	1	0.7%	9	1.9%
Head/face other	6	1.9%	2	1.3%	8	1.7%

Figure 5.2 Time Loss of Girls' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 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, 2010-11 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	27	8.8%	7	4.7%	34	7.5%
Did not require surgery	279	91.2%	141	95.3%	420	92.5%
Total	306	100%	148	100%	454	100%

Figure 5.3 History of Girls' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

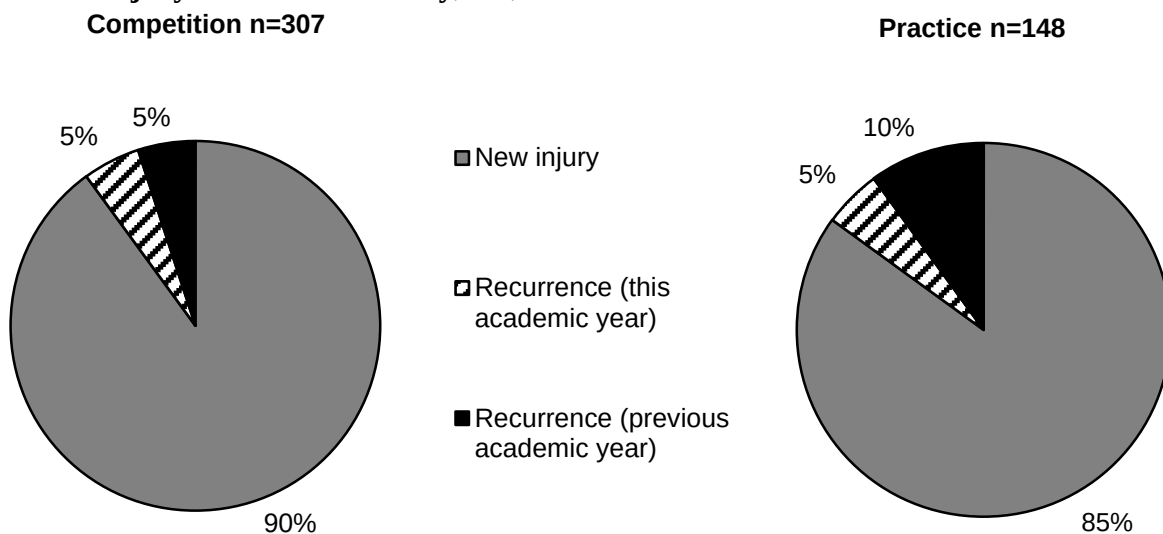


Table 5.6 Time during Season of Girls' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Season		
Preseason	83	17.8%
Regular season	367	78.9%
Post season	15	3.2%
Total	465	100%

Table 5.7 Competition-Related Variables for Girls' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Competition		
Pre-competition/warm-ups	7	2.3%
First half	104	34.9%
Second half	185	62.1%
Overtime	2	0.7%
Total	298	100%
Field Location		
Top of goal box extended to center line (offense)	82	28.5%
Top of goal box extended to center line (defense)	68	23.6%
Goal box (defense)	37	12.8%
Side of goal box (defense)	33	11.5%
Side of goal box (offense)	32	11.1%
Goal box (offense)	31	10.8%
Off the field	5	1.7%
Total	288	100%

Table 5.8 Practice-Related Variables for Girls' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Practice		
First 1/2 hour	22	15.2%
Second 1/2 hour	29	20.0%
1-2 hours into practice	83	57.2%
>2 hours into practice	11	7.6%
Total	145	100%

Figure 5.4 Player Position of Girls' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

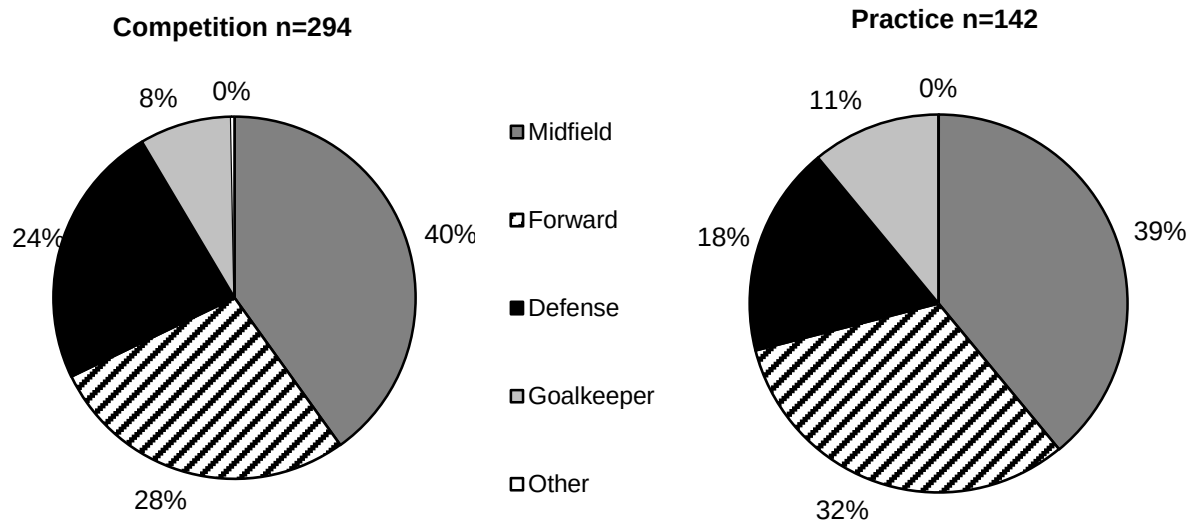
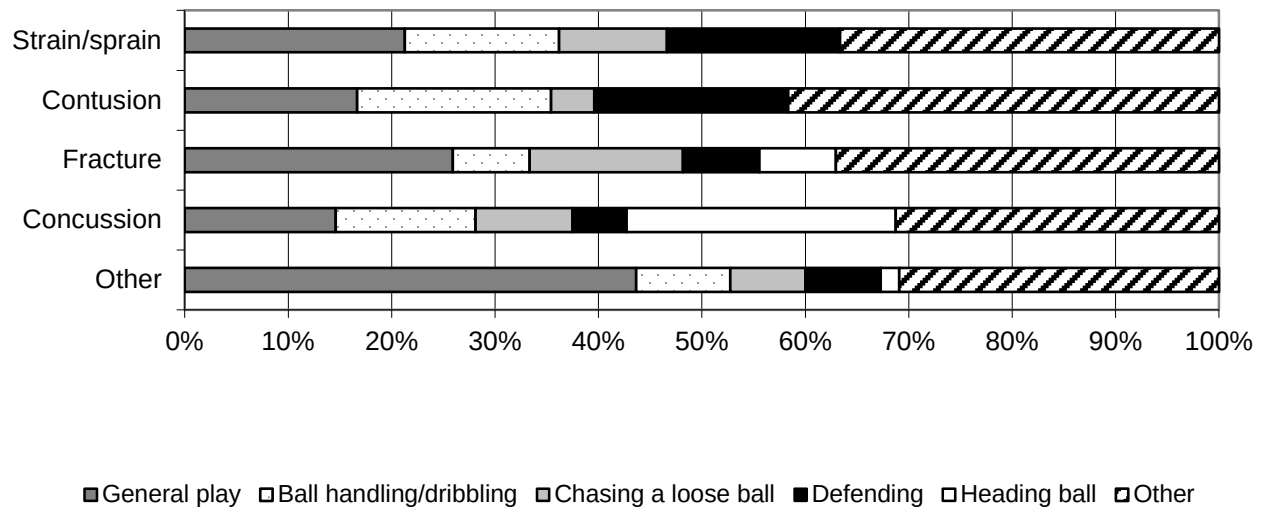


Table 5.9 Activities Leading to Girls' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

Activity	Competition		Practice		Overall	
	n	%	n	%	n	%
General play	55	18.2%	45	30.6%	100	22.3%
Defending	50	16.6%	16	10.9%	66	14.7%
Ball handling/dribbling	37	12.3%	16	10.9%	53	11.8%
Chasing loose ball	34	11.3%	8	5.4%	42	9.4%
Shooting (foot)	21	7.0%	12	8.2%	33	7.3%
Passing (foot)	24	7.9%	8	5.4%	32	7.1%
Goaltending	22	7.3%	8	5.4%	30	6.7%
Heading ball	27	8.9%	1	0.7%	28	6.2%
Conditioning	1	0.3%	25	17.0%	26	5.8%
Receiving pass	15	5.0%	3	2.0%	18	4.0%
Blocking shot	5	1.7%	2	1.4%	7	1.6%
Receiving a slide tackle	3	1.0%	0	0.0%	3	0.7%
Attempting a slide tackle	2	0.7%	0	0.0%	2	0.4%
Other	6	2.0%	3	2.0%	9	2.0%
Total	302	100%	147	100%	449	100%

Figure 5.5 Activity Resulting in Girls' Soccer Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year



VI. Boys' Volleyball Injury Epidemiology

Table 6.1 Boys' Volleyball Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	16	19,775	0.81
Competition	3	6,620	0.45
Practice	13	13,155	0.99

Table 6.2 Demographic Characteristics of Injured Boys' Volleyball Athletes, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year*

Year in School	n=15
Freshman	20.0%
Sophomore	53.3%
Junior	20.0%
Senior	6.7%
Total[†]	100%
Age (years)	
Minimum	15
Maximum	17
Mean (St. Dev.)	15.7 (0.9)
BMI	
Minimum	18.6
Maximum	29.5
Mean (St. Dev.)	22.3 (3.2)

*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 Boys' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

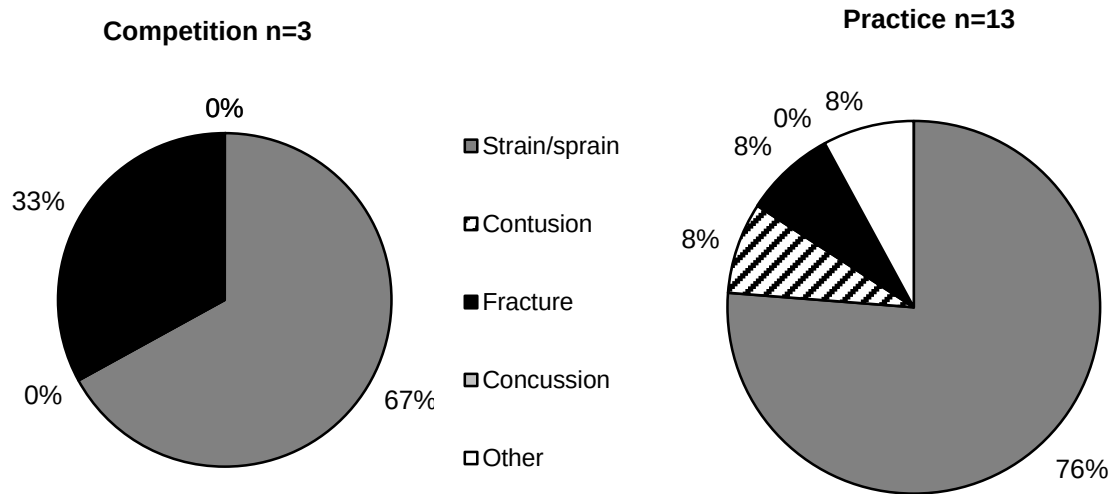


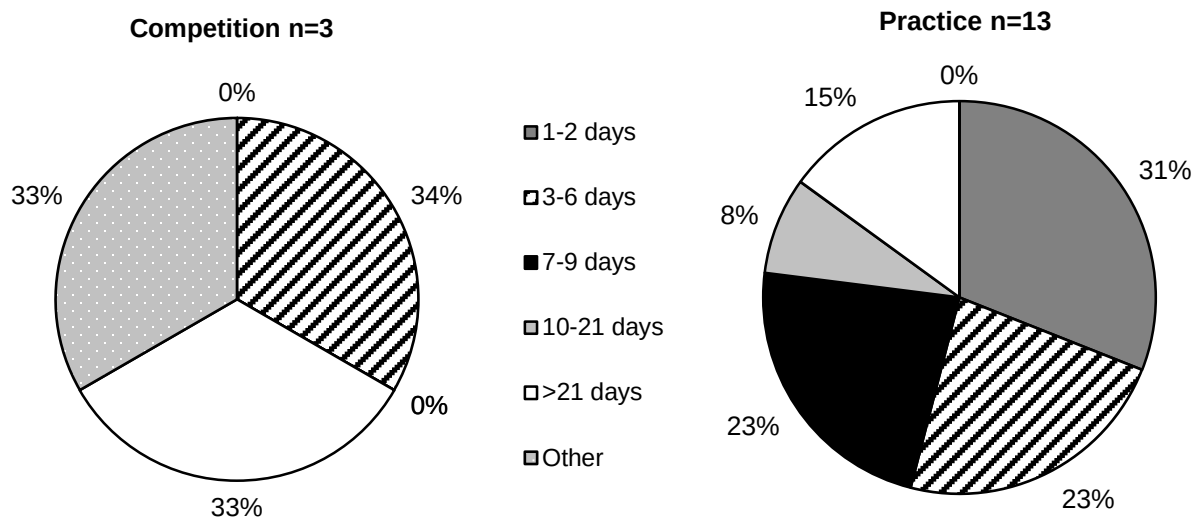
Table 6.3 Body Site of Boys' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Body Site						
Ankle	1	33.3	5	38.5	6	37.5
Hand/wrist	0	0.0	4	30.8	4	25.0
Lower leg	1	33.3	1	7.7	2	12.5
Head/face	0	0.0	1	7.7	1	6.3
Knee	1	33.3	0	0.0	1	6.3
Trunk	0	0.0	1	7.7	1	6.3
Shoulder	0	0.0	1	7.7	1	6.3
Total	3	100%	13	100%	16	100%

Table 6.4 Most Common Boys' Volleyball Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

Diagnosis	Competition n=3		Practice n=13		Total n=16	
	n	%	n	%	n	%
Ankle strain/sprain	1	33.3%	5	38.5%	6	37.5%
Hand/wrist strain/sprain	-	0.0%	3	23.1%	3	18.8%
Lower leg fracture	1	33.3%	1	7.7%	2	12.5%
Head/face other	-	0.0%	1	7.7%	1	6.3%
Knee strain/sprain	1	33.3%	-	0.0%	1	6.3%
Trunk strain/sprain	-	0.0%	1	7.7%	1	6.3%
Shoulder strain/sprain	-	0.0%	1	7.7%	1	6.3%
Hand/wrist contusion	-	0.0%	1	7.7%	1	6.3%

Figure 6.2 Time Loss of Boys' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 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 Boys' Volleyball Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 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	3	100.0%	13	100.0%	16	100.0%
Total	3	100%	13	100%	16	100%

Figure 6.3 History of Boys' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

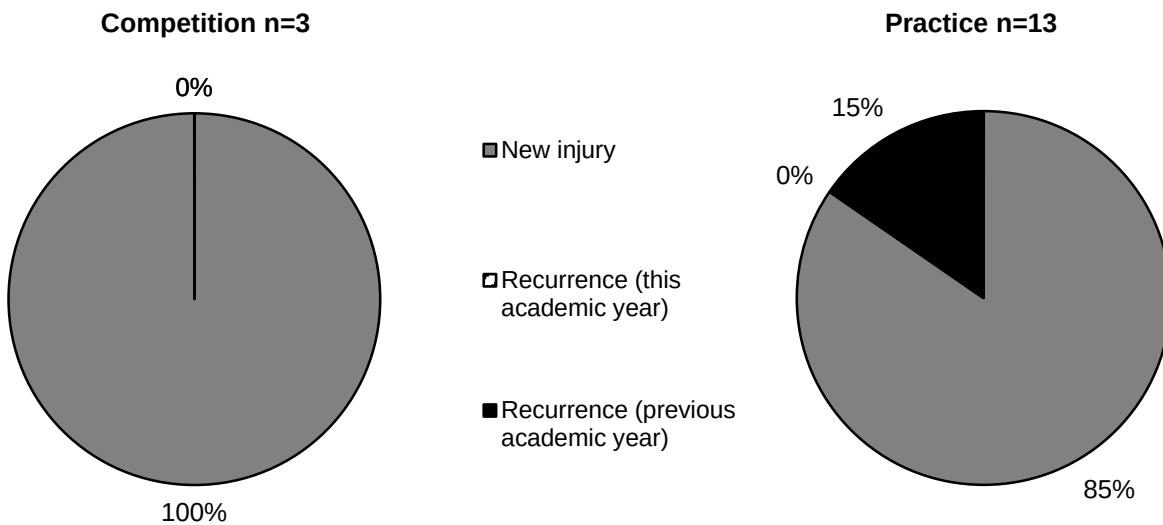


Table 6.6 Time during Season of Boys' Volleyball Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Season		
Preseason	5	31.3%
Regular season	10	62.5%
Post season	1	6.3%
Total	16	100%

Table 6.7 Competition-Related Variables for Boys' Volleyball Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Competition		
Pre-competition/warm-ups	2	66.7%
First game	-	0.0%
Second game	1	33.3%
Third game	-	0.0%
Total	3	100%
Court Location		
Left front	-	0.0%
Right forward	1	33.3%
Middle forward	1	33.3%
Outside court	1	33.3%
Total	3	100%

Table 6.8 Practice-Related Variables for Boys' Volleyball Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Practice		
First 1/2 hour	0	0.0%
Second 1/2 hour	5	38.5%
1-2 hours into practice	6	46.2%
>2 hours into practice	2	15.4%
Total	13	100%

Figure 6.4 Player Position of Boys' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

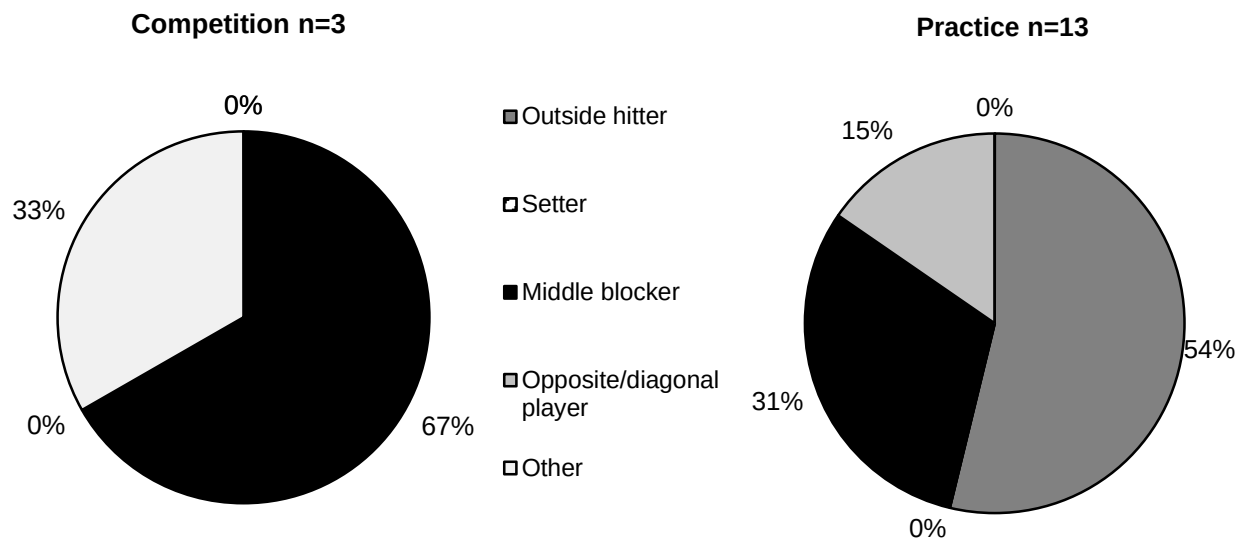
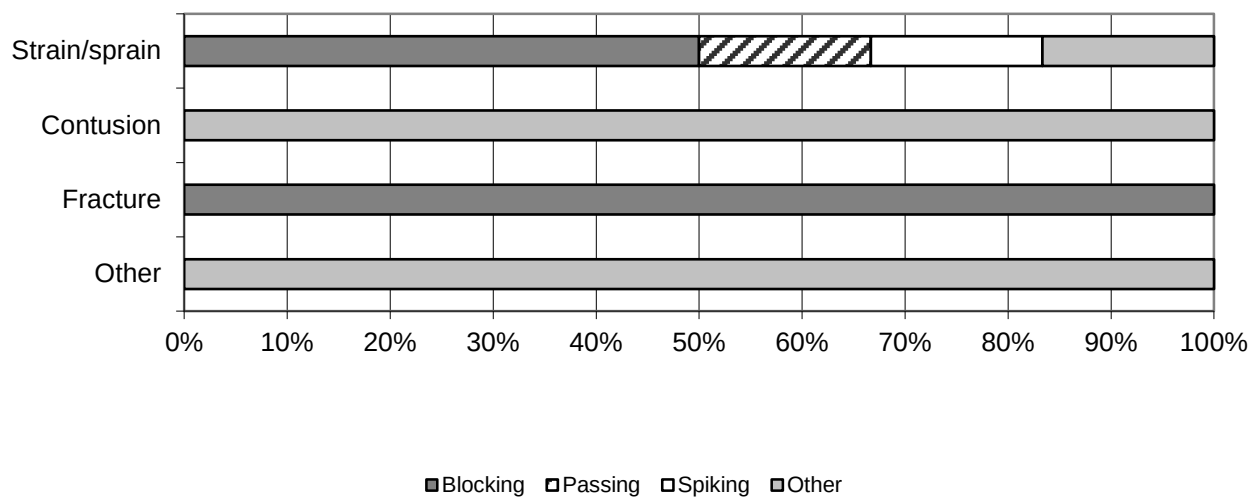


Table 6.9 Activities Leading to Boys' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Activity						
Blocking	1	33.3%	7	53.8%	8	50.0%
Spiking	1	33.3%	1	7.7%	2	12.5%
Passing	1	33.3%	1	7.7%	2	12.5%
Serving	-	0.0%	1	7.7%	1	6.3%
General play	-	0.0%	1	7.7%	1	6.3%
Digging	-	0.0%	1	7.7%	1	6.3%
Other	-	0.0%	1	7.7%	1	6.3%
Total	3	100%	13	100%	16	100%

Figure 6.5 Activity Resulting in Boys' Volleyball Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year



VII. Girls' Volleyball Injury Epidemiology

Table 7.1 Girls' Volleyball Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	209	225,305	0.93
Competition	90	77,348	1.16
Practice	119	147,957	0.80

Table 7.2 Demographic Characteristics of Injured Girls' Volleyball Athletes, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year*

Year in School	n=208
Freshman	30.3%
Sophomore	26.9%
Junior	23.1%
Senior	19.7%
Total†	100%
Age (years)	
Minimum	13
Maximum	18
Mean (St. Dev.)	15.5 (1.3)
BMI	
Minimum	16.4
Maximum	41.4
Mean (St. Dev.)	21.9 (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 7.1 Diagnosis of Girls' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

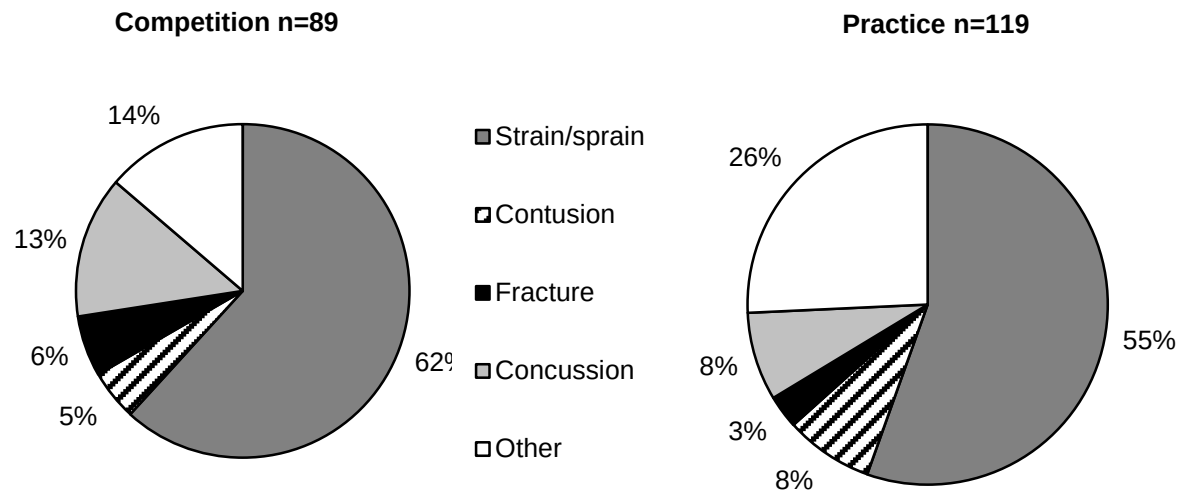


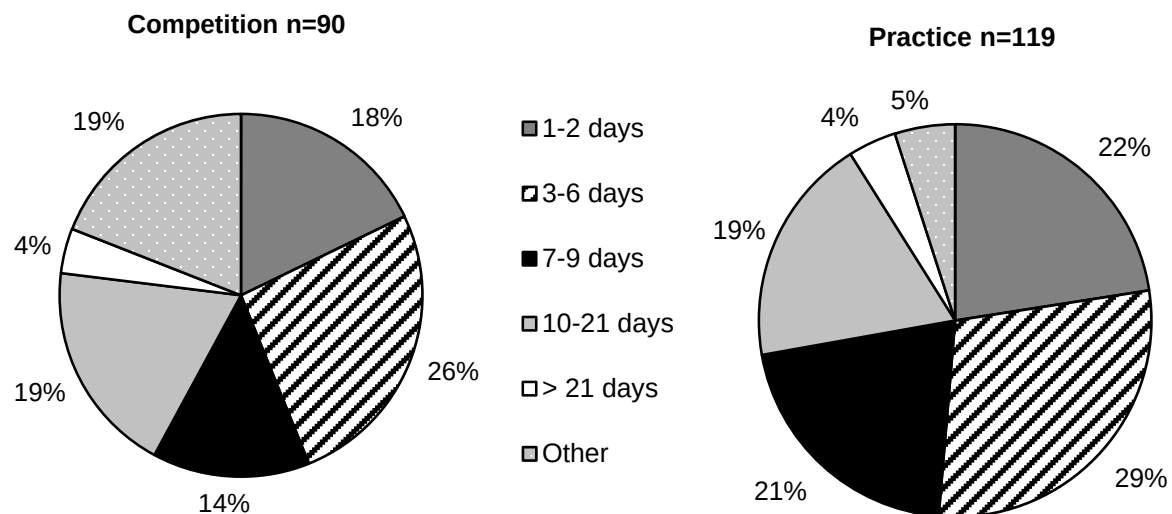
Table 7.3 Body Site of Girls' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Body Site						
Ankle	28	31.1%	45	37.8%	73	34.9%
Knee	16	17.8%	17	14.3%	33	15.8%
Head/face	14	15.6%	12	10.1%	26	12.4%
Hand/wrist	11	12.2%	8	6.7%	19	9.1%
Trunk	5	5.6%	6	5.0%	11	5.3%
Foot	3	3.3%	7	5.9%	10	4.8%
Shoulder	2	2.2%	8	6.7%	10	4.8%
Lower leg	3	3.3%	5	4.2%	8	3.8%
Hip/thigh/upper leg	2	2.2%	4	3.4%	6	2.9%
Arm/elbow	3	3.3%	2	1.7%	5	2.4%
Neck	2	2.2%	1	0.8%	3	1.4%
Other	1	1.1%	4	3.4%	5	2.4%
Total	90	100%	119	100%	209	100%

Table 7.4 Ten Most Common Girls' Volleyball Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Competition n=89		Practice n=119		Total n=208	
	n	%	n	%	n	%
Diagnosis						
Ankle strain/sprain	27	30.3%	42	35.3%	69	33.2%
Head/face concussion	12	13.5%	10	8.4%	22	10.6%
Knee other	9	10.1%	9	7.6%	18	8.7%
Hand/wrist strain/sprain	8	9.0%	4	3.4%	12	5.8%
Knee strain/sprain	6	6.7%	4	3.4%	10	4.8%
Trunk strain/sprain	5	5.6%	3	2.5%	8	3.8%
Shoulder other	0	0.0%	6	5.0%	6	2.9%
Hip/thigh/upper leg strain/sprain	1	1.1%	4	3.4%	5	2.4%
Lower leg strain/sprain	1	1.1%	3	2.5%	4	1.9%
Shoulder strain/sprain	2	2.2%	2	1.7%	4	1.9%
Knee contusion	0	0.0%	4	3.4%	4	1.9%

Figure 7.2 Time Loss of Girls' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 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 Girls' Volleyball Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	5	5.8%	2	1.7%	7	3.4%
Did not require surgery	81	94.2%	117	98.3%	198	96.6%
Total	86	100%	119	100%	205	100%

Figure 7.3 History of Girls' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

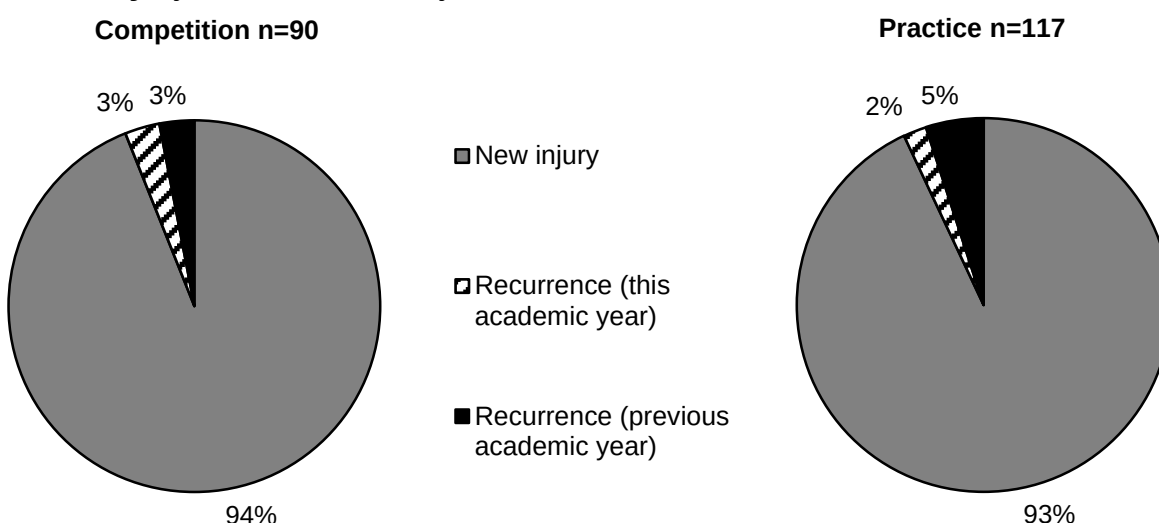


Table 7.6 Time during Season of Girls' Volleyball Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Season		
Preseason	54	26.0%
Regular season	147	70.7%
Post season	7	3.4%
Total	208	100%

Table 7.7 Competition-Related Variables for Girls' Volleyball Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Competition		
Pre-competition/warm-ups	16	18.6%
First game	13	15.1%
Second game	30	34.9%
Third game	22	25.6%
Fourth game	5	5.8%
Fifth game	-	0.0%
Total	86	100%
Court Location		
Middle forward	26	31.7%
Left back	16	19.5%
Right forward	11	13.4%
Left forward	8	9.8%
Outside court (your side)	7	8.5%
Outside the playable area	7	8.5%
At the net	5	6.1%
Right back (server)	2	2.4%
Total	82	100%

Table 7.8 Practice-Related Variables for Girls' Volleyball Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Practice		
First 1/2 hour	18	15.5%
Second 1/2 hour	20	17.2%
1-2 hours into practice	70	60.3%
>2 hours into practice	8	6.9%
Total	116	100%

Figure 7.4 Player Position of Girls' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

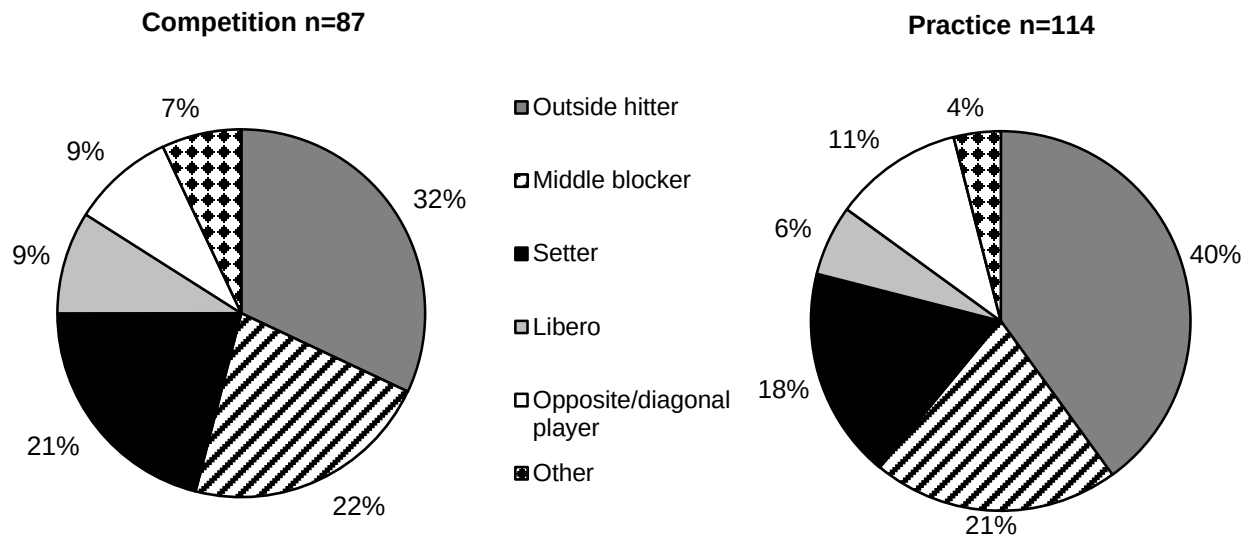
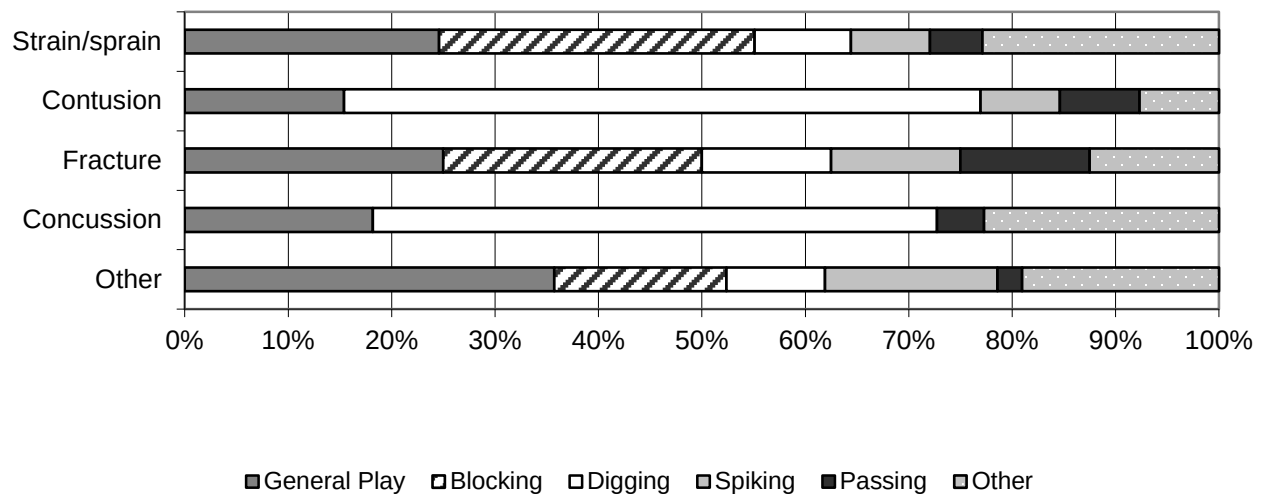


Table 7.9 Activities Leading to Girls' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Activity						
General play	19	21.6%	33	28.4%	52	25.5%
Blocking	19	21.6%	26	22.4%	45	22.1%
Digging	18	20.5%	19	16.4%	37	18.1%
Spiking	7	8.0%	11	9.5%	18	8.8%
Conditioning	0	0.0%	13	11.2%	13	6.4%
Passing	6	6.8%	4	3.4%	10	4.9%
Serving	5	5.7%	3	2.6%	8	3.9%
Setting	6	6.8%	2	1.7%	8	3.9%
Other	8	9.1%	5	4.3%	13	6.4%
Total	88	100%	116	100%	204	100%

Figure 7.5 Activity Resulting in Girls' Volleyball Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year



VIII. Boys' Basketball Injury Epidemiology

Table 8.1 Boys' Basketball Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	443	322,972	1.37
Competition	228	97,788	2.33
Practice	215	225,184	0.95

Table 8.2 Demographic Characteristics of Injured Boys' Basketball Athletes, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year*

Year in School	n=438
Freshman	19.9%
Sophomore	27.2%
Junior	25.8%
Senior	27.2%
Total[†]	100%
Age (years)	
Minimum	14
Maximum	19
Mean (St. Dev.)	16.2 (1.3)
BMI	
Minimum	9.1
Maximum	51.4
Mean (St. Dev.)	22.9 (3.1)

*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 8.1 Diagnosis of Boys' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

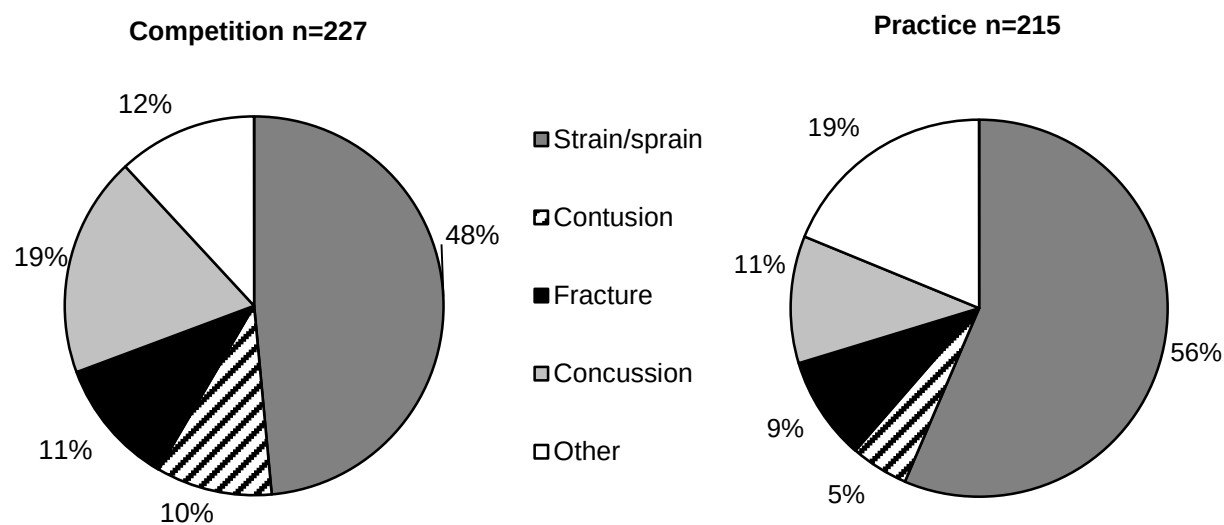


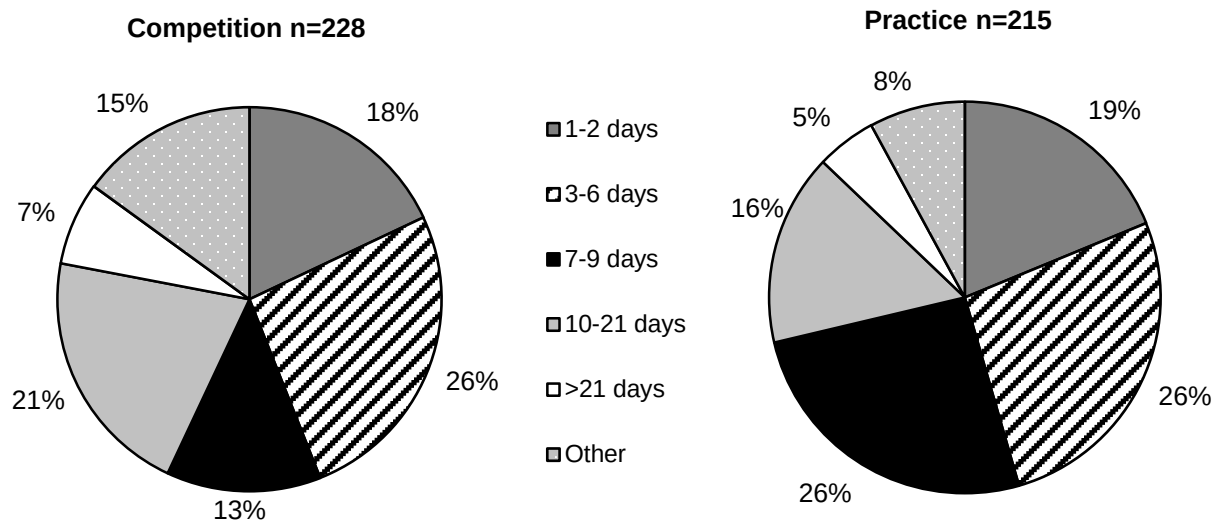
Table 8.3 Body Site of Boys' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Body Site						
Ankle	78	34.2%	75	34.9%	153	34.5%
Head/face	61	26.8%	43	20.0%	104	23.5%
Knee	19	8.3%	18	8.4%	37	8.4%
Hand/wrist	21	9.2%	16	7.4%	37	8.4%
Hip/thigh/upper leg	12	5.3%	21	9.8%	33	7.4%
Foot	10	4.4%	11	5.1%	21	4.7%
Trunk	8	3.5%	12	5.6%	20	4.5%
Lower leg	8	3.5%	10	4.7%	18	4.1%
Shoulder	7	3.1%	4	1.9%	11	2.5%
Arm/elbow	3	1.3%	2	0.9%	5	1.1%
Other	1	0.4%	3	1.4%	4	0.9%
Total	228	100%	215	100%	443	100%

Table 8.4 Ten Most Common Boys' Basketball Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

Diagnosis	Competition n=227		Practice n=215		Total n=442	
	n	%	n	%	n	%
Ankle strain/sprain	74	32.6%	73	34.0%	147	33.3%
Head/face concussion	42	18.5%	23	10.7%	65	14.7%
Head/face other	11	4.8%	15	7.0%	26	5.9%
Hip/thigh/upper leg strain/sprain	3	1.3%	18	8.4%	21	4.8%
Hand/wrist fracture	9	4.0%	9	4.2%	18	4.1%
Knee strain/sprain	9	4.0%	6	2.8%	15	3.4%
Hand/wrist strain/sprain	8	3.5%	7	3.3%	15	3.4%
Knee other	6	2.6%	6	2.8%	12	2.7%
Trunk strain/sprain	4	1.8%	8	3.7%	12	2.7%
Hip/thigh/upper leg contusion	9	4.0%	1	0.5%	10	2.3%

Figure 8.2 Time Loss of Boys' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 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 Boys' Basketball Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	11	5.0%	8	3.8%	19	4.4%
Did not require surgery	210	95.0%	203	96.2%	413	95.6%
Total	221	100%	211	100%	432	100%

Figure 8.3 History of Boys' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

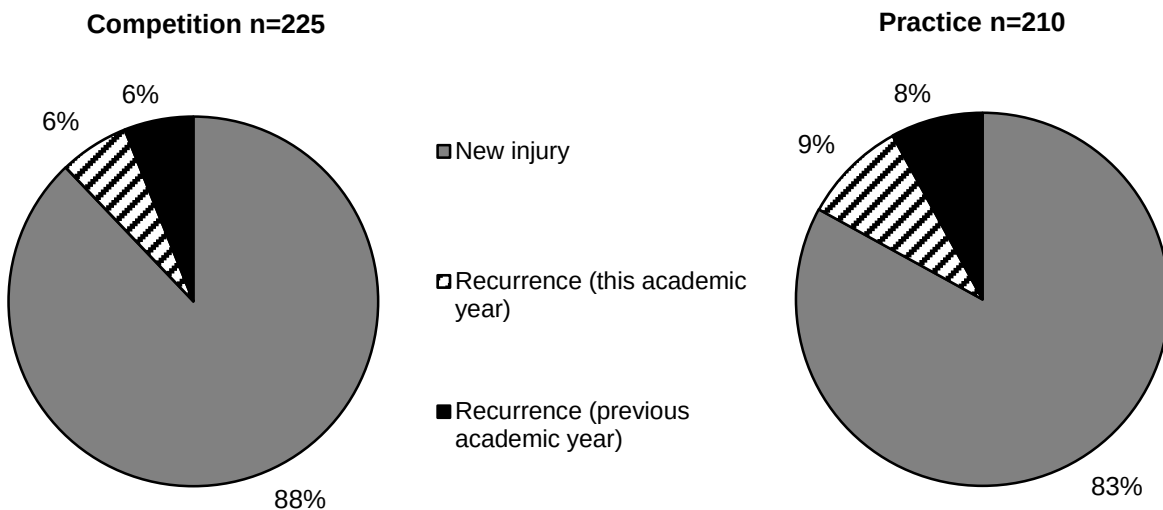


Table 8.6 Time during Season of Boys' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Season		
Preseason	74	16.7%
Regular season	359	81.0%
Post season	10	2.3%
Total	443	100%

Table 8.7 Competition-Related Variables for Boys' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Competition		
Pre-competition-warm-ups	4	1.9%
First quarter	21	10.1%
Second quarter	60	29.0%
Third quarter	67	32.4%
Fourth quarter	55	26.6%
Overtime	-	0.0%
Total	207	100%
Court Location		
Inside lane (offense)	59	29.4%
Inside lane (defense)	50	24.9%
Between 3 pt arc and lane (defense)	26	12.9%
Between 3 pt arc and lane (offense)	20	10.0%
Outside 3 point arc - offense	16	8.0%
Backcourt	16	8.0%
Outside 3 point arc - defense	7	3.5%
Out of bounds	7	3.5%
Total	201	100%

Table 8.8 Practice-Related Variables for Boys' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Practice		
First 1/2 hour	27	12.9%
Second 1/2 hour	52	24.9%
1-2 hours into practice	116	55.5%
>2 hours into practice	14	6.7%
Total	209	100%

Figure 8.4 Player Position of Boys' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

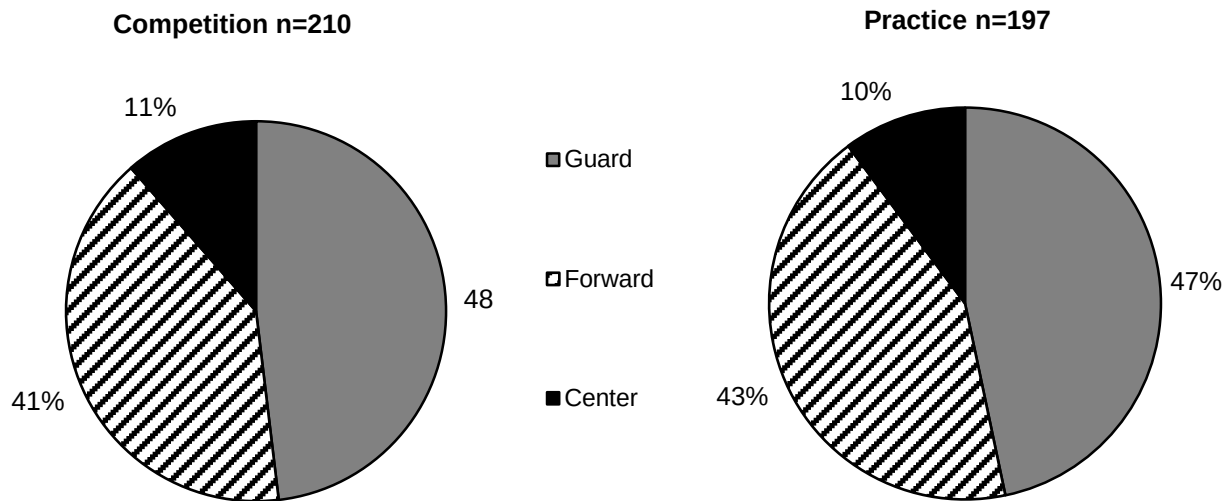
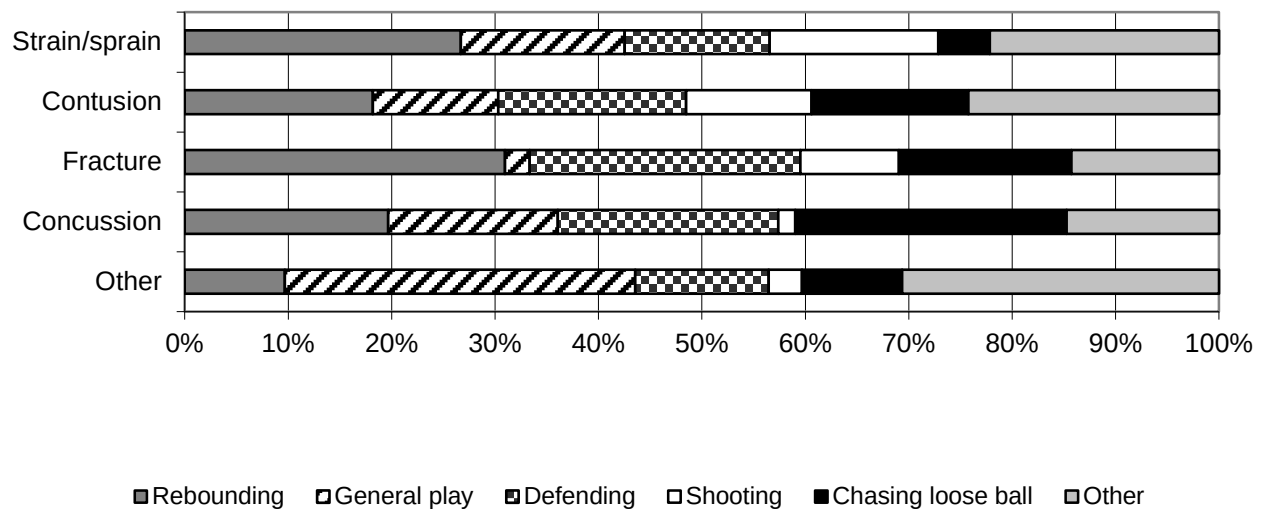


Table 8.9 Activities Leading to Boys' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Activity						
Rebounding	52	24.2%	44	21.6%	96	22.9%
General play	28	13.0%	43	21.1%	71	16.9%
Defending	37	17.2%	32	15.7%	69	16.5%
Shooting	26	12.1%	21	10.3%	47	11.2%
Chasing loose ball	33	15.3%	12	5.9%	45	10.7%
Ball handling/dribbling	19	8.8%	10	4.9%	29	6.9%
Receiving pass	10	4.7%	10	4.9%	20	4.8%
Conditioning	1	0.5%	17	8.3%	18	4.3%
Passing	1	0.5%	5	2.5%	6	1.4%
Screening	2	0.9%	3	1.5%	5	1.2%
Other	6	2.8%	7	3.4%	13	3.1%
Total	215	100%	204	100%	419	100%

Figure 8.5 Activity Resulting in Boys' Basketball Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year



IX. Girls' Basketball Injury Epidemiology

Table 9.1 Girls' Basketball Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete- exposures)
Total	454	251,244	1.81
Competition	277	77,174	3.59
Practice	177	174,070	1.02

Table 9.2 Demographic Characteristics of Injured Girls' Basketball Athletes, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year*

Year in School	n=450
Freshman	28.9%
Sophomore	29.8%
Junior	21.8%
Senior	19.6%
Total†	100%
Age (years)	
Minimum	13
Maximum	18
Mean (St. Dev.)	15.8 (1.3)
BMI	
Minimum	14.5
Maximum	39.1
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 9.1 Diagnosis of Girls' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

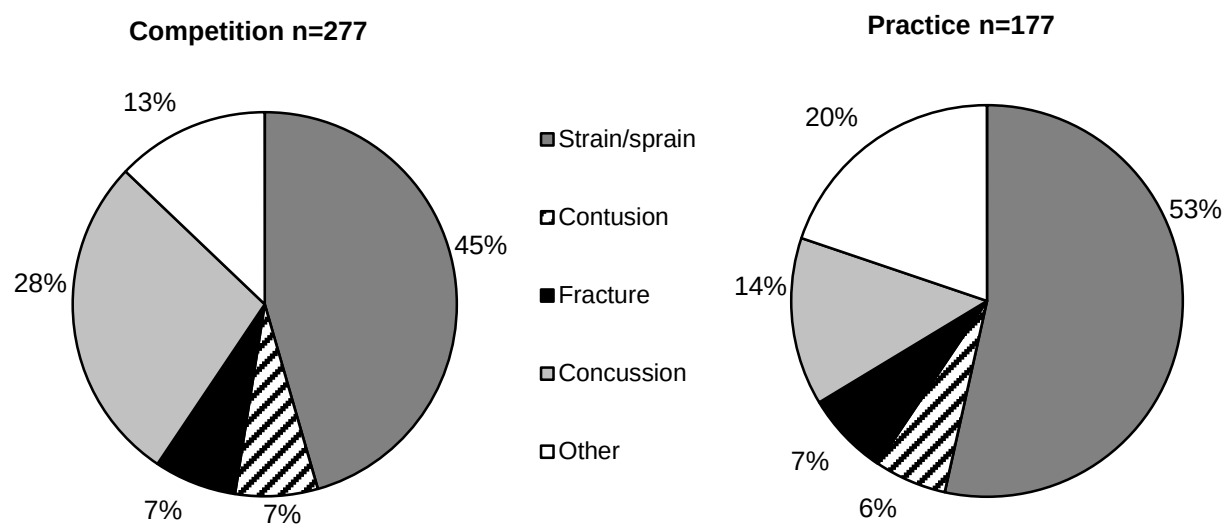


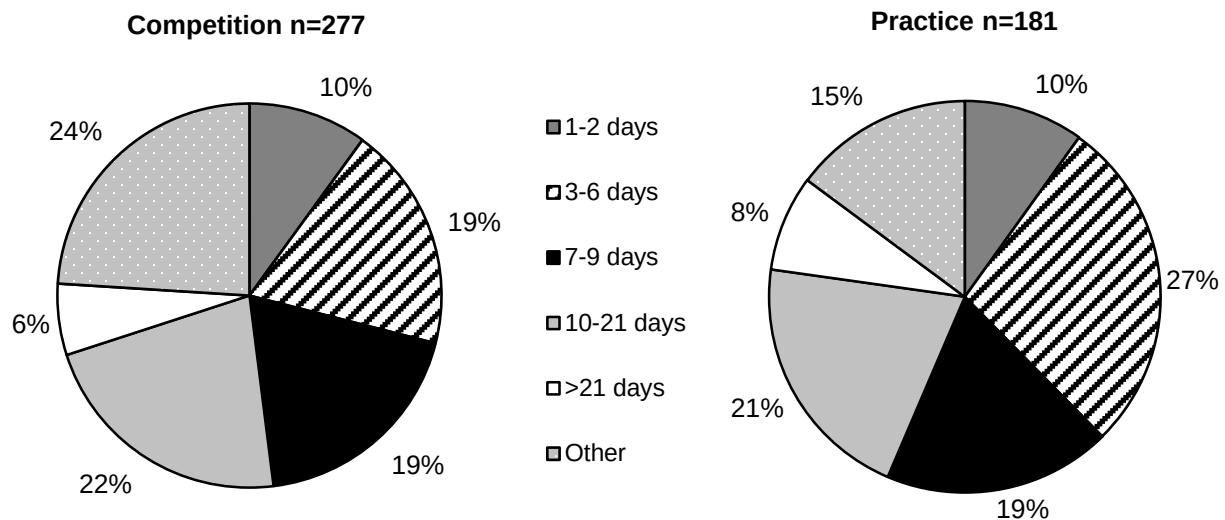
Table 9.3 Body Site of Girls' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Body Site						
Head/face	91	33.0%	26	14.7%	117	25.8%
Ankle	62	22.5%	46	26.0%	108	23.8%
Knee	60	21.7%	25	14.1%	85	18.8%
Hand/wrist	27	9.8%	22	12.4%	49	10.8%
Trunk	7	2.5%	18	10.2%	25	5.5%
Hip/thigh/upper leg	4	1.4%	15	8.5%	19	4.2%
Lower leg	5	1.8%	13	7.3%	18	4.0%
Shoulder	10	3.6%	3	1.7%	13	2.9%
Foot	4	1.4%	5	2.8%	9	2.0%
Arm/elbow	5	1.8%	2	1.1%	7	1.5%
Neck	1	0.4%	1	0.6%	2	0.4%
Other	-	0.0%	1	0.6%	1	0.2%
Total	276	100	177	100%	453	100%

Table 9.4 Ten Most Common Girls' Basketball Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

Diagnosis	Competition n=276		Practice n=177		Total n=453	
	n	%	n	%	n	%
Ankle strain/sprain	61	22.1%	43	24.3%	104	23.0%
Head/face concussion	77	27.9%	24	13.6%	101	22.3%
Knee strain/sprain	38	13.8%	13	7.3%	51	11.3%
Knee other	17	6.2%	9	5.1%	26	5.7%
Hand/wrist strain/sprain	14	5.1%	8	4.5%	22	4.9%
Hand/wrist fracture	10	3.6%	11	6.2%	21	4.6%
Hip/thigh/upper leg strain/sprain	2	0.7%	14	7.9%	16	3.5%
Trunk strain/sprain	2	0.7%	11	6.2%	13	2.9%
Lower leg other	2	0.7%	10	5.6%	12	2.6%
Knee contusion	5	1.8%	3	1.7%	8	1.8%

Figure 9.2 Time Loss of Girls' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 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 Girls' Basketball Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	30	11.3%	12	7.0%	42	9.6%
Did not require surgery	236	88.7%	160	93.0%	396	90.4%
Total	266	100%	172	100%	438	100%

Figure 9.3 History of Girls' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

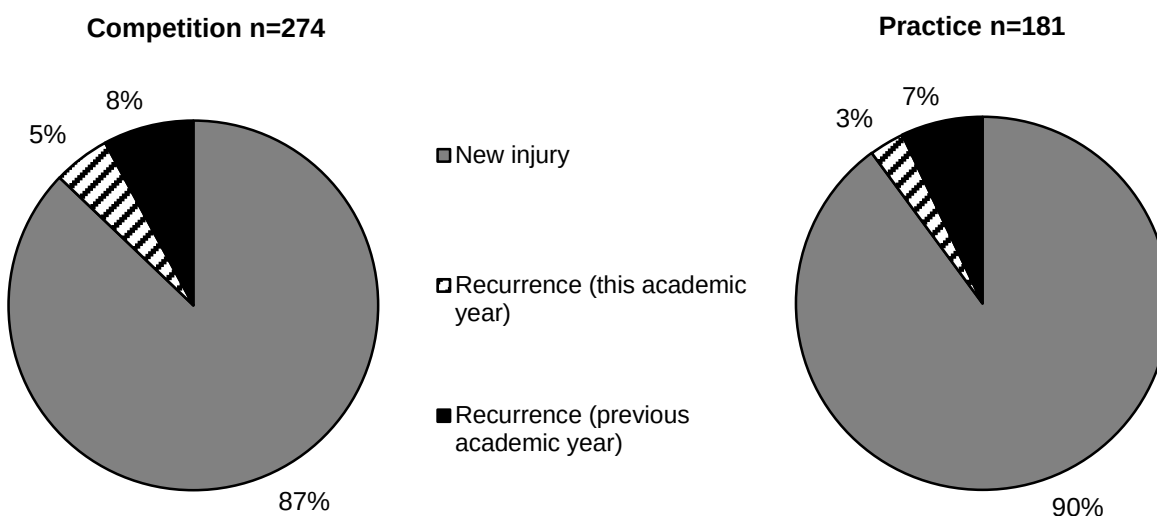


Table 9.6 Time during Season of Girls' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Season		
Preseason	72	15.9%
Regular season	363	80.1%
Post season	18	4.0%
Total	453	100%

Table 9.7 Competition-Related Variables for Girls' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Competition		
Pre-competition/Warm-ups	-	0.0%
First quarter	18	7.2%
Second quarter	63	25.1%
Third quarter	93	37.1%
Fourth quarter	76	30.3%
Overtime	1	0.4%
Total	251	100%
Court Location		
Inside lane (offense)	59	24.1%
Inside lane (defense)	58	23.7%
Between 3 point arc and lane (defense)	31	12.7%
Between 3 point arc and lane (offense)	28	11.4%
Outside 3 point arc - offense	24	9.8%
Outside 3 point arc - defense	20	8.2%
Backcourt	17	6.9%
Out of bounds	5	2.0%
Off the court	3	1.2%
Total	245	100%

Table 9.8 Practice-Related Variables for Girls' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Practice		
First 1/2 hour	21	12.5%
Second 1/2 hour	38	22.6%
1-2 hours into practice	94	56.0%
>2 hours into practice	15	8.9%
Total	168	100%

Figure 9.4 Player Position of Girls' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

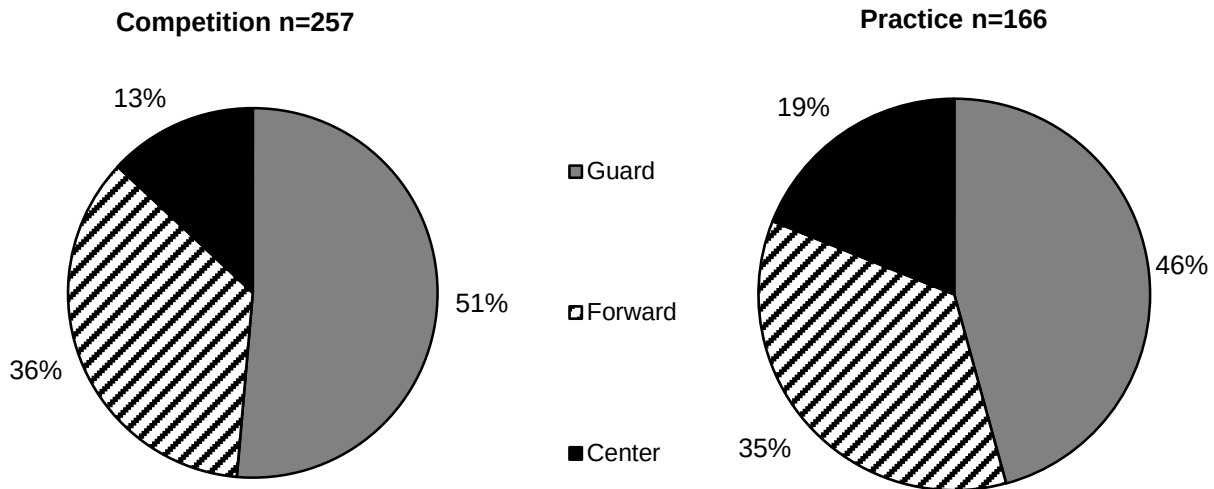
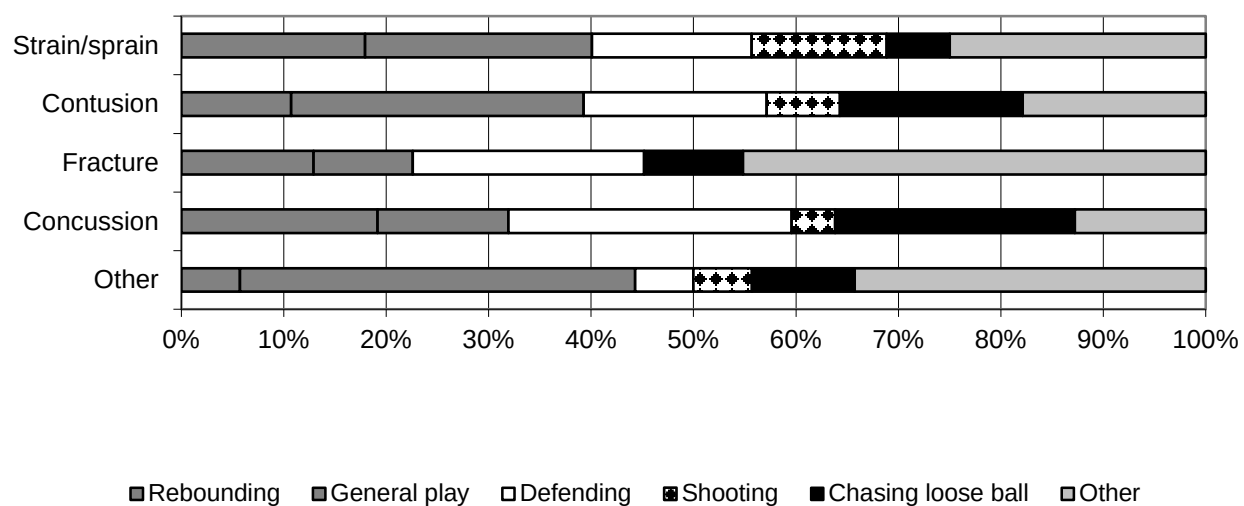


Table 9.9 Activities Leading to Girls' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

Activity	Competition		Practice		Overall	
	n	%	n	%	n	%
General play	51	19.3%	46	26.9%	97	22.3%
Defending	58	22.0%	17	9.9%	75	17.2%
Rebounding	48	18.2%	19	11.1%	67	15.4%
Chasing loose ball	35	13.3%	15	8.8%	50	11.5%
Shooting	29	11.0%	9	5.3%	38	8.7%
Conditioning	1	0.4%	33	19.3%	34	7.8%
Ball handling/dribbling	24	9.1%	7	4.1%	31	7.1%
Receiving pass	9	3.4%	17	9.9%	26	6.0%
Passing	3	1.1%	4	2.3%	7	1.6%
Screening	3	1.1%	1	0.6%	4	0.9%
Other	3	1.1%	3	1.8%	6	1.4%
Total	264	100%	171	100%	435	100%

Figure 9.5 Activity Resulting in Girls' Basketball Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year



X. Wrestling Injury Epidemiology

Table 10.1 Wrestling Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	493	226,432	2.18
Competition	213	56,509	3.77
Practice	280	169,923	1.65

Table 10.2 Demographic Characteristics of Injured Wrestlers, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year*

Year in School	n=487
Freshman	17.7%
Sophomore	24.8%
Junior	27.9%
Senior	29.6%
Total[†]	100%
Age (years)	
Minimum	13
Maximum	19
Mean (St. Dev.)	16.2 (1.3)
BMI	
Minimum	15.7
Maximum	55.7
Mean (St. Dev.)	24.3 (5.3)

*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 10.1 Diagnosis of Wrestling Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

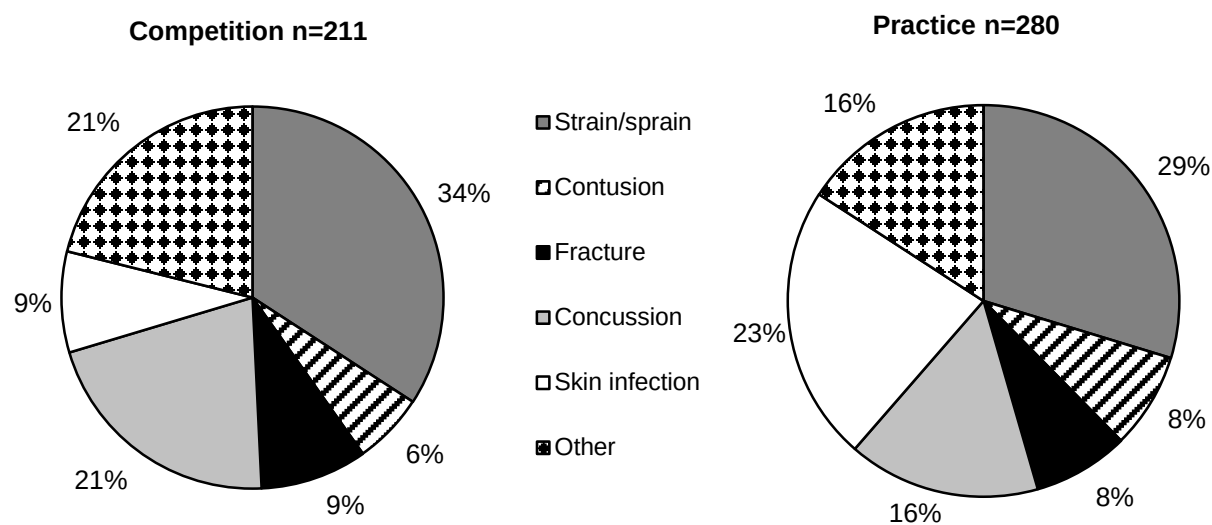


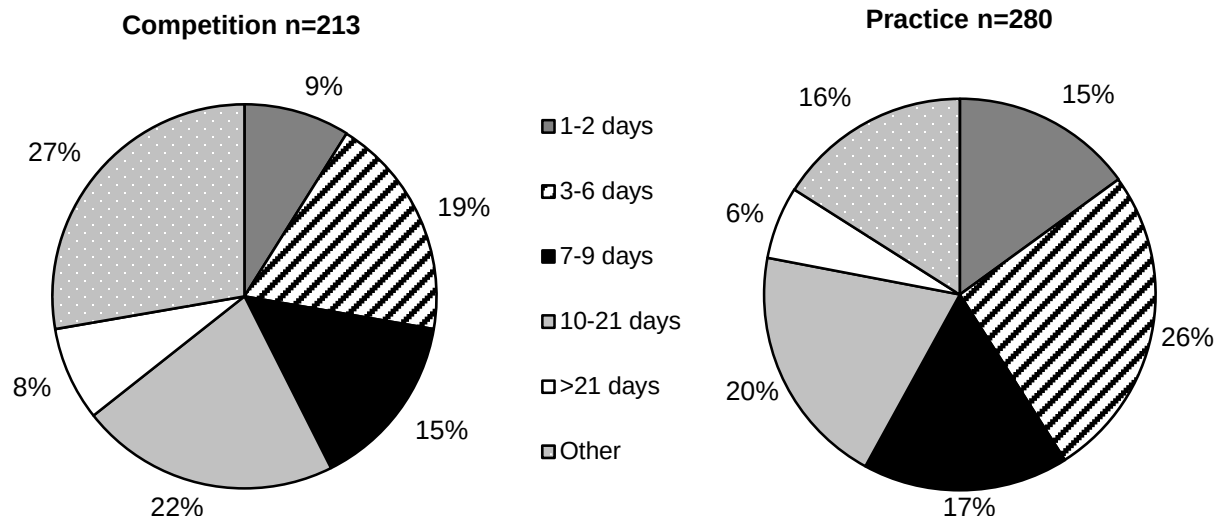
Table 10.3 Body Site of Wrestling Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Body Site						
Head/face	54	25.4%	76	27.1%	130	26.4%
Shoulder	34	16.0%	38	13.6%	72	14.6%
Knee	31	14.6%	33	11.8%	64	13.0%
Arm/elbow	22	10.3%	23	8.2%	45	9.1%
Trunk	14	6.6%	25	8.9%	39	7.9%
Hand/wrist	14	6.6%	20	7.1%	34	6.9%
Ankle	14	6.6%	15	5.4%	29	5.9%
Lower leg	5	2.3%	10	3.6%	15	3.0%
Hip/thigh/upper leg	7	3.3%	7	2.5%	14	2.8%
Foot	1	0.5%	6	2.1%	7	1.4%
Neck	8	3.8%	11	3.9%	19	3.9%
Other	9	4.2%	16	5.7%	25	5.1%
Total	213	100%	280	100%	493	100%

Table 10.4 Ten Most Common Wrestling Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Competition n=211		Practice n=280		Total n=491	
	n	%	n	%	n	%
Diagnosis						
Head/face concussion	44	20.9%	45	16.1%	89	18.1%
Shoulder strain/sprain	18	8.5%	20	7.1%	38	7.7%
Head/face skin infection	8	3.8%	24	8.6%	32	6.5%
Shoulder other	13	6.2%	18	6.4%	31	6.3%
Knee other	15	7.1%	15	5.4%	30	6.1%
Knee strain/sprain	12	5.7%	15	5.4%	27	5.5%
Ankle strain/sprain	11	5.2%	13	4.6%	24	4.9%
Neck strain/sprain	6	2.8%	9	3.2%	15	3.1%
Trunk strain/sprain	7	3.3%	8	2.9%	15	3.1%
Hand/wrist strain/sprain	5	2.4%	4	1.4%	9	1.8%
Arm/elbow strain/sprain	1	0.5%	4	1.4%	5	1.0%

Figure 10.2 Time Loss of Wrestling Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 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 Wrestling Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	13	6.2%	13	4.7%	26	5.3%
Did not require surgery	197	93.8%	264	95.3%	461	94.7%
Total	210	100%	277	100%	487	100%

Figure 10.3 History of Wrestling Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

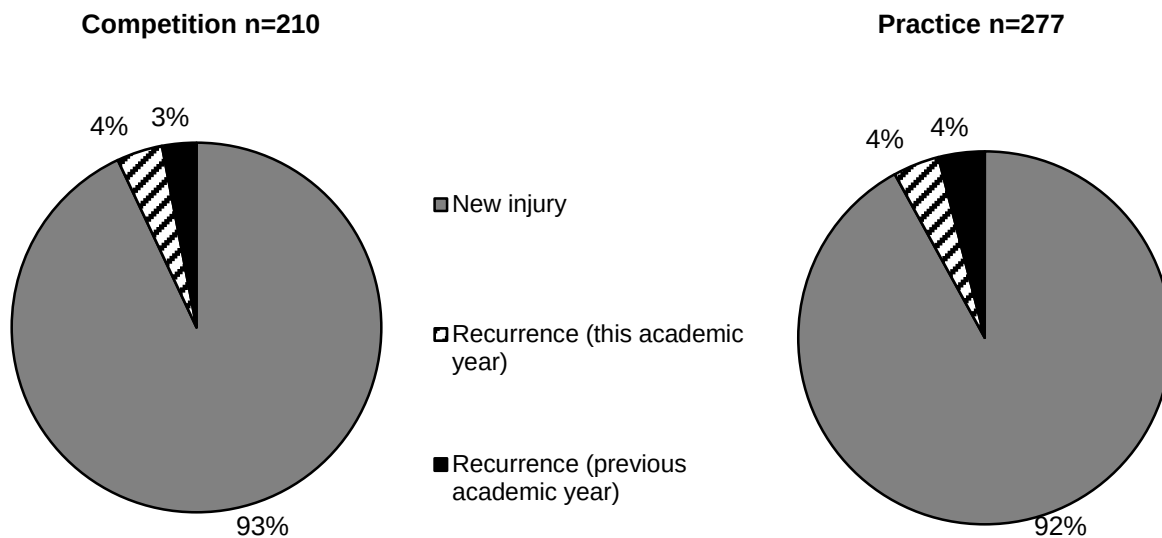


Table 10.6 Time during Season of Wrestling Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Season		
Preseason	62	12.6%
Regular season	401	81.5%
Post season	29	5.9%
Total	492	100%

Table 10.7 Competition-Related Variables for Wrestling Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Competition		
Pre-competition/warm-ups	5	2.7%
First period	47	25.4%
Second period	83	44.9%
Third period	50	27.0%
Overtime	-	0.0%
Total	185	100%
Mat Location*		
Within 28 ft. circle	410	91.7%
Out of bounds	13	2.9%
Off the mat	24	5.4%
Total	447	100%

*Mat location question consists of competition and practice related injuries.

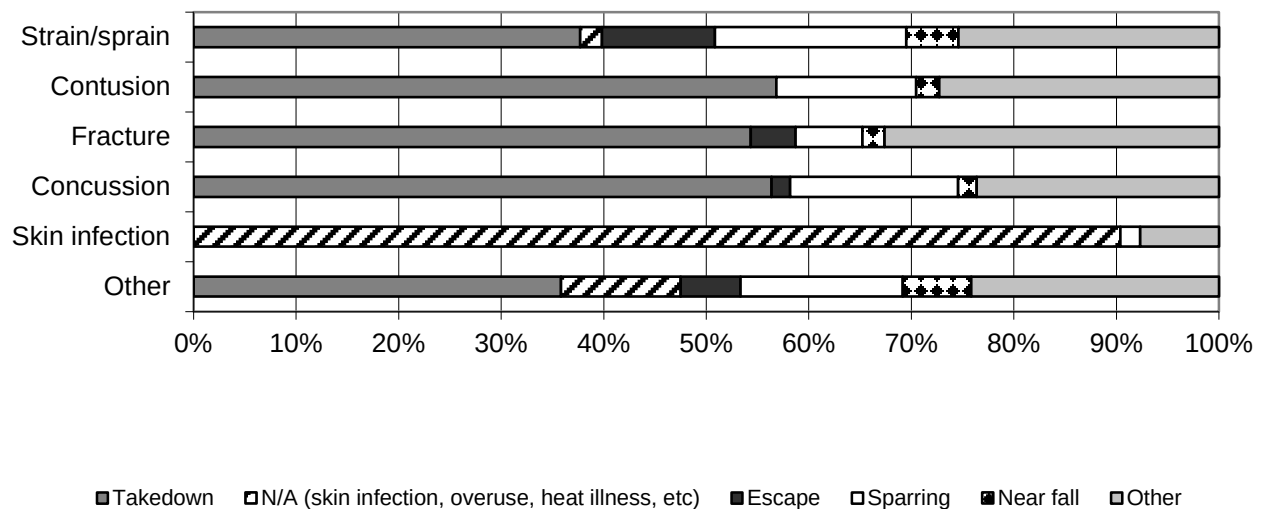
Table 10.8 Practice-Related Variables for Wrestling Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Practice		
First 1/2 hour	40	15.6%
Second 1/2 hour	43	16.8%
1-2 hours into practice	148	57.8%
>2 hours into practice	25	9.8%
Total	256	100%

Table 10.9 Activities Leading to Wrestling Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

Activity	Competition		Practice		Overall	
	n	%	n	%	n	%
Takedown	109	53.7%	77	28.2%	186	39.1%
Sparring	18	8.9%	67	24.5%	85	17.9%
N/A (skin infection, overuse, etc.)	18	8.9%	60	22.0%	78	16.4%
Fall	10	4.9%	16	5.9%	26	5.5%
Conditioning	0	0.0%	22	8.1%	22	4.6%
Near fall	16	7.9%	5	1.8%	21	4.4%
Escape	8	3.9%	7	2.6%	15	3.2%
Riding	5	2.5%	6	2.2%	11	2.3%
Reversal	5	2.5%	2	0.7%	7	1.5%
Other	14	6.9%	11	4.0%	25	5.3%
Total	203	100%	273	100%	476	100%

Figure 10.4 Activities Resulting in Wrestling Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year



XI. Baseball Injury Epidemiology

Table 11.1 Baseball Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete- exposures)
Total	189	228,648	0.83
Competition	111	77,267	1.44
Practice	78	151,381	0.52

Table 11.2 Demographic Characteristics of Injured Baseball Athletes, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year*

Year in School	n=183
Freshman	19.1%
Sophomore	27.3%
Junior	32.8%
Senior	20.8%
Total[†]	100%
Age (years)	
Minimum	13
Maximum	18
Mean (St. Dev.)	16.1 (1.3)
BMI	
Minimum	17.6
Maximum	40.9
Mean (St. Dev.)	24.2 (3.6)

*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 11.1 Diagnosis of Baseball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

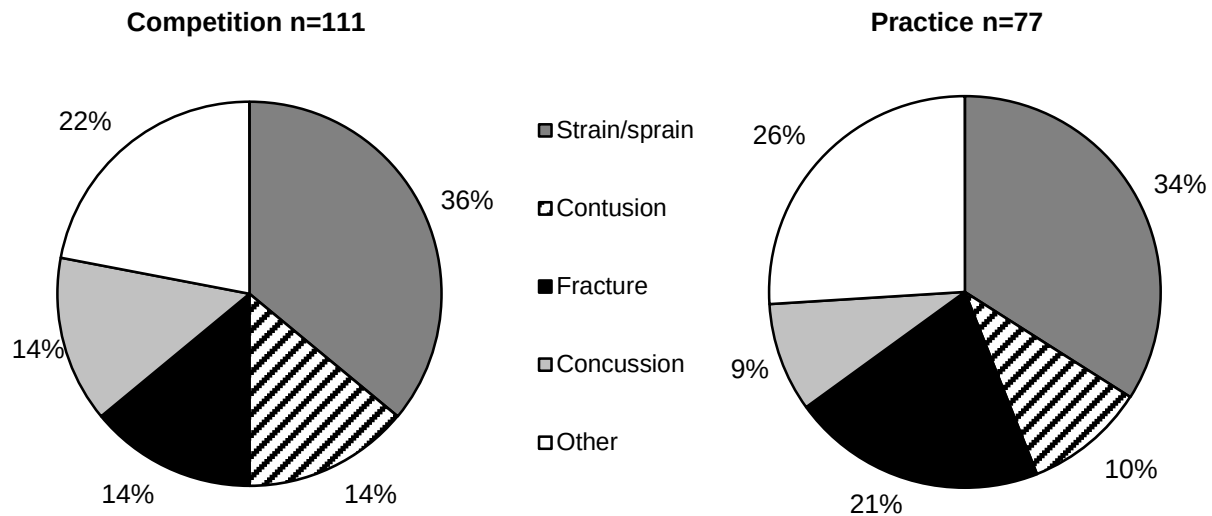


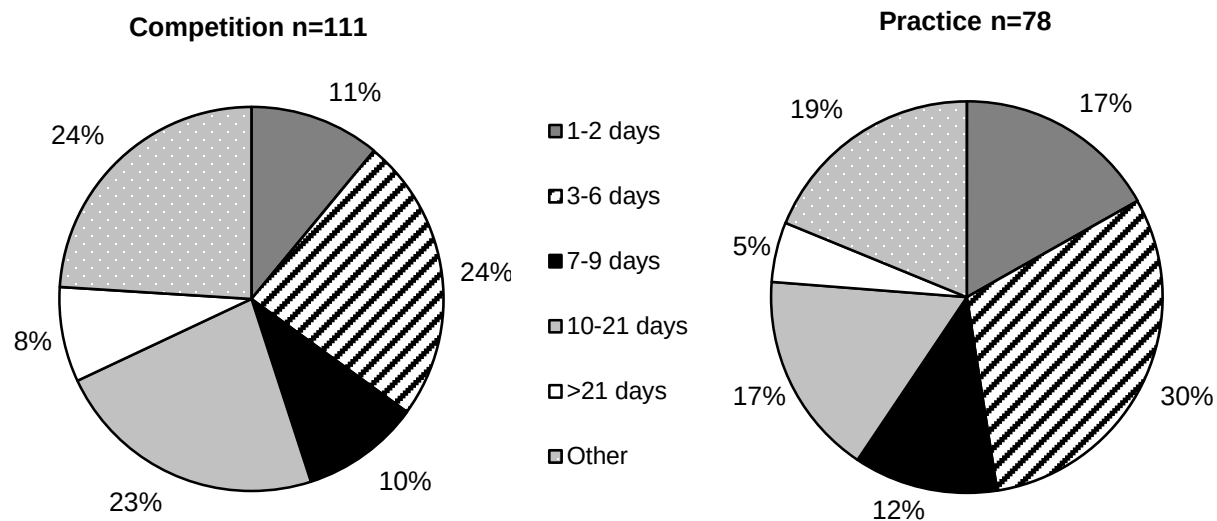
Table 11.3 Body Site of Baseball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Body Site						
Head/face	23	20.7%	22	28.2%	45	23.8%
Arm/elbow	17	15.3%	14	17.9%	31	16.4%
Shoulder	19	17.1%	9	11.5%	28	14.8%
Hand/wrist	15	13.5%	10	12.8%	25	13.2%
Hip/thigh/upper leg	13	11.7%	5	6.4%	18	9.5%
Ankle	7	6.3%	7	9.0%	14	7.4%
Knee	9	8.1%	4	5.1%	13	6.9%
Trunk	3	2.7%	1	1.3%	4	2.1%
Lower leg	1	0.9%	1	1.3%	2	1.1%
Foot	1	0.9%	1	1.3%	2	1.1%
Neck	-	0.0%	1	1.3%	1	0.5%
Other	3	2.7%	3	3.8%	6	3.2%
Total	111	100%	78	100%	189	100%

Table 11.4 Ten Most Common Baseball Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Competition n=111		Practice n=77		Total n=188	
	n	%	n	%	n	%
Diagnosis						
Head/face concussion	15	13.5%	7	9.1%	22	11.7%
Arm/elbow strain/sprain	6	5.4%	8	10.4%	18	9.6%
Shoulder other	10	9.0%	4	5.2%	14	7.4%
Head/face fracture	6	5.4%	8	10.4%	14	7.4%
Hip/thigh/upper leg strain/sprain	9	8.1%	4	5.2%	13	6.9%
Ankle strain/sprain	6	5.4%	6	7.8%	12	6.4%
Shoulder strain/sprain	7	6.3%	4	5.2%	11	5.9%
Hand/wrist fracture	5	4.5%	5	6.5%	10	5.3%
Knee other	4	3.6%	3	3.9%	7	3.7%
Trunk strain/sprain	1	0.9%	1	1.3%	2	1.1%

Figure 11.2 Time Loss of Baseball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 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 Baseball Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	8	7.2%	8	11.0%	16	8.7%
Did not require surgery	103	92.8%	65	89.0%	168	91.3%
Total	111	100%	73	100%	184	100%

Figure 11.3 History of Baseball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

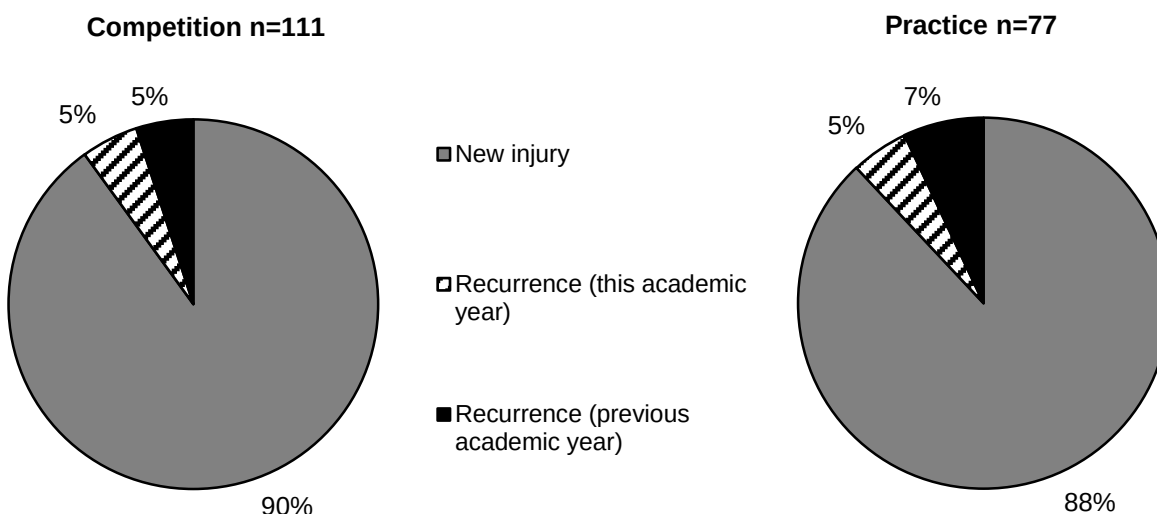


Table 11.6 Time during Season of Baseball Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Season		
Preseason	37	19.6%
Regular season	144	76.2%
Post season	8	4.2%
Total	189	100%

Table 11.7 Competition-Related Variables for Baseball Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Competition		
Pre-competition/warm-ups	7	6.7%
First inning	6	5.7%
Second inning	10	9.5%
Third inning	12	11.4%
Fourth inning	33	31.4%
Fifth inning	16	15.2%
Sixth inning	14	13.3%
Seventh inning	7	6.7%
Total	105	100%
Field Location		
Home plate	31	29.0%
First base	10	9.3%
Second base	15	14.0%
Third base	9	8.4%
Infield	4	3.7%
Pitcher's mound	20	18.7%
Outfield	12	11.2%
Foul territory	3	2.8%
Other	3	2.8%
Total	107	100%

Table 11.8 Practice-Related Variables for Baseball Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Practice		
First 1/2 hour	11	15.5%
Second 1/2 hour	15	21.1%
1-2 hours into practice	35	49.3%
>2 hours into practice	10	14.1%
Total	71	100%

Figure 11.4 Player Position of Baseball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

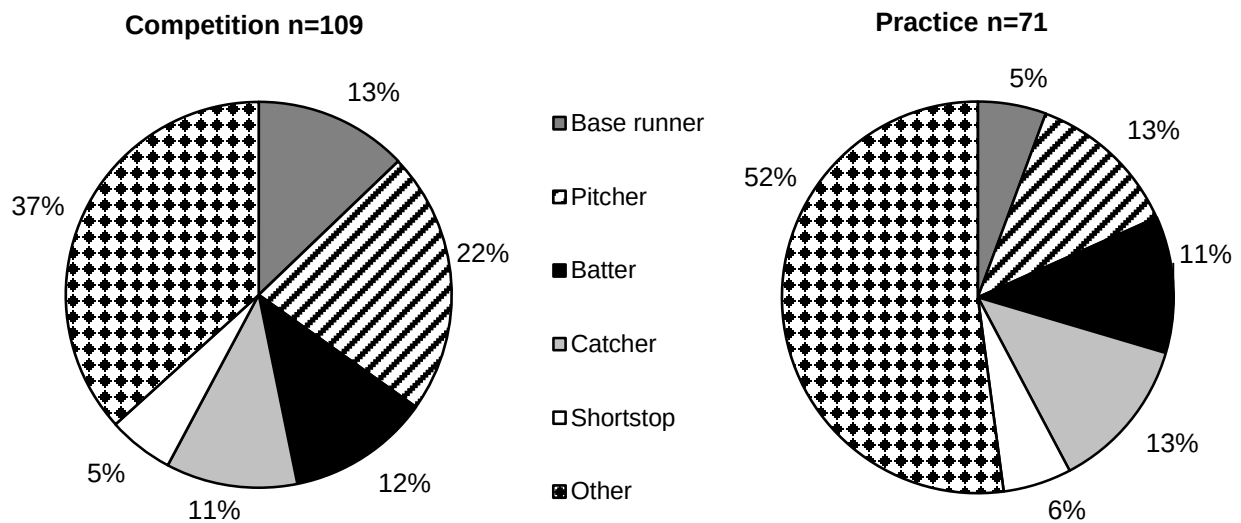
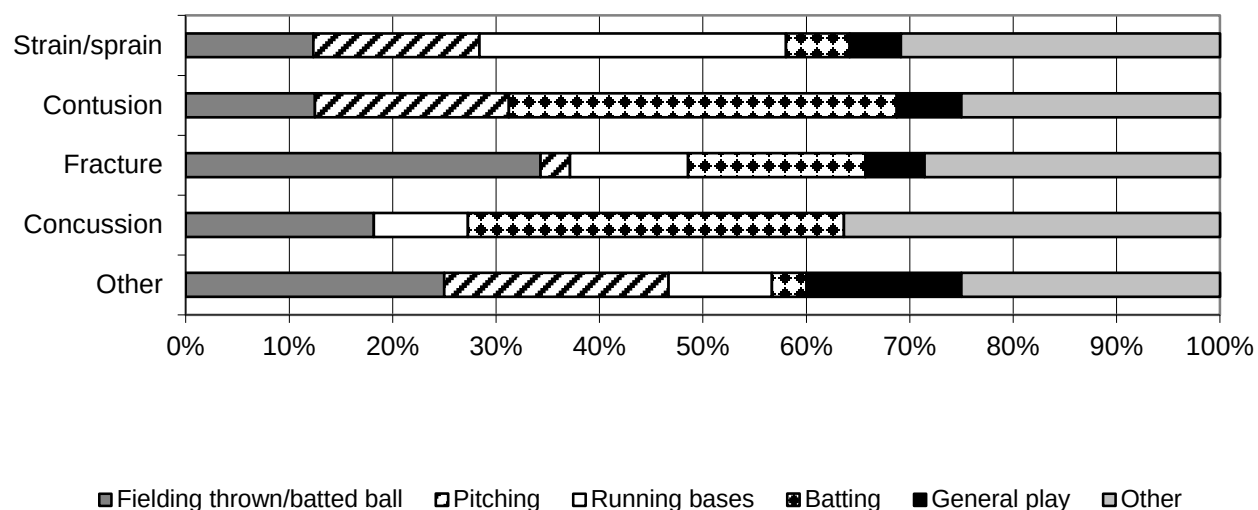


Table 11.9 Activities Leading to Baseball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

Activity	Competition		Practice		Overall	
	n	%	n	%	n	%
Pitching	21	19.1%	9	12.0%	30	16.2%
Fielding a batted ball	13	11.8%	15	20.0%	28	15.1%
Batting	19	17.3%	7	9.3%	26	14.1%
Running bases	13	11.8%	8	10.7%	21	11.4%
Throwing (not pitching)	10	9.1%	8	10.7%	18	9.7%
Sliding	15	13.6%	2	2.7%	17	9.2%
Catching	0	0.0%	5	6.7%	14	7.6%
Fielding a thrown ball	5	4.5%	8	10.7%	13	7.0%
Other	3	2.7%	5	6.7%	8	4.3%
Conditioning	9	8.2%	5	6.7%	5	2.7%
General play	2	1.8%	3	4.0%	5	2.7%
Total	110	100%	75	100%	185	100%

Figure 11.5 Activity Resulting in Baseball Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year



XII. Softball Injury Epidemiology

Table 12.1 Softball Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete- exposures)
Total	167	172,340	0.97
Competition	86	56,738	1.52
Practice	81	115,602	0.70

Table 12.2 Demographic Characteristics of Injured Softball Athletes, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year*

Year in School	n=164
Freshman	28.7%
Sophomore	28.7%
Junior	22.0%
Senior	20.7%
Total[†]	100%
Age (years)	
Minimum	14
Maximum	18
Mean (St. Dev.)	15.9 (1.2)
BMI	
Minimum	16.3
Maximum	45.0
Mean (St. Dev.)	23.7 (4.3)

*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 12.1 Diagnosis of Softball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

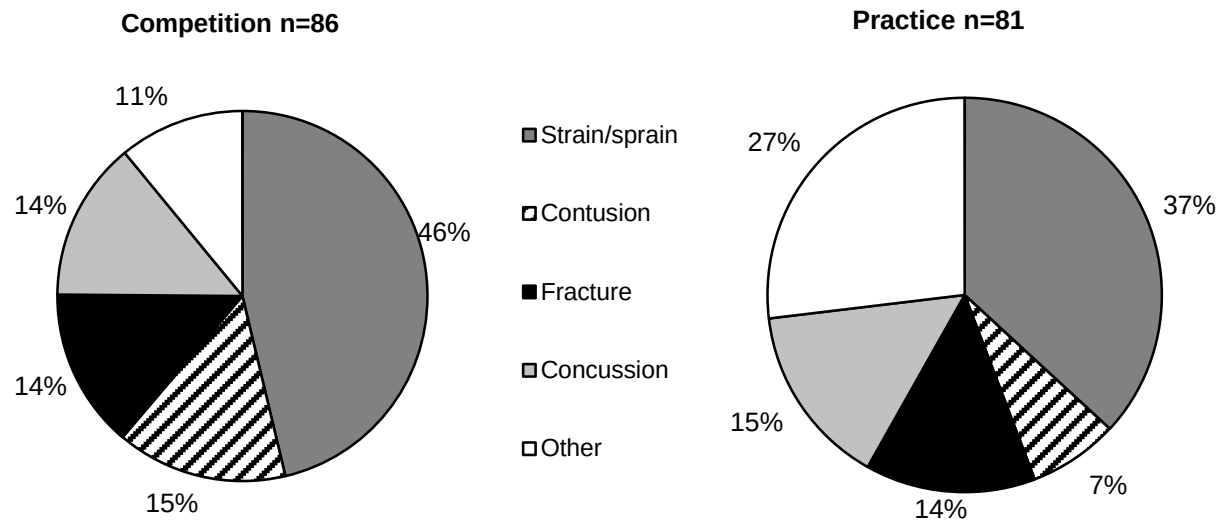


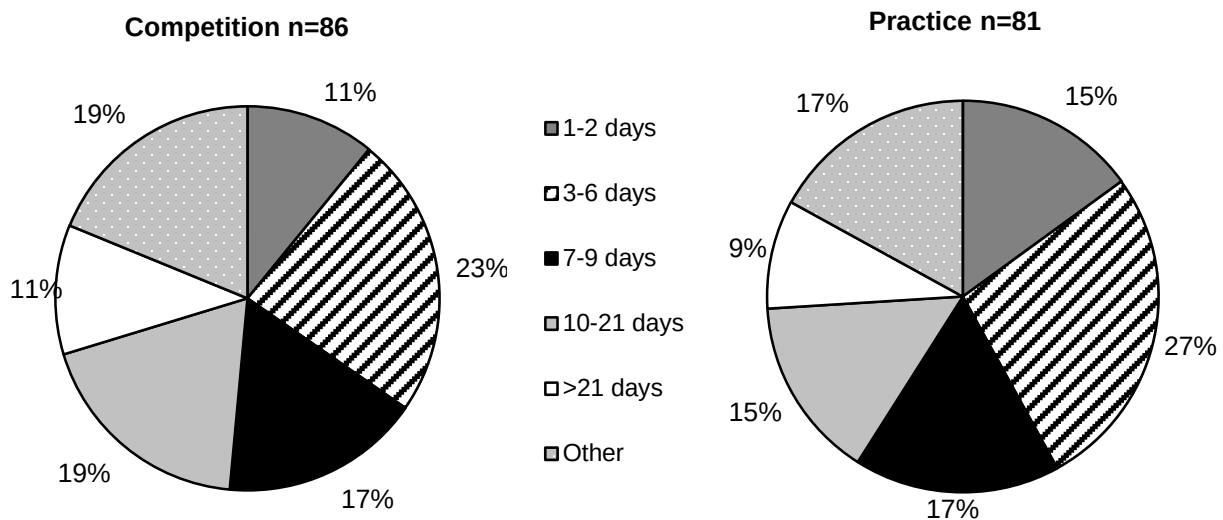
Table 12.3 Body Site of Softball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Body Site						
Ankle	24	27.9%	11	13.6%	35	21.0%
Head/face	15	17.4%	19	23.5%	34	20.4%
Hand/wrist	16	18.6%	15	18.5%	31	18.6%
Hip/thigh/upper leg	8	9.3%	6	7.4%	14	8.4%
Arm/elbow	6	7.0%	8	9.9%	14	8.4%
Knee	5	5.8%	7	8.6%	12	7.2%
Shoulder	4	4.7%	7	8.6%	11	6.6%
Lower leg	3	3.5%	3	3.7%	6	3.6%
Foot	3	3.5%	2	2.5%	5	3.0%
Trunk	1	1.2%	3	3.7%	4	2.4%
Neck	1	1.2%	0	0.0%	1	0.6%
Total	86	100%	81	100%	167	100%

Table 12.4 Ten Most Common Softball Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

Diagnosis	Competition n=86		Practice n=81		Total n=167	
	n	%	n	%	n	%
Ankle strain/sprain	22	25.6%	8	9.9%	30	18.0%
Head/face concussion	12	14.0%	12	14.8%	24	14.4%
Hand/wrist fracture	4	4.7%	7	8.6%	11	6.6%
Hip/thigh/upper leg strain/sprain	6	7.0%	5	6.2%	11	6.6%
Knee strain/sprain	5	5.8%	3	3.7%	8	4.8%
Hand/wrist strain/sprain	3	3.5%	4	4.9%	7	4.2%
Shoulder other	3	3.5%	4	4.9%	7	4.2%
Hand/wrist contusion	5	5.8%	1	1.2%	6	3.6%
Shoulder strain/sprain	1	1.2%	3	3.7%	4	2.4%
Trunk strain/sprain	0	0.0%	3	3.7%	3	1.8%

Figure 12.2 Time Loss of Softball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 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 Softball Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	7	8.2%	6	7.8%	13	8.0%
Did not require surgery	78	91.8%	71	92.2%	149	92.0%
Total	85	100%	77	100%	162	100%

Figure 12.3 History of Softball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

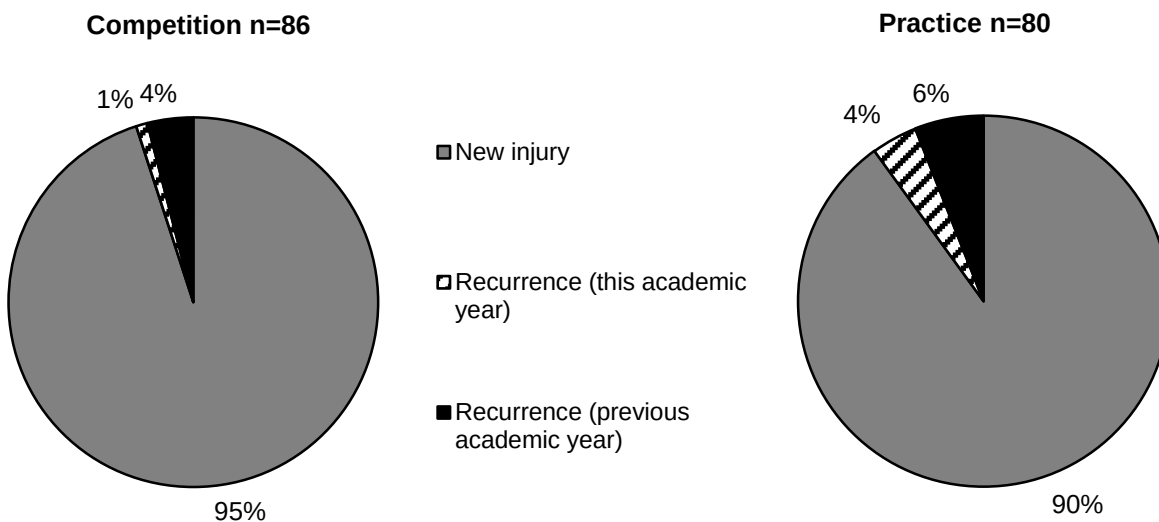


Table 12.6 Time during Season of Softball Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Season		
Preseason	49	29.9%
Regular season	108	65.9%
Post season	7	4.3%
Total	164	100%

Table 12.7 Competition-Related Variables for Softball Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Competition		
Pre-competition/warm-ups	6	7.6%
First inning	1	1.3%
Second inning	4	5.1%
Third inning	14	17.7%
Fourth inning	16	20.3%
Fifth inning	21	26.6%
Sixth inning	11	13.9%
Seventh inning	5	6.3%
Extra innings	1	1.3%
Total	79	100%
Field Location		
Home plate	23	28.4%
First base	10	12.3%
Second base	12	14.8%
Third base	9	11.1%
Infield	2	2.5%
Pitcher's mound	4	4.9%
Outfield	13	16.0%
Foul territory	3	3.7%
Other	5	6.2%
Total	81	100%

Table 12.8 Practice-Related Variables for Softball Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Practice		
First 1/2 hour	15	18.8%
Second 1/2 hour	17	21.3%
1-2 hours into practice	46	57.5%
>2 hours into practice	2	2.5%
Total	80	100%

Figure 12.4 Player Position of Softball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

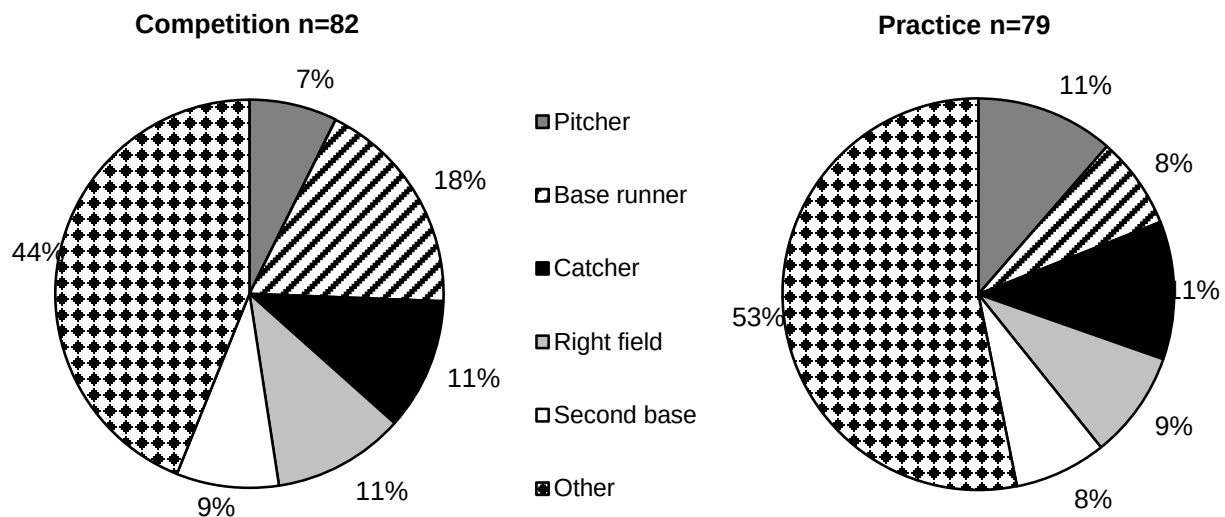
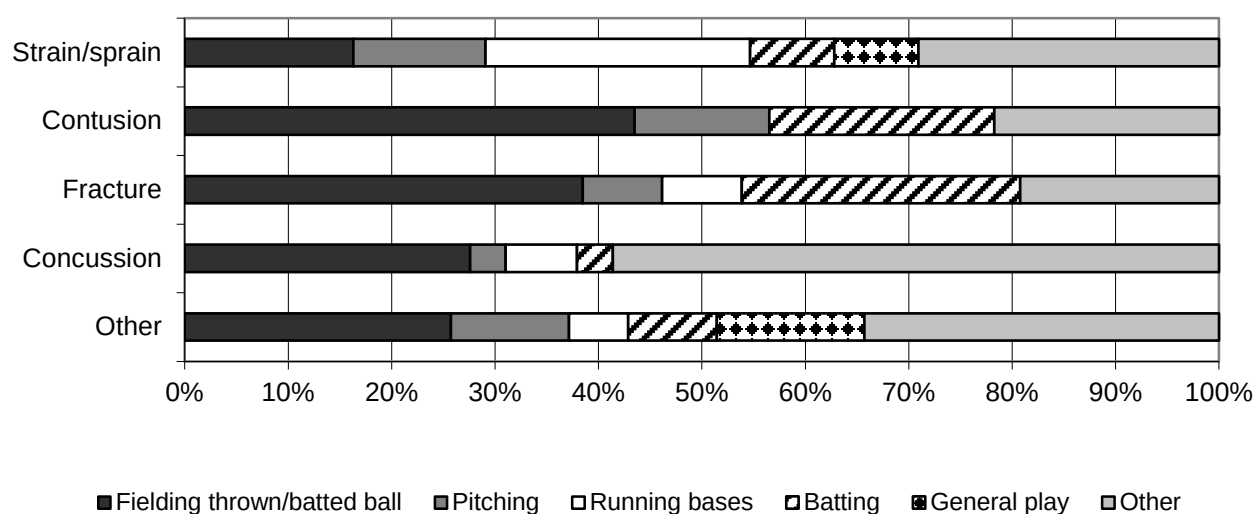


Table 12.9 Activities Leading to Softball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

Activity	Competition		Practice		Overall	
	n	%	n	%	n	%
Running bases	20	23.3%	9	11.1%	29	17.4%
Fielding a batted ball	13	15.1%	14	17.3%	27	16.2%
Sliding	18	20.9%	1	1.2%	19	11.4%
Catching	8	9.3%	10	12.3%	18	10.8%
Batting	8	9.3%	5	6.2%	13	7.8%
Fielding a thrown ball	4	4.7%	9	11.1%	13	7.8%
Pitching	7	8.1%	5	6.2%	12	7.2%
Throwing (not pitching)	1	1.2%	11	13.6%	12	7.2%
General play	2	2.3%	7	8.6%	9	5.4%
Conditioning	0	0.0%	7	8.6%	7	4.2%
Other	5	5.8%	3	3.7%	8	4.8%
Total	86	100%	81	100%	167	100%

Figure 12.5 Activity Resulting in Softball Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year



XIII. Girls' Field Hockey Injury Epidemiology

Table 13.1 Girls' Field Hockey Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	164	92,528	1.77
Competition	87	30,000	2.90
Practice	77	62,528	1.23

Table 13.2 Demographic Characteristics of Injured Girls' Field Hockey Athletes, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year*

Year in School	n=161
Freshman	26.1%
Sophomore	27.3%
Junior	20.5%
Senior	26.1%
Total†	100%
Age (years)	
Minimum	13
Maximum	18
Mean (St. Dev.)	15.7 (1.3)
BMI	
Minimum	15.4
Maximum	41.6
Mean (St. Dev.)	22.8 (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 13.1 Diagnosis of Girls' Field Hockey Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

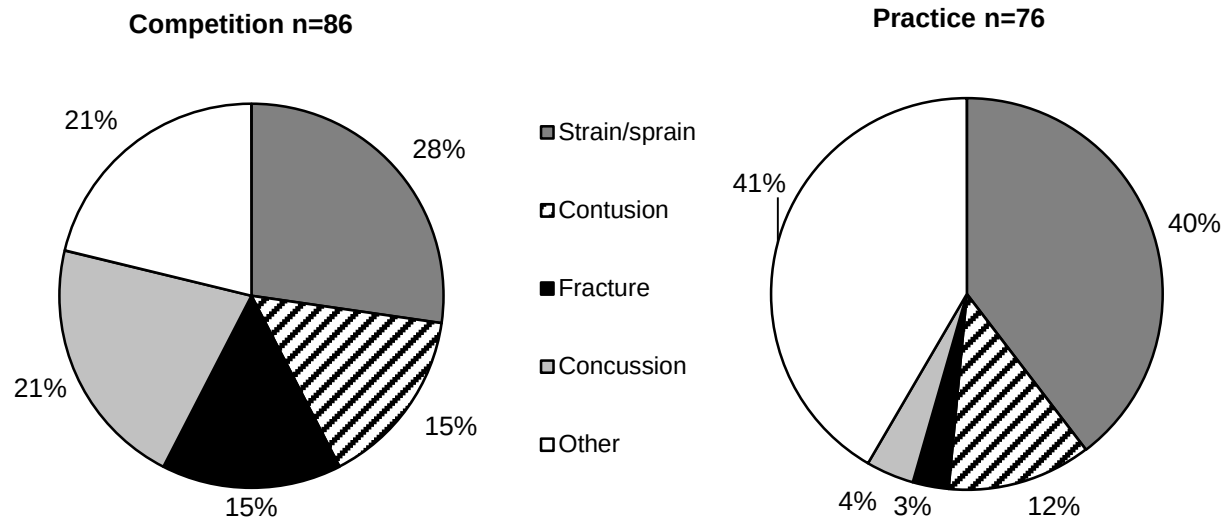


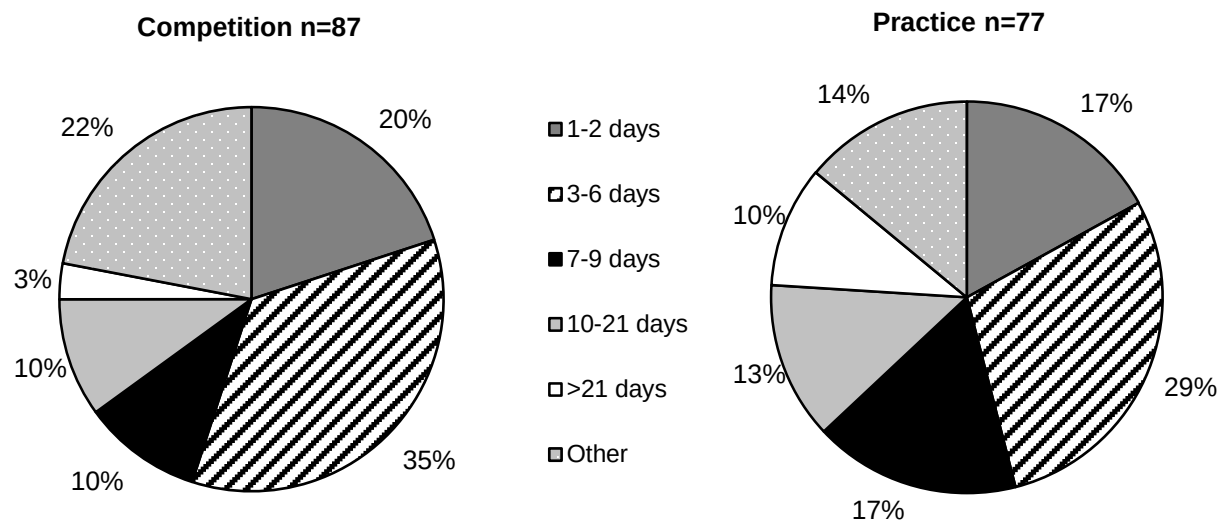
Table 13.3 Body Site of Girls' Field Hockey Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Body Site						
Head/face	34	39.1%	8	10.7%	42	25.9%
Hip/thigh/upper leg	6	6.9%	18	24.0%	24	14.8%
Knee	10	11.5%	14	18.7%	24	14.8%
Hand/wrist	15	17.2%	4	5.3%	19	11.7%
Lower leg	5	5.7%	10	13.3%	15	9.3%
Ankle	8	9.2%	4	5.3%	12	7.4%
Trunk	6	6.9%	3	4.0%	9	5.6%
Foot	1	1.1%	4	5.3%	5	3.1%
Arm/elbow	0	0.0%	2	2.7%	2	1.2%
Neck	1	1.1%	0	0.0%	1	0.6%
Other	1	1.1%	8	10.7%	9	5.6%
Total	87	100%	75	100%	162	100%

Table 13.4 Ten Most Common Girls' Field Hockey Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Competition n=86		Practice n=75		Total n=161	
	n	%	n	%	n	%
Diagnosis						
Head/face concussion	19	22.1%	3	4.0%	22	13.7%
Hip/thigh/upper leg strain/sprain	4	4.7%	16	21.3%	20	12.4%
Head/face other	7	8.1%	5	6.7%	12	7.5%
Ankle strain/sprain	7	8.1%	4	5.3%	11	6.8%
Knee other	3	3.5%	8	10.7%	11	6.8%
Knee strain/sprain	6	7.0%	4	5.3%	10	6.2%
Hand/wrist contusion	4	4.7%	4	5.3%	8	5.0%
Hand/wrist fracture	6	7.0%	0	0.0%	6	3.7%
Trunk strain/sprain	2	2.3%	3	4.0%	5	3.1%
Head/face contusion	3	3.5%	0	0.0%	3	1.9%
Lower leg strain/sprain	2	2.3%	0	0.0%	2	1.2%

Figure 13.2 Time Loss of Girls' Field Hockey Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 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 Girls' Field Hockey Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	6	7.0%	1	1.3%	7	4.3%
Did not require surgery	80	93.0%	75	98.7%	155	95.7%
Total	86	100%	76	100%	162	100%

Figure 13.3 History of Girls' Field Hockey Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

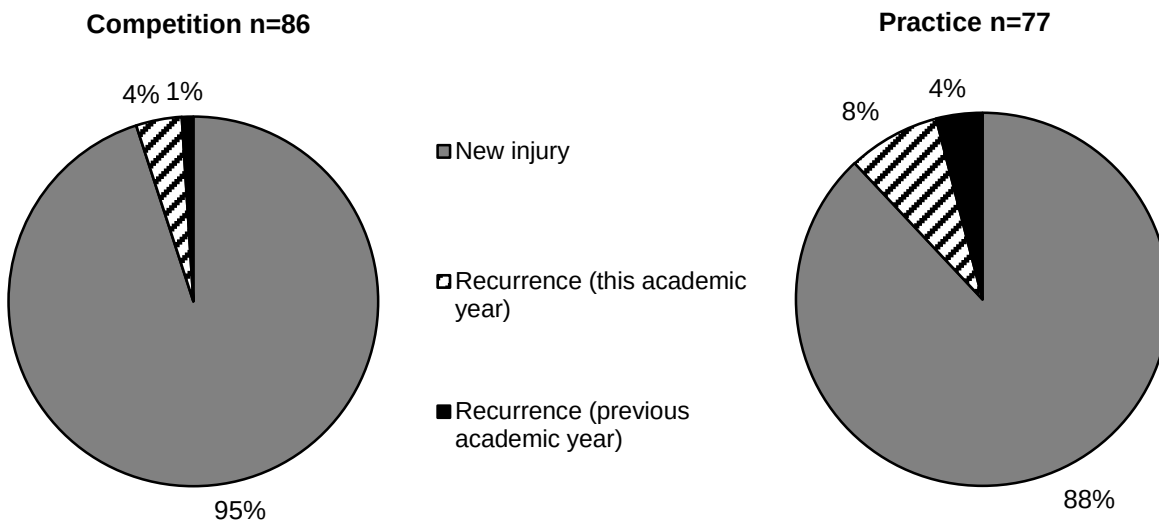


Table 13.6 Time during Season of Girls' Field Hockey Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Season		
Preseason	47	28.7%
Regular season	113	68.9%
Post season	4	2.4%
Total	164	100%

Table 13.7 Competition-Related Variables for Girls' Field Hockey Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Competition		
Pre-competition/warm-ups	6	7.7%
First half	28	35.9%
Second half	41	52.6%
Overtime	3	3.8%
Total	78	100%
Field Location		
Between 25-yard line and center line	28	36.8%
Within 25-yard line	19	25.0%
Within 16-yard arc	14	18.4%
Goal area/circle	8	10.5%
Sideline	4	5.3%
Other	3	3.9%
Total	76	100%

Table 13.8 Practice-Related Variables for Girls' Field Hockey Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Practice		
First 1/2 hour	13	18.6%
Second 1/2 hour	10	14.3%
1-2 hours into practice	38	54.3%
>2 hours into practice	9	12.9%
Total	70	100%

Figure 13.4 Player Position of Girls' Field Hockey Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

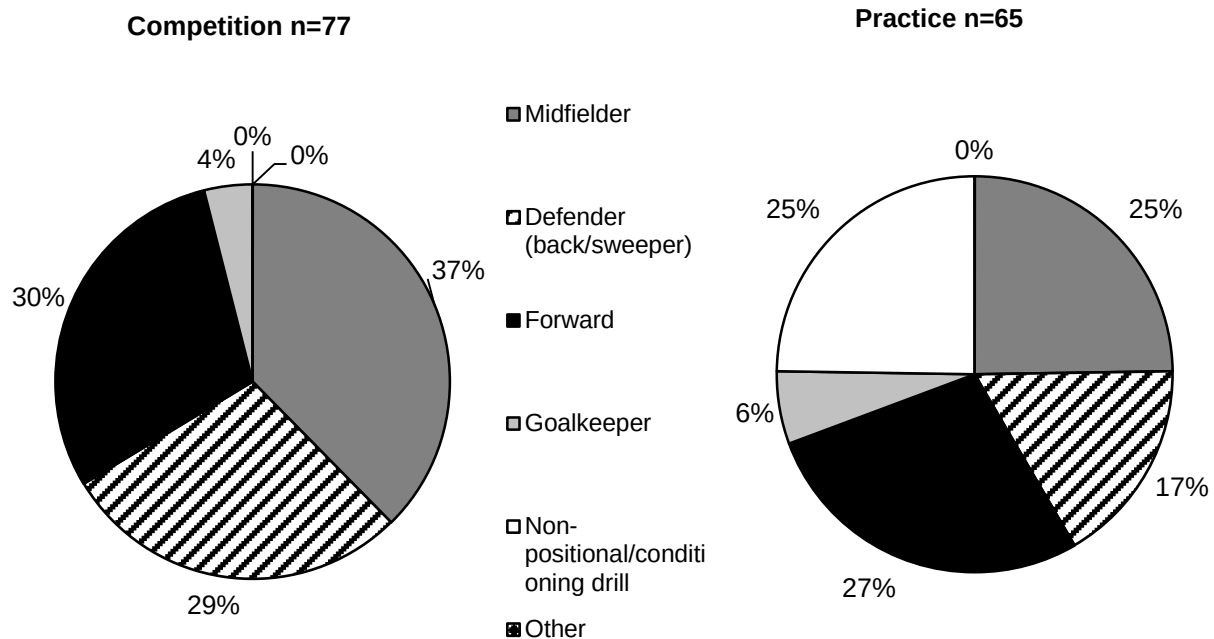
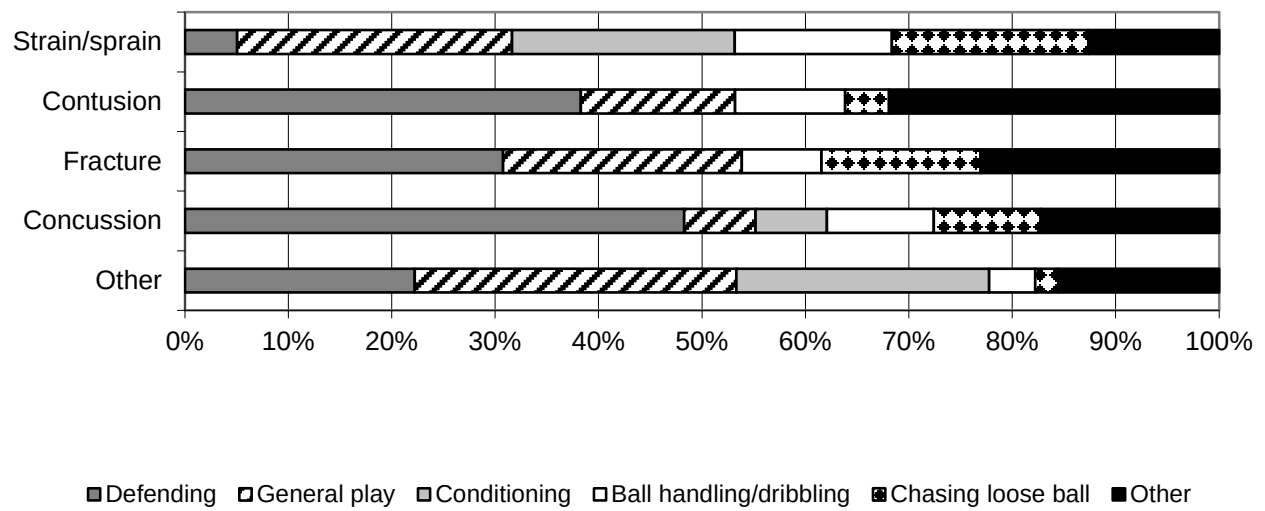


Table 13.9 Activities Leading to Girls' Field Hockey Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

Activity	Competition		Practice		Overall	
	n	%	n	%	n	%
General play	19	23.2%	17	26.6%	36	24.7%
Defending	25	30.5%	9	14.1%	34	23.3%
Conditioning	0	0.0%	22	34.4%	22	15.1%
Chasing a loose ball	14	17.1%	5	7.8%	19	13.0%
Ball handling/dribbling	10	12.2%	5	7.8%	15	10.3%
Receiving pass	4	4.9%	1	1.6%	5	3.4%
Goaltending	3	3.7%	2	3.1%	5	3.4%
Shooting	3	3.7%	1	1.6%	4	2.7%
Passing	2	2.4%	0	0.0%	2	1.4%
Blocking shot	1	1.2%	1	1.6%	2	1.4%
Other	1	1.2%	1	1.6%	2	1.4%
Total	82	100%	64	100%	146	100%

Figure 13.5 Activity Resulting in Girls' Field Hockey Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year



XIV. Girls' Gymnastics Injury Epidemiology

Table 14.1 Girls' Gymnastics Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	26	17,180	1.51
Competition	8	3,317	2.41
Practice	18	13,863	1.30

Table 14.2 Demographic Characteristics of Injured Girls' Gymnastics Athletes, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year*

Year in School	n=26
Freshman	15.4%
Sophomore	42.3%
Junior	19.2%
Senior	23.1%
Total[†]	100%
Age (years)	
Minimum	13
Maximum	18
Mean (St. Dev.)	15.6 (1.4)
BMI	
Minimum	18.8
Maximum	31.2
Mean (St. Dev.)	22.1 (2.9)

*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 14.1 Diagnosis of Girls' Gymnastics Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

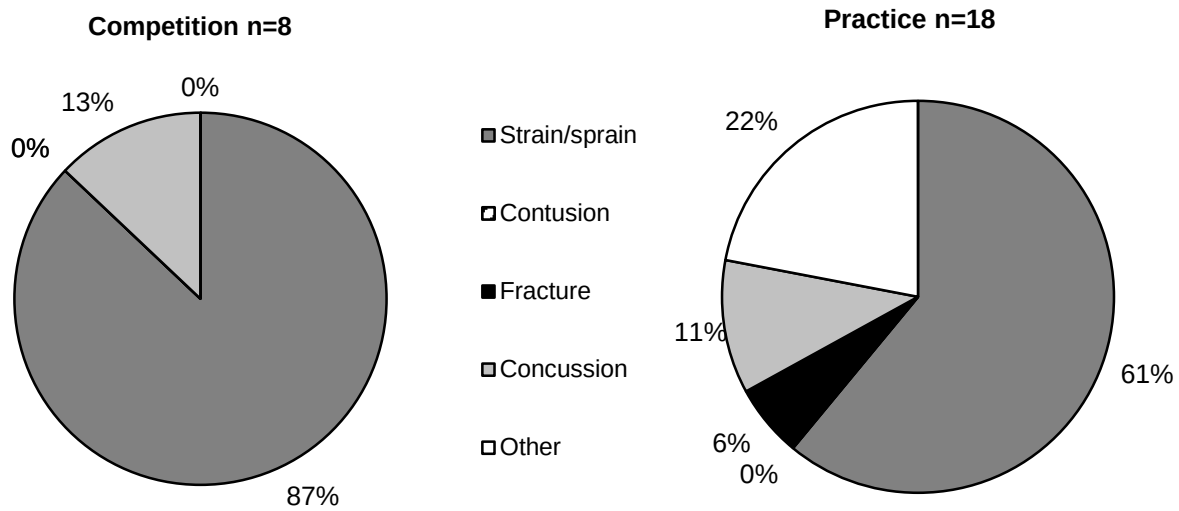


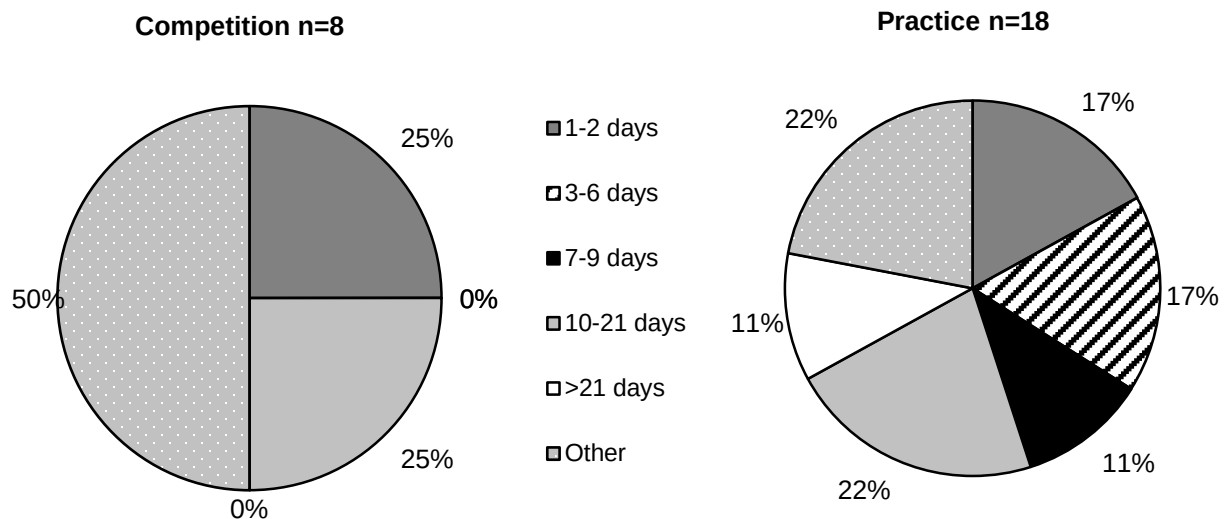
Table 14.3 Body Site of Girls' Gymnastics Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Body Site						
Ankle	3	37.5%	7	38.9%	10	38.5%
Knee	2	25.0%	3	16.7%	5	19.2%
Head/face	1	12.5%	2	11.1%	3	11.5%
Hip/thigh/upper leg	1	12.5%	1	5.6%	2	7.7%
Lower leg	0	0.0%	2	11.1%	2	7.7%
Arm/elbow	1	12.5%	1	5.6%	2	7.7%
Foot	0	0.0%	1	5.6%	1	3.8%
Shoulder	0	0.0%	1	5.6%	1	3.8%
Total	8	100%	18	100%	26	100%

Table 14.4 Ten Most Common Girls' Gymnastics Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

Diagnosis	Competition n=8		Practice n=18		Total n=26	
	n	%	n	%	n	%
Ankle strain/sprain	3	37.5%	7	38.9%	10	38.5%
Knee strain/sprain	2	25.0%	2	11.1%	4	15.4%
Head/face concussion	1	12.5%	2	11.1%	3	11.5%
Hip/thigh/upper leg strain/sprain	1	12.5%	1	5.6%	2	7.7%
Knee other	-	0.0%	1	5.6%	1	3.8%
Lower leg contusion	-	0.0%	1	5.6%	1	3.8%
Lower leg other	-	0.0%	1	5.6%	1	3.8%
Foot strain/sprain	-	0.0%	1	5.6%	1	3.8%
Arm/elbow strain/sprain	1	12.5%	-	0.0%	1	3.8%
Shoulder other	-	0.0%	1	5.6%	1	3.8%

Figure 14.2 Time Loss of Girls' Gymnastics Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 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 Girls' Gymnastics Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	2	25.0%	2	11.1%	4	15.4%
Did not require surgery	6	75.0%	16	88.9%	22	84.6%
Total	8	100%	18	100%	26	100%

Figure 14.3 History of Girls' Gymnastics Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

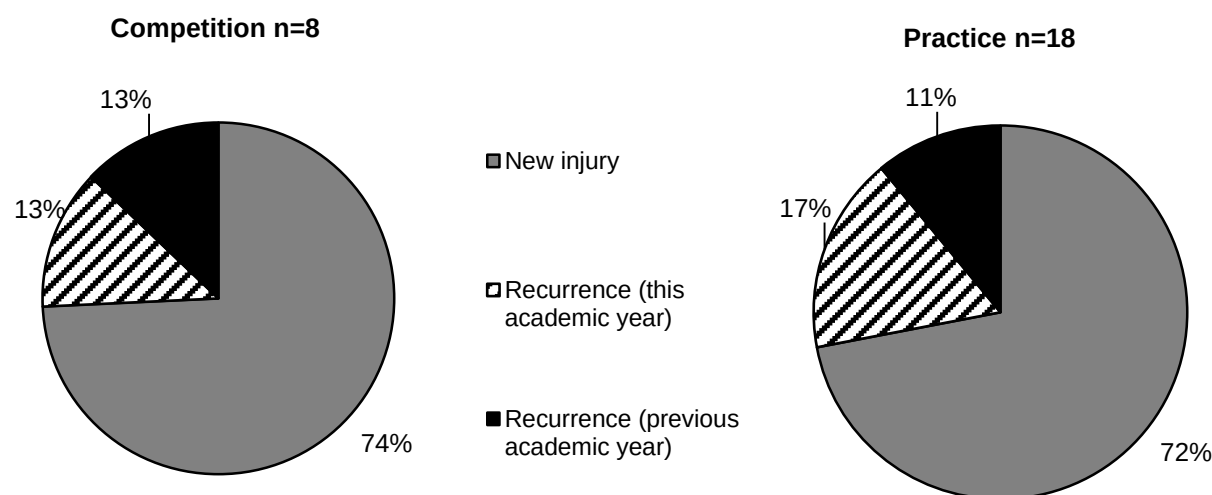


Table 14.6 Time during Season of Girls' Gymnastics Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Season		
Preseason	6	23.1%
Regular season	18	69.2%
Post season	2	7.7%
Total	26	100%

Table 14.7 Event or Apparatus for Girls' Gymnastics Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Gymnast event/apparatus		
Floor exercise	12	46.2%
Warm-up/stretching/conditioning	7	26.9%
Uneven parallel bars	3	11.5%
Vault	2	7.7%
Balance beam	1	3.8%
Other	1	3.8%
Total	26	100%

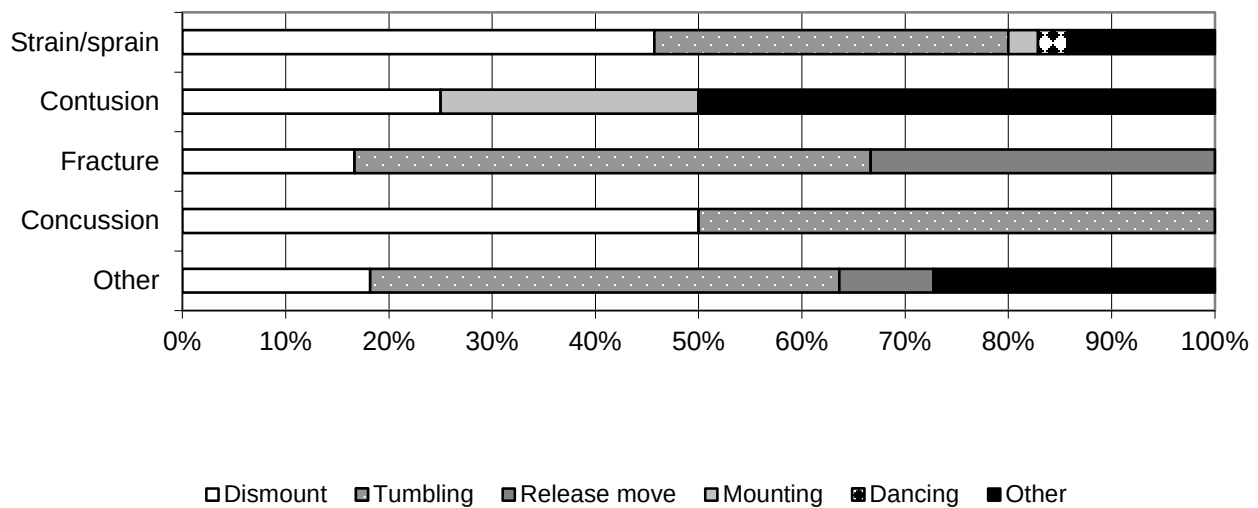
Table 14.8 Practice-Related Variables for Girls' Gymnastics Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Practice		
First 1/2 hour	2	11.1%
Second 1/2 hour	3	16.7%
1-2 hours into practice	11	61.1%
>2 hours into practice	2	11.1%
Total	18	100%

Table 14.9 Activities Leading to Girls' Gymnastics Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

Activity	Competition		Practice		Overall	
	n	%	n	%	n	%
Tumbling	3	37.5%	6	33.3%	9	34.6%
Dismount	0	0.0%	5	27.8%	5	19.2%
Dancing	3	37.5%	2	11.1%	5	19.2%
Mounting	0	0.0%	2	11.1%	2	7.7%
Release move	1	12.5%	0	0.0%	1	3.8%
Other	1	12.5%	3	16.7%	4	15.4%
Total	8	100%	18	100%	26	100%

Figure 14.4 Activity Resulting in Girls' Gymnastics Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year



XV. Boys' Ice Hockey Injury Epidemiology

Table 15.1 Boys' Ice Hockey Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete- exposures)
Total	163	73,699	2.21
Competition	134	23,794	5.63
Practice	29	49,905	0.58

Table 15.2 Demographic Characteristics of Injured Boys' Ice Hockey Athletes, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year*

Year in School	n=161
Freshman	14.3%
Sophomore	23.0%
Junior	28.6%
Senior	34.2%
Total[†]	100%
Age (years)	
Minimum	14
Maximum	19
Mean (St. Dev.)	16.6 (1.2)
BMI	
Minimum	18.2
Maximum	39.1
Mean (St. Dev.)	24.3 (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 15.1 Diagnosis of Boys' Ice Hockey Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

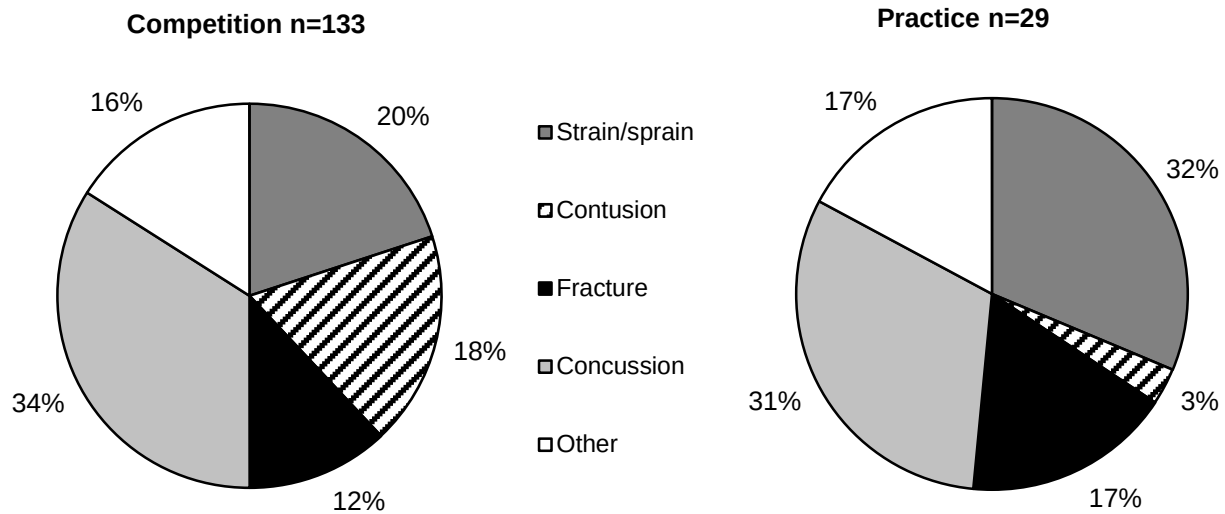


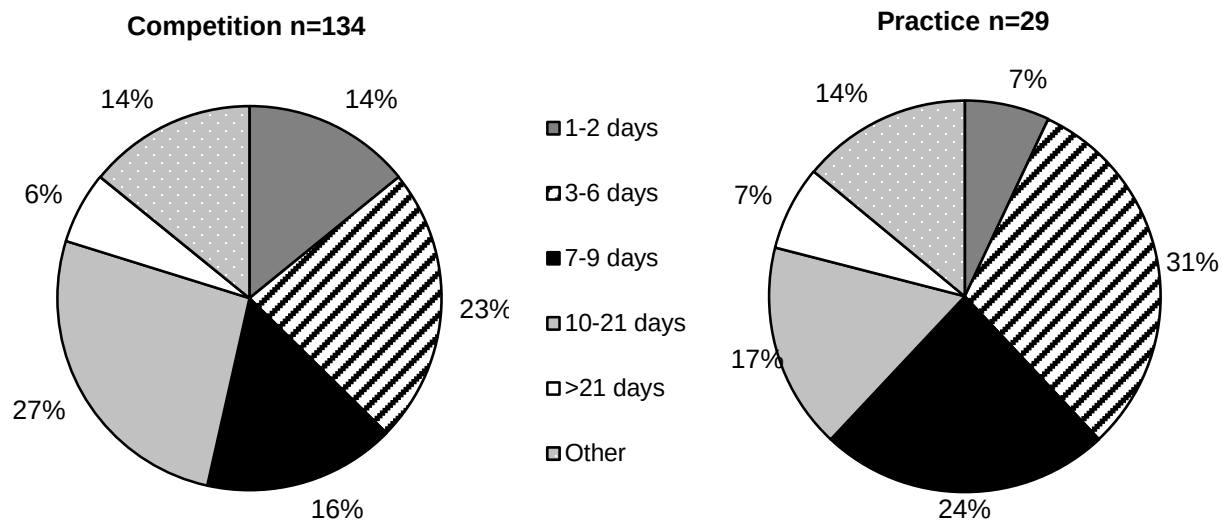
Table 15.3 Body Site of Boys' Ice Hockey Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Body Site						
Head/face	50	37.3%	10	34.5%	60	36.8%
Shoulder	18	13.4%	4	13.8%	22	13.5%
Hip/thigh/upper leg	12	9.0%	4	13.8%	16	9.8%
Hand/wrist	11	8.2%	3	10.3%	14	8.6%
Trunk	10	7.5%	3	10.3%	13	8.0%
Ankle	6	4.5%	1	3.4%	7	4.3%
Knee	6	4.5%	0	0.0%	6	3.7%
Lower leg	3	2.2%	2	6.9%	5	3.1%
Arm/elbow	3	2.2%	1	3.4%	4	2.5%
Foot	2	1.5%	1	3.4%	3	1.8%
Neck	2	1.5%	0	0.0%	2	1.2%
Other	11	8.2%	0	0.0%	11	6.7%
Total	134	100%	29	100%	163	100%

Table 15.4 Ten Most Common Boys' Ice Hockey Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

Diagnosis	Competition n=133		Practice n=29		Total n=162	
	n	%	n	%	n	%
Head/face concussion	45	33.8%	9	31.0%	54	33.3%
Shoulder other	8	6.0%	2	6.9%	10	6.2%
Shoulder strain/sprain	8	6.0%	2	6.9%	10	6.2%
Hip/thigh/upper leg contusion	10	7.5%	-	0.0%	10	6.2%
Hand/wrist fracture	7	5.3%	2	6.9%	9	5.6%
Trunk contusion	7	5.3%	-	0.0%	7	4.3%
Hip/thigh/upper leg strain/sprain	2	1.5%	3	10.3%	5	3.1%
Trunk strain/sprain	2	1.5%	3	10.3%	5	3.1%
Knee contusion	3	2.3%	-	0.0%	3	1.9%
Knee strain/sprain	3	2.3%	-	0.0%	3	1.9%

Figure 15.2 Time Loss of Boys' Ice Hockey Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 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 Boys' Ice Hockey Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	4	3.1%	2	6.9%	6	3.8%
Did not require surgery	126	96.9%	27	93.1%	153	96.2%
Total	130	100%	29	100%	159	100%

Figure 15.3 History of Boys' Ice Hockey Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

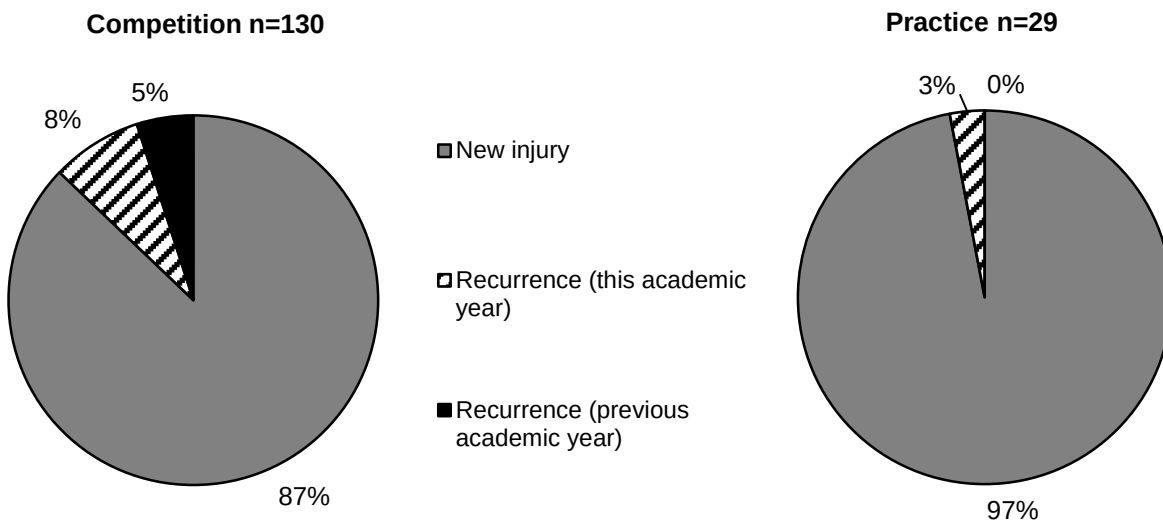


Table 15.6 Time during Season of Boys' Ice Hockey Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Season		
Preseason	16	9.8%
Regular season	143	87.7%
Post season	4	2.5%
Total	163	100%

Table 15.7 Competition-Related Variables for Boys' Ice Hockey Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Competition		
Warm-ups	1	0.8%
First period	26	20.2%
Second period	56	43.4%
Third period	46	35.7%
Overtime	-	0.0%
Total	129	100%
Rink Location		
Between goal line and blue line	47	36.2%
Corner	31	23.8%
Neutral zone	27	20.8%
Behind goal	13	10.0%
Goal area	5	3.8%
Face-off circle	4	3.1%
Bench	1	0.8%
Other	2	1.5%
Total	130	100%

Table 15.8 Practice-Related Variables for Boys' Ice Hockey Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Practice		
First 1/2 hour	2	6.9%
Second 1/2 hour	8	27.6%
1-2 hours into practice	15	51.7%
>2 hours into practice	4	13.8%
Total	29	100%

Figure 15.4 Player Position of Boys' Ice Hockey Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

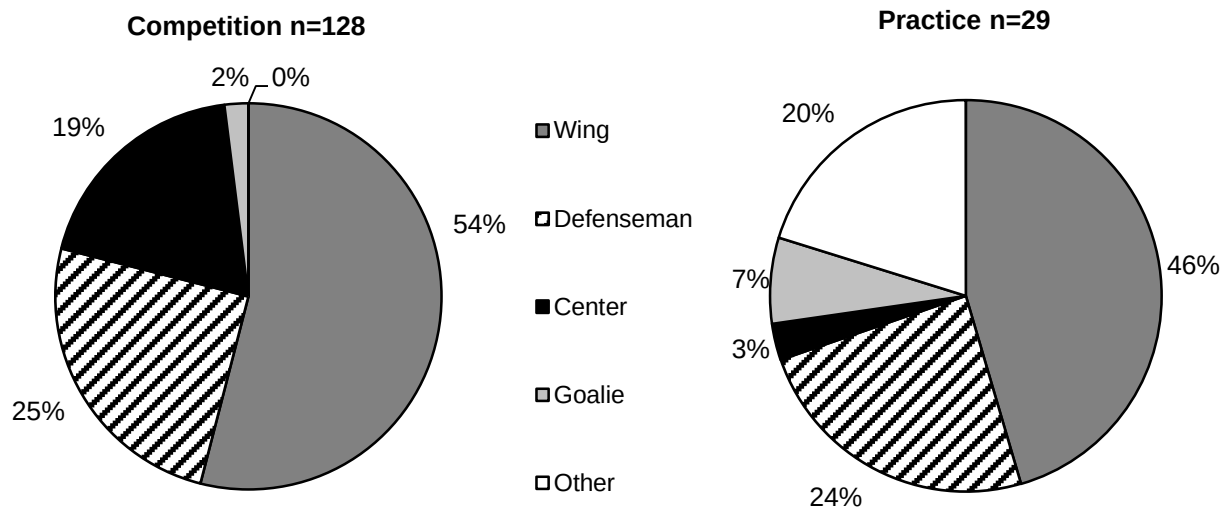
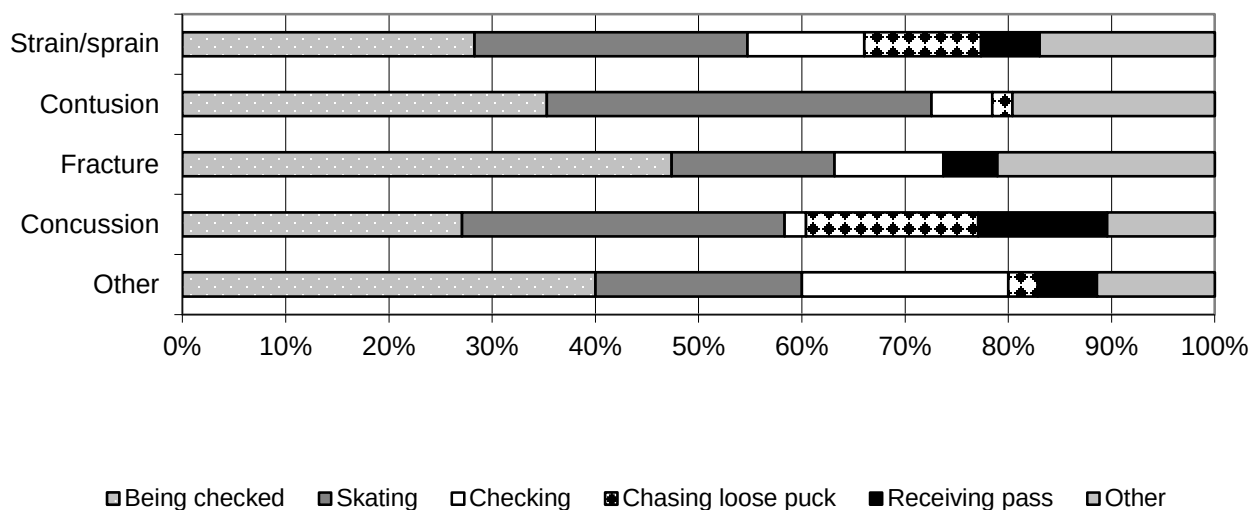


Table 15.9 Activities Leading to Boys' Ice Hockey Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

Activity	Competition		Practice		Overall	
	n	%	n	%	n	%
Being checked	55	42.3%	4	13.8%	59	37.1%
Skating	29	22.3%	11	37.9%	40	25.2%
Chasing loose puck	14	10.8%	8	27.6%	22	13.8%
Checking	17	13.1%	1	3.4%	18	11.3%
Receiving pass	6	4.6%	2	6.9%	8	5.0%
Goaltending	3	2.3%	2	6.9%	5	3.1%
Passing	2	1.5%	1	3.4%	3	1.9%
Shooting	1	0.8%	0	0.0%	1	0.6%
Other	3	2.3%	0	0.0%	3	1.9%
Total	130	100%	29	100%	159	100%

Figure 15.5 Activity Resulting in Boys' Ice Hockey Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year



XVI. Boys' Lacrosse Injury Epidemiology

Table 16.1 Boys' Lacrosse Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	205	108,001	1.90
Competition	124	32,344	3.83
Practice	81	75,657	1.07

Table 16.2 Demographic Characteristics of Injured Boys' Lacrosse Athletes, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year*

Year in School	n=200
Freshman	20.5%
Sophomore	27.0%
Junior	23.0%
Senior	29.5%
Total[†]	100%
Age (years)	
Minimum	13
Maximum	18
Mean (St. Dev.)	16.2 (1.3)
BMI	
Minimum	18.0
Maximum	38.3
Mean (St. Dev.)	24.2 (3.3)

*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 16.1 Diagnosis of Boys' Lacrosse Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

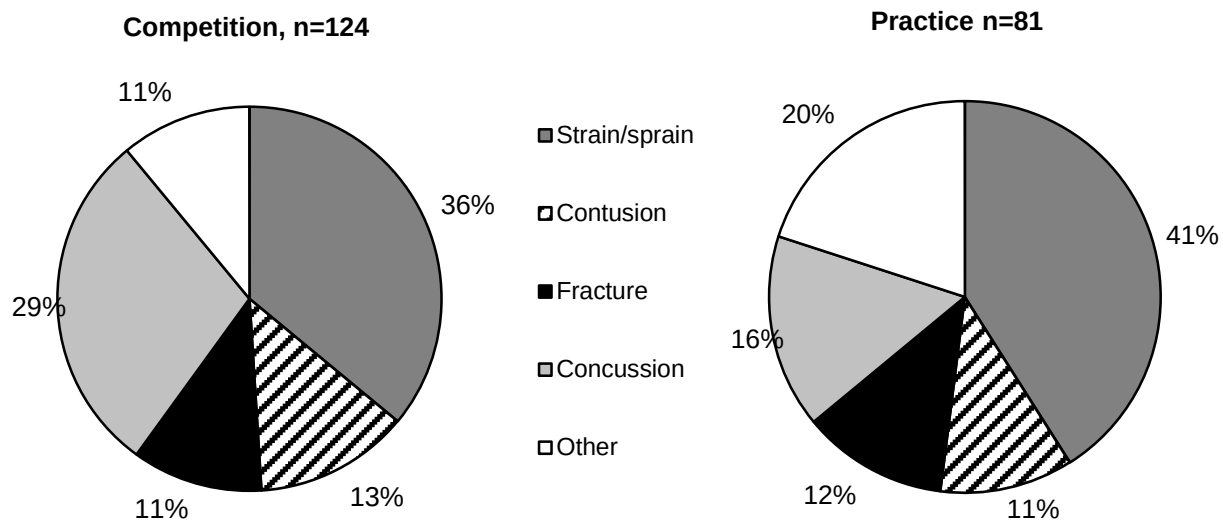


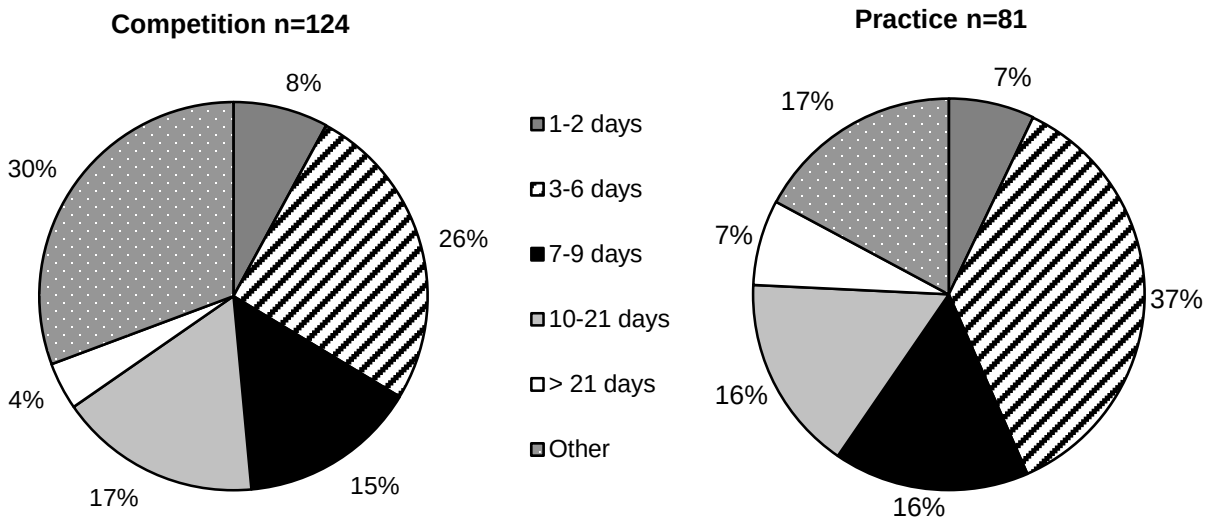
Table 16.3 Body Site of Boys' Lacrosse Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Body Site						
Head/face	35	28.5%	13	16.0%	48	23.5%
Knee	19	15.4%	13	16.0%	32	15.7%
Hip/thigh/upper leg	12	9.8%	14	17.3%	26	12.7%
Ankle	17	13.8%	5	6.2%	22	10.8%
Hand/wrist	12	9.8%	8	9.9%	20	9.8%
Trunk	9	7.3%	3	3.7%	12	5.9%
Lower leg	3	2.4%	7	8.6%	10	4.9%
Shoulder	7	5.7%	3	3.7%	10	4.9%
Arm/elbow	3	2.4%	2	2.5%	5	2.5%
Neck	1	0.8%	4	4.9%	5	2.5%
Foot	0	0.0%	4	4.9%	4	2.0%
Other	5	4.1%	5	6.2%	10	4.9%
Total	123	100%	81	100%	204	100%

Table 16.4 Ten Most Common Boys' Lacrosse Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

Diagnosis	Competition n=123		Practice n=81		Total n=204	
	n	%	n	%	n	%
Head/face concussion	35	28.5%	13	16.0%	48	23.5%
Hip/thigh/upper leg strain/sprain	11	8.9%	13	16.0%	24	11.8%
Ankle strain/sprain	16	13.0%	5	6.2%	21	10.3%
Knee strain/sprain	10	8.1%	6	7.4%	16	7.8%
Hand/wrist fracture	6	4.9%	6	7.4%	12	5.9%
Shoulder other	4	3.3%	2	2.5%	6	2.9%
Trunk contusion	4	3.3%	1	1.2%	5	2.5%
Lower leg other	-	0.0%	5	6.2%	5	2.5%
Trunk other	4	3.3%	-	0.0%	4	2.0%
Shoulder sprain/strain	2	1.6%	-	0.0%	2	1.0%

Figure 16.2 Time Loss of Boys' Lacrosse Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 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' Lacrosse Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	9	7.6%	6	7.7%	15	7.6%
Did not require surgery	110	92.4%	72	92.3%	182	92.4%
Total	119	100%	78	100%	197	100%

Figure 16.3 History of Boys' Lacrosse Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

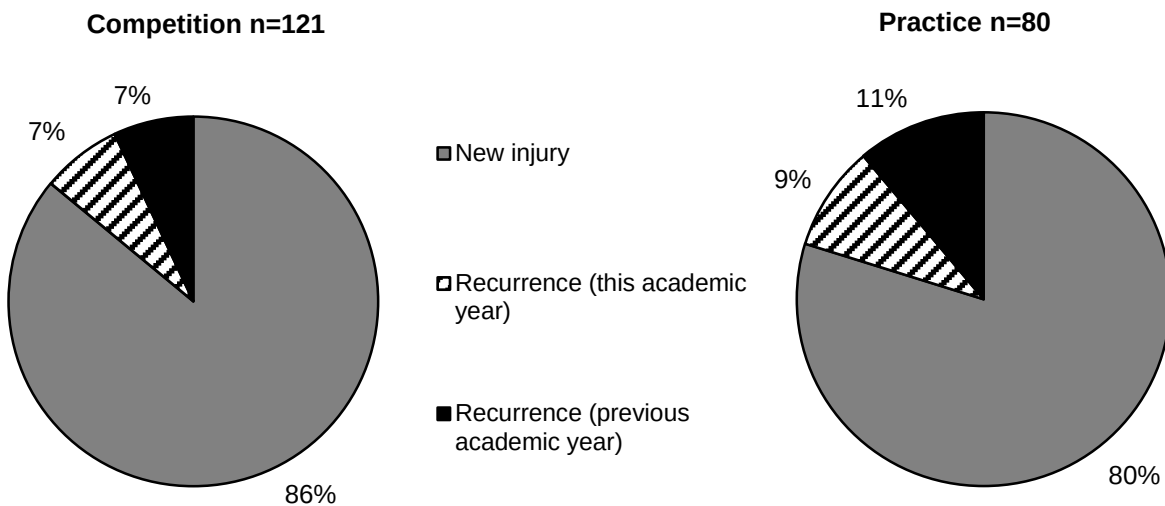


Table 16.6 Time during Season of Boys' Lacrosse Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Season		
Preseason	49	24.0%
Regular season	152	74.5%
Post season	3	1.5%
Total	204	100%

Table 16.7 Competition-Related Variables for Boys' Lacrosse Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Competition		
Pre-competition/warm-ups	2	1.8%
First quarter	11	9.9%
Second quarter	30	27.0%
Third quarter	38	34.2%
Fourth quarter	30	27.0%
Overtime	-	0.0%
Total	111	100%
Field Location		
Midfield	39	33.9%
Goal area	34	29.6%
Wing area	20	17.4%
Defensive area	19	16.5%
Sideline	3	2.6%
Total	115	100%

Table 16.8 Practice-Related Variables for Boys' Lacrosse Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Practice		
First ½ hour	11	14.7%
Second ½ hour	17	22.7%
1-2 hours into practice	42	56.0%
> 2 hours into practice	5	6.7%
Total	75	100%

Figure 16.4 Player Position of Boys' Lacrosse Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

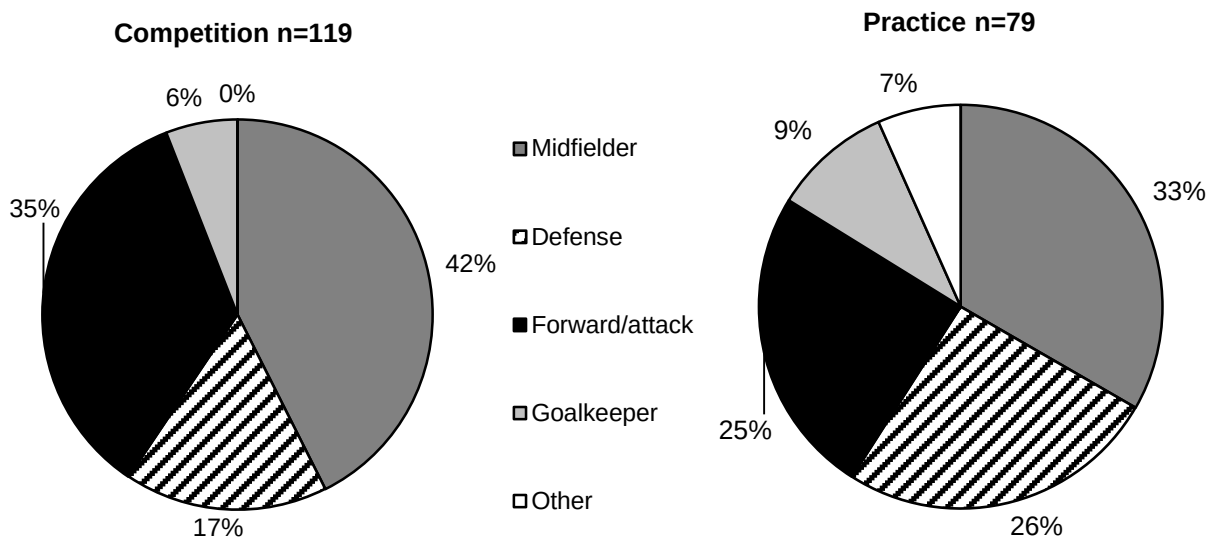
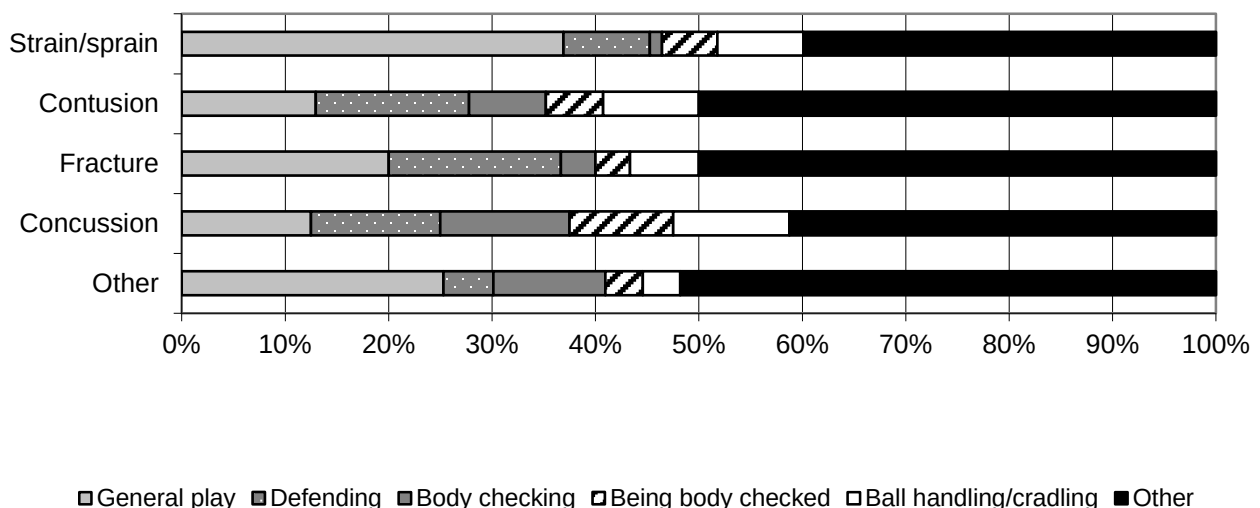


Table 16.9 Activities Leading to Boys' Lacrosse Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

Activity	Competition		Practice		Overall	
	n	%	n	%	n	%
General play	17	14.4%	21	26.9%	38	19.4%
Being body checked	15	12.7%	5	6.4%	20	10.2%
Defending	12	10.2%	7	9.0%	19	9.7%
Chasing loose ball	10	8.5%	6	7.7%	16	8.2%
Being crosse/stick checked	9	7.6%	6	7.7%	15	7.7%
Shooting	10	8.5%	3	3.8%	13	6.6%
Passing	7	5.9%	4	5.1%	11	5.6%
Body checking	7	5.9%	4	5.1%	11	5.6%
Receiving pass	7	5.9%	2	2.6%	9	4.6%
Conditioning	0	0.0%	9	11.5%	9	4.6%
Ball handling/cradling	5	4.2%	3	3.8%	8	4.1%
Goaltending	6	5.1%	2	2.6%	8	4.1%
Face-off	6	5.1%	1	1.3%	7	3.6%
Crosse/stick checking	5	4.2%	1	1.3%	6	3.1%
Other	2	1.7%	4	5.1%	6	3.2%
Total	118	100%	78	100%	196	100%

Figure 16.5 Activity Resulting in Boys' Lacrosse Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year



XVII. Girls' Lacrosse Injury Epidemiology

Table 17.1 Girls' Lacrosse Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete- exposures)
Total	104	74,545	1.40
Competition	50	22,727	2.20
Practice	54	51,818	1.04

Table 17.2 Demographic Characteristics of Injured Girls' Lacrosse Athletes, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year*

Year in School	n=103
Freshman	19.4%
Sophomore	33.0%
Junior	19.4%
Senior	28.2%
Total	100%
Age (years)	
Minimum	13
Maximum	18
Mean (St. Dev.)	16.1 (1.3)
BMI	
Minimum	16.1
Maximum	29.1
Mean (St. Dev.)	21.8 (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 17.1 Diagnosis of Girls' Lacrosse Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

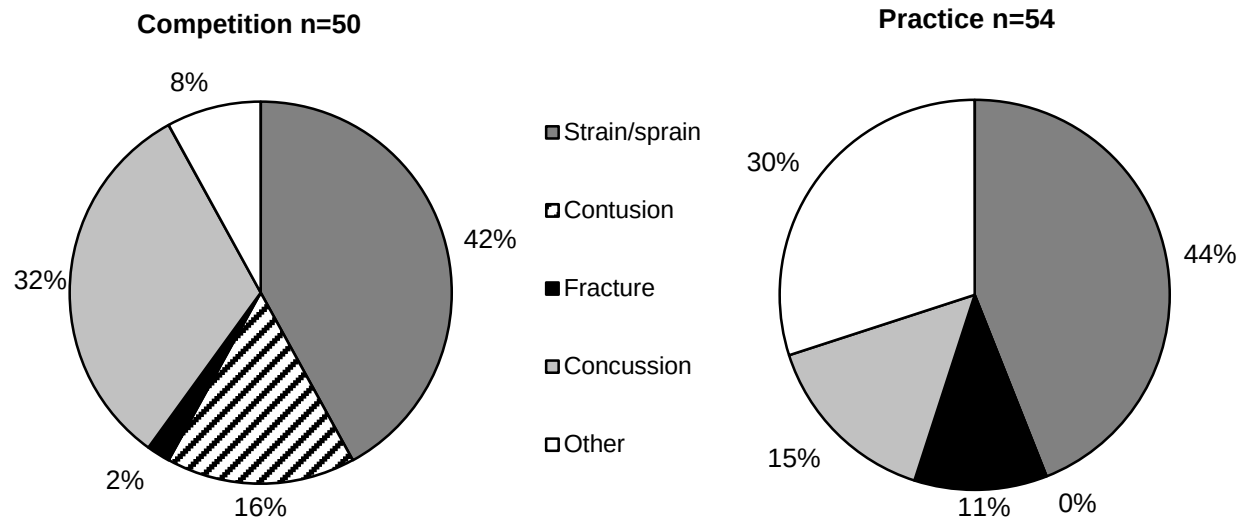


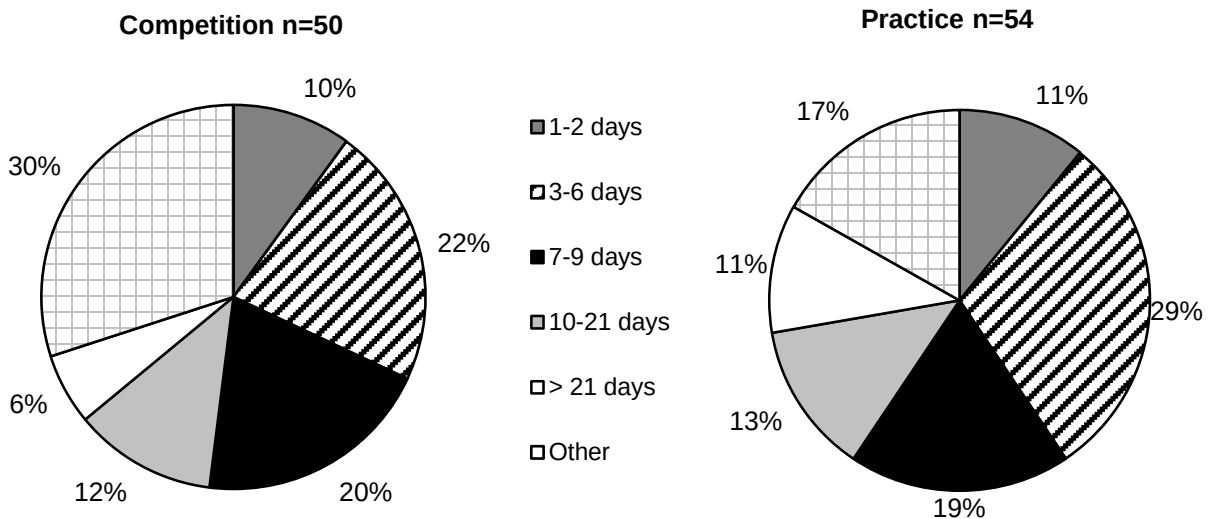
Table 17.3 Body Site of Girls' Lacrosse Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Body Site						
Head/face	18	37.5%	9	16.7%	27	26.5%
Lower leg	4	8.3%	12	22.2%	16	15.7%
Knee	8	16.7%	6	11.1%	14	13.7%
Ankle	8	16.7%	6	11.1%	14	13.7%
Hip/thigh/upper leg	2	4.2%	9	16.7%	11	10.8%
Hand/wrist	5	10.4%	4	7.4%	9	8.8%
Foot	0	0.0%	4	7.4%	4	3.9%
Trunk	0	0.0%	2	3.7%	2	2.0%
Arm/elbow	2	4.2%	0	0.0%	2	2.0%
Neck	1	2.1%	0	0.0%	1	1.0%
Other	0	0.0%	2	3.7%	2	2.0%
Total	48	100%	54	100%	102	100%

Table 17.4 Ten Most Common Girls' Lacrosse Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

Diagnosis	Competition n=48		Practice n=54		Total n=102	
	n	%	n	%	n	%
Head/face concussion	16	33.3%	8	14.8%	24	23.5%
Ankle strain/sprain	8	16.7%	6	11.1%	14	13.7%
Hip/thigh/upper leg strain/sprain	1	2.1%	7	13.0%	8	7.8%
Knee strain/sprain	7	14.6%	1	1.9%	8	7.8%
Lower leg strain/sprain	-	0.0%	6	11.1%	6	5.9%
Knee other	-	0.0%	5	9.3%	5	4.9%
Lower leg other	1	2.1%	4	7.4%	5	4.9%
Hand/wrist fracture	-	0.0%	2	3.7%	2	2.0%
Trunk strain/sprain	-	0.0%	1	1.9%	1	1.0%
Foot stain/sprain	-	0.0%	1	1.9%	1	1.0%

Figure 17.2 Time Loss of Girls' Lacrosse Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 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' Lacrosse Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	7	10.0%	2	3.7%	9	8.7%
Did not require surgery	43	86.0%	52	96.3%	95	91.3%
Total	50	100%	54	100%	104	100%

Figure 17.3 History of Girls' Lacrosse Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

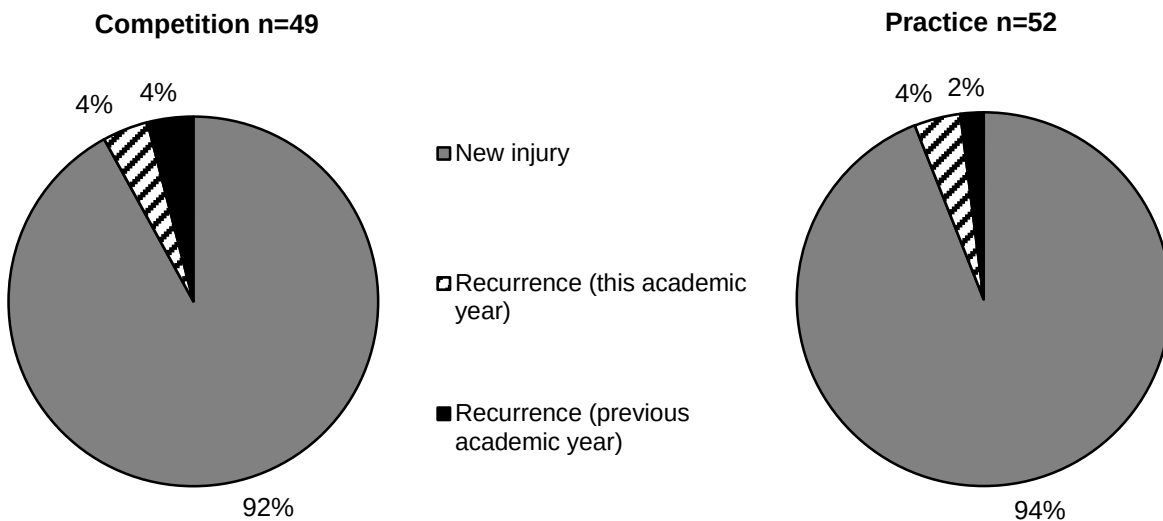


Table 17.6 Time during Season of Girls' Lacrosse Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Season		
Preseason	26	25.5%
Regular season	74	72.5%
Post season	2	2.0%
Total	102	100%

Table 17.7 Competition-Related Variables for Girls' Lacrosse Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Competition		
Pre-Competition-Warm-ups	3	6.4%
First half	10	21.3%
Second half	34	72.3%
Overtime	-	0.0%
Total	47	100%
Field Location		
Midfield (between restraining lines)	26	55.3%
Critical scoring area (including the fan and arc)	13	27.7%
Goal circle	4	8.5%
Center circle	2	4.3%
Sideline	2	4.3%
Total	47	100%

Table 17.8 Practice-Related Variables for Girls' Lacrosse Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Practice		
First 1/2 hour	10	20.8%
Second 1/2 hour	12	25.0%
1-2 hours into practice	21	43.8%
>2 hours into practice	5	10.4%
Total	48	100%

Figure 17.4 Player Position of Girls' Lacrosse Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

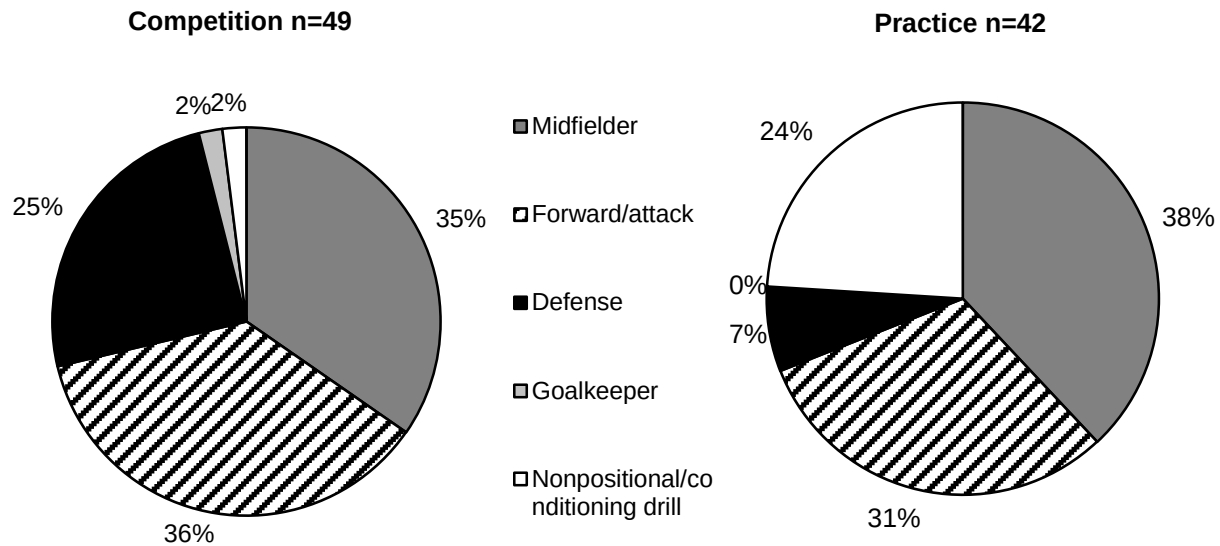
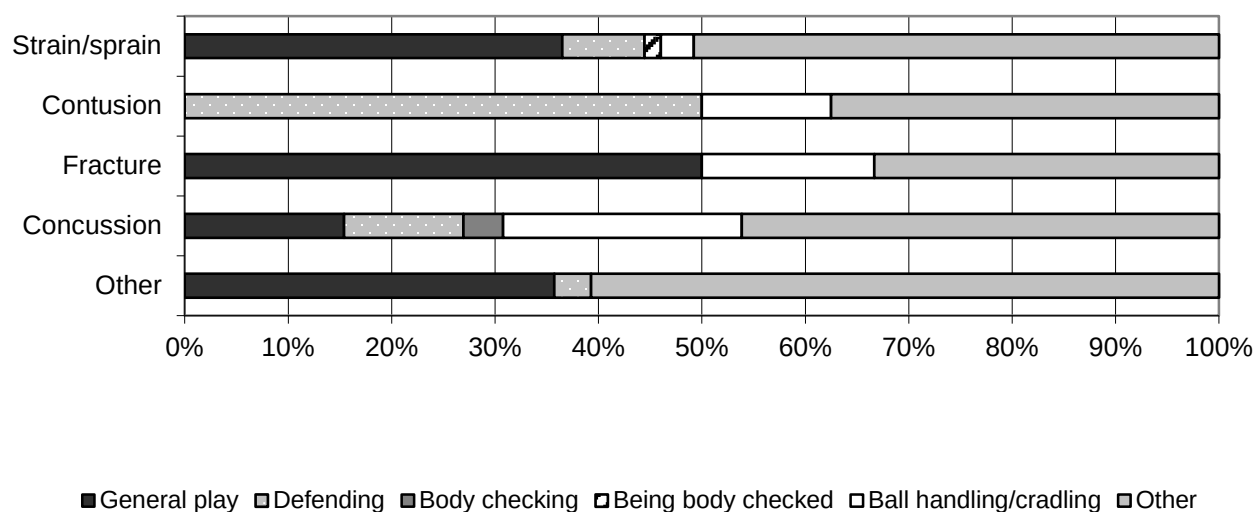


Table 17.9 Activities Leading to Girls' Lacrosse Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

Activity	Competition		Practice		Overall	
	n	%	n	%	n	%
Conditioning	0	0.0%	16	39.0%	16	17.8%
General play	11	22.4%	2	4.9%	13	14.4%
Receiving pass	6	12.2%	6	14.6%	12	13.3%
Chasing loose ball	6	12.2%	5	12.2%	11	12.2%
Defending	8	16.3%	2	4.9%	10	11.1%
Ball handling/cradling	6	12.2%	1	2.4%	7	7.8%
Shooting	3	6.1%	1	2.4%	4	4.4%
Being crosse/stick checked	4	8.2%	0	0.0%	4	4.4%
Passing	2	4.1%	0	0.0%	2	2.2%
Being body checked	1	2.0%	1	2.4%	2	2.2%
Blocking shot	1	2.0%	1	2.4%	2	2.2%
Goaltending	1	2.0%	0	0.0%	1	1.1%
Other	0	0.0%	6	14.6%	6	6.7%
Total	49	100%	41	100%	90	100%

Figure 17.5 Activity Resulting in Girls' Lacrosse Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year



XVIII. Boys' Swimming and Diving Injury Epidemiology

Table 18.1 Boys' Swimming and Diving Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete- exposures)
Total	14	75,979	0.18
Competition	1	15,269	0.07
Practice	13	60,710	0.21

Table 18.2 Demographic Characteristics of Injured Boys' Swimming and Diving Athletes, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year*

Year in School	n=14
Freshman	21.4%
Sophomore	28.6%
Junior	14.3%
Senior	35.7%
Total†	100%
Age (years)	
Minimum	15
Maximum	17
Mean (St. Dev.)	16.0 (1.0)
BMI	
Minimum	14.7
Maximum	32.6
Mean (St. Dev.)	22.8 (4.9)

*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 18.1 Diagnosis of Boys' Swimming and Diving Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

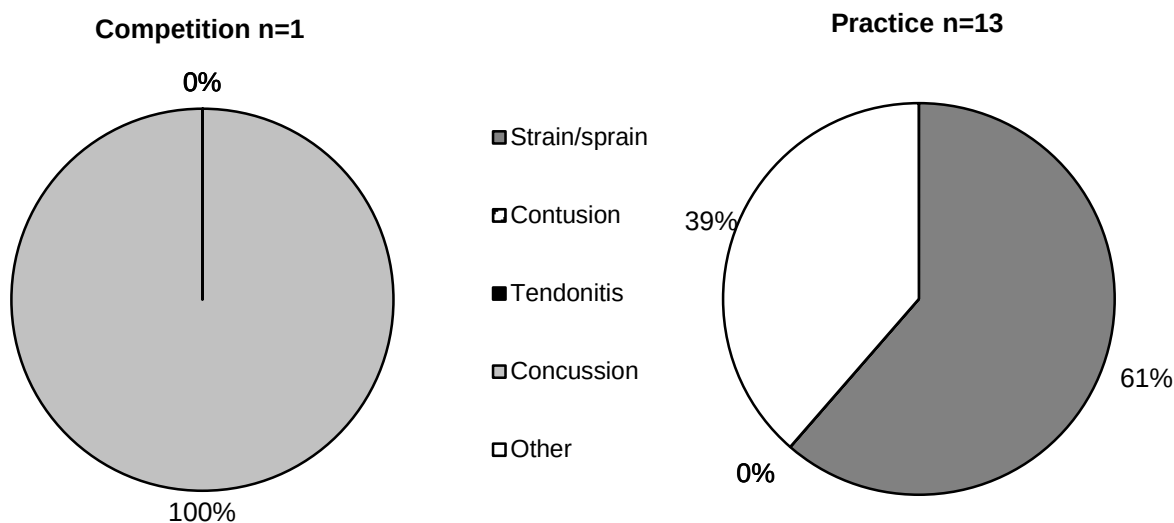


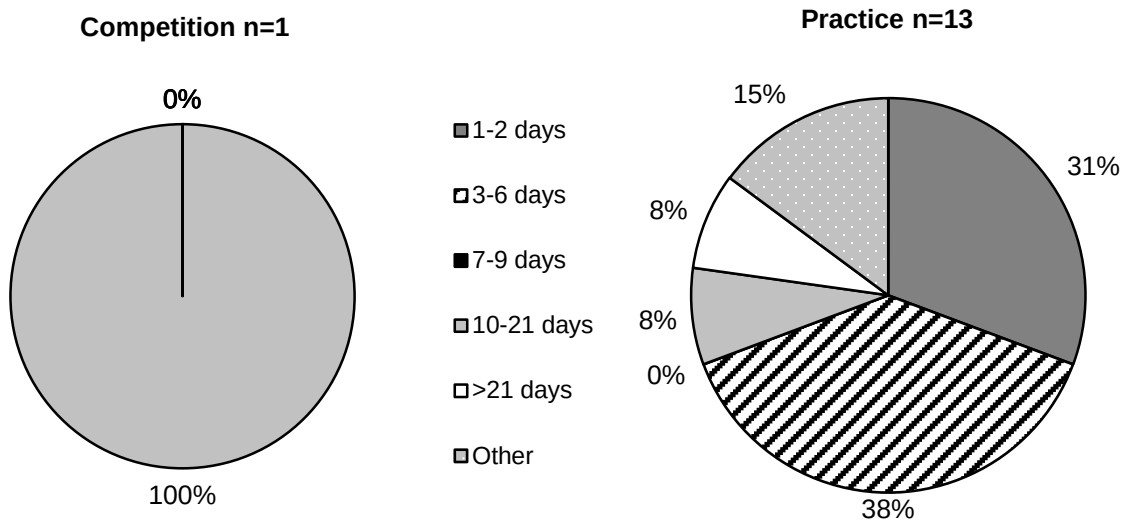
Table 18.3 Body Site of Boys' Swimming and Diving Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Body Site						
Shoulder	0	0.0%	7	53.8%	7	50.0%
Knee	0	0.0%	1	7.7%	1	7.1%
Head/face	1	100.0%	0	0.0%	1	7.1%
Arm/elbow	0	0.0%	1	7.7%	1	7.1%
Trunk	0	0.0%	3	23.1%	3	21.4%
Other	0	0.0%	1	7.7%	1	7.1%
Total	1	100%	13	100%	14	100%

Table 18.4 Ten Most Common Boys' Swimming and Diving Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

Diagnosis	Competition n=1		Practice n=13		Total n=14	
	n	%	n	%	n	%
Head/face concussion	1	100.0%	-	0.0%	1	7.1%
Knee strain/sprain	-	0.0%	1	7.7%	1	7.1%
Shoulder strain/sprain	-	0.0%	4	30.8%	4	28.6%
Trunk strain/sprain	-	0.0%	2	15.4%	2	14.3%
Shoulder other	-	0.0%	3	23.1%	3	21.4%
Arm/elbow other	-	0.0%	1	7.7%	1	7.1%
Trunk other	-	0.0%	1	7.7%	1	7.1%

Figure 18.2 Time Loss of Boys' Swimming and Diving Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 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' Swimming and Diving Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	0	0.0%	1	7.7%	1	7.1%
Did not require surgery	1	100.0%	12	92.3%	13	92.9%
Total	1	100%	13	100%	14	100%

Figure 18.3 History of Boys' Swimming and Diving Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

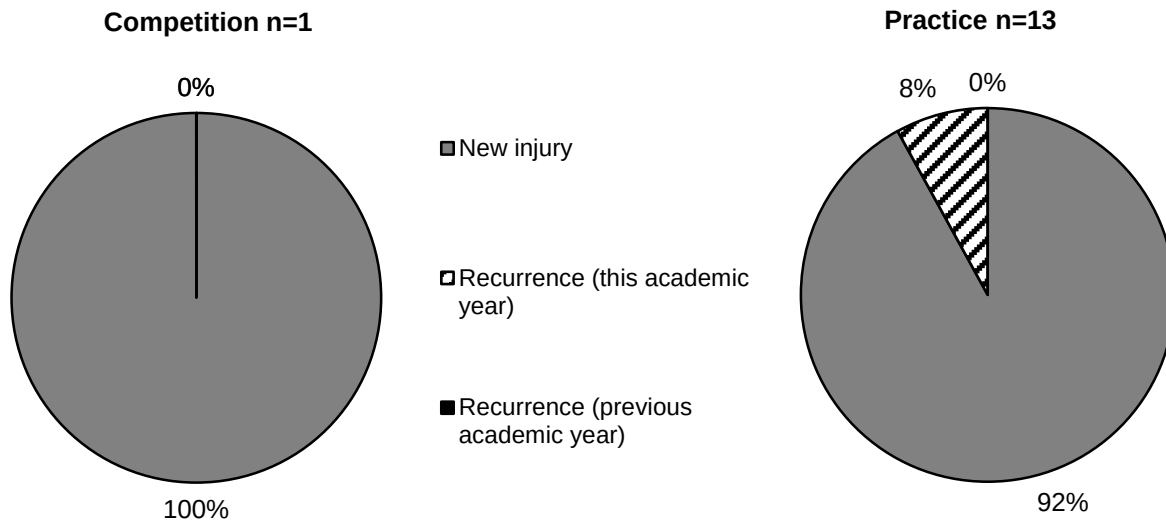


Table 18.6 Time during Season of Boys' Swimming and Diving Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Season		
Preseason	5	35.7%
Regular season	9	64.3%
Post season	-	0.0%
Total	14	100%

Table 18.7 Pool Location for Boys' Swimming and Diving Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Pool Location		
Starting platform	-	0.0%
In pool	13	92.9%
Poolside	-	0.0%
Other	-	0.0%
Total	14	100%

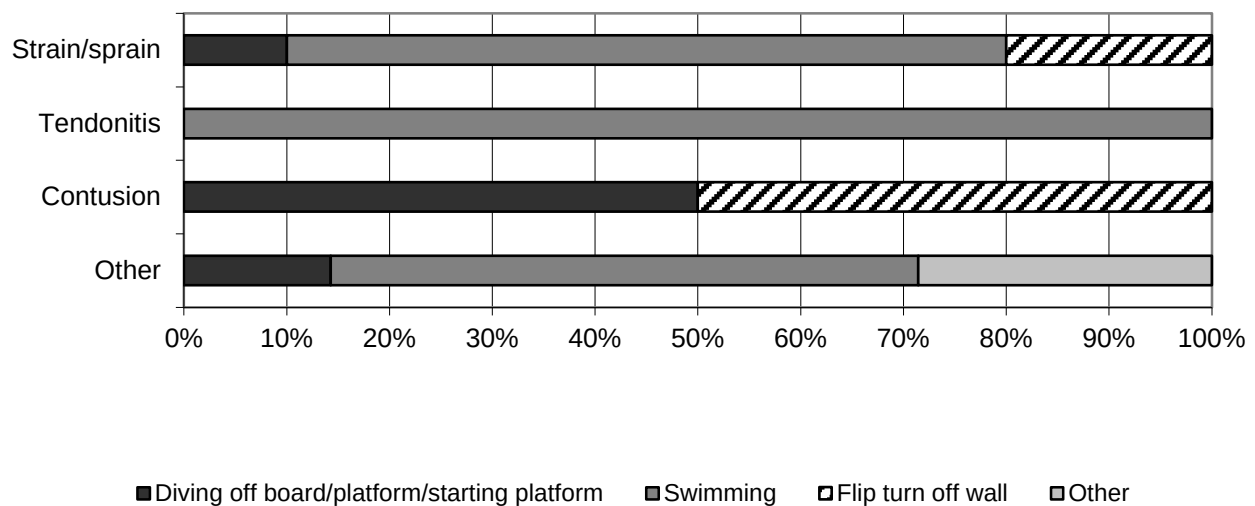
Table 18.8 Practice-Related Variables for Boys' Swimming and Diving Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Practice		
First 1/2 hour	3	23.1%
Second 1/2 hour	3	23.1%
1-2 hours into practice	5	38.5%
>2 hours into practice	2	15.4%
Total	13	100%

Table 18.9 Activities Leading to Boys' Swimming and Diving Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

Activity	Competition		Practice		Overall	
	n	%	n	%	n	%
Swimming	0	0.0%	11	84.6%	11	78.6%
Diving off board/platform/block	0	0.0%	1	7.7%	1	7.1%
Flip turn off wall	1	100.0%	0	0.0%	1	7.1%
Other	0	0.0%	1	7.7%	1	7.1%
Total	1	100%	13	100%	14	100%

Figure 18.4 Activity Resulting in Boys' Swimming and Diving Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year



XIX. Girls' Swimming and Diving Injury Epidemiology

Table 19.1 Girls' Swimming and Diving Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete- exposures)
Total	22	81,334	0.27
Competition	6	15,864	0.38
Practice	16	65,470	0.24

Table 19.2 Demographic Characteristics of Injured Girls' Swimming and Diving Athletes, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year*

Year in School	n=22
Freshman	27.3%
Sophomore	18.2%
Junior	36.4%
Senior	18.2%
Total[†]	100%
Age (years)	
Minimum	14
Maximum	18
Mean (St. Dev.)	15.9 (1.5)
BMI	
Minimum	15.0
Maximum	29.6
Mean (St. Dev.)	20.6 (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 19.1 Diagnosis of Girls' Swimming and Diving Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

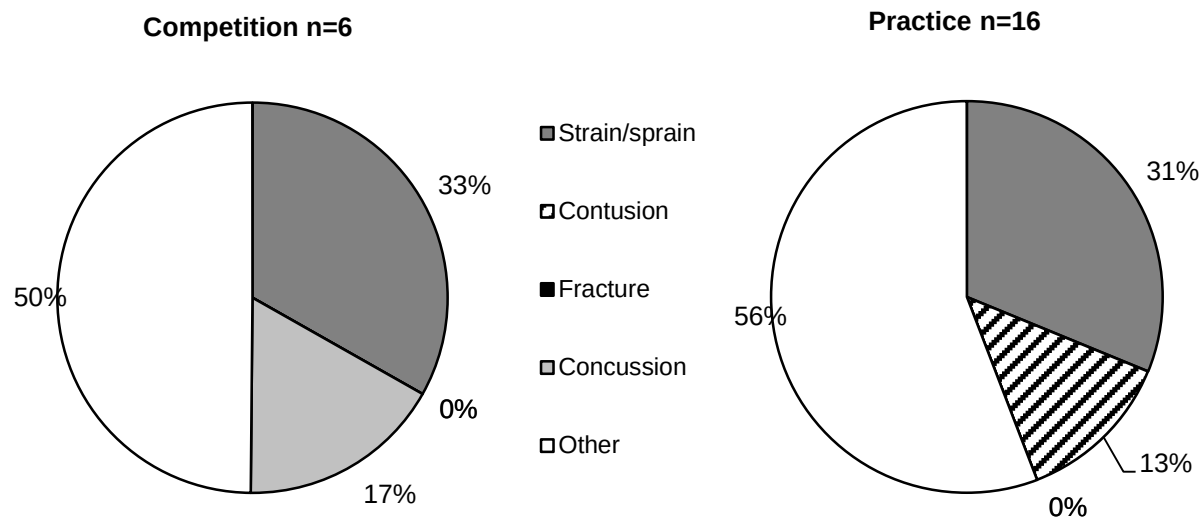


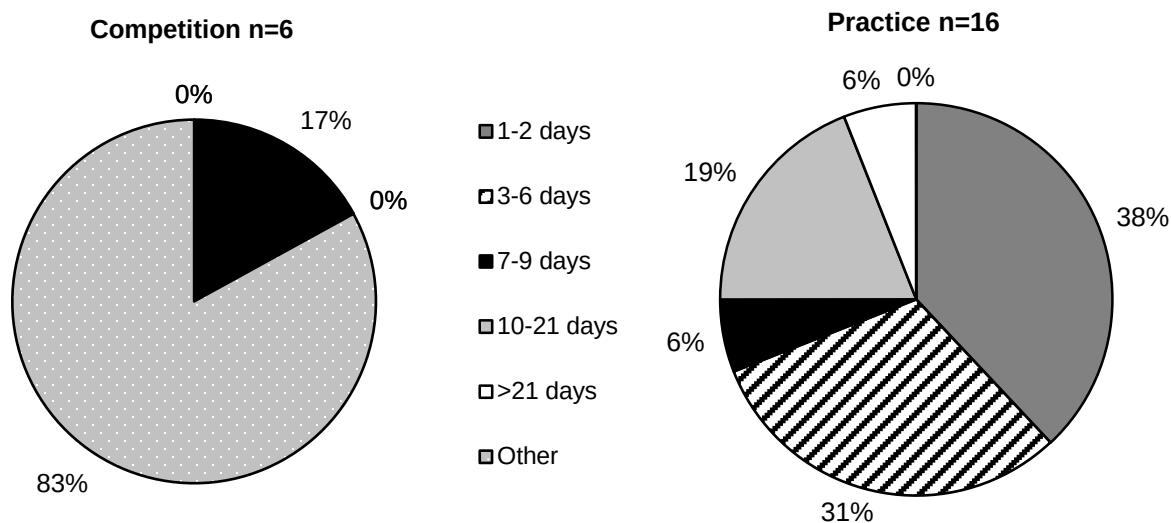
Table 19.3 Body Site of Girls' Swimming and Diving Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Body Site						
Shoulder	2	33.3%	5	31.3%	7	31.8%
Trunk	1	16.7%	3	18.8%	4	18.2%
Knee	1	16.7%	2	12.5%	3	13.6%
Head/face	1	16.7%	1	6.3%	2	9.1%
Neck	1	16.7%	1	6.3%	2	9.1%
Foot	0	0.0%	1	6.3%	1	4.5%
Arm/elbow	0	0.0%	1	6.3%	1	4.5%
Other	0	0.0%	2	12.5%	2	9.1%
Total	6	100%	16	100%	22	100%

Table 19.4 Ten Most Common Girls' Swimming and Diving Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

Diagnosis	Competition n=6		Practice n=16		Total n=22	
	n	%	n	%	n	%
Shoulder other	1	16.7%	3	18.8%	4	18.2%
Shoulder strain/sprain	1	16.7%	2	12.5%	3	13.6%
Trunk strain/sprain	1	16.7%	1	6.3%	2	9.1%
Trunk other	-	0.0%	2	12.5%	2	9.1%
Head/face contusions	-	0.0%	1	6.3%	1	4.5%
Knee strain/sprain	-	0.0%	1	6.3%	1	4.5%
Head/face concussion	1	16.7%	-	0.0%	1	4.5%
Foot other	-	0.0%	1	6.3%	1	4.5%
Knee contusion	-	0.0%	1	6.3%	1	4.5%
Knee other	1	16.7%	-	0.0%	1	4.5%
Arm/elbow other	-	0.0%	1	6.3%	1	4.5%
Neck strain/sprain	-	0.0%	1	6.3%	1	4.5%
Neck other	1	16.7%	-	0.0%	1	4.5%

Figure 19.2 Time Loss of Girls' Swimming and Diving Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 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' Swimming and Diving Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	1	20.0%	0	0.0%	1	4.8%
Did not require surgery	4	80.0%	16	100.0%	20	95.2%
Total	5	100%	16	100%	21	100%

Figure 19.3 History of Girls' Swimming and Diving Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

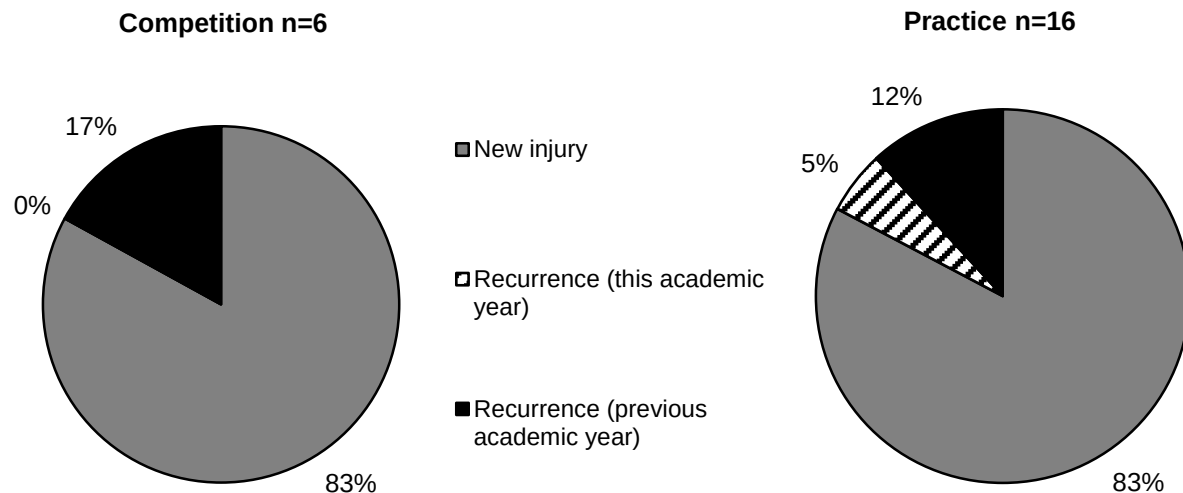


Table 19.6 Time during Season of Girls' Swimming and Diving Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Season		
Preseason	6	27.3%
Regular season	14	63.6%
Post season	2	9.1%
Total	22	100%

Table 19.7 Competition-Related Variables for Girls' Swimming and Diving Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Pool Location		
In pool	19	86.4%
Poolside	3	13.6%
Starting platform/board/blocks	-	0.0%
Other	-	0.0%
Total	22	100%

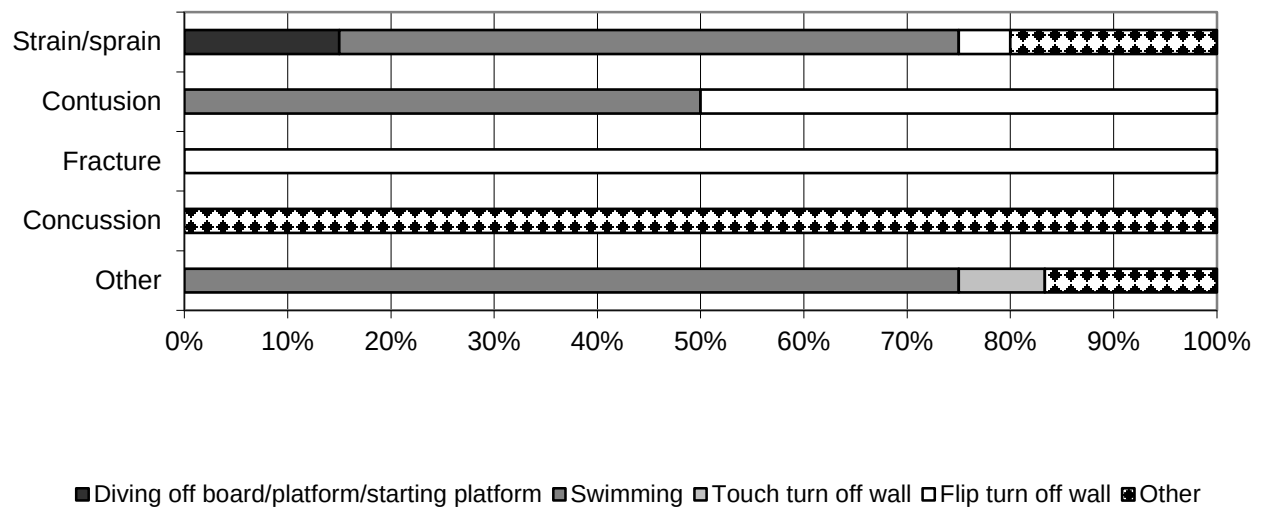
Table 19.8 Practice-Related Variables for Girls' Swimming and Diving Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Practice		
First 1/2 hour	5	31.3%
Second 1/2 hour	4	25.0%
1-2 hours into practice	7	43.8%
>2 hours into practice	-	0.0%
Total	16	100%

Table 19.9 Activities Leading to Girls' Swimming and Diving Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Activity						
Swimming	5	83.3%	10	62.5%	15	68.2%
Flip turn off wall	0	0.0%	3	18.8%	3	13.6%
Diving off board/platform/block	0	0.0%	1	6.3%	1	4.5%
Using kickboard	0	0.0%	1	6.3%	1	4.5%
Other	1	16.7%	1	6.3%	2	9.1%
Total	6	100%	16	100%	22	100%

Figure 19.4 Activity Resulting in Girls' Swimming and Diving Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year



XX. Boys' Track and Field Injury Epidemiology

Table 20.1 Boys' Track and Field Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	135	237,419	0.57
Competition	49	45,036	1.09
Practice	86	192,383	0.45

Table 20.2 Demographic Characteristics of Injured Boys' Track and Field Athletes, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year*

Year in School	n=135
Freshman	17.8%
Sophomore	31.9%
Junior	22.2%
Senior	28.1%
Total[†]	100%
Age (years)	
Minimum	14
Maximum	18
Mean (St. Dev.)	16.4 (1.3)
BMI	
Minimum	18.1
Maximum	30.2
Mean (St. Dev.)	22.7 (2.4)

*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 20.1 Diagnosis of Boys' Track and Field Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

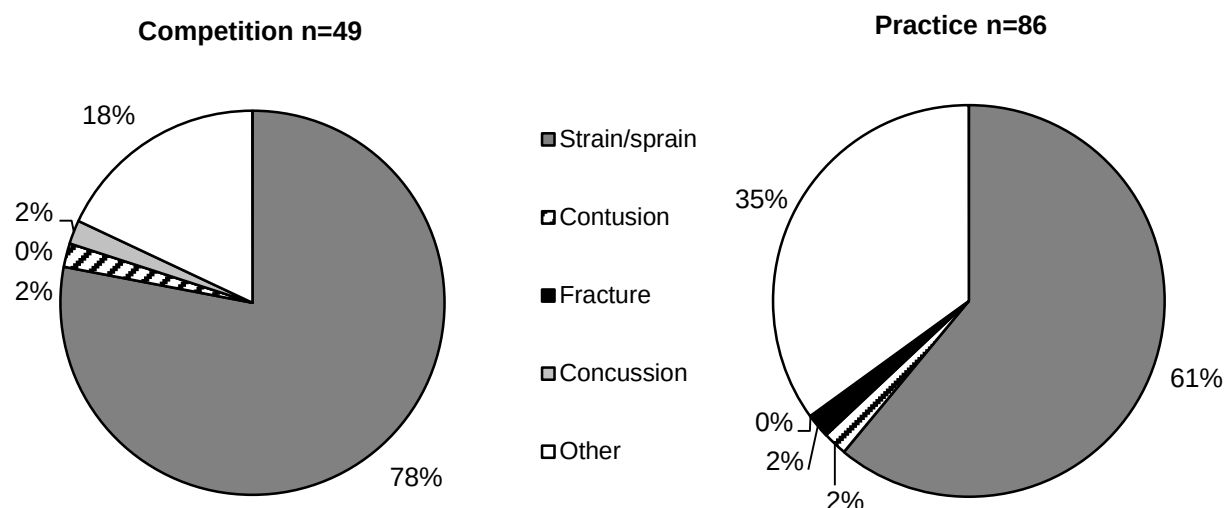


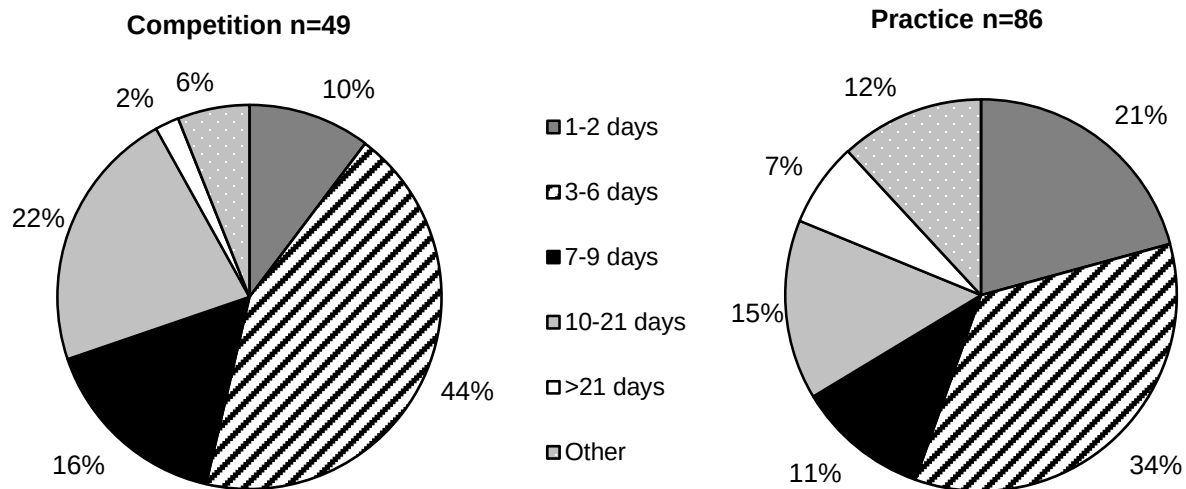
Table 20.3 Body Site of Boys' Track and Field Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Body Site						
Hip/thigh/upper leg	29	59.2%	37	43.0%	66	48.9%
Lower leg	4	8.2%	14	16.3%	18	13.3%
Ankle	3	6.1%	8	9.3%	11	8.1%
Trunk	3	6.1%	7	8.1%	10	7.4%
Foot	1	2.0%	7	8.1%	8	5.9%
Knee	3	6.1%	4	4.7%	7	5.2%
Shoulder	0	0.0%	4	4.7%	4	3.0%
Head/face	1	2.0%	1	1.2%	2	1.5%
Hand/wrist	2	4.1%	0	0.0%	2	1.5%
Arm/elbow	1	2.0%	1	1.2%	2	1.5%
Neck	2	4.1%	0	0.0%	2	1.5%
Other	0	0.0%	3	3.5%	3	2.2%
Total	49	100%	86	100%	135	100%

Table 20.4 Ten Most Common Boys' Track and Field Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Competition n=49		Practice n=86		Total n=135	
	n	%	n	%	n	%
Diagnosis						
Hip/thigh/upper leg strain/sprain	28	57.1%	30	34.9%	58	43.0%
Lower leg other	2	4.1%	8	9.3%	10	7.4%
Ankle strain/sprain	3	6.1%	6	7.0%	9	6.7%
Lower leg strain/sprain	2	4.1%	6	7.0%	8	5.9%
Hip/thigh/upper leg other	1	2.0%	7	8.1%	8	5.9%
Knee other	3	6.1%	3	3.5%	6	4.4%
Trunk strain/sprain	2	4.1%	3	3.5%	5	3.7%
Shoulder strain/sprain	-	0.0%	4	4.7%	4	3.0%
Foot other	1	2.0%	2	2.3%	3	2.2%
Foot strain/sprain	-	0.0%	2	2.3%	2	1.5%

Figure 20.2 Time Loss of Boys' Track and Field Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 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' Track and Field Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	1	2.1%	2	2.4%	3	2.3%
Did not require surgery	47	97.9%	83	97.6%	130	97.7%
Total	48	100%	85	100%	133	100%

Figure 20.3 History of Boys' Track and Field Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

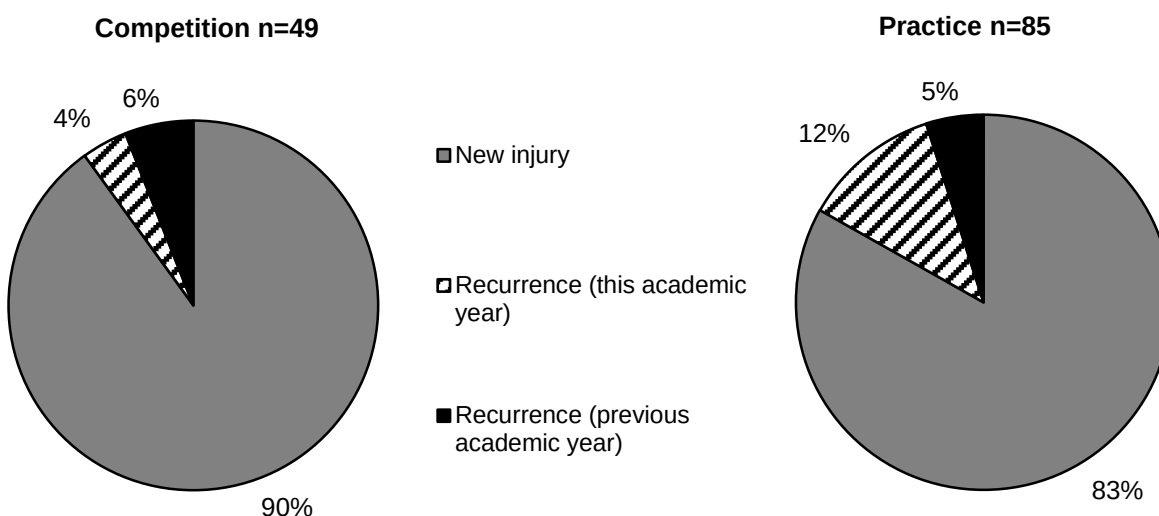


Table 20.6 Time during Season of Boys' Track and Field Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Season		
Preseason	22	16.7%
Regular season	107	81.1%
Post season	3	2.3%
Total	132	100%

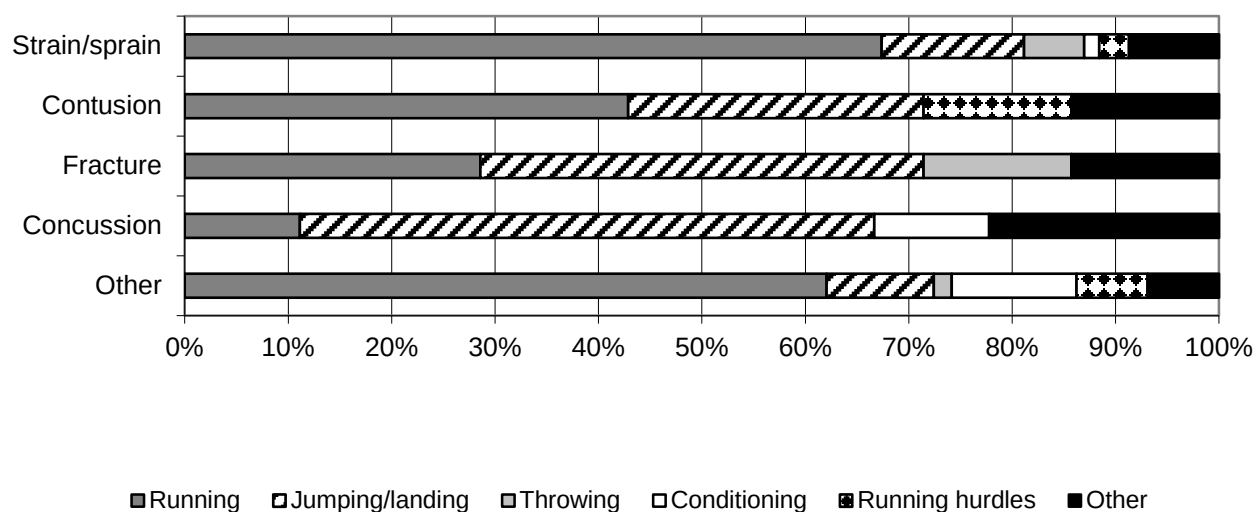
Table 20.7 Practice-Related Variables for Boys' Track and Field Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Practice		
First 1/2 hour	10	12.2%
Second 1/2 hour	20	24.4%
1-2 hours into practice	41	50.0%
>2 hours into practice	11	13.4%
Total	82	100%

Table 20.8 Activities Leading to Boys' Track and Field Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Activity						
Running	31	63.3%	57	66.3%	88	65.2%
Jumping/landing	7	14.3%	10	11.6%	17	12.6%
Conditioning	1	2.0%	6	7.0%	7	5.2%
Throwing	2	4.1%	4	4.7%	6	4.4%
Leaving block	3	6.1%	1	1.2%	4	3.0%
Warming up	0	0.0%	2	2.3%	2	1.5%
Hit by shot put/discus/javelin/hammer	1	2.0%	0	0.0%	1	0.7%
Running hurdles	2	4.1%	2	2.3%	4	3.0%
Other	2	4.1%	4	4.7%	6	4.4%
Total	49	100%	86	100%	135	100%

Figure 20.4 Activity Resulting in Boys' Track and Field Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year



XXI. Girls' Track and Field Injury Epidemiology

Table 21.1 Girls' Track and Field Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	164	183,147	0.90
Competition	47	34,723	1.35
Practice	117	148,424	0.79

Table 21.2 Demographic Characteristics of Injured Girls' Track and Field Athletes, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year*

Year in School	n=162
Freshman	27.8%
Sophomore	25.3%
Junior	26.5%
Senior	20.4%
Total[†]	100%
Age (years)	
Minimum	13
Maximum	19
Mean (St. Dev.)	15.9 (1.3)
BMI	
Minimum	10.2
Maximum	38.0
Mean (St. Dev.)	21.4 (3.3)

*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' Track and Field Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

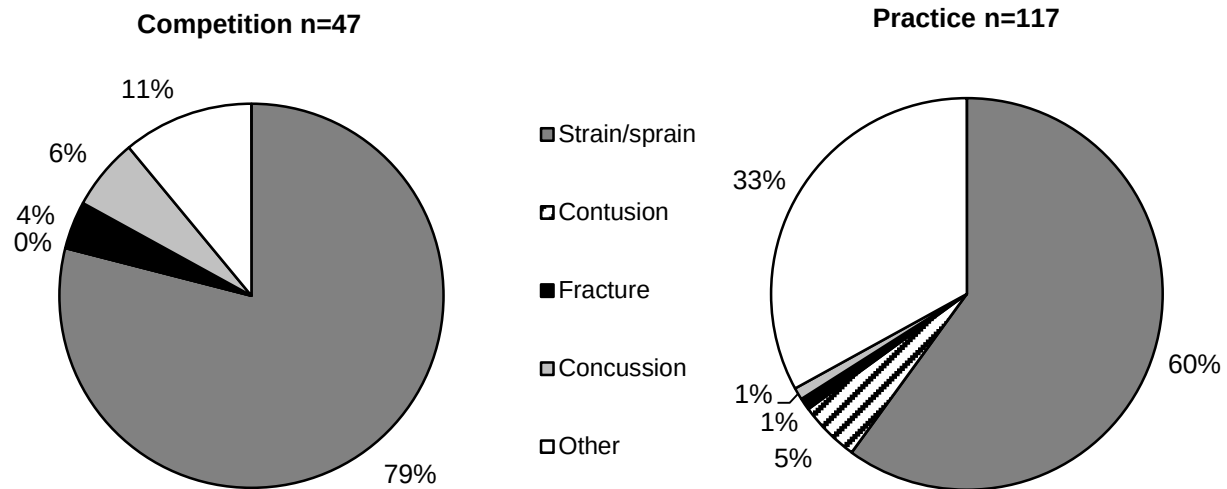


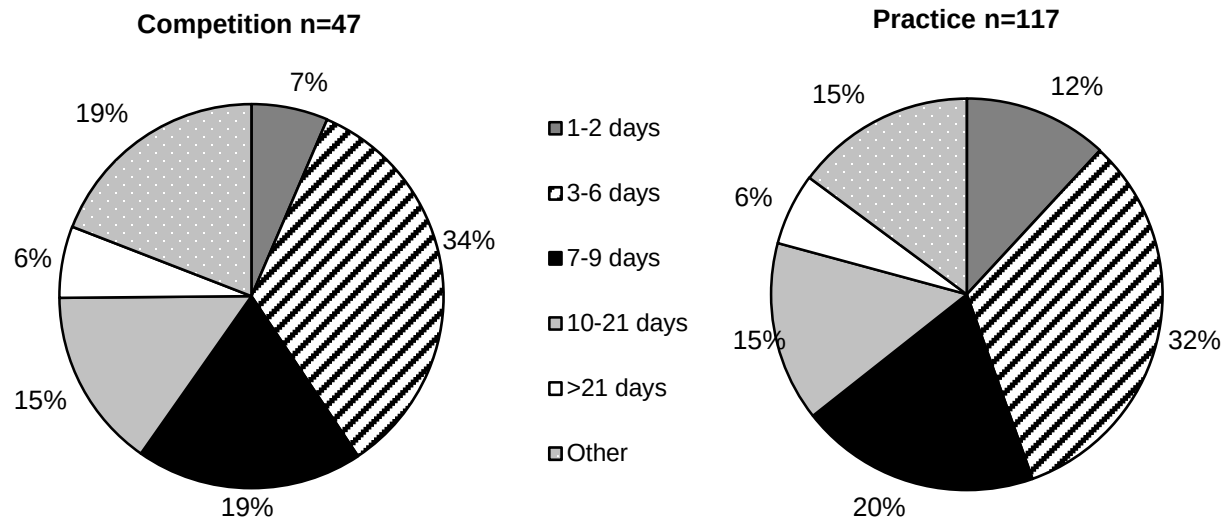
Table 21.3 Body Site of Girls' Track and Field Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Body Site						
Hip/thigh/upper leg	14	29.8%	44	37.9%	58	35.6%
Lower leg	7	14.9%	27	23.3%	34	20.9%
Ankle	12	25.5%	10	8.6%	22	13.5%
Knee	3	6.4%	14	12.1%	17	10.4%
Foot	4	8.5%	8	6.9%	12	7.4%
Head/face	3	6.4%	3	2.6%	6	3.7%
Trunk	1	2.1%	5	4.3%	6	3.7%
Shoulder	2	4.3%	3	2.6%	3	1.8%
Hand/wrist	0	0.0%	2	1.7%	2	1.2%
Arm/elbow	0	0.0%	0	0.0%	2	1.2%
Other	1	2.1%	0	0.0%	1	0.6%
Total	47	100%	116	100%	163	100%

Table 21.4 Ten Most Common Girls' Track and Field Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Competition n=47		Practice n=116		Total n=163	
	n	%	n	%	n	%
Diagnosis						
Hip/thigh/upper leg strain/sprain	14	29.8%	42	36.2%	56	34.4%
Lower leg other	2	4.3%	20	17.2%	22	13.5%
Ankle strain/sprain	12	25.5%	8	6.9%	20	12.3%
Lower leg strain/sprain	5	10.6%	6	5.2%	11	6.7%
Knee other	1	2.1%	7	6.0%	8	4.9%
Knee strain/sprain	2	4.3%	5	4.3%	7	4.3%
Foot strain/sprain	3	6.4%	3	2.6%	6	3.7%
Head/face concussion	3	6.4%	1	0.9%	4	2.5%
Trunk strain/sprain	-	0.0%	3	2.6%	3	1.8%
Foot other	-	0.0%	3	2.6%	3	1.8%

Figure 21.2 Time Loss of Girls' Track and Field Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 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' Track and Field Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	3	6.5%	4	3.4%	7	4.3%
Did not require surgery	43	93.5%	112	96.6%	155	95.7%
Total	46	100%	116	100%	162	100%

Figure 21.3 History of Girls' Track and Field Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

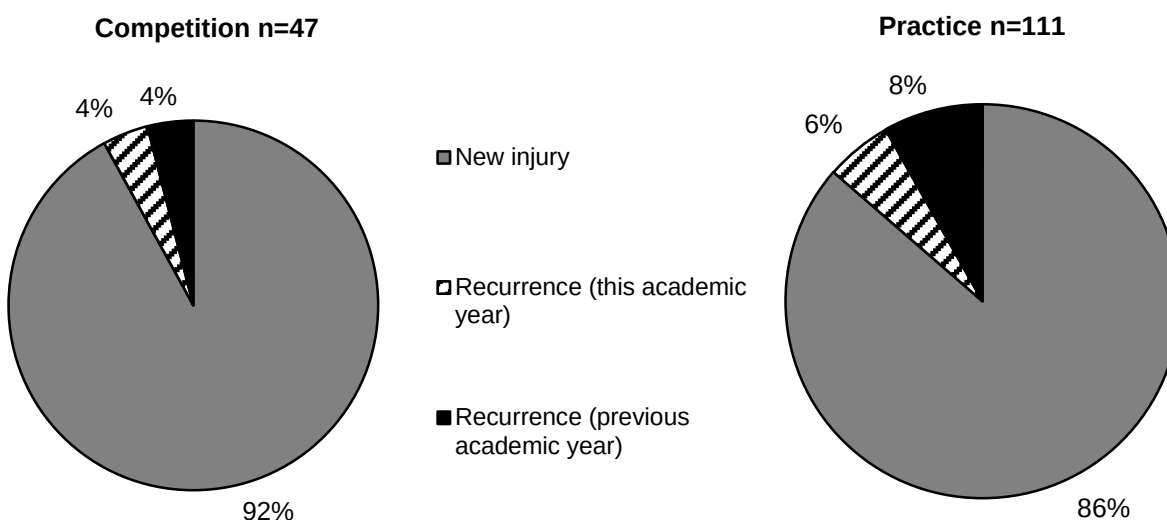


Table 21.6 Time during Season of Girls' Track and Field Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Season		
Preseason	42	25.6%
Regular season	116	70.7%
Post season	6	3.7%
Total	164	100%

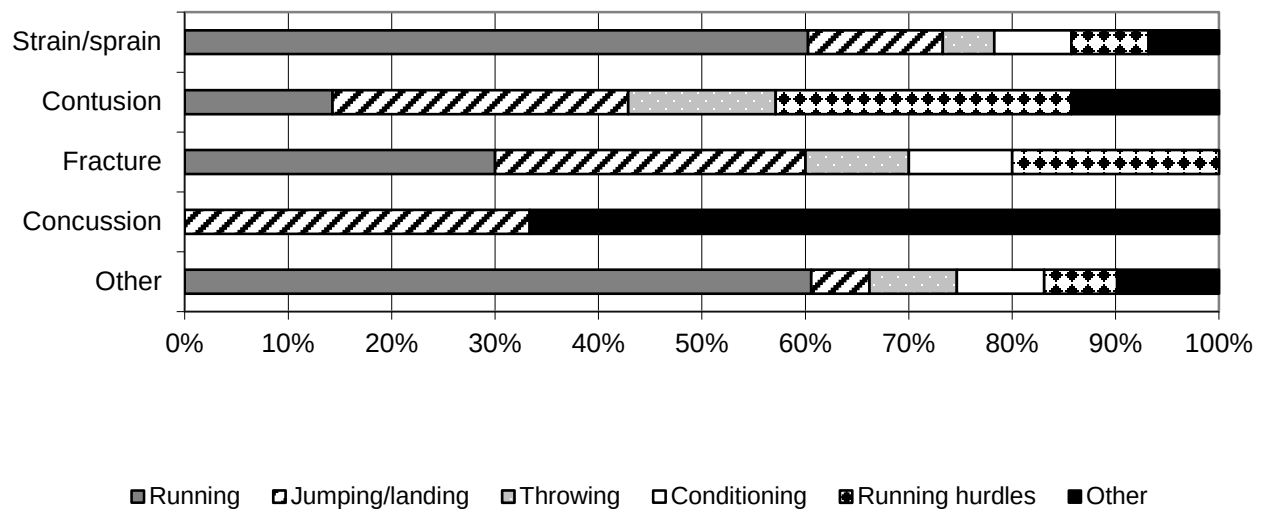
Table 21.7 Practice-Related Variables for Girls' Track and Field Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Practice		
First 1/2 hour	19	16.8%
Second 1/2 hour	42	37.2%
1-2 hours into practice	46	40.7%
>2 hours into practice	6	5.3%
Total	113	100%

Table 21.8 Activities Leading to Girls' Track and Field Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Activity						
Running	21	45.7%	71	62.8%	92	57.9%
Jumping/landing	15	32.6%	11	9.7%	26	16.4%
Conditioning	0	0.0%	11	9.7%	11	6.9%
Warming up	2	4.3%	7	6.2%	9	5.7%
Throwing	3	6.5%	5	4.4%	8	5.0%
Running hurdles	3	6.5%	5	4.4%	8	5.0%
Other	2	4.3%	3	2.7%	5	3.1%
Total	46	100%	113	100%	159	100%

Figure 21.4 Activity Resulting in Girls' Track and Field Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year



XXII. Cheerleading Injury Epidemiology

Table 22.1 Cheerleading Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete- exposures)
Total	98	167,349	0.59
Competition	7	12,866	0.54
Practice	80	124,796	0.64
Performance	11	29,687	0.37

Table 22.2 Demographic Characteristics of Injured Cheerleading Athletes, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year*

Year in School	n=96
Freshman	20.8%
Sophomore	29.2%
Junior	27.1%
Senior	22.9%
Total[†]	100%
Age (years)	
Minimum	12
Maximum	18
Mean (St. Dev.)	15.8 (1.4)
BMI	
Minimum	16.6
Maximum	34.9
Mean (St. Dev.)	21.5 (3.0)

*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 22.1 Diagnosis of Cheerleading Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

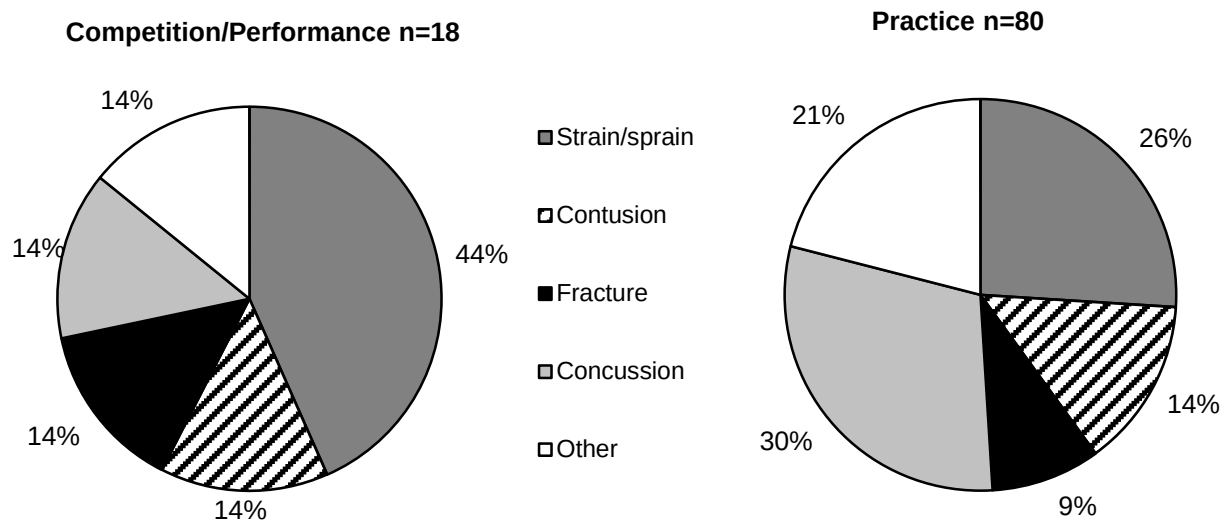


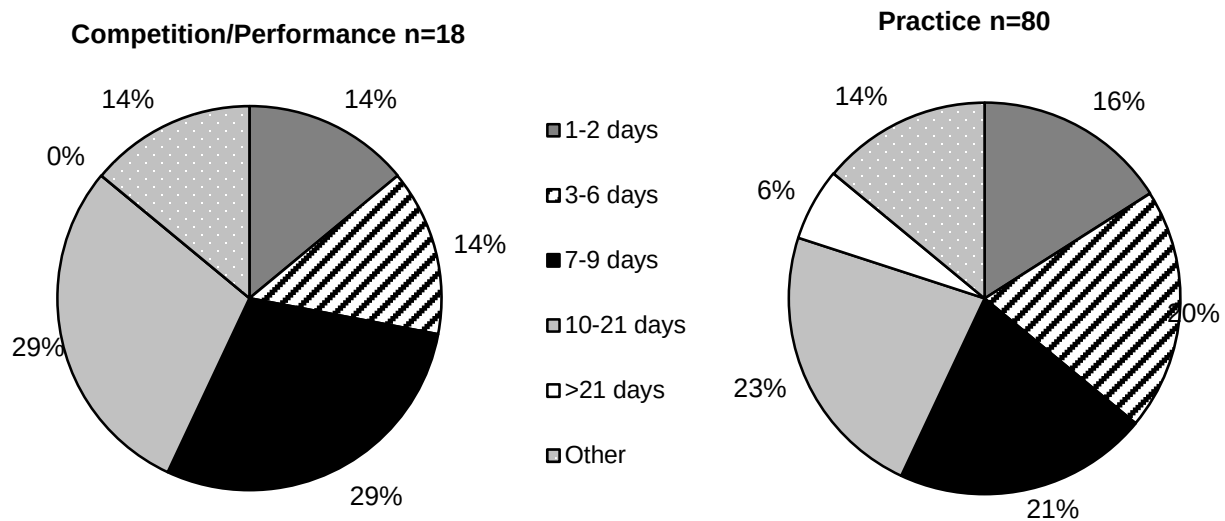
Table 22.3 Body Site of Cheerleading Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Competition		Practice		Performance		Overall	
	n	%	n	%	n	%	n	%
Body Site								
Head/face	1	14.3%	35	43.8%	3	30.0%	39	40.2%
Shoulder	0	0.0%	10	12.5%	2	20.0%	12	12.4%
Trunk	0	0.0%	9	11.3%	1	10.0%	10	10.3%
Ankle	2	28.6%	6	7.5%	1	10.0%	9	9.3%
Hand/wrist	1	14.3%	6	7.5%	1	10.0%	8	8.2%
Arm/elbow	2	28.6%	3	3.8%	0	0.0%	5	5.2%
Knee	0	0.0%	4	5.0%	0	0.0%	4	4.1%
Neck	0	0.0%	3	3.8%	1	10.0%	4	4.1%
Hip/thigh/upper leg	1	14.3%	2	2.5%	0	0.0%	3	3.1%
Lower leg	0	0.0%	0	0.0%	1	10.0%	1	1.0%
Other	0	0.0%	2	2.5%	0	0.0%	2	2.1%
Total	7	100%	80	100%	10	100%	97	100%

Table 22.4 Ten Most Common Cheerleading Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

Diagnosis	Competition n=7		Practice n=80		Performance n=10		Total n=97	
	n	%	n	%	n	%	n	%
Head/face concussion	1	14.3%	24	30.0%	1	10.0%	26	26.8%
Ankle strain/sprain	1	14.3%	5	6.3%	1	10.0%	7	7.2%
Shoulder strain/sprain	-	0.0%	6	7.5%	1	10.0%	7	7.2%
Head/face other	-	0.0%	5	6.3%	1	10.0%	6	6.2%
Hand/wrist strain/sprain	-	0.0%	3	3.8%	-	0.0%	3	3.1%
Hip/thigh/upper leg strain/sprain	1	14.3%	2	2.5%	-	0.0%	3	3.1%
Neck strain/sprain	-	0.0%	2	2.5%	1	10.0%	3	3.1%
Knee other	-	0.0%	3	3.8%	-	0.0%	3	3.1%
Trunk strain/sprain	-	0.0%	2	2.5%	-	0.0%	2	2.1%
Knee strain/sprain	-	0.0%	1	1.3%	-	0.0%	1	1.0%

Figure 22.2 Time Loss of Cheerleading Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 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 Cheerleading Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Competition		Practice		Performance		Overall	
	n	%	n	%	n	%	n	%
Need for surgery								
Required surgery	1	14.3%	2	2.6%	1	9.1%	3	3.2%
Did not require surgery	6	85.7%	76	97.4%	10	90.9%	92	96.8%
Total	7	100%	78	100%	11	100%	95	100%

Figure 22.3 History of Cheerleading Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

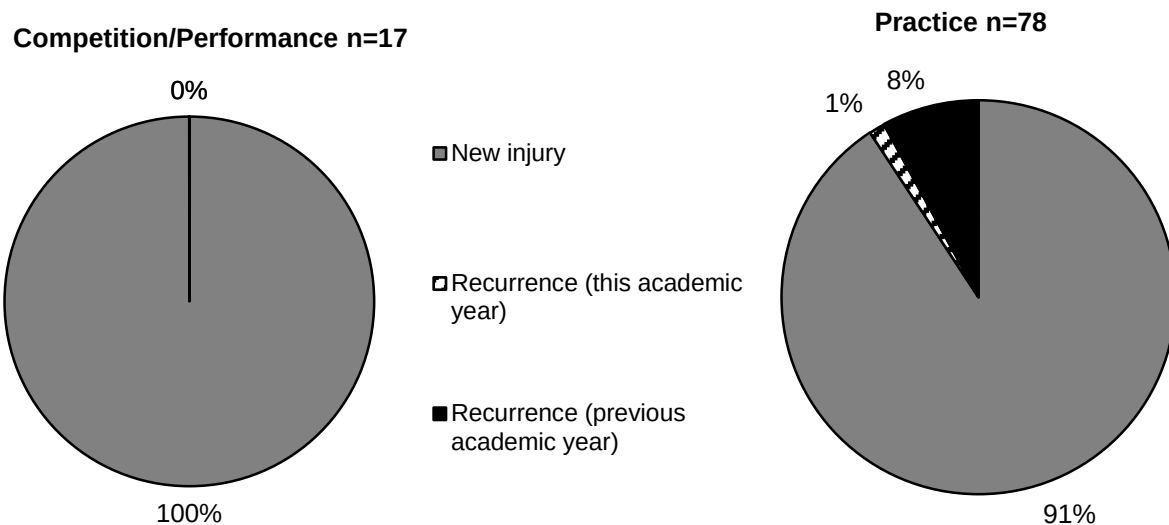


Table 22.6 Time during Season of Cheerleading Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Season		
Preseason	12	12.4%
Regular season	82	84.5%
Post season	3	3.1%
Total	97	100%

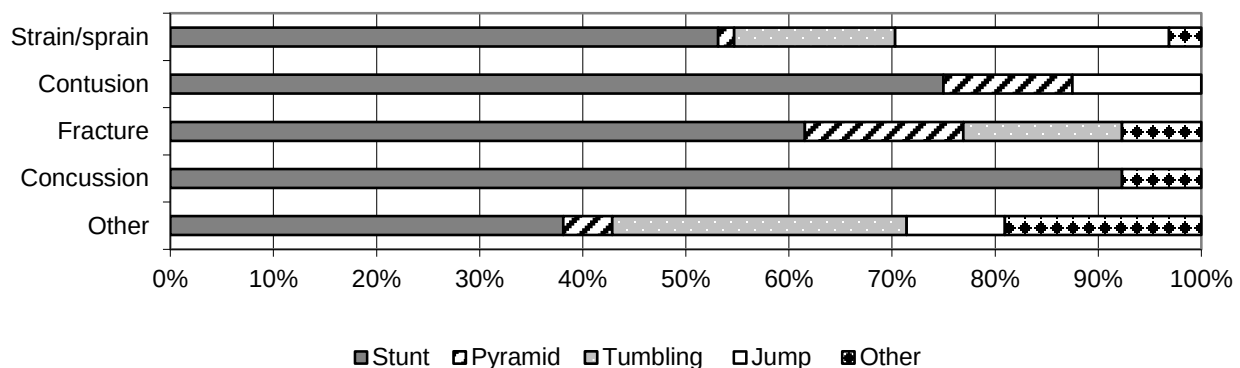
Table 22.7 Practice-Related Variables for Cheerleading Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	n	%
Time in Practice		
First 1/2 hour	4	5.3%
Second 1/2 hour	15	19.7%
1-2 hours into practice	49	64.5%
>2 hours into practice	8	10.5%
Total	76	100%

Table 22.8 Activities Leading to Cheerleading Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

Activity	Competition		Practice		Performance		Overall	
	n	%	n	%	n	%	n	%
Stunt	2	28.6%	54	69.2%	3	30.0%	59	62.1%
Tumbling	4	57.1%	14	17.9%	4	40.0%	22	5.3%
Jump	1	14.3%	2	2.6%	3	30.0%	6	23.2%
Pyramid	0	0.0%	5	6.4%	0	0.0%	5	6.3%
Other	0	0.0%	3	3.8%	0	0.0%	3	3.2%
Total	7	100%	78	100%	10	100%	95	100%

Figure 22.4 Activity Resulting in Cheerleading Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year



XXIII. Gender Differences within Sports

23.1 Boys' and Girls' Soccer

Table 23.1 Comparison of Boys' and Girls' Soccer Injury Rates, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Boys' soccer	Girls' soccer*	RR (95% CI) [†]
Total	1.67	2.11	1.26 (1.11-1.44)
Competition	3.52	4.53	1.29 (1.10-1.51)
Practice	0.89	1.00	1.12 (0.90-1.39)

*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 23.10 Comparison of Body Sites of Boys' and Girls' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Boys' soccer	Girls' soccer	IPR (95% CI)
Body Site			
Ankle	19.7%	24.2%	1.23 (0.97-1.57)
Knee	13.0%	17.0%	1.30 (0.96-1.77)
Head/face	22.2%	25.1%	1.13 (0.90-1.42)
Hip/thigh/upper leg	15.6%	13.1%	1.19 (0.87-1.63)
Hand/wrist	5.1%	3.0%	1.71 (0.89-3.26)
Shoulder	1.9%	0.6%	2.99 (0.81-10.96)
Trunk	4.5%	2.6%	1.74 (0.86-3.50)
Lower leg	7.9%	6.9%	1.15 (0.73-1.82)
Arm/elbow	0.4%	1.1%	2.51 (0.49-12.89)
Foot	7.5%	5.4%	1.39 (0.85-2.29)
Neck	0.2%	0.4%	2.01 (0.18-22.08)
Other	1.9%	0.6%	2.99 (0.81-11.25)
Total	100%	100%	---

Table 23.11 Comparison of Diagnoses of Boys' and Girls' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Boys' soccer	Girls' soccer	IPR (95% CI)
Diagnosis			
Strain/sprain	45.6%	48.6%	1.07 (0.93-1.22)
Contusion	11.5%	11.2%	1.03 (0.72-1.47)
Fracture	10.4%	6.2%	1.68 (1.08-2.60)
Concussion	17.3%	21.5%	1.26 (0.96-1.62)
Other	15.1%	12.5%	1.21 (0.88-1.68)
Total	100%	100%	---

Table 23.12 Most Common Boys' and Girls' Soccer Injury Diagnoses*, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Boys' soccer	Girls' soccer	IPR (95% CI)
Diagnosis			
Hip/thigh/upper leg strain/sprain	12.4%	11.0%	1.13 (0.80-1.61)
Ankle strain/sprain	17.1%	21.7%	1.27 (0.97-1.65)
Head/face concussion	17.3%	21.5%	1.25 (0.96-1.62)
Knee strain/sprain	7.3%	10.3%	1.42 (0.93-2.16)
Knee other	4.9%	4.7%	1.04 (0.59-1.84)

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

Table 23.13 Comparison of Time Loss of Boys' and Girls' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Boys' soccer	Girls' soccer	IPR (95% CI)
Time Loss			
1-2 days	13.6%	13.7%	1.01 (0.73-1.39)
3-6 days	29.4%	24.2%	1.21 (0.98-1.50)
7-9 days	14.9%	17.2%	1.15 (0.86-1.54)
10-21 days	14.9%	17.4%	1.17 (0.87-1.56)
22 days or more	6.2%	4.9%	1.25 (0.74-2.13)
Other	20.9%	22.5%	1.08 (0.85-1.38)
Total	100%	100%	---

Table 23.14 Comparison of Mechanisms of Boys' and Girls' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Boys' soccer	Girls' soccer	IPR (95% CI)
Soccer Mechanism			
Contact with ball	8.9%	9.9%	1.12 (0.75-1.68)
Contact with goal	0.2%	0.7%	3.06 (0.32-29.31)
Stepped on/fell on/kicked	13.6%	13.2%	1.03 (0.74-1.43)
Slide tackle	6.7%	4.4%	1.52 (0.88-2.63)
Contact with another player	26.8%	28.9%	1.08 (0.88-1.33)
Rotation around planted foot/inversion	11.9%	15.0%	1.26 (0.91-1.76)
Uneven playing surface	2.8%	2.6%	1.06 (0.49-2.30)
N/A (overuse, heat illness, conditioning, etc.)	15.8%	16.6%	1.05 (0.78-1.41)
Other	13.2%	8.6%	1.53 (1.05-2.24)
Total	100%	100%	---

Table 23.15 Comparison of Activities of Boys' and Girls' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Boys' soccer	Girls' soccer	IPR (95% CI)
Soccer Activity			
General play	23.4%	22.3%	1.05 (0.78-1.46)
Defending	11.2%	14.7%	1.32 (0.94-1.85)
Chasing loose ball	12.0%	9.4%	1.29 (0.88-1.88)
Ball handling/dribbling	9.8%	11.8%	1.20 (0.82-1.75)
Goaltending	8.5%	6.7%	1.28 (0.81-2.02)
Heading ball	9.2%	6.2%	1.47 (0.93-2.34)
Receiving pass	4.6%	4.0%	1.15 (0.62-2.12)
Passing (foot)	5.9%	7.1%	1.21 (0.74-1.98)
Shooting (foot)	6.3%	7.3%	1.16 (0.72-1.88)
Other	9.1%	10.5%	1.17 (0.78-1.74)
Total	100%	100%	---

23.2 Boys' and Girls' Volleyball

Table 23.2 Comparison of Boys' and Girls' Volleyball Injury Rates, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Boys' volleyball	Girls' volleyball	RR (95% CI)
Total	0.81	0.93	1.15 (0.69-1.91)
Competition	0.45	1.16	2.57 (0.81-8.11)
Practice	0.99	0.80	1.23 (0.69-2.18)

Table 23.20 Comparison of Body Sites of Boys' and Girls' Volleyball Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Boys' volleyball	Girls' volleyball	IPR (95% CI)
Body Site			
Ankle	37.5%	34.9%	1.07 (0.56-2.08)
Knee	6.3%	15.8%	2.53 (0.37-17.29)
Head/face	6.3%	12.4%	1.99 (0.29-13.73)
Hip/thigh/upper leg	0.0%	2.9%	---
Hand/wrist	25.0%	9.1%	2.75 (1.06-7.18)
Shoulder	6.3%	4.8%	1.31 (0.18-9.57)
Trunk	6.3%	5.3%	1.19 (0.16-8.63)
Lower leg	12.5%	3.8%	3.27 (0.86-14.11)
Arm/elbow	0.0%	2.4%	---
Foot	0.0%	4.8%	---
Other	0.0%	2.4%	---
Total	100%	100%	---

Table 23.21 Comparison of Diagnoses of Boys' and Girls' Volleyball Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Boys' volleyball	Girls' volleyball	IPR (95% CI)
Diagnosis			
Strain/sprain	75.0%	58.7%	1.28 (0.94-1.74)
Contusion	6.3%	6.3%	1.00 (0.14-7.17)
Fracture	12.5%	3.8%	3.25 (0.75-14.05)
Concussion	0.0%	10.6%	---
Other	6.3%	20.7%	3.31 (0.49-22.48)
Total	100%	100%	---

Table 23.22 Most Common Boys' and Girls' Volleyball Injury Diagnoses*, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Boys' volleyball	Girls' volleyball	IPR (95% CI)
Diagnosis			
Ankle strain/sprain	37.5%	33.2%	1.14 (0.59-2.20)
Hand/wrist strain/sprain	18.8%	5.8%	3.27 (1.03-10.40)
Hip/thigh/upper leg strain/sprain	-	2.4%	---
Shoulder other	-	2.9%	----
Trunk strain/sprain	6.3%	3.8%	1.63 (0.22-12.26)

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

Table 23.23 Comparison of Time Loss of Boys' and Girls' Volleyball Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Boys' volleyball	Girls' volleyball	IPR (95% CI)
Time Loss			
1-2 days	25.0%	20.6%	1.22 (0.50-2.96)
3-6 days	25.0%	27.3%	1.09 (0.45-2.62)
7-9 days	18.8%	18.2%	1.03 (0.36-2.98)
10-21 days	6.3%	18.7%	2.99 (0.44-20.34)
22 days or more	18.8%	4.3%	4.35 (1.31-14.51)
Other	6.3%	11.0%	1.76 (0.25-12.21)
Total	100%	100%	---

Table 23.24 Comparison of Mechanisms of Boys' and Girls' Volleyball Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Boys' volleyball	Girls' volleyball	IPR (95% CI)
Volleyball Mechanism			
Jumping/landing	25.0%	26.4%	1.06 (0.44-2.55)
N/A (overuse, heat illness, conditioning, etc.)	-	13.9%	---
Diving for ball	12.5%	12.5%	1.00 (0.26-3.84)
Contact with teammate	18.8%	15.9%	1.18 (0.41-3.44)
Rotation around planted foot/inversion	12.5%	7.2%	1.73 (0.43-6.92)
Contact with ball	31.3%	11.1%	2.83 (1.24-6.43)
Contact with opponent	-	3.4%	---
Contact with standard/pole	-	0.5%	---
Contact with seats/bleachers/table	-	1.0%	---
Contact with officials stand	-	-	---
Other	-	6.7%	---
Total	100%	100%	---

Table 23.25 Comparison of Activities of Boys' and Girls' Volleyball Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Boys' volleyball	Girls' volleyball	IPR (95% CI)
Volleyball Activity			
General play	6.3%	25.5%	4.08 (0.66-39.81)
Blocking	50.0%	22.1%	2.27 (1.30-3.94)
Digging	6.3%	18.1%	2.90 (0.43-19.79)
Spiking	12.5%	8.8%	1.42 (0.36-5.57)
Passing	12.5%	4.9%	2.55 (0.61-10.66)
Conditioning	-	6.4%	---
Setting	-	3.9%	---
Serving	6.3%	3.9%	1.59 (0.21-11.96)
Other	6.3%	6.4%	1.02 (0.14-7.31)
Total	100%	100%	---

23.3 Boys' and Girls' Basketball

Table 23.3 Comparison of Boys' and Girls' Basketball Injury Rates, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Boys' basketball	Girls' basketball	RR (95% CI)
Total	1.37	1.81	1.32 (1.16-1.50)
Competition	2.33	3.59	1.54 (1.29-1.83)
Practice	0.95	1.02	1.07 (0.87-1.30)

Table 23.30 Comparison of Body Sites of Boys' and Girls' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Boys' basketball	Girls' basketball	IPR (95% CI)
Body Site			
Ankle	34.5%	23.8%	1.45 (1.18-1.79)
Knee	8.4%	18.8%	2.25 (1.56-3.23)
Head/face	23.5%	25.8%	1.10 (0.88-1.38)
Hip/thigh/upper leg	7.4%	4.2%	1.78 (1.03-3.08)
Hand/wrist	8.4%	10.8%	1.30 (0.86-1.94)
Shoulder	2.5%	2.9%	1.16 (0.52-2.55)
Trunk	4.5%	5.5%	1.22 (0.69-2.17)
Lower leg	4.1%	4.0%	1.02 (0.54-1.94)
Arm/elbow	1.1%	1.5%	1.37 (0.44-4.28)
Foot	4.7%	2.0%	2.39 (1.11-5.15)
Neck	0.0%	0.4%	---
Other	0.9%	0.2%	4.09 (0.46-36.45)
Total	100%	100%	---

Table 23.31 Comparison of Diagnoses of Boys' and Girls' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Boys' basketball	Girls' basketball	IPR (95% CI)
Diagnosis			
Strain/sprain	52.7%	48.9%	1.08 (0.95-1.23)
Contusion	7.7%	6.2%	1.25 (0.77-2.02)
Fracture	10.0%	6.8%	1.46 (0.94-2.27)
Concussion	14.7%	22.5%	1.53 (1.15-2.03)
Other	14.9%	15.6%	1.05 (0.77-1.43)
Total	100%	100%	---

Table 23.32 Most Common Boys' and Girls' Basketball Injury Diagnoses*, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Boys' basketball	Girls' basketball	IPR (95% CI)
Diagnosis			
Ankle strain/sprain	33.3%	23.0%	1.45 (1.17-1.80)
Head/face concussion	14.7%	22.3%	1.52 (1.15-2.02)
Knee strain/sprain	3.4%	11.3%	3.32 (1.89-5.81)
Knee other	2.7%	5.7%	2.11 (1.08-4.14)
Hip/thigh/upper leg strain/sprain	4.8%	3.5%	1.35 (0.71-2.54)

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

Table 23.33 Comparison of Time Loss of Boys' and Girls' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Boys' basketball	Girls' basketball	IPR (95% CI)
Time Loss			
1-2 days	18.3%	9.9%	1.85 (1.31-2.59)
3-6 days	26.6%	22.5%	1.19 (0.94-1.49)
7-9 days	19.0%	18.9%	1.00 (0.76-1.31)
10-21 days	18.5%	21.6%	1.17 (0.90-1.52)
22 days or more	5.9%	6.6%	1.13 (0.68-1.87)
Other	11.7%	20.5%	1.75 (1.28-2.39)
Total	100%	100%	---

Table 23.34 Comparison of Mechanisms of Boys' and Girls' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Boys' basketball	Girls' basketball	IPR (95% CI)
Basketball Mechanism			
Collision with another player	30.9%	32.6%	1.06 (0.87-1.28)
Jumping/landing	20.8%	17.6%	1.19 (0.90-1.56)
Rotation around a planted foot/inversion	11.5%	9.8%	1.17 (0.79-1.72)
N/A (e.g., overuse, heat illness, etc.)	11.5%	13.0%	1.13 (0.79-1.62)
Stepped on/fell on/kicked	11.2%	6.8%	1.64 (1.06-2.5)
Contact with ball	2.6%	7.5%	2.93 (1.50-5.71)
Other	11.5%	12.7%	1.09 (0.76-1.57)
Total	100%	100%	---

Table 23.35 Comparison of Activities of Boys' and Girls' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Boys' basketball	Girls' basketball	IPR (95% CI)
Basketball Activity			
Rebounding	22.9%	15.4%	1.49 (1.12-1.97)
General play	16.9%	22.3%	1.32 (0.99-1.73)
Defending	16.5%	17.2%	1.05 (0.78-1.41)
Chasing loose ball	10.7%	11.5%	1.07 (0.73-1.57)
Shooting	11.2%	8.7%	1.28 (0.86-1.93)
Receiving pass	4.8%	6.0%	1.25 (0.71-2.21)
Ball handling/dribbling	6.9%	7.1%	1.03 (0.63-1.68)
Conditioning	4.3%	7.8%	1.82 (1.04-3.17)
Other	5.8%	4.0%	1.47 (0.80-2.69)
Total	100%	100%	---

23.4 Boys' Baseball and Girls' Softball

Table 23.4 Comparison of Baseball and Softball Injury Rates, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Baseball	Softball	RR (95% CI)
Total	0.83	0.97	1.17 (0.95-1.44)
Competition	1.44	1.52	1.06 (0.80-1.40)
Practice	0.52	0.70	1.36 (0.997-1.86)

Table 23.40 Comparison of Body Sites of Baseball and Softball Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

Body Site	Baseball	Softball	IPR (95% CI)
Ankle	7.4%	21.0%	2.83 (1.58-5.07)
Knee	6.9%	7.2%	1.05 (0.49-2.23)
Head/face	23.8%	20.4%	1.17 (0.79-1.73)
Hip/thigh/upper leg	9.5%	8.4%	1.14 (0.58-2.21)
Hand/wrist	13.2%	18.6%	1.40 (0.87-2.28)
Shoulder	14.8%	6.6%	2.25 (1.16-4.38)
Trunk	2.1%	2.4%	1.13 (0.29-4.46)
Lower leg	1.1%	3.6%	3.40 (0.70-16.60)
Arm/elbow	16.4%	8.4%	1.96 (1.08-3.55)
Foot	1.1%	3.0%	2.83 (0.56-14.39)
Neck	0.5%	0.6%	1.13 (0.07-17.95)
Other	3.2%	0.0%	---
Total	100%	100%	---

Table 23.41 Comparison of Diagnoses of Baseball and Softball Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Baseball	Softball	IPR (95% CI)
Diagnosis			
Strain/sprain	35.1%	41.9%	1.19 (0.92-1.56)
Contusion	12.8%	11.4%	1.12 (0.64-1.97)
Fracture	17.0%	13.8%	1.24 (0.75-2.03)
Concussion	11.7%	14.4%	1.23 (0.72-2.11)
Other	23.4%	18.6%	1.26 (0.84-1.90)
Total	100%	100%	---

Table 23.42 Most Common Baseball and Softball Injury Diagnoses*, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Baseball	Softball	IPR (95% CI)
Diagnosis			
Head/face concussion	11.7%	14.4%	1.24 (0.72-2.12)
Ankle strain/sprain	6.4%	18.0%	2.83 (1.50-5.35)
Hand/wrist fracture	5.3%	6.6%	1.25 (0.54-2.86)
Hip/thigh/upper leg strain/sprain	6.9%	6.6%	1.04 (0.48-2.27)
Shoulder other	7.4%	4.2%	1.77 (0.73-4.27)

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

Table 23.43 Comparison of Time Loss of Baseball and Softball Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Baseball	Softball	IPR (95% CI)
Time Loss			
1-2 days	13.2%	12.6%	1.05 (0.61-1.81)
3-6 days	27.0%	25.7%	1.05 (0.74-1.49)
7-9 days	10.6%	17.4%	1.64 (0.97-2.79)
10-21 days	20.1%	16.8%	1.20 (0.77-1.87)
22 days or more	6.9%	9.6%	1.39 (0.69-2.81)
Other	22.2%	18.0%	1.24 (0.81-1.88)
Total	100%	100%	---

Table 23.44 Comparison of Mechanisms of Baseball and Softball Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Baseball	Softball	IPR (95% CI)
Baseball/Softball Mechanism			
N/A (overuse, heat illness, conditioning, etc.)	9.8%	12.7%	1.29 (0.71-2.33)
Contact with another player	8.7%	5.4%	1.61 (0.73-3.55)
Contact with bases	8.7%	13.3%	1.52 (0.83-2.79)
Hit by pitch	8.7%	6.0%	1.45 (0.68-3.11)
Hit by batted ball	15.8%	8.4%	1.88 (1.03-3.43)
Throwing - pitching	10.9%	4.2%	2.59 (1.13-5.97)
Rotation around a planted foot/inversion	3.3%	8.4%	2.57 (1.01-6.54)
Throwing - not pitching	8.2%	4.8%	1.70 (0.74-3.91)
Contact with thrown ball (non-pitch)	8.2%	12.0%	1.47 (0.78-2.78)
Other	17.7%	24.8%	1.41 (0.94-2.13)
Total	100%	100%	---

Table 23.45 Comparison of Activities of Baseball and Softball Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Baseball	Softball	IPR (95% CI)
Baseball/Softball Activity			
Pitching	16.2%	7.2%	2.26 (1.20-4.26)
Throwing (not pitching)	9.7%	7.2%	1.35 (0.67-2.73)
Fielding a thrown ball	7.0%	7.8%	1.11 (0.53-2.32)
Fielding a batted ball	15.1%	16.2%	1.07 (0.66-1.74)
Batting	14.1%	7.8%	1.81 (0.96-3.40)
Running bases	11.4%	17.4%	1.53 (0.91-2.58)
Sliding	9.2%	11.4%	1.24 (0.67-2.30)
Catching	7.6%	10.8%	1.42 (0.73-2.77)
Conditioning	2.7%	4.2%	1.55 (0.50-4.79)
General play	2.7%	5.4%	1.99 (0.68-5.83)
Other	4.3%	4.6%	1.12 (0.43-2.89)
Total	100%	100%	---

23.5 Boys' and Girls' Swimming

Table 23.5 Comparison of Boys' and Girls' Swimming Injury Rates, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Boys' swimming	Girls' swimming	RR (95% CI)
Total	0.18	0.27	1.47 (0.75-2.87)
Competition	0.07	0.38	5.78 (0.70-47.96)
Practice	0.21	0.24	1.14 (0.55-2.37)

Table 23.50 Comparison of Body Sites of Boys' and Girls' Swimming and Diving Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Boys' swimming	Girls' swimming	IPR (95% CI)
Body Site			
Ankle	-	-	---
Knee	7.1%	13.6%	1.91 (0.22-16.58)
Head/face	7.1%	9.1%	1.27 (0.13-12.76)
Hip/thigh/upper leg	-	-	---
Hand/wrist	-	-	---
Shoulder	50.0%	31.8%	1.57 (0.70-3.52)
Trunk	21.4%	18.2%	1.18 (0.31-4.50)
Lower leg	-	-	---
Arm/elbow	7.1%	4.5%	1.57 (0.11-23.14)
Foot	0.0%	4.5%	---
Neck	0.0%	9.1%	---
Other	7.1%	9.1%	1.27 (0.13-12.76)
Total	100%	100%	---

Table 23.51 Comparison of Diagnoses of Boys' and Girls' Swimming Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Boys' swimming	Girls' swimming	IPR (95% CI)
Diagnosis			
Strain/sprain	57.1%	31.8%	1.80 (0.84-3.85)
Contusion	0.0%	9.1%	---
Fracture	0.0%	0.0%	---
Concussion	7.1%	4.5%	1.57 (0.11-23.14)
Other	35.7%	54.5%	1.53 (0.69-3.40)
Total	100%	100%	---

Table 23.52 Most Common Boys' and Girls' Swimming Injury Diagnoses, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Boys' swimming	Girls' swimming	IPR (95% CI)
Diagnosis			
Shoulder strain/sprain	28.6%	13.6%	2.09 (0.55-7.99)
Shoulder other	21.4%	18.2%	1.18 (0.31-4.50)
Trunk other	7.1%	9.1%	1.27 (0.13-12.76)
Trunk strain/sprain	14.3%	9.1%	1.57 (0.25-9.91)

Table 23.53 Comparison of Time Loss of Boys' and Girls' Swimming Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Boys' swimming	Girls' swimming	IPR (95% CI)
Time Loss			
1-2 days	28.6%	27.3%	1.05 (0.36-3.06)
3-6 days	35.7%	22.7%	1.57 (0.55-4.46)
7-9 days	0.0%	9.1%	---
10-21 days	14.3%	13.6%	1.05 (0.20-5.50)
22 days or more	7.1%	4.5%	1.57 (0.11-23.14)
Other	14.3%	22.7%	1.59 (0.36-7.11)
Total	100%	100%	---

Table 23.54 Comparison of Mechanisms of Boys' and Girls' Swimming and Diving Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Boys' swimming	Girls' swimming	IPR (95% CI)
Swimming Mechanism			
N/A (overuse, heat illness, conditioning, etc.)	71.4%	59.1%	1.21 (0.75-1.95)
Contact with wall	7.1%	13.6%	1.91 (0.22-16.58)
Contact with another person	-	9.1%	---
Other	21.4%	18.2%	1.18 (0.31-4.50)
Total	100%	100%	---

Table 23.55 Comparison of Activities of Boys' and Girls' Swimming and Diving Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Boys' swimming	Girls' swimming	IPR (95% CI)
Swimming Activity			
Swimming	78.6%	68.2%	1.15 (0.78-1.71)
Flip turn off wall	7.1%	13.6%	1.91 (0.22-16.58)
Diving off board/platform/starting platform	7.1%	4.5%	1.57 (0.11-23.14)
Other	7.1%	13.7%	1.92 (0.79-2.23)
Total	100%	100%	---

23.6 Boys' and Girls' Track and Field

Table 23.6 Comparison of Boys' and Girls' Track and Field Injury Rates, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Boys' track	Girls' track	RR (95% CI)
Total	0.57	0.90	1.58 (1.25-1.98)
Competition	1.09	1.35	1.24 (0.83-1.86)
Practice	0.45	0.79	1.76 (1.34-2.33)

Table 23.60 Comparison of Body Sites of Boys' and Girls' Track and Field Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Boys' track	Girls' track	IPR (95% CI)
Body Site			
Ankle	8.1%	13.5%	1.66 (0.83-3.29)
Knee	5.2%	10.4%	2.01 (0.86-4.71)
Head/face	1.5%	3.7%	2.49 (0.51-12.11)
Hip/thigh/upper leg	48.9%	35.6%	1.37 (1.05-1.80)
Hand/wrist	1.5%	1.2%	1.21 (0.17-8.46)
Shoulder	3.0%	1.8%	1.61 (0.37-7.07)
Trunk	7.4%	3.7%	2.01 (0.75-5.40)
Lower leg	13.3%	20.9%	1.56 (0.93-2.64)
Arm/elbow	1.5%	1.2%	1.21 (0.17-8.46)
Foot	5.9%	7.4%	1.24 (0.52-2.95)
Neck	1.5%	0.0%	---
Other	2.2%	0.6%	3.62 (0.38-34.42)
Total	100%	100%	---

Table 23.61 Comparison of Diagnoses of Boys' and Girls' Track and Field Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Boys' track	Girls' track	IPR (95% CI)
Diagnosis			
Strain/sprain	66.7%	65.2%	1.02 (0.87-1.20)
Contusion	2.2%	3.7%	1.65 (0.42-6.46)
Fracture	1.5%	1.8%	1.24 (0.21-7.28)
Concussion	0.7%	2.4%	3.29 (0.37-29.11)
Other	28.9%	26.8%	1.08 (0.75-1.55)
Total	100%	100%	---

Table 23.62 Most Common Boys' and Girls' Track and Field Injury Diagnoses, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Boys' track	Girls' track	IPR (95% CI)
Diagnosis			
Lower leg other	7.4%	13.5%	1.82 (0.77-2.13)
Shoulder strain/sprain	3.0%	-	---
Hip/thigh/upper leg strain/sprain	43.0%	34.4%	1.25 (0.94-1.67)
Trunk strain/sprain	3.7%	1.8%	2.01 (0.49-8.27)
Hip/thigh/upper leg other	5.9%	-	----

Table 23.63 Comparison of Time Loss of Boys' and Girls' Track and Field Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Boys' track	Girls' track	IPR (95% CI)
Time Loss			
1-2 days	17.0%	10.4%	1.64 (0.92-2.95)
3-6 days	37.8%	33.5%	1.13 (0.83-1.53)
7-9 days	12.6%	19.5%	1.55 (0.90-2.67)
10-21 days	17.8%	14.6%	1.22 (0.72-2.04)
22 days or more	5.2%	6.1%	1.18 (0.46-3.01)
Other	9.6%	15.9%	1.65 (0.88-3.08)
Total	100%	100%	---

Table 23.64 Comparison of Mechanisms of Boys' and Girls' Track and Field Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Boys' track	Girls' track	IPR (95% CI)
Track Mechanism			
N/A (e.g., overuse, heat illness, conditioning, etc.)	56.5%	47.8%	1.18 (0.92-1.26)
Contact with ground/track/surface	10.7%	21.7%	2.03 (1.09-2.50)
Fall/trip	-	6.2%	---
Contact with field equipment	5.3%	6.2%	1.17 (0.47-2.25)
Rotation around planted foot/inversion	6.1%	3.1%	1.97 (0.42-2.99)
Uneven playing surface	2.3%	2.5%	1.09 (0.23-5.64)
Contact with another person	-	0.6%	---
Stepped on/kicked	-	0.6%	----
Other	19.1%	11.2%	1.71 (1.11-3.12)
Total	100%	100%	---

Table 23.65 Comparison of Activities of Boys' and Girls' Track and Field Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

	Boys' track	Girls' track	IPR (95% CI)
Track Activity			
Running	65.2%	57.9%	1.13 (0.97-1.29)
Jumping/landing	12.6%	16.4%	1.30 (0.83-2.04)
Conditioning	5.2%	6.9%	1.33 (0.64-2.99)
Throwing	4.4%	5.0%	1.14 (0.34-3.94)
Running hurdles	3.0%	5.0%	1.37 (0.64-3.02)
Warming up	1.5%	-	---
Leaving block	3.0%	-	---
Hit by shot put/discus/javelin/hammer	0.7%	-	---
Other	4.4%	8.8%	2.00 (1.01-4.59)
Total	100%	100%	---

XXIV. Reporter Demographics & Compliance

During the 2010-11 school year, 211 ATs were invited to participate in the study at the beginning of the school year. ATs were expected to report for every week in which they were enrolled. For example, an AT who joined the study as a replacement school in week 10 was not expected to report for weeks 1-9. Overall, 176 enrolled ATs reported an average of 37 study weeks. The majority of ATs (77.8%) reported all the weeks during which they were enrolled, with only 15.9% of ATs missing over 10 weeks. Internal validity checks yielded 96.3% sensitivity, 100.0% specificity, a positive predictive value of 100.0%, and a negative predictive value of 99.5%.

Prior to the start of the 2010-11 High School RIO™ study, participating ATs were asked to complete a short demographics survey. Three-quarters (73.6%) of participating high schools were public schools, with the remainder being private. All ATs provided services to athletes of their high school on 5 or more days each week. 68.4% of ATs participating during the 2010-11 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 (n=176 combined) the opportunity to provide feedback on their experiences with High School RIO™. This survey was completed by 116 ATs (65.9%). Average reporting time burdens were 19 minutes for the weekly exposure report and 9 minutes for the injury report form. Using a 5 point Likert scale, RIO™ was overwhelmingly reported to be either very easy (61.2%) or somewhat easy (33.6%) to use (5 and 4 on the Likert scale, respectively), with ATs being either very satisfied (68.1%) or somewhat satisfied (28.4%) with the study (5 and 4 on the Likert scale, respectively). Suggestions provided by ATs, such as the addition or clarification of questions or answer choices, will be used to improve the National High School Sports-Related Injury Surveillance Study for the 2011-12 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 dispersed 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.