

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

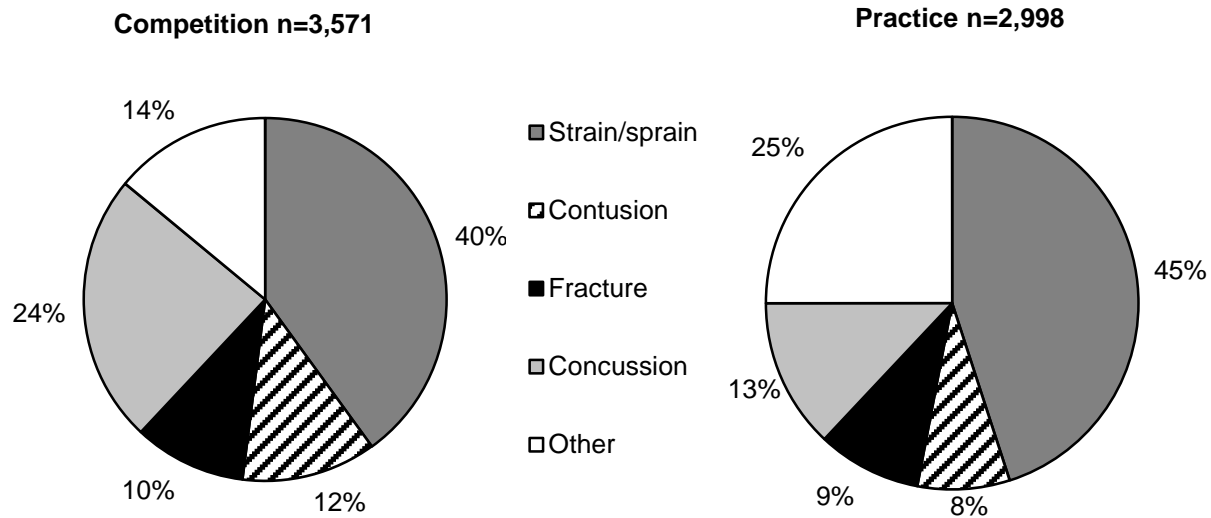


Table 2.4 Body Site of Injury by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| | 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

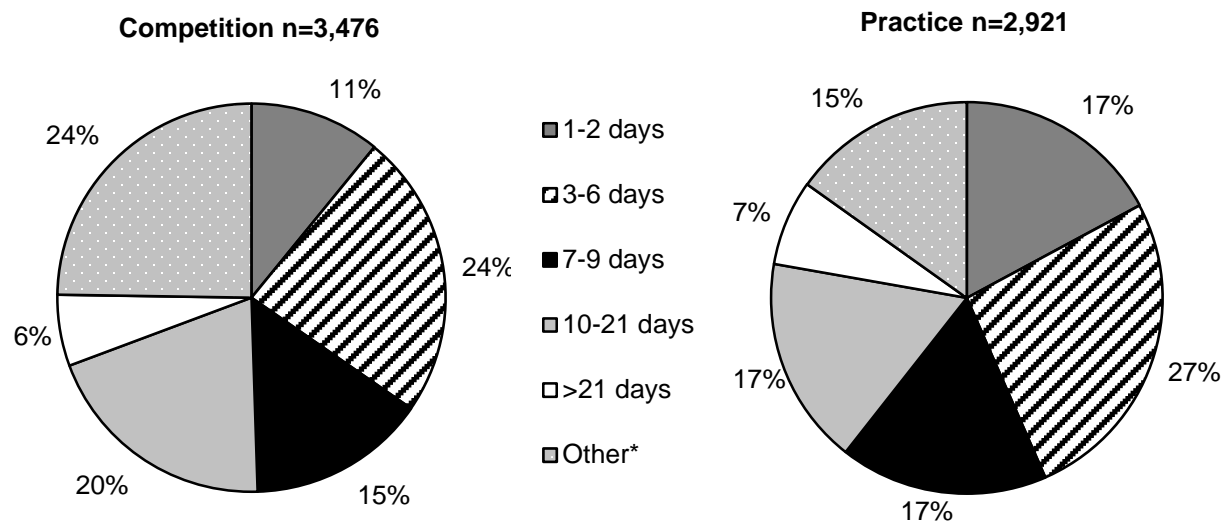
| | Male | | Female | | Total | |
|-----------------------------|------------|-------------|------------|-------------|------------|-------------|
| | n | % | n | % | n | % |
| Knee Ligament | | | | | | |
| Medial collateral ligament | 173 | 30.1% | 49 | 17.7% | 222 | 26.1% |
| Patella/patellar tendon | 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

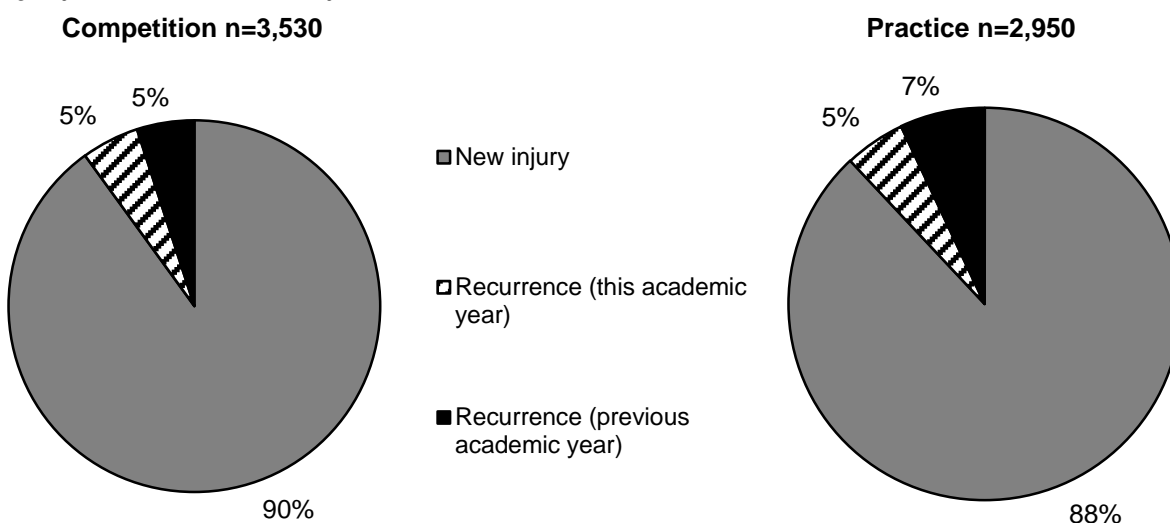


Table 2.9 Time during Season of Injury, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| | 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

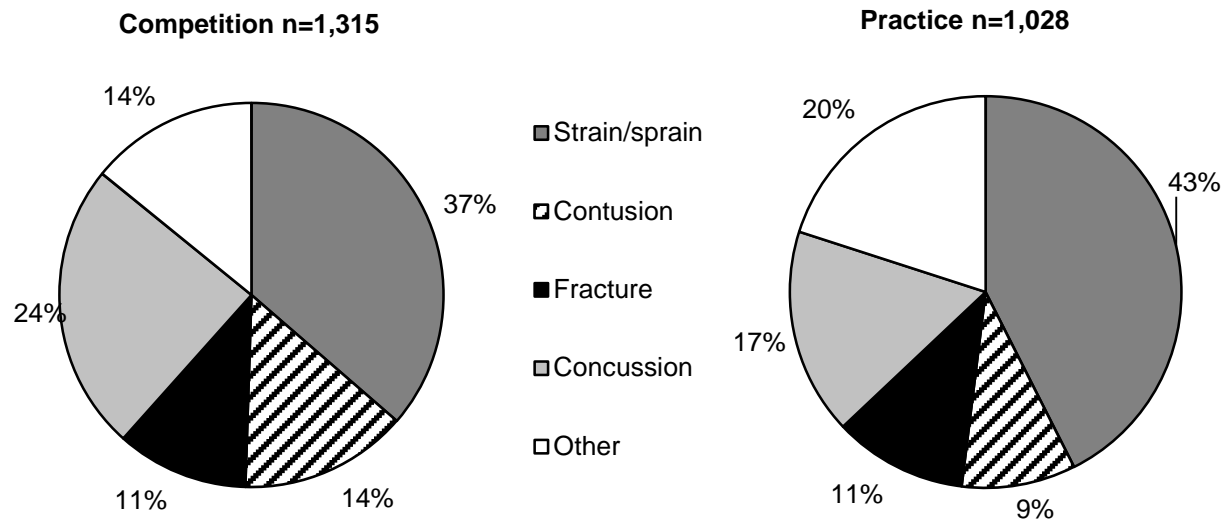


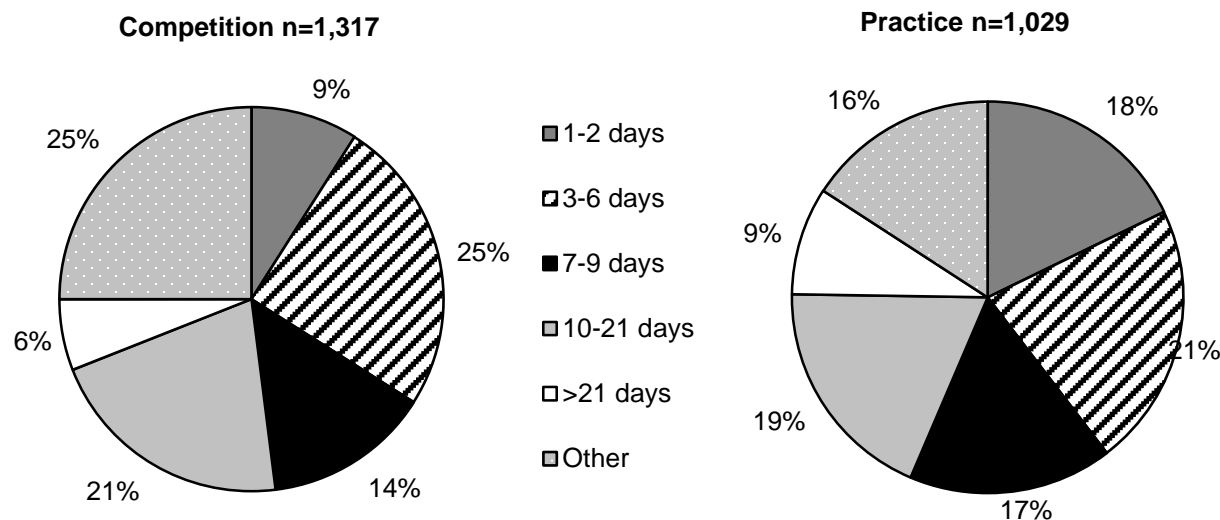
Table 3.3 Body Site of Football Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| | 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

| | Competition n=1,315 | | Practice n=1,024 | | Total n=2,339 | |
|-----------------------------------|------------------------|-------|---------------------|-------|------------------|-------|
| | n | % | n | % | n | % |
| Diagnosis | | | | | | |
| 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

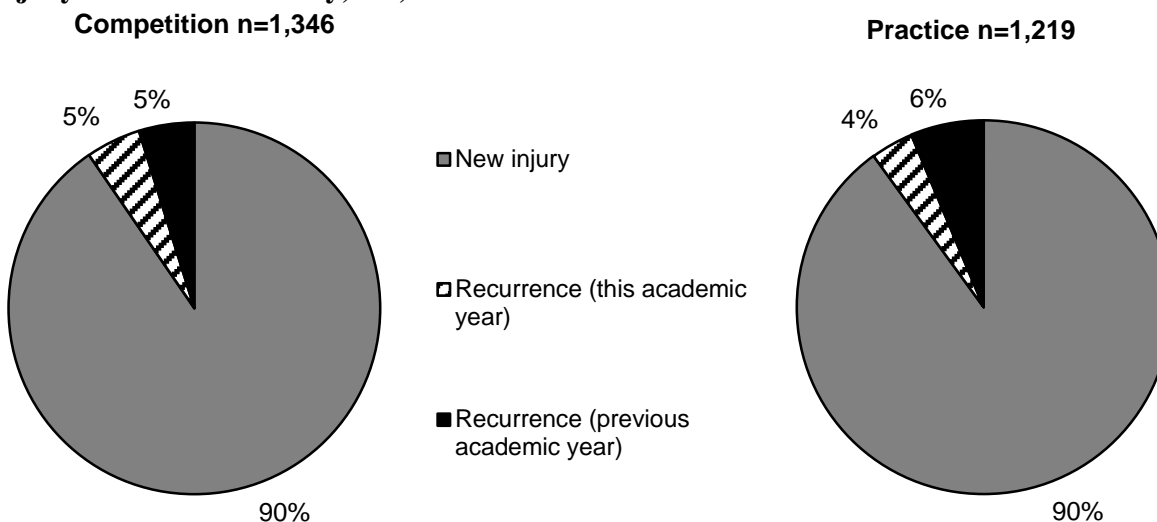


Table 3.6 Time during Season of Football Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| | 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

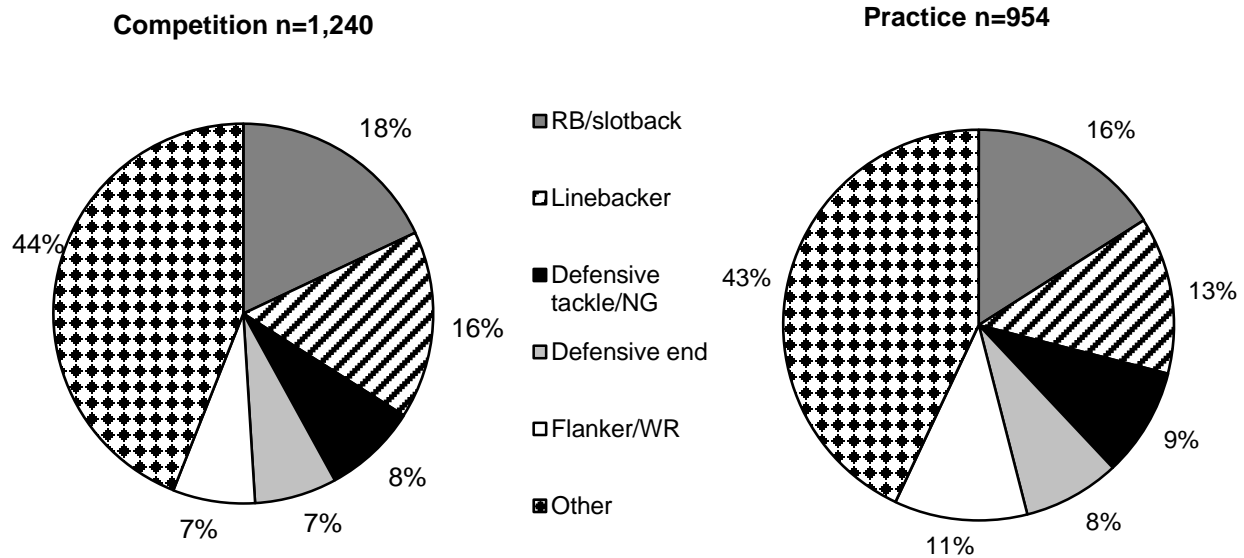
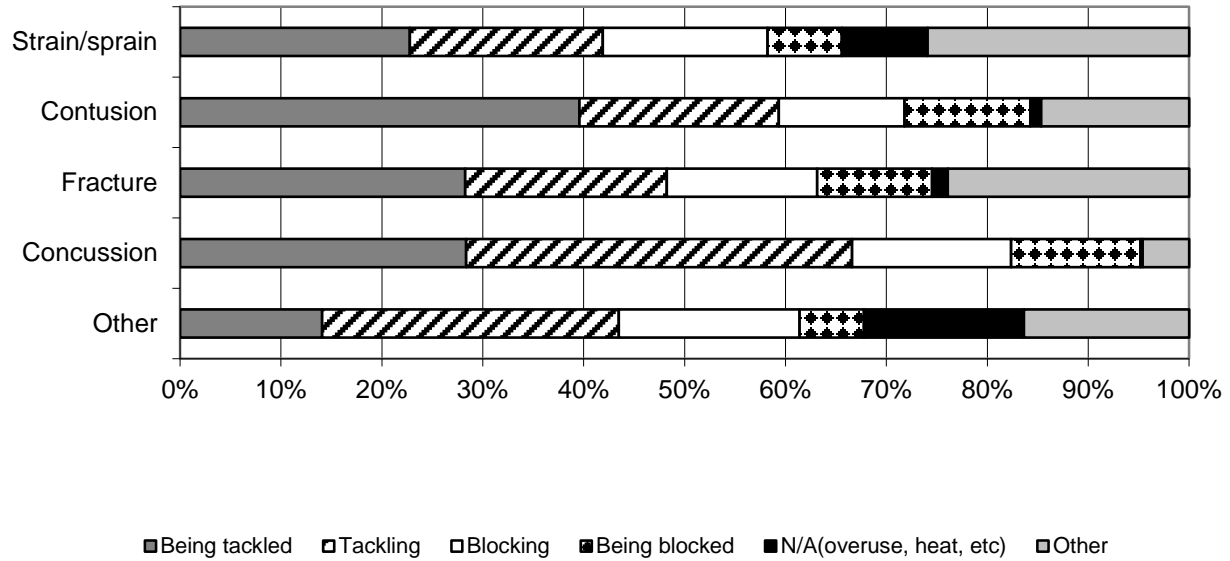


Table 3.9 Activities Leading to Football Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| 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

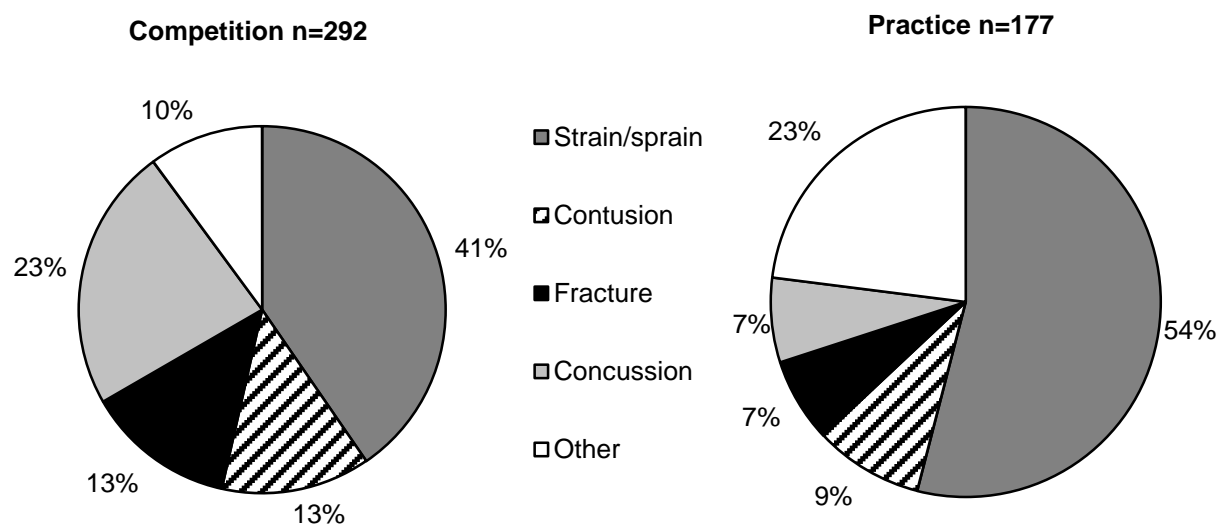


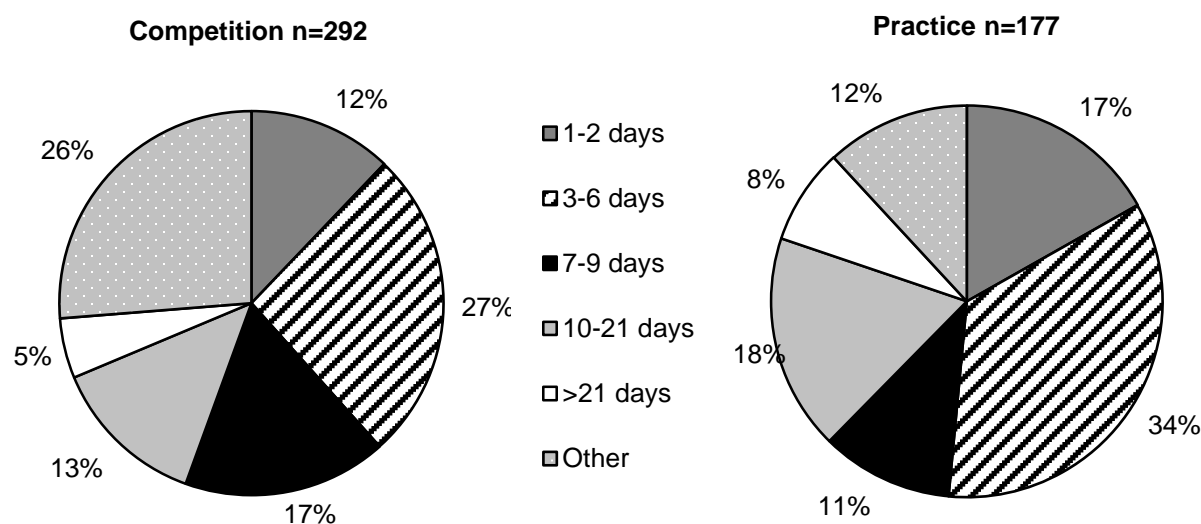
Table 4.3 Body Site of Boys' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| | 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

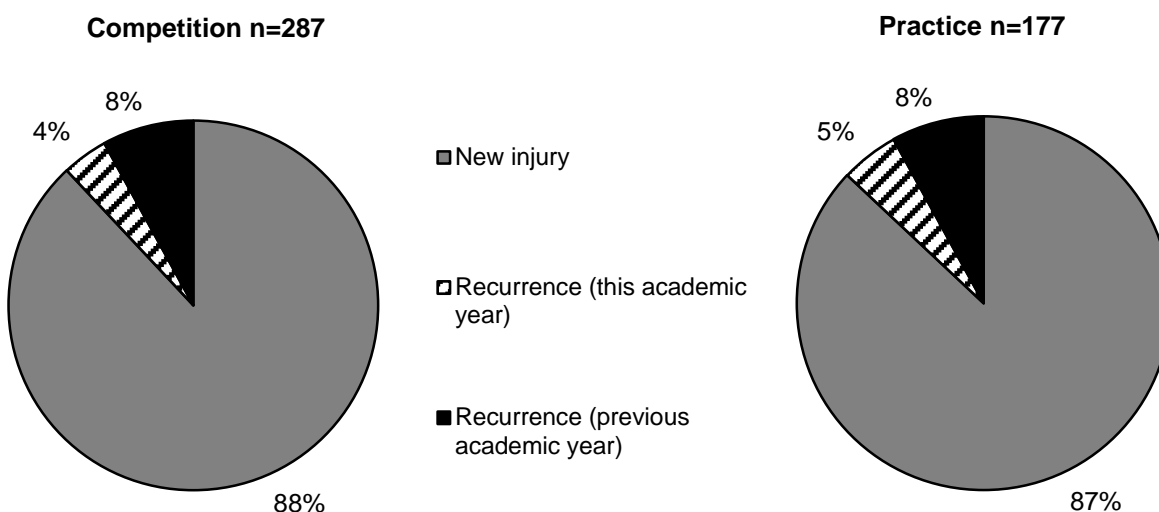


Table 4.6 Time during Season of Boys' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| | 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

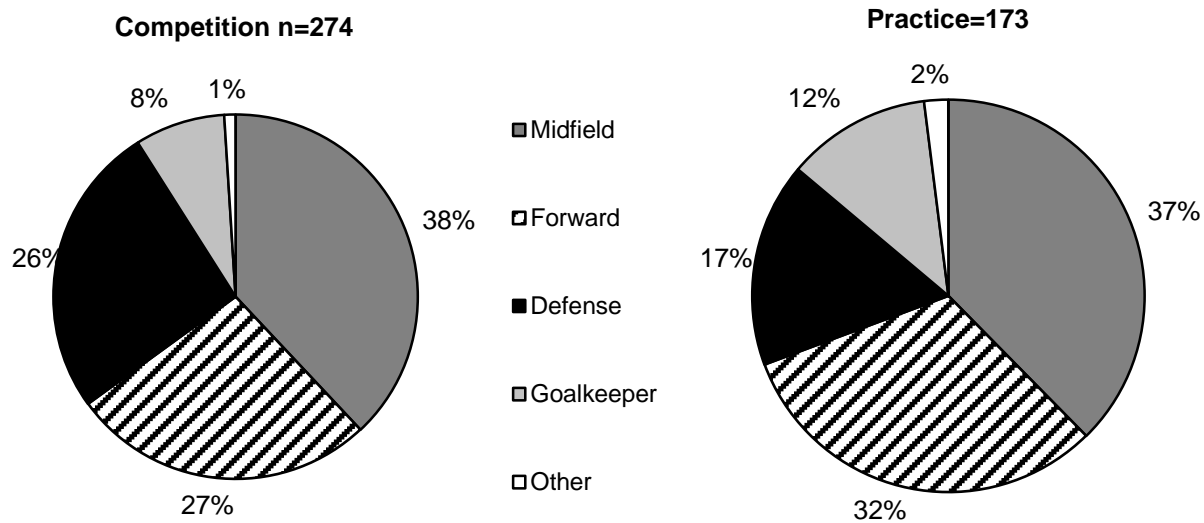
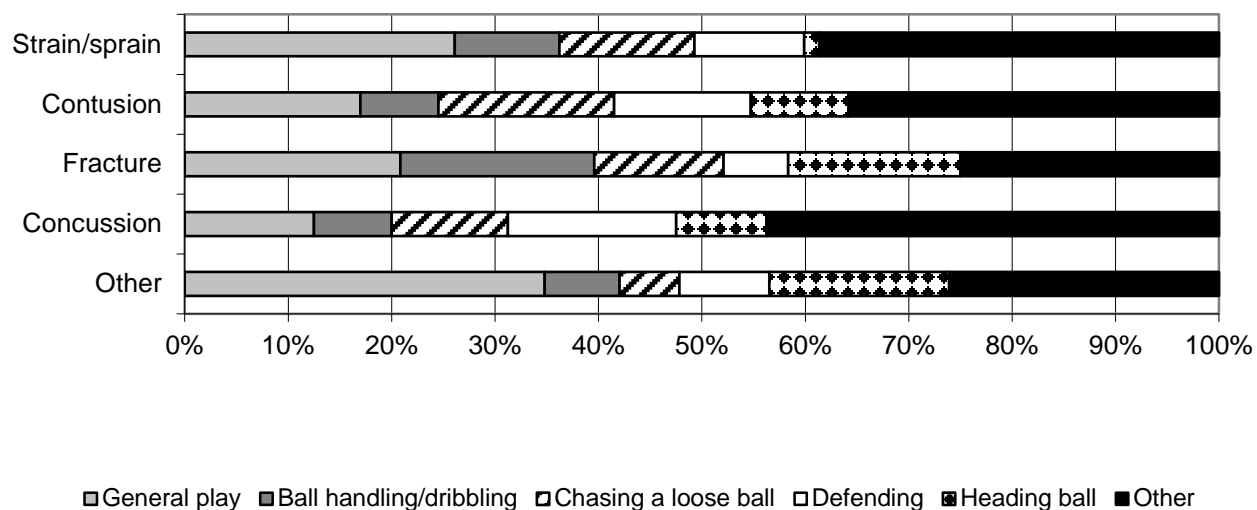


Table 4.9 Activities Leading to Boys' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| | 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

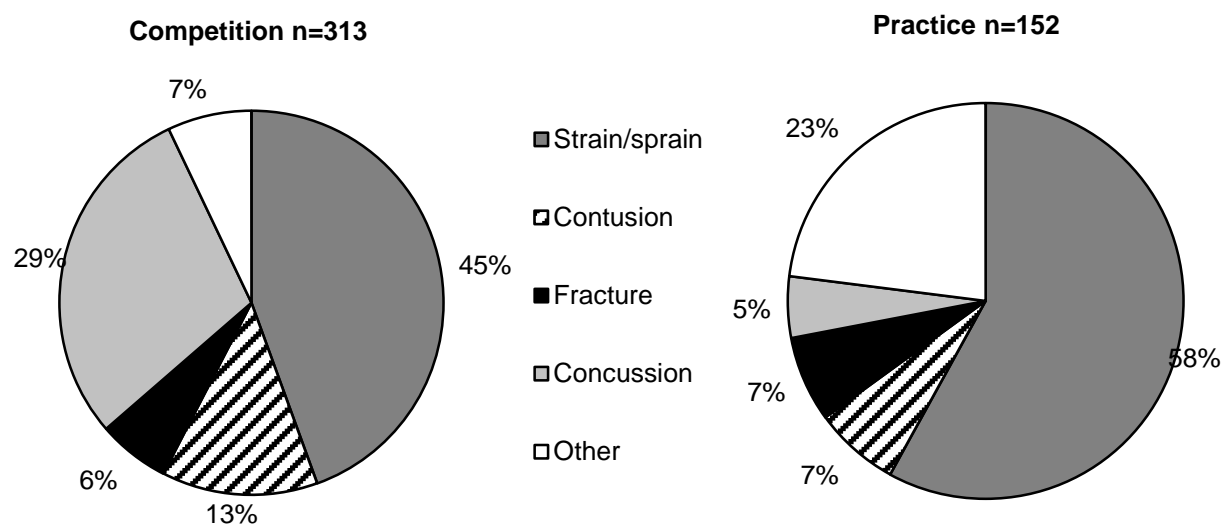


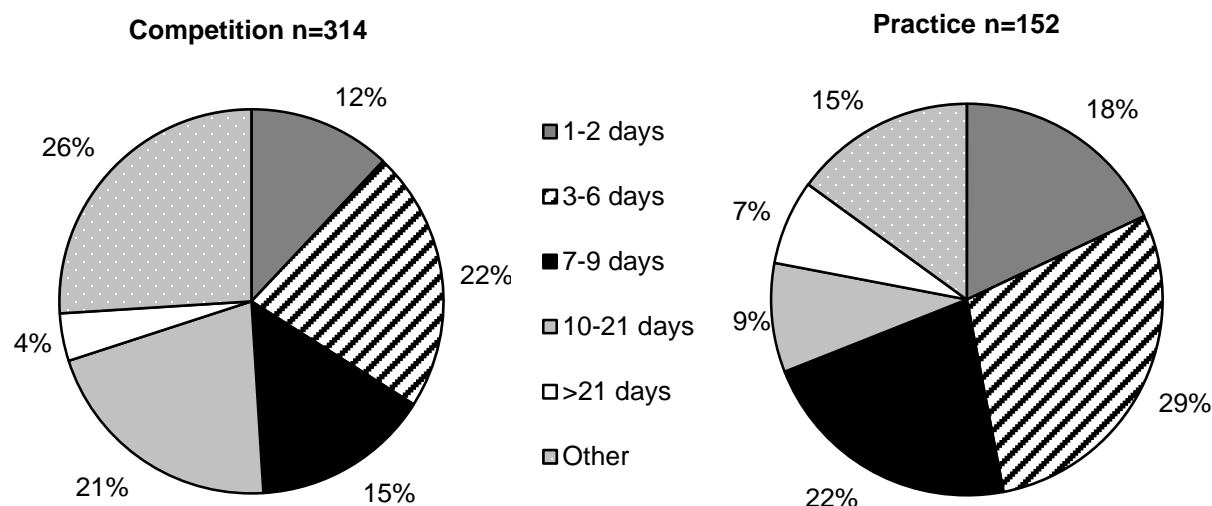
Table 5.3 Body Site of Girls' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| | 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

| Diagnosis | Competition n=313 | | Practice n=152 | | Total n=465 | |
|-----------------------------------|----------------------|-------|-------------------|-------|----------------|-------|
| | n | % | n | % | n | % |
| 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

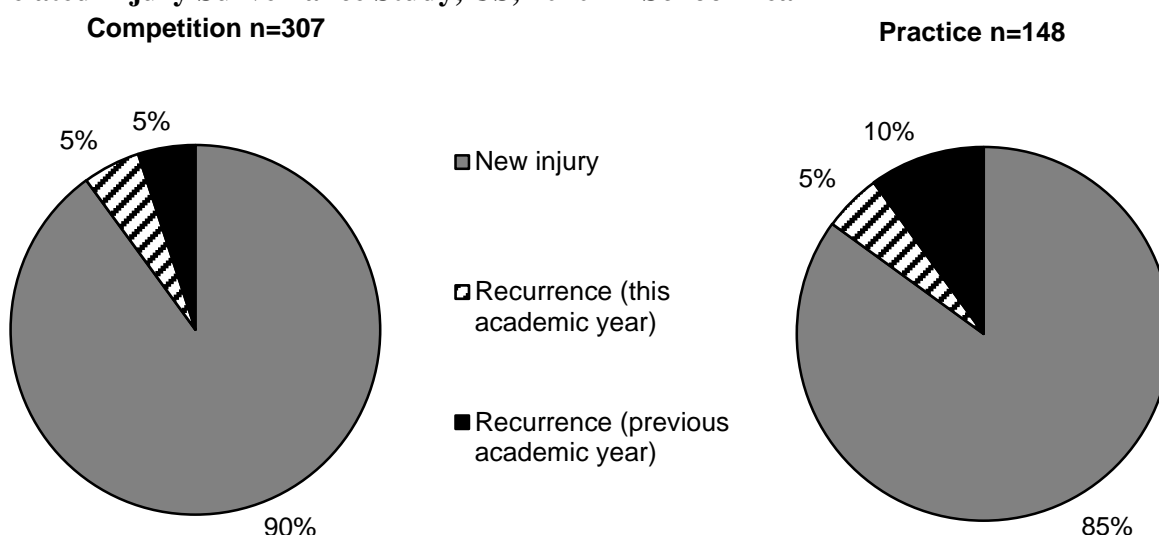


Table 5.6 Time during Season of Girls' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| | 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

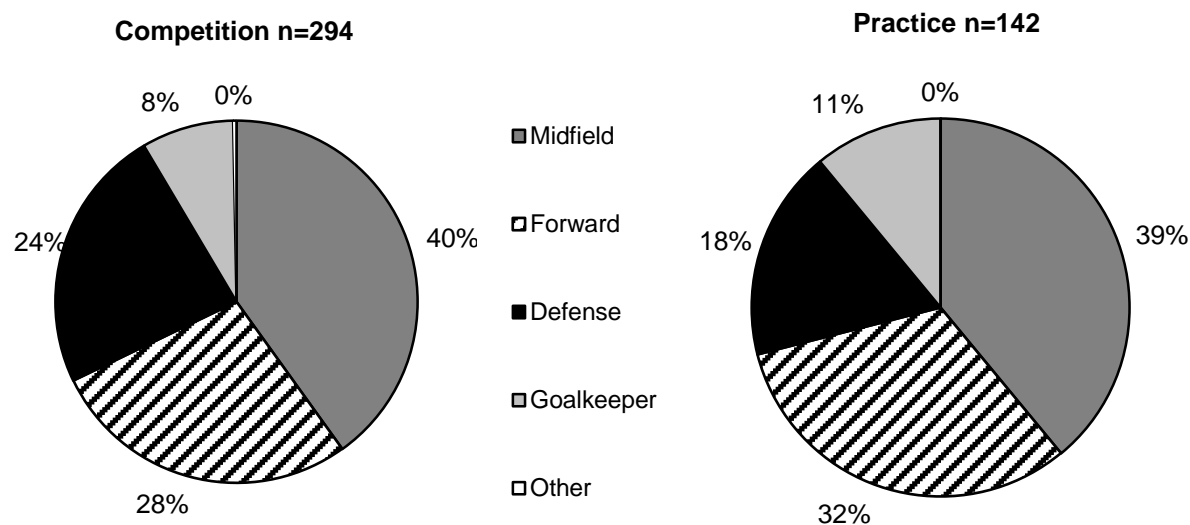
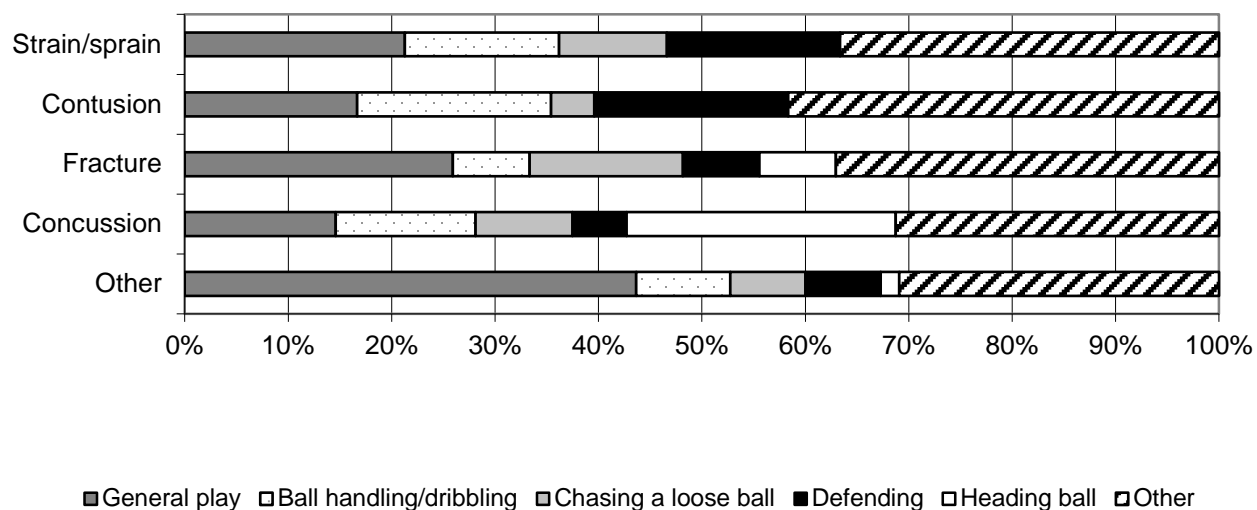


Table 5.9 Activities Leading to Girls' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| 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

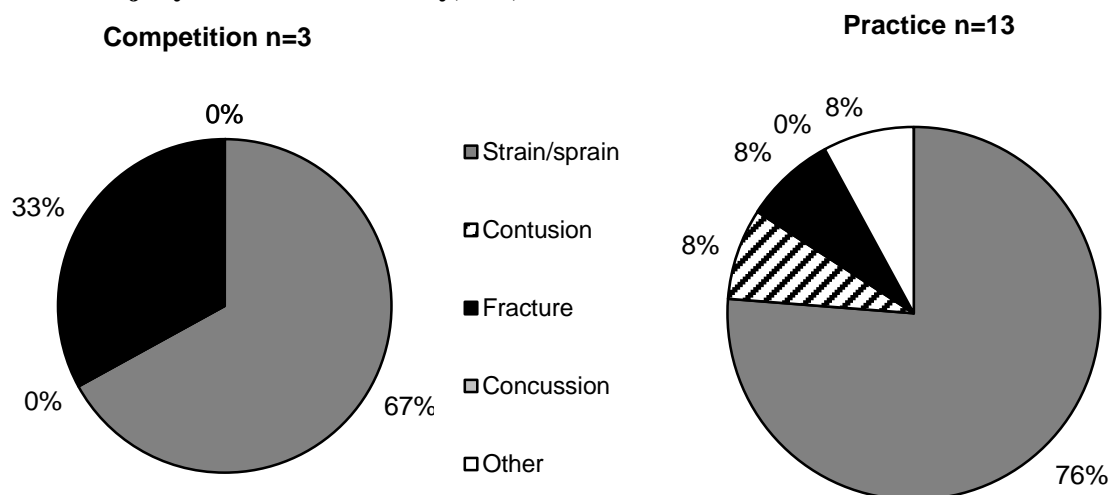


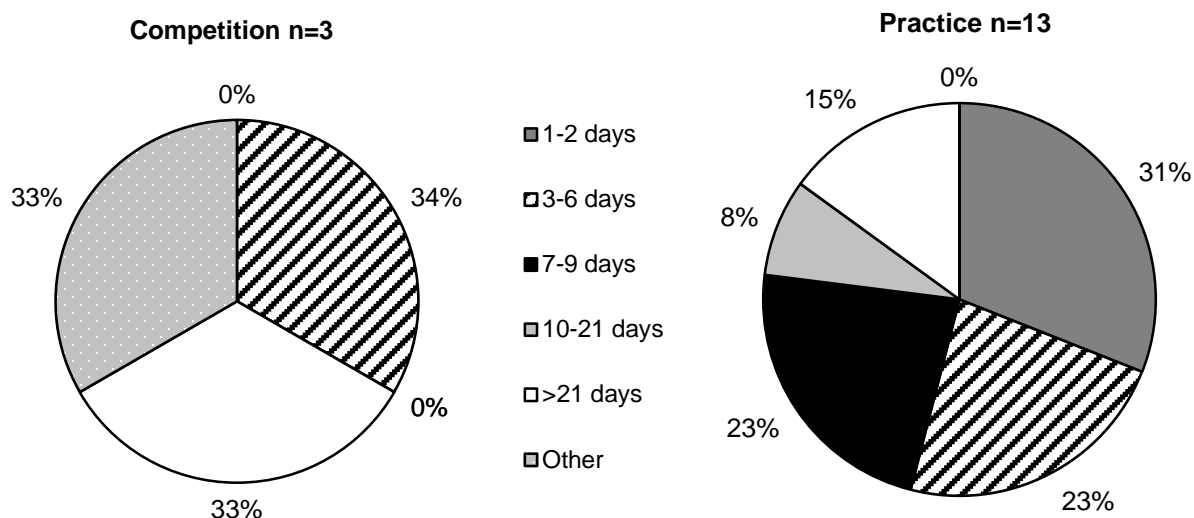
Table 6.3 Body Site of Boys' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| | 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

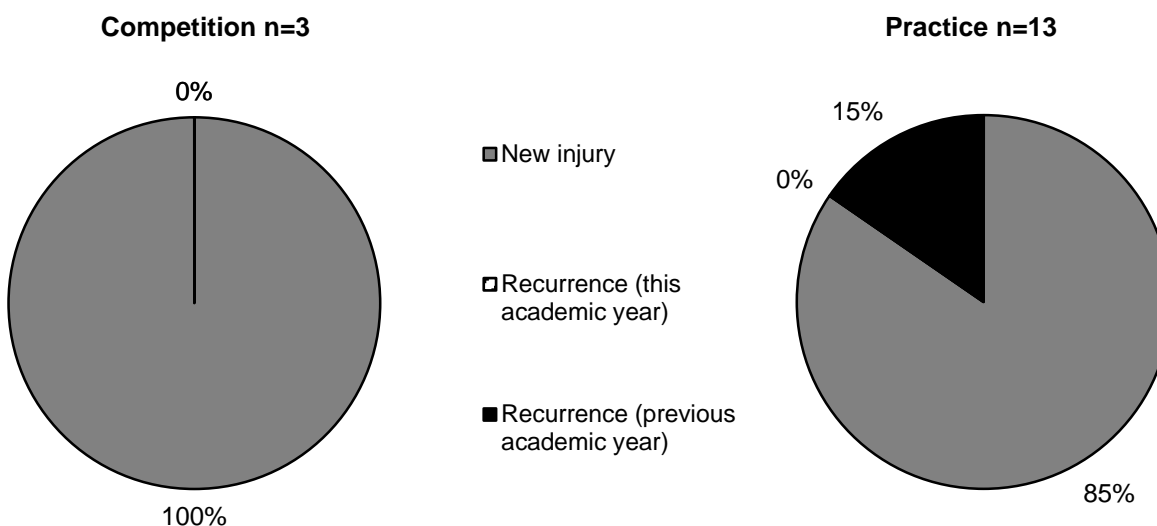


Table 6.6 Time during Season of Boys' Volleyball Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| | 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

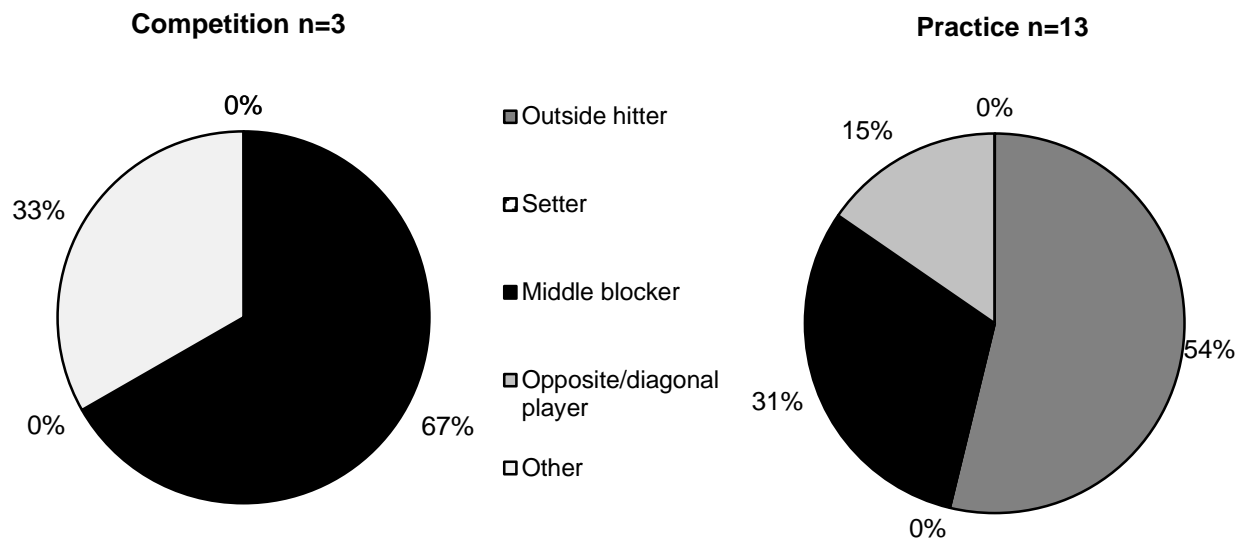
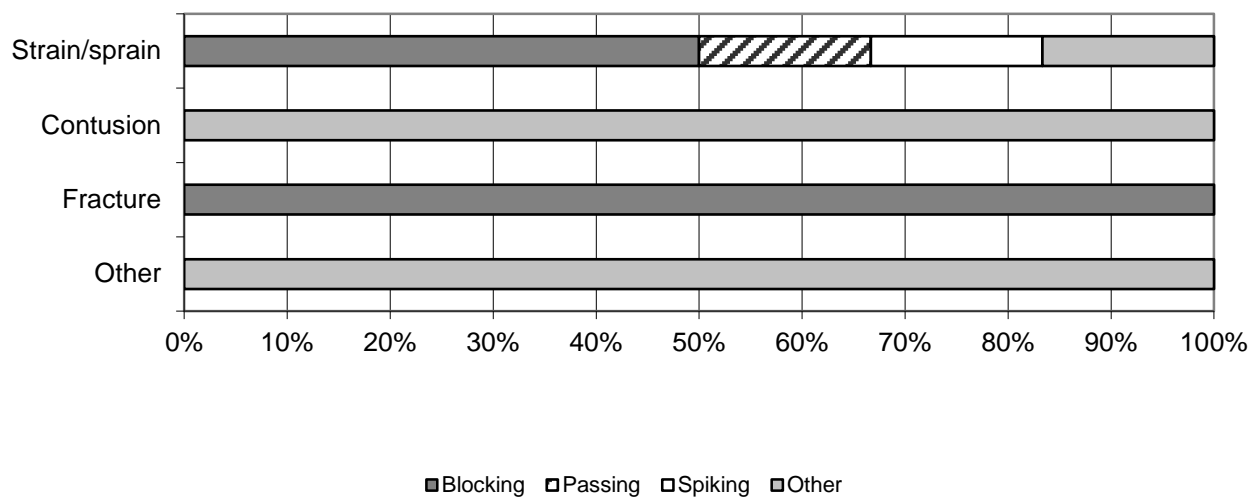


Table 6.9 Activities Leading to Boys' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| | 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

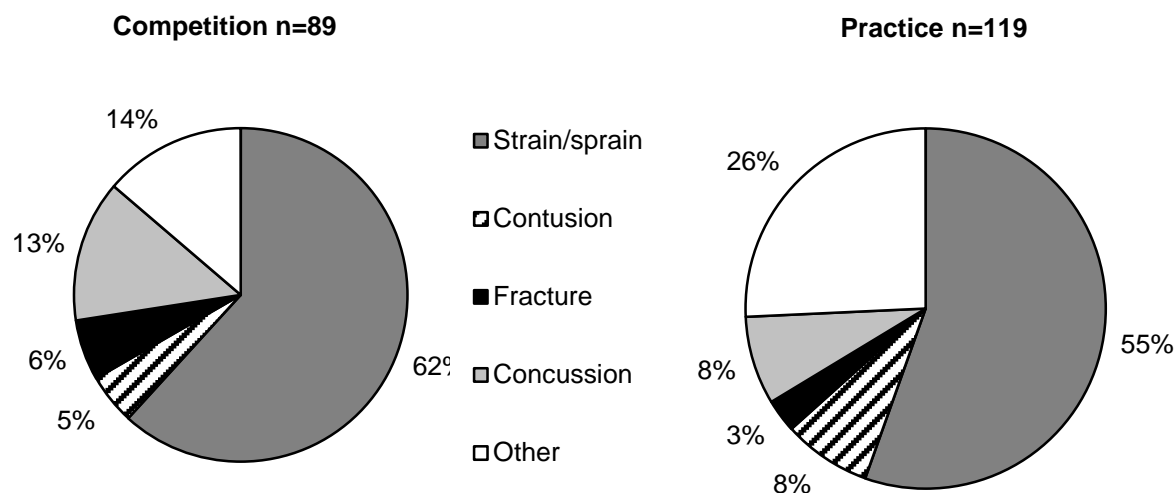


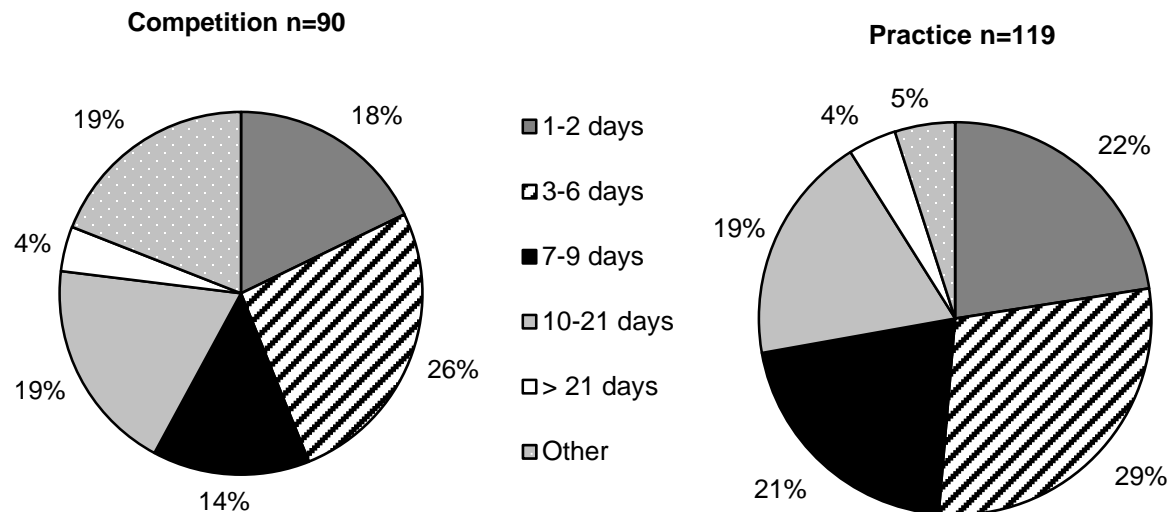
Table 7.3 Body Site of Girls' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| | 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

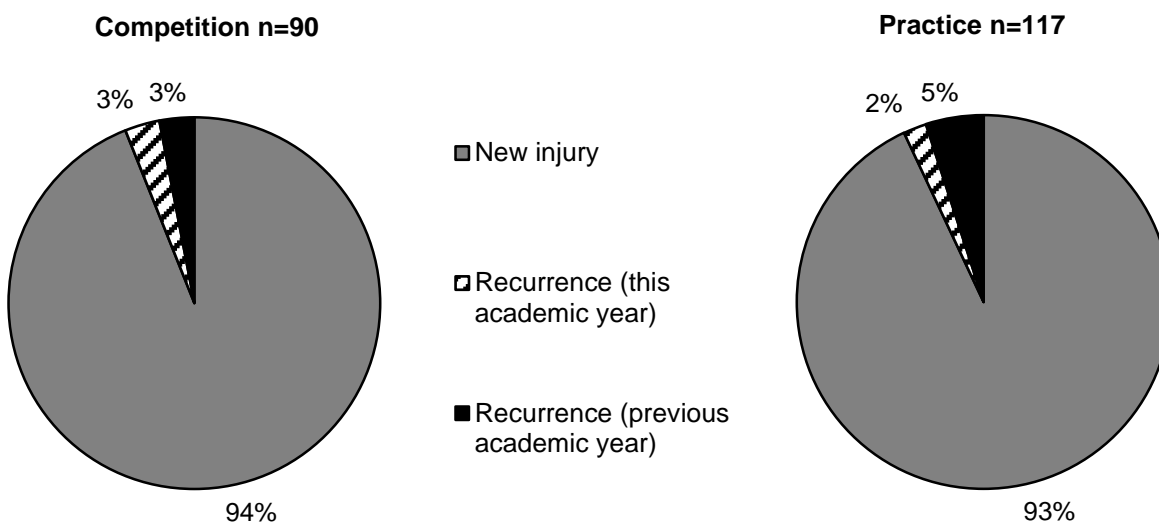


Table 7.6 Time during Season of Girls' Volleyball Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| | 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

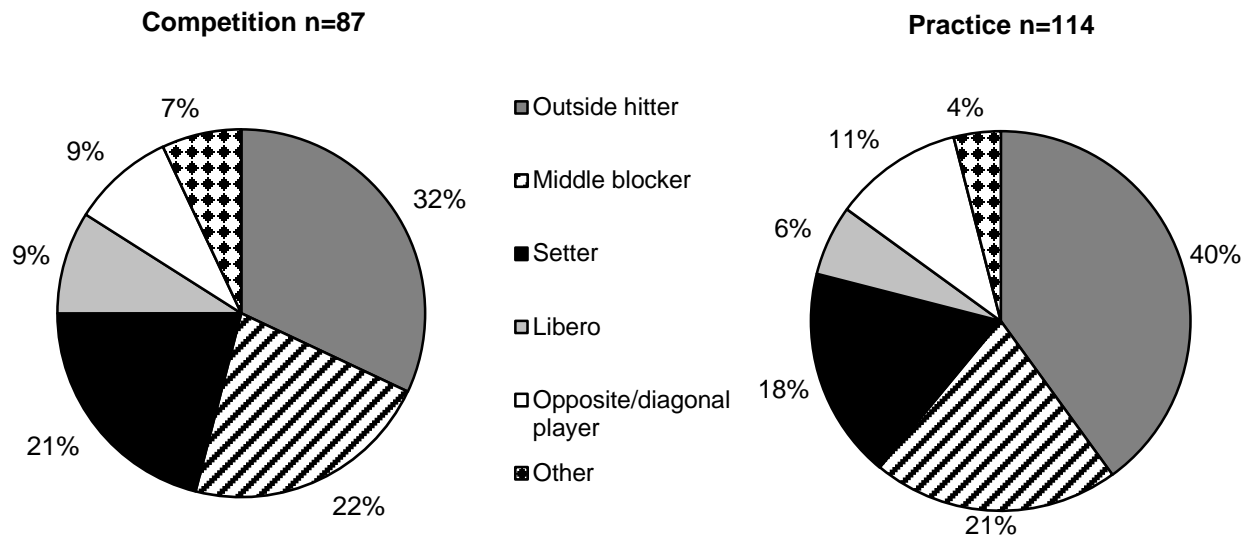
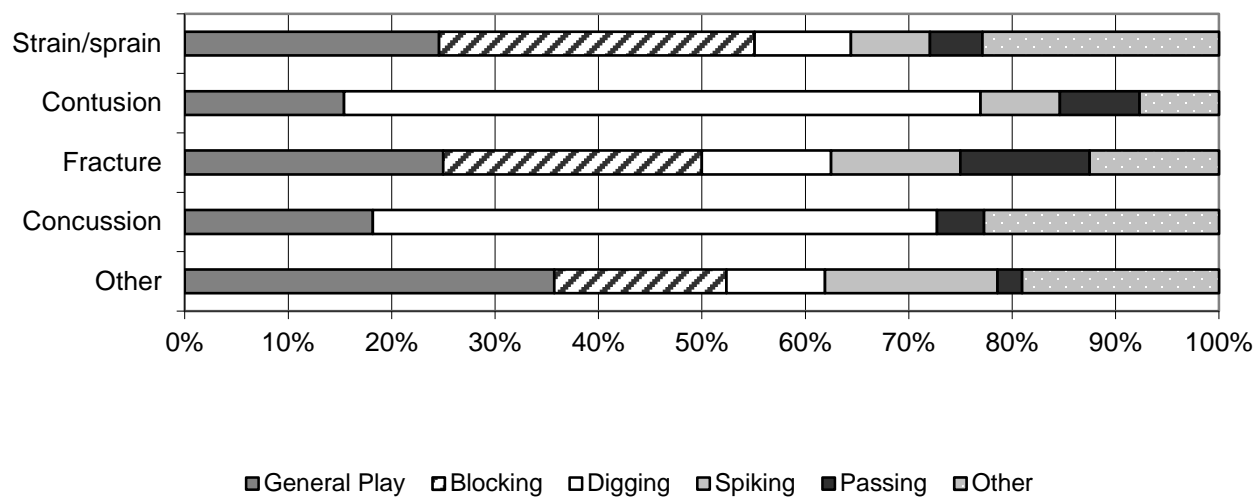


Table 7.9 Activities Leading to Girls' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| | 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

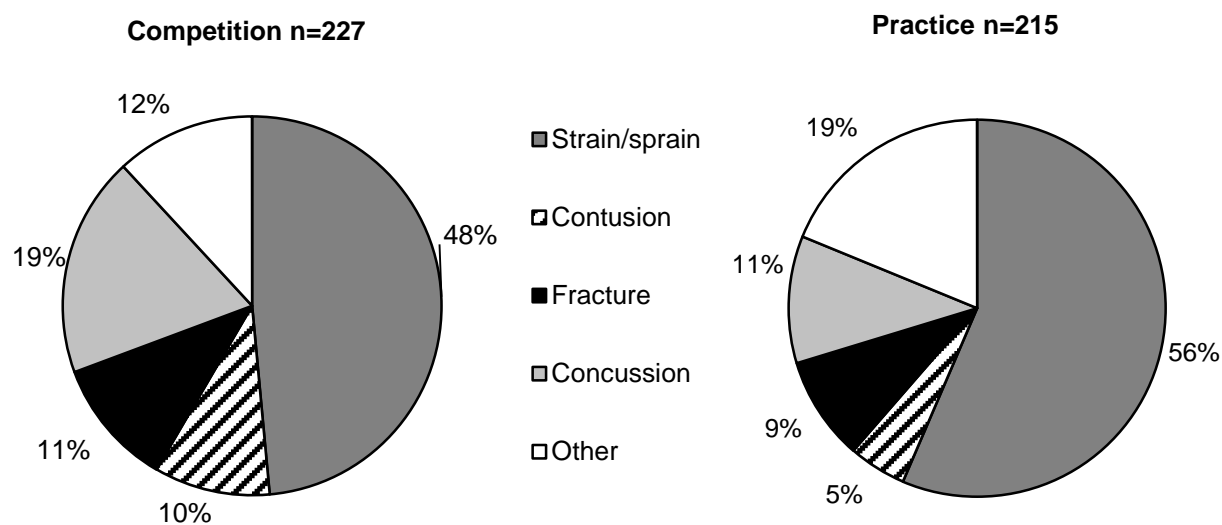


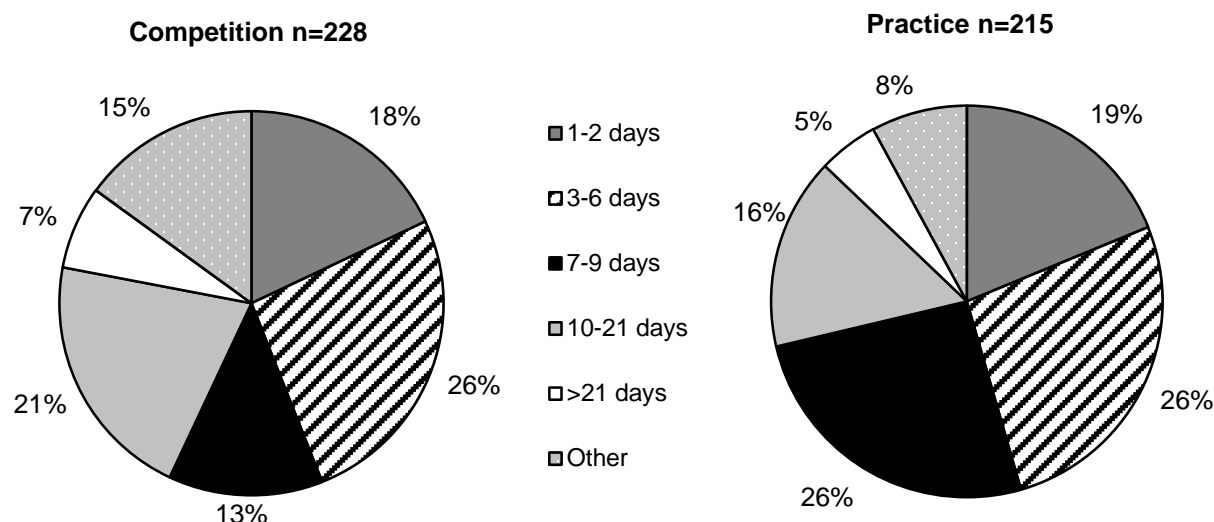
Table 8.3 Body Site of Boys' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| | 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

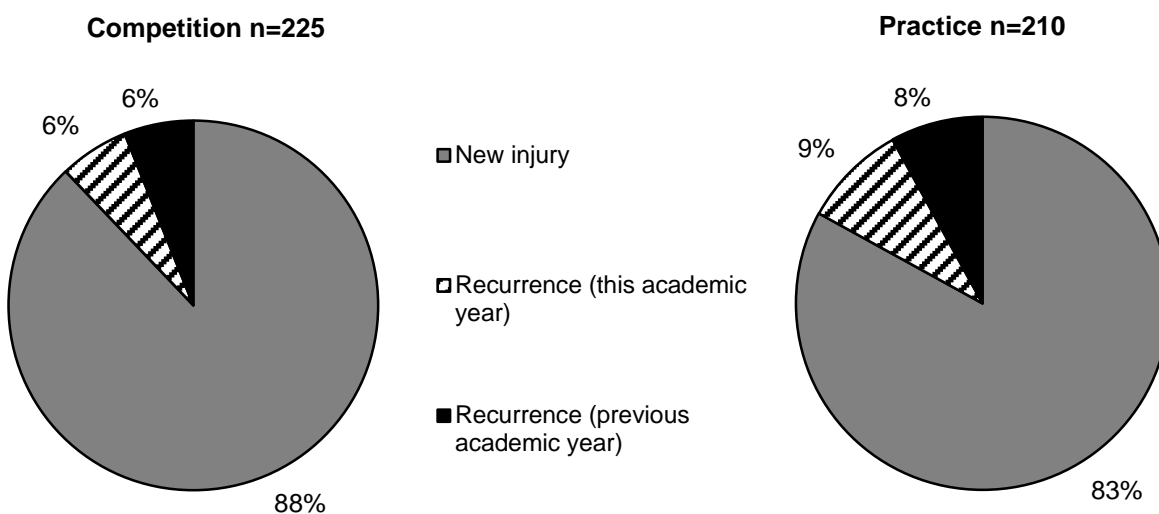


Table 8.6 Time during Season of Boys' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| | 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

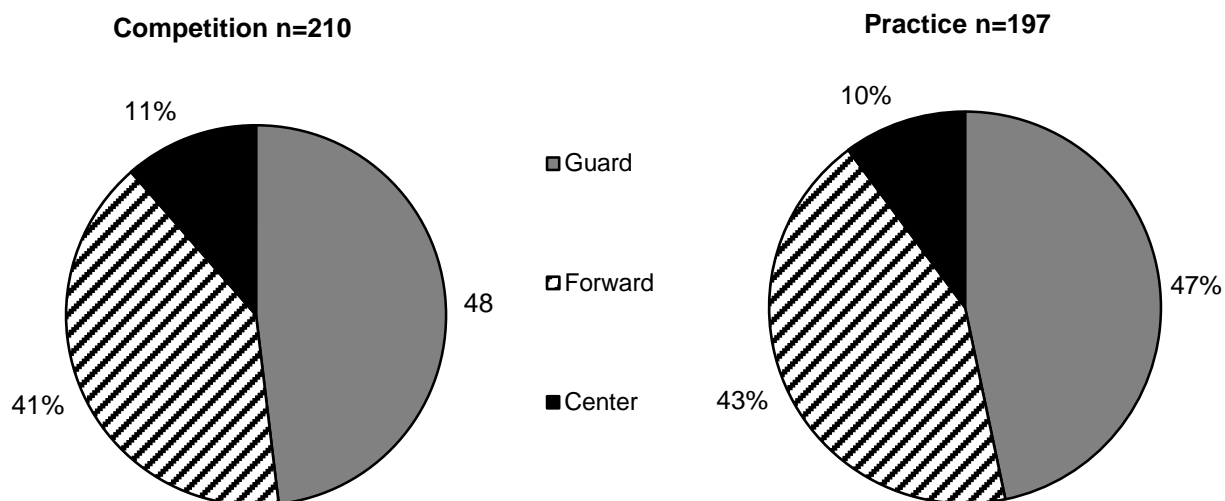
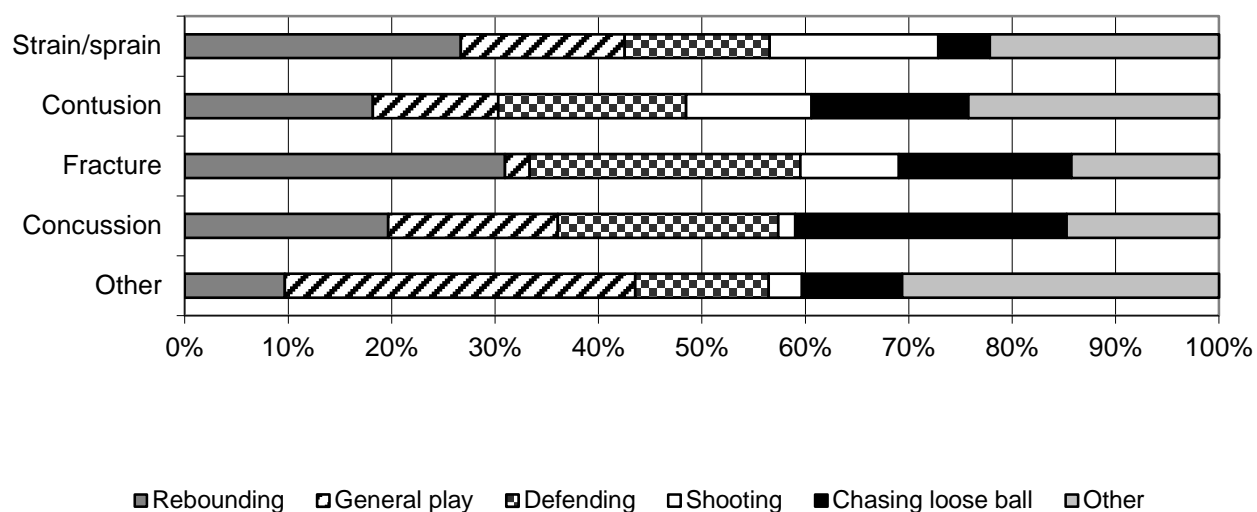


Table 8.9 Activities Leading to Boys' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| | 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

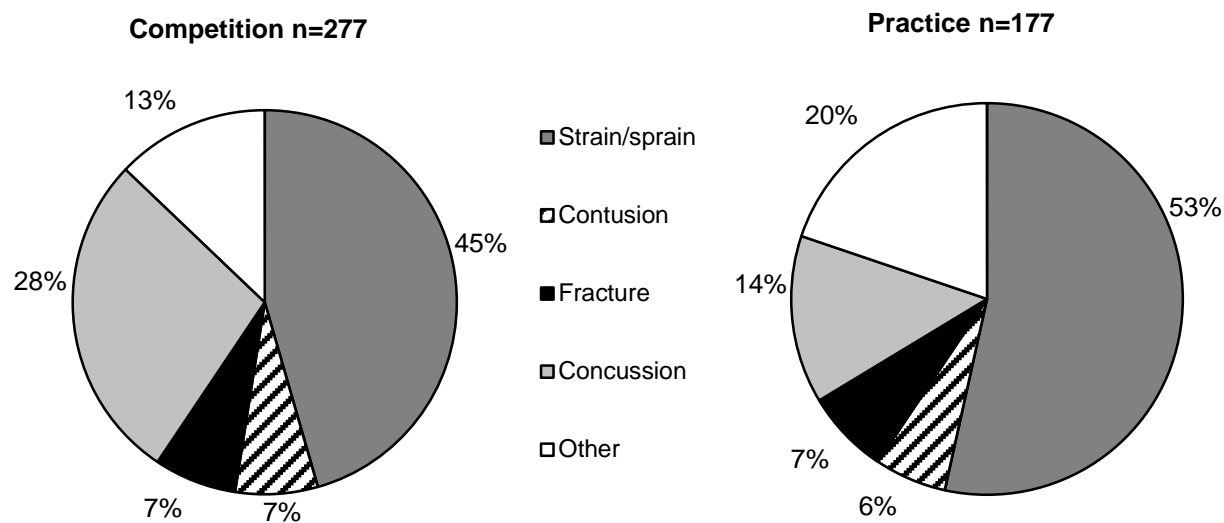


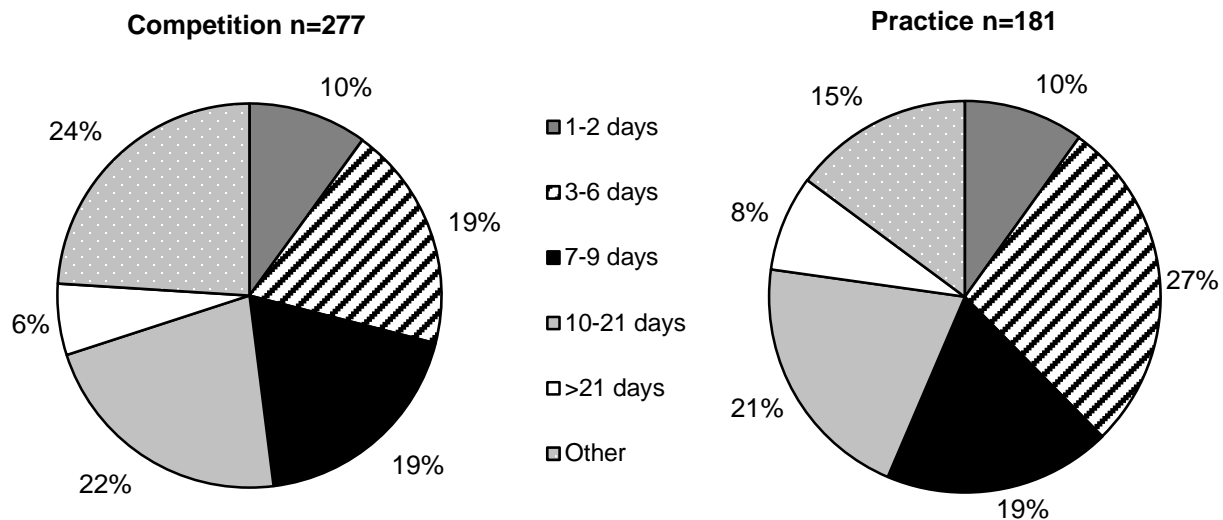
Table 9.3 Body Site of Girls' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| | 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

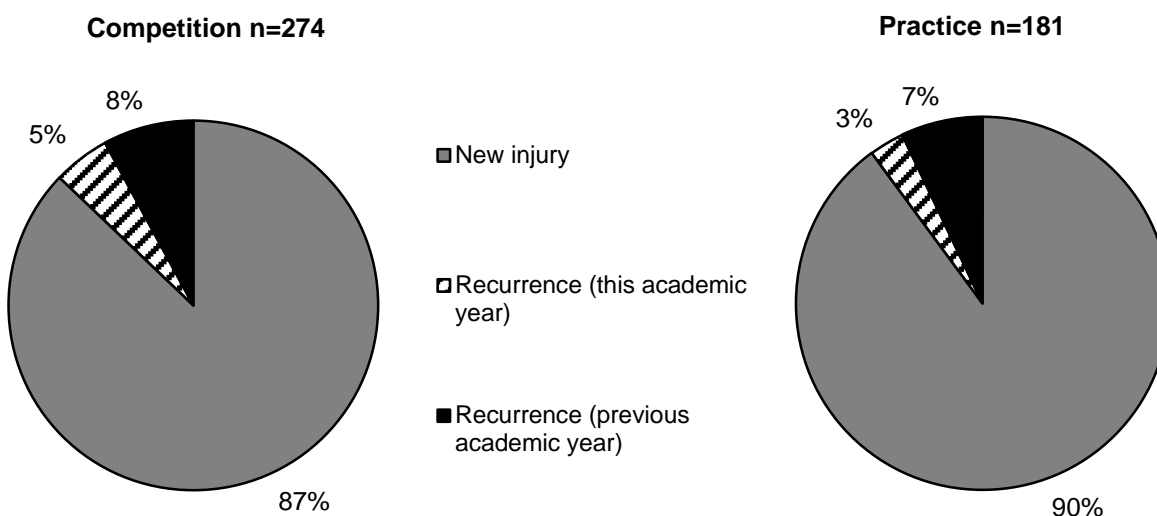


Table 9.6 Time during Season of Girls' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| | 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

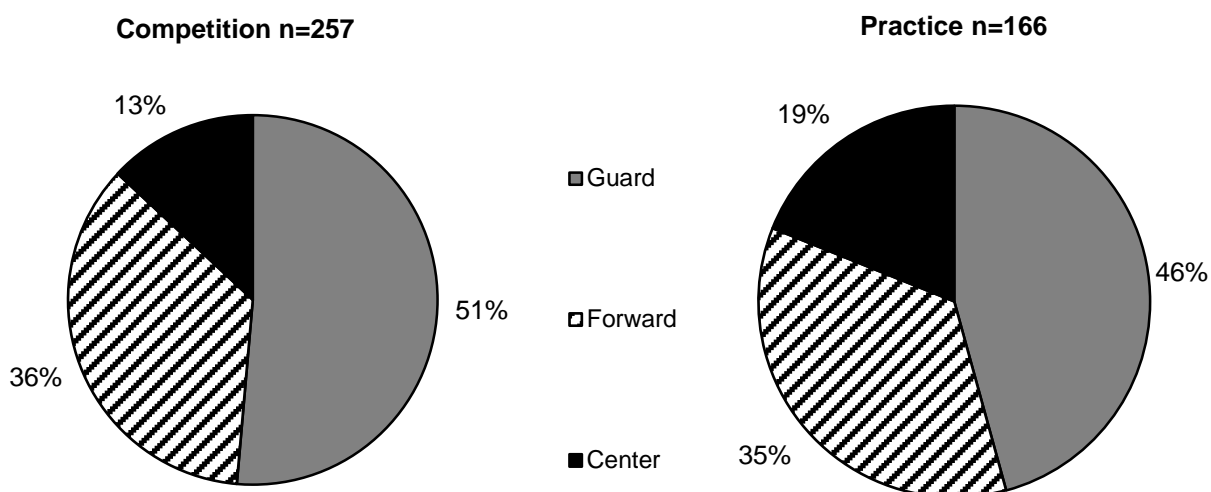
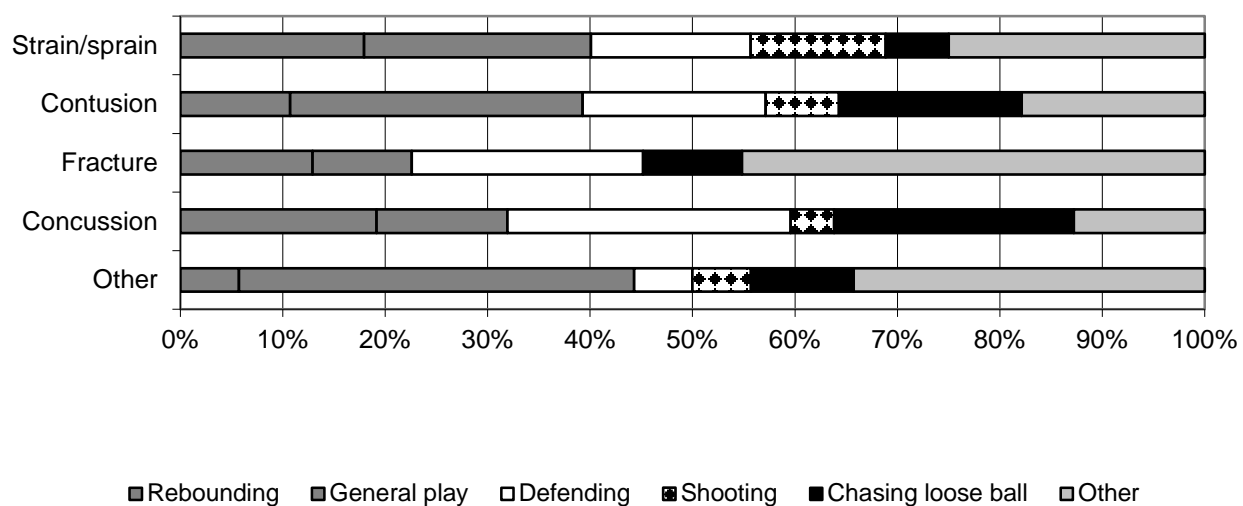


Table 9.9 Activities Leading to Girls' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| 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

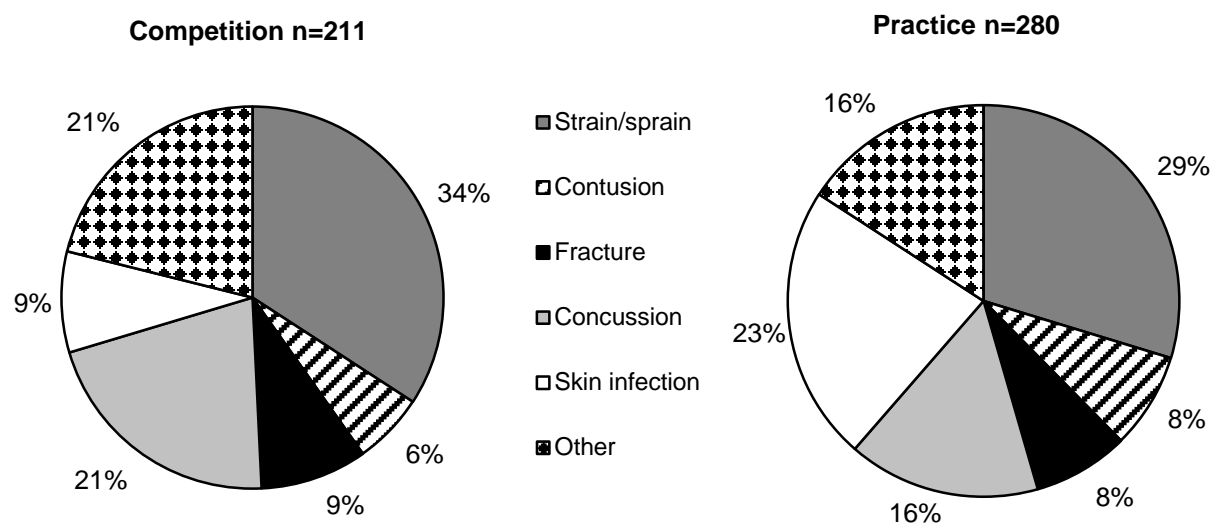


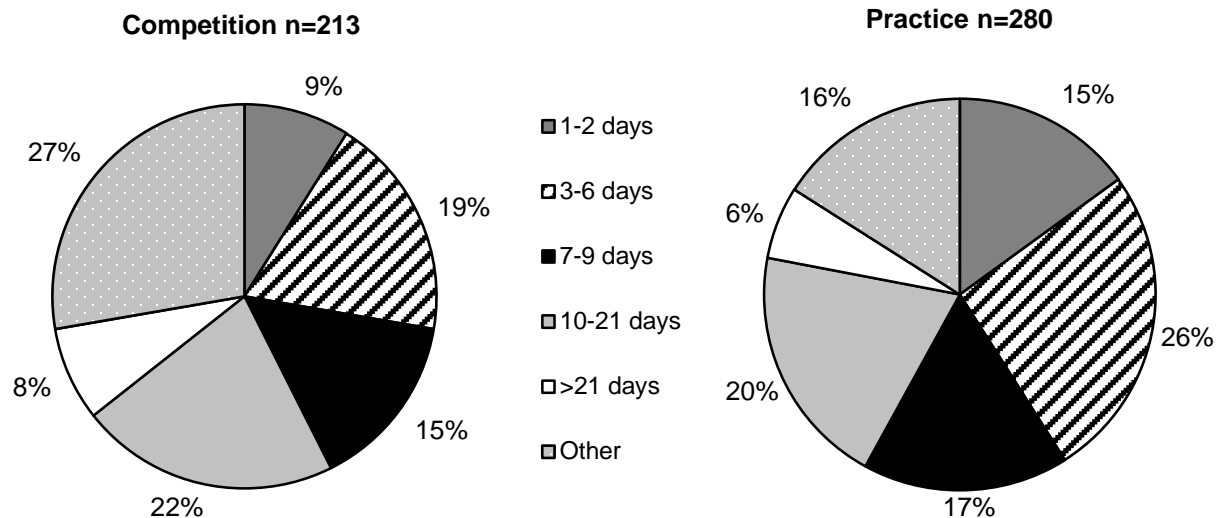
Table 10.3 Body Site of Wrestling Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| | 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

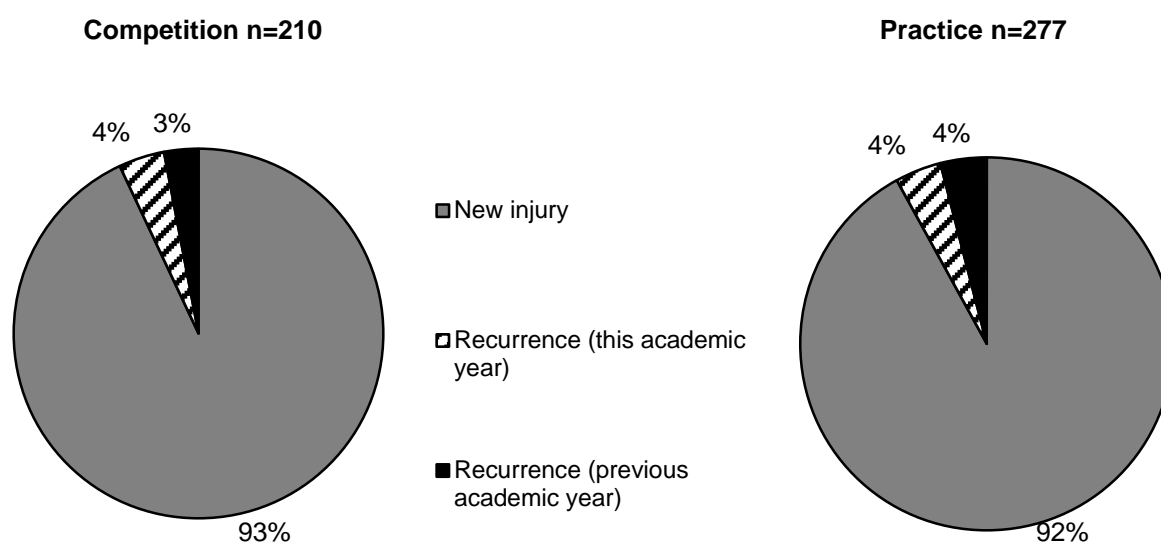


Table 10.6 Time during Season of Wrestling Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| | 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.

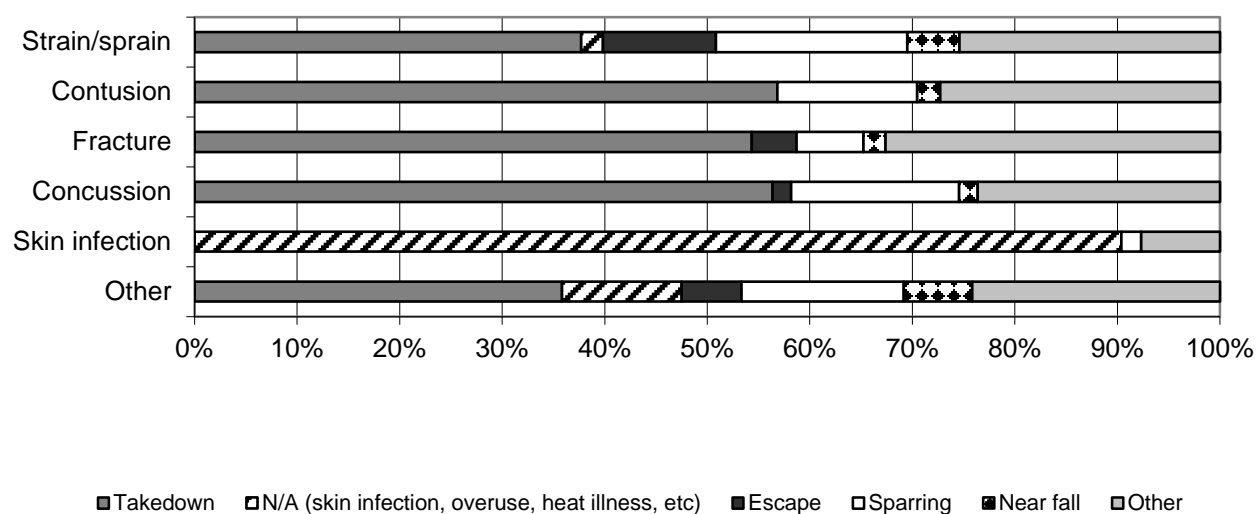
Table 10.8 Practice-Related Variables for Wrestling Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| | 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

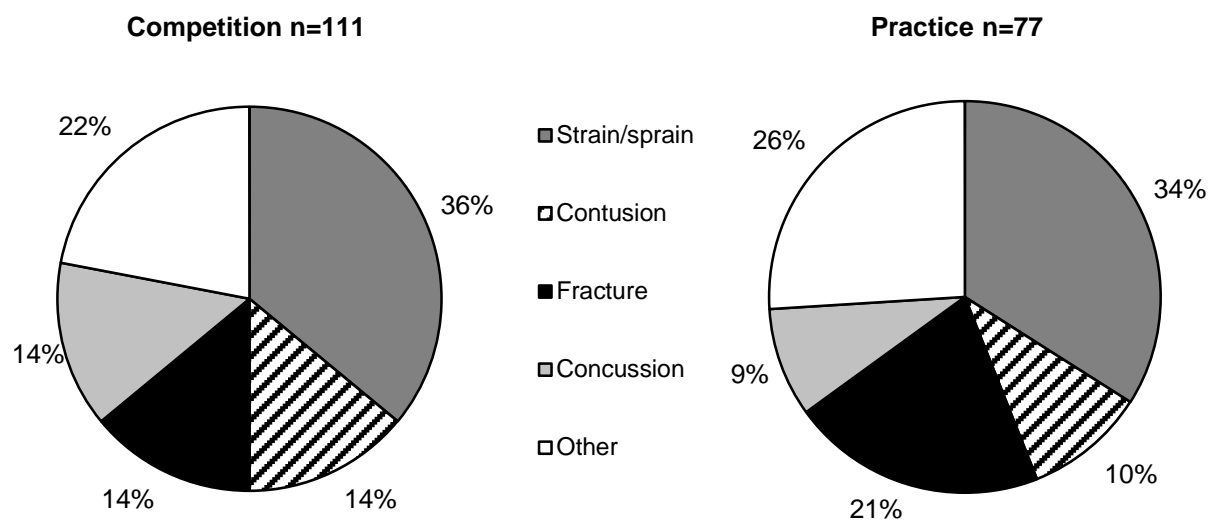


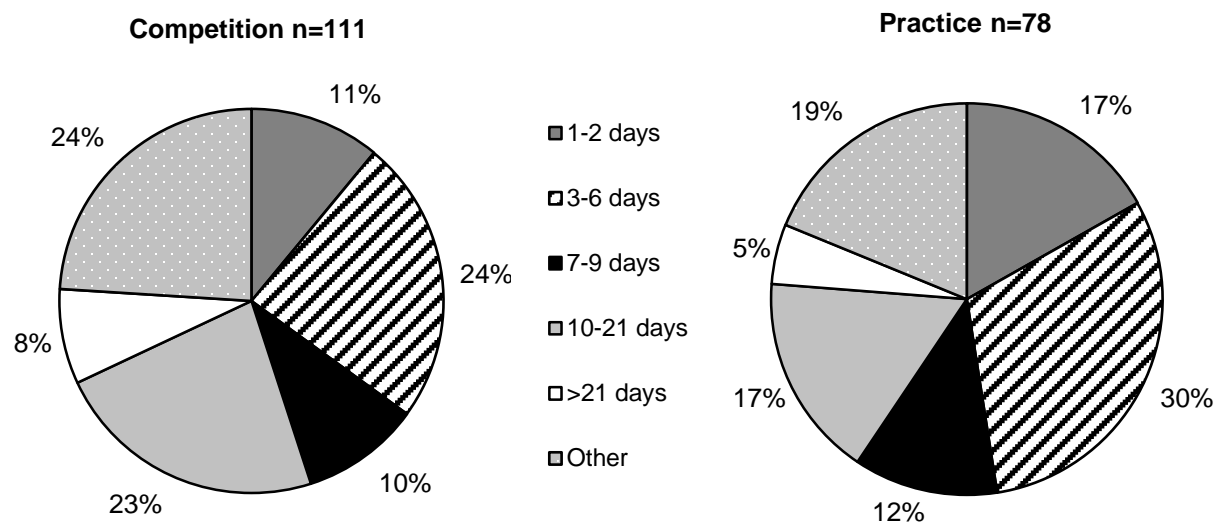
Table 11.3 Body Site of Baseball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| | 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

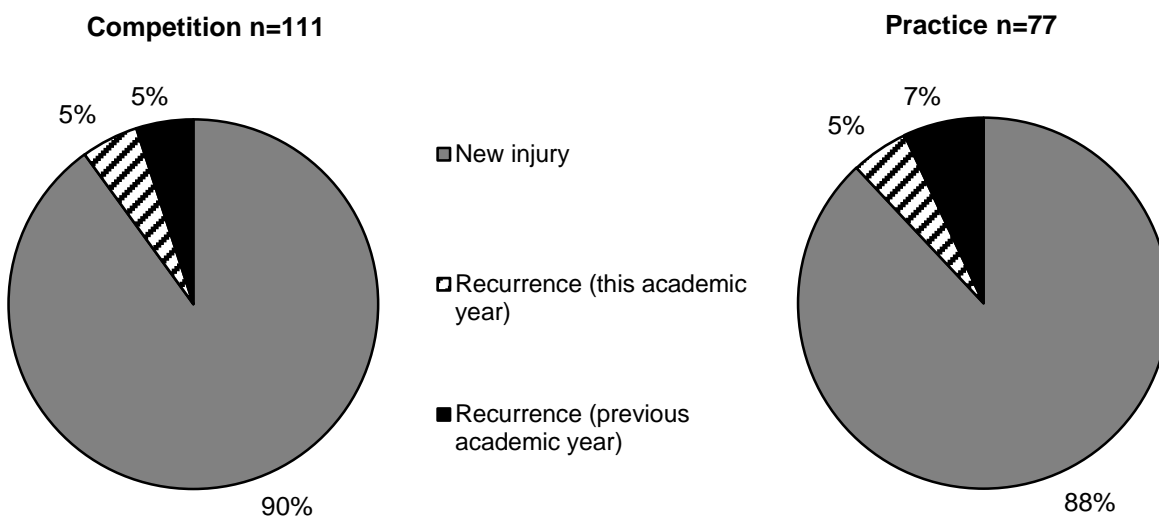


Table 11.6 Time during Season of Baseball Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| | 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

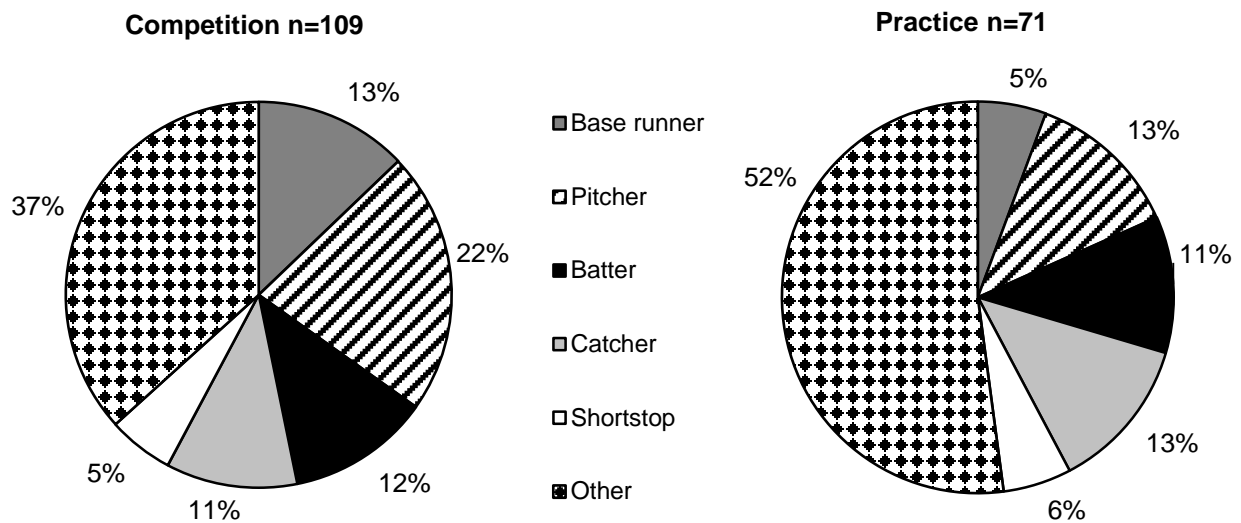
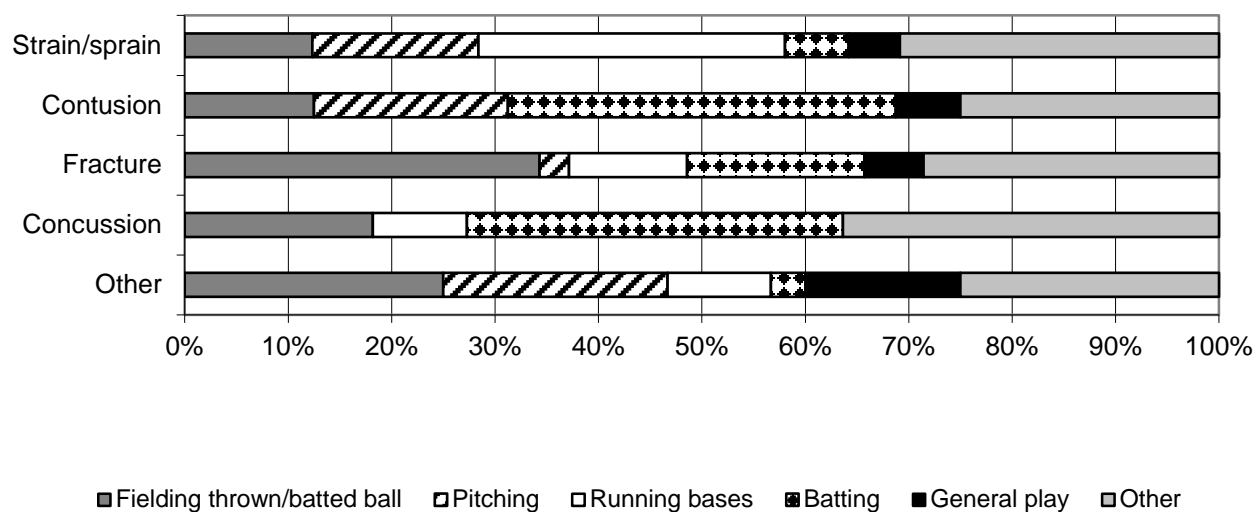


Table 11.9 Activities Leading to Baseball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| 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

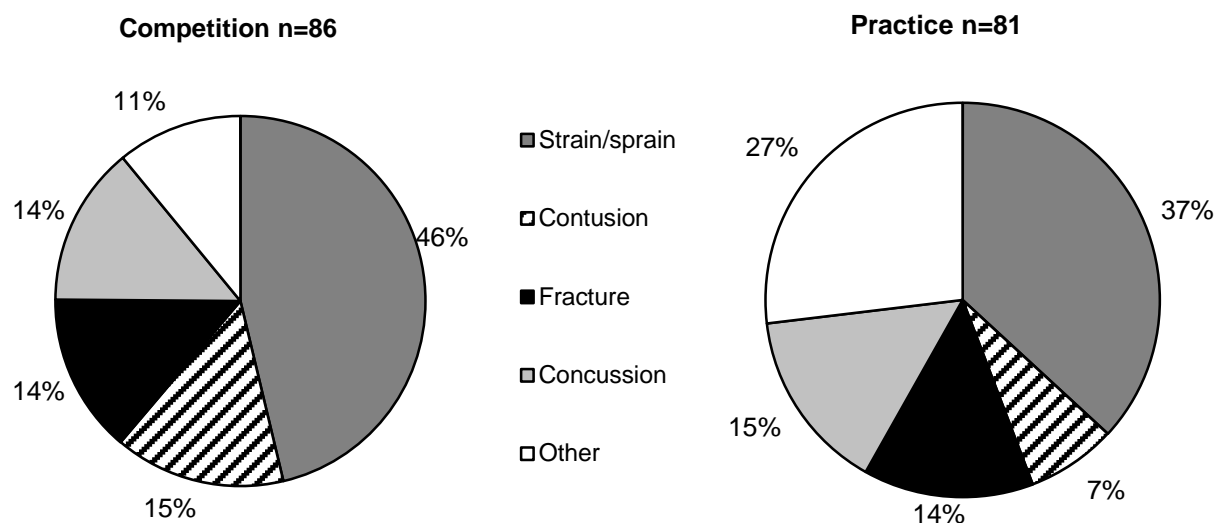


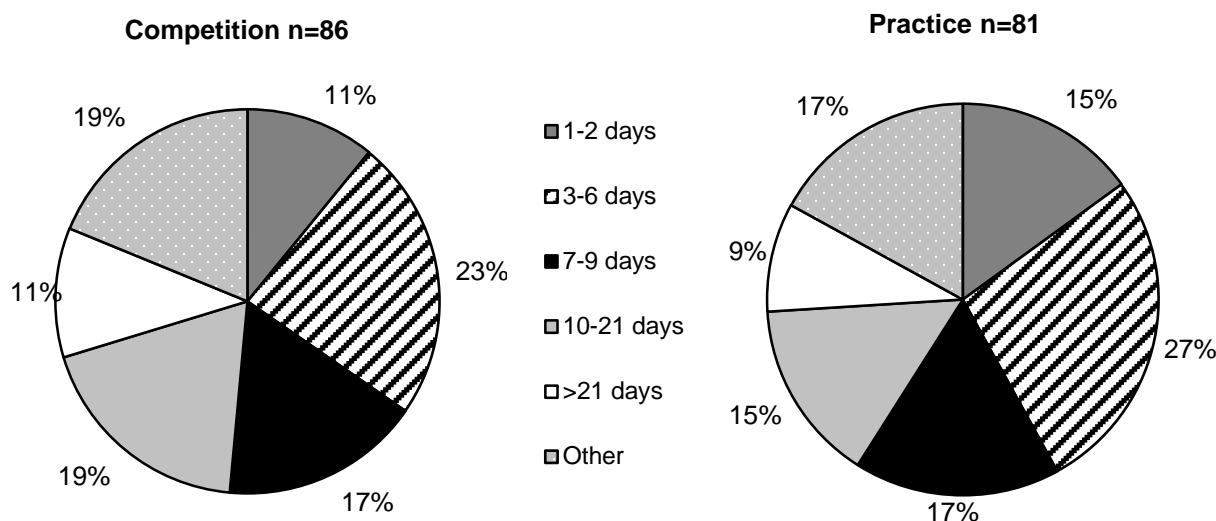
Table 12.3 Body Site of Softball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| | 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

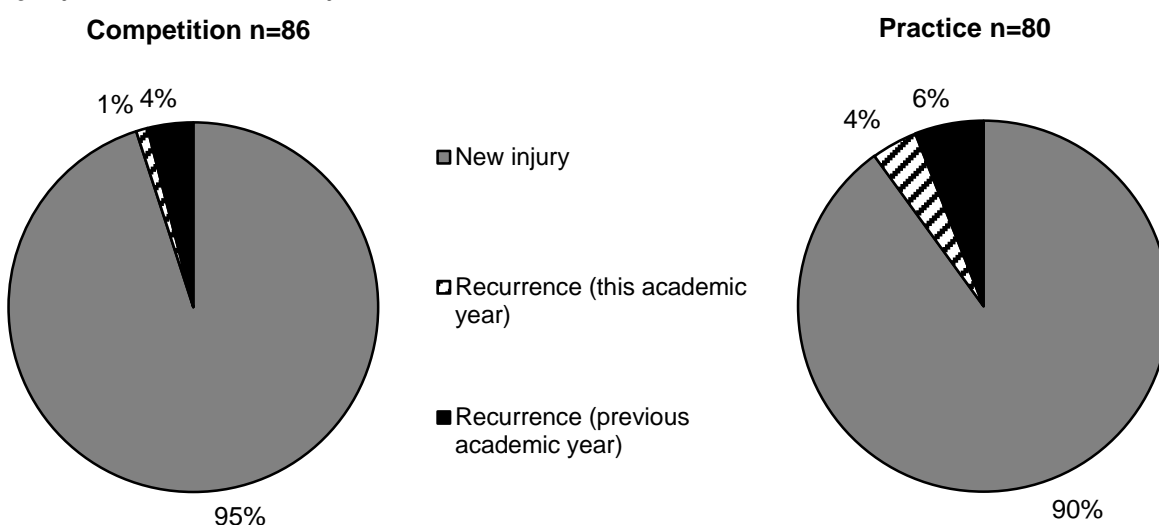


Table 12.6 Time during Season of Softball Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| | 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

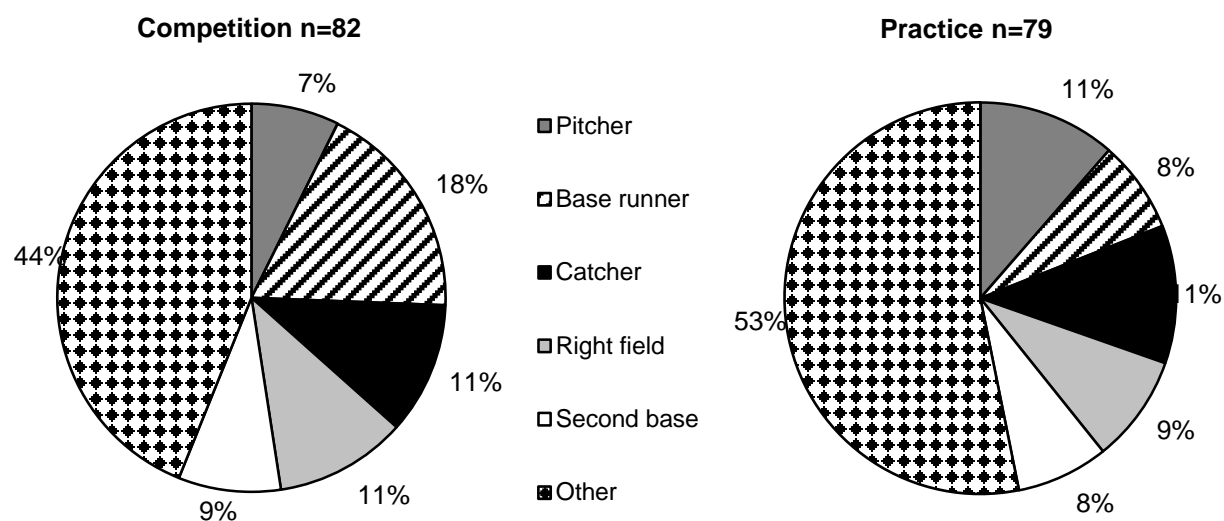
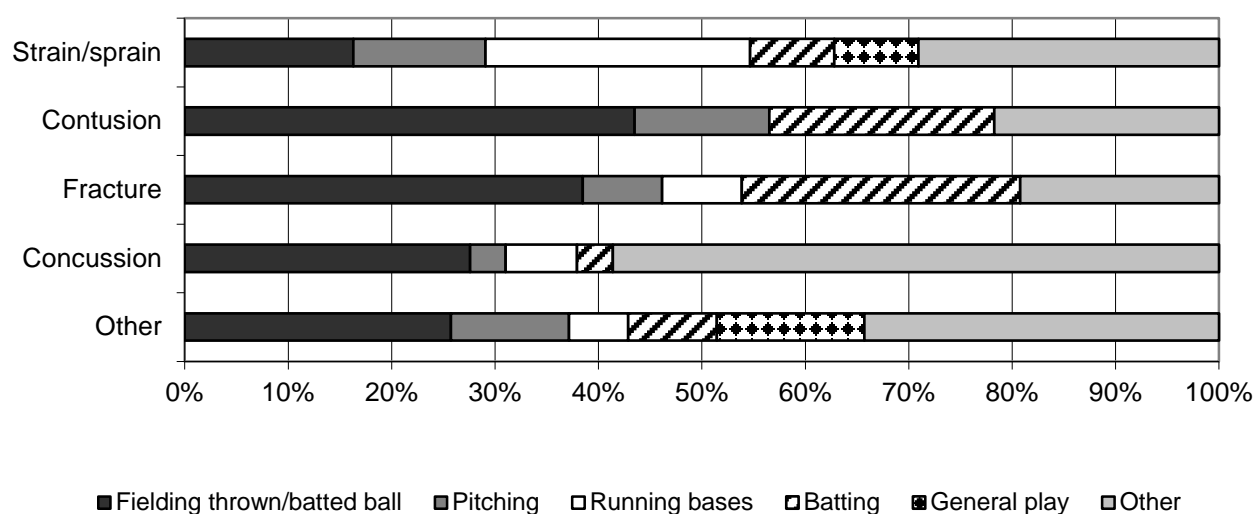


Table 12.9 Activities Leading to Softball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| 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

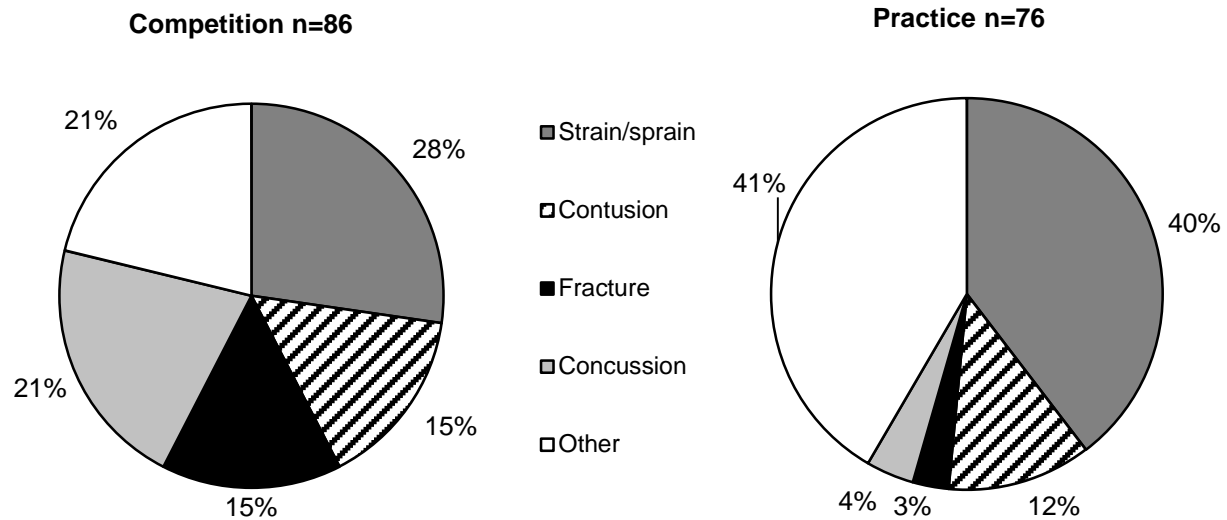


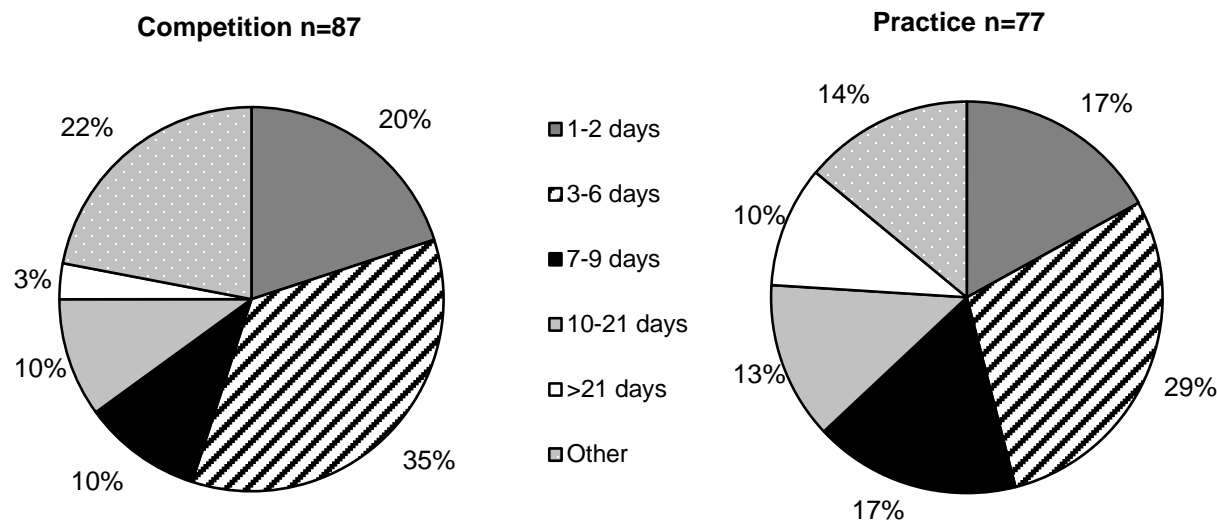
Table 13.3 Body Site of Girls' Field Hockey Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| | 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

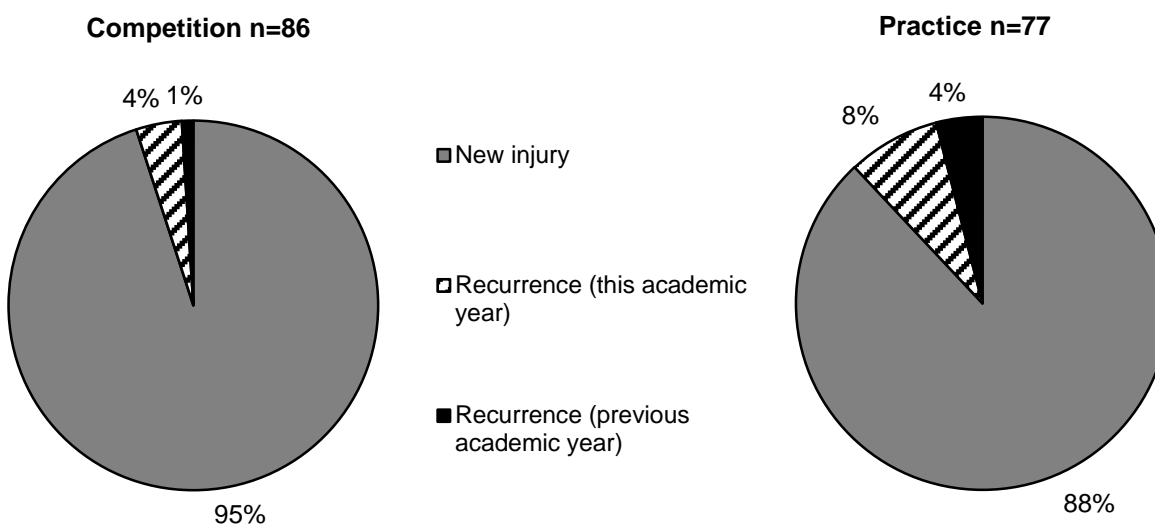


Table 13.6 Time during Season of Girls' Field Hockey Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| | 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

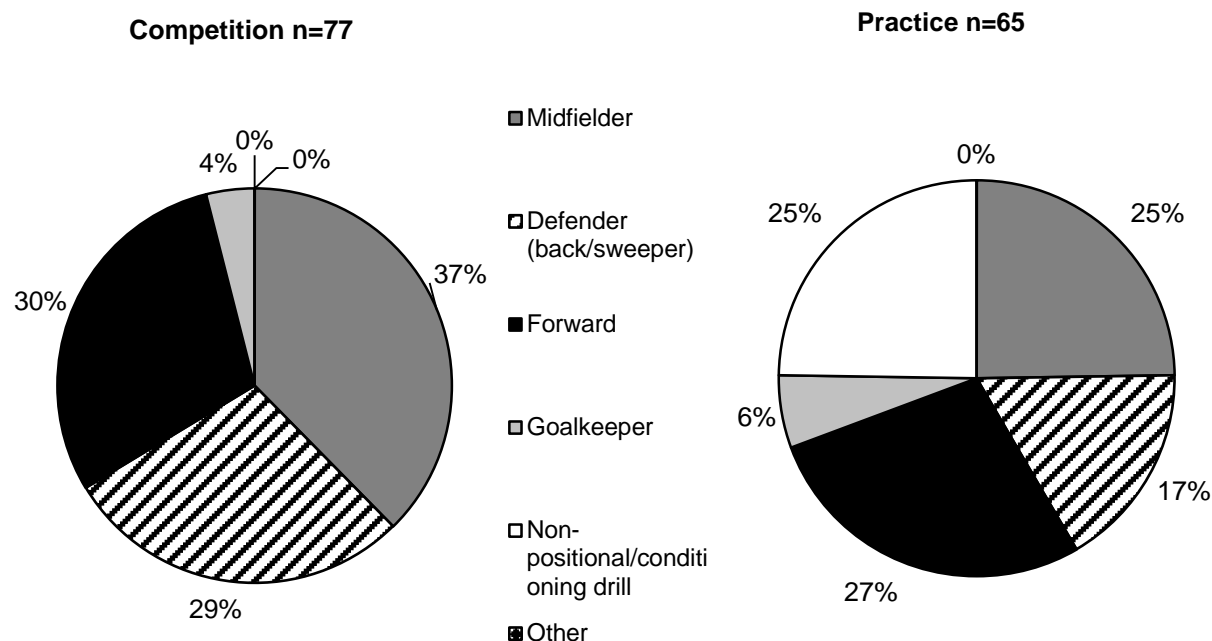
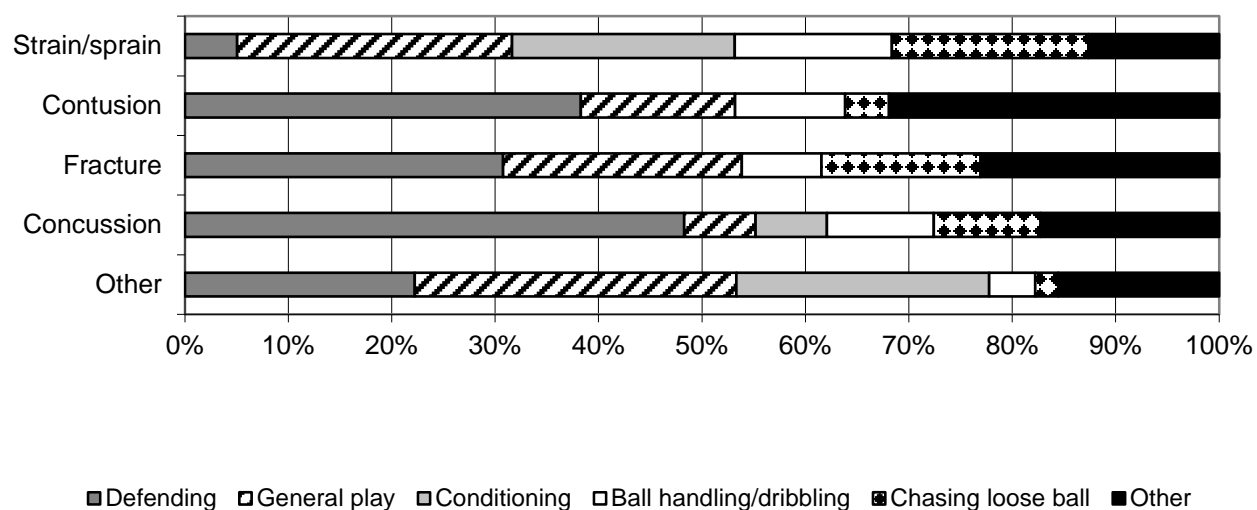


Table 13.9 Activities Leading to Girls' Field Hockey Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| 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

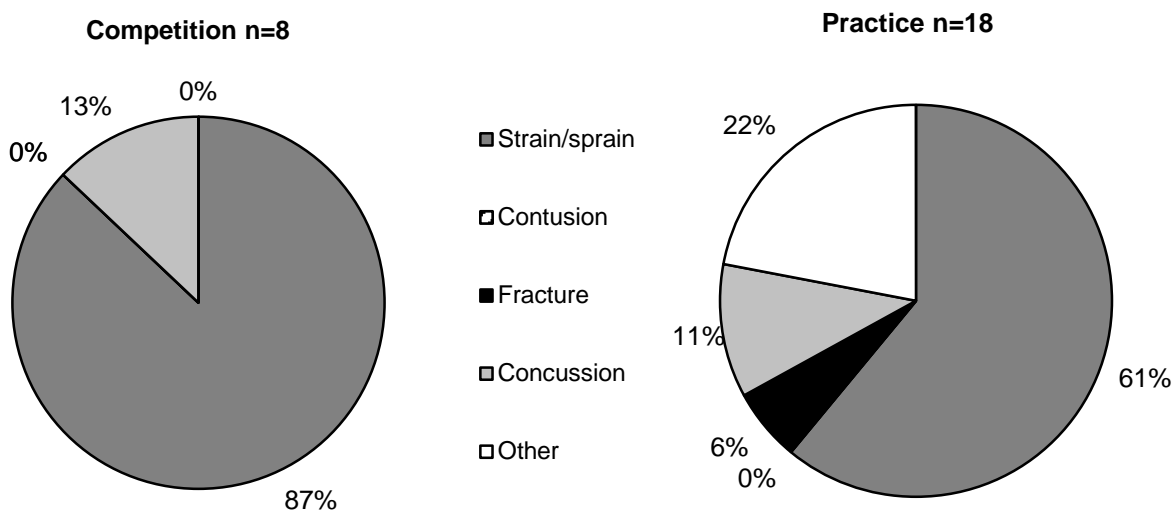


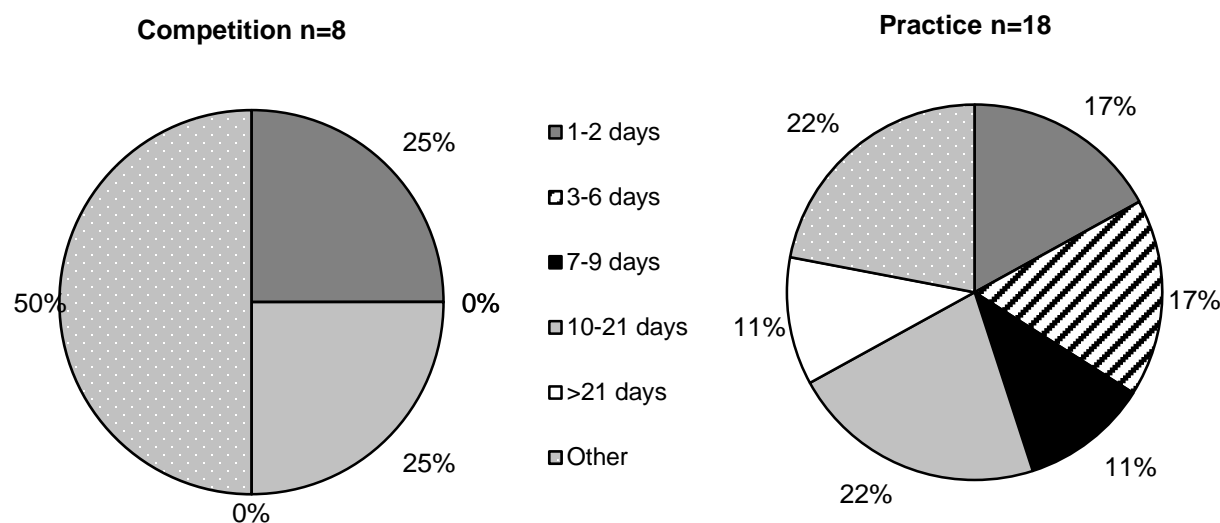
Table 14.3 Body Site of Girls' Gymnastics Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| | 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

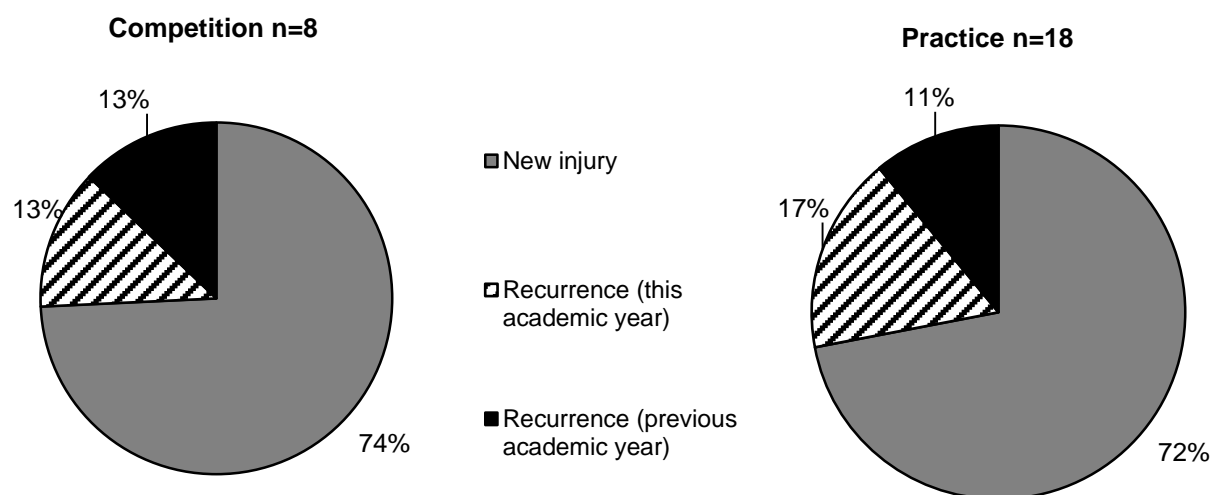


Table 14.6 Time during Season of Girls' Gymnastics Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| | 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% |

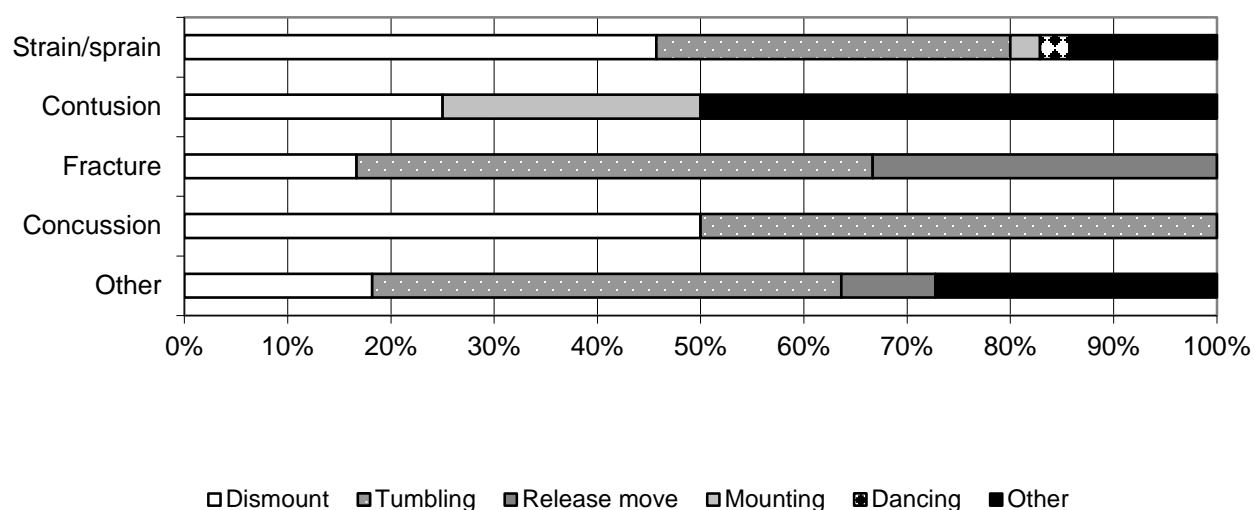
Table 14.8 Practice-Related Variables for Girls' Gymnastics Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| | 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

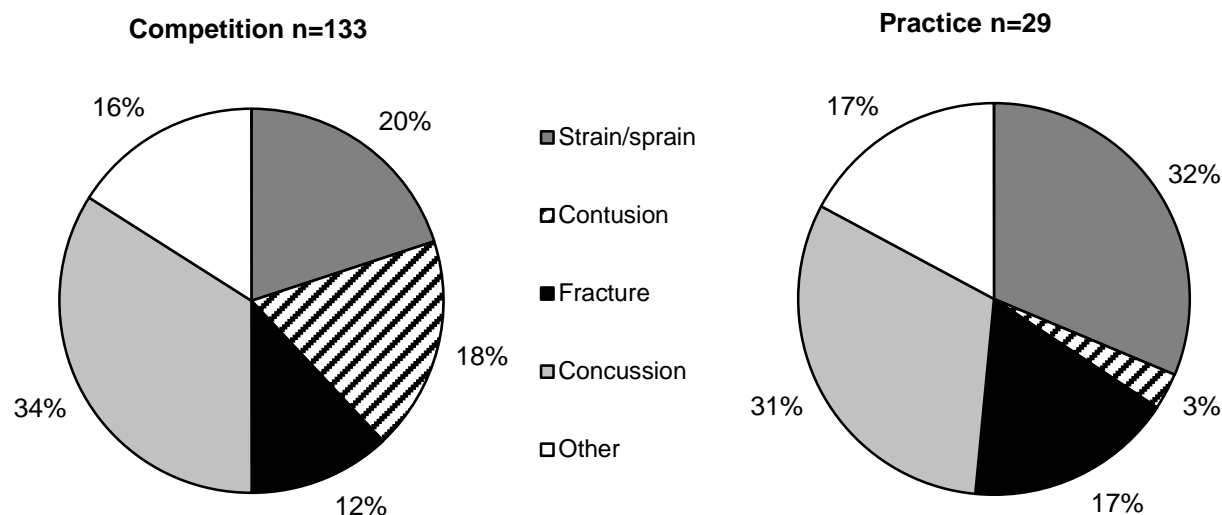


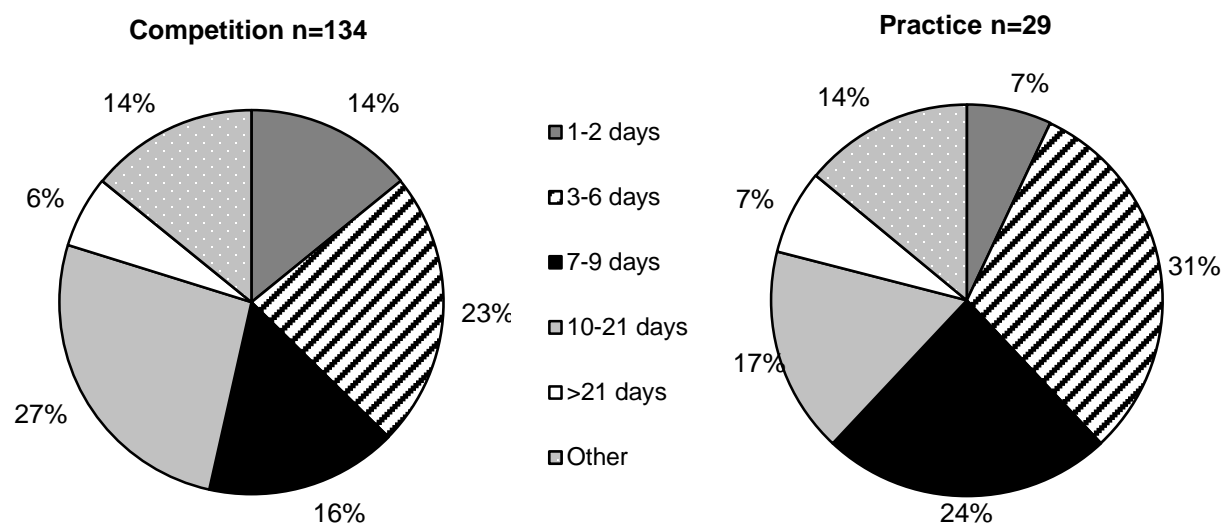
Table 15.3 Body Site of Boys' Ice Hockey Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| | 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

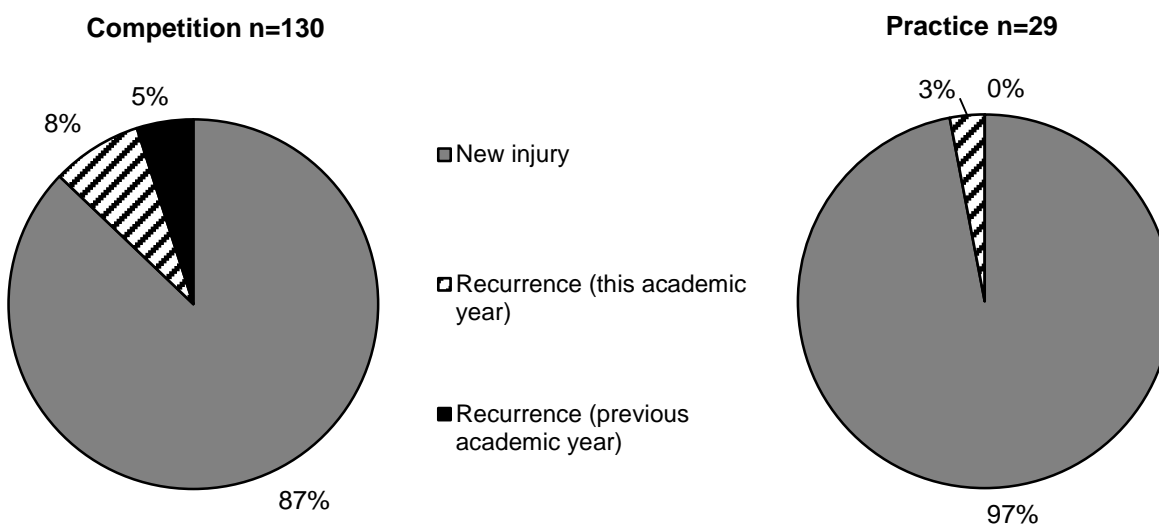


Table 15.6 Time during Season of Boys' Ice Hockey Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| | 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

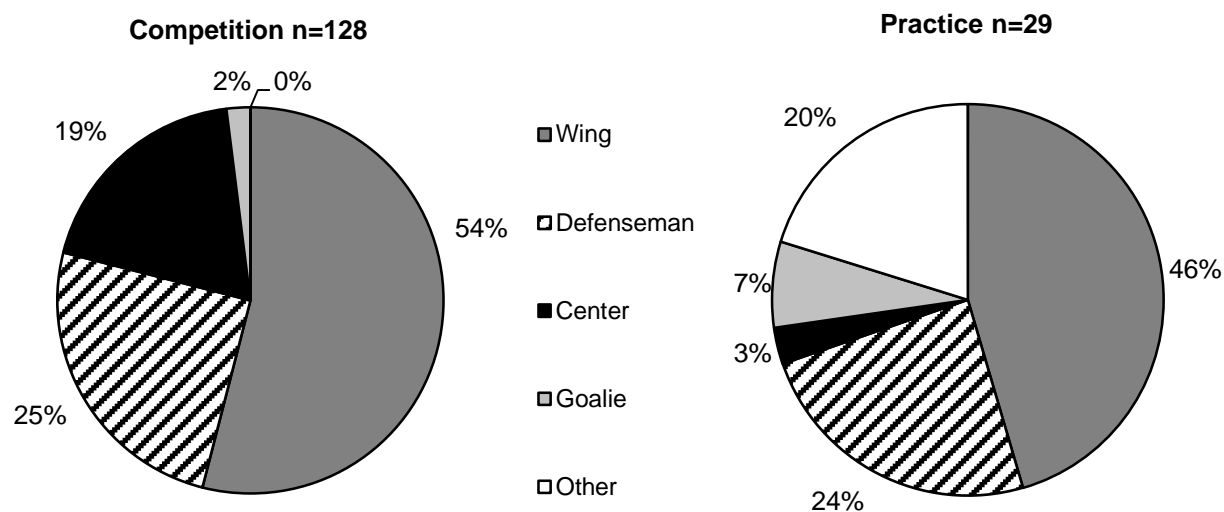
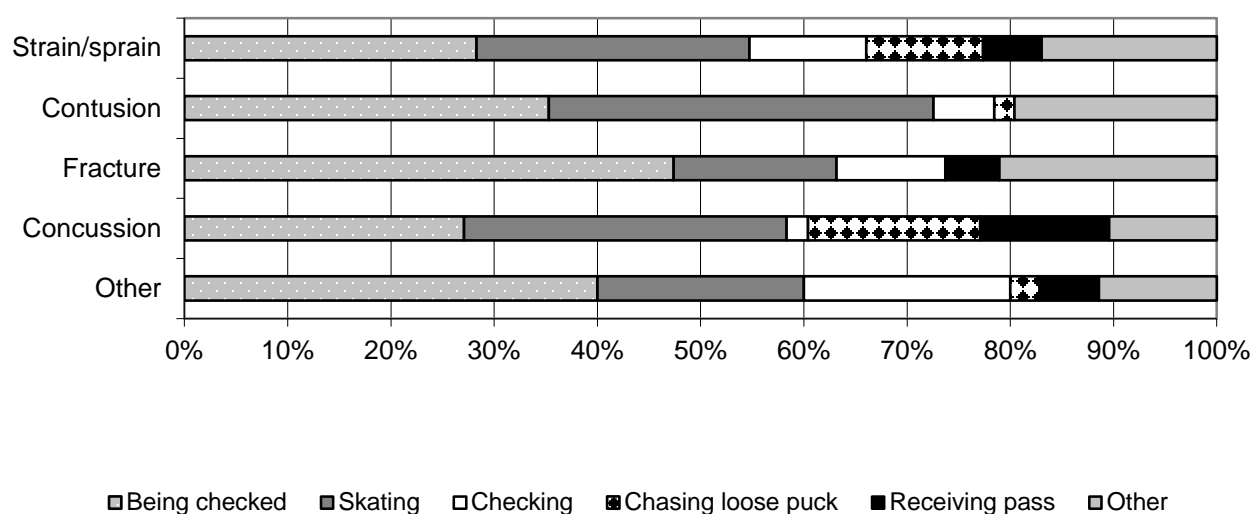


Table 15.9 Activities Leading to Boys' Ice Hockey Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| 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

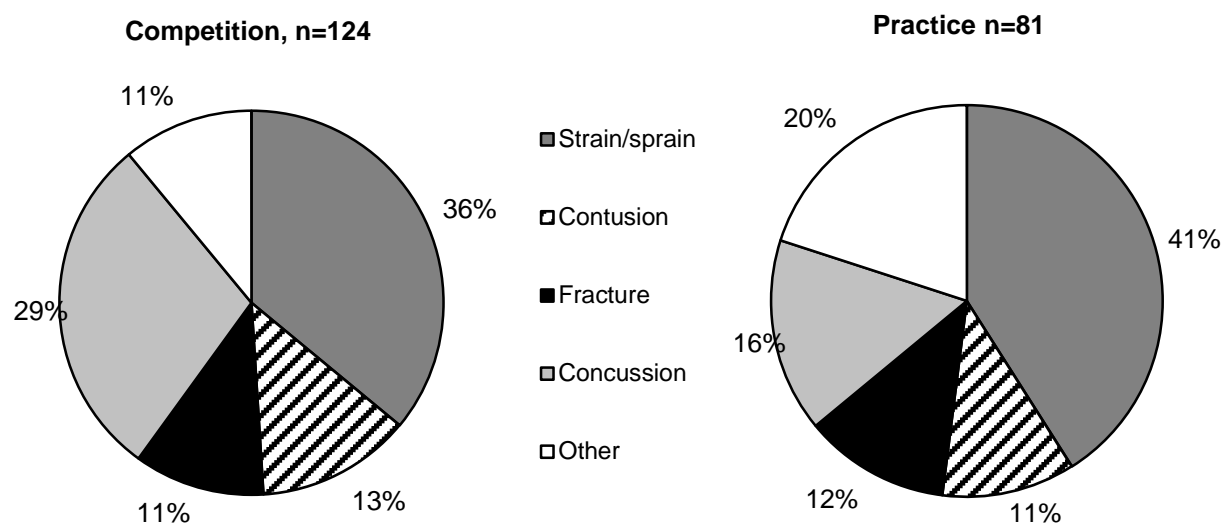


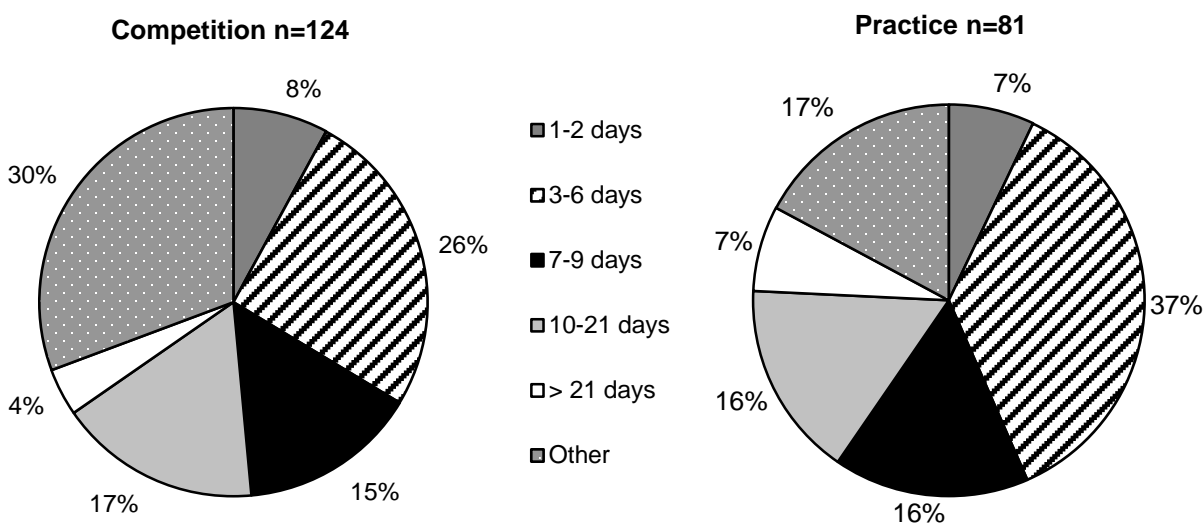
Table 16.3 Body Site of Boys' Lacrosse Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| | 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

| | Competition n=123 | | Practice n=81 | | Total n=204 | |
|-----------------------------------|----------------------|-------|------------------|-------|----------------|-------|
| | n | % | n | % | n | % |
| Diagnosis | | | | | | |
| 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

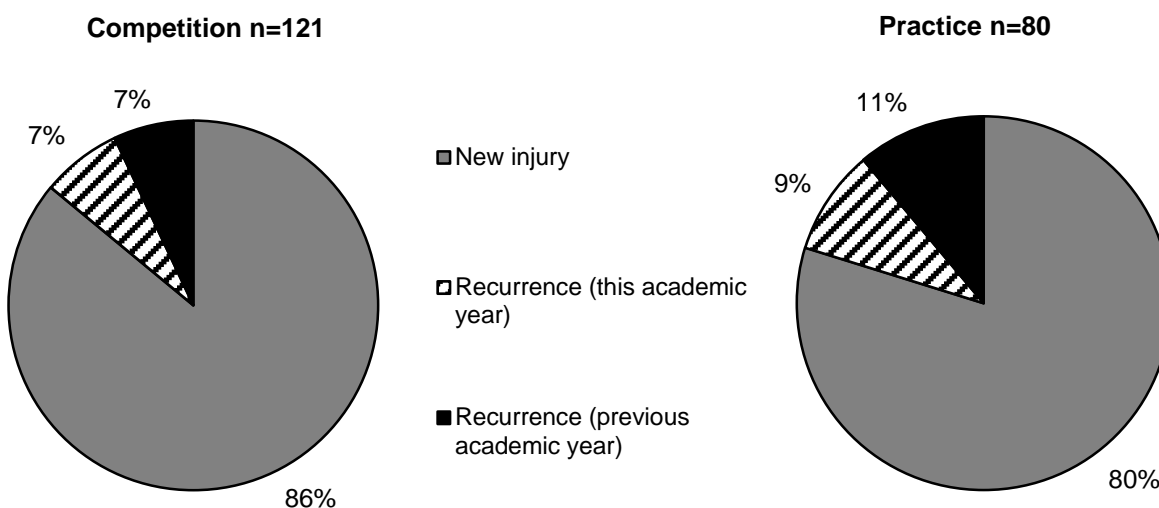


Table 16.6 Time during Season of Boys' Lacrosse Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| | 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

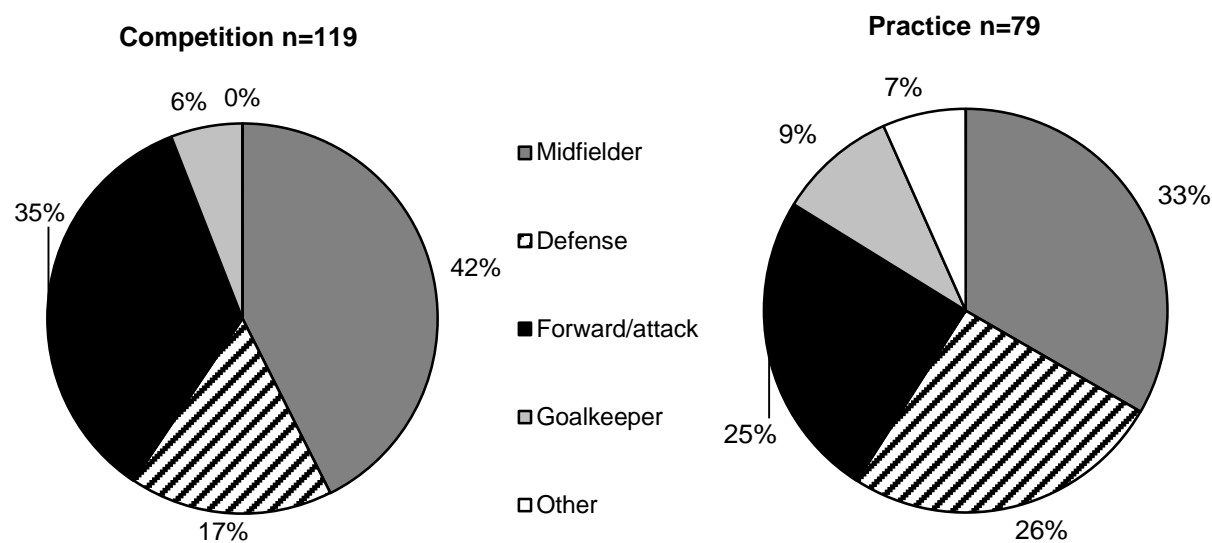
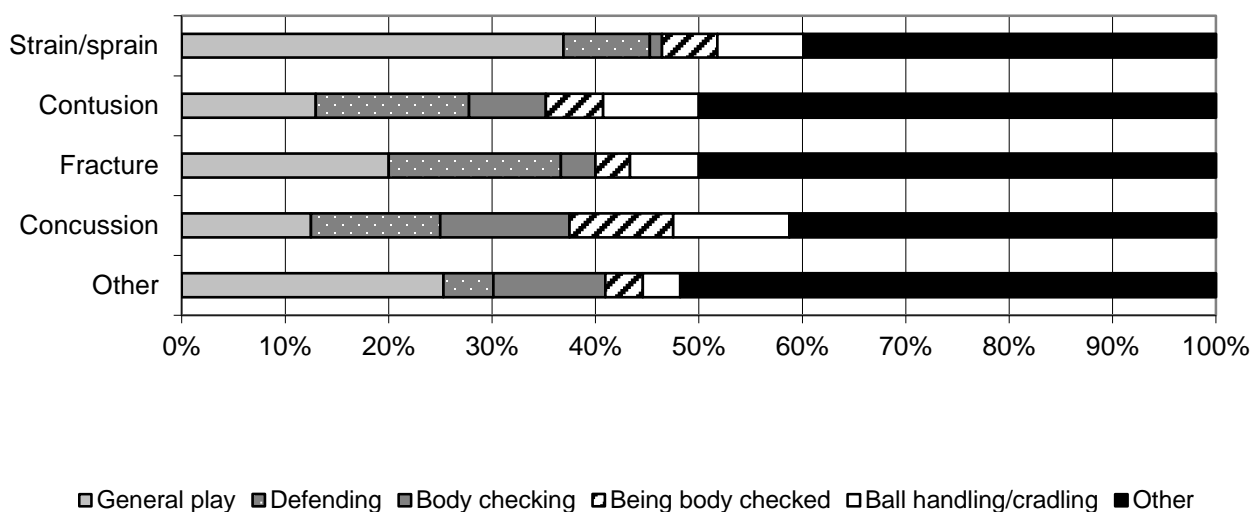


Table 16.9 Activities Leading to Boys' Lacrosse Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| 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

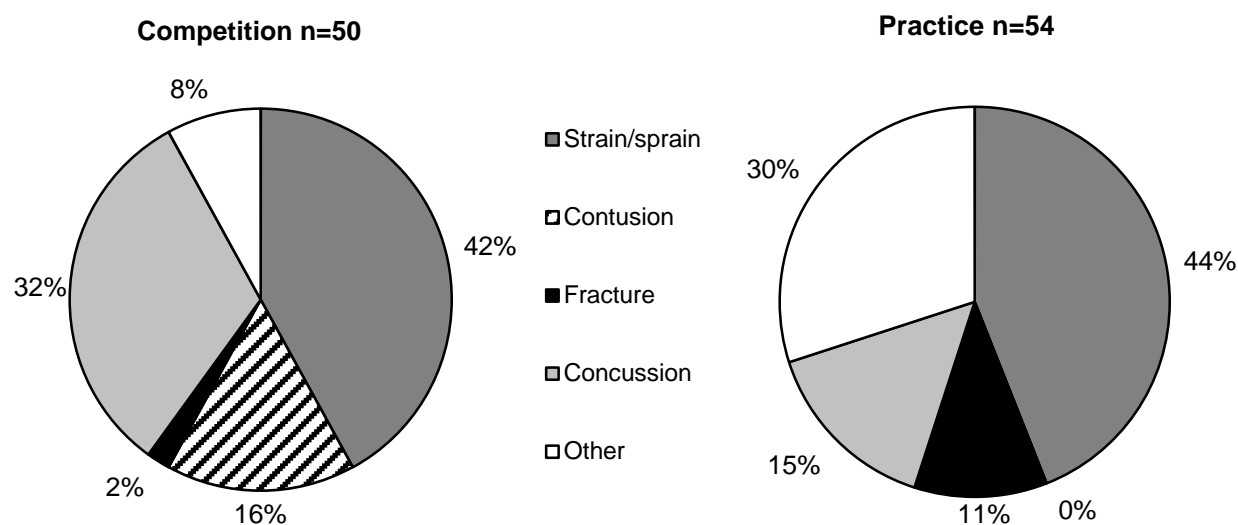


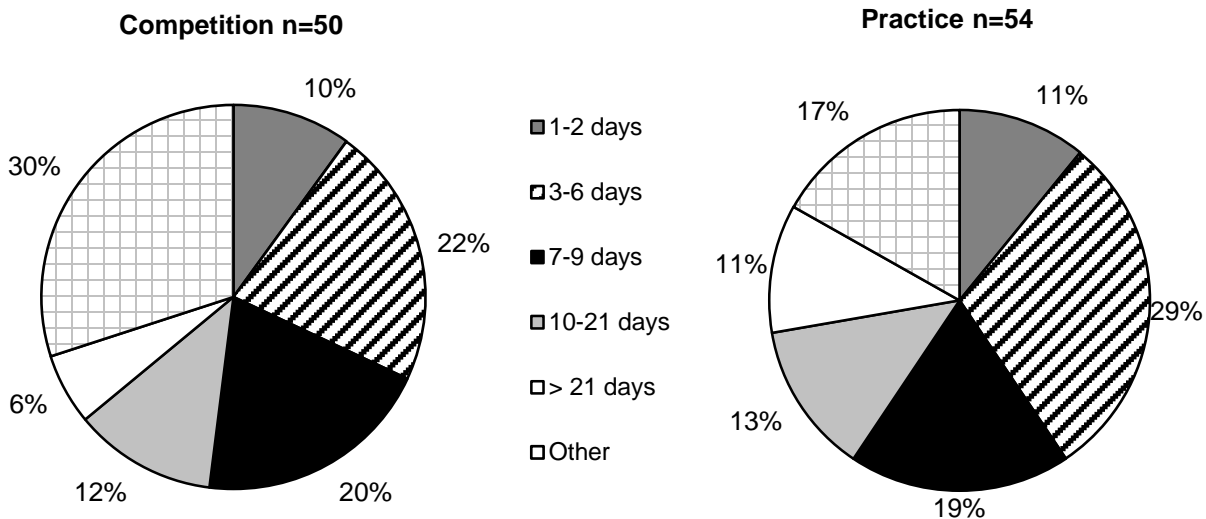
Table 17.3 Body Site of Girls' Lacrosse Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| | 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

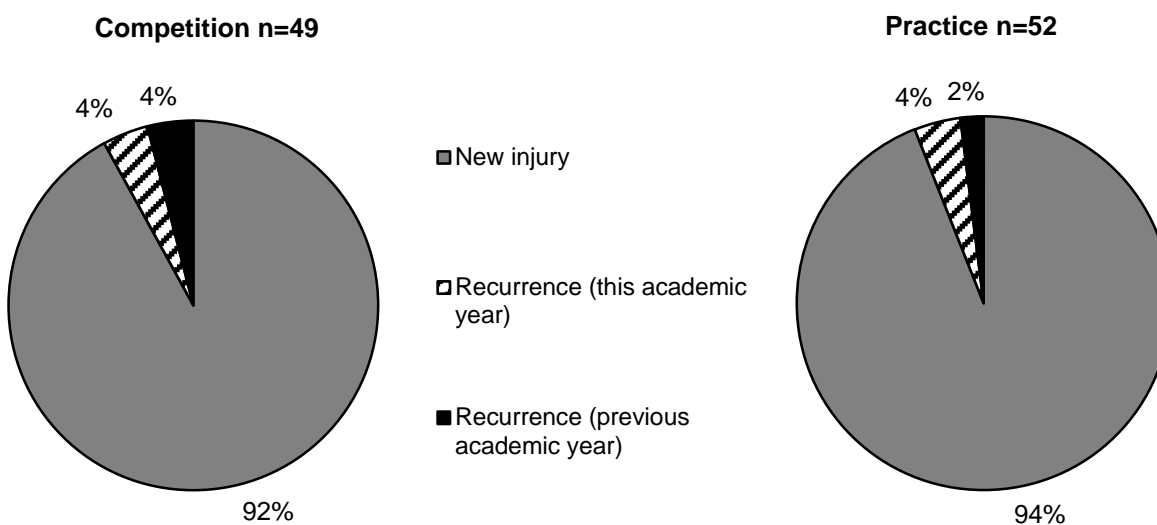


Table 17.6 Time during Season of Girls' Lacrosse Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| | 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

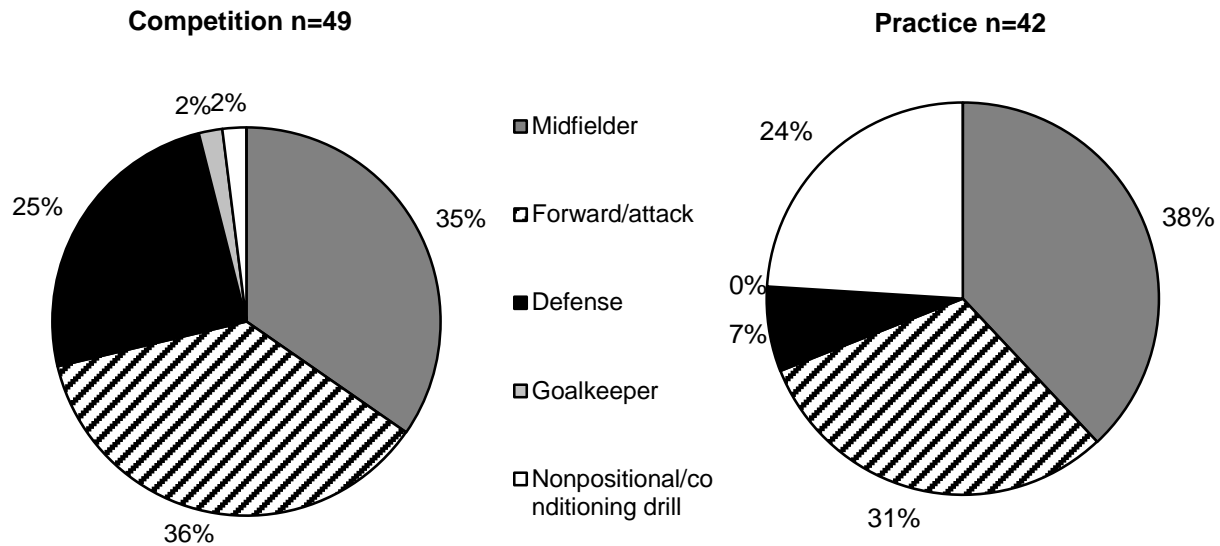
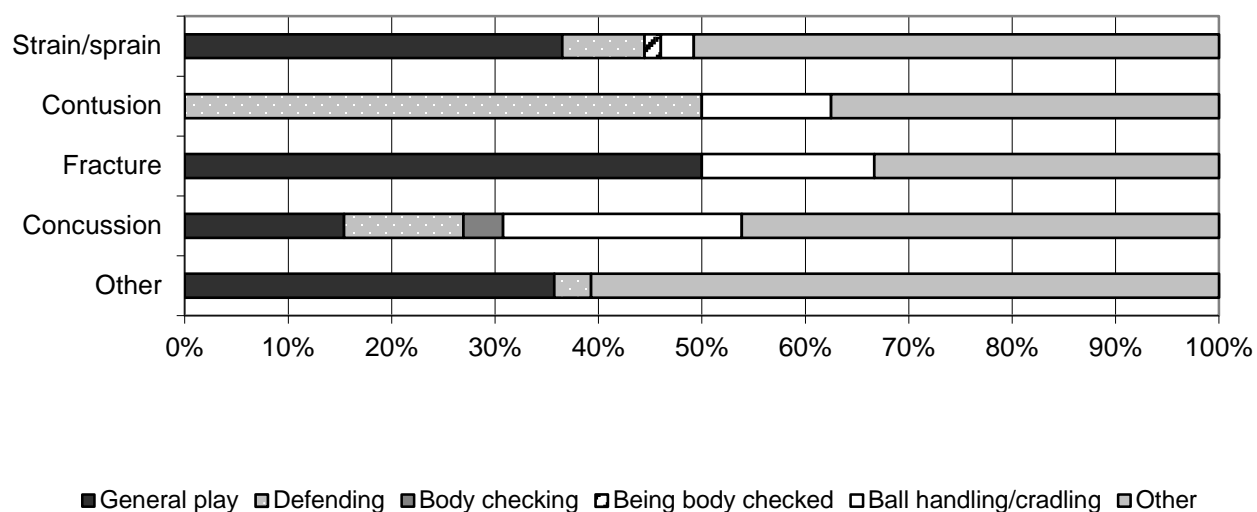


Table 17.9 Activities Leading to Girls' Lacrosse Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| 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

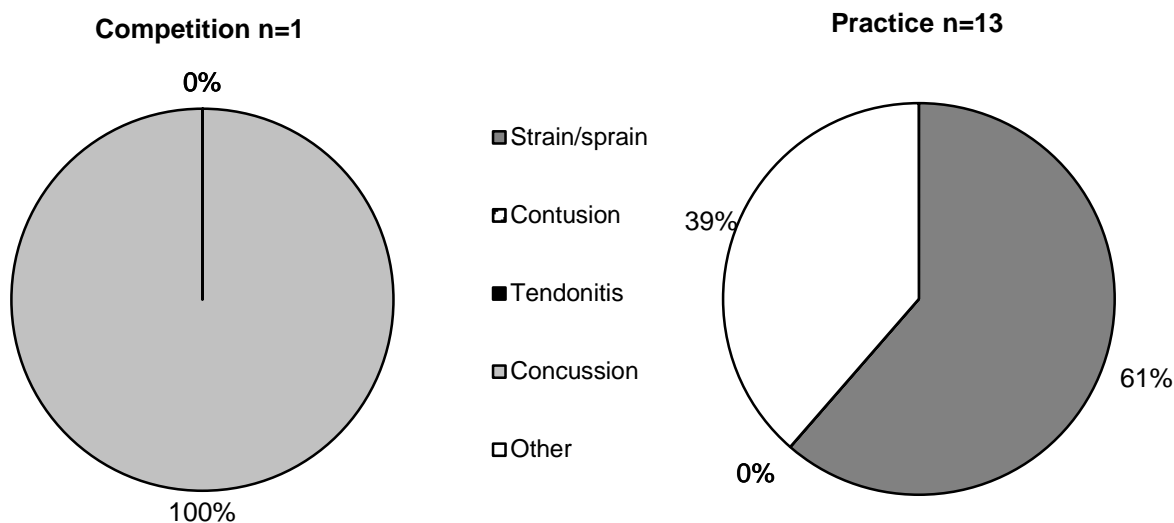


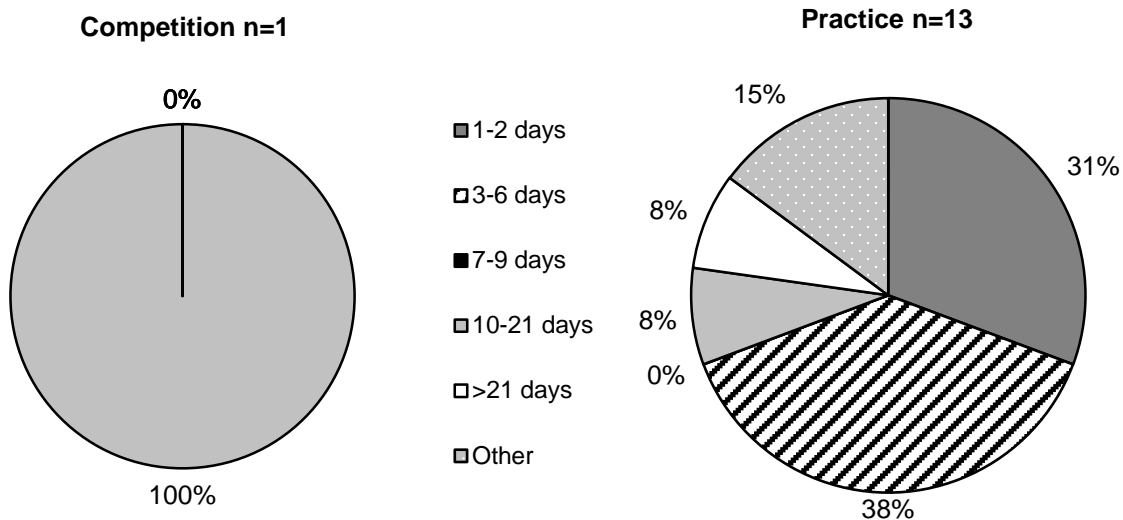
Table 18.3 Body Site of Boys' Swimming and Diving Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| | 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

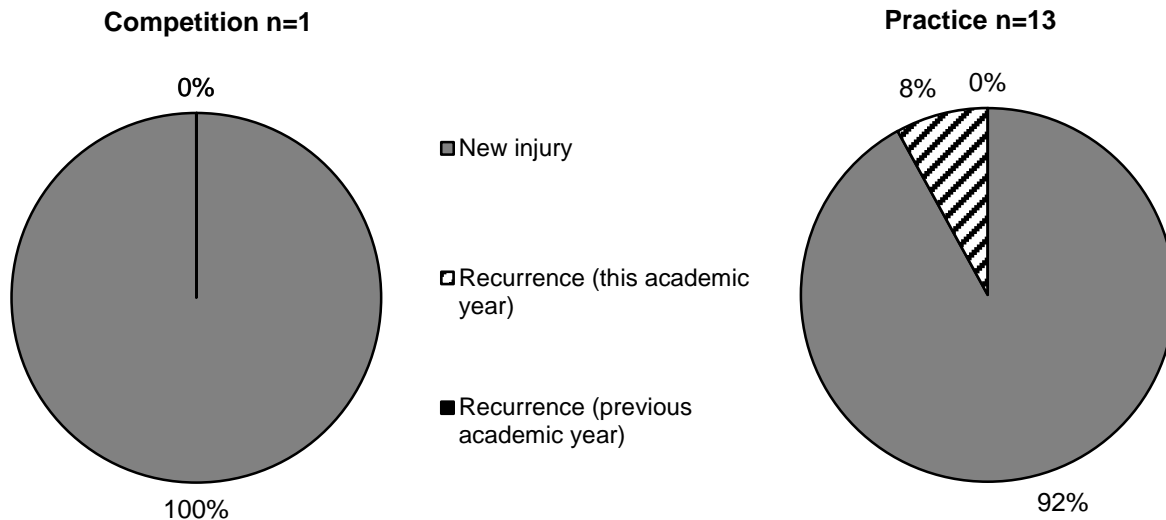


Table 18.6 Time during Season of Boys' Swimming and Diving Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| | 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% |

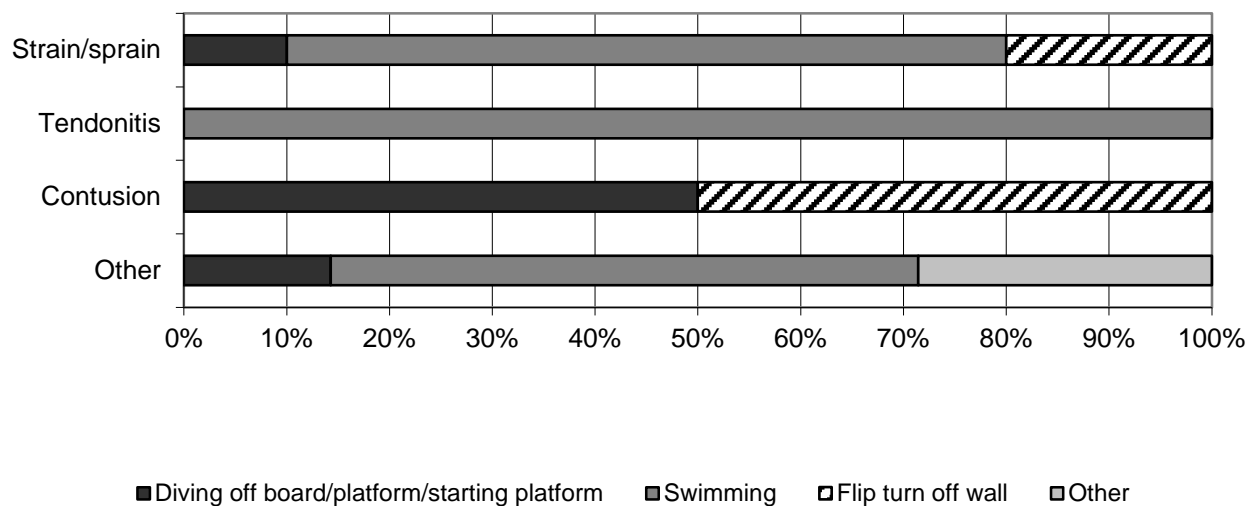
Table 18.8 Practice-Related Variables for Boys' Swimming and Diving Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| | 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

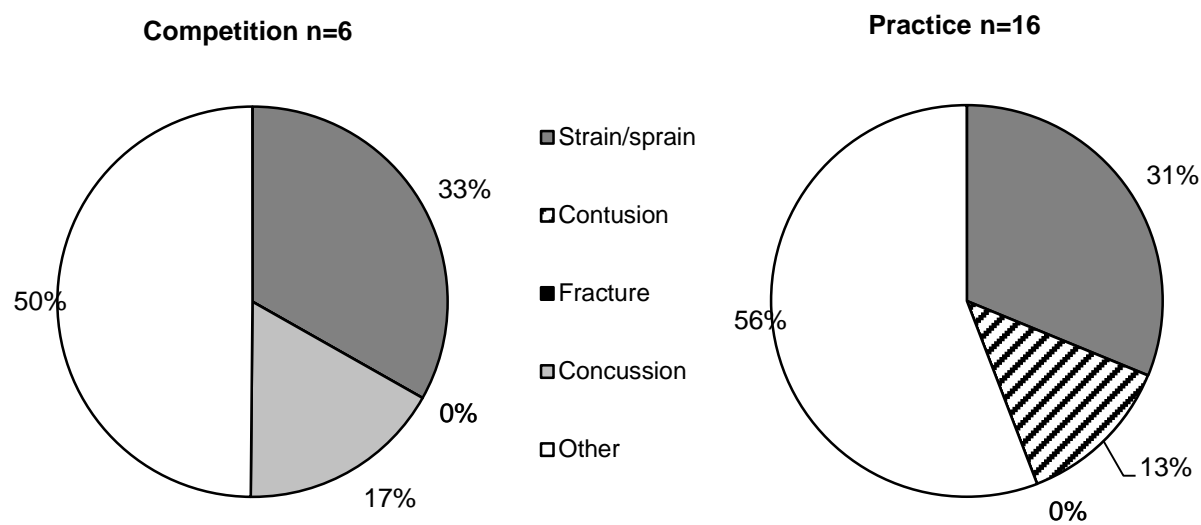


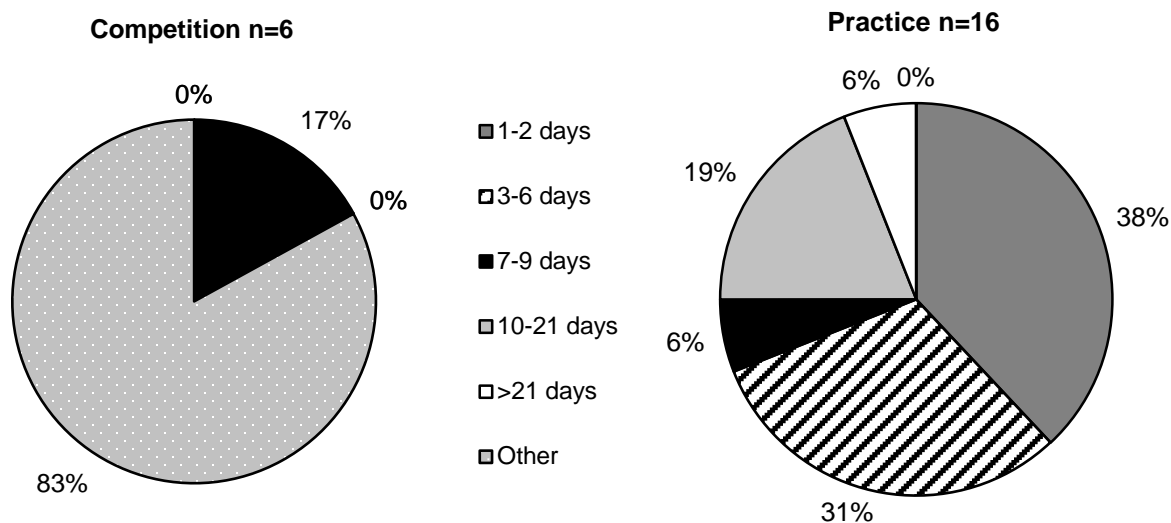
Table 19.3 Body Site of Girls' Swimming and Diving Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| | 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

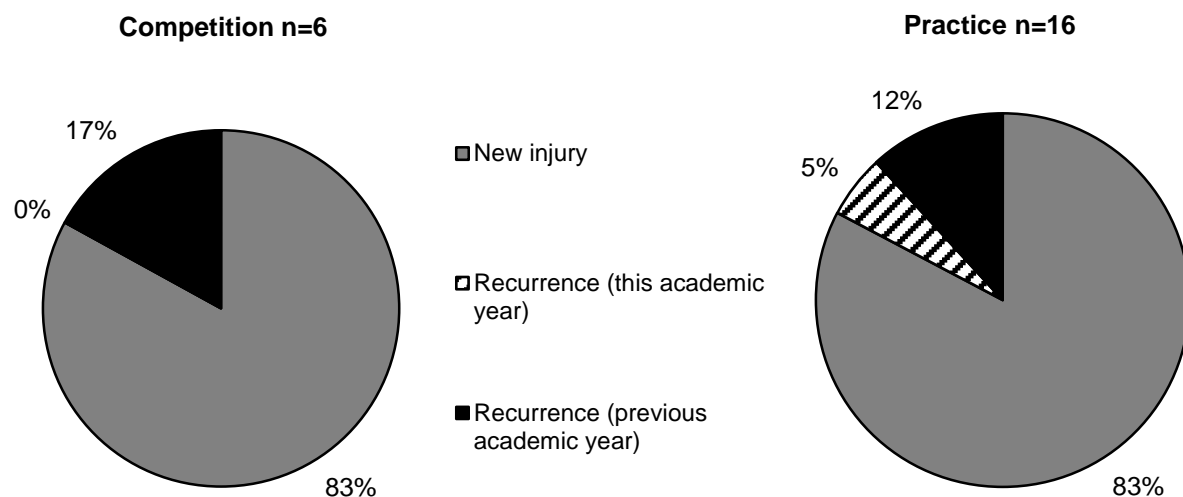


Table 19.6 Time during Season of Girls' Swimming and Diving Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| | 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% |

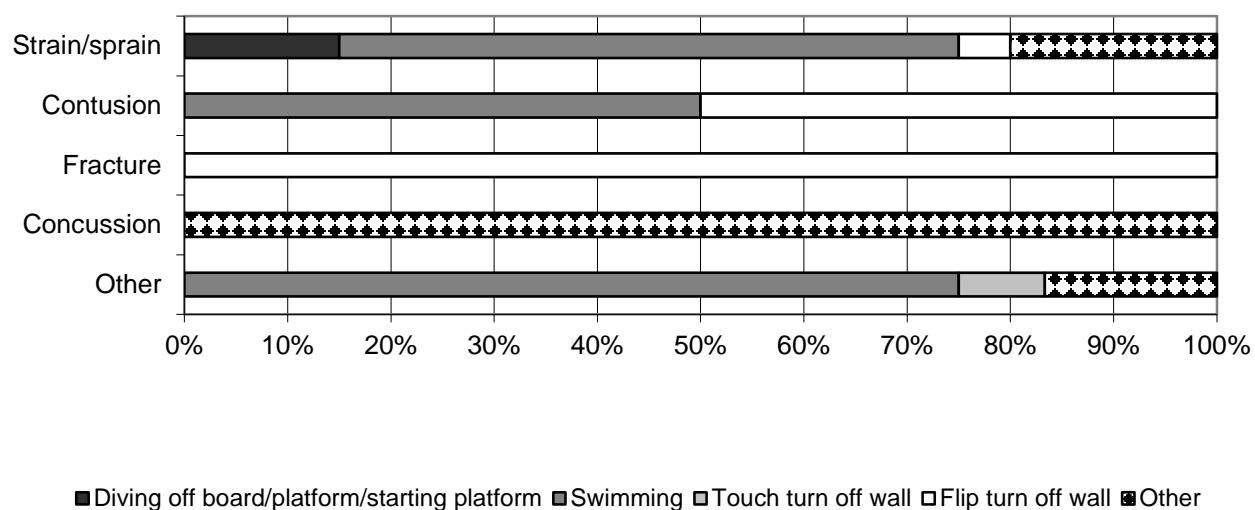
Table 19.8 Practice-Related Variables for Girls' Swimming and Diving Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| | 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

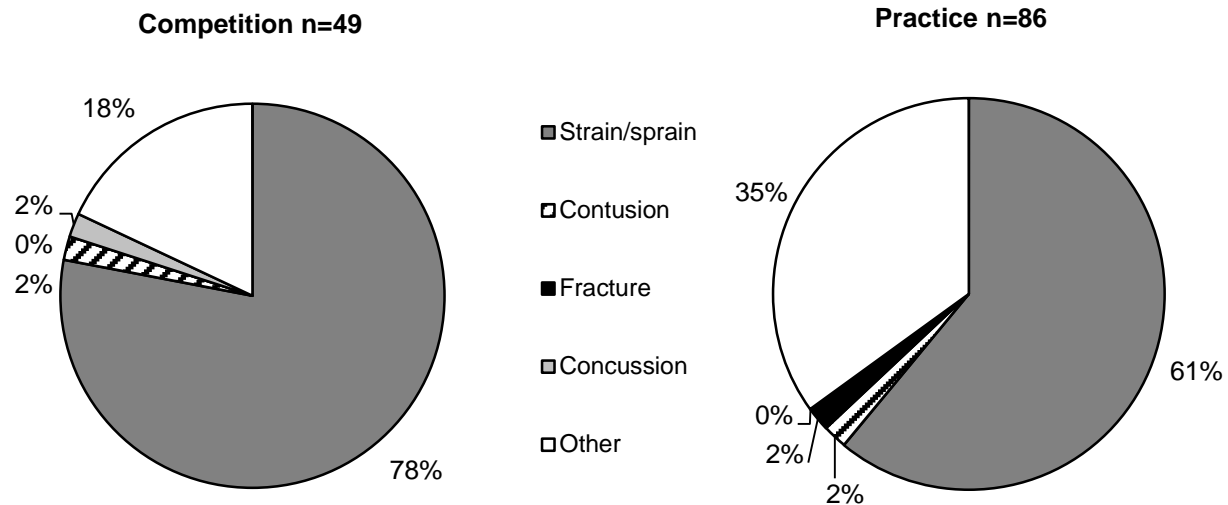


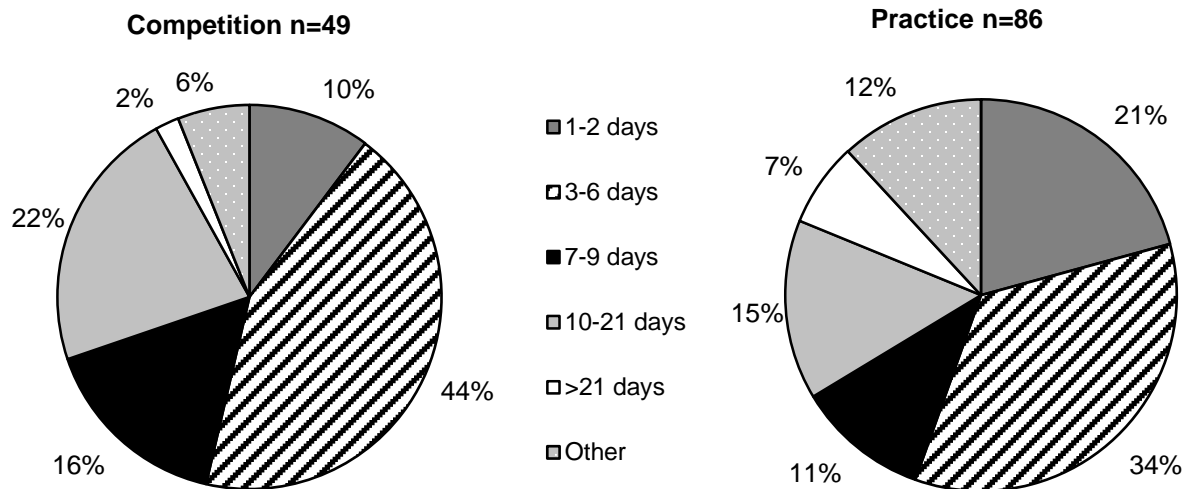
Table 20.3 Body Site of Boys' Track and Field Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| | 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

| Diagnosis | Competition n=49 | | Practice n=86 | | Total n=135 | |
|-----------------------------------|---------------------|-------|------------------|-------|----------------|-------|
| | n | % | n | % | n | % |
| 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

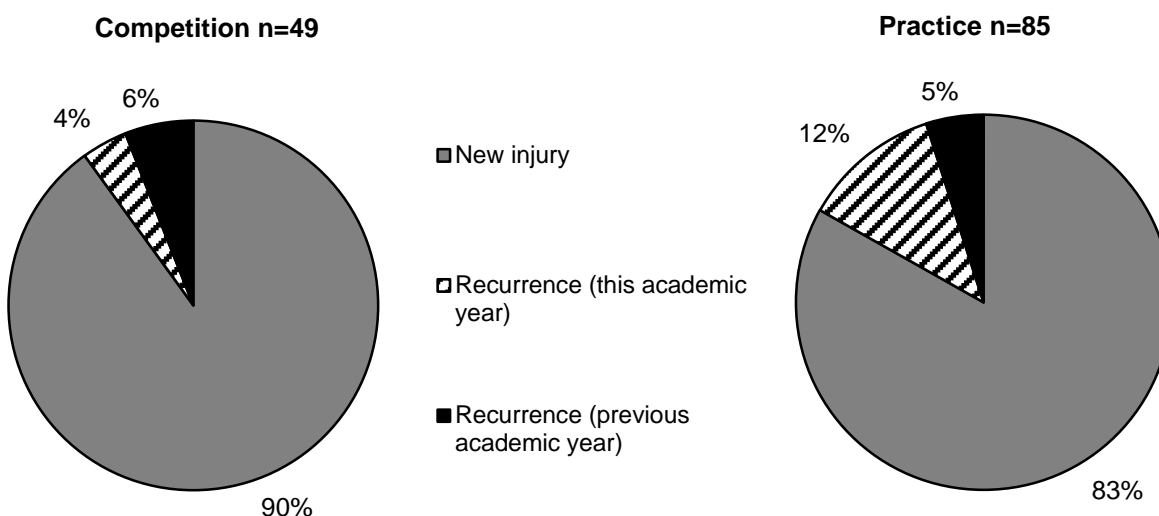


Table 20.6 Time during Season of Boys' Track and Field Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

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

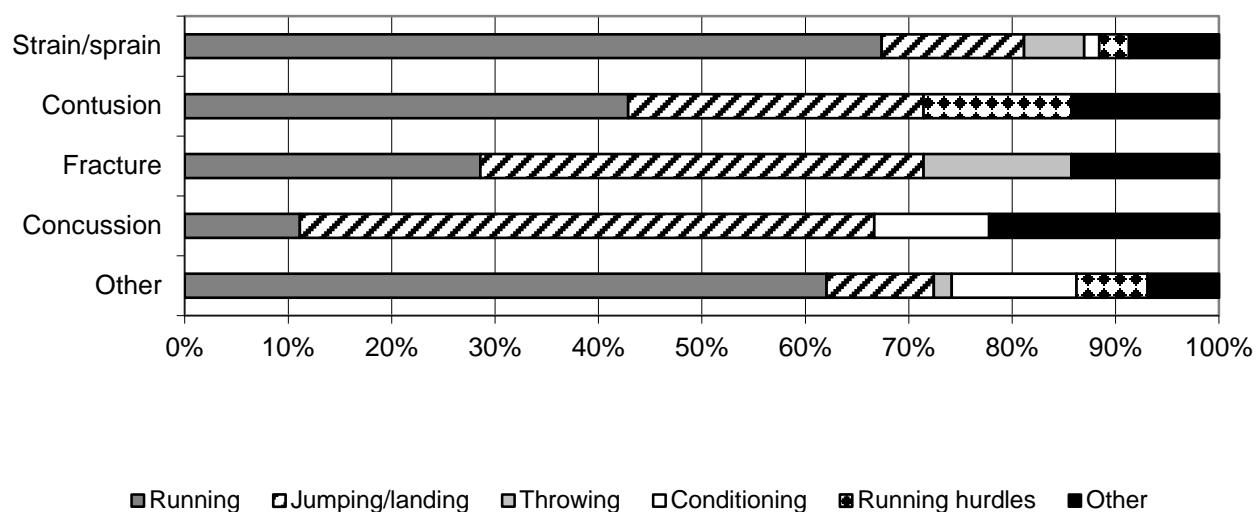
Table 20.7 Practice-Related Variables for Boys' Track and Field Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| | 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

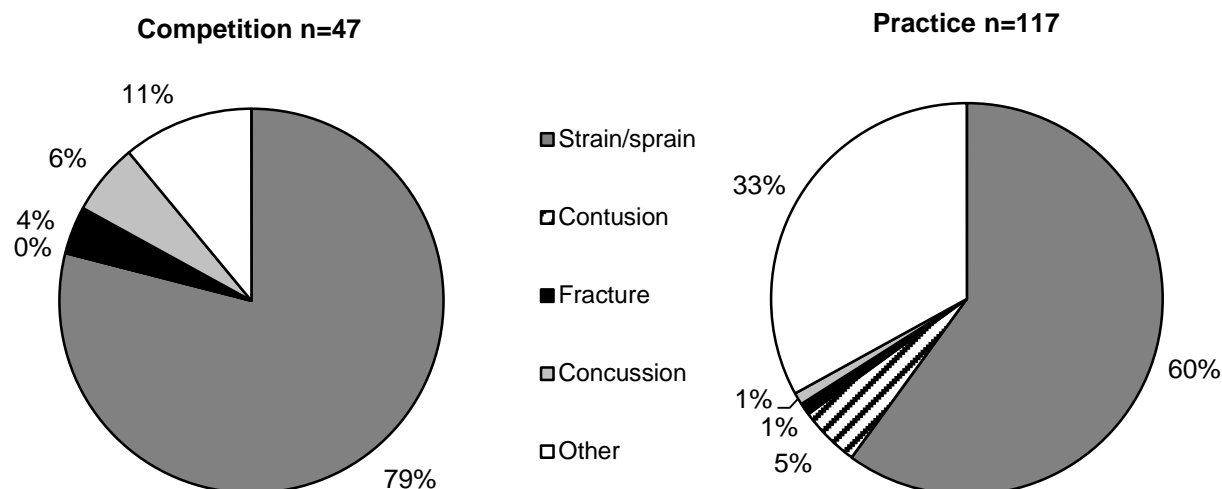


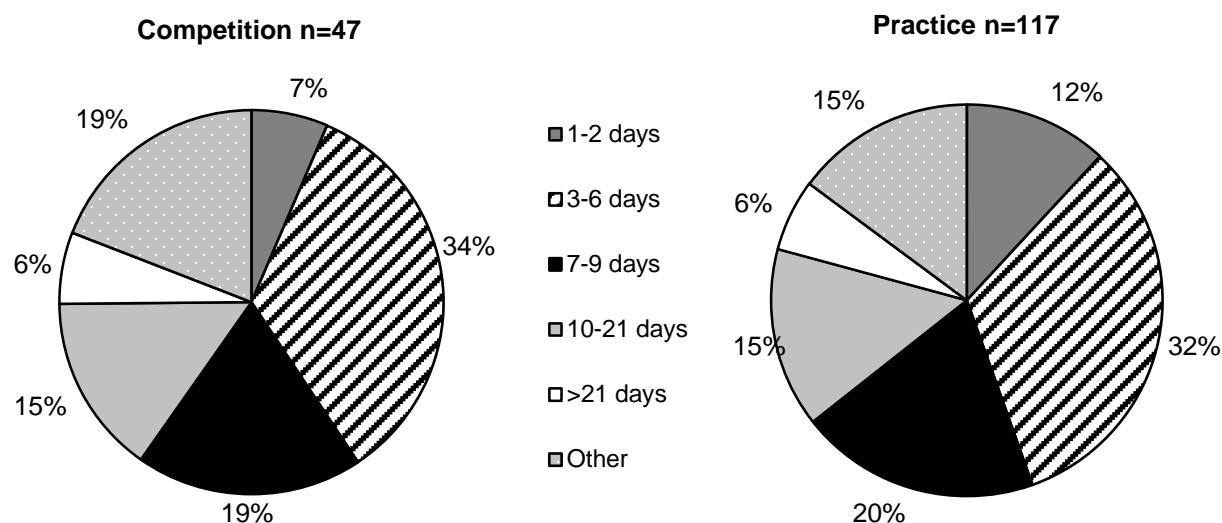
Table 21.3 Body Site of Girls' Track and Field Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| | 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

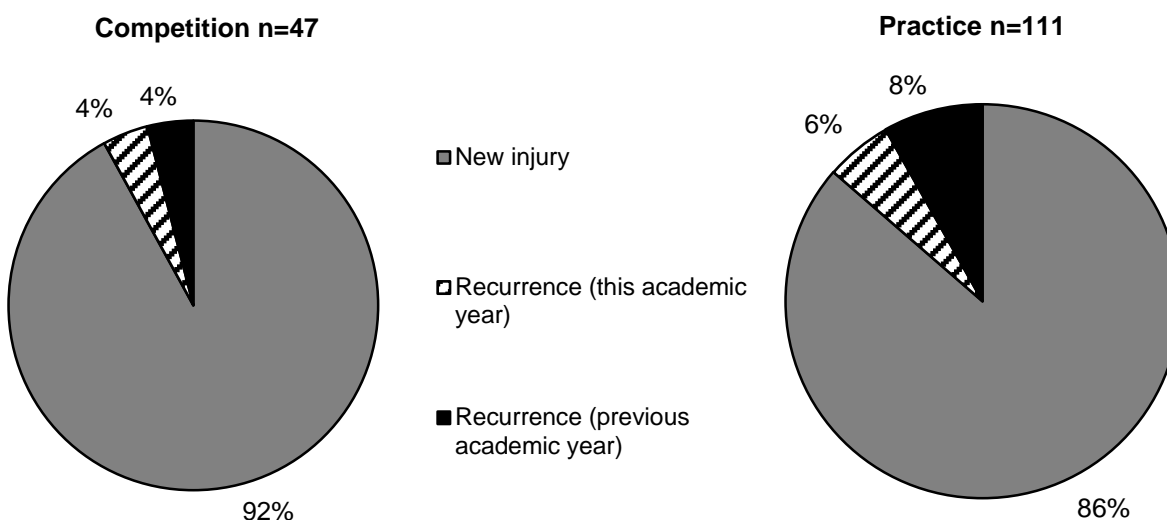


Table 21.6 Time during Season of Girls' Track and Field Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

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

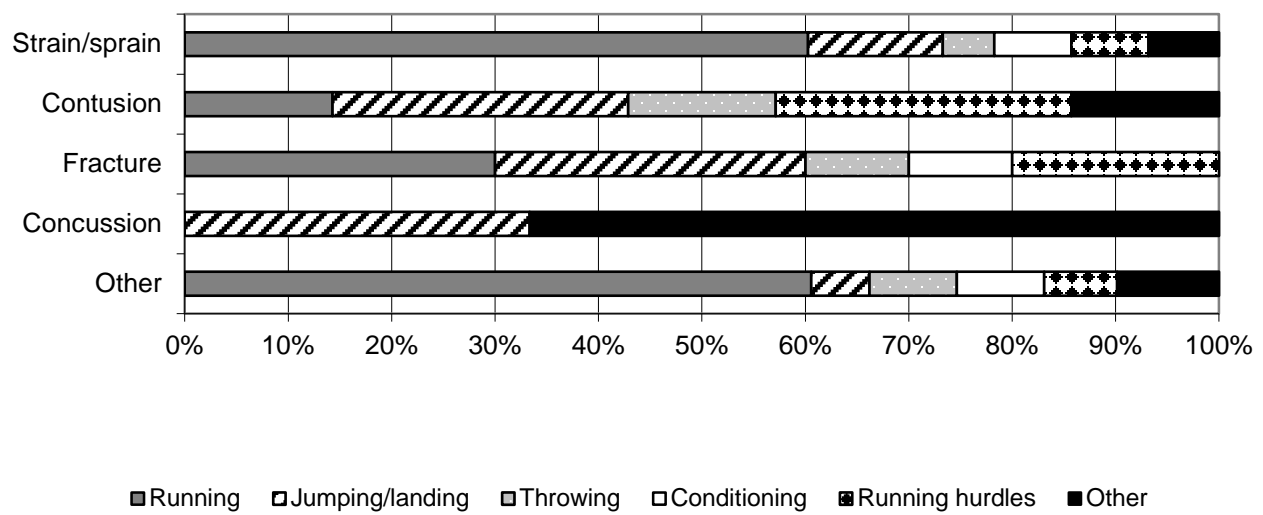
Table 21.7 Practice-Related Variables for Girls' Track and Field Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| | 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

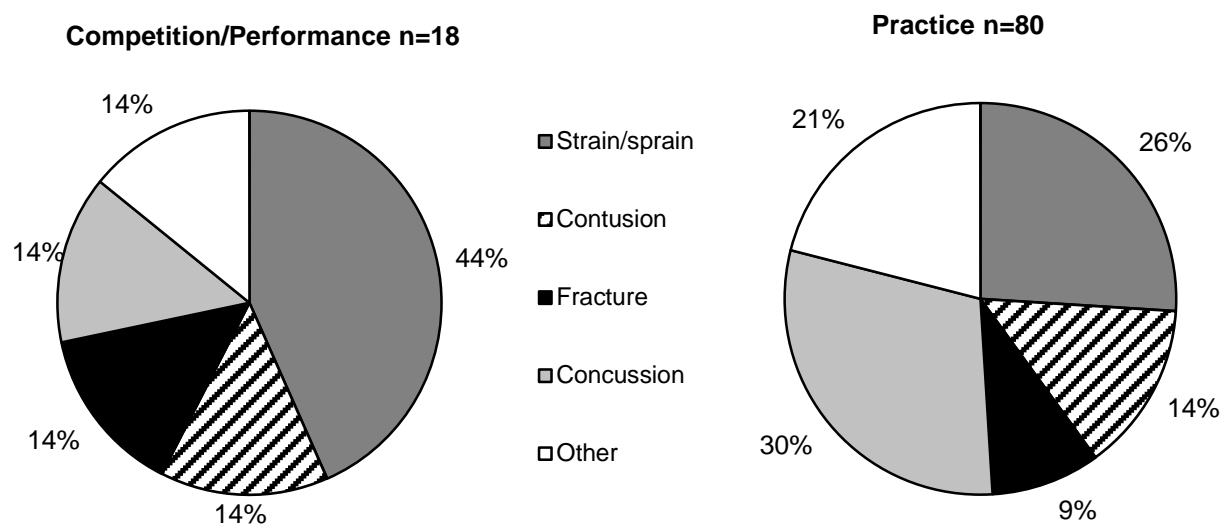


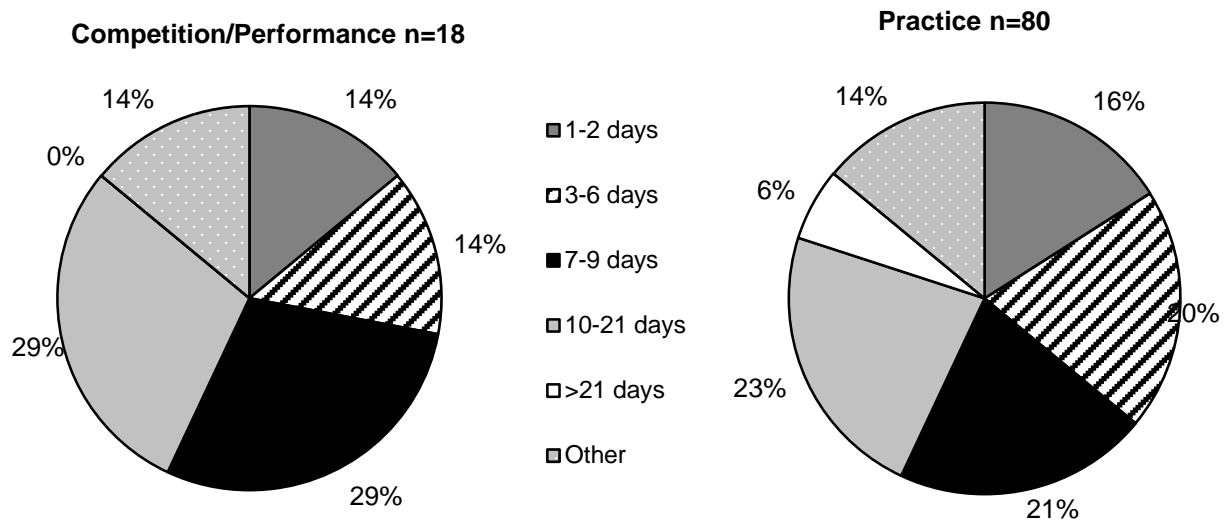
Table 22.3 Body Site of Cheerleading Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| | 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

| | Competition n=7 | | Practice n=80 | | Performance n=10 | | Total n=97 | |
|-----------------------------------|--------------------|-------|------------------|-------|---------------------|-------|---------------|-------|
| | n | % | n | % | n | % | n | % |
| Diagnosis | | | | | | | | |
| 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

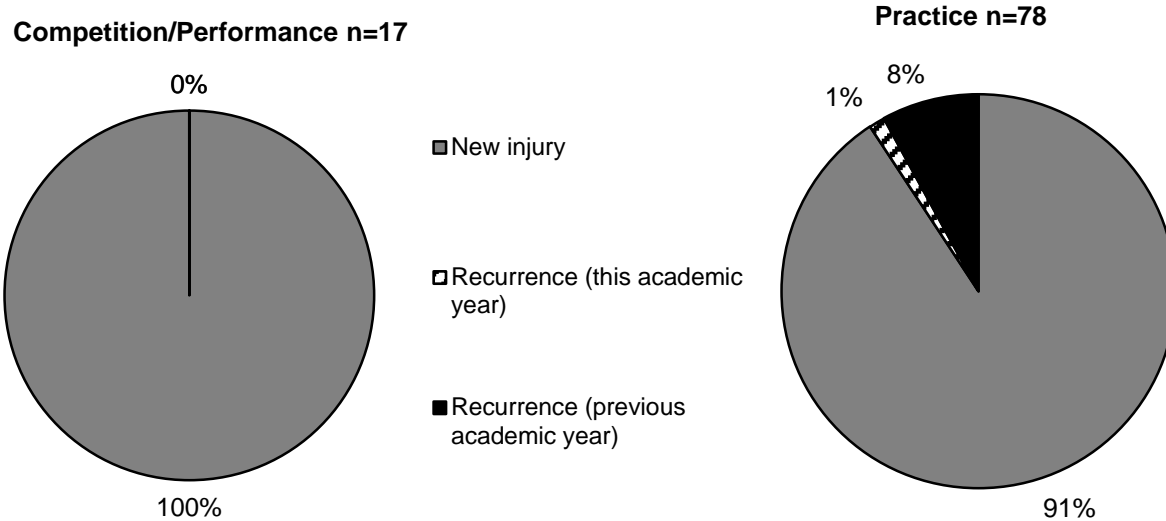


Table 22.6 Time during Season of Cheerleading Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

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

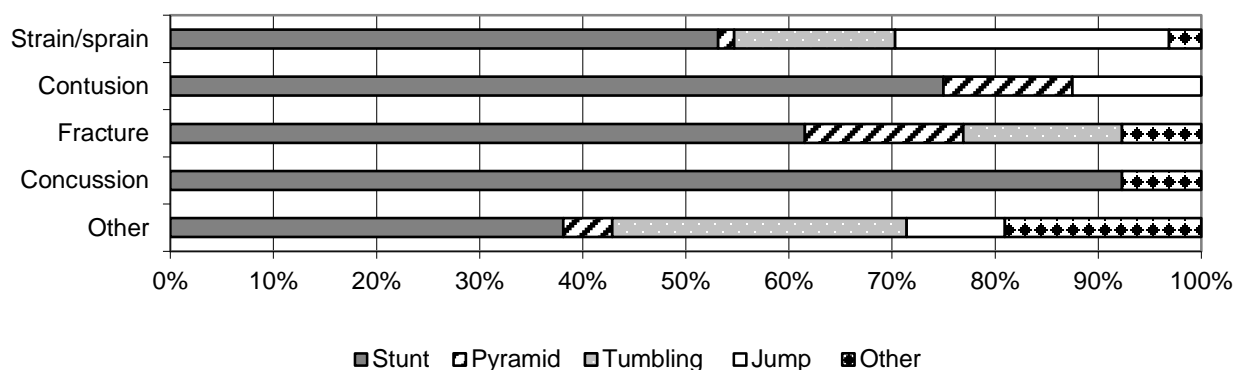
Table 22.7 Practice-Related Variables for Cheerleading Injuries, High School Sports-Related Injury Surveillance Study, US, 2010-11 School Year

| | 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.