

# Epidemiology of High School Competition and Practice Injuries

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# Introduction

- 7 million high school athletes competed in interscholastic sports during the 2005-2006 school year
  - Increase of 16.1% over the past decade
  - 1.4 million injuries
- Objective: Compare practice and competition related injuries, leading to recommendations for injury prevention

# Methods

- High School RIO™
  - 100 nationally representative schools with ATCs
  - Football, soccer, basketball, wrestling, baseball, softball, and volleyball
- Definition of Injury
  - Occurring from participation in practice or competition
  - Requiring medical attention
  - Resulting in restriction of participation for  $\geq$  one day
- Analyzed using EpiInfo and SPSS

# RRs vs. IPRs

- Rate Ratio

- $RR = \frac{(\# \text{ Competition Injuries} / \# \text{ Competition AE}) * 1,000}{(\# \text{ Practice Injuries} / \# \text{ Practice AE}) * 1,000}$

- Injury Proportion Ratio

- $IPR = \frac{(\# \text{ competition concussions} / \# \text{ total competition injuries})}{(\# \text{ Practice concussions} / \# \text{ total practice injuries})}$
  - Numerator – Subgroup of denominator
  - Magnitude of Association

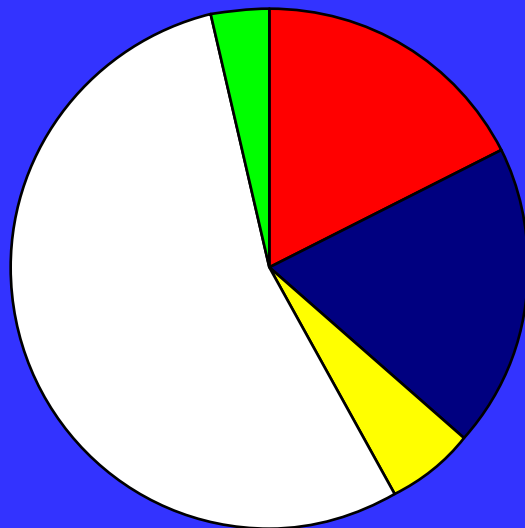
- Same tests for statistical significance

# Injury Rates

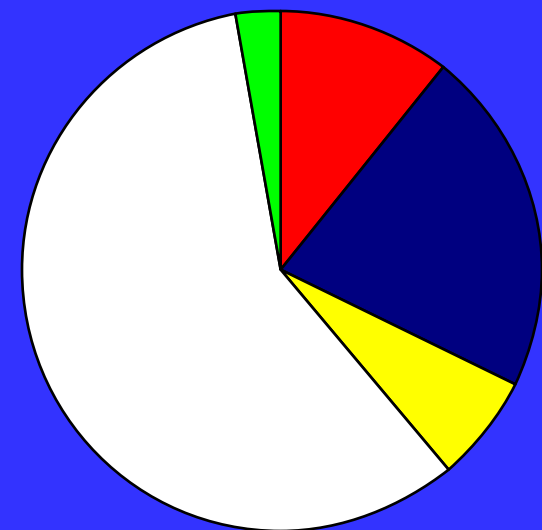
- 4,350 injury reports correlating to an estimated 1.4 million injuries nationwide
- Rates of injury per 1,000 athlete exposures
  - Total: 2.51
  - Competition: 4.63
  - Practice 1.69
  - RR=2.73, 95% CI: 2.58-2.90
- Highest rates of injury in competition:
  - Football: 12.09
  - Girls' soccer: 5.21
  - Boys' soccer: 4.22

# Body Site

## Competition



## Practice



Head/Face/Neck (competition vs. practice)

Overall; IPR=1.61, 95% CI:1.34-1.94

Boys' Soccer; IPR=7.74, 95% CI:2.53-23.65

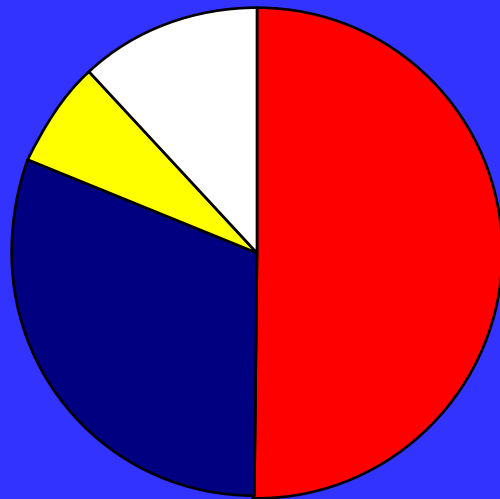
Girls' Basketball; IPR=6.03, 95% CI: 2.39-15.22

# Diagnosis

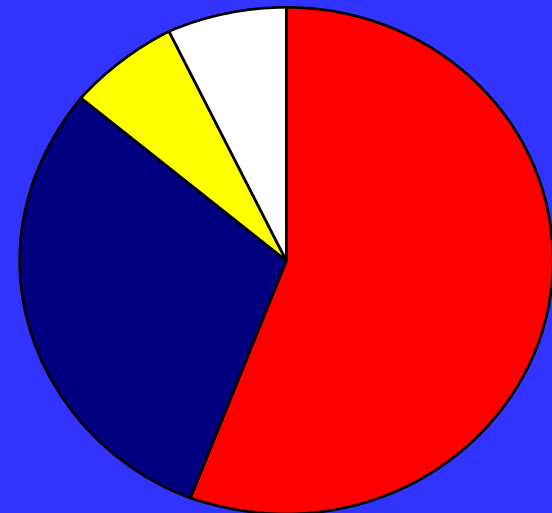
- Sprains/strains: Higher proportion of practice injuries; IPR=1.23, 95% CI: 1.14-1.32
- Fractures: Higher proportion of competition injuries; IPR=1.30, 95% CI:1.04-1.63
- Concussions:
  - Higher Proportion of Competition Injuries
    - Overall; IPR=2.02, 95% CI: 1.56-2.62
    - Boys' soccer; IPR=6.94, 95% CI: 2.01-23.95
    - Girls' basketball: IPR=5.83, 95% CI: 2.06-16.49
  - Higher Proportion of Practice Injuries
    - Girls' softball; IPR=20.26, 95% CI: 2.27-181

# Severity

## Competition



## Practice



- <1 Week
- 1-3 Weeks
- > 3 Weeks
- End of Season/Career

>3 Weeks or End of Season/Career; IPR=1.28, 95% CI: 1.08-1.52

End of Season/Career; IPR=1.73, 95% CI: 1.36-2.21

Surgery; IPR=1.62; 95% CI: 1.18-2.24



# Limitations

- Only high schools with NATA-affiliated athletic trainers were eligible for participation
- Definition of injury as resulting in time loss of one day restricted number of reported injuries
- Definition of an athlete exposure as a single competition or practice is less precise than a definition based on minutes of exposure

# Injury Prevention

- Incorporate drills of high-risk situations into practice
- Enforce wearing of safety equipment in practice as well as competition
- Focus attention on reducing sprains/strains
- Educate coaches and players on symptoms of concussion to increase reporting

# Conclusion

- Rates and patterns of high school sports injuries differ between practice and competition
- Sport-specific studies will help coaches develop targeted techniques to lower injury rates
- Reducing injury rates should be a priority

# The Importance of Injury Epidemiology

