YOUTH FOOTBALL SAFETY STUDY

Efficacy of coach education and policy change in reducing injuries and head impact exposure in American youth football

Thomas Dompier, PhD, ATC
President and Lead Epidemiologist
Adjunct Faculty, Rocky Mountain University of Health Professions
Affiliate Member, Institute for Partnerships to Eliminate Health Disparities, University of South Carolina
Disclosures

• No financial conflicts

• Mention of company names or products does not constitute endorsement by the Datalys Center, its Board of Directors, Officers, or Sponsors

• Funding
  – NCAA
  – National Athletic Trainers’ Association
  – BioCrossroads
  – USA Football
Disclosures - 7 Years Old Son

• 6 Months
  – Skull Fracture/Subdural Hematoma
  – Fall
• 5 Years
  – Concussion
  – Rollerblading
• 6 Years
  – Multiple abrasions on knees and hands
  – Bicycle crash in street
• 7 Years
  – Mandible hematoma
  – Hit in face by coach in coach pitch baseball
• 7 Years
  – Scalp hematoma from colliding heads
  – Playing two-hand touch with friends in backyard
• 7 Years
  – Multiple abrasions on face, hand and knees
  – Bicycle crash on sidewalk

• Sports Participation
  – Baseball
  – Basketball
  – Bicycle Riding
  – Flag Football
  – Gymnastics
  – Mountain Biking
  – Rollerblading/Ice Skating
  – Skiing
  – Soccer
  – Swimming
  – General Mayhem

• Wants to play tackle FB next season, I will require the league be a Pop Warner and or Heads Up FB certified league

*Reportable injuries based on Datalys’ methods
References


Youth FB Study Background

• 2012-2013 Youth Football Safety Study:
  – Purpose was to compare Age-Only and Age-Weight playing standards.
  – No difference in standard but, found that injuries may be associated with the leagues and teams
  – Results led to the 2014 study
### Table 3. Concussion Risk and Risk Ratios in Football

<table>
<thead>
<tr>
<th>Level of Competition</th>
<th>Year</th>
<th>Athletes With Concussion, No.</th>
<th>Total Athletes, No.</th>
<th>Risk, % (95% CI)</th>
<th>Risk Ratio (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Youth</td>
<td>2012</td>
<td>70</td>
<td>1982</td>
<td>3.53 (2.72-4.34)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2013</td>
<td>66</td>
<td>2110</td>
<td>3.13 (2.39-3.87)</td>
<td></td>
</tr>
<tr>
<td>High school</td>
<td>2012</td>
<td>417</td>
<td>4177</td>
<td>9.98 (9.07-10.89)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2013</td>
<td>350</td>
<td>7780</td>
<td>4.50 (4.04-4.96)</td>
<td></td>
</tr>
<tr>
<td>College&lt;sup&gt;b&lt;/sup&gt;</td>
<td>2012</td>
<td>120</td>
<td>2166</td>
<td>5.54 (4.58-6.50)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2013</td>
<td>125</td>
<td>2264</td>
<td>5.52 (4.58-6.46)</td>
<td></td>
</tr>
<tr>
<td>Youth vs high school</td>
<td>2012</td>
<td></td>
<td></td>
<td>0.35 (0.28-0.45)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2013</td>
<td></td>
<td></td>
<td>0.70 (0.54-0.90)</td>
<td></td>
</tr>
<tr>
<td>Youth vs college</td>
<td>2012</td>
<td></td>
<td></td>
<td>0.59 (0.44-0.79)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2013</td>
<td></td>
<td></td>
<td>0.55 (0.41-0.74)</td>
<td></td>
</tr>
<tr>
<td>High school vs college</td>
<td>2012</td>
<td></td>
<td></td>
<td>1.57 (1.37-2.03)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2013</td>
<td></td>
<td></td>
<td>0.79 (0.65-0.97)</td>
<td></td>
</tr>
</tbody>
</table>

- Youth risk between 30% and 65% lower than HS
- Youth risk between 41% and 45% lower than college
Figure. Injury Rates by Level of Competition

<table>
<thead>
<tr>
<th>Level of competition</th>
<th>Rate (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Youth</td>
<td>2.38 (1.84-2.92)</td>
</tr>
<tr>
<td>High school</td>
<td>2.01 (1.80-2.22)</td>
</tr>
<tr>
<td>College</td>
<td>3.74 (3.04-4.43)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Comparison</th>
<th>Rate Ratio (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>College vs high school</td>
<td>1.86 (1.50-2.31)</td>
</tr>
<tr>
<td>College vs youth</td>
<td>1.57 (1.17-2.10)</td>
</tr>
<tr>
<td>High school vs youth</td>
<td>0.84 (0.66-1.08)</td>
</tr>
</tbody>
</table>
**Level of competition** | **Rate (95% CI)**
--- | ---
Youth | 0.59 (0.45-0.73) | 0.61 (0.46-0.76) | 0.12 (0.06-0.18) | 0.37 (0.26-0.48)
High school | 0.66 (0.60-0.72) | 1.67 (1.57-1.77) | 0.29 (0.25-0.33) | 0.40 (0.35-0.45)
College | 0.53 (0.44-0.61) | 0.68 (0.58-0.77) | 0.32 (0.26-0.39) | 0.18 (0.13-0.23)

**Comparison** | **Rate Ratio (95% CI)**
--- | ---
College vs high school | 0.80 (0.67-0.96) | 0.41 (0.35-0.47) | 1.11 (0.87-1.42) | 0.45 (0.34-0.61)
College vs youth | 0.89 (0.67-1.20) | 1.11 (0.84-1.47) | 2.68 (1.51-4.77) | 0.49 (0.33-0.74)
High school vs youth | 1.12 (0.86-1.45) | 2.74 (2.14-3.50) | 2.42 (1.39-4.21) | 1.08 (0.78-1.50)
## Putting it in Perspective

<table>
<thead>
<tr>
<th></th>
<th>Youth</th>
<th>High School</th>
<th>NCAA</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Players</strong></td>
<td>3,000,000</td>
<td>1,100,000</td>
<td>71,000</td>
<td>4,171,000</td>
</tr>
<tr>
<td><strong>Concussions</strong></td>
<td>99,000</td>
<td>79,640</td>
<td>3,905</td>
<td>182,000</td>
</tr>
<tr>
<td><strong>Team Size</strong></td>
<td>25</td>
<td>77</td>
<td>107</td>
<td></td>
</tr>
<tr>
<td><strong>Meaning</strong></td>
<td>1 in 30</td>
<td>1 in 14</td>
<td>1 in 20</td>
<td></td>
</tr>
</tbody>
</table>
Current Study Purpose

• 2014 Heads Up Football Comparison Study
  – Purpose was to compare injury rates and head impact exposure of leagues from three conditions:

1. Heads Up Football Education + Practice Contact Restrictions (HUF+PW)

2. Heads Up Football Education Only (HUF)

3. Non-HUF (NHUF): No organized education policy, not Pop Warner affiliated
Theoretical Framework

• Social-Ecological Model
  – Posits that public health interventions are most effective when multiple factors are intervened upon at the same time.

Kerr, Brain Injury, 2014
Theoretical Framework

- Social-Ecological Model in Public Health
  - Coach education Influences coach/player behavior
  - Practice guidelines reduce injurious activities

Kerr, Brain Injury, 2014
Methods – Observational Cohort

• Athletic Trainers attended all practices and games
• Recorded de-identified injury and athlete-exposure information
• Provided care for injured players
• Used an online application to document injuries
• Hypothesized there would be fewer injuries in during practice in the HUF+PW and HUF groups compared to the NHUF group
Methods – Definitions

• Injury:
  – Any injury evaluated by the AT or a physician, can be further stratified by severity as determined by time loss, injury type, others, etc.

• Athlete-Exposure (AE):
  – One player participating in a game or practice equals one exposure.

• Injury Rate (IR):
  – Injuries/AE * 1000

• Rate Ratio (RR)
  – IRa/IRb

• Risk (%)
  – #Players Concussed/total # of players *100
# Cohort Demographics

## TABLE 1
Youth Football Player Demographics by Group$^a$

<table>
<thead>
<tr>
<th>Group</th>
<th>No. of Players</th>
<th>Variable$^b$</th>
<th>Mean ± SD</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>HUF+PW</td>
<td>741</td>
<td>Age</td>
<td>11.12 ± 1.98</td>
<td>5.20</td>
<td>15.29</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Height</td>
<td>148.20 ± 14.95</td>
<td>107.40</td>
<td>197.70</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Weight</td>
<td>44.48 ± 12.53</td>
<td>19.50</td>
<td>135.17</td>
</tr>
<tr>
<td>HUF-only</td>
<td>663</td>
<td>Age</td>
<td>10.94 ± 1.82</td>
<td>5.57</td>
<td>15.64</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Height</td>
<td>145.67 ± 14.29</td>
<td>92.89</td>
<td>184.39</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Weight</td>
<td>45.77 ± 10.21</td>
<td>23.59</td>
<td>113.49</td>
</tr>
<tr>
<td>NHUF$^c$</td>
<td>704</td>
<td>Age</td>
<td>10.56 ± 1.90</td>
<td>5.42</td>
<td>15.27</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Height</td>
<td>143.55 ± 12.58</td>
<td>104.14</td>
<td>210.82</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Weight</td>
<td>43.46 ± 13.44</td>
<td>20.59</td>
<td>121.93</td>
</tr>
<tr>
<td>Overall</td>
<td>2108</td>
<td>Age</td>
<td>10.88 ± 1.92</td>
<td>5.20</td>
<td>15.64</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Height</td>
<td>145.93 ± 14.16</td>
<td>92.89</td>
<td>210.82</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Weight</td>
<td>44.54 ± 12.23</td>
<td>19.50</td>
<td>135.17</td>
</tr>
</tbody>
</table>


$^b$Age is measured in years, height is measured in centimeters, and weight is measured in kilograms.

$^c$Players in the non-Heads Up Football group were also not affiliated with Pop Warner Football.
Injury Rates Stratified by Age Group

**TABLE 3**
Injury Rates in Youth Football Teams, by Implementation of Heads Up Football, Affiliation With Pop Warner Football, Event Type, and Age$^a$

<table>
<thead>
<tr>
<th></th>
<th>HUF+PW</th>
<th>HUF-only</th>
<th>NHUF</th>
<th>Rate$^c$</th>
<th>Rate$^c$</th>
<th>Rate$^c$</th>
<th>Rate Ratio (95% CI)</th>
<th>Rate Ratio (95% CI)</th>
<th>Rate Ratio (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td></td>
<td>n</td>
<td></td>
<td></td>
<td>n</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Practice</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5-10 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All injuries</td>
<td>8</td>
<td>1.25</td>
<td>12</td>
<td>2.51</td>
<td>41</td>
<td>3.91</td>
<td>0.32 (0.15-0.68)$^e$</td>
<td>0.64 (0.34-1.22)</td>
<td>0.50 (0.20-1.22)</td>
</tr>
<tr>
<td>Time-loss injuries$^d$</td>
<td>6</td>
<td>0.94</td>
<td>8</td>
<td>1.67</td>
<td>17</td>
<td>1.62</td>
<td>0.58 (0.29-1.47)</td>
<td>1.03 (0.44-2.39)</td>
<td>0.56 (0.19-1.62)</td>
</tr>
<tr>
<td>Concussions</td>
<td>2</td>
<td>0.31</td>
<td>3</td>
<td>0.63</td>
<td>4</td>
<td>0.38</td>
<td>0.82 (0.15-4.48)</td>
<td>1.64 (0.37-7.34)</td>
<td>0.50 (0.08-2.99)</td>
</tr>
<tr>
<td>11-15 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All injuries</td>
<td>12</td>
<td>0.85</td>
<td>30</td>
<td>2.83</td>
<td>107</td>
<td>10.52</td>
<td>0.08 (0.04-0.15)$^e$</td>
<td>0.27 (0.18-0.40)$^e$</td>
<td>0.30 (0.15-0.59)$^e$</td>
</tr>
<tr>
<td>Time-loss injuries$^d$</td>
<td>8</td>
<td>0.57</td>
<td>21</td>
<td>1.98</td>
<td>39</td>
<td>3.83</td>
<td>0.15 (0.07-0.32)$^e$</td>
<td>0.52 (0.30-0.88)$^e$</td>
<td>0.29 (0.13-0.64)$^e$</td>
</tr>
<tr>
<td>Concussions</td>
<td>2</td>
<td>0.14</td>
<td>7</td>
<td>0.66</td>
<td>8</td>
<td>0.79</td>
<td>0.18 (0.04-0.85)$^f$</td>
<td>0.84 (0.31-2.32)</td>
<td>0.21 (0.04-1.03)</td>
</tr>
<tr>
<td><strong>Game</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5-10 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All injuries</td>
<td>3</td>
<td>2.20</td>
<td>11</td>
<td>8.83</td>
<td>30</td>
<td>8.66</td>
<td>0.25 (0.08-0.83)$^e$</td>
<td>1.02 (0.51-2.03)</td>
<td>0.25 (0.07-0.89)$^e$</td>
</tr>
<tr>
<td>Time-loss injuries$^d$</td>
<td>3</td>
<td>2.20</td>
<td>3</td>
<td>2.41</td>
<td>12</td>
<td>3.46</td>
<td>0.63 (0.18-2.25)</td>
<td>0.70 (0.20-2.46)</td>
<td>0.91 (0.18-4.52)</td>
</tr>
<tr>
<td>Concussions</td>
<td>0</td>
<td>0.00</td>
<td>0</td>
<td>0.00</td>
<td>4</td>
<td>1.15</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>11-15 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All injuries</td>
<td>12</td>
<td>3.97</td>
<td>44</td>
<td>15.99</td>
<td>60</td>
<td>17.84</td>
<td>0.22 (0.12-0.41)$^e$</td>
<td>0.90 (0.61-1.32)</td>
<td>0.25 (0.13-0.47)$^e$</td>
</tr>
<tr>
<td>Time-loss injuries$^d$</td>
<td>7</td>
<td>2.32</td>
<td>21</td>
<td>7.63</td>
<td>23</td>
<td>6.84</td>
<td>0.34 (0.15-0.79)$^f$</td>
<td>1.12 (0.62-2.02)</td>
<td>0.30 (0.13-0.71)$^e$</td>
</tr>
<tr>
<td>Concussions</td>
<td>3</td>
<td>0.99</td>
<td>6</td>
<td>2.18</td>
<td>6</td>
<td>1.78</td>
<td>0.56 (0.14-2.23)</td>
<td>1.22 (0.39-3.79)</td>
<td>0.46 (0.11-1.82)</td>
</tr>
</tbody>
</table>

$^a$HUF-only, Heads Up Football/non-Pop Warner–affiliated; HUF+PW, Heads Up Football and Pop Warner–affiliated; n/a, not applicable; NHUF, non–Heads Up Football.

$^b$Players in the non–Heads Up Football group were also not affiliated with Pop Warner Football.
Risk of Concussion

• Heads Up + Pop Warner
  – 0.9%
  – 0.9% / 3.1% = 0.30 or 70% lower

• Heads Up Only
  – 2.4%
  – Risk Ratio 2.4% / 3.1% = 0.77 or 23% lower

• Neither Heads Up or Pop Warner
  – 3.1%
## Putting it in Perspective

<table>
<thead>
<tr>
<th></th>
<th>HUF+ PW</th>
<th>HUF Only</th>
<th>Non-HUF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Players</td>
<td>3,000,000</td>
<td>3,000,000</td>
<td>3,000,000</td>
</tr>
<tr>
<td>Risk</td>
<td>0.9%</td>
<td>2.4%</td>
<td>3.1%</td>
</tr>
<tr>
<td>Concussions</td>
<td>27,000</td>
<td>72,000</td>
<td>93,000</td>
</tr>
<tr>
<td>Team Size</td>
<td>25</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>Meaning</td>
<td>1 in 111</td>
<td>1 in 42</td>
<td>1 in 32</td>
</tr>
</tbody>
</table>
Methods – Head Impact Exposure

• Players wore xPatch accelerometer during practices and games

• Applied behind ear as shown in picture, didn’t cause any helmet issues

• Minimum impact exposure was set at 10gs

• Able to calculate mean number of impacts per session

• Hypothesized we would see fewer impacts during **practice** in the HUF+PW and HUF groups compared to the NHUF group.
# Head Impact Demographics

## TABLE 1
Youth Football Player Demographics by Group, 2014 Season

<table>
<thead>
<tr>
<th>Group</th>
<th>No. of Players</th>
<th>Variable$^a$</th>
<th>Mean ± SD</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heads Up Football</td>
<td>38</td>
<td>Age</td>
<td>11.7 ± 1.5</td>
<td>8.5-14.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Weight</td>
<td>51.8 ± 9.5</td>
<td>32.8-73.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Height</td>
<td>152.7 ± 11.9</td>
<td>116.1-167.6</td>
</tr>
<tr>
<td>Non–Heads Up Football</td>
<td>32</td>
<td>Age</td>
<td>11.7 ± 1.3</td>
<td>8.8-15.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Weight</td>
<td>51.4 ± 9.9</td>
<td>29.9-72.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Height</td>
<td>151.7 ± 8.7</td>
<td>133.4-165.1</td>
</tr>
<tr>
<td>Overall</td>
<td>70</td>
<td>Age</td>
<td>11.7 ± 1.4</td>
<td>8.5-15.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Weight</td>
<td>51.6 ± 9.6</td>
<td>29.9-73.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Height</td>
<td>152.2 ± 10.5</td>
<td>116.1-167.6</td>
</tr>
</tbody>
</table>
## Head Impact Exposure

### TABLE 2

Number of Impacts Overall and per Individual Event in Youth Football Players by Group, 2014 Season<sup>a</sup>

<table>
<thead>
<tr>
<th>Type of Event</th>
<th>Group</th>
<th>No. of Impacts</th>
<th>Mean ± SD</th>
<th>Difference (95% CI)&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>10g cutoff</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Practice</td>
<td>NHUF 2933</td>
<td>8.9 ± 3.1</td>
<td>0.0</td>
<td>9.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>HUF 1317</td>
<td>5.6 ± 2.9</td>
<td>3.4 (2.9 to 3.9)&lt;sup&gt;c&lt;/sup&gt;</td>
<td>6.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Overall 4250</td>
<td>7.5 ± 3.4</td>
<td></td>
<td>7.5</td>
</tr>
<tr>
<td></td>
<td>Games</td>
<td>NHUF 1704</td>
<td>12.7 ± 4.0</td>
<td>0.0</td>
<td>13.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>HUF 1524</td>
<td>13.1 ± 3.7</td>
<td>−0.4 (−1.4 to 0.5)</td>
<td>13.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Overall 3228</td>
<td>12.9 ± 3.9</td>
<td></td>
<td>13.0</td>
</tr>
<tr>
<td>20g cutoff</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Practice</td>
<td>NHUF 1235</td>
<td>3.9 ± 1.9</td>
<td>0.0</td>
<td>4.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>HUF 580</td>
<td>2.9 ± 1.4</td>
<td>1.0 (0.7 to 1.3)&lt;sup&gt;c&lt;/sup&gt;</td>
<td>3.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Overall 1815</td>
<td>3.5 ± 1.8</td>
<td></td>
<td>3.0</td>
</tr>
<tr>
<td></td>
<td>Games</td>
<td>NHUF 741</td>
<td>5.6 ± 2.5</td>
<td>0.0</td>
<td>5.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>HUF 671</td>
<td>5.8 ± 2.4</td>
<td>−0.2 (−0.9 to 0.4)</td>
<td>5.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Overall 1412</td>
<td>5.7 ± 2.5</td>
<td></td>
<td>5.0</td>
</tr>
</tbody>
</table>

<sup>a</sup>HUF, Heads Up Football; NHUF, non–Heads Up Football.

<sup>b</sup>Difference of the mean number of impacts per individual event between NHUF and HUF; 95% CI obtained from independent-samples t test.

<sup>c</sup>Statistically significant difference.
Is 10g Meaningful?
Discussion
Health Disparities from Rising Participation Costs in Sports

- Case Example from our Youth Football Data
  - >300 lb
  - 5’5” tall
  - 11-year-old, Black/African American
  - Lower SES organization

- What’s he going to play if not football?
  - Long-term health consequences of inactivity

- Health Disparity
  - Kids like him, who need the physical activity and structure the most, will be priced out of the sport
  - Flag football is aimed at skill positions, will likely not play
  - Parents of the kids in the burbs will pay whatever it takes
  - Kids of lower SES means will not be able to play
All Cause Mortality in the NCAA

Rate Ratio = 0.15 
(NCAA/US)

An NCAA Student-Athlete is 85% more likely to live beyond the age of 23

Conversely, the general population of 18-23 year olds are 6.6 times more likely to die


<table>
<thead>
<tr>
<th>Cause</th>
<th>NCAA student-athletes</th>
<th>U.S. 18-23 year-olds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accidents</td>
<td>7.1</td>
<td>42.7</td>
</tr>
<tr>
<td>Cardiovascular</td>
<td>2.2</td>
<td>3.5</td>
</tr>
<tr>
<td>Suicide</td>
<td>1.3</td>
<td>11.6</td>
</tr>
<tr>
<td>Cancer</td>
<td>1.0</td>
<td>4.2</td>
</tr>
<tr>
<td>Homicide</td>
<td>0.8</td>
<td>15.3</td>
</tr>
<tr>
<td>Sickle Cell</td>
<td>0.3</td>
<td>0.2</td>
</tr>
<tr>
<td>Drug Overdose</td>
<td>0.3</td>
<td>9.9</td>
</tr>
<tr>
<td>Heat Stroke</td>
<td>0.2</td>
<td>--</td>
</tr>
<tr>
<td>Meningitis</td>
<td>0.2</td>
<td>0.1</td>
</tr>
<tr>
<td>Unknown</td>
<td>0.2</td>
<td>--</td>
</tr>
<tr>
<td>All causes</td>
<td>13.9</td>
<td>92.1</td>
</tr>
</tbody>
</table>

NOTE: Data may not be directly comparable due to varying methodologies for identifying mortality cases and causes of death.

Data originates from Harmon et al., 2011

Data originates from the Center for Disease Control and Prevention (CDC) CenterWide-ranging Online Data for Epidemiologic Research (WONDER); Data for heat stroke and unknown were not available from WONDER.
BENEFITS OF YOUTH SPORTS

A lot of research has examined the impact of sports on physical and psychosocial health in children and adolescents. Overall, the research has shown youth sport participants have higher levels of physical activity that positively influence physical and psychological health in adolescence and later in life.

PHYSICAL HEALTH
Youth athletes have:
- Higher levels of physical activity and they expend more energy daily
- Less body fat
- A reduced risk of becoming overweight or obese
- Higher levels of cardiovascular fitness
- Stronger bones and muscles
- An increased likelihood of being physically active later in life

PSYCHOLOGICAL HEALTH
Youth athletes have:
- Higher levels of self-esteem and social connectedness
- Lower levels of depression
- Lower levels of suicidal ideation, thoughts, and attempts
- Lower levels of problem behaviors (aggression problems, social problems, and delinquency problems)

SOCIAL WELL-BEING
Sports can provide:
- Opportunities to make new friends
- Exposure to positive role models
- Opportunities to train

ACADEMIC PERFORMANCE
- Middle and high school athletes have higher grade point averages than non-athletes
- Grade point averages increase as the number of sports teams participated on increase
- High school sports participation is associated with higher graduation rates and lower dropout rates
- Youth athletes also less likely to attend college

HEALTH BEHAVIORS
Sports participation has also been shown to be associated with positive health behaviors. Youth athletes report:
- Consuming more fruits and vegetables
- Being less likely to smoke cigarettes
- Watching less television
- Being more satisfied with their weight

ADDITIONAL RESOURCES:
U.S. Department of Health and Human Services Physical Activity Guidelines for Americans
http://www.health.gov/physicalactivity/
Conclusions

• These data support social-ecological model, where the HUF+PW and HUF injury rates were 87% and 63% lower than NHUF injury rate, respectively.

• Likelihood of Suffering a Concussion
  – 1 in 111 Players in HUF+PW leagues
  – 1 in 42 Players in HUF Only leagues
  – 1 in 32 Players in Non-HUF or PW leagues
  – 1 in 14 High School Players
  – 1 in 20 College Players

• Players in the HUF condition had on average, 3 less impacts 10g or greater per practice session, and 1 less above 20g.
  – Example:
    • A player in a HUF organization would have on average 108 less 10g impacts to the head over a 12 week season if there were 3 practices per week.
Datalys Center’s Recommendations

• Note: our views may not be the views of our sponsors and are based on our data and experience as epidemiologists and clinical athletic trainers.

1. Comprehensive coach education and sound practice guidelines should be mandatory in youth and high school football.

2. Parents should seek youth football organizations that are Pop Warner affiliated and or minimally have coaches that are Heads Up Football certified.

3. Ongoing research is evaluating Heads Up Football in the high school setting and research is also evaluating USA Football’s Practice Guidelines in lieu of Pop Warner affiliation.
Thanks and Questions

• Many Thanks!
  – Youth FB Organizations
  – Coaches
  – Parents
  – Players
  – Athletic Trainers
  – Collaborators
  – Funding Agencies
    • NCAA
    • NATA
    • USA Football
    • BioCrossroads
About the Datalys Center

• A 501c(3) non-profit independent provider of epidemiological research services specializing in injuries related to sports and physical activity

• Formed in 2006 through a collaboration between the American College of Sports Medicine (ACSM), National College Athletic Association (NCAA) and BioCrossroads, a life sciences catalyst company

• Our Mission is to assist other organizations make sports safer through data driven research
Datalys Center Leadership

Board of Directors

- Marjorie J. Albohm, MS, ATC Past President, NATA; Director, Ossur Academy
- Irvin E. Bomberger Executive Director, AOSSM
- Brian Hainline, MD Chief Medical Officer, NCAA
- Troy D. Hege Project Manager, BioCrossroads
- Barry P. Katz, PhD Chair, Biostatistics, IU School of Medicine
- Kathleen McNeely Chief Financial Officer, NCAA
- James R. Whitehead Executive Vice President and CEO, ACSM

Past Members of the Board of Directors

- Robert C. Vowels, Jr. Director of Athletics, University of Detroit, Mercy
- John B. "Jack" Swarbrick Jr. Director of Athletics, Notre Dame University
- James L. Isch, PhD Former Chief Operating Officer, NCAA, Retired
Datalys Center Staff and Advisors

Faculty and Staff
• Thomas P. Dompier, PhD, ATC
  President, Lead Epidemiologist
• Zachary Y. Kerr, PhD, MPH
  Project Director, NCAA Injury Surveillance Program
• Karen Roos, PhD, MSPT, ATC
  Project Director, Youth Injury Surveillance Program
• Sara Dalton, MA, ATC
  Project Coordinator, NATION
• Melissa Niceley
  Project Coordinator, CARE
• Aristarque Djoko, MS
  Statistician
• Dustin Folger
  Recruitment and Support
• Mary Grant
  Administration and Data Quality Control

External Advisory Board
• Gary Wilkerson PhD, ATC
  University of Tennessee Chattanooga
• Julie Agel, ATC
  Harbor View Injury Center, University of Minnesota
• Jennifer Hootman, PhD, ATC
  Centers for Disease Control (CDC)
• Julie Gilchrist, PhD
  Centers for Disease Control (CDC)
• Dawn Comstock, PhD
  University of Colorado, Denver
• Alison Snyder, PhD, ATC
  AT Still University
• Jim Torner, PhD
  University of Iowa
• Bruce Miller, MD
  University of Michigan