Temporal Trends in Pediatric Firearm Injuries using the National Trauma Data Bank

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No disclosures
Firearm injuries are a significant source of morbidity and mortality among children in the United States – 15% of childhood and adolescent deaths\textsuperscript{1} – Second leading cause of death in children\textsuperscript{1}

Aim:
– To define temporal and regional trends in pediatric firearm injury across the United States

\textsuperscript{1} Cunningham et al. NEJM 2018.
Methods

Retrospective review of the National Trauma Data Bank – 2007-2015

Firearm injuries in children <18 years of age
– Exclusion criteria:
  - Terrorism
  - Air gun injuries
  - Puerto Rico and the US territories

Pediatric population calculated based on US census data\(^2\)

\(^2\)The Annie E. Casey Foundation Kids Count Data Center.
From 2007-2015: 29,795 pediatric firearm injuries

Rates by region:

- South - 37% (10,953)
- Midwest - 24% (7,244)
- West - 21% (6,403)
- Northeast - 11% (3,407)
- Unknown - 5% (1,788)
From 2007-2015:
29,795 pediatric firearm injuries

Prevalence by region:
- Midwest: 4.53 per 10,000
- South: 3.94 per 10,000
- West: 3.59 per 10,000
- Northeast: 2.79 per 10,000

- p<0.001
Pediatric Firearm Injury Demographics

85% male
- Similar across regions
- Range: 85-87%
- p=0.05

73% teenagers (15-17 yrs.)
- Range: 69-78%
- p<0.001

South: 10% children 5-11 yrs.
- 6-7% in other regions
- p<0.001

81% racial/ethnic minorities
- 59% Black
- 17% Hispanic
- 5% Asian/Other
- p<0.001

West: 42% Hispanic
- p<0.001

56% government insurance
- Range: 53-57%
- p<0.001
Pediatric Firearm Injury by Intent

Intent by Region

- Midwest: 72% Assault, 18% Accident, 5% Suicide, 4% Undetermined, 5% Legal
- Northeast Region: 80% Assault, 12% Accident, 3% Suicide, 5% Undetermined, 3% Legal
- South: 65% Assault, 22% Accident, 6% Suicide, 5% Undetermined, 5% Legal
- West: 79% Assault, 13% Accident, 5% Suicide, 5% Undetermined, 5% Legal

Intent by Age

- 0 to 4: 49% Assault, 40% Accidental, 46% Suicide, 4% Undetermined, 5% Legal
- 5 to 11: 45% Assault, 46% Accidental, 3% Suicide, 5% Undetermined, 8% Legal
- 12 to 14: 59% Assault, 29% Accidental, 8% Suicide, 3% Undetermined, 8% Legal
- 15 to 17: 80% Assault, 11% Accidental, 5% Suicide, 3% Undetermined, 5% Legal
Temporal Trends in Pediatric Firearm Injuries

- A) Assault
- B) Accidental
- C) Suicide
- D) Total

Injuries per 1,000,000:
- p=0.01
- p=0.02
Conclusions

• The majority of pediatric firearm injuries are due to assaults among teenagers

• Despite increased national attention on firearm injury prevention, national rates of accidental injuries and suicides are increasing
Thank You!

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<table>
<thead>
<tr>
<th>Age group</th>
<th>Total 29,795</th>
<th>Northeast n=3,407 (11%)</th>
<th>Midwest n=7,244 (24%)</th>
<th>West n=6,403 (21%)</th>
<th>South n=10,953 (37%)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>25,399 (85%)</td>
<td>2,921 (87%)</td>
<td>6,133 (85%)</td>
<td>5,501 (86%)</td>
<td>9,282 (85%)</td>
<td>0.051</td>
</tr>
<tr>
<td>Age group</td>
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<td></td>
<td>&lt;0.001</td>
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<tr>
<td>0-4 yrs.</td>
<td>1,530 (5%)</td>
<td>122 (4%)</td>
<td>394 (5%)</td>
<td>236 (4%)</td>
<td>707 (6%)</td>
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</tr>
<tr>
<td>5-11 yrs.</td>
<td>2,257 (8%)</td>
<td>195 (6%)</td>
<td>541 (7%)</td>
<td>370 (6%)</td>
<td>1,047 (10%)</td>
<td></td>
</tr>
<tr>
<td>12-14 yrs.</td>
<td>4,336 (15%)</td>
<td>447 (13%)</td>
<td>1,033 (14%)</td>
<td>894 (14%)</td>
<td>1,671 (15%)</td>
<td></td>
</tr>
<tr>
<td>15-17 yrs.</td>
<td>21,672 (73%)</td>
<td>2,643 (78%)</td>
<td>5,276 (73%)</td>
<td>4,903 (77%)</td>
<td>7,528 (69%)</td>
<td></td>
</tr>
<tr>
<td>Intent</td>
<td>Total 29,795</td>
<td>Northeast n=3,407 (11%)</td>
<td>Midwest n=7,244 (24%)</td>
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<td>-------------------------</td>
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</tr>
<tr>
<td>Assault</td>
<td>21,563 (72%)</td>
<td>2,742 (80%)</td>
<td>5,246 (72%)</td>
<td>5,074 (79%)</td>
<td>7,169 (65%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Accident</td>
<td>5,270 (18%)</td>
<td>407 (12%)</td>
<td>1,307 (18%)</td>
<td>804 (13%)</td>
<td>2,457 (22%)</td>
<td></td>
</tr>
<tr>
<td>Suicide</td>
<td>1,522 (5%)</td>
<td>118 (3%)</td>
<td>344 (5%)</td>
<td>310 (5%)</td>
<td>682 (6%)</td>
<td></td>
</tr>
<tr>
<td>Law enforcement</td>
<td>194 (0.7%)</td>
<td>15 (0.4%)</td>
<td>33 (0.5%)</td>
<td>53 (0.8%)</td>
<td>83 (0.8%)</td>
<td></td>
</tr>
<tr>
<td>Unknown</td>
<td>1,246 (4%)</td>
<td>125 (4%)</td>
<td>314 (4%)</td>
<td>162 (3%)</td>
<td>562 (5%)</td>
<td></td>
</tr>
</tbody>
</table>
## Pediatric firearm injury demographics

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Northeast</th>
<th>Midwest</th>
<th>West</th>
<th>South</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Race/Ethnicity</strong></td>
<td>29,795</td>
<td>n=3,407 (11%)</td>
<td>n=7,244 (24%)</td>
<td>n=6,403 (21%)</td>
<td>n=10,953 (37%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>White</td>
<td>5,562 (19%)</td>
<td>457 (14%)</td>
<td>1,377 (20%)</td>
<td>1,051 (17%)</td>
<td>2,434 (23%)</td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>16,959 (59%)</td>
<td>2,203 (68%)</td>
<td>4,936 (71%)</td>
<td>1,746 (28%)</td>
<td>6,889 (64%)</td>
<td></td>
</tr>
<tr>
<td>Hispanic</td>
<td>4,991 (17%)</td>
<td>388 (12%)</td>
<td>443 (6%)</td>
<td>2,672 (43%)</td>
<td>1,230 (11%)</td>
<td></td>
</tr>
<tr>
<td>Asian/Other</td>
<td>1,450 (5%)</td>
<td>170 (5%)</td>
<td>203 (3%)</td>
<td>777 (12%)</td>
<td>260 (2%)</td>
<td></td>
</tr>
<tr>
<td><strong>Insurance</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Private</td>
<td>6,568 (28%)</td>
<td>832 (31%)</td>
<td>1,644 (29%)</td>
<td>1,740 (33%)</td>
<td>2,352 (24%)</td>
<td></td>
</tr>
<tr>
<td>Government</td>
<td>13,024 (56%)</td>
<td>1,508 (55%)</td>
<td>3,228 (56%)</td>
<td>2,817 (53%)</td>
<td>5,471 (57%)</td>
<td></td>
</tr>
<tr>
<td>Self-pay</td>
<td>3,833 (16%)</td>
<td>385 (14%)</td>
<td>846 (15%)</td>
<td>797 (15%)</td>
<td>1,805 (19%)</td>
<td></td>
</tr>
</tbody>
</table>