The epidemiology of hockey injuries in Victoria, Australia

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Data sources (datasets held by VISU)

- **Hospital admissions**: Victorian Admitted Episodes Dataset (VAED)
  - Admissions to all public and private hospitals in Victoria
  - Coded to ICD-10-AM
  - Chapter 20 External Causes: Codes for Activity, Causes, Place

- **Emergency Department (ED) presentations, non-admissions**: 
  - Victorian Emergency Minimum Dataset (VEMD)
  - ED presentations to 39 public hospitals,
  - Drop-down menu: minimum injury dataset includes narrative

- **Sports participation data**: ERASS national annual survey (persons aged 15+) (Victoria oversampled for minor sports)
Data years analysed

- **Main Analysis**: 2010/11 – 2012/13 (3 years)
- **Trends**: frequency 2002/03 – 2012/13 (11 years) 
  rate 2002/03-2009/10 (8 years)

Population

- All ages for frequency, adults only for rates, both sexes, organised and unorganised sport
- Mainly community-level participants
Ranking of sports for serious injury, Victoria

Adult hospital admissions (16 Sports), 2007/08 – 2009/10

Rank based on frequency

1. Australian Football
2. Soccer
3. Basketball
4. Netball
5. Cricket
6. Rugby
7. Tennis
8. Hockey

Rank based on rate per 100,000 adult participants

1. Australian Football
2. Hockey
3. Soccer
4. Basketball
5. Netball
6. Cricket

Trend in frequency of injury
2002/03 – 2012/13 (all ages)

Frequency of hospital-treated injury
Year of injury
Frequency of hospital-treated injury
0 100 200 300 400 500 600 700 800

- admissions
- ED presentations
- all hospital-treated

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Trend in rate per 100,000 adult participants

Year of injury

Rate per 100,000 ADULT participants

- admissions
- ED presentations
- all hospital-treated

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Gender

<table>
<thead>
<tr>
<th></th>
<th>Admissions (n=341)</th>
<th>ED presentations (n=1647)</th>
<th>Hospital-treated (n=1988)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Male</strong></td>
<td>72.1%</td>
<td>60.3%</td>
<td>62.3%</td>
</tr>
<tr>
<td><strong>Female</strong></td>
<td>27.9%</td>
<td>39.7%</td>
<td>37.7%</td>
</tr>
</tbody>
</table>

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Age

Proportion of cases

- Admissions (n=341)
- ED presentations (n=1647)
- Hospital-treated (n=1988)
Body Region Injured (Grouped)

**Admissions**
- Head/face/neck – 36%
- Upper extremity – 43%
- Trunk - 2%
- Lower extremity - 17%

**ED presentations**
- Head/face/neck - 35%
- Upper extremity - 35%
- Trunk - 2%
- Lower extremity - 25%
Commonest injury diagnoses

<table>
<thead>
<tr>
<th>Admissions (n=341)</th>
<th>ED Presentations (n=1647)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Fracture of wrist/hand</td>
<td>1. Open wound to head</td>
</tr>
<tr>
<td></td>
<td>18%</td>
</tr>
<tr>
<td>2. Fracture of skull/facial bones</td>
<td>2. Fracture of hand/wrist</td>
</tr>
<tr>
<td></td>
<td>11%</td>
</tr>
<tr>
<td>3. Open wound to head</td>
<td>3. Dislocation/sprain/strain ankle/foot</td>
</tr>
<tr>
<td></td>
<td>9%</td>
</tr>
<tr>
<td></td>
<td>7%</td>
</tr>
<tr>
<td>5. Intracranial (incl. concussion)</td>
<td>5. Superficial injury of head</td>
</tr>
<tr>
<td></td>
<td>6%</td>
</tr>
<tr>
<td>6. Fracture lower leg including ankle</td>
<td>6. Dislocation/sprain/strain knee</td>
</tr>
<tr>
<td></td>
<td>5%</td>
</tr>
</tbody>
</table>
Causes of injury

1. Hit/struck by equipment – ball, bat
   - 67% admissions
   - 65% ED presentation
   - 65% ALL

2. Fall
   - 12% admissions
   - 11% ED presentations
   - 11% ALL

3. Hit/struck/crush by person
   - 2% admissions
   - 6% ED presentations
   - 5% ALL
Direct hospital costs – admissions only
n=341 (2010/11-12/13)

Total cost: $1.2million AUD
Mean cost per case: $3,577 AUD
Range: $656 - $26,415 AUD
Data limitations

- **Hospital-based collections - capture biased to acute and serious injury** - NSW pop. health survey - only 15% of injured sports participants are treated in hospital (Mitchell et al. 2010)

- **Injury cases on hospital datasets underestimated**
  Substantial missing data on sport being played

- **Lack of information and mechanisms/circumstances of injury** –
  VAED all data coded - no coding of mechanism of injury and no narrative.
  VEMD narrative data of variable quality

- **Uneven commitment from hospital**
  ED management and staff
  Data quality is variable
Feasibility of sports injury data collection

- Difficult to get funding for a stand-alone Sports Injury Surveillance System
- ED surveillance - ICECI is a better alternative – core and modules
- SportsInjury Tracker – community sports injury on-line surveillance system
What do we know about community level hockey injury?

- Comparatively few studies – all but two descriptive
- One prospective cohort study (Western Australia) but risk factor analysis not done – low number of hockey injury cases.
- No case control studies to investigate risk and protective factors
- One published evaluation: of protective eyewear in US high school hockey found eyewear reduces head and face injuries (Kriz et al, 2012)
Research needs

- More injury surveillance to underpin research and prevention
- More analytical studies to determine risk/protective factors – focus on head injury
- More interventions and evaluations

All photographs courtesy of www.sportsonline.net.au