The individual, family and societal impacts of injury

Alex Collie

1. Chief Research Officer, ISCRR
2. Department of Epidemiology and Preventive Medicine, Monash University.

Presentation to ACHR Forum, Auckland, NZ
8-9 November 2012
Acknowledgments

• Co-investigators & project management committee
  • Adam Vogel, Helen Keleher, Rod McClure, Alan Petersen, Niki Ellis, Sharon Newnam, Peta Odgers, David Attwood

• Funders
  • WorkSafe Victoria
  • Transport Accident Commission
  • Comcare
  • Australian Research Council
Outline

• Some injury outcome assessment frameworks

• The individual, family and societal impacts of injury: a systematic meta-review.

• Conclusions and implications
Impact of work injury on family members

**TABLE II.** Incidence of One or More Hospitalizations 3 Months After and 3 Months Before Occupational Injury (Percent of Families)\(^a\)

<table>
<thead>
<tr>
<th></th>
<th>All injured workers</th>
<th>Non-severely injured workers</th>
<th>Severely injured workers</th>
</tr>
</thead>
<tbody>
<tr>
<td>After injury (percent)</td>
<td>1.91</td>
<td>1.82</td>
<td>2.38</td>
</tr>
<tr>
<td>Before injury (percent)</td>
<td>1.50</td>
<td>1.48</td>
<td>1.62</td>
</tr>
<tr>
<td>Absolute difference</td>
<td>0.41</td>
<td>0.34</td>
<td>0.76</td>
</tr>
<tr>
<td>Percentage difference</td>
<td>27.33</td>
<td>22.97</td>
<td>46.91</td>
</tr>
<tr>
<td>Number of observations</td>
<td>18,411</td>
<td>15,514</td>
<td>2,897</td>
</tr>
</tbody>
</table>

\(^a\)Among families with hospitalizations, 11.9% (before) and 12.5% (after) had more than one hospitalization.

**TABLE III.** Conditional Logistic Regression Results: Odds of One or More Family Hospitalizations 3 Months After Versus 3 Months Before Occupational Injury

<table>
<thead>
<tr>
<th></th>
<th>All injured workers</th>
<th>Non-severely injured workers</th>
<th>Severely injured workers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Odds ratio</td>
<td>1.31</td>
<td>1.26</td>
<td>1.56</td>
</tr>
<tr>
<td>Z-score</td>
<td>3.17</td>
<td>2.47</td>
<td>2.18</td>
</tr>
<tr>
<td>(P &gt;</td>
<td>z</td>
<td>)</td>
<td>0.002</td>
</tr>
<tr>
<td>95% confidence interval</td>
<td>1.11–1.55</td>
<td>1.05–1.52</td>
<td>1.05–2.34</td>
</tr>
<tr>
<td>Number of observations (families)(^a)</td>
<td>1,340</td>
<td>1,088</td>
<td>212</td>
</tr>
</tbody>
</table>

\(^a\)In the conditional logistic regression analysis only families with change in hospitalization status before and after injury are considered.
List of All Deficits (LOAD) framework

Society
- Societal fear of injuries (S1)
- Psychological consequences in observers (S2)
- Copy cat events (S3)
- Direct medical costs (S4)
- Indirect costs (S5)

Individual
- Death, including foetal life (I1)
- Pain and discomfort (I2)
- Reduced short term physical activity (I3)
- Long term physical disability (I4)
- Psychological disability (I5)
- Concomitant diseases (I6)
- Development of secondary conditions (I7)
- Behavioural change and secondary health loss (I8)
- Fear of repeated injury (I9)
- Tangible costs (I10)
- Intangible costs (I11)
- Diminished quality of life (I12)

Family
- Observer consequences (F1)
- Carer consequences (F2)
- Dependant consequences (F3)

Sherbrooke model
Injured Person / Bystander

Family / Colleagues / Friends

Community: Employer / Sporting clubs etc..

Systems: Healthcare / Legal / Compensation etc..
Background

• Estimates of the burden of injury are based almost entirely on knowledge of the impact on the injured person.

• Very limited understanding of the impacts of injury on individuals and groups connected to the injured person (family members, carers, compensation systems, healthcare providers).

• Effective policy development requires understanding of the full burden of injury.
ARC industry linkage project

Title: Determining the individual, community and societal impact of compensable injury in Australia (2011 to 2014: $548k)

<table>
<thead>
<tr>
<th>Phase</th>
<th>Description</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Review of injury outcomes literature</td>
<td>Complete</td>
</tr>
<tr>
<td>2</td>
<td>Qualitative interviews with injured persons, employers, compensation scheme personnel, healthcare practitioners, family members</td>
<td>Data collection complete</td>
</tr>
<tr>
<td>3</td>
<td>Series of detailed case to examine in depth the impacts of injury on those involved in compensation systems</td>
<td>Planned</td>
</tr>
</tbody>
</table>
Objectives

1. To summarise the published research literature in the field of injury outcomes using a meta-review methodology.

2. To develop and describe an injury outcome framework that captures impacts of injury at the level of the individual, the community and society.
Search Strategy

• Databases

  • Medline, Psychinfo, Embase, International Bibliography of Social Sciences (IBSS), Economic Evaluation Database (EED), Cochrane Reviews

• Search terms included “injury”, “systematic review”, “meta-analysis”, “literature review”.
Inclusion / Exclusion

• **Inclusion criteria**
  - Systematic reviews
  - Narrative reviews
  - Meta-analysis
  - English language
  - Available as full text
  - Adults (18 + years)
  - Jan 1970 – Sept 2011

• **Exclusion criteria**
  - Non-injury outcomes
  - Primary studies
  - Commentary
  - Paediatric populations (0 to 17 years)
  - If focus was on:
    - treatment effectiveness
    - predictors of outcome
    - psychometric studies
Search process

**Stage 1:** 3178 potentially relevant studies were identified through database searches: Medline (n=1699), Psychinfo (n=572), Embase (n = 729), IBSS (n = 55), EED (n=123)

**Stage 2:** Initial abstract screening = 3009 studies excluded (no injury outcome reported, injury prevention focused, evaluation of medical trials/treatments, non-review paper).

**Stage 3:** Second abstract screening = 94 further studies excluded because:
Predictors/prognostics of (n=21), Paediatric populations (n=4), Evaluations of rehabilitation programs (n=5), Treatments for injury (n=21), Conceptual/epidemiology reviews (n=9), Non-review paper (n=9), Non-injury related reviews (n=11), Psychometric evaluation (n=14)

**Stage 4:** 75 full-text studies retrieved and screened. 17 excluded including 5 duplicates and 12 studies failing screening criteria.

**Stage 5:** 20 additional eligible studies identified through hand searching of reference lists.

**Stage 6:** Data extraction from 78 studies meeting screening criteria.

**Stage 7:** Synthesis of extracted data. Development of injury outcomes framework.
Data Extraction

• Publication details

• Study population

• Injury type (e.g., burns, brain injury, musculoskeletal injury)

• Mechanism of injury (e.g., trauma, work-related)

• Study design (systematic review, meta-analysis, narrative review)

• Injury outcomes reported (e.g., mortality, quality of life, psychological).

• Number of primary studies identified.
Definitions

• Individual level outcomes were considered to be those characteristics of injury directly experienced by an injured person.

• Community level outcomes were considered to be impacts on individuals in personal contact with the injured person (e.g., parents, dependents, spouses, carers, work colleagues) before and after the injury.

• Societal level outcomes were considered to be impacts on the social and/or economic organisation of the broader community and groups in society with whom the injured person interacts (e.g., employer), or those groups in society that play a role in the injured rehabilitation and recovery from injury (e.g., healthcare providers, injury compensation personnel).
Levels of impact

• Specific injury outcomes = first order impacts.

• Logical groupings of related outcomes = second order impacts.

➢ Arrived at by consensus between two reviewers.
Results

- 78 studies included:
  - 33 systematic reviews
  - 16 meta-analyses
  - 26 narrative reviews
  - 3 systematic reviews / meta-analyses

- Of the studies
  - 70 (83%) focussed on injured person / individual domain
  - 9 (11%) focussed on community domain
  - 5 (6%) focussed on societal domain
Injured person impacts

• N= 70 studies

• Cognition (N=18), Psychological health (N=15), Mortality (N=12), Psychosocial function (e.g., QoL, ADL N=9), Physical functioning (N=7), Return to work (N=7), Sexual function (N=6), Emotion (N=4), Pain (N=3), Onset of a neurological condition (N=3), Hyper-metabolism (N=2), Driving (N=2), Fertility (N=2), Menstruation (N=1), Disease onset (N=1)

• ICF domains
  • Body Function (N=62)
  • Body Structure (N=0)
  • Activity (N= 9)
  • Participation (N=9)
  • + Mortality (N=12)
Community impacts

• N=9 studies

• Traumatic Brain Injury (N=8)
  • Family members experiences
  • Other primary care-givers experiences
  • Marital relationships

• Work injury (N=1)
  • Employers and co-workers experiences
Societal impacts

• N=5 studies

• Economic costs of falls in the elderly (N=3)

• Health service utilisation of TBI and SCI (N=1)

• Health care practitioners and injury compensation personnel experiences of work-related injury (N=1)
Summary – 1\textsuperscript{st} order impacts

**Individual level impacts**
- Body Function
- Participation
- Activity
- Mortality

**Community level impacts**
- Family
- Carers
- Workplace

**Societal impacts**
- Economy
- Healthcare system
- Compensation system
Summary – 2\textsuperscript{nd} order impacts (individual domain)

- **Body Function**
  - Cognition
  - Psychological Health
  - Physical function
  - Sexual function
  - Emotion
  - Pain
  - Disease onset
  - Hypermetabolism
  - Menstruation

- **Activity**
  - Activities of Daily Living
  - Health-related Quality of Life
  - Driving ability

- **Participation**
  - Employment / Return to work

- **Mortality**
**Summary**

- We know quite a lot about the function, activity and participation of the injured person
  - Some injuries / conditions poorly studied

- We know very little about the impact of injury beyond the injured person.

**Next steps:**

- Focus on compensable injury (work and transport)
- Add published primary studies
- Describe impacts on family, employers & compensation schemes (qual studies)
So what?

- What is the economic and non-economic impact of work injury on the employer?

- What is the impact of brain injury on the family and the provision of informal care?

- What is the impact on case managers of interactions with injured persons?

- How does disruption to social networks impact on return to work?
This project is funded by WorkSafe Victoria, the Transport Accident Commission, Comcare, and the Australian Research Council, through the Institute for Safety Compensation and Recovery Research.