



**TAC** TRANSPORT ACCIDENT COMMISSION

November 2013

## How do different definitions of 'Serious Injury' overlap?

*Hafez Alavi; Michael Nieuwesteeg; Michael Fitzharris; Renee Schuster*



### Context

- Traditional focus on fatal injuries – is it still useful?
- Safe System's mandate to eliminate 'Serious Injury'
- Defining 'Serious Injury' to fulfil different purposes
- Impact of the adopted definition on road safety resource allocations and intervention development
- Various lenses to define and measure 'Serious Injury'

## Perspectives to view injury severity

- Threat to Life**
  - Risk of mortality
- Impairment**
  - An anatomical or psychological damage that may or may not culminate in disability
- Pain and Suffering**
  - Physical and emotional stress
- Quality of Life Loss**
  - Victim's loss of capability to enjoy the important possibilities in his/her life
- Financial Cost**
  - Treatment, rehabilitation, compensation and other extraneous financial costs
- Resource Use**
  - Medical and emergency resources to cater for an injury

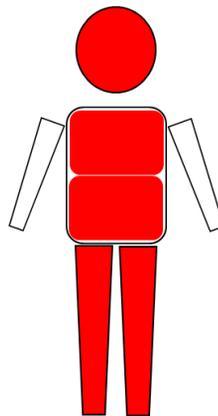
## Case Study

### Sociodemography

- Age: 26-39
- Gender: Male
- Marital Status: Married
- Education: High School
- Bricklayer

### Life Story (pre-injury)

- Married father with two young children
- Owned successful bricklaying business
- Employed other people
- Enjoyed boating, fishing, camping, water sports
- Suffered asthma
- Occasional recreational drug use



Injured Body Regions

### Road Crash Circumstances

- Road User: Driver
- Run-off-Road into a Pole
- Vehicle: Ute
- Rural Intersection

### Injury Details

- Concussive closed head injury
- Facial laceration
- Collapsed lung
- Internal chest injuries
- Multiple ribs fractures
- Fractured left hip, legs and ankles
- Psychological reaction



## Objectives

- Define 'Serious Injury' on the basis of identified injury consequences
- Investigate the relationship among proposed definitions (correlations and overlaps)

## Data and methods

- 67,797 TAC claims (2006 to 2010)
- Data on threat to life, impairment, cost and resource use was extracted
- No data was available for pain and suffering, and quality of life loss
- Each claim was assigned serious or not serious on each of the four elements (four binary variables, 1: Serious Injury; 0: Not)
- Mean square contingency coefficients were calculated (Phi coefficients)
- An Euler diagram was developed to examine overlaps

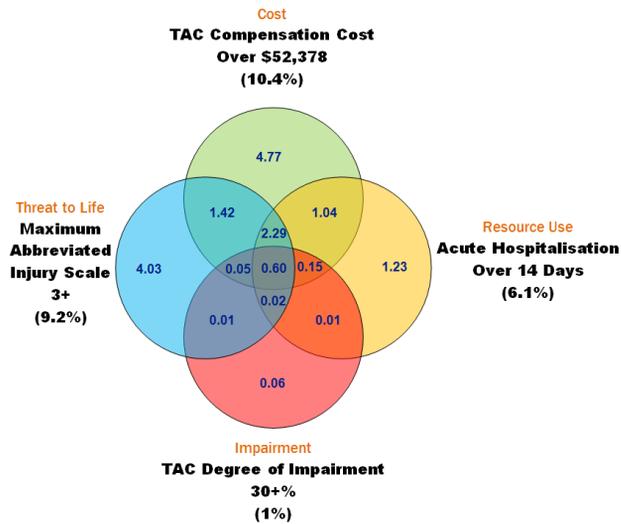
## Definitions

Aspect	Measure of Injury Severity	Cut-off Point	% of claims classified as serious injury
Threat to Life	Maximum Abbreviated Injury Scale (MAIS)	$\geq 3$	9.2
Impairment	Degree of impairment	$\geq 30\%$	1
Resource Use	TAC claim with an admission to hospital within 7 days from the road crash	$> 14$ days continually admitted	6.1
Cost	Estimated lifetime compensation payout by TAC for no-fault benefits	We chose a cut-off cost of \$52,378 (75% of TAC liabilities come from claims costing more than this)	10.4

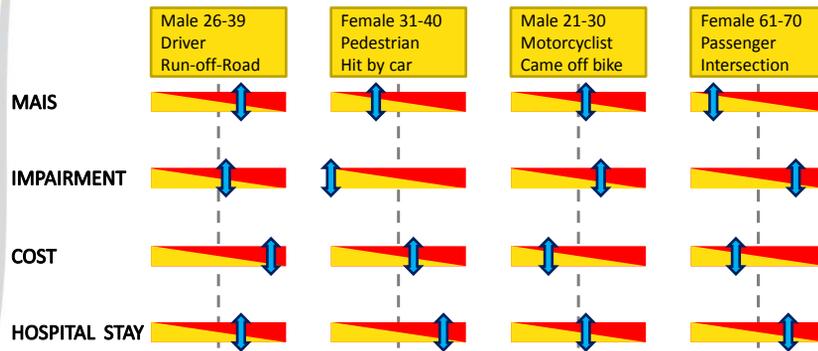
Results - correlations

PHI	Threat to Life	Impairment	Resource Use	Cost
Threat to Life	1	0.208 (<0.001)	0.451 (<0.001)	0.385 (<0.001)
Impairment	0.208 (<0.001)	1	0.304 (<0.001)	0.259 (<0.001)
Resource Use	0.451 (<0.001)	0.304 (<0.001)	1	0.471 (<0.001)
Cost	0.385 (<0.001)	0.259 (<0.001)	0.471 (<0.001)	1

Results – Euler diagram



## Results – TAC claims case studies



## Conclusions

- Injury means different things to different people
- Injury consequences can be captured through various aspects
- A selection of definitions based on these aspects correlate significantly, but do not highly overlap each other
- A high proportion of claims are classified as serious injury by only one definition of serious injury
- The adopted definition significantly impacts the magnitude of the problem and policy makers' decisions to allocate road safety resources