Measuring and assessing risk of quality of life loss following a road traffic injury: a proposed methodology for use of a composite score

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Loss of health – "objective" measuring

- Risk of permanent medical impairment
- Standardized instruments as a measure of health outcome, eg. EQ-5D, SF-36 etc.
- Sick leave
- Etc.

Content of inj. database:
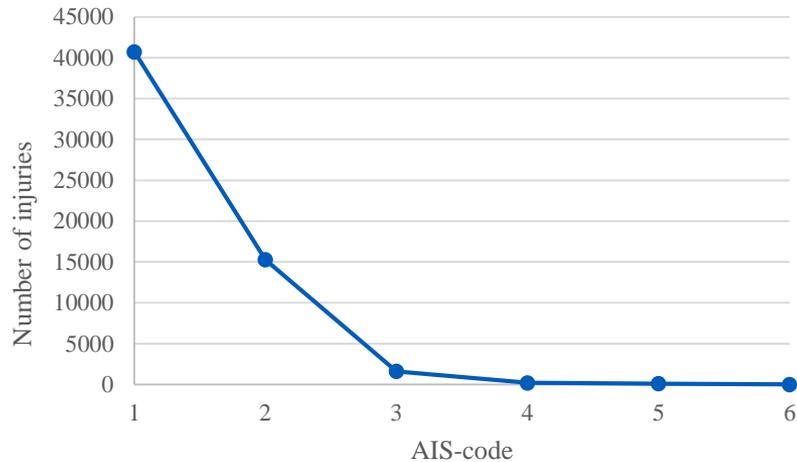- ICD
- AIS
- ISS
- MAIS

"Develop/generate"

Examples of health measures/outcome:
- Physical, psycological, social….
- Number of persons perm. med. Imp.
- Number of days of sick leaves
- Loss of quality of life

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Distribution of injuries and injured persons by AIS and MAIS in Strada, 2016

Number of injuries per AIS-code, all road users
Sweden hospital data 2016, Strada

Number of persons per MAIS-code, all road users
Sweden hospital data 2016, Strada
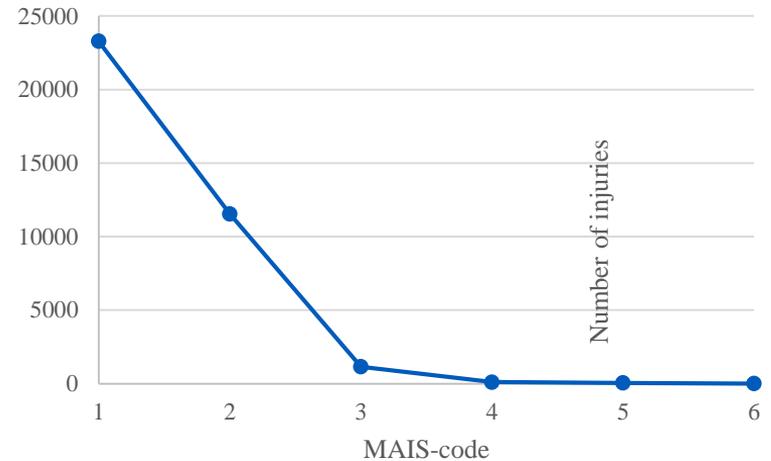
AIM

- To compute a relatively simple composite score that takes into account key injury dimensions (i.e. number, location, and severity) to assess the overall burden of injuries in the QoL lost by individuals

- Input to a development of a more refined and validated index that can be of use in policy making and regulation by public and private institutions.

Materials and methods

EQ-5D

•The burden of having sustained a road traffic injuries (RTI) was computed using a composite score comprising three elements that relate to the probability of subsequent long-term quality of life (QoL) loss: number of injuries sustained in the crash, body parts affected, and severity of the injuries.

•The score was grouped into five exposure categories of increasing severity (the score), and binary logistic regression was used to investigate whether such categories were predictive of low QoL defined as a QoL below 90% or 80% of the mean QoL score of a matched sample of non-injured injured individuals of the same sex and age.

•Euro Quality of Life Questionnaire (EQ-5D-3L)
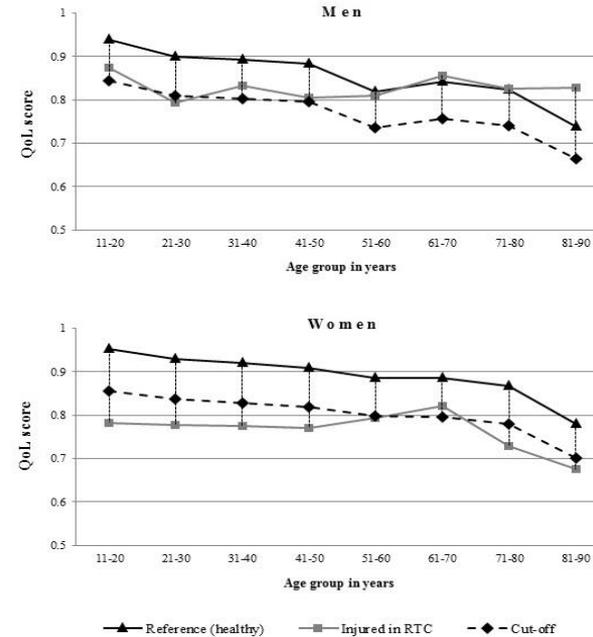
•5000 + 5000 questionnaires, two reminders

Figure 1. Graphic representation of the mean quality of life (QoL) score by sex and age group in healthy and injured individuals along with the cut-off to define low QoL (≤90% of the mean for the reference healthy population)

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Results

Table 3. Crude and adjusted odds ratios (OR) with 95% confidence intervals (CI) from binary logistic regression using two cut-off points to define low health-related quality of life (QoL[1]), <90% (model 1) and <80% (model 2), with categories of the Injury Burden Score as exposure and the non-injured individuals as comparison group

Injury burden score[2]	Model 1				Model 2			
	Low QoL <90%		OR (95% CI)		Low QoL <80%		OR (95% CI)	
	Yes	No	Crude	Adjusted[3]	Yes	No	Crude	Adjusted[3]
No injury	561	1549	1.00	1.00	149	1961	1.00	1.00
0.01-1.00	213	357	1.64 (1.35-2.00)	2.35 (1.48-3.72)	89	481	2.43 (1.83-3.22)	3.59 (2.04-6.29)
1.01-1.50	139	165	2.32 (1.82-2.97)	3.86 (2.33-6.38)	75	229	4.31 (3.16-5.87)	6.87 (3.75-12.5)
1.51-2.00	137	184	2.05 (1.61-2.61)	3.20 (1.94-5.29)	70	251	3.67 (2.68-5.01)	5.79 (3.15-10.6)
2.01-3.00	90	129	1.92 (1.44-2.56)	3.06 (1.81-5.16)	41	178	3.03 (2.07-4.42)	5.04 (2.65-9.58)
3.01-9.00	157	127	3.41 (2.65-4.39)	6.10 (3.65-10.2)	87	197	5.81 (4.29-7.86)	10.9 (5.92-20.0)

[1] Defined as 10% and 20% relative loss from the mean QOL score of the reference non-injured individuals in each specific age group and sex

[2] A composite based on three injury items: number of body parts affected, type of body part, and severity of the injured body part

[3] Adjusted for sex, age group and time elapsed between the crash (injury) and the date when the QoL was measured (survey date)

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Results (cont.)
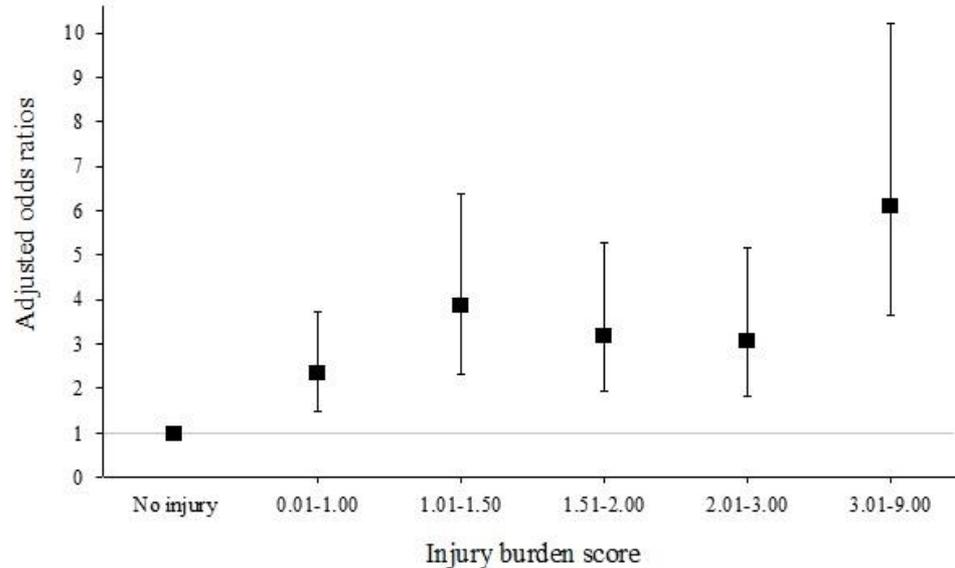
Figure 2. Adjusted odds ratios with 95% confidence intervals from binary logistic regression for low health-related quality of life (<90% of the non-injured reference population) with categories of the injury burden score as exposure

Conclusion

- Compared with non-injured individuals victims of RTIs any category of the injury burden score had a higher risk of impoverished QoL one to four years after the crash.

- For policy making and regulation it is essential to pay attention to the fact that negative consequences of RTIs can be long-term and can arise even for apparently minor injurious events.

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Conclusion (cont.)

- The proposed composite score can be an initial step in the development of more elaborated instruments that can be useful in policy making and regulation.

- The international MAIS trauma scale (maximum abbreviated injury score) has been used as the EU definition of serious road traffic injuries since 2014. The 'scale 3 and more' (MAIS3+) is the one that applies to serious injuries today.

- The EU definition should at highest be MAIS2+ !!

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