Measuring serious injuries on European roads

Robert Bauer, KFV - Austrian Road Safety Board, Vienna

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Cube

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ÖSTERREICH

Minister will bei Verkehrsunfällen Schwerverletzte zählen

By apa • September 13, 2016

479 Menschen sind in Österreich im Jahr 2015 auf Österreichs Straßen gestorben. Wie viele Personen zwar überlebten, aber bei Unfällen schwer verletzt wurden, ist unklar. Denn bisher gibt es hierzulande keine derartige Auswertung. Verkehrsminister Jörg Leichtfried (SPÖ) plant nun ein Straßenverkehrsunfallstatistikgesetz. Dieses soll "noch heuer beschlussreif sein", sagte er bei einer Pressereise.

Agenda

- About KFV (Austrian Road Safety Board)
- EU focus on serious injuries
- What are serious injuries?
- Current practice in the EU
- SafetyCube recommendations
- Acknowledgements

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Kuratorium für Verkehrssicherheit

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Area of expertise

Kuratorium für Verkehrssicherheit > Area of expertise

The KFV has been at the heart of accident prevention since 1959 and is Austria's leading independent non-profit association regarding the promotion of safety and prevention of accidents. We facilitate research and offer advice and information in the following areas of accident prevention:

Road Safety →

Home Safety →

Leisure Safety →

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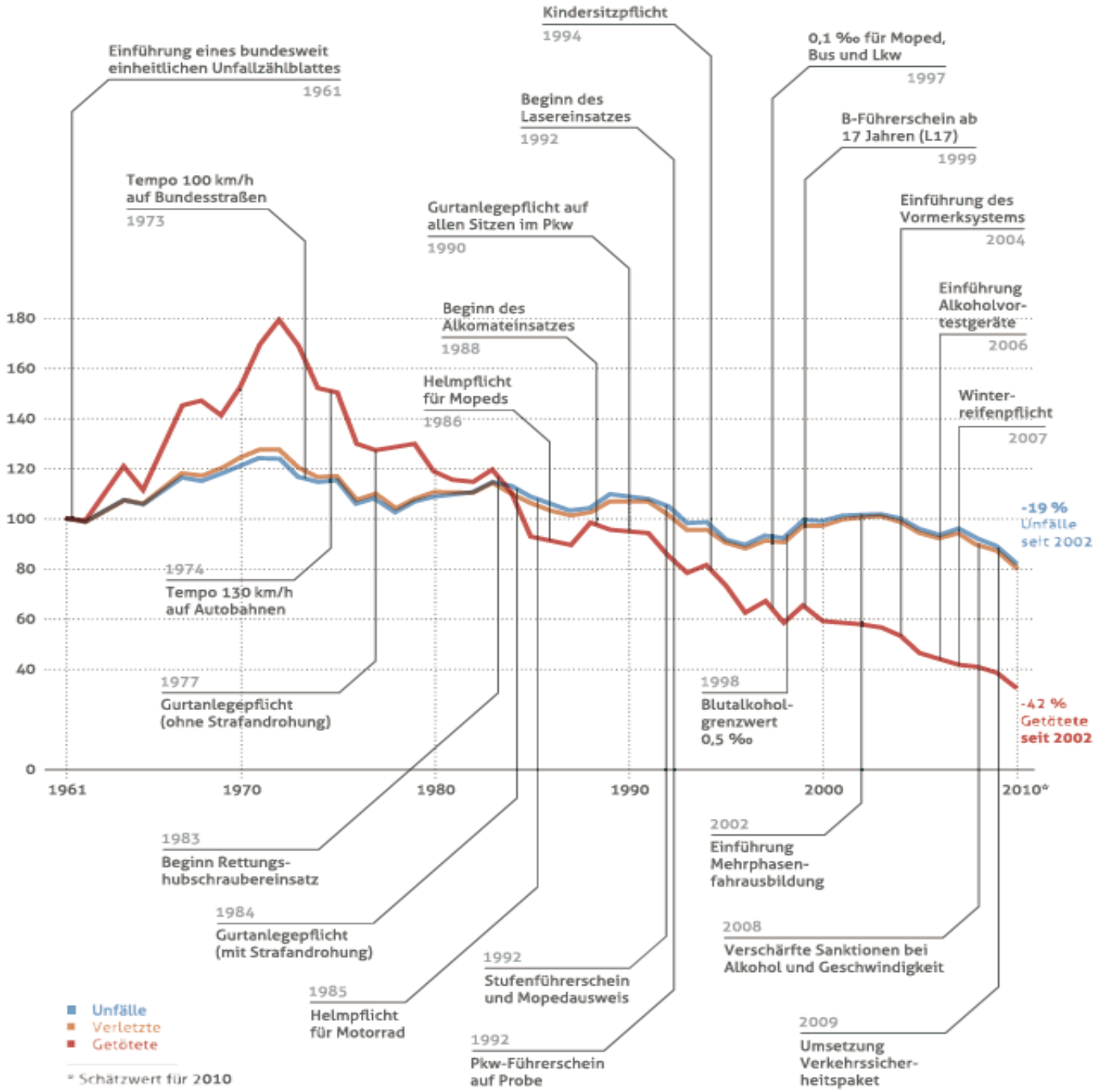
The KFV provides professional expertise of the highest scientific level and advises government agencies and private bodies. It plays a key role in various regional and national networks and has established itself as a renowned and innovative project partner.

The KFV takes account of the latest technological developments and social changes. Based on the findings derived from our research, new strategies and measures are adopted. The KFV works tirelessly at reducing accidents and improving the lives of people living in Austria.

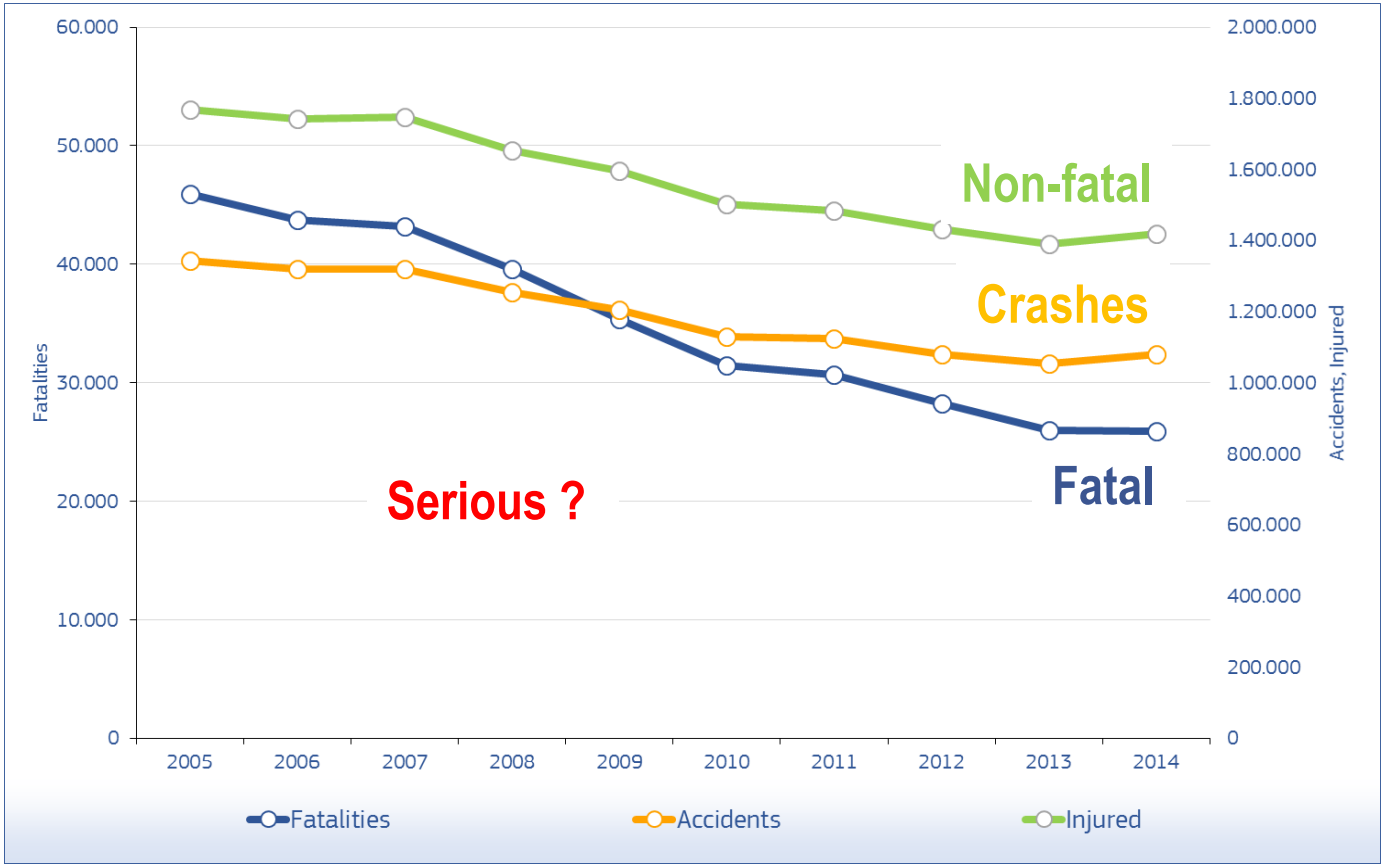
Measures & Achievements in Austria, EU

Accidents
Fatalities
Injured
Serious injuries ?



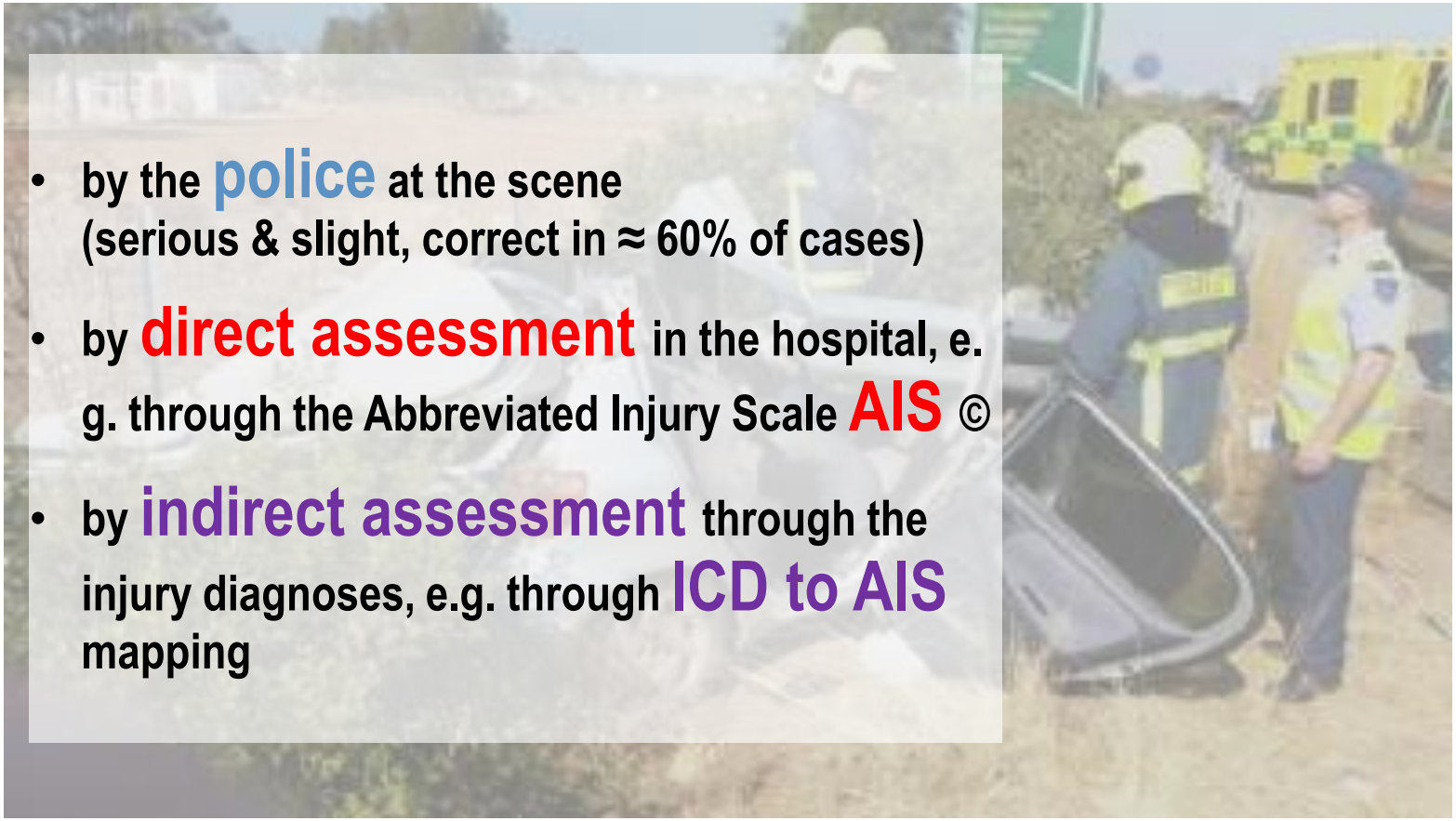
Source: http://unfallstatistik.kfv.at/index.php?id=57

Annual number of road traffic crashes, non-fatal and fatal injuries in the EU



Source: CARE (EU road accidents database) or national publications. Last update: May 2016

How to assess injury severity?



- by the **police** at the scene
  (serious & slight, correct in ≈ 60% of cases)
- by **direct assessment** in the hospital, e. g. through the Abbreviated Injury Scale **AIS** ©
- by **indirect assessment** through the injury diagnoses, e.g. through **ICD to AIS** mapping

DG Move focus on serious injuries
Background

- Reducing the number of serious traffic injuries is one of the key priorities in the road safety programme 2011-2020 of the European Commission (EC, 2010)
- In January 2013, the High Level Group on Road Safety, representing all EU Member States, established the definition of serious traffic injuries as road casualties with an injury level of MAIS ≥ 3

What is MAIS3+?

AIS: Abbreviated Injury Scale **123456.7**

- 1 Body Region
- 2 Type of Anatomical Structure
- 3/4 Specific Anatomical Structure
- 5/6 Level
- 7 Severity Score

"7" Severity Score (AIS ©)

- 1 Minor
- 2 Moderate
- 3 Serious
- 4 Severe
- 5 Critical
- 6 Maximum

Severity Score Examples

1 superficial laceration

2 fractured sternum

3 open fracture of humerus

4 perforated trachea

5 ruptured liver with tissue loss

6 total severance of aorta

MAIS

- Maximum AIS for an occupant or body region; MAIS>2 = **MAIS3+**

DG Move focus on serious injuries
Options for reporting

- The High Level Group identified three main ways Member States can collect data on serious traffic injuries (MAIS ≥ 3):
  1. by applying a correction on police data,
  2. by using hospital data and
  3. by using linked police and hospital data.
- Currently, EU member states use different procedures to determine the number of MAIS ≥ 3 traffic injuries, dependent on the available data.

What do we know?

→135,000 people seriously injured on Europe's roads in 2014

→ the majority of those were vulnerable road users, pedestrians, cyclists and drivers of powered two-wheelers

→ while the number of deaths on European roads has fallen dramatically over the last decade, serious injuries seem to have declined at a much slower rate

→ Official targets to reduce road deaths have been in place since 2001, but there is no equivalent for serious injuries

Source: *www.tispol.org* Published Sat, 30/04/2016 - 09:59

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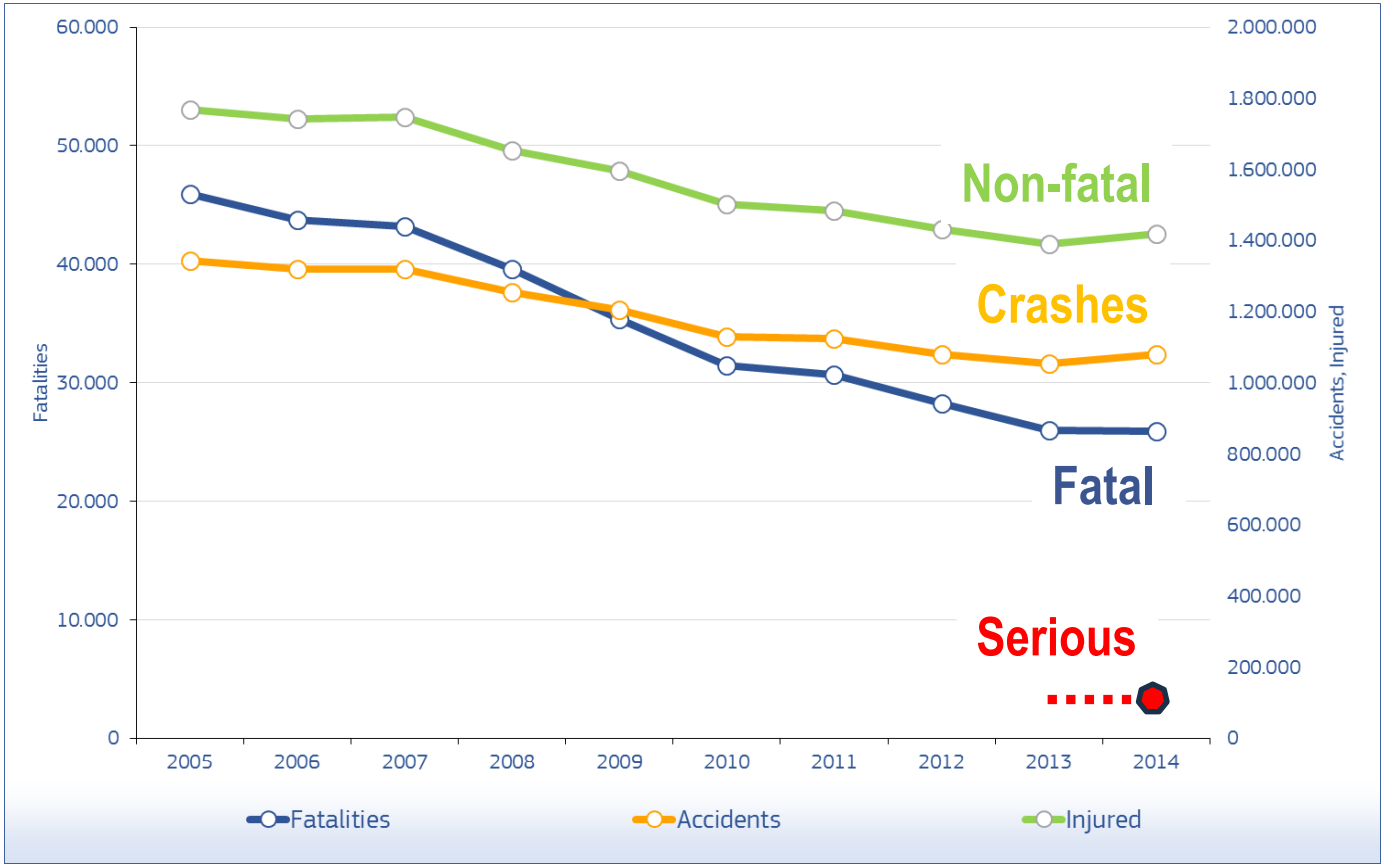


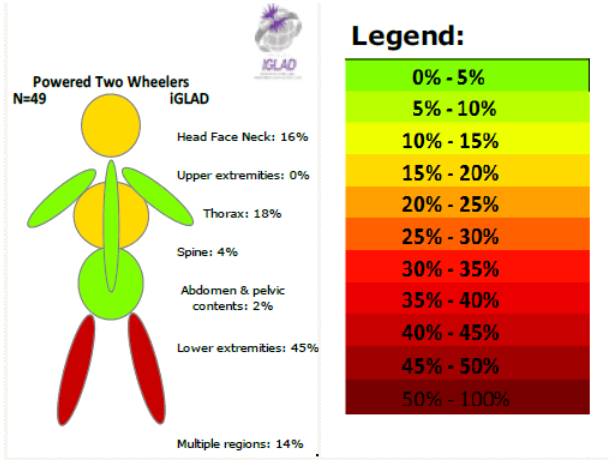
Source: CARE (EU road accidents database) or national publications. Last update: May 2016

What do we expect?

→ The MAIS3+ new methodology should yield more reliable and comparable data than the old reporting system

→ In the longer term, the Commission will be able to monitor and benchmark Member State performance

→ Also, the new data (*) shows that fatal crashes and crashes resulting in serious injury have slightly different characteristics. This will help to see where more work is needed, such as on safety for vulnerable road users or safety in urban areas



* https://ec.europa.eu/transport/road_safety/sites/roadsafety/files/injuries_study_2016.pdf

What still needs to be done?

→ Further harmonisation of methods over the next years is desirable in order to ensure that the estimated numbers of MAIS ≥ 3 road traffic injuries are comparable across Europe

→ Complete ongoing research on MASI3+ Guidelines by the EU Horizon 2020 project SafetyCube: www.safetycube-project.eu

Safety CaUsation, Benefits and Efficiency

Funding	EU Kommission / INEA (Innovation and Networks Executive Agency)
Duration	2015-2018
Coordinator	Transport Safety Research, Loughborough University (LOUGH)
Partners	NTUA, BRSI, SWOV, KFV, IFSTTAR, CHALMERS, Institute of Transport Economics, ERF, CTL, ASPB, Medical University of Hannover, AVP, LAB, CEESAR, CIDAUT, DEKRA Automobil GmbH

SafetyCube survey results
Current practice in the EU

- Only 17 of the 26: MAIS ≥ 3 estimates to DG-MOVE

- Difficulties to get access to hospital discharge data

- 9 hospital data, 2 corrections to police data, and 4 record linkage of police and hospital data. France and Germany apply a combination

- The ratio of MAIS ≥ 3 casualties / fatalities differs considerably between these countries, from **0.6** MAIS ≥ 3 in Poland to **13.2** MAIS ≥ 3 in the Netherlands

Source: State of data collection on serious traffic injuries across Europe (June 2016). http://www.safetycube-project.eu

SafetyCube Recommendations - Correcting police data

WHEN

- In case you there is no hospital data for the entire country and/or every year
- In case hospital data becomes available at a too late stage

HOW

Use a sample of hospital data (previous years and/or part of the country)

Derive and apply multiple correction factors

Update correction factors on a regular basis.

SafetyCube Recommendations - Hospital data

WHEN:

In case hospital data of good enough quality is available and record linkage with police data is not available

HOW

Select patients with **external causes for road traffic injuries** (public road): ICD9CM: E810-E819, E826, E827, E829, E988.5; ICD10: V01-89 for those codes for traffic injuries and/or weighting -correcting for non-public road- for non-traffic injury codes

Exclude hospitalized fatalities within 30 days

Exclude readmissions (as well as scheduled admissions when they are a second episode of a previous emergency injury)

Select all cases with any **injury diagnosis** (ICD9CM: 800-999; ICD10: S00-T88; AIS injury)

In case of ICD coded injuries, **assess the severity (AIS)** of each injury using a ICD to AIS recoding tool (e.g. ICDpic, AAAM, ECIP/Navarra)

SafetyCube Recommendations - Hospital data

Other issues with hospital data

- **External causes** (E/V-codes) may be **missing or misspecified** for many casualties. Compensate for these missing E-codes by using information from additional sources.
- Traffic Crashes happening on **public roads** should be selected (country specific weighting factor).
- **Different versions of AIS:** multiplied by a factor 0.89 when injuries are coded in AIS1990 or AIS1998 instead of AIS2005 or AIS2008
- **ICD to AIS recoding tool** applied. Current version of the AAAM10 (2016) tool results in a clear underestimation of the number of MAIS3+ casualties and the tool is not able to deal with truncated codes
- **Limited number of injuries:** can result in an underestimation. Weighting factors: 1.28 in case of 1 injury, 1.11 in case of 2 injuries, 1.05 in case of 3 injuries
- **ICD codes** are **truncated** leads to a less reliable selection of MAIS3+ casualties. Not use ICDpic and AAAM10 tools. Weighting: 1.06 in case of ICDmap90 or DGT, 1.03 in case of ECIP,1.11 in case of AAAM9

SafetyCube Recommendations - Record linkage

WHEN:

In case the selection of MAIS3+ road traffic casualties is problematic (missing Ecodes)

HOW

Link hospital and police (and possibly other sources) on the basis of variables that are common to in both data sources

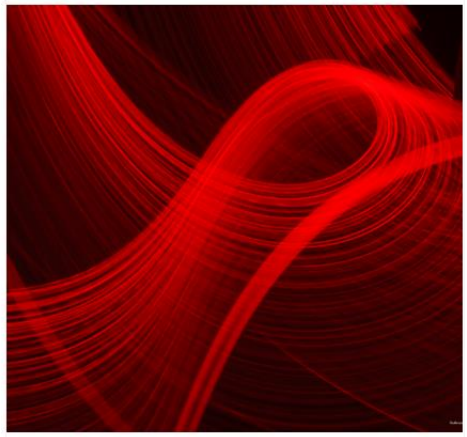
Ideally, linkage is based on a unique personal identification number (**deterministic linkage**), but this is rarely available for privacy reasons

When deterministic linkage is not possible, **probabilistic or distance based** linkage is recommend.

Once the linkage is completed, the number of serious traffic casualties recorded in hospital data but not identified as such can be estimated using the **capture-recapture method**.

SafetyCube Conclusions

- A common definition is a very good first step
- Hospital data of good quality is essential
- All three methods for estimating the number of serious traffic injuries have both advantages and limitations
- Which method(s) to choose will depend on the context and constraints of each individual country
- Further harmonisation of methods over the next years is desirable in order to ensure that the estimated numbers of MAIS ≥ 3 road traffic injuries are comparable across Europe



Safety CaUsation, Benefits and Efficiency
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- **Pérez, K., Olabarria, M.** (ASPB, Agència de Salut Pública de Barcelona), Spain
- **Weijermars, W., Bos, N., Houwing, S.** (SWOV Institute for Road Safety Research), Netherlands
- **Machata, K., Bauer, R.** (KFV, Austrian Road Safety Board), Austria
- **Amoros, E., Martin, JL., Pascal, L.** (IFSTTAR, French Institute of Science and Technology for Transport, development and Networks), France
- **Filtness, A.** (LOUGH, Transport Safety Research Centre, Loughborough University), United Kingdom
- **Dupont, E., Nuyttens, N., Van den Berghe, W.** (BRSI, Belgian Road Safety Institute)
- **Johannsen, H**. (MHH, Medical University of Hannover), Germany
- **Leskovsek, B.** (AVP, Slovenian Traffic Safety Agency), Slovenia

www.safetycube-project.eu/