SafetyCube

Applying correction factors to police data (deliverable WP7.1)
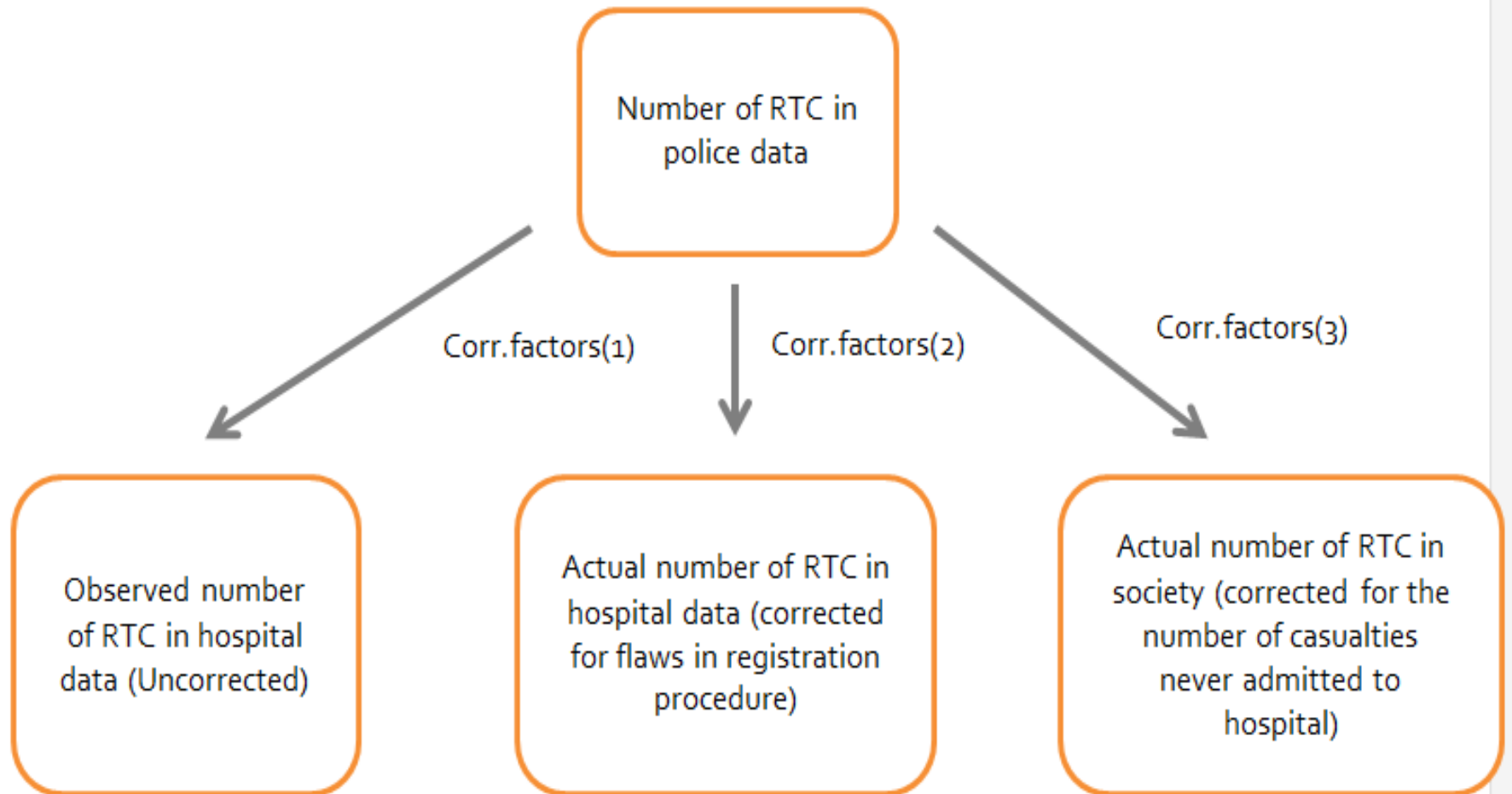
Den Haag 24/05/2016
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5/31/2016

Theory

Correction factor: what is it?

- One of the three options proposed by the EC to estimate the number of MAIS3+ victims in a EU country

- It is defined by the EC as a factor that should be applied to police data to estimate the number of MAIS3+ casualties

- Need access to some reference/comparison data, namely hospital data

Correction factor: what is it?

Number of RTC in police data

Corr.factors(1)

Corr.factors(2)

Corr.factors(3)

Observed number of RTC in hospital data (Uncorrected)

Actual number of RTC in hospital data (corrected for flaws in registration procedure)

Actual number of RTC in society (corrected for the number of casualties never admitted to hospital)

Correction factor: why?

- No recent hospital data available (e.g. Belgium: 2009-2011)
- Only a sample of hospital data are available (e.g. France Rhône Register)

Some time ago … Safetynet

- Estimation of MAIS3+
- European Project held in 2004 – 2008 in 8 countries
- <u>Estimation method requires linking (probabilistic)</u>
- Result

	Correction factor / serious	Correction factor / slight
UK Scotland	0.20	0.01
CZ	0.21	0.02
FR	0.68	0.06
EL	0.46	0.12
HU	0.48	0.04
NL	0.39	0.016
ES	0.26	0.02

- *Two correction factors*
- *Same table was calculated for each road user type*

- <u>Conclusion</u>: correction factors are neither temporally, nor geographically constant and should be recalculated if the time or location parameters change

Correction factors: how many?

- Ratios (and thus correction factors) vary according to the characteristics of the victims and of the accident

  - *Victims: road user type, age, gender*

  - *Accident: severity, number of vehicles involved, motorized vehicle involved (Y/N), year*

	MAIS3+ Hosp / Seriously Injured Pol
Pedestrian	0,5
Bike	1,4
PTW	0,6
Motor vehicle other than PTW	0,4
Other/unknown	2,2

- An overall national correction factor should not be applied to a subgroup in police data (e.g. cyclists)

- It is recommended to calculate a correction factor

  - *for those variables that have the most diverse impact on hospital/police ratios (beginning with road user type)*

  - *for each combination of those variables (e.g. male cyclist versus female cyclist versus male driver versus female driver...)*

Guidelines: how to do it

- The calculation of correction factors requires access to <u>hospital data</u> of good quality

- An overall national correction factor should not be applied to a subgroup in police data

- Ideally, more than one correction factor should be estimated, beginning with a correction factor for each road user type

- Correction factors vary over time and place
  - *Correction factors should be updated on a regular basis*
  - *Countries should not apply correction factors that are estimated in other countries*

- A statistical model allows to identify which variables have a significant impact on the ratio "MAIS3+ / police data"

Case study Belgium

Estimation of MAIS3+ in Belgium

- Belgium applies option 2 and option 1 proposed by the EC
  - *Option 2, use of hospital data, for the period 2009-2011*
  - *Option 1, correction factors applied to police data, for the period 2005-2013*

Calculation of MAIS3+ victims between 2009 and 2011: use of hospital data

- All diagnoses
- Exclusion of readmissions and fatalities 30 days
- Not adjusted for missing E-codes causing an underestimation of MAIS3+ victims

Estimated number of MAIS3+ road casualties based on option 2
(use of hospital data)

Year	Value
2009	3864
2010	3627
2011	3853
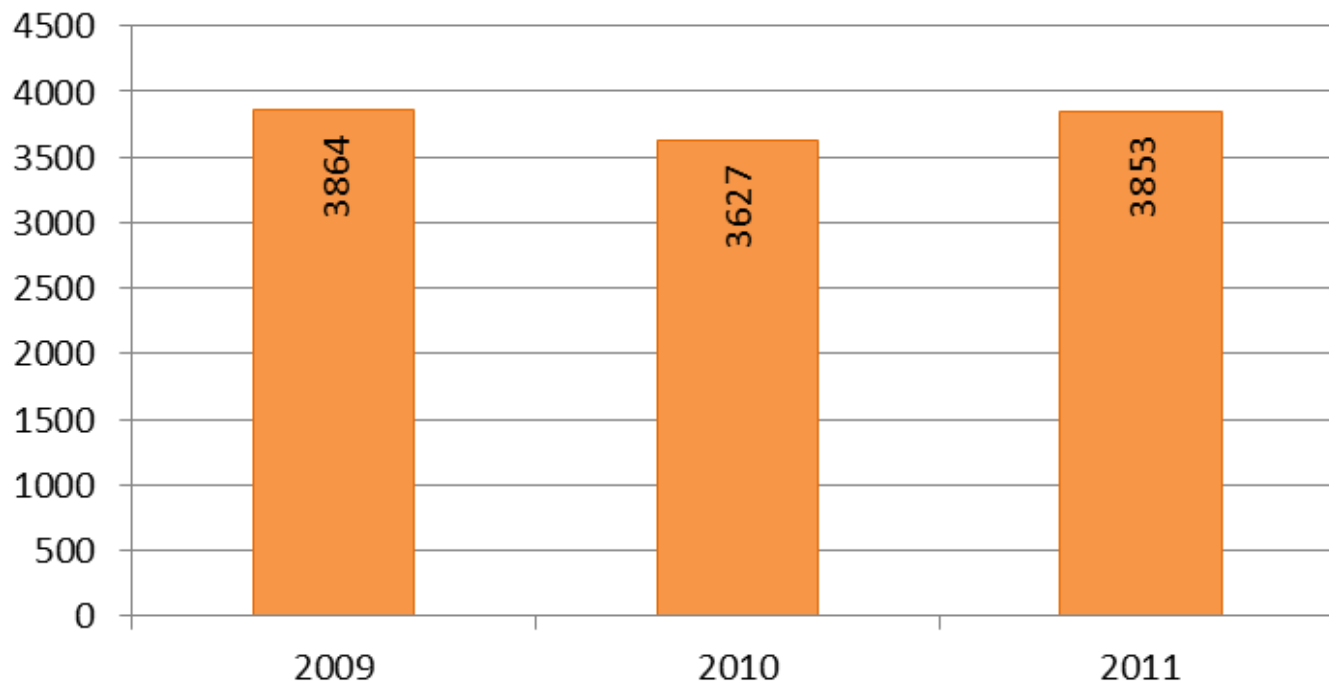
Source: FPS
Public Health /
Edited by BRSI

Calculation of MAIS3+ victims between 2005 and 2013: use of correction factors

- Calculation of ratios MAIS3+ / injured recorded by the police for the period 2009-2011
  - *Calculated for each combination of the following variables: year (3); gender (3); road user type (5); age (about 100); and accident involving motorized vehicles (2)*

- These ratios (+/- 2000 ratios) were modelled by a generalized linear regression model

- Log (ratio) = Gender + Road User Type + Accident with motorized vehicles (yes/no)+ Age + Age^2
  - *Year = not significant (p=0.07)*
  - *R^2 = 0.770*
  - *Model results in +/- 2000 "correction" factors*

Log [MAIS3+ (hospital data) / Injured (police data)]
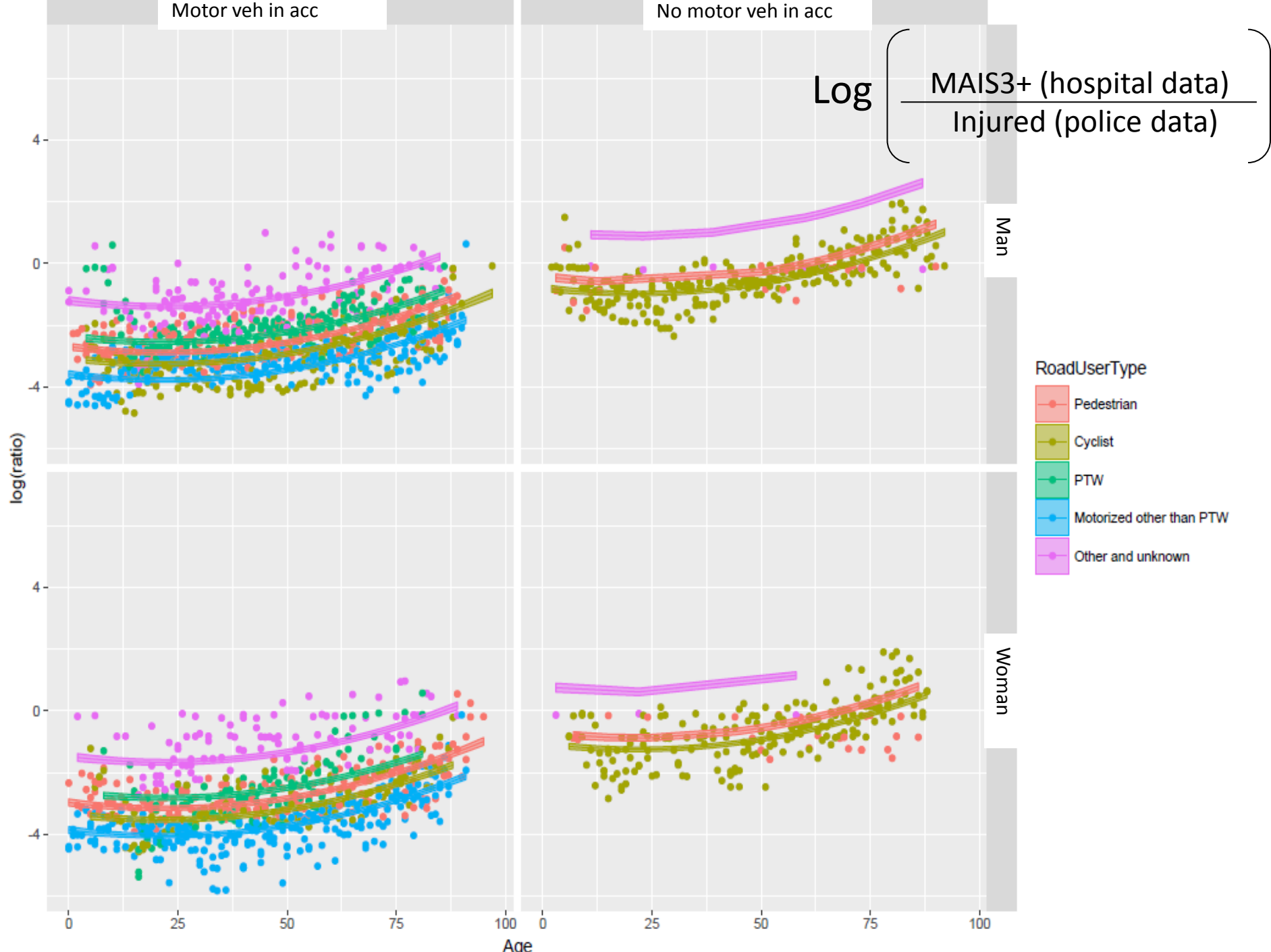
Applying the estimated correction factors
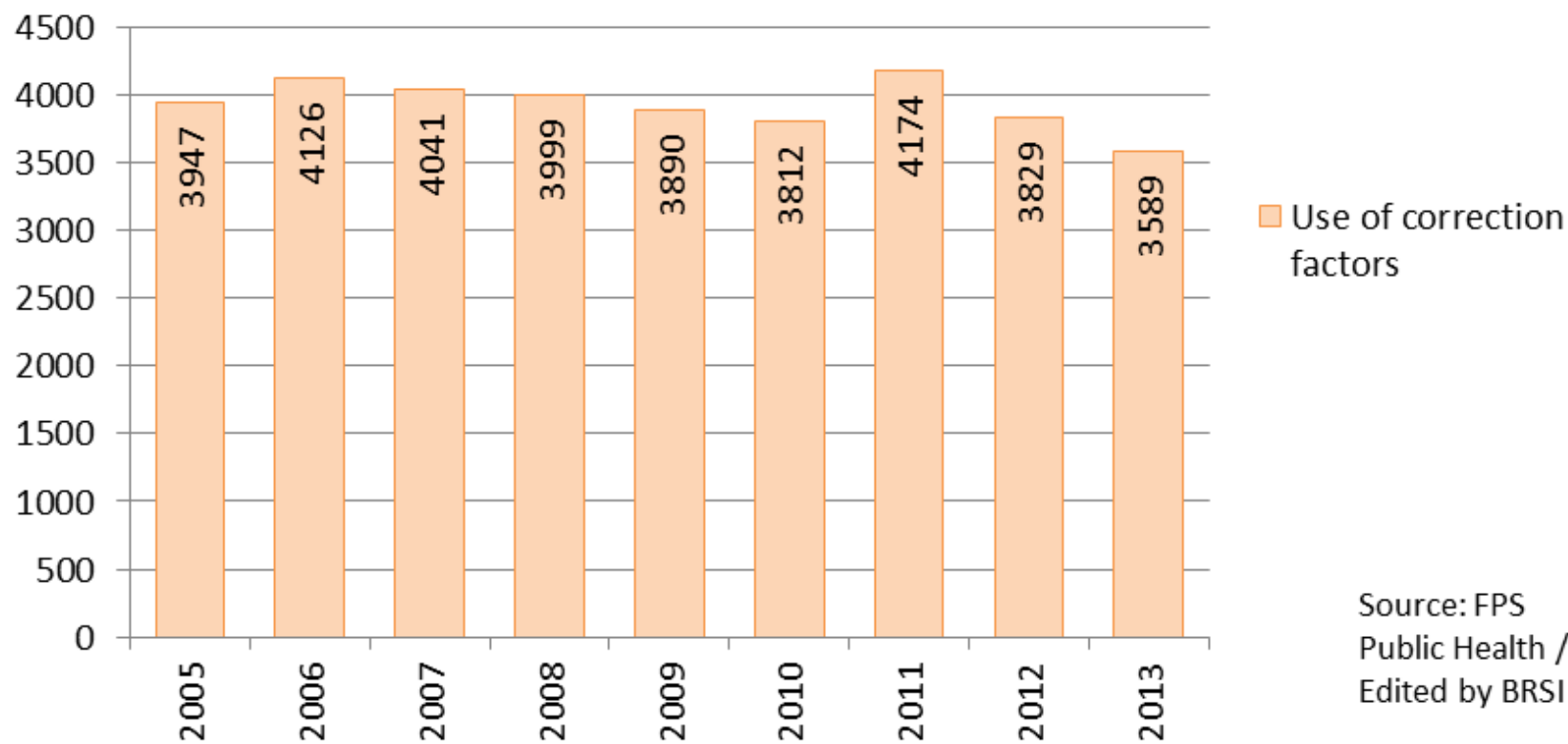
Estimated number of MAIS3+ road casualties based on option 1
(use of correction factors)

Source: FPS
Public Health /
Edited by BRSI

Limitations

- Further refinement of the model (next weeks)
  - *Include year in the model?*
  - *Interaction terms?*
- Further refinement of selected traffic victims based on the code E849 "place of occurrence" (next weeks)
- Not able to adjust for missing E-codes causing an underestimation of MAIS3+ victims

Guidelines: how to do it

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- Ideally, more than one correction factor should be estimated, beginning with a correction factor for each road user type

- Correction factors vary over time and place
  - *Correction factors should be updated on a regular basis*
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- A statistical model allows to identify which variables have a significant impact on the ratio "MAIS3+ / police data"

Discussion

- Questions and remarks?

- Do you agree with the guidelines?

- Same understanding of "correction" factors?

- Comments on the Belgian Case Study?
  - *Too complex?*