SafetyCube

Costs of road crashes in EU countries

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Introduction

- W2Economics: research/consultancy, specialized in economic analysis of road safety
  - *Costs of road crashes*
  - *Economic evaluation road safety programs/measures*
  - *Economic valuation of saving lives, quality of life*
  - *Financing road safety measures*
  - *Impact of economic development on road safety*

- Clients:
  - *International organizations*
  - *Governments*
  - *Private companies*
  - *Other research institutes*
  - *Universities*

SafetyCube

- SafetyCube: Safety CaUsation, Benefits and Efficiency
- A European Commission funded Horizon 2020 project
- Aims at developing an innovative road safety Decision Support System (DSS), helping policy makers to
  - *Assess effectiveness of road safety measures*
  - *Prioritize measures*
  - *Assess cost-effectiveness of measures*
  - *Monitor serious injuries and the associated socio-economic costs*
- Including an Economic Efficiency Assessment tool
  - *Cost-benefit analysis*
  - *Cost-effectiveness analysis*

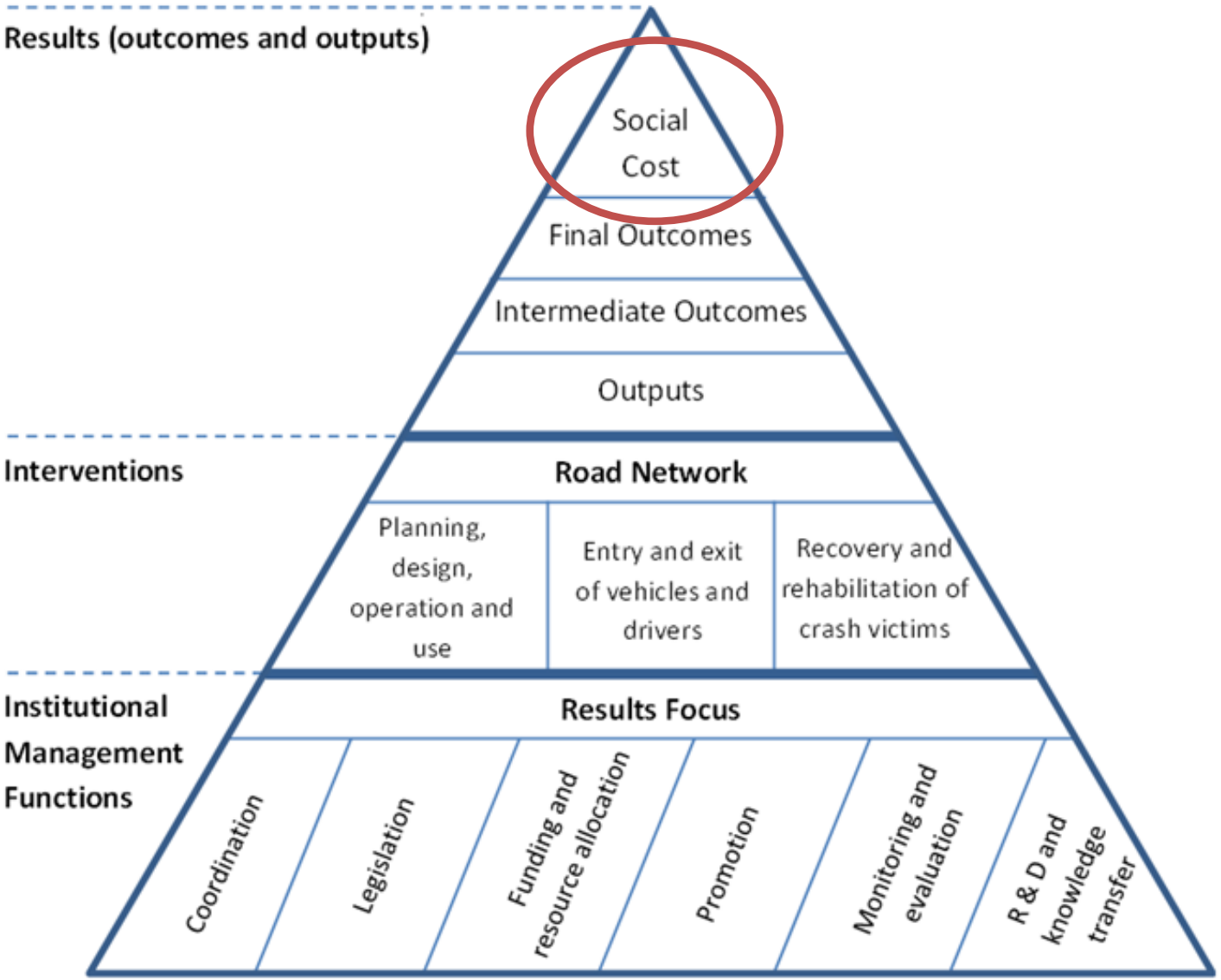
Cost-benefit analysis

Road safety investments

Road crash cost savings

(+ other impacts)

Costs as road safety indicator



Analysis of road crash costs

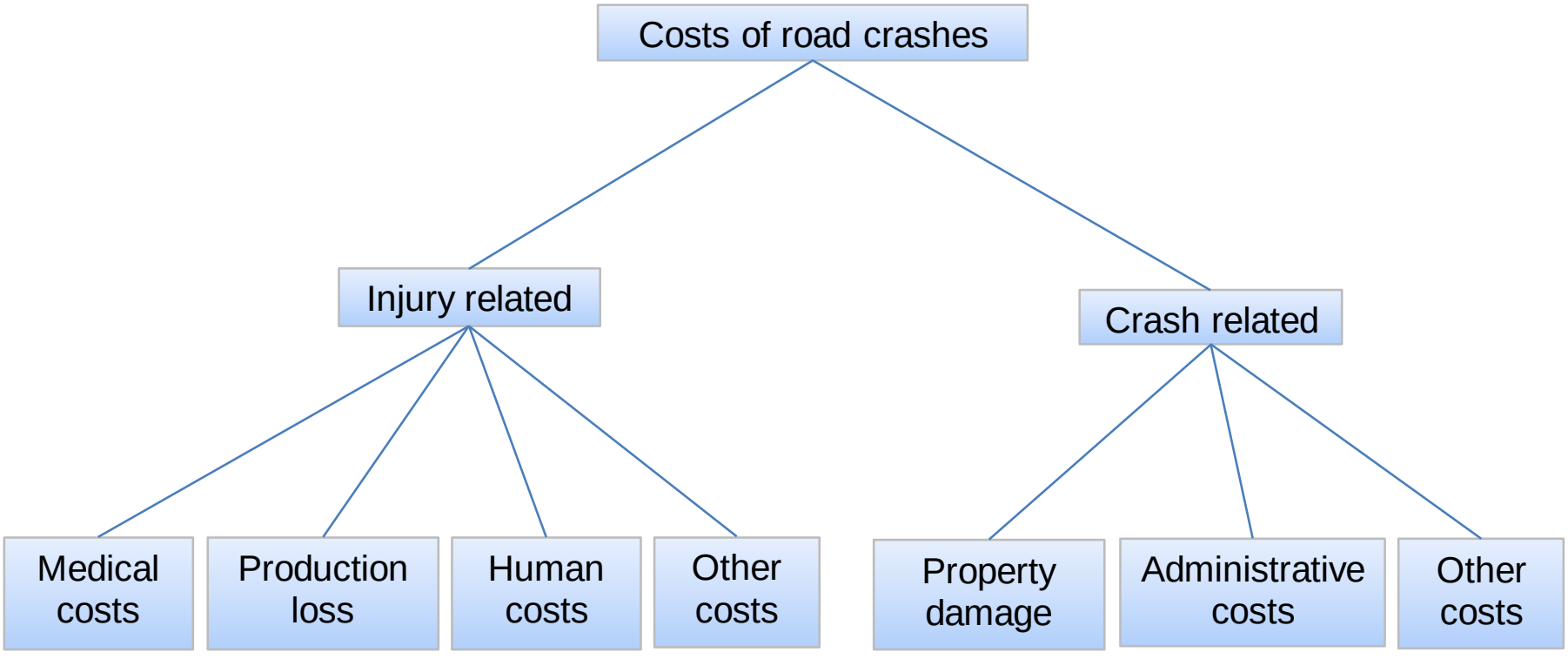
1. Literature review to identify
   - *All relevant cost items*
   - *Methods*
   - *Best practices*
2. Survey among EU countries
3. Data analysis
4. Developing harmonized EU-values

The SafetyCube-InDeV cost team

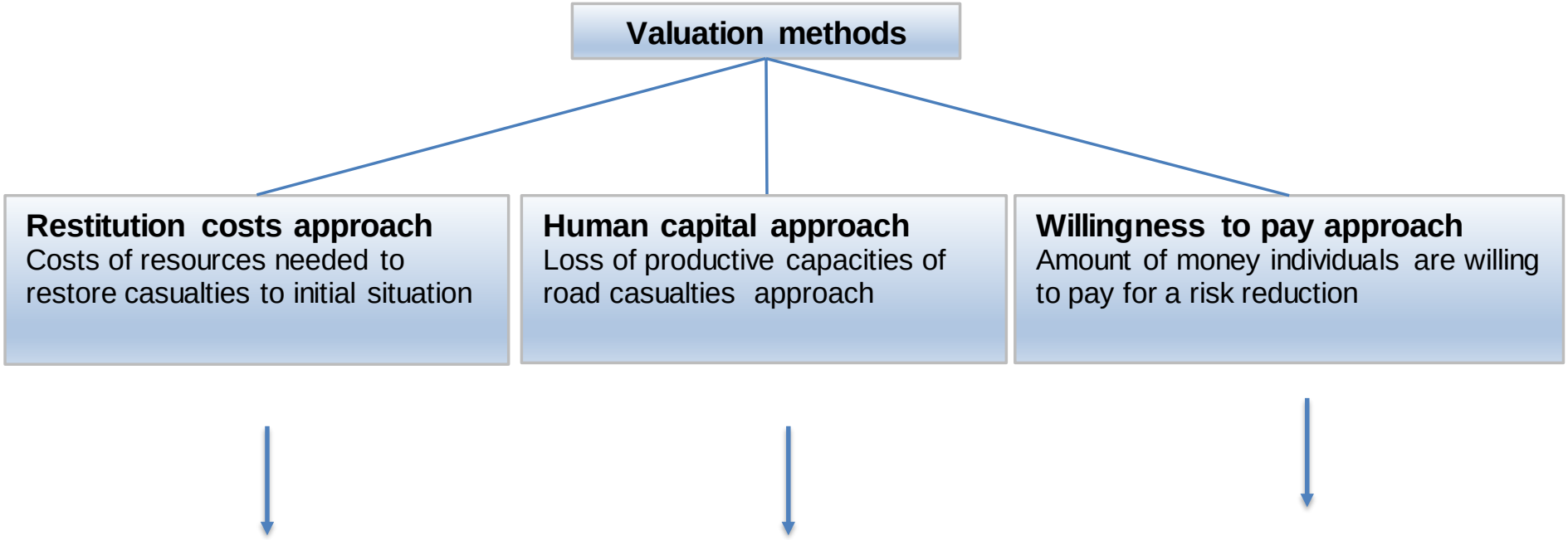
SafetyCube partners:

- SWOV
- VIAS
- KfV
- IFSTTAR
- TOI

Cost components



Methods



- Medical costs
- Property damage
- Administrative costs

Production loss

Human costs

The survey

- Survey among the 28 EU member states + Iceland, Norway, Serbia and Switzerland
- Data received from 31 countries
- Issues:
  - *Which cost items included?*
  - *Method(s) per cost item*
  - *Total costs (value, % of GDP)*
  - *Distribution costs among cost items*
  - *Costs per casualty and crash*
  - *Total costs by severity level*
- Official values used by national governments

Methods (official figure)

Cost component	incl. in crash costs	Cost item	Method if 'other' or several options: specify in 'further comments' For explanation see blue tab below.	Database if 'other' or several options: specify in 'further comments' For explanation see blue tab below.	incl. in cost item	Cost element	Cost item is included in... fatalities	seriously injured	slightly injured	property damage only	crashes with fatalities	crashes with seriously injured	crashes with slightly injured	crashes with property damage only	Other injuries	other group, see Cost per unit
Medical costs	☑	First aid and transportation	Restitution c	Hospitals	☑	ambulance	☑	☑	☑		☐	☐	☐		☐	☐
					☑	helicopter										
					☐	*other:*										
	☑	Emergency department	Restitution cc	Hospitals			☑	☑	☑		☐	☐	☐		☑	☐
	☑	In-patient hospital treatment (overnight stay)	Restitution cc	Hospitals			☑	☑	☑		☐	☐	☐		☐	☐
	☑	Out-patient treatment (no overnight stay)	Restitution cc	Hospitals			☐	☑	☑		☐	☐	☐		☑	☐
	☑	Non-hospital treatment	Restitution c	other	☑	rehabilitation centres	☐	☑	☑		☐	☐	☐		☑	☐
					☑	general practitioners										
					☑	physiotherapy										
					☑	home care										
					☑	*other: nursing homes*										
	☐	Aids and appliances	other	other			☐	☐	☐		☐	☐	☐		☐	☐
	☑	*other items: medicines*					☑	☑	☑		☐	☐	☐		☐	☐
	1. Several types of data sources have been used for costs of non-hospital treatment have been used, including hospital data, national surveys and insurance data. 2. For some cost items, e.g. out-patient treatment of victims who have not been treated at the emergency department, national surveys have been used in addition to hospital data. 3. The severity categories for which costs of non-hospital treatment are calcuted differ between the cost items (e.g. rehabilition does not include 'other' injuries, while costs of general practitioner do include this group).															
Production loss	☑	Loss of future market production	Human capi	National su	☑	gross production loss (incl. consumption loss)	☑	☑	☑		☐	☐	☐		☐	☐
					☐	net production loss										
					☐	*other:*										
	☐	Friction costs			☐	recruiting and training new employees	☐	☐	☐		☐	☐	☐		☐	☐
					☐	vocational rehabilitation of employee (victim)										
	☐	Loss of non-market production			☐	household work	☐	☐	☐		☐	☐	☐		☐	☐
					☐	taking care of children										
					☐	voluntary work										
					☐	*other:*										
	☐	*other items:*					☐	☐	☐		☐	☐	☐		☐	☐
	Calculation of loss of future market production is based on statistics of Statistics Netherlands (production data, sick leave and inability to work) and Netherlands Bureau for Economic Policy Analysis (CPB), which are based on national surveys															

Costs per component

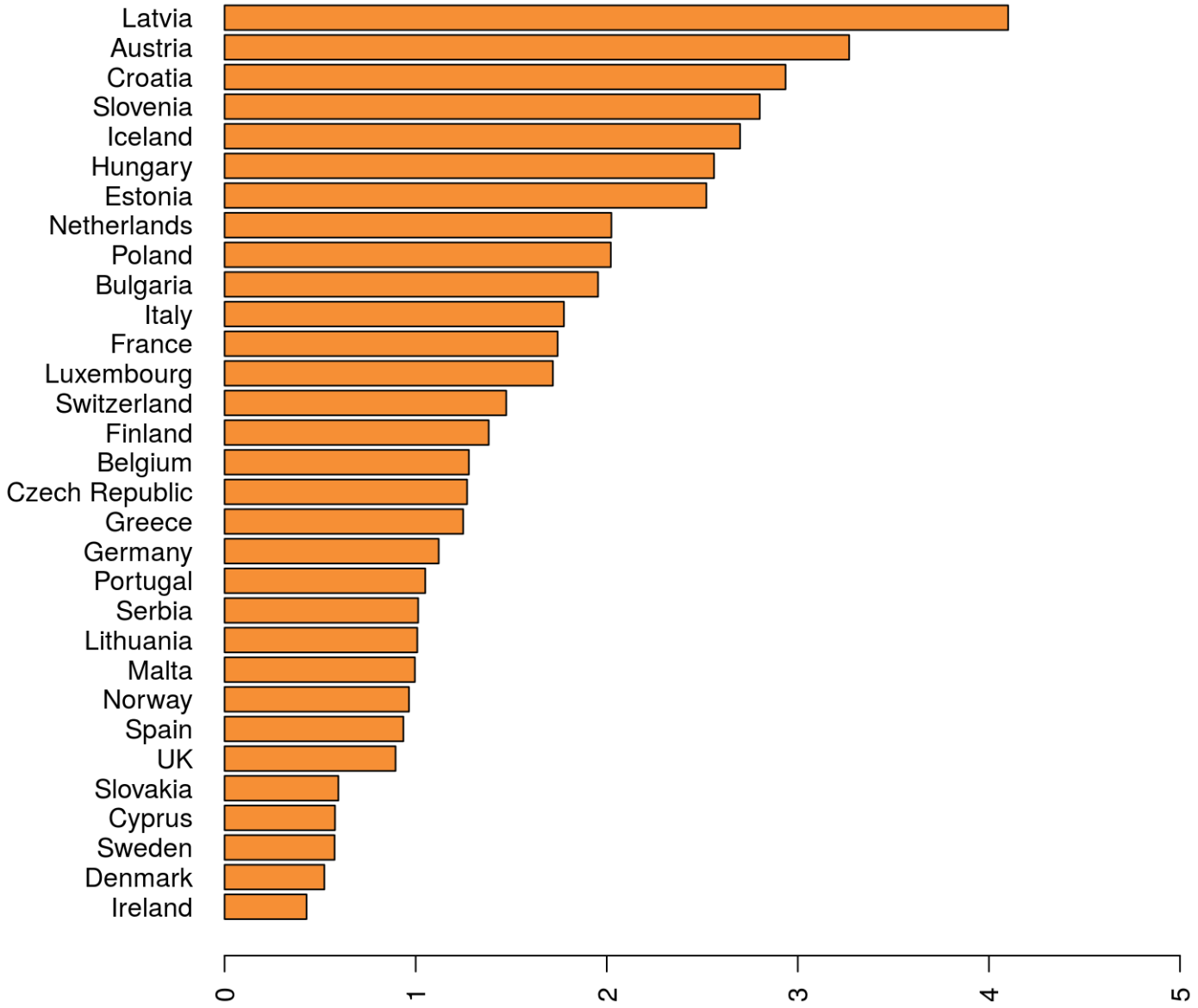
More detailed information		
Do you have more detailed information on the crash costs **per cost component** and per casualty? If so, please fill those in here. If you only have data on total costs, please choose the right tick box.		
Is the information below given in costs per casualty or in total costs?	☑ Costs per casualty (preferred)	☐ Total costs

Currency in which the official information is provided (EUR/Pound/etc.):	EUR

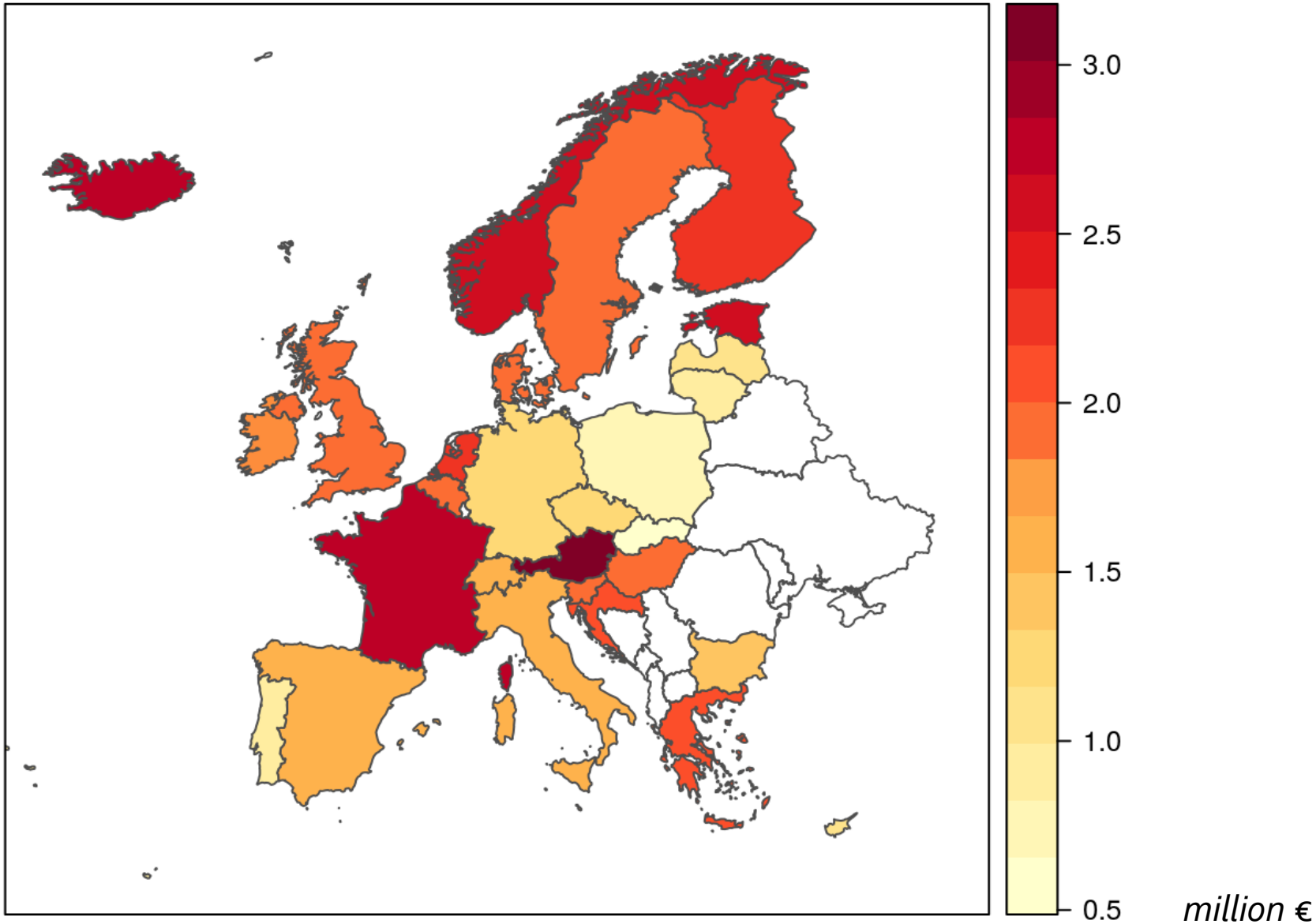
Official figure	Medical costs	Production loss	Human costs	Property damage	Administrative costs	Other costs
fatalities	9.904	576.679	1.991.083	10.805	17.462	5.566
serious injuries	10.229	20.859	232.957	10.498	5.667	431
slight injuries	1.036	1.122	-	4.323	1.747	405
fatal crashes						
serious injury crashes						
slight injury crashes						
property damage only (PDO) crashes						
Other injuries	222	-	-	3.060	965	623
[other groups] (your definition from tab **'Costs per unit'**)						
Total crashes						

Further notes:	Costs of house adaptions and visiting people in hospital are included in medical costs

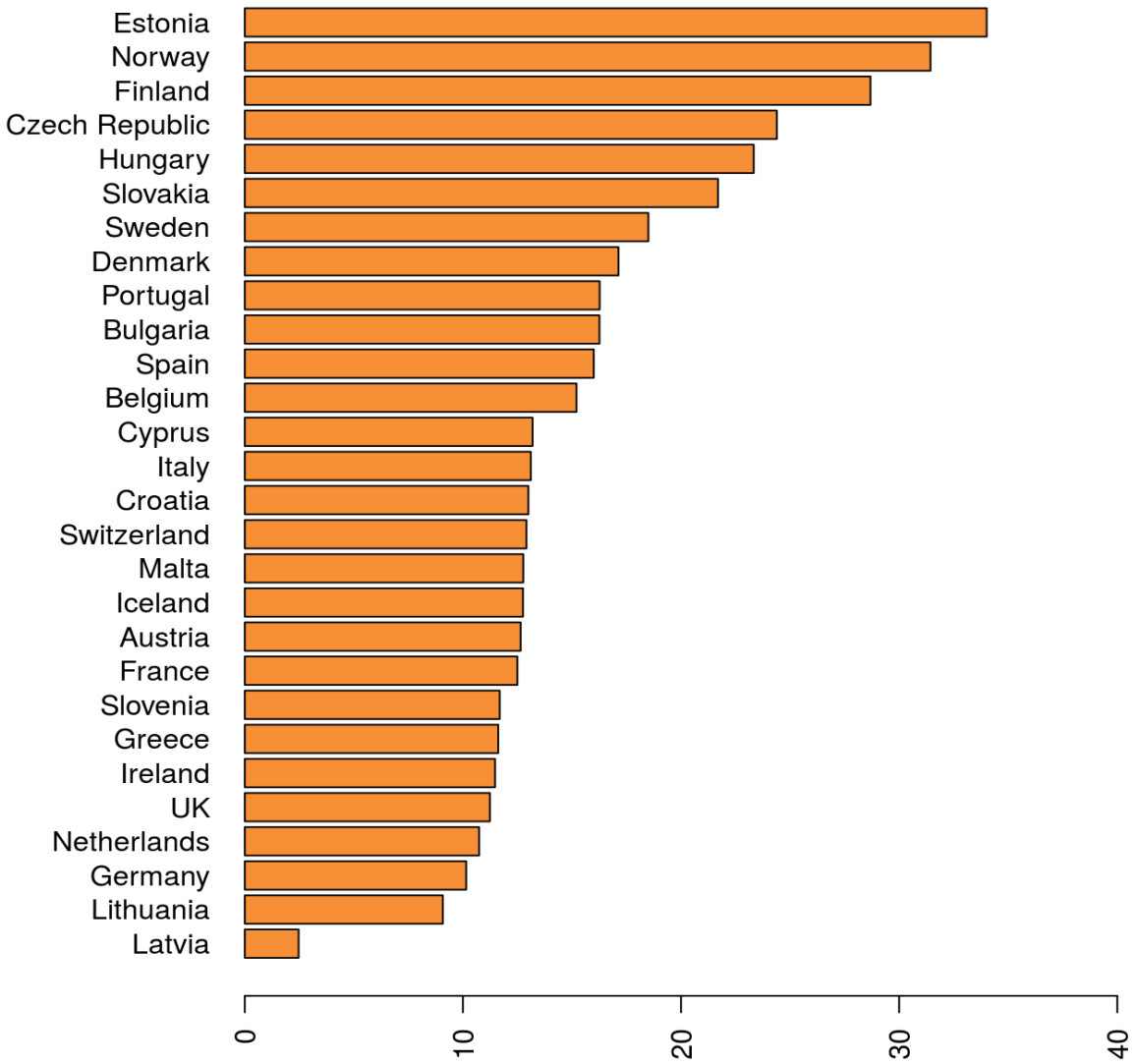
Total costs (%GDP)



Costs per fatality



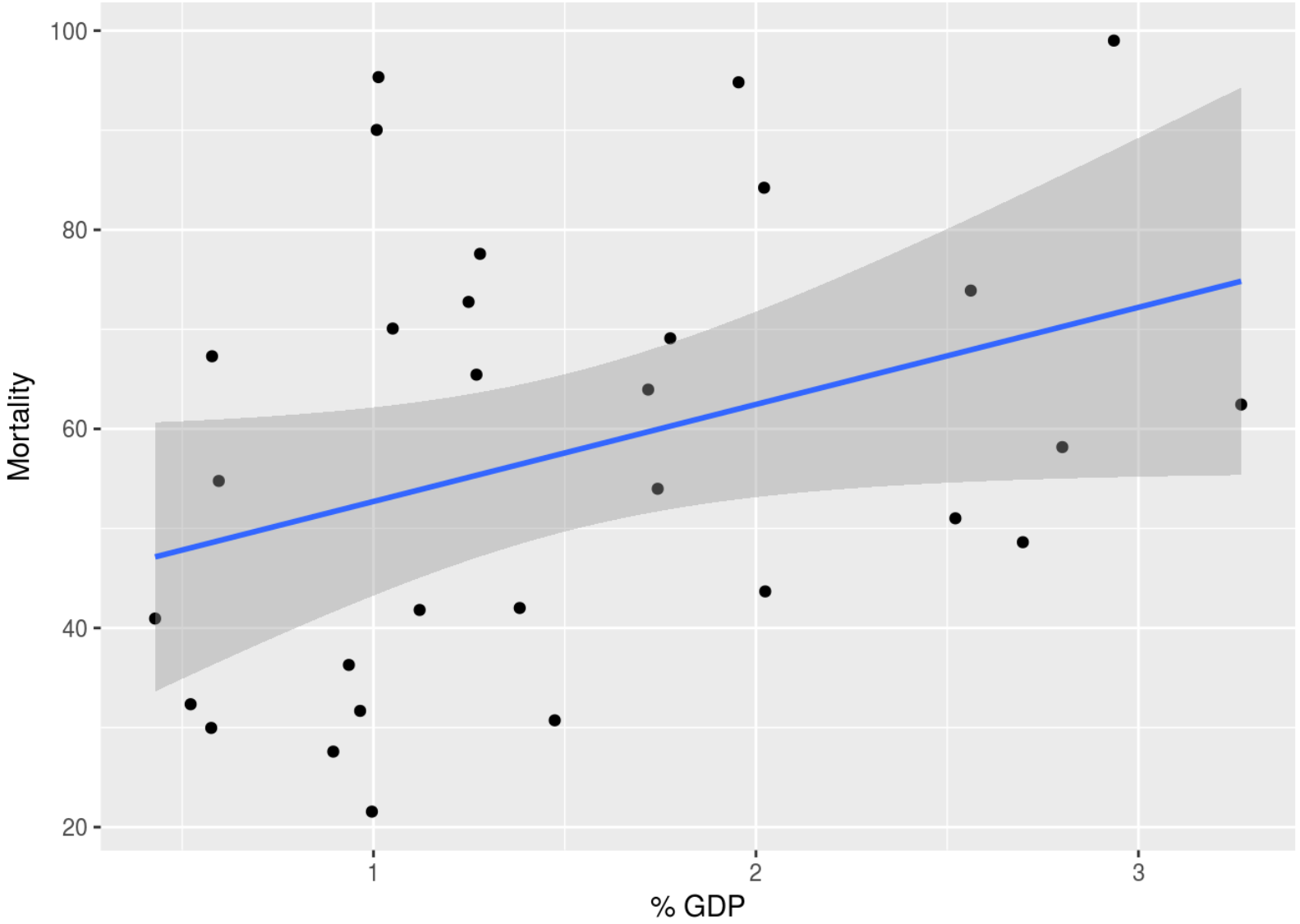
Costs per serious injury (% fatality)



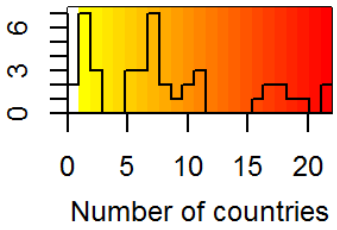
What explains the cost differences?

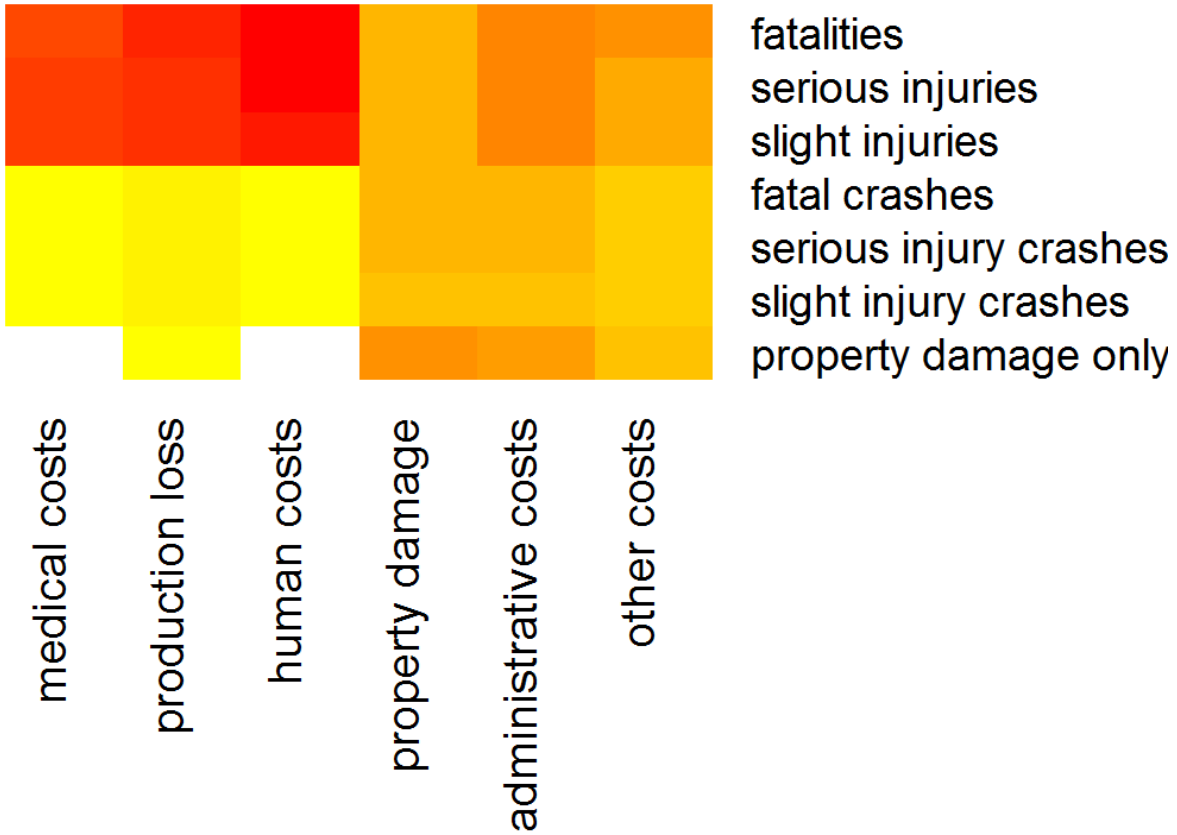
- Total costs: road safety performance (number of casualties / crashes)
- Methodological differences:
  - *Cost items included*
  - *Methods*
  - *Severity categories included, particularly property damage only crashes*
  - *Underreporting*
  - *Definitions serious/slight injuries*

Relation mortality – total cost

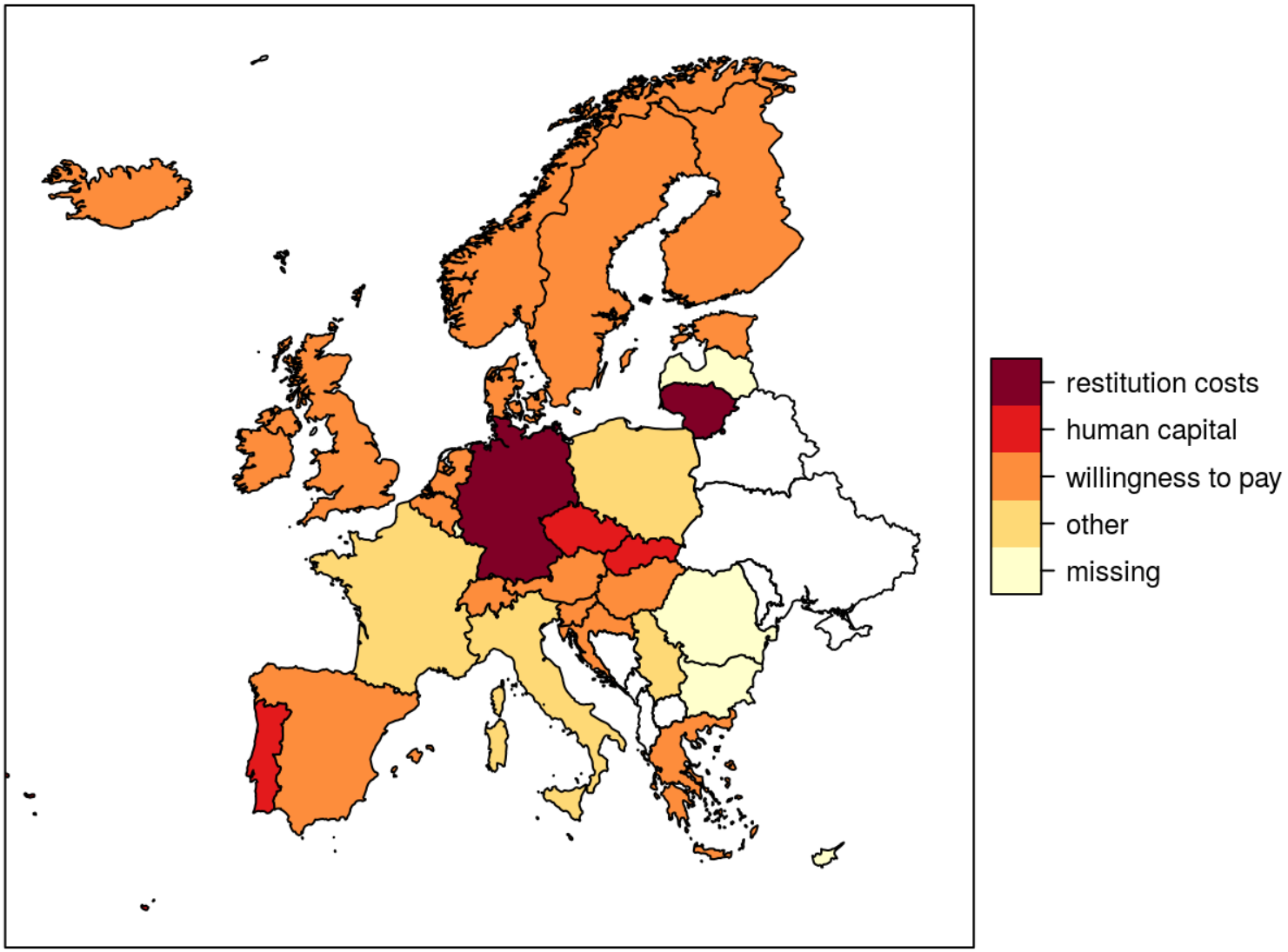


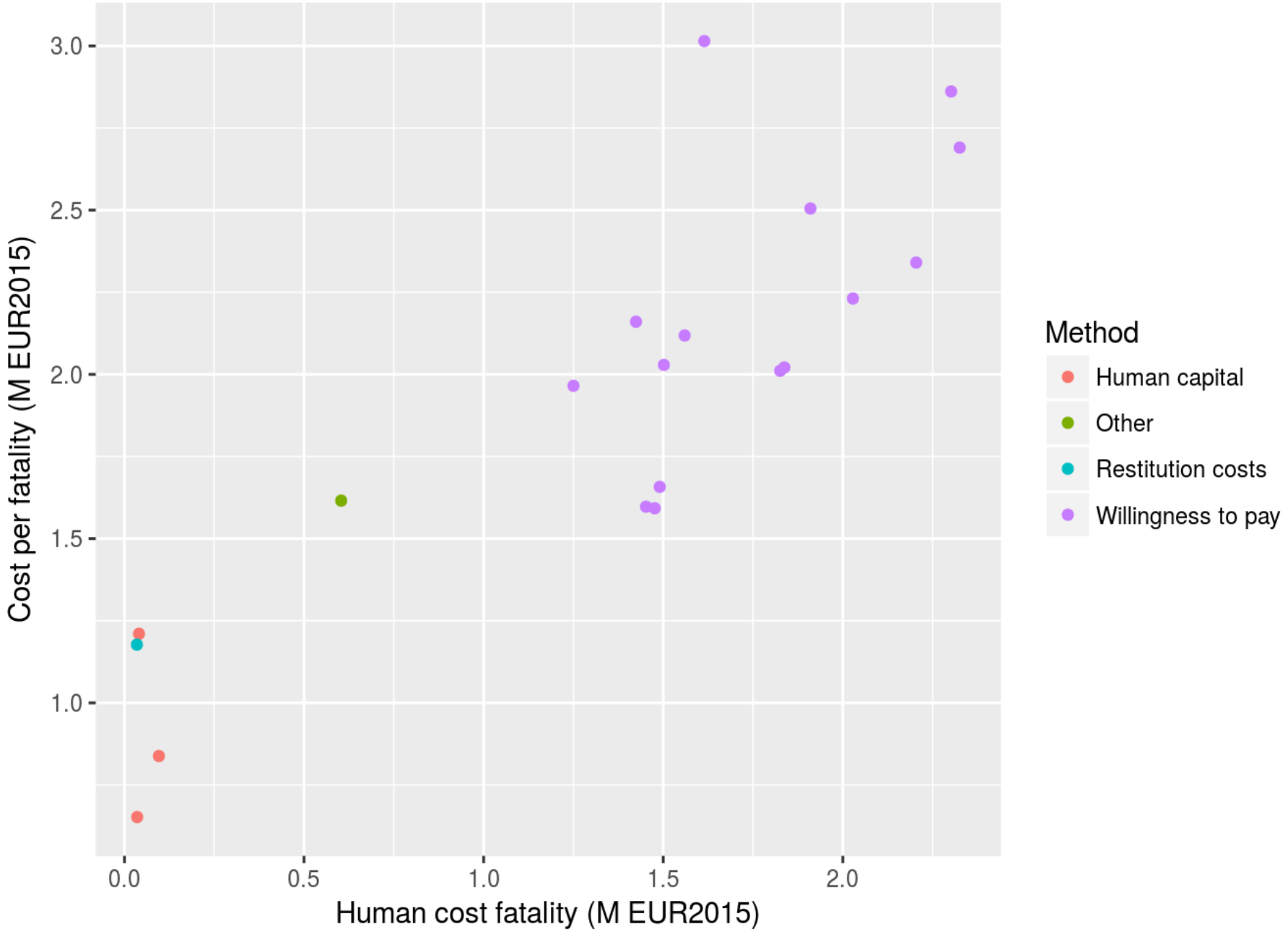
Cost components included



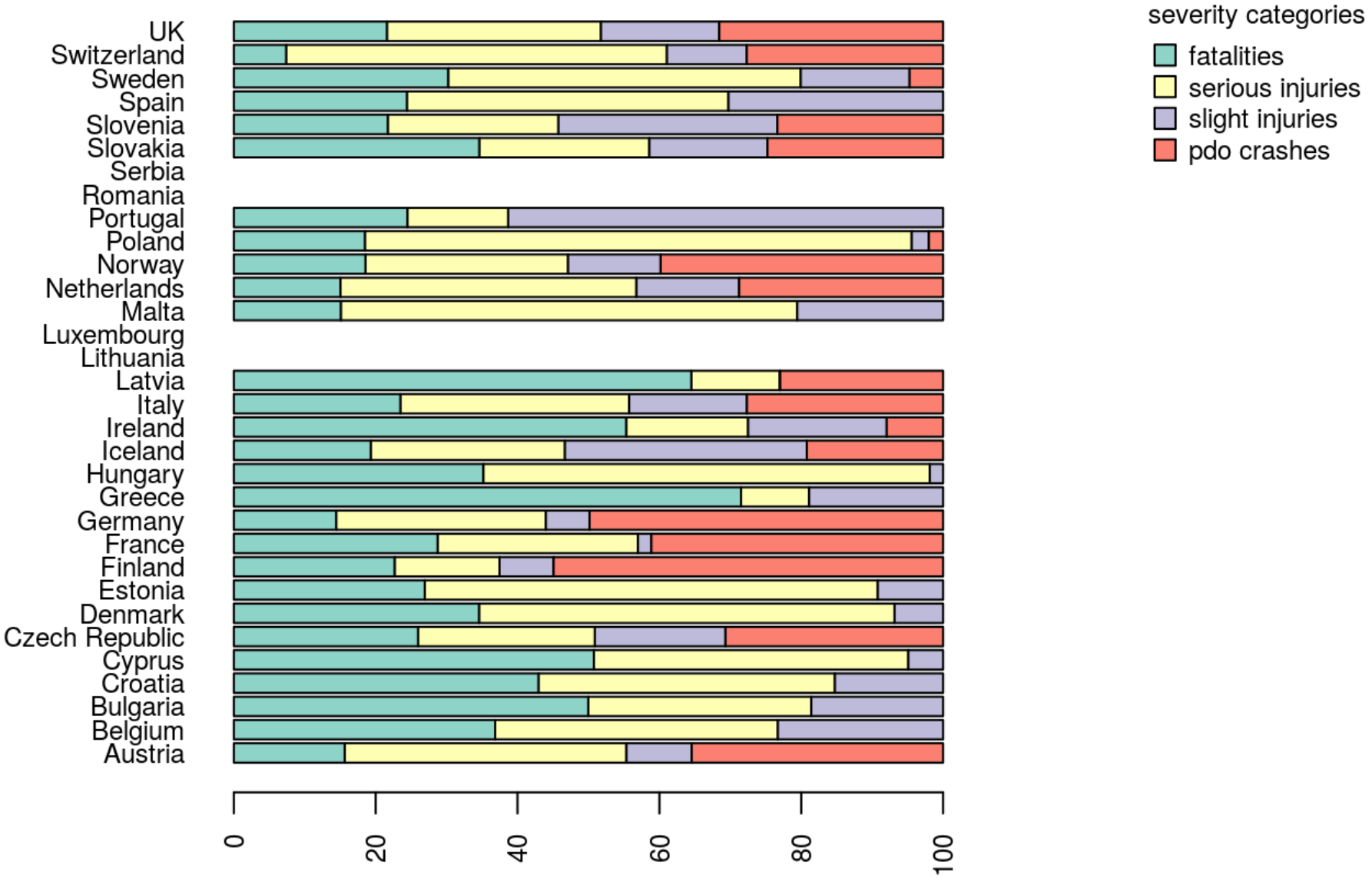


Different methods: human costs

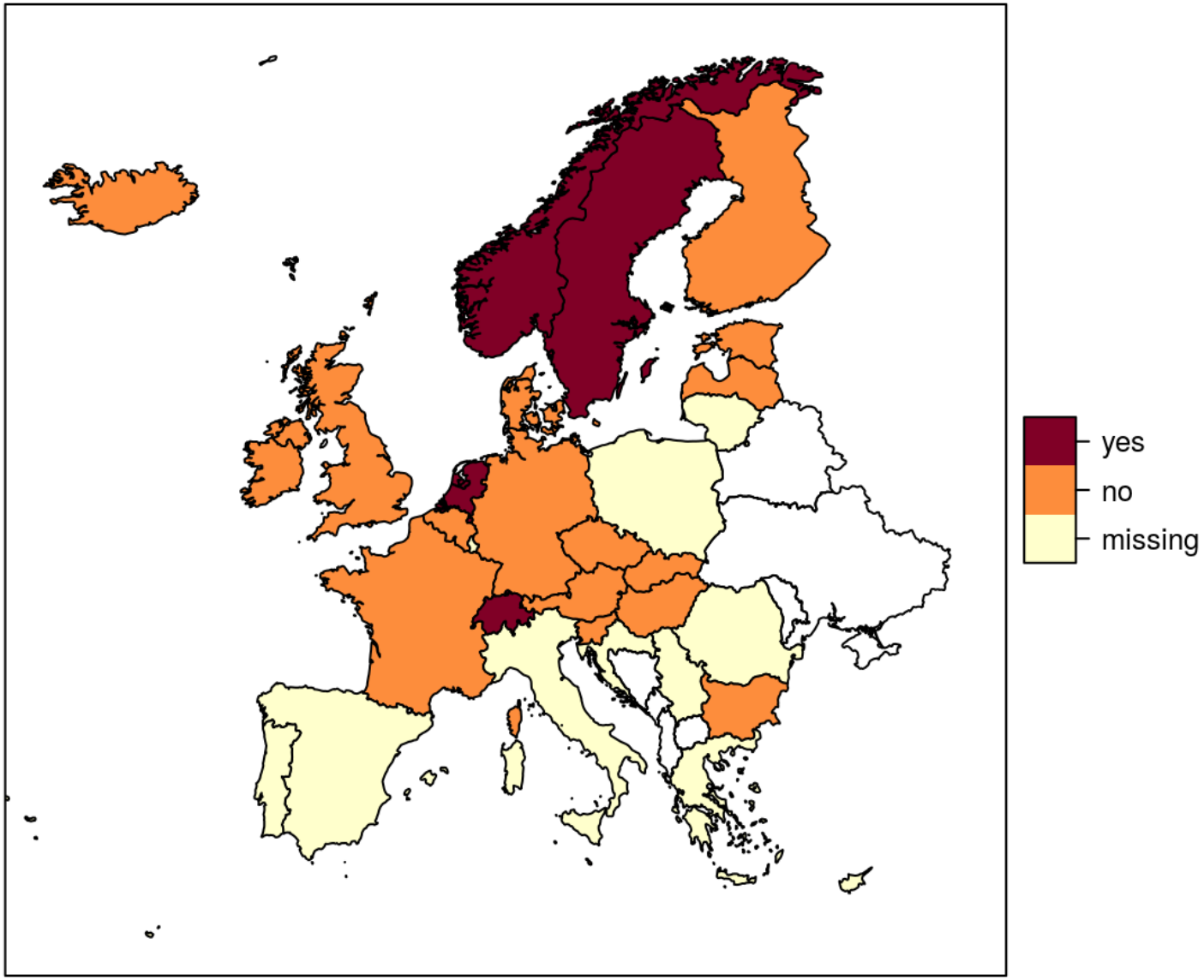



Cost per fatality (M EUR2015)
3.0
2.5
2.0
1.5
1.0
0.0
0.5
1.0
1.5
2.0
Human cost fatality (M EUR2015)
Method
Human capital
Other
Restitution costs
Willingness to pay

PDO crashes included?

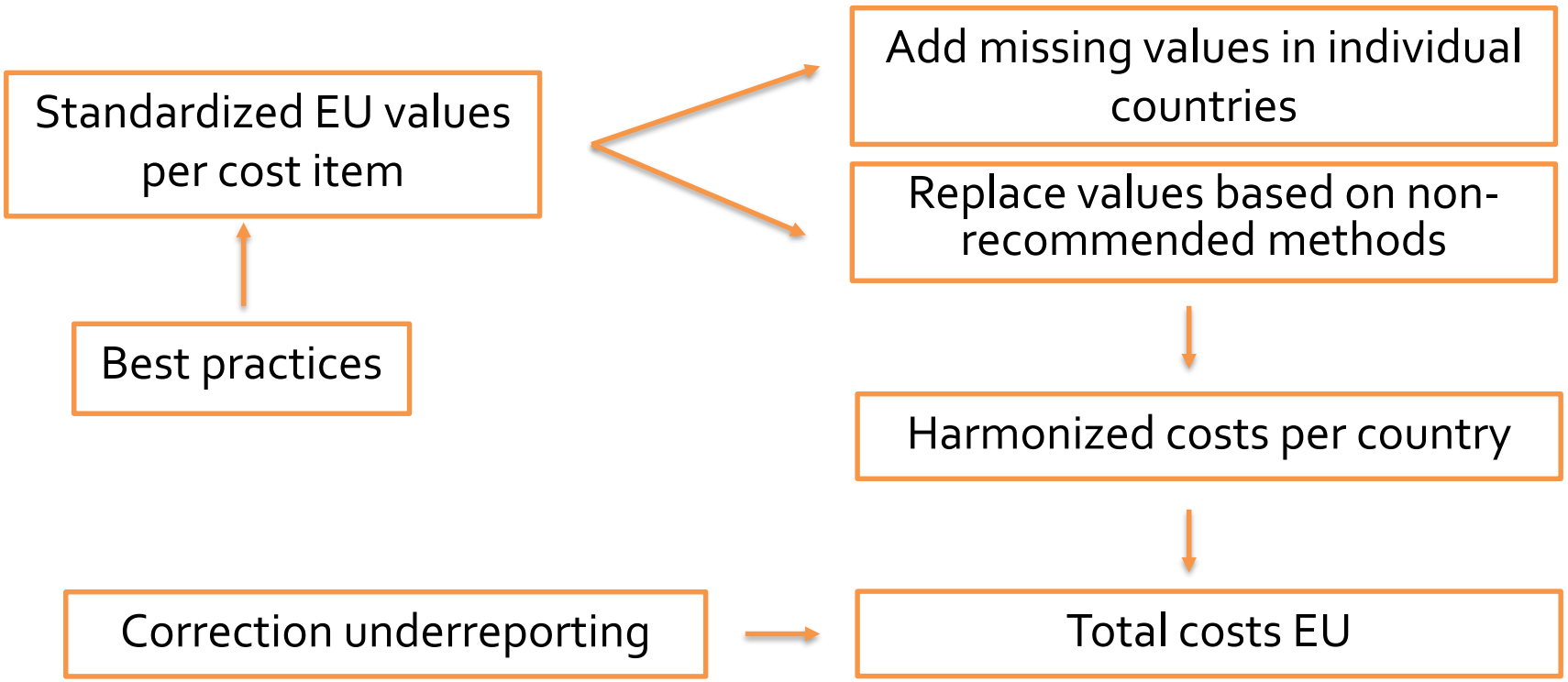


Correction for underreporting?



Harmonized estimates

Value transfer approach:

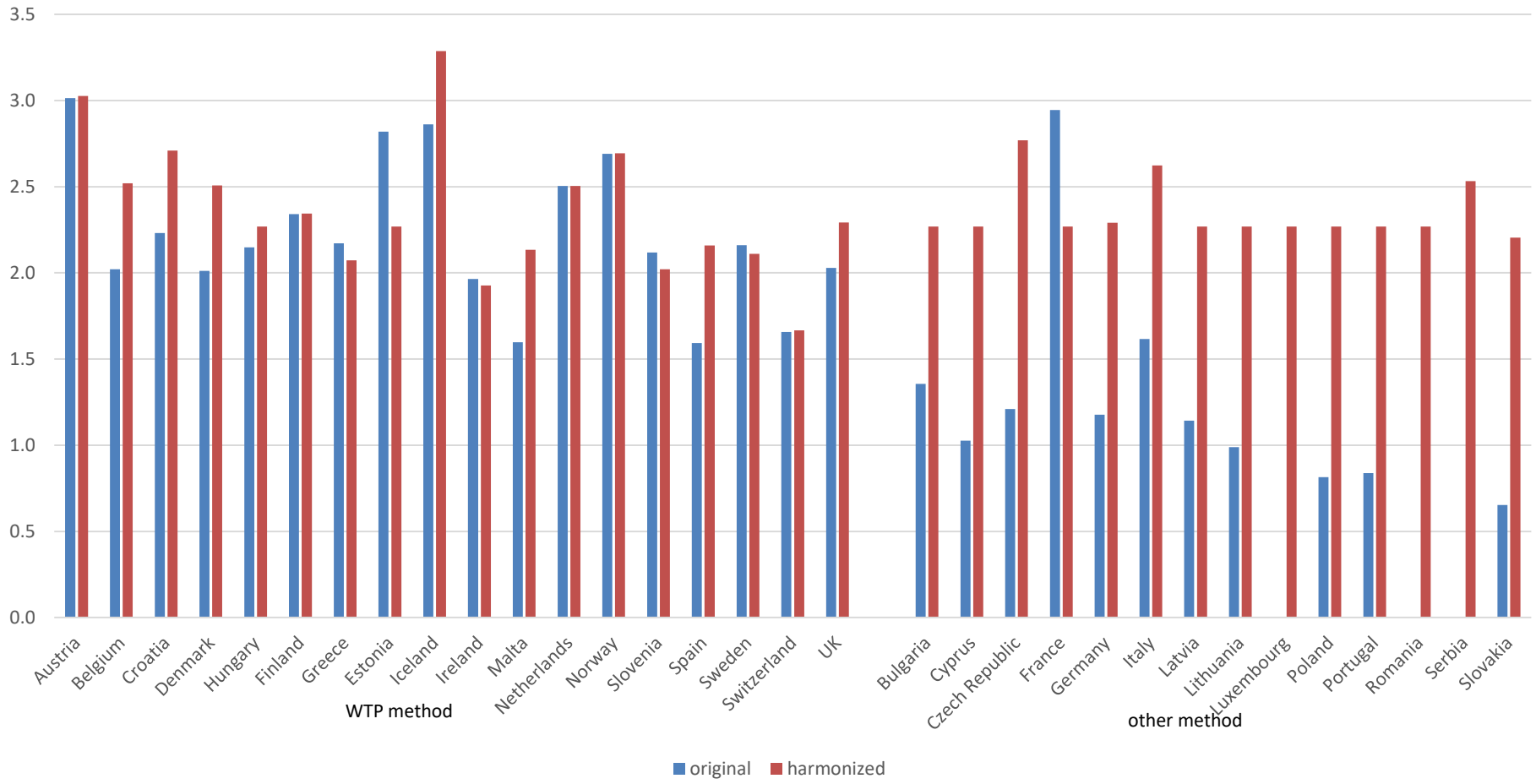


Standardized EU values

	Medical costs	Production loss	Human costs	Property damage	Administrative costs	Other costs	Total (unit) costs
Fatalities	5,430	655,376	1,587,001	11,555	6,346	3,638	2,269,346
Serious injuries	16,719	43,627	230,385	7,622	4,364	413	303,130
Slight injuries	1,439	2,669	15,597	5,317	1,876	519	27,418
Fatal crashes	11,757	727,616	1,809,467	17,542	8,891	3,817	2,579,089
Serious injury crashes	19,158	50,285	263,945	11,143	5,557	709	350,796
Slight injury crashes	1,957	3,629	21,212	7,231	2,677	634	37,340
PDO crashes	-	-	-	2,795	764	400	3,960

Euro, 2015

Original vs. harmonized fatality costs



- Total cost in EU:
  - *Original values: €200 billion*
  - *Value transfer: at least €500 billion (3% of GDP)*

Conclusions

- Official estimates of costs of road crashes in European countries range from 0.4 to 4.1% of GDP
- Costs per fatality range from 0.7 to 3.0 million EUR (2015)
- Variations mainly explained by methodological differences:
  - *Different cost components*
  - *Willingness to pay or other method*
  - *Correction for underreporting*
  - *Inclusion of property damage only crashes*
- Official values (largely) underestimate the costs in most countries
- If corrections are made, costs of road crashes in the EU are at least € 500 billion Euro or 3% of GDP

Thank you for your attention!

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