

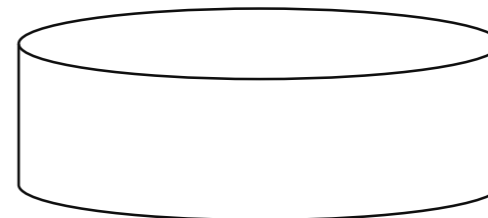
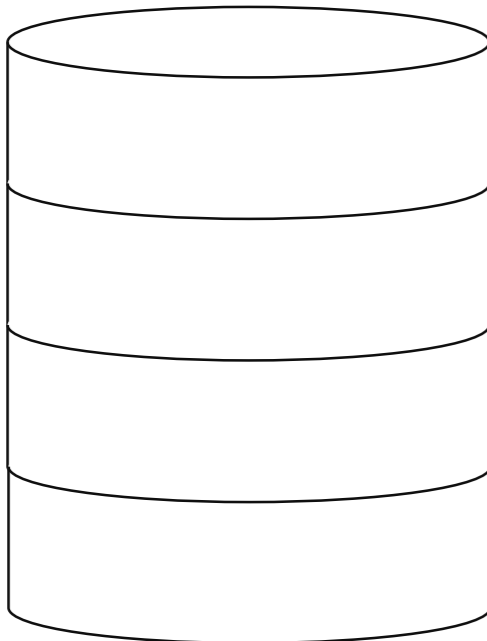
Relevance of 2nd row injuries and abdominal injuries in frontal crashes

Ernst Tomasch, Corina Klug

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Data sources

- National Statistics
- CEDATU – Central Database for In-Depth Accident Study

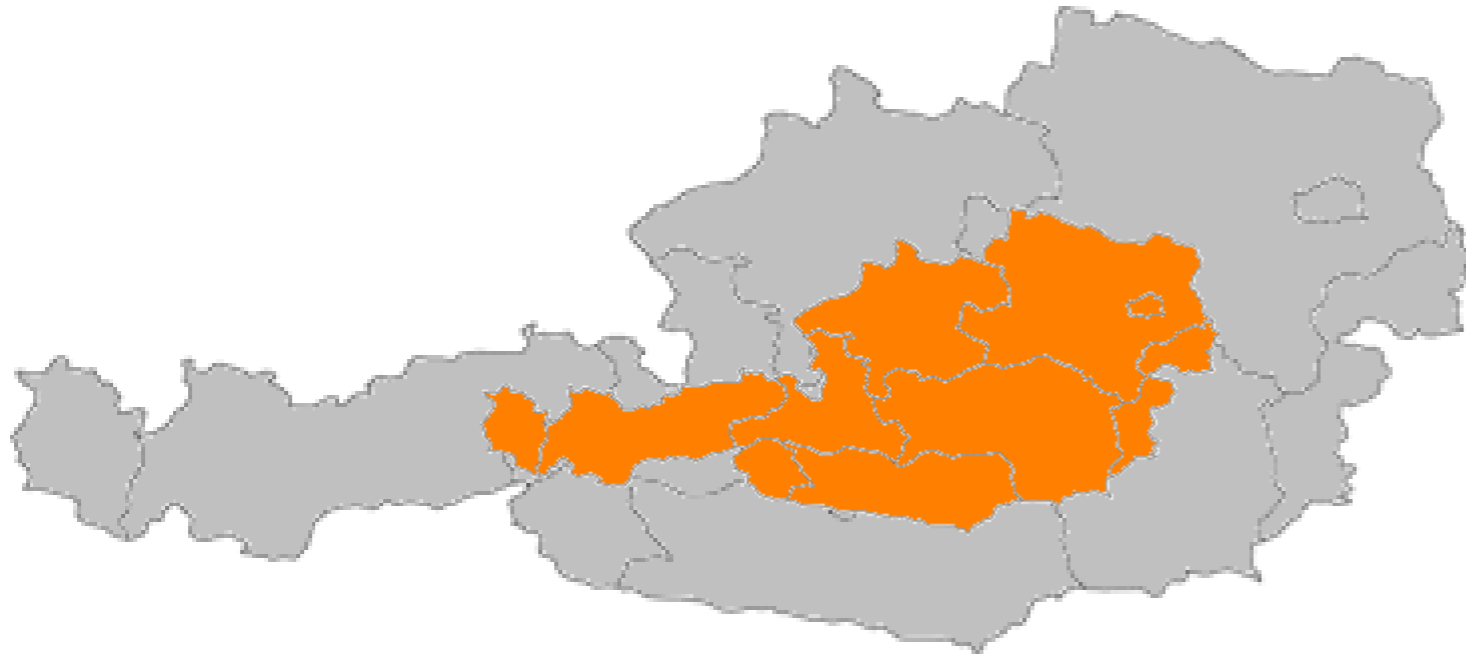


Data source National Statistics = complete Austria



- Almost all road crashes
- Data collection with census templates by police
- Macroscopic level -> Lack on details e.g. occupants in passenger cars only identified as driver and other occupants

Data source CEDATU = small Austria



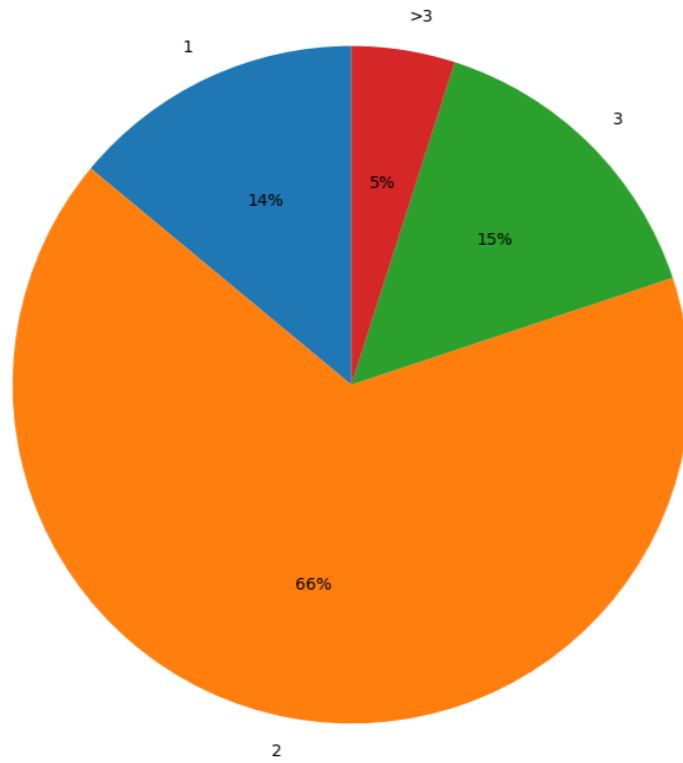
- CEDATU is a sub-sample of the National Statistics
- Data collection all across Austria with data from court
- In-depth level incl. complete accident reconstruction, damage pattern, injuries, etc.

Filter criterion National Statistics

- Year 2012 - 2024
- Crashes with at least one passenger car
- Excluding crashes with vulnerable road users and other small road users (e.g. small cars with weight less than 500 kg, trains, tramways, motorcycles, etc.)

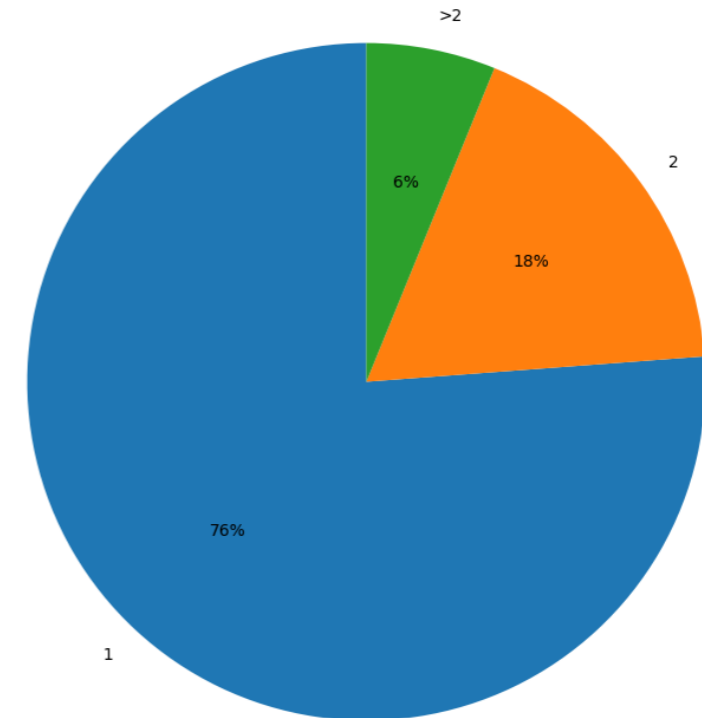
Number of road users and occupants

Number of participating road users in crashes with at least one passenger car



Source: National Statistics, analysed by: TU Graz, VSI

Number of occupants in passenger cars (crashes with more than two vehicles excluded)

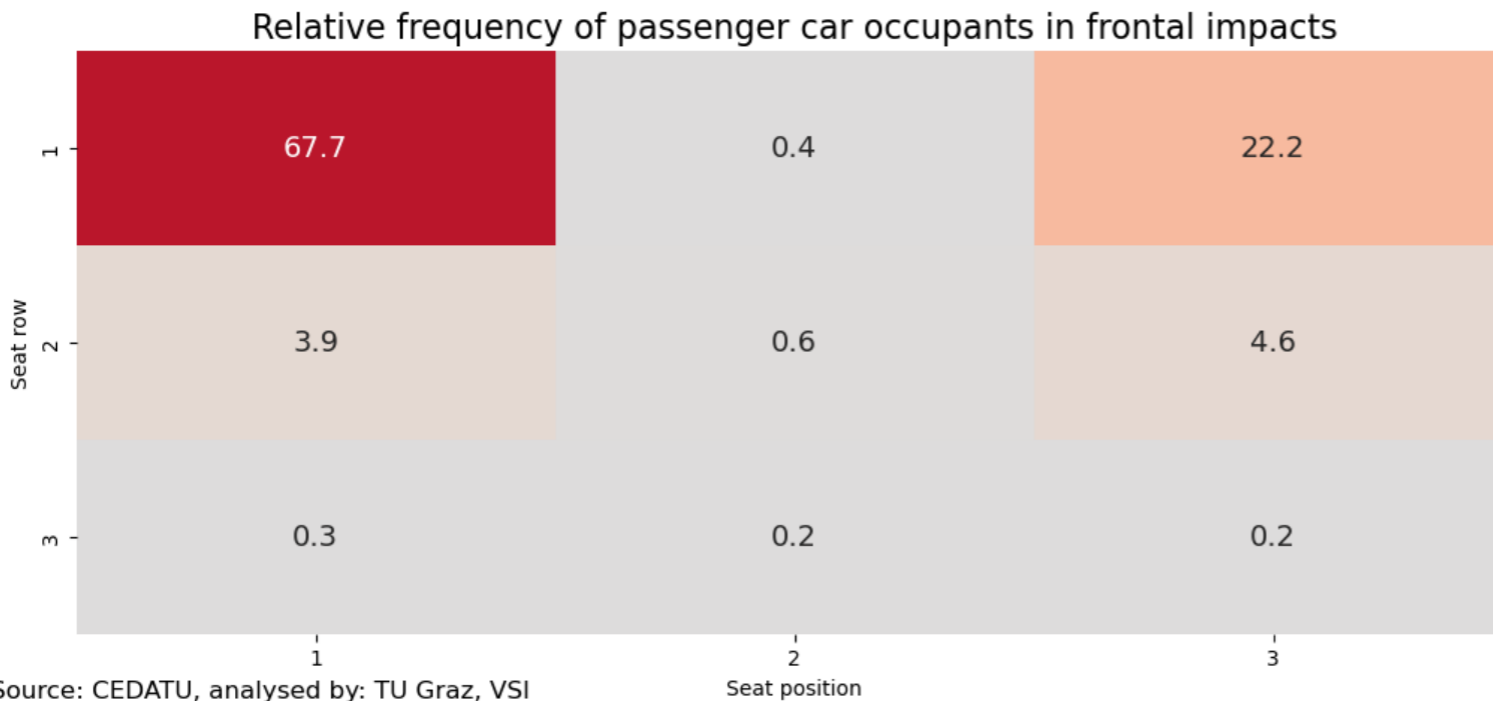


Source: National Statistics, analysed by: TU Graz, VSI

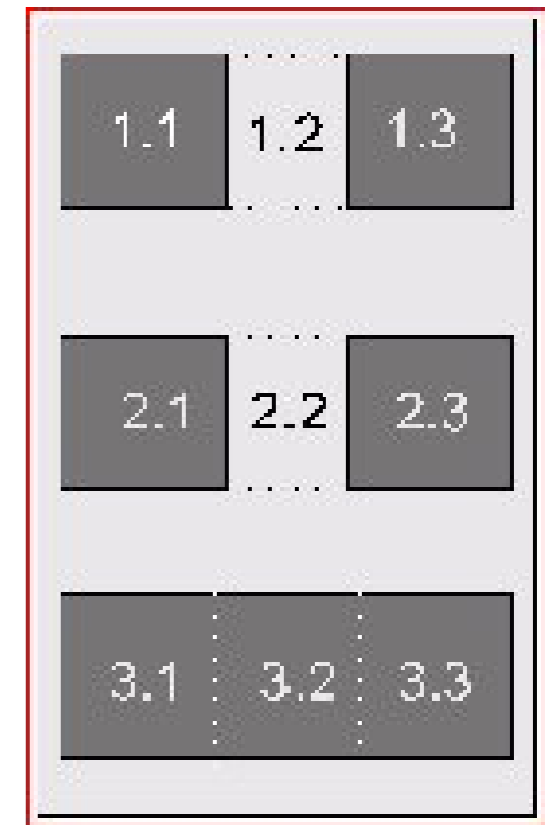
Filter criteria

- Crashes with at least one passenger car
- Crashes with 2 participants only
- Excluding crashes with vulnerable road users and other small road users (e.g. small cars with weight less than 500 kg, trains, tramways, motorcycles, etc.)
- Collision location: CDC3 Frontal impacts
- Number of collisions: 1 -> crashes with subsequent collisions excluded

Frequency of car occupants in frontal impacts

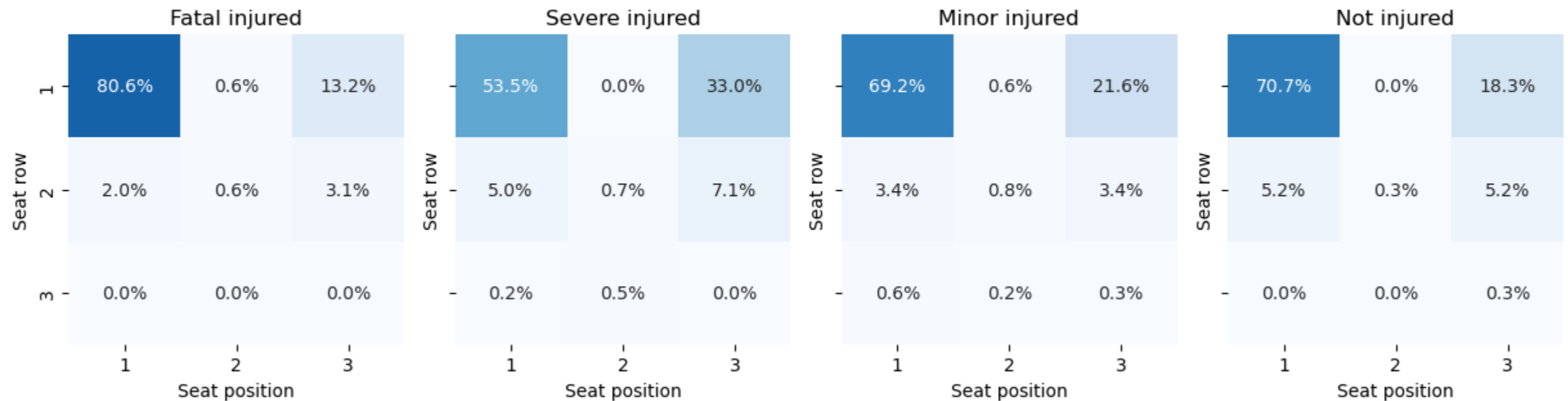


Seat position metric



Casualties by seat position (relative)

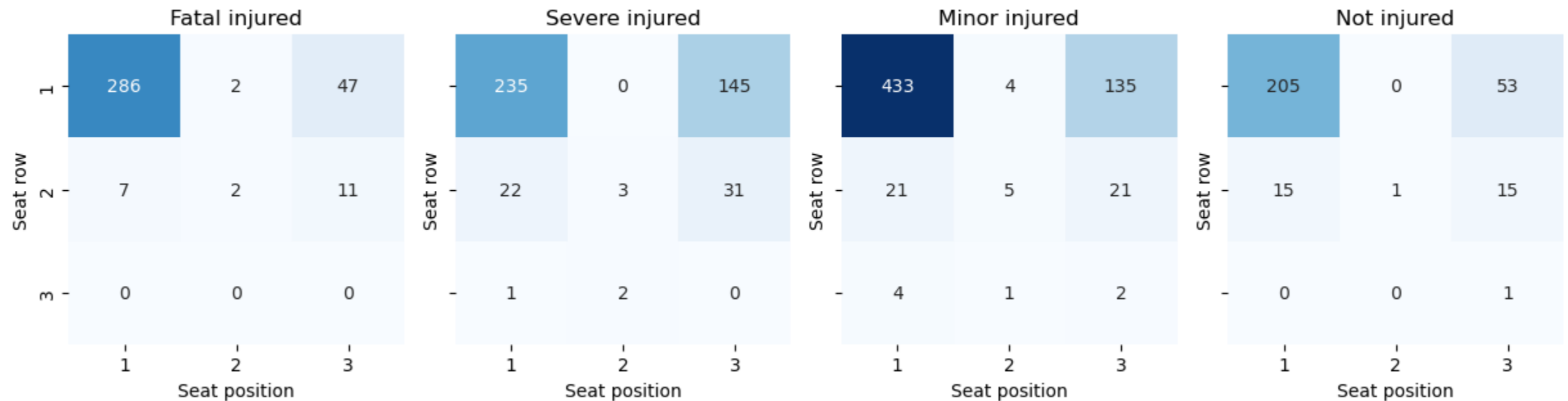
Relative distribution of casualties by seat position in frontal impacts



Source: CEDATU, analysed by: TU Graz, VSI

Casualties by seat position (absolute)

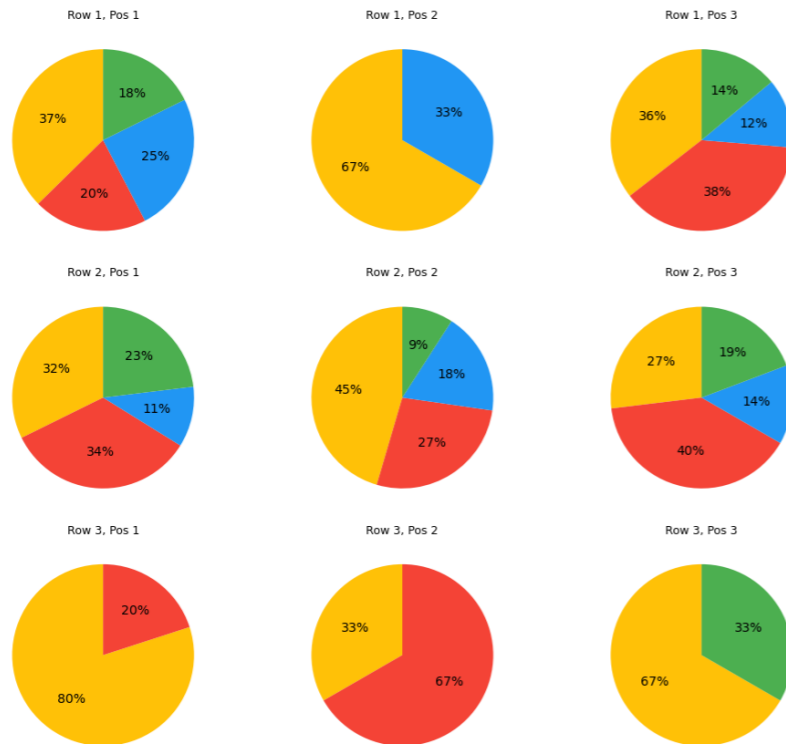
Number of casualties in passenger cars by seat position in frontal impacts



Source: CEDATU, analysed by: TU Graz, VSI

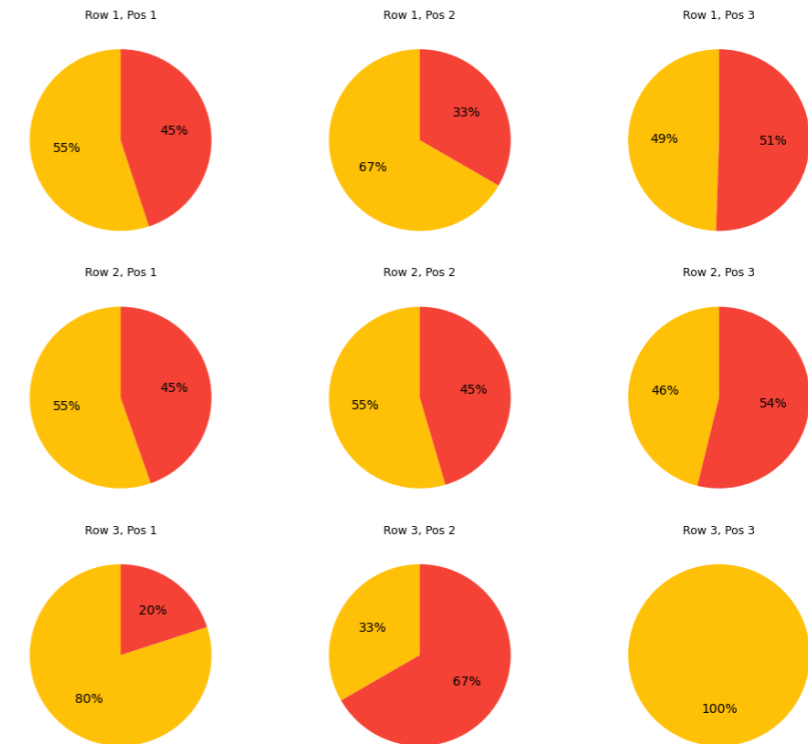
Injury severity by seat position

Injury severity by seat position



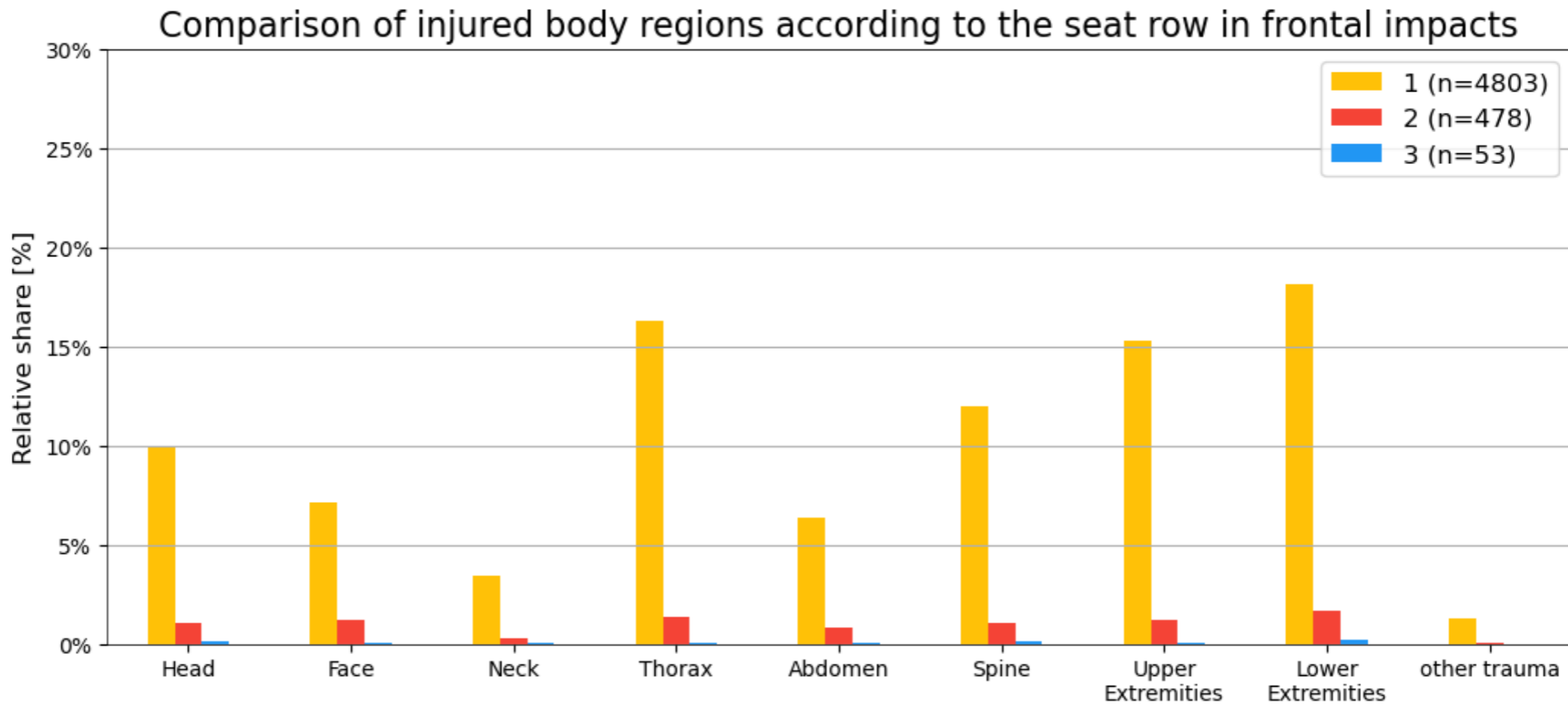
Source: CEDATU, analysed by: TU Graz, VSI ■ Minor injured ■ Severe injured ■ Fatal injured ■ Not injured

'Killed and Severe Injured' and 'Not and Minor Injured' occupants by seat position



Source: CEDATU, analysed by: TU Graz, VSI ■ ksi ■ nmi

Injured body regions



Source: CEDATU, analysed by: TU Graz, VSI

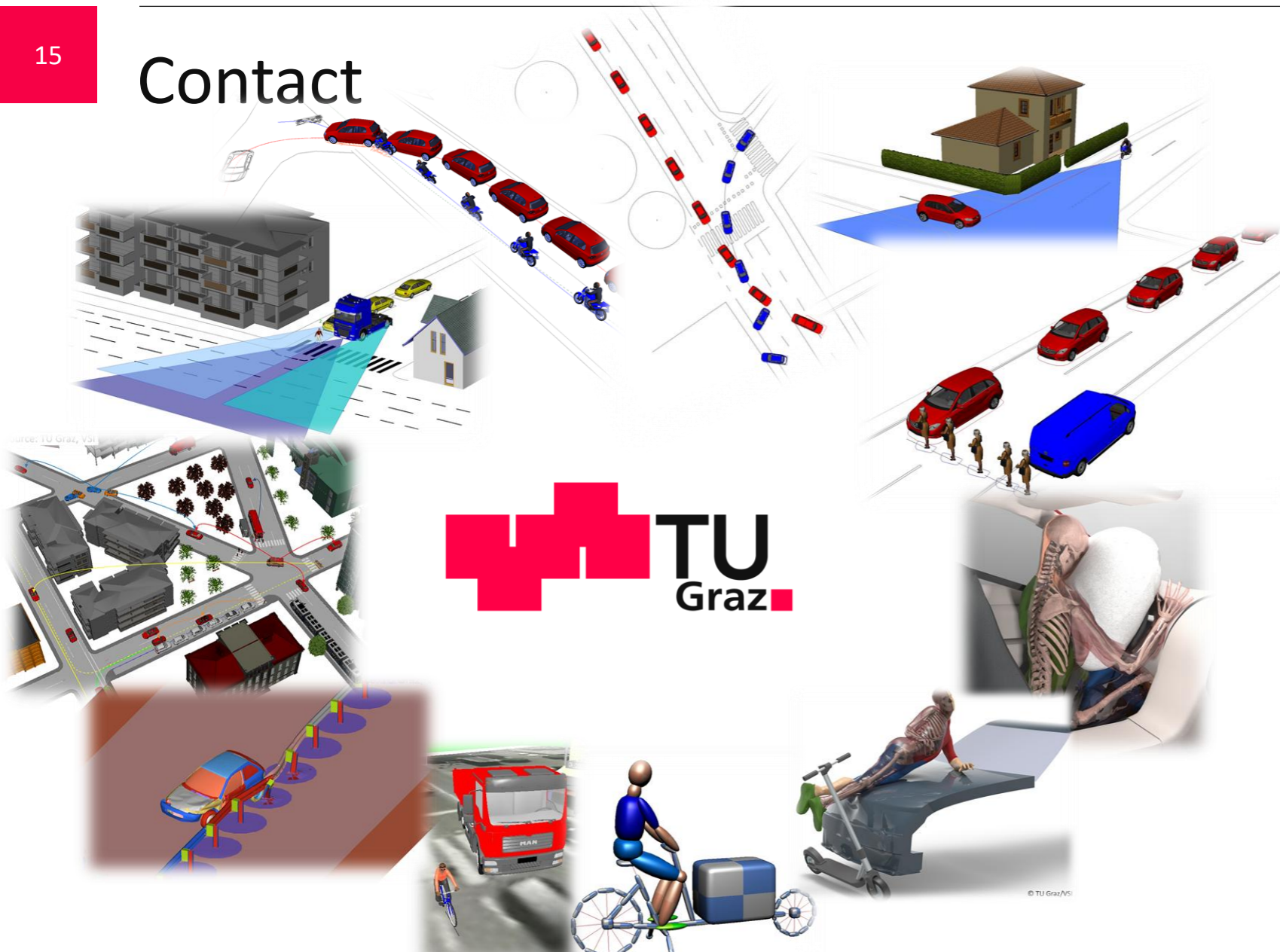
Injured body regions

	Seat row (absolute)			Seat row (relative)		
	1	2	3	1	2	3
Head	535	59	9	10	1.1	0.2
Face	381	67	6	7.1	1.3	0.1
Neck	184	16	3	3.4	0.3	0.1
Thorax	869	75	5	16.3	1.4	0.1
Abdomen	340	45	6	6.4	0.8	0.1
Spine	640	58	7	12	1.1	0.1
Upper Extremities	815	65	4	15.3	1.2	0.1
Lower Extremities	969	89	13	18.2	1.7	0.2
other trauma	70	4	0	1.3	0.1	0
	4803	478	53	5334		

Summary

- 80% in passenger car crashes related to single vehicle accidents and crashes with one other road user
- 94% of passenger cars have one or two occupants -> 6% are in the second or other rows
- Injuries in second rows slightly more severe compared to first row
- Abdomen injuries accounts to 7.3% in frontal impacts

Contact



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