Road traffic accidents in the province of Milan (Italy): which risk factors?

Chiara Orsi

Ph.D. student

Centre of Study and Research on Road Safety

University of Pavia

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3 pm - Thames Room

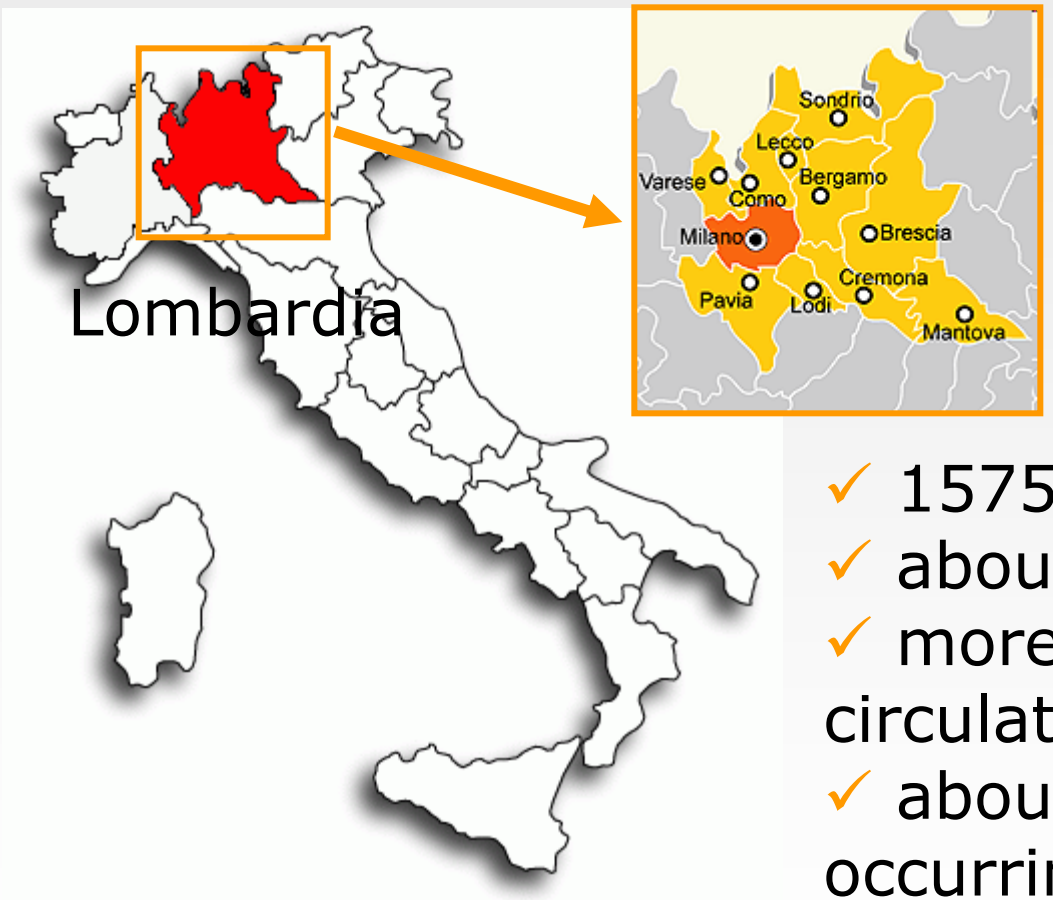
Background: road accidents

Road accident consequences in one year in Italy:

- → more than 4500 people die
- → around 310 800 are injured
- → ranks 12th in mortality (96 deaths per million inhabitants) among the 25 EU countries

Data sources: European road safety observatory (2007), National Institute of Statistics (2008)

The study area: the Milan province



Milan province:

- ✓ 1575 km²
- ✓ about 3.2 millions inhabitants
- ✓ more than 2 millions circulating vehicles
- ✓ about 11% of road accidents occurring in Italy

Data source: A.C.I. (2007)

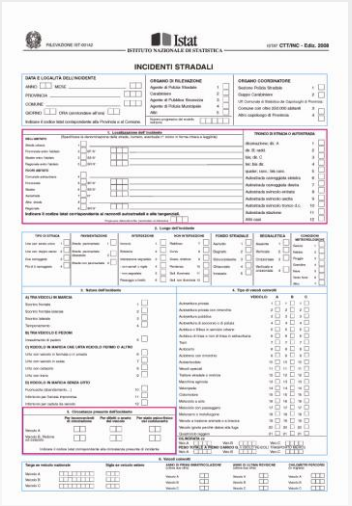
Objective: risk factors individuation

To identify the major risk factors associated with the risk of being injured or dying in a road accident

Study design: analysis of current data

Data collection

- Police
- Carabinieri
- Local police



Data source

ISTAT

Study population

Drivers involved in an accident in the province of Milan in 2004-2005

Statistical analysis: logistic regressions

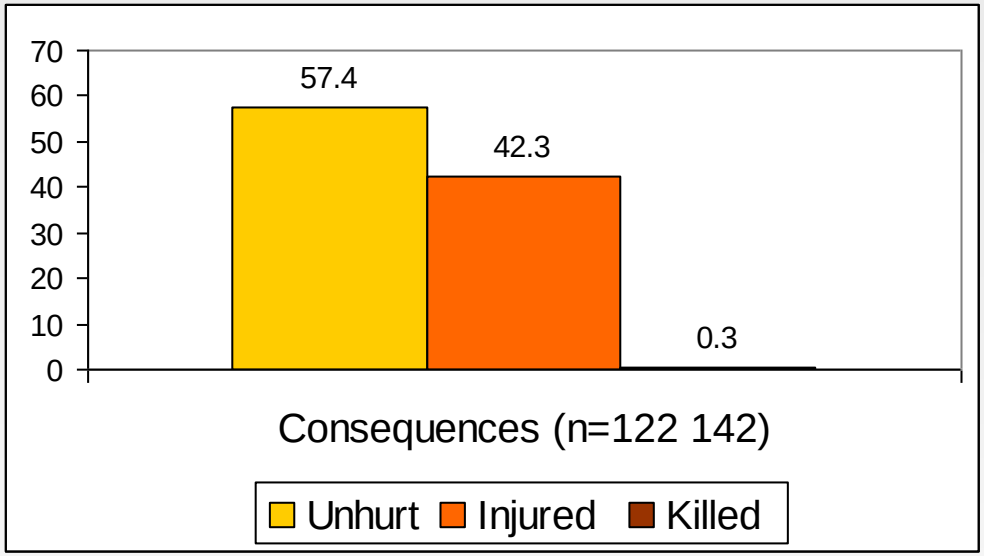
- injured vs unhurt
- killed vs unhurt

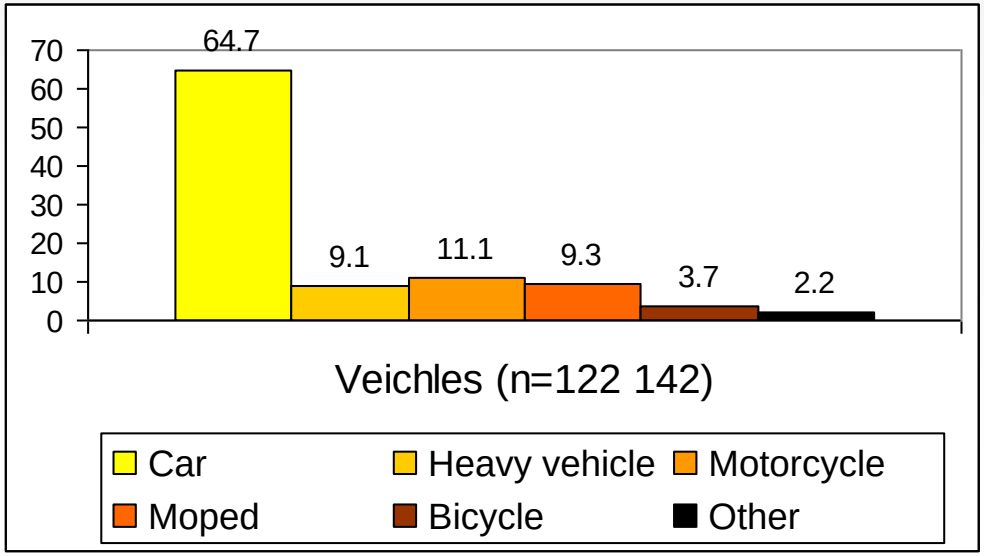
- all vehicles
- cars
- heavy vehicles
- motorized two-wheeled vehicles
- bicycles

Independent variables:
possible factors associated with accidents consequences

Dependent variable:
accident consequences

Database characteristics





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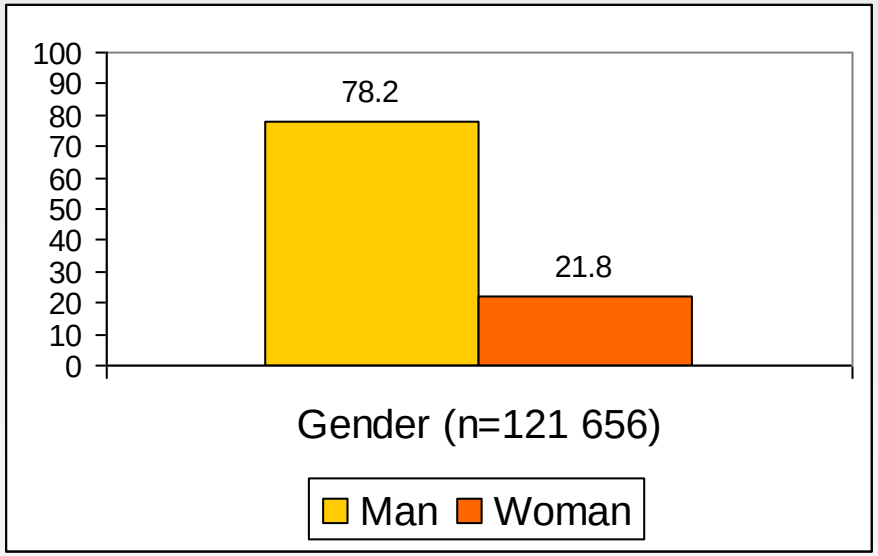

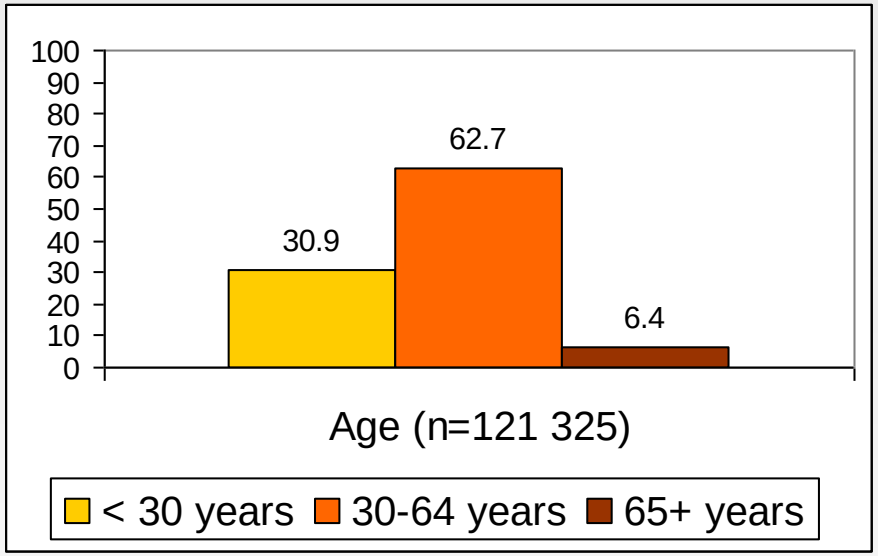

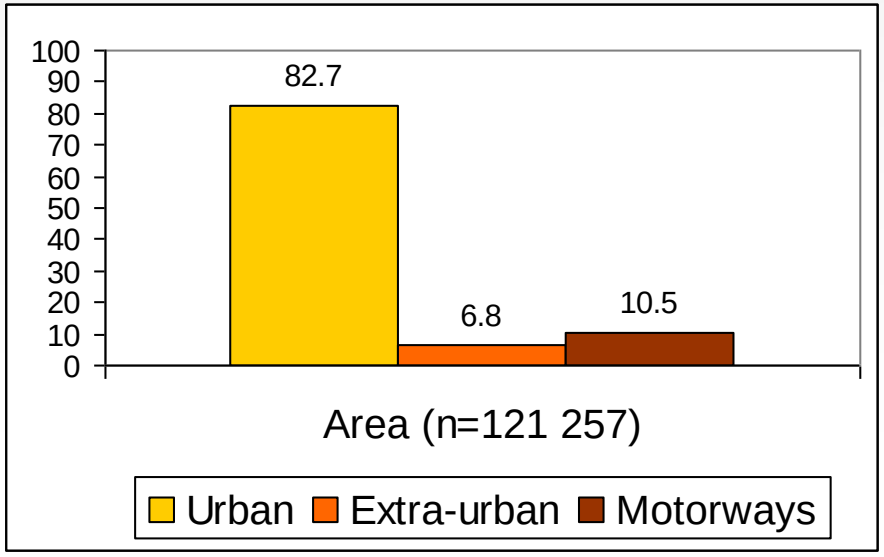

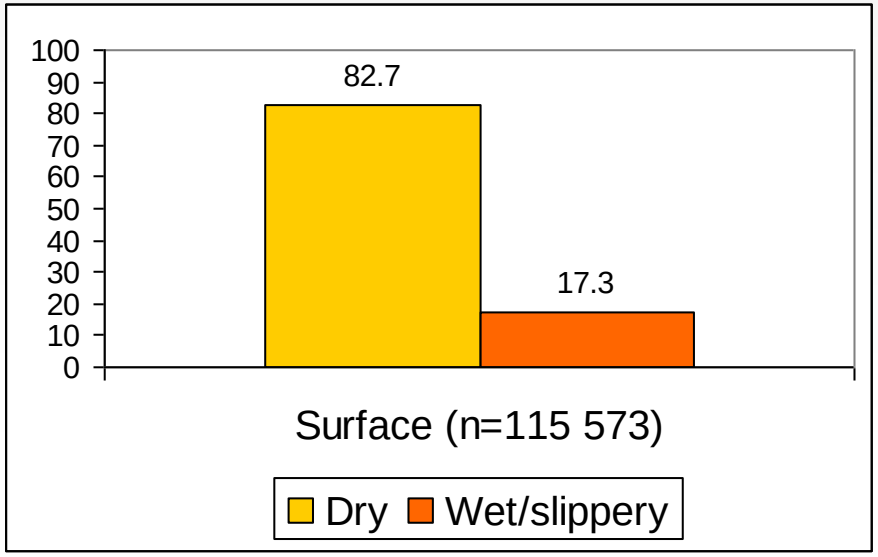

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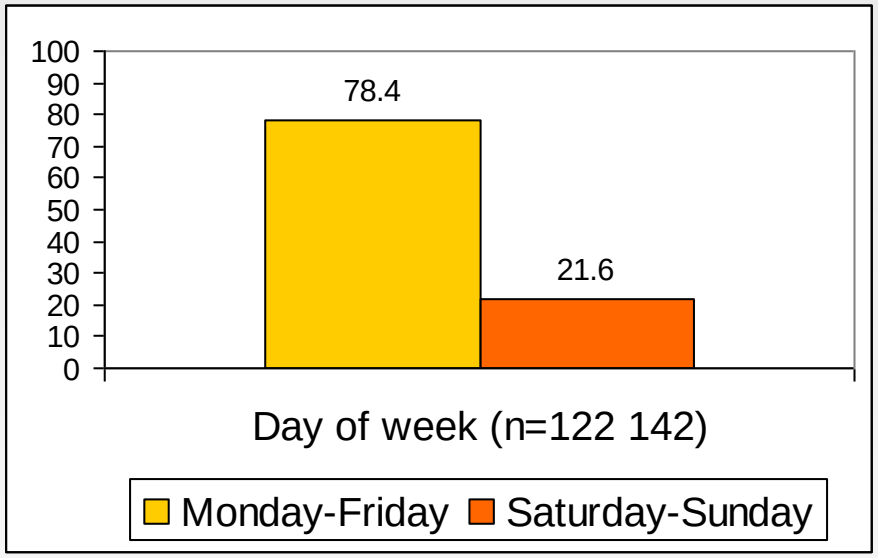
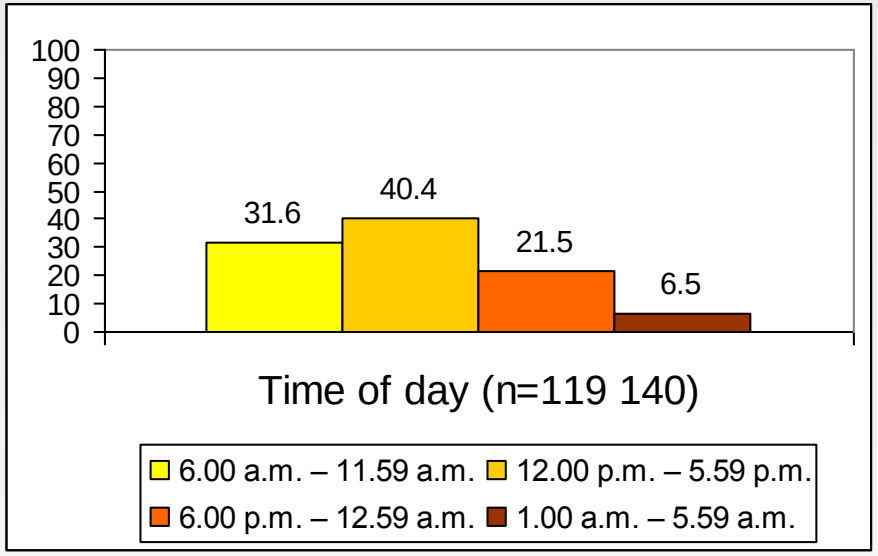
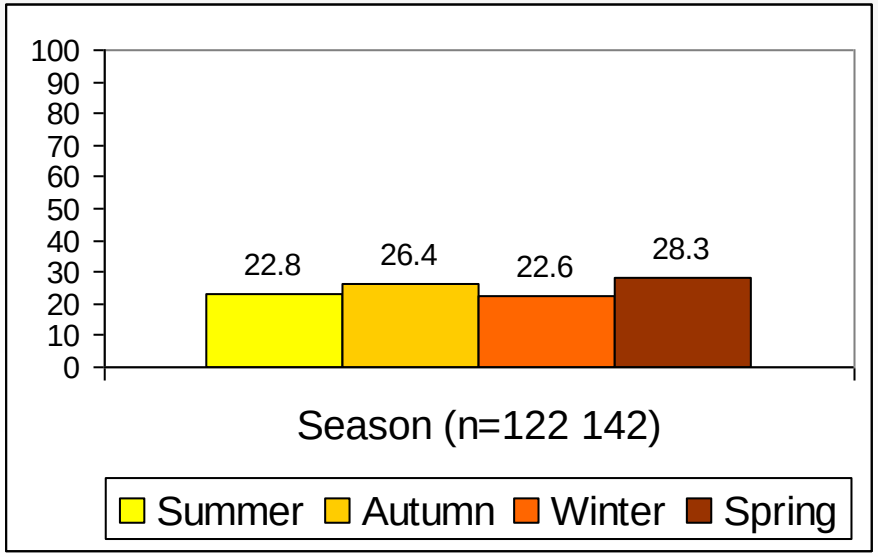
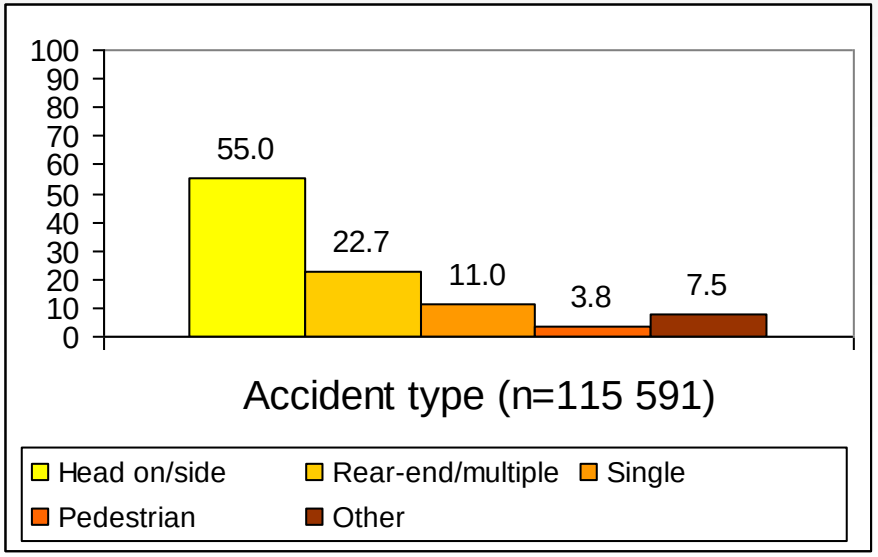








All vehicles: vehicle type

Vehicle type	Injured vs unhurt			Killed vs unhurt		
	OR	95% CI		OR	95% CI	
Heavy vehicles vs cars	0.49	0.47	0.53	1.03	0.61	1.72
Motorcycles vs cars	34.96	32.62	37.47	72.79	52.63	100.65
Mopeds vs cars	26.97	25.06	29.03	26.18	16.54	41.42
Bicycles vs cars	35.42	31.24	40.15	133.32	88.03	201.90
Other vs cars	0.72	0.65	0.80	1.87	0.86	4.08

The ORs are adjusted for the other variables in the model

Risk factors for cars drivers

Risk factor		Injured vs unhurt			Killed vs unhurt		
		OR	95% IC		OR	95% IC	
Gender	Woman vs man	1.96	1.89	2.03	0.58	0.32	1.08
Age	30-64 years vs < 30 years	0.79	0.76	0.82	1.08	0.69	1.68
	65+ years vs < 30 years	0.67	0.62	0.72	2.12	1.03	4.39
Time	Afternoon vs morning	0.97	0.93	1.01	1.00	0.56	1.80
	Evening vs morning	1.11	1.06	1.17	1.17	0.62	2.20
	Night vs morning	2.57	2.40	2.74	5.55	3.03	10.17
Day	Week-end vs week	1.08	1.04	1.13	1.36	0.89	2.08
Season	Autumn vs summer	0.96	0.92	1.01	0.61	0.34	1.09
	Winter vs summer	1.05	1.00	1.10	0.82	0.50	1.36
	Spring vs summer	0.94	0.90	0.99	0.69	0.40	1.19
Area	Extra-urban vs urban	1.15	1.08	1.22	5.28	3.21	8.70
	Motorways vs urban	0.47	0.44	0.49	1.75	1.00	3.07
Type of accident	Rear-end/multiple vs head on/side	1.62	1.56	1.69	0.39	0.20	0.76
	Single vs head on/side	1.74	1.64	1.85	2.44	1.46	4.09
	Pedestrian vs head on/side	0.06	0.05	0.07	0.77	0.24	2.49
	Other vs head on/side	1.26	1.18	1.32	0.36	0.09	1.47
Surface	Wet/slippery vs dry	1.19	1.14	1.24	1.05	0.66	1.65
Points lost	Yes vs no	0.58	0.52	0.65	-	-	-

Risk factors for motorized two-wheelers riders

Risk factor		Injured vs unhurt			Killed vs unhurt		
		OR	95% IC		OR	95% IC	
Gender	Woman vs man	2.31	1.92	2.78	0.36	0.08	1.52
Age	30-64 years vs < 30 years	1.04	0.94	1.15	0.82	0.55	1.22
	65+ years vs < 30 years	1.16	0.77	1.75	-	-	-
Time	Afternoon vs morning	0.94	0.84	1.05	0.80	0.50	1.26
	Evening vs morning	1.06	0.93	1.20	1.19	0.73	1.95
	Night vs morning	1.98	1.34	2.92	5.52	2.19	13.95
Day	Week-end vs week	0.91	0.80	1.03	1.20	0.78	1.86
Season	Autumn vs summer	1.03	0.90	1.18	1.04	0.59	1.85
	Winter vs summer	1.00	0.87	1.15	1.39	0.76	2.56
	Spring vs summer	0.96	0.85	1.10	1.36	0.80	2.30
Area	Extra-urban vs urban	0.69	0.56	0.85	4.20	2.55	6.92
	Motorways vs urban	0.21	0.17	0.27	1.01	0.48	2.12
Type of accident	Rear-end/multiple vs head on/side	0.66	0.57	0.77	0.38	0.18	0.81
	Single vs head on/side	2.14	1.80	2.55	2.46	1.50	4.03
	Pedestrian vs head on/side	0.10	0.08	0.11	0.10	0.03	0.34
	Other vs head on/side	1.20	1.00	1.43	0.34	0.13	0.88
Surface	Wet/slippery vs dry	1.25	1.07	1.46	0.36	0.15	0.86
Vehicle	Moped vs motorcycle	0.79	0.71	0.87	0.30	0.19	0.49

Risk factors for bicycles riders

Risk factor		Injured vs unhurt			Killed vs unhurt		
		OR	95% IC		OR	95% IC	
Gender	Woman vs man	1.45	1.10	1.91	1.03	0.45	2.39
Age	30-64 years vs < 30 years	1.66	1.25	2.21	4.13	1.16	14.68
	65+ years vs < 30 years	1.57	1.11	2.24	14.70	4.13	52.32
Time	Afternoon vs morning	0.81	0.61	1.08	0.47	0.21	1.03
	Evening vs morning	0.88	0.60	1.28	0.53	0.15	1.84
	Night vs morning	2.81	0.38	20.81	17.86	1.36	234.59
Day	Week-end vs week	0.86	0.63	1.18	0.60	0.20	1.83
Season	Autumn vs summer	0.82	0.57	1.18	0.78	0.29	2.15
	Winter vs summer	1.01	0.66	1.55	1.31	0.44	3.93
	Spring vs summer	0.76	0.53	1.08	0.73	0.26	2.06
Area	Extra-urban vs urban	1.72	0.74	4.02	25.04	4.94	126.96
	Motorways vs urban	0.12	0.01	1.47	-	-	-
Type of accident	Rear-end/multiple vs head on/side	0.99	0.61	1.60	1.76	0.62	4.99
	Single vs head on/side	1.59	1.05	2.39	-	-	-
	Pedestrian vs head on/side	0.07	0.04	0.11	0.17	0.02	1.43
	Other vs head on/side	1.38	0.89	2.14	1.01	0.30	3.34
Surface	Wet/slippery vs dry	1.92	1.08	3.43	3.40	0.83	13.85

Main findings: risk factors for injuries

The **risk of being injured** is:

higher:

- for two-wheeled vehicles riders compared to car drivers and decreases from bicycles to motorcycles to mopeds
- for women compared to men
- during the night and during the week-end
- for single-vehicle accident
- on wet or slippery road surface

lower:

- on motorways
- in pedestrian knocking down

Main findings: risk factors for dying

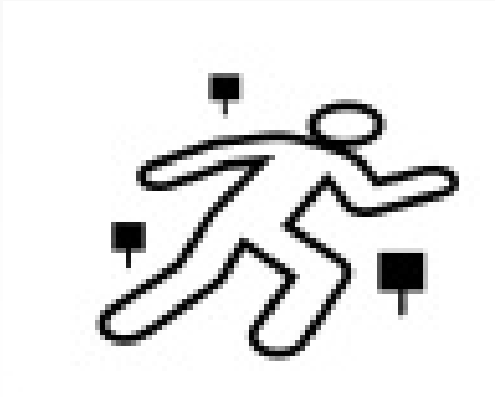
The **risk of being killed** is:

higher:

- for two-wheeled vehicles riders compared to car drivers and decreases from bicycles to motorcycles to mopeds
- for older drivers
- during the night
- on extra-urban road
- for single-vehicle accident

lower:

- in rear-end/multiple collisions and pedestrian knocking down vs head on/side crashes



Thank you!

chiaraorsi@gmail.com

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