

Correlation of road risk with selected interurban road characteristics

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Overview

- Background
- Methodology
- Model estimation results
- Discussion

Background

- Quantify impact of geometric characteristics on risk
- Highway Safety Manual
 - Accident modification factors

$$N = N_B C(AMF_1, AMF_2, \dots, AMF_n)$$

Data

- NTUA database
 - Collected by Police
 - Processed by National Statistical Organization
- Accidents (KSI) on interurban network
 - Higher accident rates
 - More homogeneous

Methodology

- Poisson regression (and relaxation)
- Independent variables
 - In/out of urban areas (1=urban)
 - Weather conditions (1=rain)
 - Directions of traffic (1=one way)
 - Number of lanes (2, 3, 4+)

Model estimation results

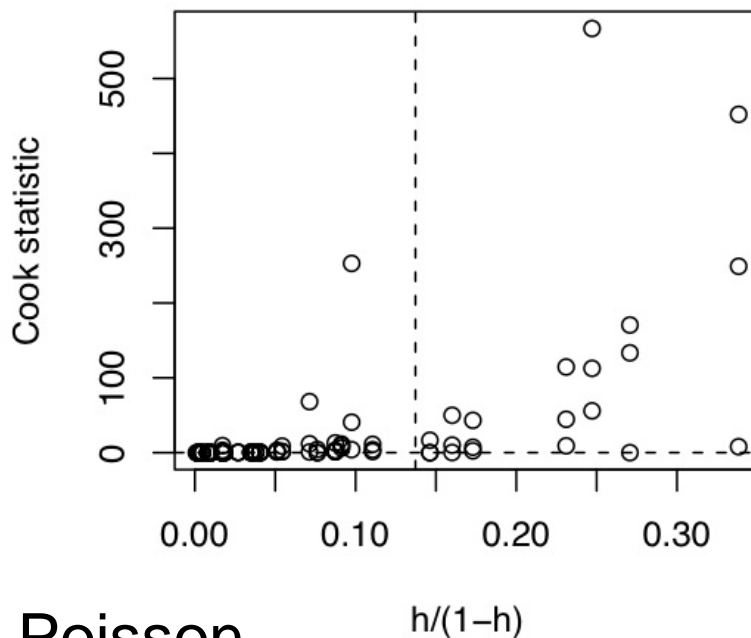
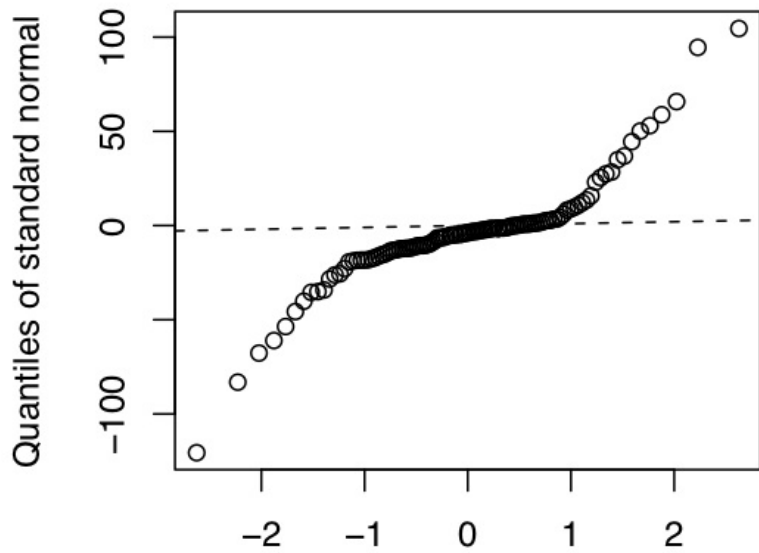
Poisson

	Coefficient estimate	Standard error	z-value
Intercept	9.195	0.005	1814.27
Out of urban areas	-0.775	0.007	-110.79
Wet pavement	-2.347	0.012	-203.46
Single direction	-1.666	0.009	-187.81
2 lanes (per direction)	-0.718	0.007	-97.45
3 lanes (per direction)	-1.827	0.011	-161.24
4+ lanes (per direction)	-4.019	0.022	-186.19
Null deviance		322295	(115 d.o.f.)
Residual deviance		75770	(109 d.o.f.)
AIC		76461	

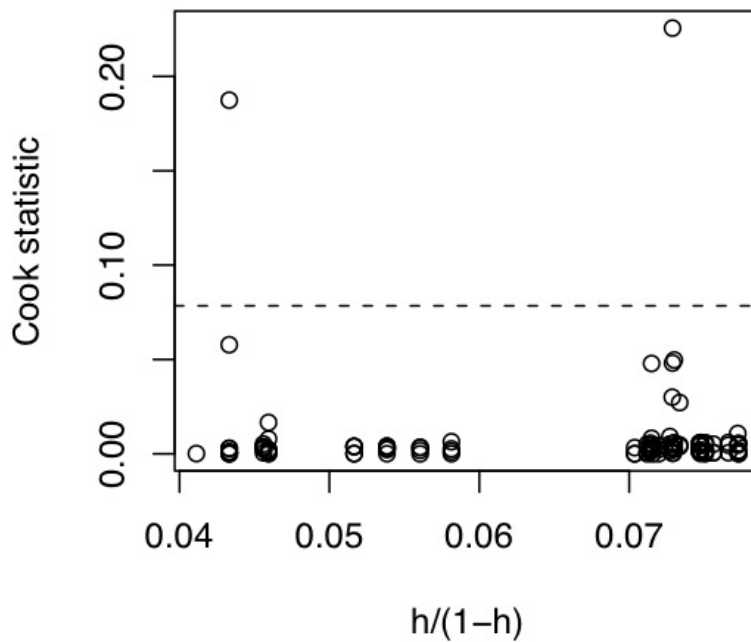
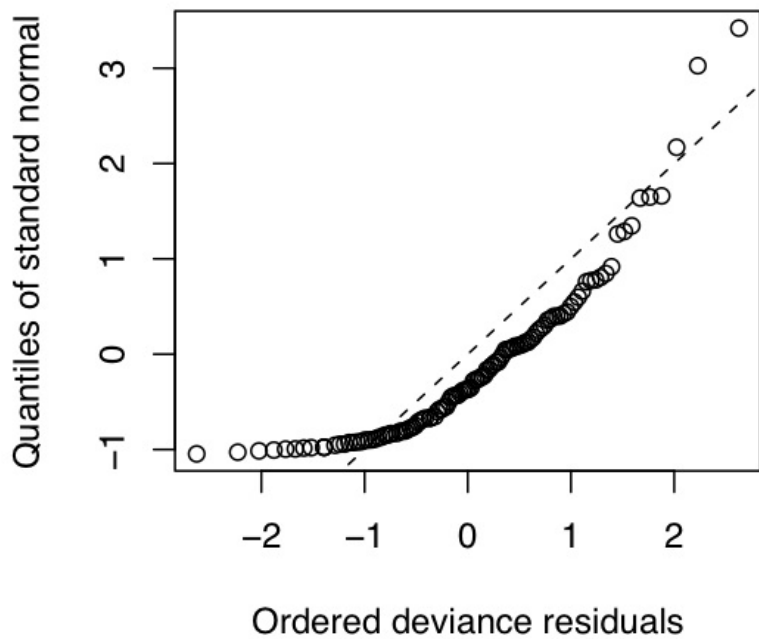
Model estimation results quasi-Poisson

	Coefficient estimate	Standard error	z-value
Intercept	9.7895	0.3587	27.295
Out of urban areas	-1.7177	0.2587	-6.64
Wet pavement	-2.3808	0.2546	-9.351
Single direction	-1.7522	0.253	-6.927
2 lanes (per direction)	-0.9062	0.3872	-2.341
3 lanes (per direction)	-2.3968	0.3888	-6.165
4+ lanes (per direction)	-4.1847	0.3474	-12.045
Null deviance		305.756	(115 d.o.f.)
Residual deviance		78.196	(109 d.o.f.)
AIC		101.81	

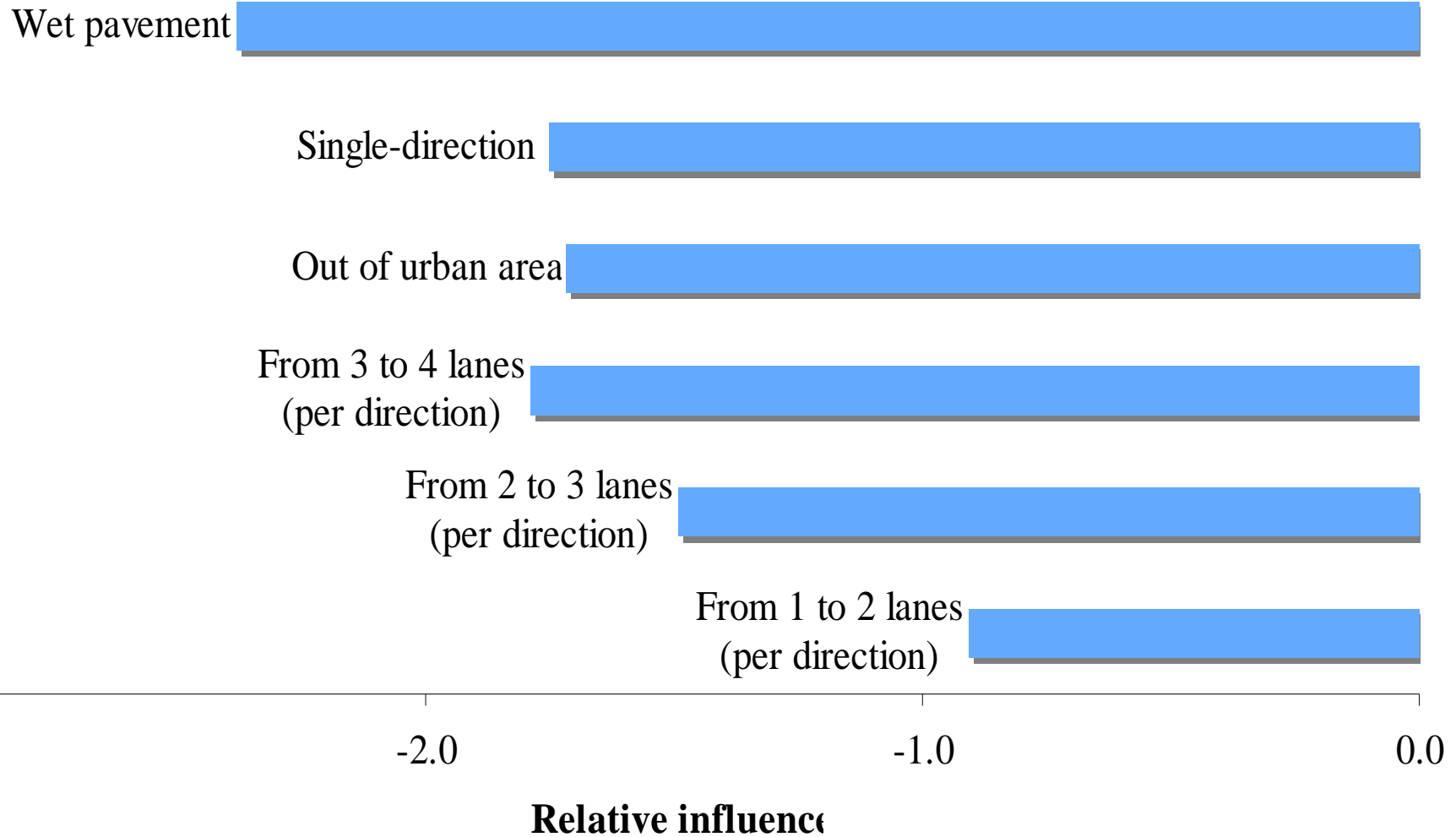
Poisson



quasi-Poisson



Relative influence



Discussion

- A pseudo-elasticity measure for discrete/factor variables
 - Allows direct comparison of influence
- Need to extend the model in terms of explanatory variables and data coverage

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