Crashes and safety critical events

all ping data

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1 Data

- 31,881 drivers
 - -18,759,300 trips,
 - -2,323,007,042 miles,
 - 65,706,497 hours travelled,
- 35008 crashes, 480331 SCEs,
 - 184,773 headways,
 - -231,101 hard brakes,
 - 55,345 collision mitigation,
 - 9,112 rolling stability,
- gender:
 - 29296 (91.89%) male,
 - -1585 (4.97%) female,
 - -1000 (3.14%) unspecified
- mean age: 44.48 (sd: 11.72), range: 20-82.

2 Quasi-Poisson models

Table 1: Quasi-Poisson regressions with the number of safety critical events per 10,000 miles predicting crashes

			Dependent variable:	riable:		
I			The number of crashes	crashes		
	(1)	(2)	(3)	(4)	(5)	(9)
sce_N	0.0003***					
sce_HW		-0.003^{***} (0.001)	0.0005^{***} (0.0001)			
sce_HB		0.006*** (0.001)		0.001*** (0.0001)		
sce_RS		0.011*** (0.003)			0.030*** (0.0002)	
$^{ m sce}$ CM		0.044*** (0.002)				0.046^{***} (0.002)
age	-0.013^{***} (0.001)	-0.013^{***} (0.001)	-0.013^{***} (0.001)	-0.013^{***} (0.001)	-0.013^{***} (0.001)	-0.013^{***} (0.001)
ping_speed	-0.020^{***} (0.002)	-0.018^{***} (0.002)	-0.020^{***} (0.002)	-0.020^{***} (0.002)	-0.020^{***} (0.002)	-0.019^{***} (0.002)
${ m genderM}$	-0.173^{***} (0.065)	-0.178^{***} (0.058)	-0.173^{***} (0.065)	-0.173^{***} (0.066)	-0.172^{**} (0.074)	-0.177^{**} (0.069)
$\operatorname{gender} \operatorname{U}$	0.255 (0.205)	0.253 (0.182)	0.255 (0.205)	0.255 (0.209)	0.254 (0.234)	0.253 (0.219)
Constant	-0.502*** (0.100)	-0.582^{***} (0.089)	-0.500^{***} (0.100)	-0.504^{***} (0.102)	-0.489^{***} (0.114)	-0.553^{***} (0.107)
Observations	31,881	31,881	31,881	31,881	31,881	31,881
Note:					*p<0.1; **p<0.05; ***p<0.01	.05; *** p<0.01

3 Bayesian negative binomial regression

The algorithm of non-Bayesian negative binomial model cannot converge.

Table 2: Bayesian negative binomial regression

V (0.001) -0.013 0.002 X (0.001) (0.001) (0.000) B (0.002) (0.001) (0.001) S (0.002) (0.001) (0.001) V (0.002) (0.001) (0.001) V (0.002) (0.001) (0.001) O (0.018) (0.001) (0.001) (0.023) O (0.012) -0.012 -0.012 -0.012 O (0.001) (0.001) (0.001) (0.001) (0.001) O (0.001) (0.001) (0.001) (0.001) (0.001) M -0.128 -0.012 -0.012 -0.012 O (0.001) (0.001) (0.001) (0.001) (0.001) M -0.128 -0.129 -0.129 -0.129 O 0.038) (0.042) (0.040) (0.043) O 0.254 0.169 (0.042) (0.042) (0.042) O 0.254		(1)	(2)	(3)	(4)	(2)	(9)
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0.026 0.016 (0.002) 0.069 0.016 (0.008) 0.233 (0.008) 0.211 (0.001) 0.0010 -0.012 -0.012 (0.001) (0.001) (0.001) (0.001) (0.001) (0.001) (0.001) (0.001) (0.002) -0.014 -0.021 -0.019 -0.020 (0.003) (0.001) (0.001) (0.001) (0.001) (0.038) (0.039) (0.042) (0.040) (0.043) (0.254 0.169 0.255 0.259 0.214 (0.096) (0.100) (0.101) (0.107) (0.098) (0.096) (0.100) (0.101) (0.107) (0.098) (0.059) (0.070) (0.061) (0.059) (0.064) 31881 31881 31881 31881 31881 500.000 500.000 500.000 500.000 31881.000 31881.000 31881.000 31881.000 3			(0.001)	(0.000)			
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1 000 1 000 1 000	nobs.1	31881.000	31881.000	31881.000	31881.000	31881.000	31881.000
0001	sigma	1.000	1.000	1.000	1.000	1.000	1.000