Preliminary analysis - aim 2
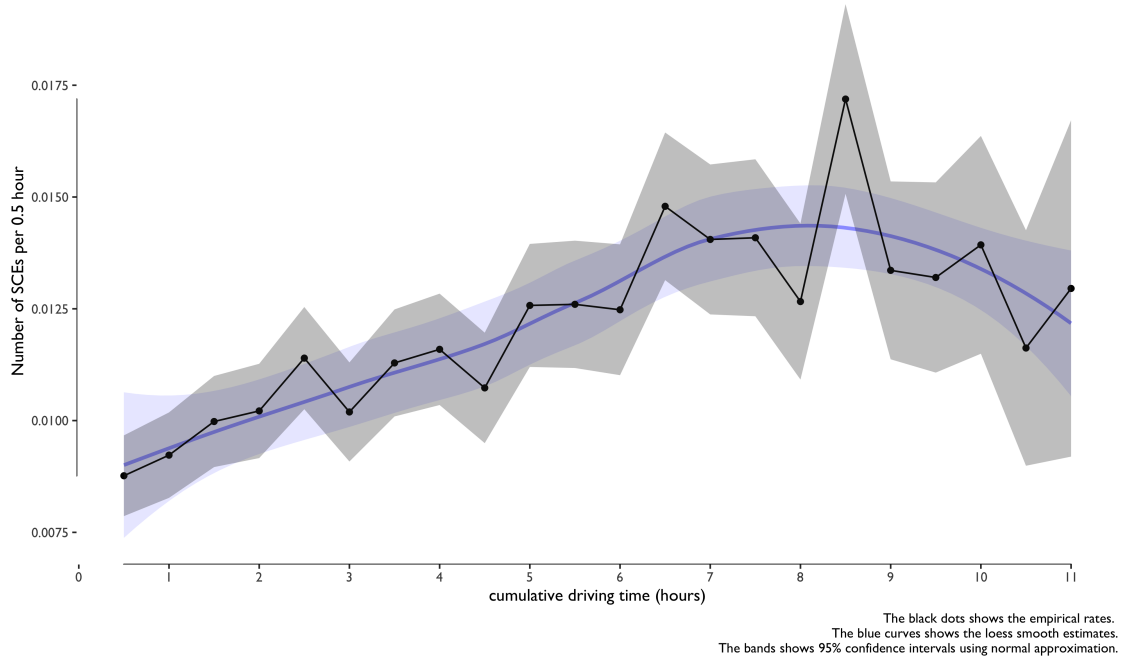

The black dots shows the empirical rates.
The blue curves shows the loess smooth estimates.
The bands shows 95% confidence intervals using normal approximation.

Figure 1: Cumulative driving time after deleting all extra-long shifts.

The black dots shows the empirical rates.
The blue curves shows the loess smooth estimates.
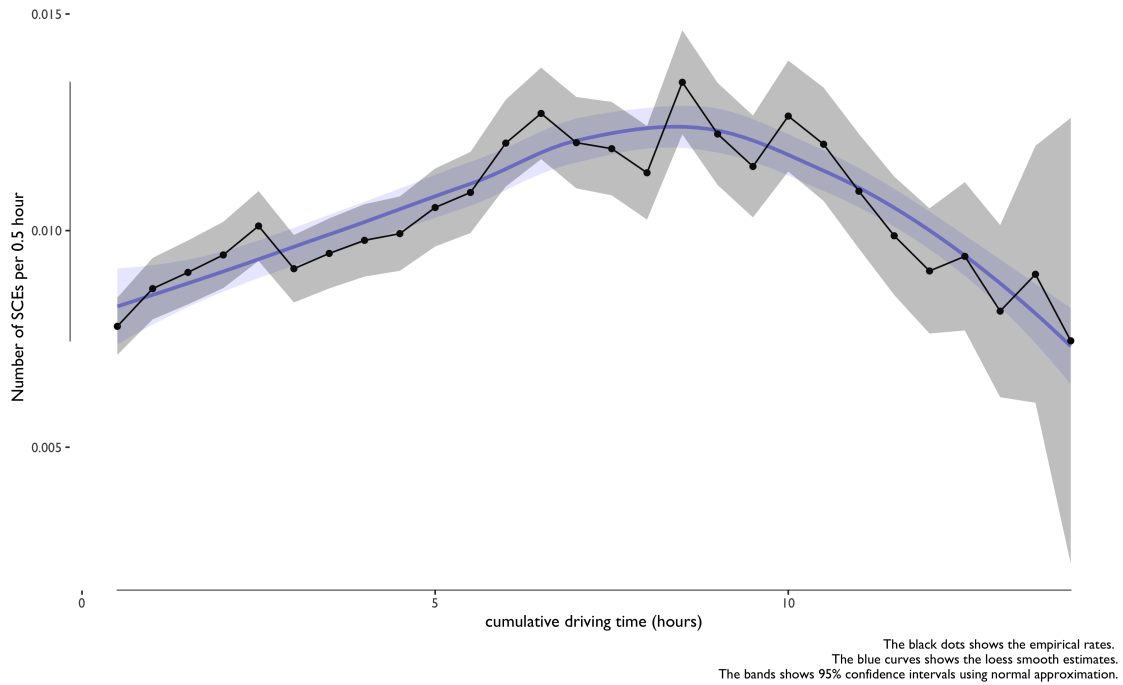The bands shows 95% confidence intervals using normal approximation.

Figure 2: Cumulative driving time with all shifts.

1 Logistic regression and Poisson

Table 1: Logistic regression and Poisson regression models

	Dependent variable:	
	At least one SCE occurred or not	The number of SCEs in the interval
	logistic	*Poisson*
	(1)	(2)
cumdrive	0.001	0.003
	(0.005)	(0.005)
speed_mean	0.006***	0.006***
	(0.001)	(0.001)
speed_sd	0.024***	0.021***
	(0.001)	(0.001)
age	−0.011***	−0.016***
	(0.001)	(0.001)
raceBlack	−0.009	−0.080***
	(0.030)	(0.028)
raceOther	0.359***	0.277***
	(0.048)	(0.046)
prep_inten	1.165	1.107*
	(0.719)	(0.652)
prep_prob	−0.175**	−0.133*
	(0.085)	(0.077)
wind_speed	−0.009**	−0.010**
	(0.004)	(0.004)
visibility	−0.036***	−0.047***
	(0.006)	(0.005)
interval_time	0.027***	
	(0.003)	
Constant	−5.350***	−7.419***
	(0.118)	(0.085)
Observations	736,222	736,222
Log Likelihood	-32,309.890	-36,445.840
Akaike Inf. Crit.	64,643.780	72,913.680

Note: *p<0.1; **p<0.05; ***p<0.01
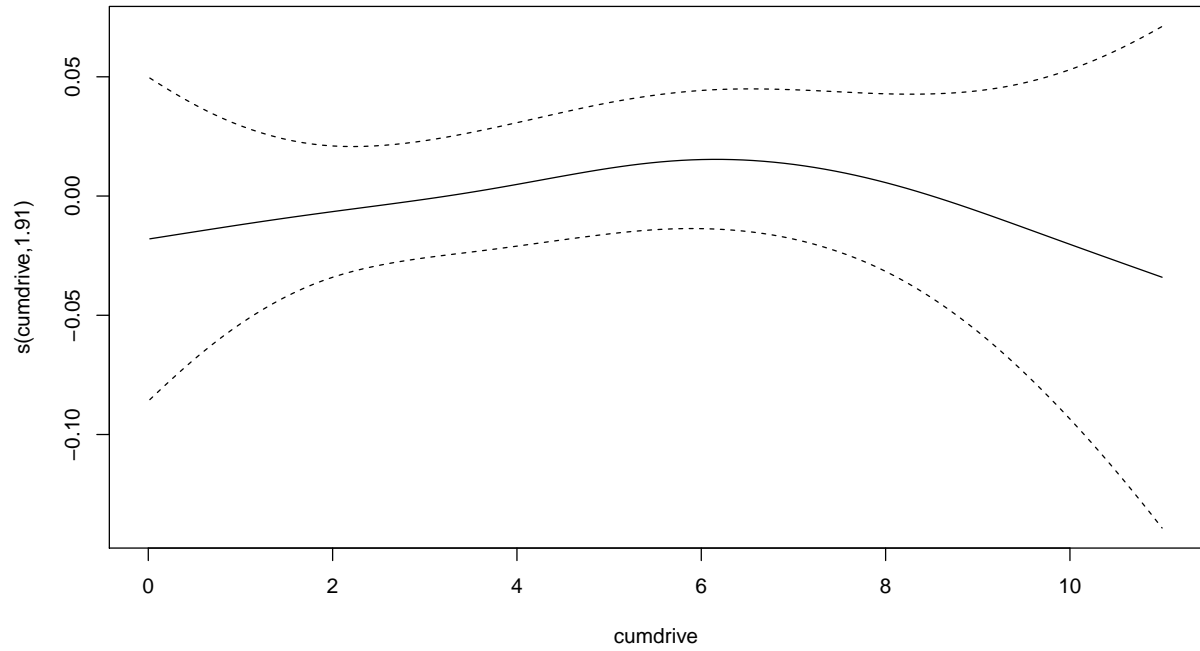
2 Generalized additive model

Figure 3: Marginal effects of cumulative driving time (in hours) on probability of SCE

Check OTR drivers. Check the number of the pings for weather.

Table 2: Hierarchical logistic and Poisson regression modeling critical events

| | *Dependent variable: critical events (binary and count))* | | | |
| | CE_binary | | nCE | |
	(1)	(2)	(3)	(4)
cumdrive	0.0001	−0.0001	0.0003***	−0.00003
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
speed_mean	0.009***	0.010***	0.011***	0.012***
	(0.001)	(0.001)	(0.001)	(0.001)
speed_sd	0.027***	0.027***	0.025***	0.025***
	(0.001)	(0.001)	(0.001)	(0.001)
age	−0.008*	−0.008*	−0.009**	−0.010**
	(0.004)	(0.004)	(0.004)	(0.004)
raceBlack	0.079	0.077	0.082	0.080
	(0.106)	(0.106)	(0.110)	(0.110)
raceOther	0.380**	0.378**	0.366*	0.365*
	(0.181)	(0.182)	(0.189)	(0.189)
prep_inten	1.879***	1.868**	1.995***	1.987***
	(0.726)	(0.727)	(0.652)	(0.652)
prep_prob	−0.075	−0.070	0.008	0.017
	(0.086)	(0.086)	(0.077)	(0.077)
wind_speed	−0.018***	−0.019***	−0.019***	−0.019***
	(0.005)	(0.005)	(0.004)	(0.004)
visibility	−0.001	−0.0005	−0.001	−0.00003
	(0.007)	(0.007)	(0.006)	(0.006)
Constant	−5.579***	−5.542***	−5.565***	−5.511***
	(0.233)	(0.234)	(0.240)	(0.241)
Observations	736,222	736,222	736,222	736,222
Log Likelihood	−30,277.220	−30,203.690	−33,105.820	−32,970.920
Akaike Inf. Crit.	60,578.450	60,435.370	66,235.650	65,969.840
Bayesian Inf. Crit.	60,716.560	60,596.500	66,373.760	66,130.970

Note: *p<0.1; **p<0.05; ***p<0.01