. // Model C.SSV.2

.

. // poisson model

. glm dv `ss\_lag\_1\_vars' `covariates' ib(freq).state ib(freq).time, family(poisson) link(log) vce(cl mineid) exposure(hours) iter(50) eform

Iteration 0: log pseudolikelihood = -23355.128

Iteration 1: log pseudolikelihood = -20950.077

Iteration 2: log pseudolikelihood = -20940.577

Iteration 3: log pseudolikelihood = -20940.572

Iteration 4: log pseudolikelihood = -20940.572

Generalized linear models No. of obs = 6,253

Optimization : ML Residual df = 6,221

Scale parameter = 1

Deviance = 22353.16361 (1/df) Deviance = 3.593179

Pearson = 27618.24598 (1/df) Pearson = 4.439519

Variance function: V(u) = u [Poisson]

Link function : g(u) = ln(u) [Log]

AIC = 6.708003

Log pseudolikelihood = -20940.57191 BIC = -32023.46

(Std. Err. adjusted for 1,238 clusters in mineid)

-----------------------------------------------------------------------------------

| Robust

dv | IRR Std. Err. z P>|z| [95% Conf. Interval]

------------------+----------------------------------------------------------------

p48\_ss\_1lag | .9983437 .0201619 -0.08 0.935 .9595989 1.038653

p75\_ss\_1lag | 1.001002 .0005152 1.95 0.052 .9999928 1.002012

mine\_time | 1.007301 .0066121 1.11 0.268 .9944248 1.020345

onsite\_insp\_hours | .9998118 .0000398 -4.73 0.000 .9997338 .9998898

|

state |

1 | .9470053 .0877927 -0.59 0.557 .789662 1.1357

2 | 1.626678 .086167 9.19 0.000 1.466265 1.804641

3 | .6586571 .0675214 -4.07 0.000 .5387651 .8052288

4 | 1.255333 .1090836 2.62 0.009 1.058749 1.488419

5 | 1.093336 .1352196 0.72 0.471 .8579866 1.393244

6 | .9830199 .0546311 -0.31 0.758 .8815704 1.096144

7 | 1.123332 .1664903 0.78 0.433 .8401383 1.501986

8 | .5065797 .0201084 -17.13 0.000 .468662 .5475651

9 | .6534043 .0282683 -9.84 0.000 .6002833 .711226

10 | .887345 .0554288 -1.91 0.056 .7850936 1.002914

11 | 1.712488 .3309056 2.78 0.005 1.172598 2.500956

12 | 1.012466 .0932225 0.13 0.893 .8452916 1.212704

13 | 1.544374 .1583912 4.24 0.000 1.263145 1.888217

14 | .4239472 .0643037 -5.66 0.000 .3149218 .570717

15 | .8051859 .0627709 -2.78 0.005 .6910953 .9381113

17 | .675046 .0248942 -10.66 0.000 .6279759 .7256442

|

time |

2000 | 1.057156 .0420845 1.40 0.163 .9778077 1.142943

2002 | .9638128 .0363547 -0.98 0.328 .895129 1.037767

2003 | .843259 .0331061 -4.34 0.000 .7808059 .9107074

2004 | .8112388 .0355357 -4.78 0.000 .7444962 .8839647

2005 | .7596352 .0393335 -5.31 0.000 .6863258 .8407751

2006 | .7264973 .0387755 -5.99 0.000 .6543387 .8066134

2007 | .7410255 .0426795 -5.20 0.000 .6619238 .82958

2008 | .7087021 .0415883 -5.87 0.000 .6317035 .7950862

2009 | .6255791 .0376742 -7.79 0.000 .5559303 .7039536

2010 | .6095631 .0407645 -7.40 0.000 .5346808 .6949326

2011 | .5571548 .0355582 -9.16 0.000 .4916448 .6313939

2012 | .4967488 .0342642 -10.14 0.000 .4339338 .5686567

2013 | .4796707 .0378392 -9.31 0.000 .4109562 .5598748

2014 | .5042795 .0433099 -7.97 0.000 .4261536 .596728

2015 | .4760718 .042534 -8.31 0.000 .3995978 .5671812

|

\_cons | .000094 5.17e-06 -168.58 0.000 .0000844 .0001047

ln(hours) | 1 (exposure)

-----------------------------------------------------------------------------------

.

. quietly poisson dv `ss\_lag\_1\_vars' `covariates' ib(freq).state ib(freq).time, vce(cl mineid) exposure(hours) iter(50) irr

. est store pois

. estat gof

Deviance goodness-of-fit = 22353.16

Prob > chi2(6221) = 0.0000

Pearson goodness-of-fit = 27618.25

Prob > chi2(6221) = 0.0000

.

. pause "next"

.

. // negative binomial model

. glm dv `ss\_lag\_1\_vars' `covariates' ib(freq).state ib(freq).time, family(nbinomial) link(log) vce(cl mineid) exposure(hours) iter(50) eform

Iteration 0: log pseudolikelihood = -17730.179

Iteration 1: log pseudolikelihood = -17506.828

Iteration 2: log pseudolikelihood = -17501.793

Iteration 3: log pseudolikelihood = -17501.783

Iteration 4: log pseudolikelihood = -17501.783

Generalized linear models No. of obs = 6,253

Optimization : ML Residual df = 6,221

Scale parameter = 1

Deviance = 3915.596225 (1/df) Deviance = .6294159

Pearson = 5294.990645 (1/df) Pearson = .8511478

Variance function: V(u) = u+(1)u^2 [Neg. Binomial]

Link function : g(u) = ln(u) [Log]

AIC = 5.608119

Log pseudolikelihood = -17501.7833 BIC = -50461.02

(Std. Err. adjusted for 1,238 clusters in mineid)

-----------------------------------------------------------------------------------

| Robust

dv | IRR Std. Err. z P>|z| [95% Conf. Interval]

------------------+----------------------------------------------------------------

p48\_ss\_1lag | .985938 .0207184 -0.67 0.500 .9461556 1.027393

p75\_ss\_1lag | 1.0029 .0006079 4.78 0.000 1.001709 1.004092

mine\_time | 1.009884 .0061743 1.61 0.108 .9978553 1.022058

onsite\_insp\_hours | .9997704 .00004 -5.74 0.000 .999692 .9998488

|

state |

1 | .8008287 .0985224 -1.81 0.071 .6292454 1.019199

2 | 1.086682 .05261 1.72 0.086 .9883096 1.194847

3 | .6866032 .0853868 -3.02 0.002 .5380832 .8761173

4 | 1.046559 .0700821 0.68 0.497 .917833 1.193339

5 | .8797541 .0816652 -1.38 0.168 .7334095 1.0553

6 | .7719759 .0382782 -5.22 0.000 .7004823 .8507664

7 | 1.077525 .2266036 0.36 0.723 .713542 1.627178

8 | .5021591 .0197794 -17.49 0.000 .4648507 .5424617

9 | .5533584 .0247469 -13.23 0.000 .5069204 .6040506

10 | .7612682 .0834586 -2.49 0.013 .6140725 .9437474

11 | 1.49229 .2756127 2.17 0.030 1.039068 2.1432

12 | 1.021075 .0782443 0.27 0.785 .8786793 1.186546

13 | 1.545544 .1767643 3.81 0.000 1.235177 1.933898

14 | .419083 .0726326 -5.02 0.000 .298384 .5886057

15 | .7077723 .0404129 -6.05 0.000 .6328358 .7915822

17 | .6258338 .0244141 -12.01 0.000 .5797665 .6755615

|

time |

2000 | 1.028974 .0594176 0.49 0.621 .9188656 1.152276

2002 | .9072523 .0514701 -1.72 0.086 .811779 1.013954

2003 | .8513042 .0629669 -2.18 0.030 .7364198 .9841109

2004 | .7678334 .048977 -4.14 0.000 .6775982 .8700852

2005 | .6897008 .0443359 -5.78 0.000 .6080554 .782309

2006 | .6780628 .0450823 -5.84 0.000 .5952181 .7724382

2007 | .6682925 .047636 -5.65 0.000 .5811561 .7684939

2008 | .6071728 .0443685 -6.83 0.000 .5261526 .700669

2009 | .5563572 .0418092 -7.80 0.000 .4801617 .6446439

2010 | .5489652 .0414022 -7.95 0.000 .4735308 .6364163

2011 | .5156769 .0381105 -8.96 0.000 .4461394 .5960529

2012 | .4638276 .0385601 -9.24 0.000 .3940872 .5459097

2013 | .4709194 .0413299 -8.58 0.000 .3964984 .5593088

2014 | .4510292 .0385606 -9.31 0.000 .3814445 .5333078

2015 | .4237723 .0375558 -9.69 0.000 .3562025 .5041598

|

\_cons | .0001114 7.87e-06 -128.95 0.000 .000097 .000128

ln(hours) | 1 (exposure)

-----------------------------------------------------------------------------------

.

. pause "next"

.

. eststo clear

. eststo: nbreg dv `ss\_lag\_1\_vars' `covariates' ib(freq).state ib(freq).time, vce(cl mineid) exposure(hours) iter(50) irr

Fitting Poisson model:

Iteration 0: log pseudolikelihood = -22240.503

Iteration 1: log pseudolikelihood = -20949.468

Iteration 2: log pseudolikelihood = -20940.579

Iteration 3: log pseudolikelihood = -20940.572

Iteration 4: log pseudolikelihood = -20940.572

Fitting constant-only model:

Iteration 0: log pseudolikelihood = -17884.199

Iteration 1: log pseudolikelihood = -17442.363

Iteration 2: log pseudolikelihood = -17390.126

Iteration 3: log pseudolikelihood = -17389.648

Iteration 4: log pseudolikelihood = -17389.648

Fitting full model:

Iteration 0: log pseudolikelihood = -16875.925

Iteration 1: log pseudolikelihood = -16740.981

Iteration 2: log pseudolikelihood = -16727.457

Iteration 3: log pseudolikelihood = -16727.411

Iteration 4: log pseudolikelihood = -16727.411

Negative binomial regression Number of obs = 6,253

Wald chi2(31) = .

Dispersion = mean Prob > chi2 = .

Log pseudolikelihood = -16727.411 Pseudo R2 = 0.0381

(Std. Err. adjusted for 1,238 clusters in mineid)

-----------------------------------------------------------------------------------

| Robust

dv | IRR Std. Err. z P>|z| [95% Conf. Interval]

------------------+----------------------------------------------------------------

p48\_ss\_1lag | .9843814 .0198318 -0.78 0.435 .9462692 1.024029

p75\_ss\_1lag | 1.00261 .0005778 4.52 0.000 1.001478 1.003743

mine\_time | 1.00743 .0056813 1.31 0.189 .9963557 1.018627

onsite\_insp\_hours | .9997831 .0000396 -5.48 0.000 .9997056 .9998607

|

state |

1 | .8266722 .0924708 -1.70 0.089 .6639246 1.029314

2 | 1.22734 .056824 4.42 0.000 1.120871 1.343923

3 | .677621 .0837708 -3.15 0.002 .5318109 .8634089

4 | 1.063393 .0671189 0.97 0.330 .9396538 1.203427

5 | .9084422 .0853305 -1.02 0.307 .7556895 1.092072

6 | .8004143 .0375565 -4.74 0.000 .7300882 .8775145

7 | 1.063759 .204368 0.32 0.748 .7299808 1.550154

8 | .5014423 .0183233 -18.89 0.000 .4667853 .5386725

9 | .5829214 .0240181 -13.10 0.000 .5376975 .631949

10 | .7795811 .0710269 -2.73 0.006 .6520924 .9319947

11 | 1.530435 .2775033 2.35 0.019 1.072686 2.183522

12 | 1.079739 .0772953 1.07 0.284 .9383905 1.242378

13 | 1.514307 .160556 3.91 0.000 1.230168 1.864076

14 | .4179348 .0724888 -5.03 0.000 .2974895 .5871451

15 | .7338622 .0398719 -5.70 0.000 .6597319 .8163222

17 | .6423076 .0231864 -12.26 0.000 .5984334 .6893984

|

time |

2000 | 1.046476 .0494568 0.96 0.336 .9538962 1.148041

2002 | .9318153 .0427157 -1.54 0.123 .851745 1.019413

2003 | .8451627 .0477891 -2.98 0.003 .7565015 .944215

2004 | .7900172 .0411546 -4.52 0.000 .7133368 .8749404

2005 | .7145685 .0394851 -6.08 0.000 .6412226 .7963041

2006 | .7020497 .0399515 -6.22 0.000 .6279551 .7848869

2007 | .6995619 .0432291 -5.78 0.000 .6197643 .7896339

2008 | .6307268 .0394325 -7.37 0.000 .557988 .7129477

2009 | .5701324 .0367258 -8.72 0.000 .5025098 .646855

2010 | .566296 .0379474 -8.49 0.000 .4965976 .6457766

2011 | .5281081 .0342677 -9.84 0.000 .46504 .5997293

2012 | .4685878 .0332591 -10.68 0.000 .4077321 .5385264

2013 | .4618818 .034492 -10.34 0.000 .3989933 .5346828

2014 | .459802 .0352707 -10.13 0.000 .3956183 .5343985

2015 | .4412067 .0355153 -10.17 0.000 .3768114 .5166069

|

\_cons | .0001072 6.37e-06 -153.83 0.000 .0000954 .0001204

ln(hours) | 1 (exposure)

------------------+----------------------------------------------------------------

/lnalpha | -1.176785 .0600221 -1.294427 -1.059144

------------------+----------------------------------------------------------------

alpha | .3082681 .0185029 .274055 .3467525

-----------------------------------------------------------------------------------

(est1 stored)

. esttab using `"`directory'Model.`injury\_label'.`time\_label'.`violation\_level\_label'.C.SSV.2.csv"', replace plain wide p eform

(note: file C:\Users\jbodson\Dropbox (Stanford Law School)\R-code\Injury-Classification\PS Model Summaries 10-10\Estout\Model.PS.Y.P.C.SSV.2.csv not found)

(output written to C:\Users\jbodson\Dropbox (Stanford Law School)\R-code\Injury-Classification\PS Model Summaries 10-10\Estout\Model.PS.Y.P.C.SSV.2.csv)

. est store nbin

.

. pause "next"

.

. // test for over-dispersion

. lrtest pois nbin, stats force

Likelihood-ratio test LR chi2(1) = 8426.32

(Assumption: pois nested in nbin) Prob > chi2 = 0.0000

Akaike's information criterion and Bayesian information criterion

-----------------------------------------------------------------------------

Model | Obs ll(null) ll(model) df AIC BIC

-------------+---------------------------------------------------------------

pois | 6,253 -24975.69 -20940.57 32 41945.14 42160.85

nbin | 6,253 -17389.65 -16727.41 33 33520.82 33743.27

-----------------------------------------------------------------------------

Note: N=Obs used in calculating BIC; see [R] BIC note.

.

. pause "next"

.

. // final model + diagnostics/assessment

. quietly nbreg dv `ss\_lag\_1\_vars' `covariates' ib(freq).state ib(freq).time, vce(cl mineid) exposure(hours) iter(50) irr

. predict cssv2\_yhat

(option n assumed; predicted number of events)

. gen cssv2\_res = dv - cssv2\_yhat

.

. summ dv cssv2\_yhat

Variable | Obs Mean Std. Dev. Min Max

-------------+---------------------------------------------------------

dv | 6,253 9.976651 14.85334 0 200

cssv2\_yhat | 6,253 10.65929 15.90749 .0035857 166.6452

. /\*

> pause "next"

>

> scatter dv cssv2\_yhat

>

> pause "next"

>

> scatter cssv2\_res dv

>

> pause "next"

>

> scatter cssv2\_res cssv2\_yhat

> \*/

. pause "complete: C.SSV.2"