. // Model C.SSV.3

.

. // poisson model

. glm dv `ss\_lag\_4\_vars' `covariates' ib(freq).state ib(freq).time, family(poisson) link(log) vce(cl mineid) exposure(hours) iter(50) eform

Iteration 0: log pseudolikelihood = -23367.996

Iteration 1: log pseudolikelihood = -20969.804

Iteration 2: log pseudolikelihood = -20960.301

Iteration 3: log pseudolikelihood = -20960.296

Iteration 4: log pseudolikelihood = -20960.296

Generalized linear models No. of obs = 6,253

Optimization : ML Residual df = 6,221

Scale parameter = 1

Deviance = 22392.61155 (1/df) Deviance = 3.59952

Pearson = 27671.93237 (1/df) Pearson = 4.448149

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

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

AIC = 6.714312

Log pseudolikelihood = -20960.29588 BIC = -31984.01

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

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

| Robust

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

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

p48\_ss\_c\_4lag | 1.00289 .0078604 0.37 0.713 .9876021 1.018415

p75\_ss\_c\_4lag | 1.000188 .0001281 1.47 0.142 .999937 1.000439

mine\_time | 1.007064 .0066784 1.06 0.288 .9940591 1.020239

onsite\_insp\_hours | .999823 .0000401 -4.41 0.000 .9997443 .9999017

|

state |

1 | .9448855 .0881576 -0.61 0.543 .7869774 1.134478

2 | 1.626819 .0862437 9.18 0.000 1.46627 1.804948

3 | .6541537 .0673349 -4.12 0.000 .5346405 .8003827

4 | 1.249526 .1052895 2.64 0.008 1.059302 1.473909

5 | 1.085995 .1336557 0.67 0.503 .853235 1.382251

6 | .9787352 .054136 -0.39 0.698 .8781798 1.090805

7 | 1.123091 .1657389 0.79 0.432 .8410078 1.499789

8 | .5017333 .0195516 -17.70 0.000 .4648397 .541555

9 | .6488642 .0280534 -10.00 0.000 .5961456 .7062447

10 | .8872813 .0573195 -1.85 0.064 .7817585 1.007048

11 | 1.714689 .3273047 2.82 0.005 1.179521 2.492672

12 | 1.003502 .093248 0.04 0.970 .8364164 1.203966

13 | 1.538273 .158242 4.19 0.000 1.257391 1.881899

14 | .420287 .0640525 -5.69 0.000 .3117606 .5665921

15 | .8026984 .062647 -2.82 0.005 .6888425 .9353731

17 | .6655576 .0249881 -10.84 0.000 .6183405 .7163803

|

time |

2000 | 1.067694 .0448994 1.56 0.119 .9832221 1.159424

2002 | .9602432 .0365848 -1.06 0.287 .8911501 1.034693

2003 | .84176 .0333969 -4.34 0.000 .7787836 .9098291

2004 | .811154 .0356577 -4.76 0.000 .7441923 .8841409

2005 | .7585979 .0394308 -5.32 0.000 .6851212 .8399547

2006 | .7257077 .0390794 -5.95 0.000 .653017 .80649

2007 | .7376285 .0427576 -5.25 0.000 .6584105 .8263779

2008 | .7063379 .0417995 -5.87 0.000 .628985 .7932037

2009 | .6218981 .0380501 -7.76 0.000 .5516194 .7011307

2010 | .6073266 .0409896 -7.39 0.000 .5320753 .6932207

2011 | .5521078 .035737 -9.18 0.000 .4863255 .6267881

2012 | .4922317 .034456 -10.13 0.000 .429127 .5646162

2013 | .4757832 .0380433 -9.29 0.000 .4067687 .556507

2014 | .4994291 .0436579 -7.94 0.000 .4207901 .5927645

2015 | .4702576 .0424124 -8.37 0.000 .3940634 .5611844

|

\_cons | .0000948 5.25e-06 -167.15 0.000 .0000851 .0001057

ln(hours) | 1 (exposure)

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

.

. quietly poisson dv `ss\_lag\_4\_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 = 22392.61

Prob > chi2(6221) = 0.0000

Pearson goodness-of-fit = 27671.93

Prob > chi2(6221) = 0.0000

.

. pause "next"

.

. // negative binomial model

. glm dv `ss\_lag\_4\_vars' `covariates' ib(freq).state ib(freq).time, family(nbinomial) link(log) vce(cl mineid) exposure(hours) iter(50) eform

Iteration 0: log pseudolikelihood = -17732.757

Iteration 1: log pseudolikelihood = -17509.015

Iteration 2: log pseudolikelihood = -17503.951

Iteration 3: log pseudolikelihood = -17503.941

Iteration 4: log pseudolikelihood = -17503.941

Generalized linear models No. of obs = 6,253

Optimization : ML Residual df = 6,221

Scale parameter = 1

Deviance = 3919.912218 (1/df) Deviance = .6301097

Pearson = 5291.819633 (1/df) Pearson = .8506381

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

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

AIC = 5.608809

Log pseudolikelihood = -17503.9413 BIC = -50456.71

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

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

| Robust

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

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

p48\_ss\_c\_4lag | 1.00266 .0080925 0.33 0.742 .986924 1.018647

p75\_ss\_c\_4lag | 1.000692 .0001634 4.24 0.000 1.000372 1.001013

mine\_time | 1.008985 .0062131 1.45 0.146 .9968803 1.021236

onsite\_insp\_hours | .9997777 .0000403 -5.52 0.000 .9996987 .9998567

|

state |

1 | .7956141 .0990475 -1.84 0.066 .6233539 1.015477

2 | 1.086219 .0528508 1.70 0.089 .9874193 1.194905

3 | .6843972 .0850421 -3.05 0.002 .5364624 .8731266

4 | 1.044511 .0692437 0.66 0.511 .9172432 1.189438

5 | .8773369 .0820044 -1.40 0.161 .7304742 1.053727

6 | .7710608 .0381637 -5.25 0.000 .6997749 .8496087

7 | 1.07605 .225559 0.35 0.727 .713519 1.622778

8 | .4999319 .0196755 -17.62 0.000 .4628184 .5400215

9 | .5502896 .0247036 -13.31 0.000 .5039404 .6009018

10 | .7600177 .0822955 -2.53 0.011 .6146879 .9397076

11 | 1.510611 .2794059 2.23 0.026 1.051266 2.170664

12 | 1.016648 .0778676 0.22 0.829 .8749336 1.181317

13 | 1.544713 .1767264 3.80 0.000 1.234424 1.932998

14 | .4196198 .0733498 -4.97 0.000 .2978965 .5910804

15 | .7071188 .0404427 -6.06 0.000 .6321339 .7909985

17 | .6174595 .0242946 -12.25 0.000 .5716326 .6669602

|

time |

2000 | 1.051335 .0609855 0.86 0.388 .9383503 1.177924

2002 | .900608 .0510288 -1.85 0.065 .8059468 1.006388

2003 | .8479739 .0627668 -2.23 0.026 .7334606 .9803658

2004 | .7666373 .0490531 -4.15 0.000 .6762792 .8690681

2005 | .6873063 .0443254 -5.81 0.000 .6056965 .7799118

2006 | .6788536 .0453397 -5.80 0.000 .59556 .7737964

2007 | .6657837 .0474743 -5.70 0.000 .5789451 .7656475

2008 | .6070727 .0444936 -6.81 0.000 .5258409 .7008531

2009 | .5533642 .0416715 -7.86 0.000 .4774311 .6413742

2010 | .5491823 .041468 -7.94 0.000 .4736347 .6367802

2011 | .5121249 .0378887 -9.05 0.000 .4429974 .5920393

2012 | .4612624 .0383857 -9.30 0.000 .391843 .5429802

2013 | .4684727 .0411603 -8.63 0.000 .3943638 .556508

2014 | .4494631 .038559 -9.32 0.000 .3799009 .5317626

2015 | .4207084 .0373213 -9.76 0.000 .3535661 .5006011

|

\_cons | .0001125 7.94e-06 -128.80 0.000 .000098 .0001292

ln(hours) | 1 (exposure)

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

.

. pause "next"

.

. eststo clear

. eststo: nbreg dv `ss\_lag\_4\_vars' `covariates' ib(freq).state ib(freq).time, vce(cl mineid) exposure(hours) iter(50) irr

Fitting Poisson model:

Iteration 0: log pseudolikelihood = -22213.106

Iteration 1: log pseudolikelihood = -20968.374

Iteration 2: log pseudolikelihood = -20960.302

Iteration 3: log pseudolikelihood = -20960.296

Iteration 4: log pseudolikelihood = -20960.296

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 = -16879.254

Iteration 1: log pseudolikelihood = -16745.992

Iteration 2: log pseudolikelihood = -16733.085

Iteration 3: log pseudolikelihood = -16733.043

Iteration 4: log pseudolikelihood = -16733.043

Negative binomial regression Number of obs = 6,253

Wald chi2(31) = .

Dispersion = mean Prob > chi2 = .

Log pseudolikelihood = -16733.043 Pseudo R2 = 0.0378

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

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

| Robust

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

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

p48\_ss\_c\_4lag | 1.001283 .0077619 0.17 0.869 .986185 1.016612

p75\_ss\_c\_4lag | 1.000617 .0001548 3.99 0.000 1.000314 1.00092

mine\_time | 1.006634 .0057237 1.16 0.245 .9954777 1.017915

onsite\_insp\_hours | .999791 .0000398 -5.25 0.000 .999713 .999869

|

state |

1 | .8215983 .0930704 -1.73 0.083 .6580149 1.025849

2 | 1.227899 .057221 4.41 0.000 1.120717 1.345331

3 | .6754888 .0835914 -3.17 0.002 .5300079 .8609024

4 | 1.061458 .066217 0.96 0.339 .939295 1.199508

5 | .9061301 .0857237 -1.04 0.297 .7527718 1.090731

6 | .7989542 .0374536 -4.79 0.000 .7288178 .87584

7 | 1.062739 .2035107 0.32 0.751 .730171 1.54678

8 | .4989116 .0183034 -18.95 0.000 .464297 .5361069

9 | .5799013 .0240573 -13.13 0.000 .5346158 .6290228

10 | .7793142 .0706164 -2.75 0.006 .6525026 .9307711

11 | 1.546714 .2808999 2.40 0.016 1.083484 2.207991

12 | 1.074677 .0769582 1.01 0.315 .9339483 1.23661

13 | 1.513654 .160784 3.90 0.000 1.229165 1.863989

14 | .417757 .0731171 -4.99 0.000 .2964449 .5887129

15 | .7328433 .0399171 -5.71 0.000 .6586387 .8154081

17 | .6341356 .0232466 -12.43 0.000 .5901714 .6813747

|

time |

2000 | 1.068945 .0509232 1.40 0.162 .973655 1.17356

2002 | .9252968 .0425045 -1.69 0.091 .8456297 1.012469

2003 | .8420029 .0478303 -3.03 0.002 .7532875 .9411663

2004 | .7884658 .0413017 -4.54 0.000 .7115329 .873717

2005 | .7120759 .0396007 -6.11 0.000 .6385403 .79408

2006 | .7026072 .0402745 -6.16 0.000 .6279434 .7861487

2007 | .696947 .043223 -5.82 0.000 .6171778 .7870263

2008 | .6304068 .0395703 -7.35 0.000 .5574313 .7129357

2009 | .5670974 .0367501 -8.75 0.000 .4994552 .6439004

2010 | .5661135 .0380521 -8.46 0.000 .4962365 .64583

2011 | .52422 .0341409 -9.92 0.000 .4613997 .5955934

2012 | .4656958 .0331996 -10.72 0.000 .4049673 .5355312

2013 | .4593266 .0344642 -10.37 0.000 .39651 .5320948

2014 | .4577829 .0353652 -10.11 0.000 .3934608 .5326202

2015 | .4375228 .0353284 -10.24 0.000 .3734816 .5125453

|

\_cons | .0001082 6.47e-06 -152.75 0.000 .0000963 .0001217

ln(hours) | 1 (exposure)

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

/lnalpha | -1.172917 .0599022 -1.290323 -1.055511

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

alpha | .3094629 .0185375 .2751818 .3480146

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

(est1 stored)

. esttab using `"`directory'Model.`injury\_label'.`time\_label'.`violation\_level\_label'.C.SSV.3.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.3.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.3.csv)

. est store nbin

.

. pause "next"

.

. // test for over-dispersion

. lrtest pois nbin, stats force

Likelihood-ratio test LR chi2(1) = 8454.51

(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 -20960.3 32 41984.59 42200.3

nbin | 6,253 -17389.65 -16733.04 33 33532.09 33754.53

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

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

.

. pause "next"

.

. // final model + diagnostics/assessment

. quietly nbreg dv `ss\_lag\_4\_vars' `covariates' ib(freq).state ib(freq).time, vce(cl mineid) exposure(hours) iter(50) irr

. predict cssv3\_yhat

(option n assumed; predicted number of events)

. gen cssv3\_res = dv - cssv3\_yhat

.

. summ dv cssv3\_yhat

Variable | Obs Mean Std. Dev. Min Max

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

dv | 6,253 9.976651 14.85334 0 200

cssv3\_yhat | 6,253 10.64847 15.82427 .0035971 154.829

. /\*

> pause "next"

>

> scatter dv cssv3\_yhat

>

> pause "next"

>

> scatter cssv3\_res dv

>

> pause "next"

>

> scatter cssv3\_res cssv3\_yhat

> \*/

. pause "complete: C.SSV.3"