. // Model C.PP.2

.

. // poisson model

. glm dv `pp\_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 = -23197.796

Iteration 1: log pseudolikelihood = -20908.26

Iteration 2: log pseudolikelihood = -20900.09

Iteration 3: log pseudolikelihood = -20900.086

Iteration 4: log pseudolikelihood = -20900.086

Generalized linear models No. of obs = 6,253

Optimization : ML Residual df = 6,221

Scale parameter = 1

Deviance = 22272.19278 (1/df) Deviance = 3.580163

Pearson = 27556.88372 (1/df) Pearson = 4.429655

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

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

AIC = 6.695054

Log pseudolikelihood = -20900.08649 BIC = -32104.43

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

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

| Robust

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

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

p48\_pp\_1lag | 1.000195 .0000913 2.14 0.032 1.000017 1.000374

p75\_pp\_1lag | 1.000007 2.39e-06 2.88 0.004 1.000002 1.000012

mine\_time | 1.004922 .0064372 0.77 0.443 .9923847 1.017619

onsite\_insp\_hours | .9997974 .0000505 -4.01 0.000 .9996985 .9998964

|

state |

1 | .9777562 .093983 -0.23 0.815 .8098642 1.180454

2 | 1.673677 .0853435 10.10 0.000 1.514494 1.849591

3 | .6523809 .0671427 -4.15 0.000 .5332071 .7981903

4 | 1.234039 .1082712 2.40 0.017 1.039075 1.465585

5 | 1.073703 .1317024 0.58 0.562 .844256 1.365507

6 | .9839778 .0567768 -0.28 0.780 .8787593 1.101795

7 | 1.133363 .1695948 0.84 0.403 .8452716 1.519643

8 | .5207776 .0208257 -16.32 0.000 .4815185 .5632375

9 | .6534788 .0278669 -9.98 0.000 .6010809 .7104443

10 | .9173101 .0586385 -1.35 0.177 .809289 1.03975

11 | 1.723528 .3153618 2.98 0.003 1.204121 2.466985

12 | 1.047998 .1034537 0.47 0.635 .8636413 1.271707

13 | 1.535274 .1568288 4.20 0.000 1.256711 1.875584

14 | .4262159 .0645119 -5.63 0.000 .3168051 .5734126

15 | .8080874 .0613767 -2.81 0.005 .696317 .9377988

17 | .6704822 .0241261 -11.11 0.000 .6248249 .7194759

|

time |

2000 | 1.042177 .0426692 1.01 0.313 .9618144 1.129254

2002 | .9643683 .0368908 -0.95 0.343 .8947077 1.039453

2003 | .8462669 .0337892 -4.18 0.000 .7825663 .9151528

2004 | .8226732 .0361762 -4.44 0.000 .7547387 .8967225

2005 | .7753632 .0407168 -4.84 0.000 .6995292 .8594181

2006 | .7393338 .0398977 -5.60 0.000 .6651292 .821817

2007 | .724029 .0420555 -5.56 0.000 .6461206 .8113315

2008 | .6542057 .0400739 -6.93 0.000 .5801939 .7376586

2009 | .5785042 .0360092 -8.79 0.000 .5120627 .6535667

2010 | .570584 .0389982 -8.21 0.000 .4990474 .6523752

2011 | .5217738 .0335553 -10.12 0.000 .4599828 .5918655

2012 | .4647244 .0321229 -11.09 0.000 .4058433 .5321481

2013 | .4482118 .0338407 -10.63 0.000 .3865595 .5196971

2014 | .4730358 .0401689 -8.82 0.000 .400509 .5586963

2015 | .4452388 .0404091 -8.92 0.000 .3726828 .5319204

|

\_cons | .000098 5.63e-06 -160.82 0.000 .0000876 .0001097

ln(hours) | 1 (exposure)

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

.

. quietly poisson dv `pp\_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 = 22272.19

Prob > chi2(6220) = 0.0000

Pearson goodness-of-fit = 27556.88

Prob > chi2(6220) = 0.0000

.

. pause "next"

.

. // negative binomial model

. glm dv `pp\_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 = -17739.692

Iteration 1: log pseudolikelihood = -17516.032

Iteration 2: log pseudolikelihood = -17510.82

Iteration 3: log pseudolikelihood = -17510.808

Iteration 4: log pseudolikelihood = -17510.808

Generalized linear models No. of obs = 6,253

Optimization : ML Residual df = 6,221

Scale parameter = 1

Deviance = 3933.646497 (1/df) Deviance = .6323174

Pearson = 5316.381563 (1/df) Pearson = .8545863

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

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

AIC = 5.611005

Log pseudolikelihood = -17510.80844 BIC = -50442.97

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

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

| Robust

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

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

p48\_pp\_1lag | 1.000135 .0001079 1.25 0.211 .9999235 1.000347

p75\_pp\_1lag | 1.000008 2.61e-06 3.07 0.002 1.000003 1.000013

mine\_time | 1.009902 .006269 1.59 0.112 .9976897 1.022264

onsite\_insp\_hours | .9998164 .0000437 -4.20 0.000 .9997308 .999902

|

state |

1 | .8322877 .1026704 -1.49 0.137 .6535366 1.05993

2 | 1.095913 .0543995 1.85 0.065 .9943143 1.207893

3 | .6692784 .0862352 -3.12 0.002 .5199137 .8615538

4 | 1.029776 .0692494 0.44 0.663 .9026137 1.174853

5 | .8578994 .0837885 -1.57 0.117 .7084383 1.038893

6 | .7694337 .0387336 -5.21 0.000 .6971422 .8492215

7 | 1.087543 .2306312 0.40 0.692 .717687 1.648001

8 | .476561 .0193529 -18.25 0.000 .4401003 .5160424

9 | .5397398 .0250782 -13.27 0.000 .4927591 .5911997

10 | .7838527 .0844106 -2.26 0.024 .6347041 .9680497

11 | 1.52753 .271147 2.39 0.017 1.078687 2.163136

12 | .9982622 .0783876 -0.02 0.982 .8558641 1.164352

13 | 1.536448 .180634 3.65 0.000 1.22024 1.934595

14 | .4157581 .0753675 -4.84 0.000 .291432 .5931223

15 | .7082275 .0409188 -5.97 0.000 .6324023 .7931441

17 | .5853604 .0224619 -13.96 0.000 .5429507 .6310828

|

time |

2000 | 1.007156 .0584266 0.12 0.902 .8989124 1.128434

2002 | .8995754 .0503786 -1.89 0.059 .8060613 1.003938

2003 | .8411344 .0622878 -2.34 0.019 .7274985 .9725204

2004 | .7644787 .0491272 -4.18 0.000 .6740082 .8670927

2005 | .68839 .045119 -5.70 0.000 .6054029 .7827529

2006 | .6825745 .0462525 -5.64 0.000 .5976833 .7795231

2007 | .6559016 .0470521 -5.88 0.000 .5698709 .75492

2008 | .5748797 .0427217 -7.45 0.000 .496959 .6650179

2009 | .5211861 .0399412 -8.50 0.000 .4484984 .6056543

2010 | .5199987 .0396393 -8.58 0.000 .4478323 .6037943

2011 | .4868745 .0361957 -9.68 0.000 .4208585 .5632458

2012 | .432574 .0361 -10.04 0.000 .3673028 .5094442

2013 | .4336817 .0383886 -9.44 0.000 .3646067 .5158431

2014 | .4129412 .0353993 -10.32 0.000 .3490753 .4884919

2015 | .3854589 .0340836 -10.78 0.000 .3241245 .4583996

|

\_cons | .0001175 8.43e-06 -126.12 0.000 .0001021 .0001352

ln(hours) | 1 (exposure)

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

.

. pause "next"

.

. eststo clear

. eststo: nbreg dv `pp\_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 = -21526.905

Iteration 1: log pseudolikelihood = -20901.844

Iteration 2: log pseudolikelihood = -20900.087

Iteration 3: log pseudolikelihood = -20900.086

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 = -16877.899

Iteration 1: log pseudolikelihood = -16753.825

Iteration 2: log pseudolikelihood = -16744.365

Iteration 3: log pseudolikelihood = -16744.344

Iteration 4: log pseudolikelihood = -16744.344

Negative binomial regression Number of obs = 6,253

Wald chi2(31) = .

Dispersion = mean Prob > chi2 = .

Log pseudolikelihood = -16744.344 Pseudo R2 = 0.0371

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

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

| Robust

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

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

p48\_pp\_1lag | 1.000119 .0000866 1.37 0.171 .9999489 1.000289

p75\_pp\_1lag | 1.000009 2.49e-06 3.56 0.000 1.000004 1.000014

mine\_time | 1.006905 .0057552 1.20 0.229 .995688 1.018248

onsite\_insp\_hours | .9998127 .0000436 -4.29 0.000 .9997273 .9998982

|

state |

1 | .8602069 .097154 -1.33 0.182 .6893916 1.073346

2 | 1.243402 .05921 4.57 0.000 1.132603 1.365039

3 | .6612614 .0846224 -3.23 0.001 .5145693 .8497722

4 | 1.046229 .0667149 0.71 0.479 .9233117 1.185511

5 | .8859949 .0878025 -1.22 0.222 .7295865 1.075934

6 | .7982461 .0383029 -4.70 0.000 .7265959 .8769618

7 | 1.072803 .2089901 0.36 0.718 .7323177 1.571595

8 | .4825506 .0190127 -18.49 0.000 .446689 .5212914

9 | .5721405 .0248736 -12.84 0.000 .5254085 .6230291

10 | .8067273 .0721408 -2.40 0.016 .6770315 .9612683

11 | 1.562752 .2706669 2.58 0.010 1.112917 2.194407

12 | 1.065479 .0779177 0.87 0.386 .9232028 1.229681

13 | 1.503919 .1640053 3.74 0.000 1.214505 1.8623

14 | .4150651 .0747245 -4.88 0.000 .2916579 .5906887

15 | .7344649 .040385 -5.61 0.000 .6594277 .8180407

17 | .6072038 .021998 -13.77 0.000 .5655836 .6518867

|

time |

2000 | 1.024797 .0490524 0.51 0.609 .9330281 1.125592

2002 | .9258095 .042204 -1.69 0.091 .8466788 1.012336

2003 | .8378821 .0477316 -3.10 0.002 .7493635 .9368569

2004 | .7889246 .0416951 -4.49 0.000 .7112937 .875028

2005 | .7164479 .0407892 -5.86 0.000 .6408016 .8010243

2006 | .708837 .0413794 -5.90 0.000 .6322026 .7947608

2007 | .6856648 .0427999 -6.05 0.000 .6067069 .7748984

2008 | .5922208 .037845 -8.20 0.000 .5225031 .6712411

2009 | .5297858 .0350718 -9.60 0.000 .4653189 .6031841

2010 | .5322353 .0363174 -9.24 0.000 .465609 .6083955

2011 | .4953462 .0325229 -10.70 0.000 .4355335 .5633732

2012 | .4346425 .0311671 -11.62 0.000 .3776545 .5002299

2013 | .4243601 .0319224 -11.39 0.000 .3661871 .4917746

2014 | .4202435 .032497 -11.21 0.000 .3611424 .4890166

2015 | .4005104 .0323628 -11.32 0.000 .3418483 .4692391

|

\_cons | .0001131 6.96e-06 -147.78 0.000 .0001003 .0001276

ln(hours) | 1 (exposure)

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

/lnalpha | -1.171554 .061235 -1.291573 -1.051536

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

alpha | .3098849 .0189758 .2748382 .3494007

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

(est1 stored)

. esttab using `"`directory'Model.`injury\_label'.`time\_label'.`violation\_level\_label'.C.PP.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.PP.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.PP.2.csv)

. est store nbin

.

. pause "next"

.

. // test for over-dispersion

. lrtest pois nbin, stats force

Likelihood-ratio test LR chi2(0) = -8311.49

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

Akaike's information criterion and Bayesian information criterion

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

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

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

nbin | 6,253 -17389.65 -16744.34 33 33554.69 33777.13

pois | 6,253 -24975.69 -20900.09 33 41866.17 42088.62

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

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

.

. pause "next"

.

. // final model + diagnostics/assessment

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

. predict cpp2\_yhat

(option n assumed; predicted number of events)

. gen cpp2\_res = dv - cpp2\_yhat

.

. summ dv cpp2\_yhat

Variable | Obs Mean Std. Dev. Min Max

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

dv | 6,253 9.976651 14.85334 0 200

cpp2\_yhat | 6,253 10.4975 14.96598 .0034767 126.6184

. /\*

> pause "next"

>

> scatter dv cpp2\_yhat

>

> pause "next"

>

> scatter cpp2\_res dv

>

> pause "next"

>

> scatter cpp2\_res cpp2\_yhat

> \*/

. pause "complete: C.PP.2"