. // Model C.PP.4

.

. // poisson model

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

Iteration 0: log pseudolikelihood = -23331.455

Iteration 1: log pseudolikelihood = -20989.15

Iteration 2: log pseudolikelihood = -20980.152

Iteration 3: log pseudolikelihood = -20980.148

Iteration 4: log pseudolikelihood = -20980.148

Generalized linear models No. of obs = 6,253

Optimization : ML Residual df = 6,221

Scale parameter = 1

Deviance = 22432.3164 (1/df) Deviance = 3.605902

Pearson = 27722.96389 (1/df) Pearson = 4.456352

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

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

AIC = 6.720662

Log pseudolikelihood = -20980.1483 BIC = -31944.3

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

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

| Robust

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

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

p48\_pp\_c\_lag\_all | 1.000019 .0000151 1.27 0.206 .9999895 1.000049

p75\_pp\_c\_lag\_all | 1 1.27e-07 -0.04 0.965 .9999997 1

mine\_time | 1.007039 .0065374 1.08 0.280 .9943072 1.019934

onsite\_insp\_hours | .9998529 .0000493 -2.98 0.003 .9997563 .9999495

|

state |

1 | .9435654 .0900194 -0.61 0.543 .7826444 1.137574

2 | 1.63584 .0810216 9.94 0.000 1.484505 1.802602

3 | .6395163 .0670587 -4.26 0.000 .5207101 .7854296

4 | 1.237739 .1026875 2.57 0.010 1.051987 1.456291

5 | 1.062139 .1274531 0.50 0.615 .8395371 1.343763

6 | .9677243 .054859 -0.58 0.563 .8659607 1.081447

7 | 1.125506 .1648619 0.81 0.420 .8446284 1.499789

8 | .4906845 .0231913 -15.06 0.000 .447272 .5383105

9 | .6354036 .0278609 -10.34 0.000 .5830779 .692425

10 | .8975295 .0597775 -1.62 0.105 .7876927 1.022682

11 | 1.715231 .3149801 2.94 0.003 1.196769 2.4583

12 | .9750971 .0995296 -0.25 0.805 .7982969 1.191054

13 | 1.51778 .1583414 4.00 0.000 1.237108 1.862129

14 | .4108628 .0632007 -5.78 0.000 .3039214 .5554337

15 | .7974431 .062917 -2.87 0.004 .6831896 .9308039

17 | .6362002 .0267949 -10.74 0.000 .5857923 .6909457

|

time |

2000 | 1.041648 .0422571 1.01 0.314 .9620332 1.127853

2002 | .959193 .0367556 -1.09 0.277 .8897922 1.034007

2003 | .8414406 .0333128 -4.36 0.000 .7786177 .9093324

2004 | .8137766 .0360223 -4.66 0.000 .7461502 .8875323

2005 | .7599283 .0393994 -5.30 0.000 .6865008 .8412095

2006 | .7301849 .0401457 -5.72 0.000 .655592 .8132651

2007 | .7366097 .0437998 -5.14 0.000 .6555773 .8276582

2008 | .696483 .0443074 -5.69 0.000 .6148377 .78897

2009 | .6126022 .0401492 -7.48 0.000 .5387556 .6965709

2010 | .5962017 .0417426 -7.39 0.000 .519753 .683895

2011 | .5401858 .0354283 -9.39 0.000 .4750253 .6142846

2012 | .4770198 .0331052 -10.67 0.000 .4163542 .5465248

2013 | .4585168 .034889 -10.25 0.000 .3949903 .5322603

2014 | .4785775 .0404314 -8.72 0.000 .4055465 .5647599

2015 | .4495752 .0399508 -9.00 0.000 .3777127 .53511

|

\_cons | .000097 5.54e-06 -161.70 0.000 .0000867 .0001085

ln(hours) | 1 (exposure)

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

.

. quietly poisson dv `pp\_lag\_all\_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 = 22432.32

Prob > chi2(6220) = 0.0000

Pearson goodness-of-fit = 27722.96

Prob > chi2(6220) = 0.0000

.

. pause "next"

.

. // negative binomial model

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

Iteration 0: log pseudolikelihood = -17746.602

Iteration 1: log pseudolikelihood = -17519.601

Iteration 2: log pseudolikelihood = -17514.194

Iteration 3: log pseudolikelihood = -17514.182

Iteration 4: log pseudolikelihood = -17514.182

Generalized linear models No. of obs = 6,253

Optimization : ML Residual df = 6,221

Scale parameter = 1

Deviance = 3940.392992 (1/df) Deviance = .6334019

Pearson = 5293.46968 (1/df) Pearson = .8509033

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

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

AIC = 5.612084

Log pseudolikelihood = -17514.18169 BIC = -50436.23

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

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

| Robust

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

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

p48\_pp\_c\_lag\_all | 1.000016 .0000214 0.76 0.447 .9999743 1.000058

p75\_pp\_c\_lag\_all | 1 1.15e-07 0.16 0.876 .9999998 1

mine\_time | 1.011137 .0064957 1.72 0.085 .998486 1.023949

onsite\_insp\_hours | .9998791 .0000424 -2.85 0.004 .9997959 .9999623

|

state |

1 | .8127663 .1017784 -1.66 0.098 .6358787 1.03886

2 | 1.088606 .053757 1.72 0.086 .9881826 1.199235

3 | .661546 .0852376 -3.21 0.001 .5139089 .8515968

4 | 1.034308 .0691172 0.50 0.614 .9073368 1.179047

5 | .8545054 .0825991 -1.63 0.104 .7070255 1.032748

6 | .7619924 .0380283 -5.45 0.000 .6909876 .8402936

7 | 1.088168 .225282 0.41 0.683 .7252249 1.632748

8 | .4642806 .018098 -19.68 0.000 .4301304 .5011421

9 | .526952 .0238657 -14.15 0.000 .4821921 .5758669

10 | .7775853 .0840619 -2.33 0.020 .6291117 .9610994

11 | 1.529155 .2718843 2.39 0.017 1.079214 2.166683

12 | .9664088 .0750279 -0.44 0.660 .8299983 1.125238

13 | 1.531134 .1808319 3.61 0.000 1.214741 1.929936

14 | .4074427 .075831 -4.82 0.000 .2829082 .5867965

15 | .7066286 .0408894 -6.00 0.000 .6308643 .7914917

17 | .5639859 .0239999 -13.46 0.000 .5188551 .6130423

|

time |

2000 | 1.007943 .0586231 0.14 0.892 .8993512 1.129647

2002 | .8946829 .0502431 -1.98 0.048 .8014341 .9987814

2003 | .8365986 .062098 -2.40 0.016 .723328 .9676071

2004 | .7576365 .0488675 -4.30 0.000 .6676648 .8597325

2005 | .6790477 .0445543 -5.90 0.000 .5971047 .7722361

2006 | .6759223 .0458956 -5.77 0.000 .5916974 .7721363

2007 | .6622689 .0482828 -5.65 0.000 .5740865 .7639966

2008 | .5967405 .0447801 -6.88 0.000 .5151223 .6912905

2009 | .5418535 .0416253 -7.98 0.000 .4661142 .6298997

2010 | .5356694 .041097 -8.14 0.000 .4608843 .6225894

2011 | .498462 .037444 -9.27 0.000 .4302201 .5775286

2012 | .4407393 .0370973 -9.73 0.000 .3737107 .5197901

2013 | .438615 .0387295 -9.33 0.000 .368912 .5214878

2014 | .4149388 .0356795 -10.23 0.000 .3505835 .4911076

2015 | .3862669 .0342812 -10.72 0.000 .3245961 .4596546

|

\_cons | .0001166 8.44e-06 -125.09 0.000 .0001012 .0001344

ln(hours) | 1 (exposure)

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

.

. pause "next"

.

. eststo clear

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

Fitting Poisson model:

Iteration 0: log pseudolikelihood = -21603.7

Iteration 1: log pseudolikelihood = -20982.079

Iteration 2: log pseudolikelihood = -20980.149

Iteration 3: log pseudolikelihood = -20980.148

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 = -16886.42

Iteration 1: log pseudolikelihood = -16764.997

Iteration 2: log pseudolikelihood = -16755.902

Iteration 3: log pseudolikelihood = -16755.882

Iteration 4: log pseudolikelihood = -16755.882

Negative binomial regression Number of obs = 6,253

Wald chi2(31) = .

Dispersion = mean Prob > chi2 = .

Log pseudolikelihood = -16755.882 Pseudo R2 = 0.0364

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

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

| Robust

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

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

p48\_pp\_c\_lag\_all | 1.000016 .0000179 0.89 0.373 .9999809 1.000051

p75\_pp\_c\_lag\_all | 1 1.02e-07 -0.18 0.859 .9999998 1

mine\_time | 1.009326 .0060444 1.55 0.121 .9975487 1.021243

onsite\_insp\_hours | .9998861 .0000416 -2.74 0.006 .9998045 .9999676

|

state |

1 | .8363184 .0957399 -1.56 0.118 .6682331 1.046683

2 | 1.222621 .05799 4.24 0.000 1.114086 1.34173

3 | .6517089 .0836439 -3.34 0.001 .506764 .838111

4 | 1.051516 .0663108 0.80 0.426 .9292601 1.189856

5 | .882761 .0860882 -1.28 0.201 .7291765 1.068695

6 | .7882879 .0372911 -5.03 0.000 .7184848 .8648727

7 | 1.07387 .2044134 0.37 0.708 .7394755 1.55948

8 | .4614473 .0176675 -20.20 0.000 .4280871 .4974072

9 | .5550726 .0234967 -13.91 0.000 .5108786 .6030895

10 | .7984118 .071904 -2.50 0.012 .6692198 .9525441

11 | 1.56324 .2710269 2.58 0.010 1.112881 2.195851

12 | 1.018626 .0754323 0.25 0.803 .8810095 1.177738

13 | 1.496524 .1647855 3.66 0.000 1.206024 1.856998

14 | .4021428 .0746123 -4.91 0.000 .2795446 .5785082

15 | .7311715 .0403909 -5.67 0.000 .6561419 .8147807

17 | .5819934 .0228559 -13.78 0.000 .5388772 .6285594

|

time |

2000 | 1.026294 .0494089 0.54 0.590 .9338826 1.127849

2002 | .9189646 .0421691 -1.84 0.066 .8399225 1.005445

2003 | .8314075 .0477127 -3.22 0.001 .7429597 .9303847

2004 | .7785909 .0414415 -4.70 0.000 .7014602 .8642027

2005 | .7025578 .0401327 -6.18 0.000 .6281427 .7857887

2006 | .6984485 .0409502 -6.12 0.000 .6226275 .7835026

2007 | .6915145 .0441961 -5.77 0.000 .6100976 .7837964

2008 | .6172574 .0402476 -7.40 0.000 .5432061 .7014035

2009 | .5539043 .0370325 -8.84 0.000 .4858765 .6314568

2010 | .5499261 .0377991 -8.70 0.000 .4806148 .629233

2011 | .5084112 .0338535 -10.16 0.000 .4462068 .5792873

2012 | .443717 .0322162 -11.19 0.000 .3848613 .5115733

2013 | .4305497 .0326498 -11.11 0.000 .3710857 .4995424

2014 | .42286 .0329798 -11.04 0.000 .3629189 .4927013

2015 | .4019086 .0327028 -11.20 0.000 .3426622 .4713988

|

\_cons | .0001119 6.96e-06 -146.26 0.000 .000099 .0001264

ln(hours) | 1 (exposure)

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

/lnalpha | -1.161398 .0599999 -1.278996 -1.043801

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

alpha | .3130481 .0187829 .2783166 .3521139

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

(est1 stored)

. esttab using `"`directory'Model.`injury\_label'.`time\_label'.`violation\_level\_label'.C.PP.4.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.4.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.4.csv)

. est store nbin

.

. pause "next"

.

. // test for over-dispersion

. lrtest pois nbin, stats force

Likelihood-ratio test LR chi2(0) = -8448.53

(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 -16755.88 33 33577.76 33800.21

pois | 6,253 -24975.69 -20980.15 33 42026.3 42248.74

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

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

.

. pause "next"

.

. // final model + diagnostics/assessment

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

. predict cpp4\_yhat

(option n assumed; predicted number of events)

. gen cpp4\_res = dv - cpp4\_yhat

.

. summ dv cpp4\_yhat

Variable | Obs Mean Std. Dev. Min Max

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

dv | 6,253 9.976651 14.85334 0 200

cpp4\_yhat | 6,253 10.51363 14.9908 .003498 127.4639

. /\*

> pause "next"

>

> scatter dv cpp4\_yhat

>

> pause "next"

>

> scatter cpp4\_res dv

>

> pause "next"

>

> scatter cpp4\_res cpp4\_yhat

> \*/

. pause "complete: C.PP.4"