. // Model C.V.4

.

. // poisson model

. glm dv `count\_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 = -23359.587

Iteration 1: log pseudolikelihood = -20989.988

Iteration 2: log pseudolikelihood = -20980.46

Iteration 3: log pseudolikelihood = -20980.455

Iteration 4: log pseudolikelihood = -20980.455

Generalized linear models No. of obs = 6,253

Optimization : ML Residual df = 6,221

Scale parameter = 1

Deviance = 22432.93067 (1/df) Deviance = 3.606001

Pearson = 27735.31791 (1/df) Pearson = 4.458338

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

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

AIC = 6.72076

Log pseudolikelihood = -20980.45544 BIC = -31943.69

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

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

| Robust

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

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

p48\_c\_lag\_all | 1.000439 .0010463 0.42 0.675 .99839 1.002491

p75\_c\_lag\_all | .999995 6.31e-06 -0.79 0.431 .9999827 1.000007

mine\_time | 1.010898 .0065948 1.66 0.097 .998055 1.023907

onsite\_insp\_hours | .9998681 .0000474 -2.78 0.005 .9997751 .9999611

|

state |

1 | .9534848 .0860562 -0.53 0.598 .7988939 1.13799

2 | 1.598375 .078804 9.51 0.000 1.45115 1.760537

3 | .6376342 .0661782 -4.34 0.000 .5202689 .7814754

4 | 1.245961 .1098067 2.50 0.013 1.048306 1.480884

5 | 1.070862 .1346084 0.54 0.586 .837022 1.370032

6 | .9644486 .0531708 -0.66 0.511 .8656686 1.0745

7 | 1.120888 .167466 0.76 0.445 .8363513 1.502228

8 | .4753009 .0199553 -17.72 0.000 .4377552 .5160667

9 | .633081 .0262878 -11.01 0.000 .5835987 .6867589

10 | .8993007 .0610726 -1.56 0.118 .7872249 1.027332

11 | 1.717756 .3142816 2.96 0.003 1.200122 2.458657

12 | .9601683 .094233 -0.41 0.679 .7921522 1.163821

13 | 1.522745 .1581781 4.05 0.000 1.242244 1.866583

14 | .4036136 .0622929 -5.88 0.000 .2982586 .5461834

15 | .7940056 .0623293 -2.94 0.003 .6807761 .9260678

17 | .644616 .0248982 -11.37 0.000 .5976178 .6953103

|

time |

2000 | 1.043415 .0425604 1.04 0.297 .9632456 1.130257

2002 | .9567124 .0362969 -1.17 0.243 .8881524 1.030565

2003 | .8385228 .0331071 -4.46 0.000 .7760812 .9059882

2004 | .809171 .03498 -4.90 0.000 .7434356 .8807188

2005 | .753645 .0384841 -5.54 0.000 .6818692 .8329761

2006 | .7254375 .0386331 -6.03 0.000 .6535358 .8052498

2007 | .7316125 .0422016 -5.42 0.000 .6534032 .819183

2008 | .6887021 .0423117 -6.07 0.000 .6105711 .776831

2009 | .6069449 .0391134 -7.75 0.000 .5349279 .6886575

2010 | .5910038 .0412279 -7.54 0.000 .5154792 .6775937

2011 | .5365017 .036102 -9.25 0.000 .4702107 .6121386

2012 | .4739624 .0342026 -10.35 0.000 .4114514 .5459707

2013 | .4565246 .0365489 -9.79 0.000 .3902275 .5340851

2014 | .4761115 .0428452 -8.25 0.000 .3991252 .5679476

2015 | .4477509 .0422527 -8.51 0.000 .3721445 .5387179

|

\_cons | .0000958 5.60e-06 -158.43 0.000 .0000855 .0001075

ln(hours) | 1 (exposure)

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

.

. quietly poisson dv `count\_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 = 22432.93

Prob > chi2(6221) = 0.0000

Pearson goodness-of-fit = 27735.32

Prob > chi2(6221) = 0.0000

.

. pause "next"

.

. // negative binomial model

. glm dv `count\_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 = -17750.819

Iteration 1: log pseudolikelihood = -17519.942

Iteration 2: log pseudolikelihood = -17514.352

Iteration 3: log pseudolikelihood = -17514.339

Iteration 4: log pseudolikelihood = -17514.339

Generalized linear models No. of obs = 6,253

Optimization : ML Residual df = 6,221

Scale parameter = 1

Deviance = 3940.707472 (1/df) Deviance = .6334524

Pearson = 5301.428848 (1/df) Pearson = .8521827

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

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

AIC = 5.612135

Log pseudolikelihood = -17514.33893 BIC = -50435.91

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

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

| Robust

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

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

p48\_c\_lag\_all | 1.000345 .0011197 0.31 0.758 .9981533 1.002542

p75\_c\_lag\_all | .9999974 6.52e-06 -0.41 0.685 .9999846 1.00001

mine\_time | 1.0125 .0066514 1.89 0.059 .9995468 1.025621

onsite\_insp\_hours | .9998915 .0000425 -2.55 0.011 .9998082 .9999747

|

state |

1 | .8222163 .1032643 -1.56 0.119 .6428083 1.051697

2 | 1.079325 .053121 1.55 0.121 .9800738 1.188627

3 | .6626072 .0850686 -3.21 0.001 .5151989 .8521919

4 | 1.037831 .0712782 0.54 0.589 .9071224 1.187373

5 | .858391 .0846161 -1.55 0.121 .7075836 1.04134

6 | .7613902 .0379185 -5.47 0.000 .6905832 .8394571

7 | 1.086578 .226405 0.40 0.690 .7222707 1.634638

8 | .4597132 .0176988 -20.19 0.000 .4263006 .4957446

9 | .5291246 .0232828 -14.47 0.000 .4854036 .5767837

10 | .7784752 .0845166 -2.31 0.021 .6292635 .9630682

11 | 1.53288 .273181 2.40 0.017 1.080966 2.173724

12 | .9613829 .0742886 -0.51 0.610 .8262696 1.11859

13 | 1.531952 .1809726 3.61 0.000 1.215321 1.931076

14 | .4043601 .0752422 -4.87 0.000 .2807884 .5823143

15 | .7062537 .0408533 -6.01 0.000 .6305549 .7910402

17 | .5715042 .0216811 -14.75 0.000 .5305514 .6156182

|

time |

2000 | 1.009033 .0587781 0.15 0.877 .9001628 1.13107

2002 | .8934624 .05018 -2.01 0.045 .8003312 .9974308

2003 | .8352689 .0619769 -2.43 0.015 .7222163 .9660184

2004 | .7555849 .0485765 -4.36 0.000 .6661308 .8570517

2005 | .6764389 .0440841 -6.00 0.000 .5953263 .768603

2006 | .6732773 .0453873 -5.87 0.000 .5899461 .7683792

2007 | .6596874 .0478176 -5.74 0.000 .5723196 .7603924

2008 | .5937608 .0444668 -6.96 0.000 .512702 .6876351

2009 | .5397111 .0415166 -8.02 0.000 .4641772 .6275364

2010 | .5335497 .0409482 -8.19 0.000 .4590373 .6201571

2011 | .4971887 .0375641 -9.25 0.000 .4287561 .5765435

2012 | .4401829 .0374828 -9.64 0.000 .3725212 .5201341

2013 | .4383184 .0391545 -9.23 0.000 .3679194 .5221877

2014 | .4148091 .036117 -10.11 0.000 .3497317 .491996

2015 | .3866195 .0345901 -10.62 0.000 .3244355 .4607222

|

\_cons | .000116 8.46e-06 -124.33 0.000 .0001006 .0001338

ln(hours) | 1 (exposure)

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

.

. pause "next"

.

. eststo clear

. eststo: nbreg dv `count\_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 = -22034.576

Iteration 1: log pseudolikelihood = -20987.464

Iteration 2: log pseudolikelihood = -20980.459

Iteration 3: log pseudolikelihood = -20980.455

Iteration 4: log pseudolikelihood = -20980.455

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 = -16886.094

Iteration 1: log pseudolikelihood = -16764.832

Iteration 2: log pseudolikelihood = -16755.756

Iteration 3: log pseudolikelihood = -16755.736

Iteration 4: log pseudolikelihood = -16755.736

Negative binomial regression Number of obs = 6,253

Wald chi2(31) = .

Dispersion = mean Prob > chi2 = .

Log pseudolikelihood = -16755.736 Pseudo R2 = 0.0365

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

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

| Robust

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

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

p48\_c\_lag\_all | 1.000193 .0010067 0.19 0.848 .9982221 1.002168

p75\_c\_lag\_all | .9999955 5.82e-06 -0.78 0.435 .999984 1.000007

mine\_time | 1.011179 .0061983 1.81 0.070 .999103 1.0234

onsite\_insp\_hours | .9999004 .0000411 -2.43 0.015 .99982 .9999809

|

state |

1 | .8512287 .0966092 -1.42 0.156 .6814597 1.063292

2 | 1.209253 .057146 4.02 0.000 1.10228 1.326608

3 | .6543649 .0834414 -3.33 0.001 .5096581 .8401581

4 | 1.056402 .0695734 0.83 0.405 .9284751 1.201956

5 | .8878258 .0892068 -1.18 0.236 .7291231 1.081072

6 | .7874518 .0370833 -5.07 0.000 .7180234 .8635936

7 | 1.071568 .2059342 0.36 0.719 .735251 1.561723

8 | .4545616 .0169893 -21.09 0.000 .4224535 .48911

9 | .5569751 .0227863 -14.31 0.000 .5140582 .6034748

10 | .8010384 .0725547 -2.45 0.014 .6707413 .9566469

11 | 1.569239 .2722884 2.60 0.009 1.116842 2.204887

12 | 1.012354 .0745939 0.17 0.868 .8762197 1.16964

13 | 1.497998 .1646743 3.68 0.000 1.207645 1.858162

14 | .39856 .0739451 -4.96 0.000 .2770574 .5733474

15 | .7305873 .0403143 -5.69 0.000 .6556956 .814033

17 | .5902451 .0212009 -14.68 0.000 .550121 .6332958

|

time |

2000 | 1.027434 .0495714 0.56 0.575 .9347278 1.129334

2002 | .9176463 .0421051 -1.87 0.061 .8387238 1.003995

2003 | .8300172 .047567 -3.25 0.001 .7418329 .9286844

2004 | .7763464 .0410736 -4.79 0.000 .6998769 .8611711

2005 | .6996993 .0395673 -6.31 0.000 .6262919 .7817107

2006 | .6957431 .0403455 -6.26 0.000 .6209956 .7794877

2007 | .688681 .0435679 -5.90 0.000 .6083712 .7795923

2008 | .6133627 .0397031 -7.55 0.000 .5402799 .6963312

2009 | .5506904 .0367645 -8.94 0.000 .4831486 .6276742

2010 | .5465011 .0374344 -8.82 0.000 .4778431 .6250242

2011 | .5058901 .0338606 -10.18 0.000 .4436934 .5768056

2012 | .4419127 .0324337 -11.13 0.000 .3827045 .510281

2013 | .429197 .0329184 -11.03 0.000 .3692934 .4988177

2014 | .4212441 .0332957 -10.94 0.000 .3607894 .4918287

2015 | .4009056 .0329714 -11.11 0.000 .3412222 .4710282

|

\_cons | .0001112 6.98e-06 -145.05 0.000 .0000983 .0001258

ln(hours) | 1 (exposure)

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

/lnalpha | -1.161865 .0600365 -1.279535 -1.044196

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

alpha | .312902 .0187855 .2781667 .3519747

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

(est1 stored)

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

. est store nbin

.

. pause "next"

.

. // test for over-dispersion

. lrtest pois nbin, stats force

Likelihood-ratio test LR chi2(1) = 8449.44

(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 -20980.46 32 42024.91 42240.62

nbin | 6,253 -17389.65 -16755.74 33 33577.47 33799.92

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

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

.

. pause "next"

.

. // final model + diagnostics/assessment

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

. predict cv4\_yhat

(option n assumed; predicted number of events)

. gen cv4\_res = dv - cv4\_yhat

.

. summ dv cv4\_yhat

Variable | Obs Mean Std. Dev. Min Max

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

dv | 6,253 9.976651 14.85334 0 200

cv4\_yhat | 6,253 10.51009 14.97346 .0034721 128.9332

. /\*

> pause "next"

>

> scatter dv cv4\_yhat

>

> pause "next"

>

> scatter cv4\_res dv

>

> pause "next"

>

> scatter cv4\_res cv4\_yhat

> \*/

. pause "complete: C.V.4"

.