. // Model C.V.1

.

. // poisson model

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

Iteration 0: log pseudolikelihood = -23305.529

Iteration 1: log pseudolikelihood = -20915.269

Iteration 2: log pseudolikelihood = -20906.022

Iteration 3: log pseudolikelihood = -20906.017

Iteration 4: log pseudolikelihood = -20906.017

Generalized linear models No. of obs = 6,253

Optimization : ML Residual df = 6,221

Scale parameter = 1

Deviance = 22284.05388 (1/df) Deviance = 3.582069

Pearson = 27548.48668 (1/df) Pearson = 4.428305

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

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

AIC = 6.696951

Log pseudolikelihood = -20906.01704 BIC = -32092.57

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

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

| Robust

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

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

p48 | 1.009109 .0051756 1.77 0.077 .9990158 1.019304

p75 | 1.000457 .0002118 2.16 0.031 1.000042 1.000872

mine\_time | 1.008093 .0064829 1.25 0.210 .9954668 1.02088

onsite\_insp\_hours | .9997809 .0000447 -4.90 0.000 .9996933 .9998685

|

state |

1 | .947569 .0881069 -0.58 0.562 .7897041 1.136992

2 | 1.630038 .0845861 9.42 0.000 1.472404 1.804547

3 | .6415412 .0670505 -4.25 0.000 .5227108 .787386

4 | 1.217957 .0989653 2.43 0.015 1.038646 1.428225

5 | 1.073159 .1287701 0.59 0.556 .8482559 1.357691

6 | .9874734 .0562328 -0.22 0.825 .8831873 1.104074

7 | 1.127944 .169016 0.80 0.422 .8408915 1.512988

8 | .512213 .0211871 -16.17 0.000 .4723258 .5554686

9 | .6494469 .0282278 -9.93 0.000 .5964125 .7071973

10 | .9017947 .0541435 -1.72 0.085 .8016813 1.01441

11 | 1.71647 .3268479 2.84 0.005 1.181821 2.492992

12 | 1.04317 .0980959 0.45 0.653 .8675832 1.254293

13 | 1.559772 .1602669 4.33 0.000 1.275264 1.907754

14 | .4253002 .0646403 -5.63 0.000 .3157357 .5728852

15 | .811601 .0607563 -2.79 0.005 .7008446 .9398605

17 | .6677067 .0244069 -11.05 0.000 .6215434 .7172987

|

time |

2000 | 1.048759 .0425061 1.17 0.240 .9686721 1.135468

2002 | .9677909 .0358654 -0.88 0.377 .8999881 1.040702

2003 | .842883 .0325508 -4.43 0.000 .7814394 .9091579

2004 | .8134616 .035603 -4.72 0.000 .7465903 .8863226

2005 | .7632803 .0384558 -5.36 0.000 .6915101 .8424993

2006 | .722647 .0389086 -6.03 0.000 .6502734 .8030755

2007 | .7303626 .0426599 -5.38 0.000 .6513591 .8189484

2008 | .7015722 .041501 -5.99 0.000 .62477 .7878155

2009 | .620809 .0377185 -7.85 0.000 .5511141 .6993175

2010 | .6071847 .0403835 -7.50 0.000 .5329763 .6917255

2011 | .5538191 .0351355 -9.31 0.000 .4890642 .6271479

2012 | .495845 .0340021 -10.23 0.000 .4334865 .5671739

2013 | .4763667 .0373801 -9.45 0.000 .4084589 .5555644

2014 | .4983225 .0424 -8.19 0.000 .4217797 .588756

2015 | .4725519 .0417156 -8.49 0.000 .397473 .5618124

|

\_cons | .0000938 5.21e-06 -166.87 0.000 .0000841 .0001045

ln(hours) | 1 (exposure)

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

.

. quietly poisson dv `count\_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 = 22284.05

Prob > chi2(6221) = 0.0000

Pearson goodness-of-fit = 27548.49

Prob > chi2(6221) = 0.0000

.

. pause "next"

.

. // negative binomial model

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

Iteration 0: log pseudolikelihood = -17733.343

Iteration 1: log pseudolikelihood = -17509.999

Iteration 2: log pseudolikelihood = -17504.893

Iteration 3: log pseudolikelihood = -17504.882

Iteration 4: log pseudolikelihood = -17504.882

Generalized linear models No. of obs = 6,253

Optimization : ML Residual df = 6,221

Scale parameter = 1

Deviance = 3921.793655 (1/df) Deviance = .6304121

Pearson = 5306.812754 (1/df) Pearson = .8530482

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

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

AIC = 5.60911

Log pseudolikelihood = -17504.88202 BIC = -50454.83

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

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

| Robust

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

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

p48 | 1.010844 .0084395 1.29 0.196 .9944373 1.027521

p75 | 1.000956 .0002246 4.26 0.000 1.000516 1.001396

mine\_time | 1.011294 .0061679 1.84 0.066 .9992767 1.023455

onsite\_insp\_hours | .999743 .0000452 -5.68 0.000 .9996544 .9998317

|

state |

1 | .8067441 .1003013 -1.73 0.084 .6322767 1.029353

2 | 1.083118 .0523265 1.65 0.098 .985266 1.190689

3 | .6499181 .0843848 -3.32 0.001 .5038943 .8382583

4 | .9964459 .0663858 -0.05 0.957 .8744691 1.135437

5 | .8475417 .0776994 -1.80 0.071 .7081515 1.014369

6 | .770805 .0384731 -5.22 0.000 .69897 .8500225

7 | 1.080369 .2290083 0.36 0.715 .7130847 1.636829

8 | .4893104 .0190476 -18.36 0.000 .4533665 .528104

9 | .5387187 .0240499 -13.86 0.000 .4935852 .5879793

10 | .7776526 .0843039 -2.32 0.020 .628794 .9617515

11 | 1.500311 .271853 2.24 0.025 1.05183 2.140017

12 | 1.024512 .0789965 0.31 0.753 .8808134 1.191654

13 | 1.558071 .1797506 3.84 0.000 1.242757 1.953386

14 | .4180001 .0742251 -4.91 0.000 .2951392 .5920056

15 | .7087755 .040565 -6.01 0.000 .6335666 .7929122

17 | .5938912 .021905 -14.13 0.000 .5524733 .6384142

|

time |

2000 | 1.013049 .0585631 0.22 0.823 .9045311 1.134586

2002 | .9055134 .051028 -1.76 0.078 .8108256 1.011259

2003 | .8472029 .0626707 -2.24 0.025 .7328598 .9793861

2004 | .7677538 .0488713 -4.15 0.000 .6777021 .8697714

2005 | .6898896 .0442608 -5.79 0.000 .6083726 .7823293

2006 | .6762643 .0450091 -5.88 0.000 .5935596 .7704928

2007 | .6586186 .0472292 -5.82 0.000 .5722618 .758007

2008 | .5956115 .0438181 -7.04 0.000 .5156341 .6879938

2009 | .5426144 .0411166 -8.07 0.000 .4677259 .6294934

2010 | .5400142 .0408415 -8.15 0.000 .4656166 .6262993

2011 | .5078208 .0375511 -9.16 0.000 .4393068 .5870203

2012 | .455308 .0378914 -9.45 0.000 .3867826 .5359738

2013 | .4570717 .0400423 -8.94 0.000 .3849585 .5426937

2014 | .433866 .0369551 -9.80 0.000 .3671584 .5126935

2015 | .4098404 .0360192 -10.15 0.000 .3449898 .4868816

|

\_cons | .0001129 8.02e-06 -128.02 0.000 .0000983 .0001298

ln(hours) | 1 (exposure)

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

.

. pause "next"

.

. eststo clear

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

Fitting Poisson model:

Iteration 0: log pseudolikelihood = -23536.065

Iteration 1: log pseudolikelihood = -20936.382

Iteration 2: log pseudolikelihood = -20906.031

Iteration 3: log pseudolikelihood = -20906.017

Iteration 4: log pseudolikelihood = -20906.017

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 = -16875.038

Iteration 1: log pseudolikelihood = -16743.541

Iteration 2: log pseudolikelihood = -16731.799

Iteration 3: log pseudolikelihood = -16731.766

Iteration 4: log pseudolikelihood = -16731.766

Negative binomial regression Number of obs = 6,253

Wald chi2(31) = .

Dispersion = mean Prob > chi2 = .

Log pseudolikelihood = -16731.766 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 | 1.008367 .006573 1.28 0.201 .9955661 1.021333

p75 | 1.000915 .000214 4.28 0.000 1.000496 1.001335

mine\_time | 1.008735 .0056671 1.55 0.122 .9976886 1.019904

onsite\_insp\_hours | .9997513 .0000449 -5.54 0.000 .9996634 .9998393

|

state |

1 | .831358 .0943753 -1.63 0.104 .6655186 1.038523

2 | 1.224714 .0564912 4.39 0.000 1.11885 1.340594

3 | .6419097 .08288 -3.43 0.001 .4983922 .8267546

4 | 1.012233 .0632655 0.19 0.846 .895529 1.144146

5 | .8757347 .0812951 -1.43 0.153 .7300539 1.050486

6 | .7994684 .0379068 -4.72 0.000 .7285201 .8773261

7 | 1.065574 .2068823 0.33 0.744 .7283196 1.558997

8 | .4922659 .0179828 -19.40 0.000 .4582524 .5288041

9 | .5689781 .0235635 -13.62 0.000 .5246192 .6170878

10 | .7967066 .0712604 -2.54 0.011 .668596 .9493647

11 | 1.535713 .2717011 2.42 0.015 1.08571 2.172232

12 | 1.088622 .0776835 1.19 0.234 .9465332 1.25204

13 | 1.527596 .1632239 3.97 0.000 1.23896 1.883473

14 | .4165058 .0736487 -4.95 0.000 .2945149 .5890266

15 | .7353131 .0399077 -5.67 0.000 .6611119 .8178424

17 | .6141739 .0211959 -14.13 0.000 .5740046 .6571543

|

time |

2000 | 1.031327 .0490655 0.65 0.517 .9395082 1.13212

2002 | .9312197 .0424567 -1.56 0.118 .8516158 1.018265

2003 | .842037 .0476622 -3.04 0.002 .7536163 .940832

2004 | .7907151 .041133 -4.51 0.000 .7140695 .8755876

2005 | .7156965 .0395276 -6.06 0.000 .6422696 .7975178

2006 | .7002225 .039917 -6.25 0.000 .626199 .7829963

2007 | .689264 .0429859 -5.97 0.000 .6099588 .7788802

2008 | .618408 .0391484 -7.59 0.000 .5462477 .7001008

2009 | .5562739 .0363609 -8.97 0.000 .489384 .6323064

2010 | .5570978 .0376007 -8.67 0.000 .4880682 .6358904

2011 | .5198996 .0338614 -10.04 0.000 .4575938 .590689

2012 | .4603344 .0328455 -10.87 0.000 .4002571 .5294292

2013 | .4496525 .0336159 -10.69 0.000 .3883662 .5206101

2014 | .443309 .0340334 -10.60 0.000 .3813807 .5152931

2015 | .4279795 .0342816 -10.60 0.000 .3657976 .5007317

|

\_cons | .0001084 6.53e-06 -151.57 0.000 .0000964 .000122

ln(hours) | 1 (exposure)

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

/lnalpha | -1.177031 .0605738 -1.295753 -1.058308

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

alpha | .3081924 .0186684 .2736916 .3470424

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

(est1 stored)

. esttab using `"`directory'Model.`injury\_label'.`time\_label'.`violation\_level\_label'.C.V.1.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.1.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.1.csv)

. est store nbin

.

. pause "next"

.

. // test for over-dispersion

. lrtest pois nbin, stats force

Likelihood-ratio test LR chi2(1) = 8348.50

(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 -20906.02 32 41876.03 42091.74

nbin | 6,253 -17389.65 -16731.77 33 33529.53 33751.98

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

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

.

. pause "next"

.

. // final model + diagnostics/assessment

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

. predict cv1\_yhat

(option n assumed; predicted number of events)

. gen cv1\_res = dv - cv1\_yhat

.

. summ dv cv1\_yhat

Variable | Obs Mean Std. Dev. Min Max

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

dv | 6,253 9.976651 14.85334 0 200

cv1\_yhat | 6,253 10.64579 15.89942 .0035381 156.3208

. /\*

> pause "next"

>

> scatter dv cv1\_yhat

>

> pause "next"

>

> scatter cv1\_res dv

>

> pause "next"

>

> scatter cv1\_res cv1\_yhat

> \*/

. pause "complete: C.V.1"

.