. // Model C.PP.1

.

. // poisson model

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

Iteration 0: log pseudolikelihood = -23178.031

Iteration 1: log pseudolikelihood = -20894.028

Iteration 2: log pseudolikelihood = -20885.962

Iteration 3: log pseudolikelihood = -20885.959

Iteration 4: log pseudolikelihood = -20885.959

Generalized linear models No. of obs = 6,253

Optimization : ML Residual df = 6,221

Scale parameter = 1

Deviance = 22243.93787 (1/df) Deviance = 3.575621

Pearson = 27517.39305 (1/df) Pearson = 4.423307

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

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

AIC = 6.690535

Log pseudolikelihood = -20885.95903 BIC = -32132.68

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

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

| Robust

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

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

p48\_pp | 1.000232 .0001053 2.20 0.028 1.000025 1.000438

p75\_pp | 1.000007 2.51e-06 2.88 0.004 1.000002 1.000012

mine\_time | 1.005422 .0063732 0.85 0.394 .9930078 1.017991

onsite\_insp\_hours | .9997907 .0000516 -4.06 0.000 .9996895 .9998918

|

state |

1 | .9812479 .0951779 -0.20 0.845 .8113625 1.186704

2 | 1.678293 .0844558 10.29 0.000 1.520664 1.852261

3 | .6530469 .0672064 -4.14 0.000 .5337593 .7989935

4 | 1.234193 .1090941 2.38 0.017 1.03787 1.467653

5 | 1.073331 .13176 0.58 0.564 .8438048 1.365292

6 | .9863434 .0569978 -0.24 0.812 .8807239 1.104629

7 | 1.137777 .1704714 0.86 0.389 .8482483 1.526129

8 | .5232203 .0210136 -16.13 0.000 .4836138 .5660705

9 | .6536392 .0276818 -10.04 0.000 .6015746 .7102098

10 | .9193556 .0585821 -1.32 0.187 .8114173 1.041652

11 | 1.725467 .3166755 2.97 0.003 1.204163 2.472453

12 | 1.055829 .1044141 0.55 0.583 .8697925 1.281656

13 | 1.537381 .1564727 4.23 0.000 1.259353 1.876791

14 | .4276159 .064726 -5.61 0.000 .3178425 .5753018

15 | .8096656 .0609509 -2.80 0.005 .6985991 .93839

17 | .6712688 .0241154 -11.09 0.000 .6256291 .7202379

|

time |

2000 | 1.039777 .0425644 0.95 0.341 .9596109 1.126639

2002 | .9649551 .0368402 -0.93 0.350 .895385 1.039931

2003 | .8461523 .0335836 -4.21 0.000 .7828248 .9146028

2004 | .8216736 .0360773 -4.47 0.000 .7539204 .8955156

2005 | .7759761 .0404798 -4.86 0.000 .7005583 .859513

2006 | .7385145 .0398421 -5.62 0.000 .6644122 .8208815

2007 | .7000624 .0415484 -6.01 0.000 .6231868 .7864212

2008 | .6521789 .0400442 -6.96 0.000 .5782324 .735582

2009 | .5782592 .0360861 -8.78 0.000 .511686 .6534939

2010 | .5698567 .039101 -8.20 0.000 .4981498 .6518855

2011 | .5191698 .0334744 -10.17 0.000 .4575376 .5891041

2012 | .4651742 .0321193 -11.08 0.000 .4062955 .5325854

2013 | .4480012 .0340028 -10.58 0.000 .386077 .5198577

2014 | .4684926 .0394862 -9.00 0.000 .3971554 .5526434

2015 | .4457821 .0403224 -8.93 0.000 .3733608 .532251

|

\_cons | .0000981 5.63e-06 -160.68 0.000 .0000876 .0001098

ln(hours) | 1 (exposure)

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

.

. quietly poisson dv `pp\_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 = 22243.94

Prob > chi2(6220) = 0.0000

Pearson goodness-of-fit = 27517.39

Prob > chi2(6220) = 0.0000

.

. pause "next"

.

. // negative binomial model

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

Iteration 0: log pseudolikelihood = -17738.966

Iteration 1: log pseudolikelihood = -17515.541

Iteration 2: log pseudolikelihood = -17510.322

Iteration 3: log pseudolikelihood = -17510.31

Iteration 4: log pseudolikelihood = -17510.31

Generalized linear models No. of obs = 6,253

Optimization : ML Residual df = 6,221

Scale parameter = 1

Deviance = 3932.64956 (1/df) Deviance = .6321571

Pearson = 5318.848411 (1/df) Pearson = .8549829

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

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

AIC = 5.610846

Log pseudolikelihood = -17510.30997 BIC = -50443.97

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

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

| Robust

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

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

p48\_pp | 1.000227 .0001547 1.47 0.142 .9999238 1.00053

p75\_pp | 1.000008 2.67e-06 3.05 0.002 1.000003 1.000013

mine\_time | 1.01045 .0062288 1.69 0.092 .9983157 1.022733

onsite\_insp\_hours | .99981 .0000445 -4.27 0.000 .9997228 .9998972

|

state |

1 | .8341241 .1031601 -1.47 0.143 .6545737 1.062926

2 | 1.096368 .0544345 1.85 0.064 .9947054 1.208421

3 | .6688012 .08589 -3.13 0.002 .519975 .8602241

4 | 1.029719 .0690723 0.44 0.662 .902862 1.174401

5 | .85701 .0833981 -1.59 0.113 .7081953 1.037096

6 | .770197 .0387854 -5.19 0.000 .6978101 .8500929

7 | 1.090468 .2306822 0.41 0.682 .7203543 1.650744

8 | .4781062 .0194892 -18.10 0.000 .4413942 .5178717

9 | .5392421 .0249978 -13.32 0.000 .4924072 .5905316

10 | .7858884 .0847471 -2.23 0.025 .6361664 .9708476

11 | 1.530207 .2731498 2.38 0.017 1.078466 2.171171

12 | 1.000732 .0786601 0.01 0.993 .8578495 1.167412

13 | 1.53777 .1808021 3.66 0.000 1.221271 1.936291

14 | .4165927 .0755417 -4.83 0.000 .2919856 .5943769

15 | .7087622 .0409658 -5.96 0.000 .6328515 .7937784

17 | .5847027 .0225725 -13.90 0.000 .5420937 .6306607

|

time |

2000 | 1.005963 .0583026 0.10 0.918 .8979435 1.126977

2002 | .899916 .0503474 -1.88 0.059 .8064548 1.004209

2003 | .8410319 .0622519 -2.34 0.019 .7274578 .9723376

2004 | .7642047 .0490191 -4.19 0.000 .673923 .866581

2005 | .6882247 .0450255 -5.71 0.000 .6054 .7823807

2006 | .6816614 .0460908 -5.67 0.000 .5970551 .778257

2007 | .6441236 .0463856 -6.11 0.000 .559334 .7417666

2008 | .572295 .0427503 -7.47 0.000 .4943509 .6625284

2009 | .5205903 .0399768 -8.50 0.000 .4478486 .605147

2010 | .5179363 .0394528 -8.64 0.000 .4461057 .6013329

2011 | .4847946 .0360902 -9.73 0.000 .4189774 .560951

2012 | .4326224 .03621 -10.01 0.000 .3671676 .5097457

2013 | .4335369 .0383779 -9.44 0.000 .3644813 .5156759

2014 | .410927 .0352211 -10.38 0.000 .3473818 .4860963

2015 | .3862975 .0342019 -10.74 0.000 .324757 .4594997

|

\_cons | .0001174 8.43e-06 -126.09 0.000 .000102 .0001352

ln(hours) | 1 (exposure)

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

.

. pause "next"

.

. eststo clear

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

Fitting Poisson model:

Iteration 0: log pseudolikelihood = -21534.374

Iteration 1: log pseudolikelihood = -20887.76

Iteration 2: log pseudolikelihood = -20885.96

Iteration 3: log pseudolikelihood = -20885.959

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 = -16876.828

Iteration 1: log pseudolikelihood = -16752.203

Iteration 2: log pseudolikelihood = -16742.664

Iteration 3: log pseudolikelihood = -16742.642

Iteration 4: log pseudolikelihood = -16742.642

Negative binomial regression Number of obs = 6,253

Wald chi2(31) = .

Dispersion = mean Prob > chi2 = .

Log pseudolikelihood = -16742.642 Pseudo R2 = 0.0372

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

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

| Robust

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

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

p48\_pp | 1.000192 .0001237 1.55 0.121 .9999494 1.000434

p75\_pp | 1.000009 2.57e-06 3.59 0.000 1.000004 1.000014

mine\_time | 1.007465 .0057142 1.31 0.190 .9963279 1.018727

onsite\_insp\_hours | .9998048 .0000444 -4.39 0.000 .9997177 .9998918

|

state |

1 | .8627594 .0977772 -1.30 0.193 .6909114 1.07735

2 | 1.244875 .0593702 4.59 0.000 1.133784 1.36685

3 | .6613116 .0844064 -3.24 0.001 .5149478 .8492766

4 | 1.045985 .0667734 0.70 0.481 .9229682 1.185399

5 | .88508 .0875424 -1.23 0.217 .7291065 1.07442

6 | .7994569 .0383983 -4.66 0.000 .7276315 .8783723

7 | 1.076233 .2092128 0.38 0.705 .7352554 1.575341

8 | .4847835 .0192079 -18.27 0.000 .4485613 .5239307

9 | .5720031 .0248249 -12.87 0.000 .5253591 .6227883

10 | .8083334 .0720442 -2.39 0.017 .6787746 .9626213

11 | 1.565292 .2728192 2.57 0.010 1.112339 2.202692

12 | 1.069587 .0781664 0.92 0.357 .92685 1.234305

13 | 1.505291 .163963 3.75 0.000 1.215917 1.863533

14 | .4161965 .0749018 -4.87 0.000 .2924893 .5922252

15 | .7351549 .0404289 -5.59 0.000 .6600367 .8188221

17 | .6074317 .0221293 -13.68 0.000 .5655714 .6523904

|

time |

2000 | 1.023251 .0488888 0.48 0.630 .9317802 1.123701

2002 | .9263348 .0421662 -1.68 0.093 .84727 1.012778

2003 | .8379138 .0476778 -3.11 0.002 .7494893 .9367705

2004 | .7887985 .0415949 -4.50 0.000 .7113453 .8746849

2005 | .7166012 .0407213 -5.86 0.000 .641073 .8010277

2006 | .707979 .0412293 -5.93 0.000 .631612 .7935792

2007 | .6705312 .0420095 -6.38 0.000 .5930487 .7581369

2008 | .5889033 .0378285 -8.24 0.000 .5192382 .6679153

2009 | .5288921 .0350676 -9.61 0.000 .4644395 .6022891

2010 | .5299716 .0360683 -9.33 0.000 .4637911 .6055958

2011 | .4927072 .0323677 -10.77 0.000 .433182 .560412

2012 | .4344202 .0311804 -11.62 0.000 .3774116 .5000399

2013 | .4241959 .0319205 -11.40 0.000 .3660277 .4916081

2014 | .417495 .0322147 -11.32 0.000 .3588978 .4856593

2015 | .4018076 .0325305 -11.26 0.000 .3428502 .4709034

|

\_cons | .0001131 6.95e-06 -147.81 0.000 .0001003 .0001276

ln(hours) | 1 (exposure)

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

/lnalpha | -1.173139 .0614233 -1.293527 -1.052752

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

alpha | .3093941 .019004 .2743017 .3489761

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

(est1 stored)

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

. est store nbin

.

. pause "next"

.

. // test for over-dispersion

. lrtest pois nbin, stats force

Likelihood-ratio test LR chi2(0) = -8286.63

(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 -16742.64 33 33551.28 33773.73

pois | 6,253 -24975.69 -20885.96 33 41837.92 42060.37

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

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

.

. pause "next"

.

. // final model + diagnostics/assessment

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

. predict cpp1\_yhat

(option n assumed; predicted number of events)

. gen cpp1\_res = dv - cpp1\_yhat

.

. summ dv cpp1\_yhat

Variable | Obs Mean Std. Dev. Min Max

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

dv | 6,253 9.976651 14.85334 0 200

cpp1\_yhat | 6,253 10.49823 14.9893 .003476 135.711

. /\*

> pause "next"

>

> scatter dv cpp1\_yhat

>

> pause "next"

>

> scatter cpp1\_res dv

>

> pause "next"

>

> scatter cpp1\_res cpp1\_yhat

> \*/

. pause "complete: C.PP.1"

.