// Model PS.Y.B.SP.V.1

**. eststo: logit dv\_indicator `count\_vars' `covariates' ib(freq).state ib(freq).time, vce(cl mineid) offset(lnhours) iter(50) or**

note: sp75\_1400\_1 != 0 predicts success perfectly

sp75\_1400\_1 dropped and 7 obs not used

note: sp75\_1405\_1 != 0 predicts success perfectly

sp75\_1405\_1 dropped and 5 obs not used

note: sp75\_500\_1 != 0 predicts success perfectly

sp75\_500\_1 dropped and 6 obs not used

note: sp75\_508\_1 != 0 predicts success perfectly

sp75\_508\_1 dropped and 4 obs not used

note: sp75\_1003\_2 != 0 predicts success perfectly

sp75\_1003\_2 dropped and 25 obs not used

note: sp75\_1322 != 0 predicts success perfectly

sp75\_1322 dropped and 2 obs not used

note: sp75\_812 != 0 predicts success perfectly

sp75\_812 dropped and 20 obs not used

note: sp75\_1003 != 0 predicts success perfectly

sp75\_1003 dropped and 105 obs not used

note: sp75\_153 != 0 predicts success perfectly

sp75\_153 dropped and 5 obs not used

note: sp75\_343 != 0 predicts success perfectly

sp75\_343 dropped and 34 obs not used

note: sp48\_24 != 0 predicts success perfectly

sp48\_24 dropped and 1 obs not used

note: sp48\_4 != 0 predicts success perfectly

sp48\_4 dropped and 2 obs not used

note: sp75\_155 != 0 predicts success perfectly

sp75\_155 dropped and 1 obs not used

note: sp75\_215 != 0 predicts success perfectly

sp75\_215 dropped and 4 obs not used

note: sp75\_156 != 0 predicts success perfectly

sp75\_156 dropped and 5 obs not used

note: sp75\_327 != 0 predicts success perfectly

sp75\_327 dropped and 1 obs not used

note: sp75\_1318 != 0 predicts success perfectly

sp75\_1318 dropped and 1 obs not used

note: 17.state != 0 predicts success perfectly

17.state dropped and 11 obs not used

note: sp75\_510 omitted because of collinearity

Iteration 0: log pseudolikelihood = -1955.931

Iteration 1: log pseudolikelihood = -1720.2839

Iteration 2: log pseudolikelihood = -1679.0284

Iteration 3: log pseudolikelihood = -1675.3668

Iteration 4: log pseudolikelihood = -1674.737

Iteration 5: log pseudolikelihood = -1674.725

Iteration 6: log pseudolikelihood = -1674.725

Logistic regression Number of obs = 6,014

Wald chi2(102) = .

Log pseudolikelihood = -1674.725 Prob > chi2 = .

(Std. Err. adjusted for 1,236 clusters in mineid)

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

| Robust

dv\_indicator | Odds Ratio Std. Err. z P>|z| [95% Conf. Interval]

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

sp48\_11 | 1.794417 .5933383 1.77 0.077 .9385706 3.430678

sp75\_1311 | .4062141 .3331859 -1.10 0.272 .0813918 2.027354

sp75\_1400\_1 | 1 (omitted)

sp75\_1404\_1 | .2548715 .2300224 -1.51 0.130 .0434619 1.494629

sp75\_1405\_1 | 1 (omitted)

sp75\_500\_1 | 1 (omitted)

sp75\_501 | .9221113 .3527695 -0.21 0.832 .4356539 1.951754

sp75\_506\_1 | 1.576169 1.205518 0.59 0.552 .3520213 7.057265

sp75\_507\_1 | 1.040255 .1248537 0.33 0.742 .8221983 1.316142

sp75\_508\_1 | 1 (omitted)

sp75\_512\_1 | 2.019285 1.631318 0.87 0.384 .4145129 9.836875

sp75\_811 | 1.117893 .4125138 0.30 0.763 .5423731 2.304104

sp75\_1002 | .9944759 .1912172 -0.03 0.977 .6822221 1.449649

sp75\_1003\_2 | 1 (omitted)

sp75\_1322 | 1 (omitted)

sp75\_1719\_2 | .3010487 .1699395 -2.13 0.033 .0995728 .9101919

sp75\_212 | 2.878715 1.960575 1.55 0.121 .7576703 10.93748

sp75\_332 | .3514077 .113544 -3.24 0.001 .1865426 .6619794

sp75\_501\_2 | .5527676 .1631843 -2.01 0.045 .3099251 .98589

sp75\_502 | .7924558 .5821488 -0.32 0.752 .1877893 3.3441

sp75\_602 | 1.330276 .3106999 1.22 0.222 .8416562 2.102562

sp75\_812 | 1 (omitted)

sp75\_1003 | 1 (omitted)

sp75\_153 | 1 (omitted)

sp75\_203 | 1.022637 .0554117 0.41 0.680 .9196005 1.137219

sp75\_213 | 2.818091 4.911115 0.59 0.552 .0925887 85.77334

sp75\_343 | 1 (omitted)

sp75\_373 | .0888274 .0857278 -2.51 0.012 .0133982 .5889069

sp75\_503 | .998264 .0149901 -0.12 0.908 .9693122 1.028081

sp75\_523 | .8524384 .0870164 -1.56 0.118 .6978674 1.041246

sp75\_523\_3 | .8820046 .0327509 -3.38 0.001 .8200943 .9485886

sp75\_603 | 1.064181 .2932764 0.23 0.821 .6200602 1.826405

sp75\_703\_3 | 1.445983 .7936148 0.67 0.502 .493161 4.239724

sp48\_24 | 1 (omitted)

sp48\_4 | 1 (omitted)

sp75\_1404 | .0351857 .0324851 -3.63 0.000 .005761 .2148995

sp75\_1719\_4 | .8289592 .2012301 -0.77 0.440 .5151145 1.334021

sp75\_204 | 1.233287 .1144761 2.26 0.024 1.028144 1.479361

sp75\_334 | .8262915 .1465444 -1.08 0.282 .5836749 1.169757

sp75\_524 | .5397472 .3917179 -0.85 0.395 .1301477 2.238433

sp75\_604 | 1.084388 .043423 2.02 0.043 1.002535 1.172925

sp75\_703\_4 | .1742531 .3047781 -1.00 0.318 .0056544 5.370048

sp48\_25 | 1.048032 .529089 0.09 0.926 .3896307 2.819003

sp48\_5 | .8577497 .3839761 -0.34 0.732 .3567103 2.062554

sp75\_1315 | .3866646 .3177343 -1.16 0.248 .077246 1.9355

sp75\_1403\_5 | .9002169 .0998305 -0.95 0.343 .7243563 1.118773

sp75\_1405 | 1.761747 .9941973 1.00 0.316 .5828938 5.32473

sp75\_155 | 1 (omitted)

sp75\_1725 | 1.050753 .0371216 1.40 0.161 .9804582 1.126088

sp75\_205 | 1.392366 1.387681 0.33 0.740 .1974312 9.819535

sp75\_215 | 1 (omitted)

sp75\_505 | 1.694535 1.225989 0.73 0.466 .4104023 6.996671

sp75\_605 | 1.232813 .1322786 1.95 0.051 .9989984 1.521352

sp48\_26 | 1.132324 .202189 0.70 0.486 .7979567 1.606802

sp48\_6 | .8184304 .1513884 -1.08 0.279 .5695496 1.176067

sp75\_1316 | 1.241647 1.444266 0.19 0.852 .1270259 12.13679

sp75\_1403\_6 | .979564 .1359445 -0.15 0.882 .7462812 1.285769

sp75\_156 | 1 (omitted)

sp75\_1906 | .7568644 .5086402 -0.41 0.678 .2027589 2.825246

sp75\_1916 | .5015747 .6304783 -0.55 0.583 .042695 5.892426

sp75\_606 | .9171221 .0537179 -1.48 0.140 .8176555 1.028689

sp75\_816 | .7839997 .1417983 -1.35 0.178 .5500005 1.117554

sp75\_906 | .4156938 .4796988 -0.76 0.447 .0433023 3.990579

sp48\_27 | .6665335 .2882618 -0.94 0.348 .2855585 1.555782

sp48\_7 | 2.697076 .9188759 2.91 0.004 1.38323 5.258864

sp75\_1403\_7 | .6663733 .231232 -1.17 0.242 .3375593 1.315483

sp75\_207 | .8943539 .4810162 -0.21 0.836 .3116751 2.566355

sp75\_327 | 1 (omitted)

sp75\_337 | 1.411507 .3779714 1.29 0.198 .8351212 2.385704

sp75\_507 | 1.22911 .4204673 0.60 0.546 .628641 2.40314

sp75\_607 | 1.215033 .33646 0.70 0.482 .7061193 2.09073

sp75\_807 | 1.138981 .0711606 2.08 0.037 1.00771 1.287352

sp75\_817 | .1112162 .0995792 -2.45 0.014 .0192323 .6431396

sp48\_28 | 1.47164 .6194095 0.92 0.359 .6449604 3.357918

sp48\_8 | 1.308625 .4059327 0.87 0.386 .7124829 2.403567

sp75\_1318 | 1 (omitted)

sp75\_1403\_8 | 5.001674 6.292917 1.28 0.201 .4247816 58.89317

sp75\_208 | .8258606 .0567774 -2.78 0.005 .7217506 .944988

sp75\_388 | 1.025805 .1823147 0.14 0.886 .7240728 1.453274

sp75\_209 | .9622204 .157613 -0.24 0.814 .6979858 1.326486

sp75\_389 | .6829504 .3309624 -0.79 0.431 .2641746 1.765579

sp75\_509 | 1.423911 .8036475 0.63 0.531 .4710523 4.304238

sp75\_100 | .7555902 .6266485 -0.34 0.735 .1487108 3.839106

sp75\_1400 | .7432014 .2710113 -0.81 0.416 .3636743 1.5188

sp75\_1403\_10 | 1.075742 .2032127 0.39 0.699 .7428692 1.557773

sp75\_160 | 1.253812 .9104212 0.31 0.755 .3021033 5.203662

sp75\_1720 | .9875701 .1380744 -0.09 0.929 .750861 1.298902

sp75\_340 | 1.247493 .1437584 1.92 0.055 .9952854 1.563611

sp75\_500 | .9109835 .1759364 -0.48 0.629 .6239067 1.330152

sp75\_510 | 1 (omitted)

sp75\_810 | .7619791 .0903013 -2.29 0.022 .6040434 .9612094

mine\_time | 1.024089 .0207822 1.17 0.241 .9841565 1.065643

onsite\_insp\_hours | 1.003582 .0004858 7.39 0.000 1.002631 1.004535

|

state |

1 | 1.130997 .8630187 0.16 0.872 .2534801 5.046373

2 | .5663133 .1070079 -3.01 0.003 .391037 .8201547

3 | 1.075789 .4603449 0.17 0.864 .4650355 2.488674

4 | 4.633497 3.376169 2.10 0.035 1.110929 19.32554

5 | .8814854 .4409205 -0.25 0.801 .3307064 2.349566

6 | .5231402 .0771435 -4.39 0.000 .3918302 .6984548

7 | 2.002443 2.310127 0.60 0.547 .208722 19.2111

8 | .8089072 .2232817 -0.77 0.442 .470915 1.389488

9 | .1377109 .0286046 -9.54 0.000 .091656 .2069072

10 | .6989492 .280297 -0.89 0.372 .3184868 1.53391

11 | 2.377018 2.103316 0.98 0.328 .419607 13.46549

12 | .5263687 .1168813 -2.89 0.004 .3406268 .8133945

13 | 1.831341 1.244133 0.89 0.373 .4836158 6.934868

14 | .4364881 .190058 -1.90 0.057 .1859249 1.024725

15 | .6384259 .1116406 -2.57 0.010 .453171 .8994125

17 | 1 (empty)

|

time |

2000 | 1.023621 .194267 0.12 0.902 .7056587 1.484854

2002 | .6619915 .1285875 -2.12 0.034 .4523891 .9687075

2003 | .8828829 .2018869 -0.54 0.586 .5639762 1.382119

2004 | .5277802 .1162971 -2.90 0.004 .3426807 .8128615

2005 | .4742157 .1008067 -3.51 0.000 .3126305 .7193175

2006 | .481354 .1048156 -3.36 0.001 .3141334 .73759

2007 | .3106619 .0709534 -5.12 0.000 .1985539 .4860687

2008 | .2224456 .0504924 -6.62 0.000 .1425646 .3470853

2009 | .2403957 .0621298 -5.52 0.000 .1448556 .3989496

2010 | .1719964 .0440706 -6.87 0.000 .1040916 .2841991

2011 | .2245991 .0580272 -5.78 0.000 .1353607 .3726692

2012 | .1527667 .0390603 -7.35 0.000 .0925526 .2521558

2013 | .2181236 .0659065 -5.04 0.000 .1206453 .394362

2014 | .1352143 .0408838 -6.62 0.000 .0747569 .2445649

2015 | .0938944 .0308147 -7.21 0.000 .0493502 .1786451

|

\_cons | .0001326 .0000247 -47.89 0.000 .000092 .0001911

lnhours | 1 (offset)

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

Note: 0 failures and 44 successes completely determined.

(est1 stored)

**. lfit**

Logistic model for dv\_indicator, goodness-of-fit test

number of observations = 6014

number of covariate patterns = 5999

Pearson chi2(5893) = 5296.54

Prob > chi2 = 1.0000

**. linktest**

Iteration 0: log likelihood = -2783.4944

Iteration 1: log likelihood = -1943.0406

Iteration 2: log likelihood = -1689.9979

Iteration 3: log likelihood = -1674.6667

Iteration 4: log likelihood = -1668.1828

Iteration 5: log likelihood = -1667.9102

Iteration 6: log likelihood = -1667.9101

Logistic regression Number of obs = 6,014

LR chi2(2) = 2231.17

Prob > chi2 = 0.0000

Log likelihood = -1667.9101 Pseudo R2 = 0.4008

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

dv\_indicator | Coef. Std. Err. z P>|z| [95% Conf. Interval]

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

\_hat | .9943083 .0430208 23.11 0.000 .909989 1.078628

\_hatsq | .0505841 .0174882 2.89 0.004 .0163078 .0848603

\_cons | -.1162746 .0560812 -2.07 0.038 -.2261918 -.0063575

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

Note: 0 failures and 212 successes completely determined.

**. estat classification**

Logistic model for dv\_indicator

-------- True --------

Classified | D ~D | Total

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

+ | 4796 566 | 5362

- | 169 483 | 652

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

Total | 4965 1049 | 6014

Classified + if predicted Pr(D) >= .5

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

Sensitivity Pr( +| D) 96.60%

Specificity Pr( -|~D) 46.04%

Positive predictive value Pr( D| +) 89.44%

Negative predictive value Pr(~D| -) 74.08%

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

False + rate for true ~D Pr( +|~D) 53.96%

False - rate for true D Pr( -| D) 3.40%

False + rate for classified + Pr(~D| +) 10.56%

False - rate for classified - Pr( D| -) 25.92%

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

Correctly classified 87.78%

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

**. summ dv\_indicator bv1\_yhat**

Variable | Obs Mean Std. Dev. Min Max

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

dv\_indicator | 6,253 .8322405 .3736824 0 1

bv1\_yhat | 6,014 .8255737 .2318071 .0021865 1