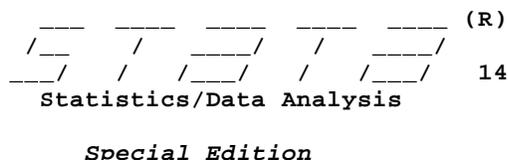


Project: BERD ROC Analysis



(R)
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Notes:

1. Unicode is supported; see [help unicode_advice](#) .
2. Maximum number of variables is set to 5000; see [help set_maxvar](#) .
3. New update available; type - [update all](#) -

```
1 . use "Y:\BERD\ROC Analysis Seminar\INJSEV.dta"
2 . *Non-parametric*
3 .
4 . . roccomp mortality iss niss
```

| | Obs | ROC Area | Std. Err. | -Asymptotic Normal - [95% Conf. Interval] | |
|-------------|-----|----------|-----------|--|---------|
| iss | 703 | 0.8422 | 0.0288 | 0.78579 | 0.89864 |
| niss | 703 | 0.8976 | 0.0243 | 0.84988 | 0.94530 |

Ho: area(**iss**) = area(**niss**)
 chi2(1) = 11.97 Prob>chi2 = 0.0005

```
5 .
6 .
7 .
8 . *Parametric*
9 .
10 . . rocreg mortality iss niss, probit ml
```

Control standardization: **normal**
 ROC method : **parametric** Link: **probit**

Status : **mortality**
 Classifiers: **iss niss**

Classifier : **iss**
 Covariate control adjustment model:

Iteration 0: log likelihood = -2636.4041
 Iteration 1: log likelihood = -2636.3992
 Iteration 2: log likelihood = -2636.3992

| | Coef. | Std. Err. | z | P> z | [95% Conf. Interval] | |
|-------------------------|----------|-----------|-------|-------|----------------------|----------|
| casecov _cons | 15.88442 | 2.155772 | 7.37 | 0.000 | 11.65918 | 20.10965 |
| casesd _cons | 16.00798 | 1.499284 | 10.68 | 0.000 | 13.06944 | 18.94652 |
| ctrlcov _cons | 16.02786 | .389415 | 41.16 | 0.000 | 15.26462 | 16.7911 |
| ctrlsd _cons | 9.897579 | .275358 | 35.94 | 0.000 | 9.357887 | 10.43727 |

Classifier : **niss**
 Covariate control adjustment model:

Iteration 0: log likelihood = -2854.4942
 Iteration 1: log likelihood = -2854.4894
 Iteration 2: log likelihood = -2854.4894

| | Coef. | Std. Err. | z | P> z | [95% Conf. Interval] | |
|-------------------------|----------|-----------|-------|-------|----------------------|----------|
| casecov _cons | 29.97368 | 2.368585 | 12.65 | 0.000 | 25.33134 | 34.61603 |
| casesd _cons | 17.40835 | 1.630441 | 10.68 | 0.000 | 14.21275 | 20.60396 |
| ctrlcov _cons | 22.44737 | .5417729 | 41.43 | 0.000 | 21.38551 | 23.50922 |
| ctrlsd _cons | 13.76999 | .3830913 | 35.94 | 0.000 | 13.01914 | 14.52083 |

Status : **mortality**
 ROC Model :

| | Coef. | Robust Std. Err. | z | P> z | [95% Conf. Interval] | |
|-------------|----------|------------------|-------|-------|----------------------|----------|
| iss | | | | | | |
| i_cons | .9922812 | .1057858 | 9.38 | 0.000 | .7849448 | 1.199618 |
| s_cons | .6182903 | .0883031 | 7.00 | 0.000 | .4452194 | .7913612 |
| auc | .8006619 | .0249655 | 32.07 | 0.000 | .7517305 | .8495934 |
| niss | | | | | | |
| i_cons | 1.721799 | .2350689 | 7.32 | 0.000 | 1.261073 | 2.182526 |
| s_cons | .7909989 | .0744549 | 10.62 | 0.000 | .6450699 | .9369279 |
| auc | .9115574 | .0243633 | 37.42 | 0.000 | .8638062 | .9593087 |

Ho: All classifiers have equal AUC values.
 Ha: At least one classifier has a different AUC value.

P-value: 3.06e-12

```

11 .
12 .
13 .
14 . *Comparing two independent ROCs

15 .
16 .
17 .
18 . logistic mortality niss if agegrp==1
    
```

```

Logistic regression                Number of obs    =           571
LR chi2( 1)                        =           104.64
Prob > chi2                        =           0.0000
Log likelihood = -79.307088        Pseudo R2       =           0.3975
    
```

| mortality | Odds Ratio | Std. Err. | z | P> z | [95% Conf. Interval] | |
|-----------|------------|-----------|--------|-------|----------------------|----------|
| niss | 1.106899 | .0137518 | 8.17 | 0.000 | 1.080272 | 1.134183 |
| _cons | .0014084 | .0008874 | -10.42 | 0.000 | .0004096 | .0048421 |

```

19 .
20 . predict p1 if e(sample), p
    (133 missing values generated)

21 .
22 . lroc, nograph
    
```

```

Logistic model for mortality

number of observations =           571
area under ROC curve  =           0.9324
    
```

```

23 .
24 .
25 .
26 .
27 .
28 . logistic mortality niss if agegrp==0
    
```

```

Logistic regression                Number of obs    =           132
LR chi2( 1)                        =           41.88
Prob > chi2                        =           0.0000
Log likelihood = -38.534644        Pseudo R2       =           0.3521
    
```

| mortality | Odds Ratio | Std. Err. | z | P> z | [95% Conf. Interval] | |
|-----------|------------|-----------|-------|-------|----------------------|----------|
| niss | 1.101938 | .0210228 | 5.09 | 0.000 | 1.061495 | 1.143922 |
| _cons | .0090503 | .0067789 | -6.28 | 0.000 | .002085 | .0392853 |

Ho: All classifiers have equal ROC values.
 Ha: At least one classifier has a different ROC value.

Test based on bootstrap (N) assumptions.

P-values not adjusted for multiple comparisons.

| ROC | P-value |
|-----|----------|
| .5 | .0857711 |
| .6 | .5801733 |
| .7 | .2066636 |
| .75 | 1 |
| .8 | 1 |
| .9 | .3221553 |

Partial area under the ROC curve

Status : mortality
 Classifier: iss

| pAUC | Observed Coef. | Bias | Bootstrap Std. Err. | [95% Conf. Interval] | |
|------|----------------|-----------|---------------------|----------------------|---------------|
| .1 | .0282983 | .0000639 | .0053975 | .0177194 | .0388772 (N) |
| | | | | .0180147 | .0394358 (P) |
| .2 | .0896638 | .0003354 | .0112837 | .0185891 | .0399114 (BC) |
| | | | | .0675482 | .1117793 (N) |
| .3 | .1752539 | -.0005008 | .0147238 | .0677931 | .112471 (P) |
| | | | | .0678428 | .1126179 (BC) |
| .4 | .2615556 | -.0004095 | .0181506 | .1463959 | .204112 (N) |
| | | | | .1454187 | .2037374 (P) |
| .5 | .3500353 | -.0003472 | .0215085 | .1473403 | .2053374 (BC) |
| | | | | .225981 | .2971302 (N) |
| | | | | .2242604 | .2955656 (P) |
| | | | | .2243028 | .2959608 (BC) |
| | | | | .3078794 | .3921912 (N) |
| | | | | .3057405 | .3896712 (P) |
| | | | | .3060115 | .3898042 (BC) |

Status : mortality
 Classifier: niss

| pAUC | Observed Coef. | Bias | Bootstrap Std. Err. | [95% Conf. Interval] | |
|------|----------------|----------|---------------------|----------------------|---------------|
| .1 | .0480637 | .000165 | .0060725 | .0361618 | .0599655 (N) |
| | | | | .0361373 | .059821 (P) |
| .2 | .1275107 | .0004105 | .0101515 | .0359035 | .0595628 (BC) |
| | | | | .1076141 | .1474073 (N) |
| .3 | .2130846 | .000408 | .0138926 | .1077531 | .1472685 (P) |
| | | | | .1071642 | .1461518 (BC) |
| .4 | .3045353 | .0004678 | .0166502 | .1858555 | .2403136 (N) |
| | | | | .185213 | .2384654 (P) |
| .5 | .3992722 | .0005419 | .0184662 | .1842264 | .2375157 (BC) |
| | | | | .2719016 | .337169 (N) |
| | | | | .2713077 | .334761 (P) |
| | | | | .269202 | .3329508 (BC) |
| | | | | .3630792 | .4354652 (N) |
| | | | | .3632631 | .4335078 (P) |
| | | | | .3588817 | .4312559 (BC) |

Ho: All classifiers have equal pAUC values.

Ha: At least one classifier has a different pAUC value.

Test based on bootstrap (N) assumptions.

P-values not adjusted for multiple comparisons.

| pAUC | P-value |
|------|----------|
| .1 | .000949 |
| .2 | .0002126 |
| .3 | .0012304 |
| .4 | .0005949 |
| .5 | .0002361 |