

```
setwd("C:\\Users\\Aasthaa\\Documents\\RA_Hutch\\2009_11_13_fromDaryl")
source("rocreg.R")
source("hidden.R")
```

Documentation examples

```
nnhs2 <- read.csv("http://labs.fhcrc.org/pepe/book/data/nnhs2.csv",header = TRUE, sep = ",")
```

```
> rocreg(dataset="nnhs2", d="d", markers="y1", cluster="id", noccsamp=T, nsamp=5000)
ROC regression for markers: y1
```

Percentile value calculation

method: empirical

tie correction: no

GLM fit

link function: probit - binormal ROC

number of points: 10

on FPR interval: (0,1)

model coefficient bootstrap se's and CI's based on sampling
w/o respect to case/control status

bootstrap samples: 5000

Model results for marker: y1

ROC-GLM model

Bootstrap results

Number of strata = 1 Number of obs = 5058

Replications = 5000

	Observed Coef.	Bootstrap Std. Err.	[95% Conf. Interval]	
alpha_0	0.452	0.0979	0.267	0.648
alpha_1	0.9	0.073	0.78	1.07

```
> rocreg(dataset="nnhs2", d="d", markers="y1", adjcov="gender", regcov="gender", cluster="id",  
noocsamp=T, level=90, nsamp=5000)
```

ROC regression for markers: y1

Model intercept term covariates: gender

Percentile value calculation

method: empirical

tie correction: no

Covariate adjustment

method: stratified

covariates: gender

of case-containing strata: 2

Stratum d=0 d=1 Total

1 2170 64 2234

2 2739 85 2824

Total 4909 149 5058

GLM fit

link function: probit - binormal ROC

number of points: 10

on FPR interval: (0,1)

model coefficient bootstrap se's and CI's based on sampling

w/o respect to case/control status

and from within covariate strata

bootstrap samples: 5000

Model results for marker: y1

ROC-GLM model

Bootstrap results

Number of strata = 2 Number of obs = 5058

Replications = 5000

	Observed Coef.	Bootstrap Std. Err.	[90% Conf. Interval]	
alpha_0	0.495	0.323	-0.0587	1.02
alpha_1	0.914	0.0718	0.81	1.05
gender	-0.0285	0.195	-0.336	0.306

```
> rocreg(dataset="nnhs2", d="d", markers="y1", adjcov="gender", regcov="gender",  
pvcmeth="normal", cluster="id", noccsamp=T, nsamp=5000)
```

ROC regression for markers: y1

Model intercept term covariates: gender

Percentile value calculation

method: normal

Covariate adjustment

method: stratified

covariates: gender

of case-containing strata: 2

Stratum d=0 d=1 Total

1 2170 64 2234

2 2739 85 2824

Total 4909 149 5058

GLM fit

link function: probit - binormal ROC

number of points: 10

on FPR interval: (0,1)

model coefficient bootstrap se's and CI's based on sampling
w/o respect to case/control status
and from within covariate strata

bootstrap samples: 5000

Model results for marker: y1

ROC-GLM model

Bootstrap results

Number of strata = 2 Number of obs = 5058

Replications = 5000

	Observed Coef.	Bootstrap Std. Err.	[95% Conf. Interval]	
alpha_0	0.48	0.32	-0.129	1.12
alpha_1	1.04	0.0826	0.893	1.22
gender	-0.00853	0.192	-0.386	0.371

```
> rocreg(dataset="nnhs2", d="d", markers=c("y1","y2"), adjcov=c("currence","gender"),  
adjmodel="linear", regcov="currence", cluster="id", noccsamp=T, nsamp=5000)
```

ROC regression for markers: y1, y2

Model intercept term covariates: currence

Percentile value calculation

method: empirical

tie correction: no

Covariate adjustment

method: linear model

covariates: currence, gender

GLM fit

link function: probit - binormal ROC

number of points: 10

on FPR interval: (0,1)

model coefficient bootstrap se's and CI's based on sampling
w/o respect to case/control status

bootstrap samples: 5000

Model results for marker: y1

Covariate adjustment - linear model, controls only

Call:

```
glm(formula = as.formula(formulaStr), data = ctrlsData)
```

Deviance Residuals:

Min	1Q	Median	3Q	Max
-27.356	-5.132	1.104	4.804	48.274

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	-1.48666	1.28861	-1.154	0.249
currence	-0.20325	0.03239	-6.275	3.8e-10 ***
gender	0.24717	0.22291	1.109	0.268

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for gaussian family taken to be 60.08613)

Null deviance: 297081 on 4906 degrees of freedom
Residual deviance: 294662 on 4904 degrees of freedom


```
> rocreg(dataset="nnhs2", d="d", markers="y1", adjcov="gender", regcov="gender",
sregcov="gender", link="logit", cluster="id", noccsamp=T, nsamp=5000)
```

```
ROC regression for markers: y1
Model intercept term covariates: gender
Model slope term covariates: gender
```

```
Percentile value calculation
method: empirical
tie correction: no
```

```
Covariate adjustment
method: stratified
covariates: gender
# of case-containing strata: 2
```

```
Stratum d=0 d=1 Total
1 2170 64 2234
2 2739 85 2824
Total 4909 149 5058
```

```
GLM fit
link function: logit - bilogistic ROC
number of points: 10
on FPR interval: (0,1)
```

```
model coefficient bootstrap se's and CI's based on sampling
w/o respect to case/control status
and from within covariate strata
```

```
bootstrap samples: 5000
```

```
*****
```

```
Model results for marker: y1
```

```
ROC-GLM model
```

```
Bootstrap results
Number of strata = 2          Number of obs = 5058
Replications = 5000
```

```
Observed Coef. Bootstrap Std. Err. [95% Conf. Interval]
alpha_0 0.793    0.552    -0.315  1.87
alpha_1 0.841    0.243    0.367  1.33
gender -0.0258    0.337    -0.663  0.668
s_gender 0.0436    0.156    -0.235  0.374
```

```
>
>
```

```
> ### Covariate adjustment
> dis <- nnhs2$d
> m1 <- nnhs2$y1
> m2 <- nnhs2$y2
> m3 <- nnhs2$y3
>
> # One marker
> test <-
rocreg(d="dis",markers="m1",adjcov=c("nnhs2$gender"),adjmodel="stratified",pvcmeth="empirical",
nsamp=5000)
ROC regression for markers: m1
```

Percentile value calculation
method: empirical
tie correction: no

Covariate adjustment
method: stratified
covariates: gender
of case-containing strata: 2

Stratum	dis=0	dis=1	Total
1	2170	64	2234
2	2739	85	2824
Total	4909	149	5058

GLM fit
link function: probit - binormal ROC
number of points: 10
on FPR interval: (0,1)

model coefficient bootstrap se's and CI's based on sampling
separately from cases and controls
and from within covariate strata

bootstrap samples: 5000

Model results for marker: m1

ROC-GLM model

Bootstrap results
Number of strata = 2 Number of obs = 5058
 Replications = 5000

Observed Coef. Bootstrap Std. Err. [95% Conf. Interval]

```
alpha_0 0.451    0.0916    0.28    0.635
alpha_1 0.914    0.0693    0.791    1.06
```

> test

```
$rocreg_m1
$rocreg_m1$fit
```

Call: glm(formula = as.formula(formulaStr), family = binomial(probit), data = reg)

Coefficients:

```
(Intercept)      x
    0.4507    0.9139
```

Degrees of Freedom: 1489 Total (i.e. Null); 1488 Residual

Null Deviance: 1948

Residual Deviance: 1580 AIC: 1584

```
$rocreg_m1$V
```

```
alpha_0 alpha_1
alpha_0 0.008389374 NA
alpha_1 0.001073310 0.004806276
```

```
$GLMparam
```

```
alpha_0 alpha_1
m1 0.451 0.914
```

```
> rocreg(d="dis",markers="m1",adjcov="nnhs2$gender",adjmodel="stratified",pvcmeth="normal",
nsamp=5000)
```

ROC regression for markers: m1

Percentile value calculation
method: normal

Covariate adjustment
method: stratified
covariates: gender
of case-containing strata: 2

Stratum	dis=0	dis=1	Total
1	2170	64	2234
2	2739	85	2824
Total	4909	149	5058

GLM fit
link function: probit - binormal ROC
number of points: 10
on FPR interval: (0,1)

model coefficient bootstrap se's and CI's based on sampling
separately from cases and controls
and from within covariate strata

bootstrap samples: 5000

Model results for marker: m1

ROC-GLM model

Bootstrap results
Number of strata = 2 Number of obs = 5058
 Replications = 5000

	Observed Coef.	Bootstrap Std. Err.	[95% Conf. Interval]	
alpha_0	0.467	0.0944	0.293	0.657
alpha_1	1.04	0.0814	0.889	1.21

```
> rocreg(d="dis",markers="m1",adjcov="nnhs2$y2",adjmodel="linear",pvcmeth="normal",
nsamp=5000)
```

ROC regression for markers: m1

Percentile value calculation

method: normal

Covariate adjustment

method: linear model

covariates: y2

GLM fit

link function: probit - binormal ROC

number of points: 10

on FPR interval: (0,1)

model coefficient bootstrap se's and CI's based on sampling
separately from cases and controls

bootstrap samples: 5000

Model results for marker: m1

Covariate adjustment - linear model, controls only

Call:

```
glm(formula = as.formula(formulaStr), data = ctrlsData)
```

Deviance Residuals:

Min	1Q	Median	3Q	Max
-22.6108	-4.3916	0.5024	4.2454	43.6259

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	-2.20880	0.18605	-11.87	<2e-16 ***
y2	0.56972	0.01357	41.98	<2e-16 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for gaussian family taken to be 44.55492)

Null deviance: 297140 on 4908 degrees of freedom
Residual deviance: 218631 on 4907 degrees of freedom
AIC: 32573

Number of Fisher Scoring iterations: 2

ROC-GLM model

Bootstrap results

Number of strata = 1 Number of obs = 5058
Replications = 5000

	Observed Coef.	Bootstrap Std. Err.	[95% Conf. Interval]	
alpha_0	0.285	0.0867	0.122	0.462
alpha_1	1.36	0.0907	1.2	1.55

```
> rocreg(d="dis",markers="m1",adjcov="nnhs2$y2",adjmodel="linear",pvcmeth="empirical",  
nsamp=5000)
```

ROC regression for markers: m1

Percentile value calculation

method: empirical

tie correction: no

Covariate adjustment

method: linear model

covariates: y2

GLM fit

link function: probit - binormal ROC

number of points: 10

on FPR interval: (0,1)

model coefficient bootstrap se's and CI's based on sampling
separately from cases and controls

bootstrap samples: 5000

Model results for marker: m1

Covariate adjustment - linear model, controls only

Call:
glm(formula = as.formula(formulaStr), data = ctrlsData)

Deviance Residuals:

Min	1Q	Median	3Q	Max
-22.6108	-4.3916	0.5024	4.2454	43.6259

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	-2.20880	0.18605	-11.87	<2e-16 ***
y2	0.56972	0.01357	41.98	<2e-16 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for gaussian family taken to be 44.55492)

Null deviance: 297140 on 4908 degrees of freedom
Residual deviance: 218631 on 4907 degrees of freedom
AIC: 32573

Number of Fisher Scoring iterations: 2

ROC-GLM model

Bootstrap results

Number of strata = 1 Number of obs = 5058
 Replications = 5000

	Observed Coef.	Bootstrap Std. Err.	[95% Conf. Interval]
alpha_0	0.274	0.0865	0.111 0.447
alpha_1	1.11	0.0738	0.97 1.26

>

```
> # Multiple markers
> test <- rocreg(d="dis", markers=c("nnhs2$y1","nnhs2$y2"),
adjcov="nnhs2$gender",adjmodel="stratified",pvcmeth="empirical",nsamp=5000)
ROC regression for markers: y1, y2
```

Percentile value calculation
method: empirical
tie correction: no

Covariate adjustment
method: stratified
covariates: gender
of case-containing strata: 2

```
Stratum dis=0 dis=1 Total
1 2170 64 2234
2 2739 85 2824
Total 4909 149 5058
```

GLM fit
link function: probit - binormal ROC
number of points: 10
on FPR interval: (0,1)

model coefficient bootstrap se's and CI's based on sampling
separately from cases and controls
and from within covariate strata

bootstrap samples: 5000

Model results for marker: y1

ROC-GLM model

Bootstrap results
Number of strata = 2 Number of obs = 5058
 Replications = 5000

	Observed Coef.	Bootstrap Std. Err.	[95% Conf. Interval]
alpha_0	0.451	0.0916	0.28 0.635
alpha_1	0.914	0.0693	0.791 1.06

Model results for marker: y2


```
$GLMparm
  alpha_0 alpha_1
y1 0.451 0.914
y2 0.329 0.891
```

```
> rocreg(d="dis", markers=c("nnhs2$y1","nnhs2$y2"),
adjcov="nnhs2$gender",adjmodel="stratified",pvcmeth="normal",nsamp=5000)
ROC regression for markers: y1, y2
```

```
Percentile value calculation
method: normal
```

```
Covariate adjustment
method: stratified
covariates: gender
# of case-containing strata: 2
```

```
Stratum dis=0 dis=1 Total
1 2170 64 2234
2 2739 85 2824
Total 4909 149 5058
```

```
GLM fit
link function: probit - binormal ROC
number of points: 10
on FPR interval: (0,1)
```

```
model coefficient bootstrap se's and CI's based on sampling
separately from cases and controls
and from within covariate strata
```

```
bootstrap samples: 5000
```

```
*****
```

```
Model results for marker: y1
```

```
ROC-GLM model
```

```
Bootstrap results
Number of strata = 2          Number of obs = 5058
Replications = 5000
```


Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	-10.7817	0.2510	-42.946	< 2e-16 ***
m3	0.2557	0.0593	4.312	1.65e-05 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for gaussian family taken to be 49.10665)

Null deviance: 241879 on 4908 degrees of freedom
Residual deviance: 240966 on 4907 degrees of freedom
AIC: 33051

Number of Fisher Scoring iterations: 2

ROC-GLM model

Bootstrap results

Number of strata = 1 Number of obs = 5058
Replications = 5000

	Observed Coef.	Bootstrap Std. Err.	[95% Conf. Interval]
alpha_0	0.33	0.0862	0.162 0.495
alpha_1	0.87	0.0683	0.753 1.02

```
> rocreg(d="dis", markers=c("nnhs2$y1", "nnhs2$y2"),  
adjcov="m3", adjmodel="linear", pvcmeth="normal", nsamp=5000)  
ROC regression for markers: y1, y2
```

Percentile value calculation
method: normal

Covariate adjustment
method: linear model
covariates: m3

GLM fit
link function: probit - binormal ROC
number of points: 10
on FPR interval: (0,1)


```
> # Multiple adjcov variables
> test <- rocreg(dataset="nnhs2", d="d", markers=c("y1"),
adjcov=c("sitenum", "gender"),adjmodel="stratified",pvcmeth="empirical",nsamp=5000)
ROC regression for markers: y1
```

Percentile value calculation
method: empirical
tie correction: no

Covariate adjustment
method: stratified
covariates: sitenum, gender
of case-containing strata: 12

Stratum	d=0	d=1	Total
1	575	9	584
2	101	4	105
3	98	7	105
4	876	26	902
5	313	7	320
6	207	11	218
7	768	11	779
8	164	4	168
9	117	5	122
10	942	40	982
11	478	21	499
12	270	4	274
Total	4909	149	5058

GLM fit
link function: probit - binormal ROC
number of points: 10
on FPR interval: (0,1)

model coefficient bootstrap se's and CI's based on sampling
separately from cases and controls
and from within covariate strata

bootstrap samples: 5000

Model results for marker: y1

ROC-GLM model

Bootstrap results
Number of strata = 12 Number of obs = 5058

Replications = 5000

	Observed Coef.	Bootstrap Std. Err.	[95% Conf. Interval]
alpha_0	0.446	0.0845	0.279 0.618
alpha_1	0.941	0.0696	0.802 1.07

> test

\$rocreg_m1
\$rocreg_m1\$fit

Call: glm(formula = as.formula(formulaStr), family = binomial(probit), data = reg)

Coefficients:

(Intercept) x
0.4460 0.9405

Degrees of Freedom: 1489 Total (i.e. Null); 1488 Residual

Null Deviance: 1952

Residual Deviance: 1566 AIC: 1570

\$rocreg_m1\$V

	alpha_0	alpha_1
alpha_0	0.007142125	NA
alpha_1	0.001165083	0.004848634

\$GLMparam

	alpha_0	alpha_1
y1	0.446	0.941

```
> rocreg(dataset="nnhs2", d="d", markers=c("y1"),
adjcov=c("sitenum","gender"),adjmodel="stratified",pvcmeth="normal",nsamp=5000)
ROC regression for markers: y1
```

Percentile value calculation
method: normal

Covariate adjustment
method: stratified
covariates: sitenum, gender
of case-containing strata: 12

Stratum	d=0	d=1	Total
1	575	9	584
2	101	4	105
3	98	7	105
4	876	26	902
5	313	7	320
6	207	11	218
7	768	11	779
8	164	4	168
9	117	5	122
10	942	40	982
11	478	21	499
12	270	4	274
Total	4909	149	5058

GLM fit
link function: probit - binormal ROC
number of points: 10
on FPR interval: (0,1)

model coefficient bootstrap se's and CI's based on sampling
separately from cases and controls
and from within covariate strata

bootstrap samples: 5000

Model results for marker: y1
ROC-GLM model

Bootstrap results
Number of strata = 12 Number of obs = 5058
Replications = 5000

	Observed Coef.	Bootstrap Std. Err.	[95% Conf. Interval]	
alpha_0	0.463	0.0873	0.299	0.644
alpha_1	1.02	0.0791	0.872	1.18

```
> rocreg(dataset="nnhs2", d="d", markers=c("y1"),
adjcov=c("currence","y3"),adjmodel="linear",pvcmeth="normal",nsamp=5000)
ROC regression for markers: y1
```

Percentile value calculation
method: normal

Covariate adjustment
method: linear model
covariates: currence, y3

GLM fit
link function: probit - binormal ROC
number of points: 10
on FPR interval: (0,1)

model coefficient bootstrap se's and CI's based on sampling
separately from cases and controls

bootstrap samples: 5000

Model results for marker: y1

Covariate adjustment - linear model, controls only

Call:
glm(formula = as.formula(formulaStr), data = ctrlData)

Deviance Residuals:
Min 1Q Median 3Q Max
-27.665 -5.085 1.100 4.749 48.281

Coefficients:
Estimate Std. Error t value Pr(>|t|)
(Intercept) 0.39416 1.27232 0.310 0.757
currence -0.20302 0.03227 -6.292 3.41e-10 ***
y3 0.38749 0.06543 5.922 3.39e-09 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for gaussian family taken to be 59.67438)

Null deviance: 297081 on 4906 degrees of freedom
Residual deviance: 292643 on 4904 degrees of freedom
AIC: 33995

Number of Fisher Scoring iterations: 2

ROC-GLM model

Bootstrap results

Number of strata = 1 Number of obs = 5056
Replications = 5000

	Observed Coef.	Bootstrap Std. Err.	[95% Conf. Interval]	
alpha_0	0.443	0.0894	0.275	0.624
alpha_1	1.05	0.0775	0.913	1.22

```
> rocreg(dataset="nnhs2", d="d", markers=c("y1"),  
adjcov=c("currage","y3"),adjmodel="linear",pvcmeth="empirical",nsamp=5000)  
ROC regression for markers: y1
```

Percentile value calculation

method: empirical
tie correction: no

Covariate adjustment

method: linear model
covariates: currage, y3

GLM fit

link function: probit - binormal ROC
number of points: 10
on FPR interval: (0,1)

model coefficient bootstrap se's and CI's based on sampling
separately from cases and controls

bootstrap samples: 5000

Model results for marker: y1

Covariate adjustment - linear model, controls only

Call:

```
glm(formula = as.formula(formulaStr), data = ctrlData)
```

Deviance Residuals:

Min	1Q	Median	3Q	Max
-27.665	-5.085	1.100	4.749	48.281

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	0.39416	1.27232	0.310	0.757
currage	-0.20302	0.03227	-6.292	3.41e-10 ***
y3	0.38749	0.06543	5.922	3.39e-09 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for gaussian family taken to be 59.67438)

Null deviance: 297081 on 4906 degrees of freedom
Residual deviance: 292643 on 4904 degrees of freedom
AIC: 33995

Number of Fisher Scoring iterations: 2

ROC-GLM model

Bootstrap results

Number of strata = 1 Number of obs = 5056
 Replications = 5000

	Observed Coef.	Bootstrap Std. Err.	[95% Conf. Interval]
alpha_0	0.447	0.0877	0.267 0.611
alpha_1	0.951	0.0686	0.822 1.09

>

```
> #nostsamp
> rocreg(dataset="nnhs2", d="d", markers=c("y1"),
adjcov=c("sitenum", "gender"), adjmodel="stratified", pvcmeth="empirical", nsamp=5000, nostsamp=T)
ROC regression for markers: y1
```

Percentile value calculation
method: empirical
tie correction: no

Covariate adjustment
method: stratified
covariates: sitenum, gender
of case-containing strata: 12

Stratum	d=0	d=1	Total
1	575	9	584
2	101	4	105
3	98	7	105
4	876	26	902
5	313	7	320
6	207	11	218
7	768	11	779
8	164	4	168
9	117	5	122
10	942	40	982
11	478	21	499
12	270	4	274
Total	4909	149	5058

GLM fit
link function: probit - binormal ROC
number of points: 10
on FPR interval: (0,1)

model coefficient bootstrap se's and CI's based on sampling
separately from cases and controls
and from within covariate strata

bootstrap samples: 5000

Model results for marker: y1

ROC-GLM model

Bootstrap results
Number of strata = 12 Number of obs = 5058

Replications = 5000

	Observed Coef.	Bootstrap Std. Err.	[95% Conf. Interval]
alpha_0	0.446	0.0889	0.276 0.624
alpha_1	0.941	0.0713	0.8 1.08

```
> rocreg(dataset="nnhs2", d="d", markers=c("y1"),  
adjcov=c("sitenum", "gender"), adjmodel="stratified", pvcmeth="normal", nsamp=5000, nostsamp=T)  
ROC regression for markers: y1
```

Percentile value calculation
method: normal

Covariate adjustment
method: stratified
covariates: sitenum, gender
of case-containing strata: 12

Stratum	d=0	d=1	Total
1	575	9	584
2	101	4	105
3	98	7	105
4	876	26	902
5	313	7	320
6	207	11	218
7	768	11	779
8	164	4	168
9	117	5	122
10	942	40	982
11	478	21	499
12	270	4	274
Total	4909	149	5058

GLM fit
link function: probit - binormal ROC
number of points: 10
on FPR interval: (0,1)

model coefficient bootstrap se's and CI's based on sampling
separately from cases and controls
and from within covariate strata

bootstrap samples: 5000

Model results for marker: y1

ROC-GLM model

Bootstrap results

Number of strata = 12 Number of obs = 5058
Replications = 5000

	Observed Coef.	Bootstrap Std. Err.	[95% Conf. Interval]
alpha_0	0.463	0.0914	0.296 0.653
alpha_1	1.02	0.0804	0.871 1.18

>
>
>

> **### regcov, sregcov with covariate adjustment**

> **# One marker**

>

rocreg(d="dis",markers="m1",adjcov="nnhs2\$gender",adjmodel="stratified",regcov="nnhs2\$currage",pvcmeth="normal", nsamp=5000)

ROC regression for markers: m1

Model intercept term covariates: currage

Percentile value calculation

method: normal

Covariate adjustment

method: stratified

covariates: gender

of case-containing strata: 2

Stratum dis=0 dis=1 Total

1 2168 64 2232

2 2739 85 2824

Total 4907 149 5056

GLM fit

link function: probit - binormal ROC

number of points: 10

on FPR interval: (0,1)

model coefficient bootstrap se's and CI's based on sampling
separately from cases and controls
and from within covariate strata

bootstrap samples: 5000

Model results for marker: m1

ROC-GLM model

Bootstrap results

Number of strata = 2 Number of obs = 5056
Replications = 5000

	Observed Coef.	Bootstrap Std. Err.	[95% Conf. Interval]
alpha_0	4.14	1.04	-1.55 2.51
alpha_1	1.09	0.0824	0.889 1.22
currage	-0.0947	0.0268	-0.0524 0.0524

>

rocreg(d="dis",markers="m1",adjcov="nnhs2\$y2",adjmodel="linear",regcov="nnhs2\$y3",pvcmeth="normal", nsamp=5000)

ROC regression for markers: m1

Model intercept term covariates: y3

Percentile value calculation

method: normal

Covariate adjustment

method: linear model

covariates: y2

GLM fit

link function: probit - binormal ROC

number of points: 10

on FPR interval: (0,1)

model coefficient bootstrap se's and CI's based on sampling
separately from cases and controls

bootstrap samples: 5000

Model results for marker: m1

Covariate adjustment - linear model, controls only

Call:

glm(formula = as.formula(formulaStr), data = ctrlData)

Deviance Residuals:

Min	1Q	Median	3Q	Max
-22.6108	-4.3916	0.5024	4.2454	43.6259

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	-2.20880	0.18605	-11.87	<2e-16 ***
y2	0.56972	0.01357	41.98	<2e-16 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for gaussian family taken to be 44.55492)

Null deviance: 297140 on 4908 degrees of freedom
Residual deviance: 218631 on 4907 degrees of freedom
AIC: 32573

Number of Fisher Scoring iterations: 2

ROC-GLM model

Bootstrap results

Number of strata = 1 Number of obs = 5058
Replications = 5000

	Observed Coef.	Bootstrap Std. Err.	[95% Conf. Interval]
alpha_0	0.365	0.198	0.00707 0.773
alpha_1	1.36	0.0906	1.2 1.55
y3	0.0243	0.0524	-0.0686 0.137

>

rocreg(d="dis",markers="m1",adjcov="nnhs2\$y2",adjmodel="linear",regcov="nnhs2\$y3",pvcmeth="empirical", nsamp=5000)

ROC regression for markers: m1
Model intercept term covariates: y3

Percentile value calculation

method: empirical
tie correction: no

Covariate adjustment

method: linear model
covariates: y2


```
rocreg(d="dis",markers="m1",adjcov="nnhs2$gender",adjmodel="stratified",regcov="nnhs2$currage",sregcov="nnhs2$currage",pvcmeth="normal", nsamp=5000)
```

```
ROC regression for markers: m1  
Model intercept term covariates: currage  
Model slope term covariates: currage
```

```
Percentile value calculation  
method: normal
```

```
Covariate adjustment  
method: stratified  
covariates: gender  
# of case-containing strata: 2
```

```
Stratum dis=0 dis=1 Total  
1 2168 64 2232  
2 2739 85 2824  
Total 4907 149 5056
```

```
GLM fit  
link function: probit - binormal ROC  
number of points: 10  
on FPR interval: (0,1)
```

```
model coefficient bootstrap se's and CI's based on sampling  
separately from cases and controls  
and from within covariate strata
```

```
bootstrap samples: 5000
```

```
*****
```

```
Model results for marker: m1
```

```
ROC-GLM model
```

```
Bootstrap results  
Number of strata = 2          Number of obs = 5056  
Replications = 5000
```

```
Observed Coef. Bootstrap Std. Err. [95% Conf. Interval]  
alpha_0 4.09      1.09      -1.69  2.58  
alpha_1 0.699     0.939     -0.854 2.84  
currage -0.0934     0.0282     -0.0543 0.0555  
s_currage 0.0101     0.0243     -0.0459 0.0499
```

```
>
```

```
rocreg(d="dis",markers="m1",adjcov="nnhs2$y2",adjmodel="linear",regcov="nnhs2$y3",sregcov="nnhs2$y3",pvcmeth="normal", nsamp=5000)
```

ROC regression for markers: m1
Model intercept term covariates: y3
Model slope term covariates: y3

Percentile value calculation
method: normal

Covariate adjustment
method: linear model
covariates: y2

GLM fit
link function: probit - binormal ROC
number of points: 10
on FPR interval: (0,1)

model coefficient bootstrap se's and CI's based on sampling
separately from cases and controls

bootstrap samples: 5000

Model results for marker: m1

Covariate adjustment - linear model, controls only

Call:
glm(formula = as.formula(formulaStr), data = ctrlsData)

Deviance Residuals:

Min	1Q	Median	3Q	Max
-22.6108	-4.3916	0.5024	4.2454	43.6259

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	-2.20880	0.18605	-11.87	<2e-16 ***
y2	0.56972	0.01357	41.98	<2e-16 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for gaussian family taken to be 44.55492)

Null deviance: 297140 on 4908 degrees of freedom
Residual deviance: 218631 on 4907 degrees of freedom
AIC: 32573

Number of Fisher Scoring iterations: 2

ROC-GLM model

Bootstrap results

Number of strata = 1 Number of obs = 5058
Replications = 5000

	Observed Coef.	Bootstrap Std. Err.	[95% Conf. Interval]	
alpha_0	0.323	0.189	-0.0294	0.706
alpha_1	1.1	0.172	0.744	1.43
y3	0.0118	0.0527	-0.0832	0.125
s_y3	-0.0849	0.0483	-0.197	-0.00876

>

rocreg(d="dis",markers="m1",adjcov="nnhs2\$y2",adjmodel="linear",regcov="nnhs2\$y3",sregcov="nnhs2\$y3",pvcmeth="empirical", nsamp=5000)

ROC regression for markers: m1
Model intercept term covariates: y3
Model slope term covariates: y3

Percentile value calculation
method: empirical
tie correction: no

Covariate adjustment
method: linear model
covariates: y2

GLM fit
link function: probit - binormal ROC
number of points: 10
on FPR interval: (0,1)

model coefficient bootstrap se's and CI's based on sampling
separately from cases and controls

bootstrap samples: 5000

Model results for marker: m1

Covariate adjustment - linear model, controls only

Call:

```
glm(formula = as.formula(formulaStr), data = ctrlData)
```

Deviance Residuals:

Min	1Q	Median	3Q	Max
-22.6108	-4.3916	0.5024	4.2454	43.6259

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	-2.20880	0.18605	-11.87	<2e-16 ***
y2	0.56972	0.01357	41.98	<2e-16 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for gaussian family taken to be 44.55492)

Null deviance: 297140 on 4908 degrees of freedom
Residual deviance: 218631 on 4907 degrees of freedom
AIC: 32573

Number of Fisher Scoring iterations: 2

ROC-GLM model

Bootstrap results

Number of strata = 1 Number of obs = 5058
Replications = 5000

	Observed Coef.	Bootstrap Std. Err.	[95% Conf. Interval]
alpha_0	0.313	0.193	-0.0575 0.696
alpha_1	1.02	0.159	0.641 1.27
y3	0.0121	0.0529	-0.0836 0.124
s_y3	-0.0297	0.046	-0.15 0.0303

>
>

```
> # Multiple regcov, sregcov markers
> test <-
rocreg(d="dis",markers="m1",adjcov="nnhs2$gender",adjmodel="stratified",regcov=c("nnhs2$currage",
"nnhs2$y3"),pvcmeth="normal", nsamp=5000)
ROC regression for markers: m1
Model intercept term covariates: currage, y3
```

Percentile value calculation
method: normal

Covariate adjustment
method: stratified
covariates: gender
of case-containing strata: 2

```
Stratum dis=0 dis=1 Total
1 2168 64 2232
2 2739 85 2824
Total 4907 149 5056
```

GLM fit
link function: probit - binormal ROC
number of points: 10
on FPR interval: (0,1)

model coefficient bootstrap se's and CI's based on sampling
separately from cases and controls
and from within covariate strata

bootstrap samples: 5000

Model results for marker: m1

ROC-GLM model

Bootstrap results
Number of strata = 2 Number of obs = 5056
 Replications = 5000

	Observed Coef.	Bootstrap Std. Err.	[95% Conf. Interval]	
alpha_0	3.58	1.12	-1.65	2.65
alpha_1	1.1	0.083	0.892	1.22
currage	-0.0864	0.0275	-0.0542	0.0535
y3	-0.0749	0.0528	-0.107	0.103

```
> test
```

```
$rocreg_m1
```

```
$rocreg_m1$fit
```

```
Call: glm(formula = as.formula(formulaStr), family = binomial(probit), data = reg)
```

```
Coefficients:
```

```
(Intercept)      x  currage      y3  
  3.58152  1.10051 -0.08637 -0.07494
```

```
Degrees of Freedom: 1489 Total (i.e. Null); 1486 Residual
```

```
Null Deviance: 1949
```

```
Residual Deviance: 1420 AIC: 1428
```

```
$rocreg_m1$V
```

```
      alpha_0  alpha_1  currage  y3  
alpha_0 1.246879669      NA      NA      NA  
alpha_1 0.002122125 6.883378e-03      NA      NA  
currage -0.030282371 2.010008e-05 0.0007577230      NA  
y3      0.020899144 -4.809414e-05 -0.0003067867 0.002788267
```

```
$GLMparam
```

```
      alpha_0 alpha_1 currage  y3  
m1  3.58  1.1 -0.0864 -0.0749
```

```
>
```

```
rocreg(d="dis",markers="m1",adjcov="nnhs2$y2",adjmodel="linear",regcov=c("nnhs2$currage","nnhs2$y3"),pvcmeth="normal", nsamp=5000)
```

```
ROC regression for markers: m1
```

```
Model intercept term covariates: currage, y3
```

```
Percentile value calculation
```

```
method: normal
```

```
Covariate adjustment
```

```
method: linear model
```

```
covariates: y2
```

```
GLM fit
```

```
link function: probit - binormal ROC
```

```
number of points: 10
```

```
on FPR interval: (0,1)
```

```
model coefficient bootstrap se's and CI's based on sampling  
separately from cases and controls
```



```
rocreg(d="dis",markers="m1",adjcov="nnhs2$y2",adjmodel="linear",regcov=c("nnhs2$currage","nnhs2$y3"),pvcmeth="empirical", nsamp=5000)
```

ROC regression for markers: m1

Model intercept term covariates: currage, y3

Percentile value calculation

method: empirical

tie correction: no

Covariate adjustment

method: linear model

covariates: y2

GLM fit

link function: probit - binormal ROC

number of points: 10

on FPR interval: (0,1)

model coefficient bootstrap se's and CI's based on sampling separately from cases and controls

bootstrap samples: 5000

Model results for marker: m1

Covariate adjustment - linear model, controls only

Call:

```
glm(formula = as.formula(formulaStr), data = ctrlsData)
```

Deviance Residuals:

Min	1Q	Median	3Q	Max
-22.6035	-4.3898	0.5011	4.2453	43.6253

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	-2.20417	0.18604	-11.85	<2e-16 ***
y2	0.57032	0.01358	42.01	<2e-16 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for gaussian family taken to be 44.54037)

Null deviance: 297081 on 4906 degrees of freedom
Residual deviance: 218471 on 4905 degrees of freedom
AIC: 32558

Number of Fisher Scoring iterations: 2

ROC-GLM model

Bootstrap results

Number of strata = 1 Number of obs = 5056
Replications = 5000

	Observed Coef.	Bootstrap Std. Err.	[95% Conf. Interval]	
alpha_0	0.087	1.06	-1.9	2.24
alpha_1	1.11	0.074	0.983	1.27
currage	0.00607	0.0262	-0.0466	0.0547
y3	0.0145	0.0557	-0.0841	0.135

>

> test <-

rocreg(d="dis",markers="m1",adjcov="nnhs2\$gender",adjmodel="stratified",regcov=c("nnhs2\$currage","nnhs2\$y3"),sregcov=c("nnhs2\$currage","nnhs2\$y3"),pvcmeth="normal", nsamp=5000)

ROC regression for markers: m1

Model intercept term covariates: currage, y3

Model slope term covariates: currage, y3

Percentile value calculation

method: normal

Covariate adjustment

method: stratified

covariates: gender

of case-containing strata: 2

Stratum dis=0 dis=1 Total

1 2168 64 2232

2 2739 85 2824

Total 4907 149 5056

GLM fit

link function: probit - binormal ROC

number of points: 10

on FPR interval: (0,1)

model coefficient bootstrap se's and CI's based on sampling

Model results for marker: m1

Covariate adjustment - linear model, controls only

Call:

```
glm(formula = as.formula(formulaStr), data = ctrlData)
```

Deviance Residuals:

Min	1Q	Median	3Q	Max
-22.6035	-4.3898	0.5011	4.2453	43.6253

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	-2.20417	0.18604	-11.85	<2e-16 ***
y2	0.57032	0.01358	42.01	<2e-16 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for gaussian family taken to be 44.54037)

Null deviance: 297081 on 4906 degrees of freedom
Residual deviance: 218471 on 4905 degrees of freedom
AIC: 32558

Number of Fisher Scoring iterations: 2

ROC-GLM model

Bootstrap results

Number of strata = 1 Number of obs = 5056
Replications = 5000

	Observed Coef.	Bootstrap Std. Err.	[95% Conf. Interval]
alpha_0	0.422	1.06	-1.58 2.55
alpha_1	1.81	1.1	-0.333 4.05
currence	-0.00245	0.0262	-0.0562 0.0468
y3	0.0131	0.0537	-0.0824 0.129
s_currence	-0.0176	0.0271	-0.0712 0.0361
s_y3	-0.0767	0.0509	-0.192 0.00643

>

```
rocreg(d="dis",markers="m1",adjcov="nnhs2$y2",adjmodel="linear",regcov=c("nnhs2$currage","nnhs2$y3"),sregcov=c("nnhs2$currage","nnhs2$y3"),pvcmeth="empirical", nsamp=5000)
```

ROC regression for markers: m1

Model intercept term covariates: currage, y3

Model slope term covariates: currage, y3

Percentile value calculation

method: empirical

tie correction: no

Covariate adjustment

method: linear model

covariates: y2

GLM fit

link function: probit - binormal ROC

number of points: 10

on FPR interval: (0,1)

model coefficient bootstrap se's and CI's based on sampling separately from cases and controls

bootstrap samples: 5000

Model results for marker: m1

Covariate adjustment - linear model, controls only

Call:

```
glm(formula = as.formula(formulaStr), data = ctrlData)
```

Deviance Residuals:

Min	1Q	Median	3Q	Max
-22.6035	-4.3898	0.5011	4.2453	43.6253

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	-2.20417	0.18604	-11.85	<2e-16 ***
y2	0.57032	0.01358	42.01	<2e-16 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for gaussian family taken to be 44.54037)

Null deviance: 297081 on 4906 degrees of freedom

Residual deviance: 218471 on 4905 degrees of freedom

AIC: 32558

Number of Fisher Scoring iterations: 2

ROC-GLM model

Bootstrap results

Number of strata = 1 Number of obs = 5056
 Replications = 5000

	Observed Coef.	Bootstrap Std. Err.	[95% Conf. Interval]
alpha_0	0.231	1.05	-1.77 2.32
alpha_1	2.24	0.909	0.303 3.87
currage	0.00211	0.026	-0.0499 0.0513
y3	0.0115	0.0539	-0.087 0.127
s_currage	-0.0303	0.0222	-0.0704 0.0167
s_y3	-0.0167	0.0479	-0.142 0.0459

>
>

> # Multiple adjcov variables

```
> rocreg(dataset="nnhs2", d="d", markers=c("y1"),  
adjcov=c("sitenum","gender"),adjmodel="stratified",regcov=c("nnhs2$currage","nnhs2$gender"),sre  
gcov=c("nnhs2$currage","nnhs2$gender"),pvcmeth="empirical",nsamp=5000)
```

Error in data.frame(..., check.names = FALSE) :

arguments imply differing number of rows: 5058, 0

```
> rocreg(dataset="nnhs2", d="d", markers=c("y1"),  
adjcov=c("sitenum","gender"),adjmodel="stratified",regcov=c("nnhs2$currage","nnhs2$gender"),sre  
gcov=c("nnhs2$currage","nnhs2$gender"),pvcmeth="normal",nsamp=5000)
```

Error in data.frame(..., check.names = FALSE) :

arguments imply differing number of rows: 5058, 0

```
> rocreg(dataset="nnhs2", d="d", markers=c("y1"),  
adjcov=c("currage","y3"),adjmodel="linear",regcov=c("nnhs2$currage","nnhs2$gender"),sregcov=c("  
nnhs2$currage","nnhs2$gender"),pvcmeth="normal",nsamp=5000)
```

Error in data.frame(..., check.names = FALSE) :

arguments imply differing number of rows: 5058, 0

```
> rocreg(dataset="nnhs2", d="d", markers=c("y1"),  
adjcov=c("currage","y3"),adjmodel="linear",regcov=c("nnhs2$currage","nnhs2$gender"),sregcov=c("  
nnhs2$currage","nnhs2$gender"),pvcmeth="empirical",nsamp=5000)
```

Error in data.frame(..., check.names = FALSE) :

arguments imply differing number of rows: 5058, 0

```
> #nostsamp
> rocreg(dataset="nnhs2", d="d", markers=c("y1"),
adjcov=c("sitenum", "gender"), adjmodel="stratified", regcov="currage", sregcov="currage", pvcmeth="
empirical", nsamp=5000, nostsamp=T)
ROC regression for markers: y1
Model intercept term covariates: currage
Model slope term covariates: currage
```

Percentile value calculation
method: empirical
tie correction: no

Covariate adjustment
method: stratified
covariates: sitenum, gender
of case-containing strata: 12

Stratum	d=0	d=1	Total
1	575	9	584
2	99	4	103
3	98	7	105
4	876	26	902
5	313	7	320
6	207	11	218
7	768	11	779
8	164	4	168
9	117	5	122
10	942	40	982
11	478	21	499
12	270	4	274
Total	4907	149	5056

GLM fit
link function: probit - binormal ROC
number of points: 10
on FPR interval: (0,1)

model coefficient bootstrap se's and CI's based on sampling
separately from cases and controls
and from within covariate strata

bootstrap samples: 5000

Model results for marker: y1

ROC-GLM model

Bootstrap results

Number of strata = 12 Number of obs = 5056
Replications = 5000

	Observed Coef.	Bootstrap Std. Err.	[95% Conf. Interval]
alpha_0	0.0398	1.06	-1.99 2.19
alpha_1	1.96	0.863	0.24 3.63
currage	0.0105	0.0273	-0.0454 0.0632
s_currage	-0.0262	0.0221	-0.0692 0.0187

```
> rocreg(dataset="nnhs2", d="d", markers=c("y1"),  
adjcov=c("sitenum", "gender"),adjmodel="stratified",regcov="currage",sregcov="currage",pvcmeth="  
normal",nsamp=5000,nostsamp=T)  
ROC regression for markers: y1  
Model intercept term covariates: currage  
Model slope term covariates: currage
```

Percentile value calculation
method: normal

Covariate adjustment
method: stratified
covariates: sitenum, gender
of case-containing strata: 12

Stratum	d=0	d=1	Total
1	575	9	584
2	99	4	103
3	98	7	105
4	876	26	902
5	313	7	320
6	207	11	218
7	768	11	779
8	164	4	168
9	117	5	122
10	942	40	982
11	478	21	499
12	270	4	274
Total	4907	149	5056

GLM fit
link function: probit - binormal ROC
number of points: 10
on FPR interval: (0,1)

model coefficient bootstrap se's and CI's based on sampling

Model results for marker: y1

ROC-GLM model

Bootstrap results

Number of strata = 1 Number of obs = 141
Replications = 5000

	Observed Coef.	Bootstrap Std. Err.	[95% Conf. Interval]
alpha_0	1.19	0.175	0.901 1.58
alpha_1	0.478	0.114	0.289 0.732

> rocreg(dataset="panCan",d="d",markers="y1", regcov="y2", nsamp=5000)

ROC regression for markers: y1

Model intercept term covariates: y2

Percentile value calculation

method: empirical

tie correction: no

GLM fit

link function: probit - binormal ROC

number of points: 10

on FPR interval: (0,1)

model coefficient bootstrap se's and CI's based on sampling
separately from cases and controls

bootstrap samples: 5000

Model results for marker: y1

ROC-GLM model

Bootstrap results

Number of strata = 1 Number of obs = 141
Replications = 5000

	Observed Coef.	Bootstrap Std. Err.	[95% Conf. Interval]
alpha_0	1.14	0.188	0.788 1.52
alpha_1	0.48	0.115	0.289 0.736
y2	0.00128	0.00266	-0.00312 0.00811

There were 50 or more warnings (use warnings() to see the first 50)

```
> rocreg(dataset="panCan",d="d",markers="y1", regcov="y2", sregcov="y2", nsamp=5000)
```

```
ROC regression for markers: y1
```

```
Model intercept term covariates: y2
```

```
Model slope term covariates: y2
```

```
Percentile value calculation
```

```
method: empirical
```

```
tie correction: no
```

```
GLM fit
```

```
link function: probit - binormal ROC
```

```
number of points: 10
```

```
on FPR interval: (0,1)
```

```
model coefficient bootstrap se's and CI's based on sampling  
separately from cases and controls
```

```
bootstrap samples: 5000
```

```
*****
```

```
Model results for marker: y1
```

```
ROC-GLM model
```

```
Bootstrap results
```

```
Number of strata = 1          Number of obs = 141
```

```
Replications = 5000
```

```
Observed Coef. Bootstrap Std. Err. [95% Conf. Interval]
```

alpha_0	1.14	0.191	0.768	1.52
alpha_1	0.49	0.123	0.259	0.734
y2	0.00118	0.00396	-0.00289	0.0115
s_y2	-0.000263	0.00268	-0.00264	0.0068

```
There were 50 or more warnings (use warnings() to see the first 50)
```

```
> rocreg(dataset="panCan", d="d", markers="y1", pvcmeth="normal", nsamp=5000)
ROC regression for markers: y1
```

```
Percentile value calculation
method: normal
```

```
GLM fit
link function:  probit - binormal ROC
number of points: 10
on FPR interval: (0,1)
```

```
model coefficient bootstrap se's and CI's based on sampling
separately from cases and controls
```

```
bootstrap samples: 5000
```

```
*****
```

```
Model results for marker: y1
```

```
ROC-GLM model
```

```
Bootstrap results
Number of strata = 1      Number of obs = 141
Replications = 5000
```

```
Observed Coef. Bootstrap Std. Err. [95% Conf. Interval]
alpha_0 1.14      0.148      0.864  1.45
alpha_1 0.607    0.0747     0.43   0.724
>
```

```
> #Link function and interval
```

```
> rocreg(dataset="panCan", d="d", markers="y1", interval=c(0, 0.1, 10), link="probit", nsamp=5000)
ROC regression for markers: y1
```

```
Percentile value calculation
method:  empirical
tie correction: no
```

```
GLM fit
link function:  probit - binormal ROC
number of points: 10
on FPR interval: (0,0.1)
```

```
model coefficient bootstrap se's and CI's based on sampling
separately from cases and controls
```



```
> rocreg(dataset="panCan", d="d", markers="y1", interval=c(0, 0.1, 10), link="logit", nsamp=5000)
ROC regression for markers: y1
```

```
Percentile value calculation
method: empirical
tie correction: no
```

```
GLM fit
link function: logit - bilogistic ROC
number of points: 10
on FPR interval: (0,0.1)
```

```
model coefficient bootstrap se's and CI's based on sampling
separately from cases and controls
```

```
bootstrap samples: 5000
```

```
*****
```

```
Model results for marker: y1
```

```
ROC-GLM model
```

```
Bootstrap results
Number of strata = 1      Number of obs = 141
Replications = 5000
```

```
Observed Coef. Bootstrap Std. Err. [95% Conf. Interval]
alpha_0 1.57      0.525      0.464      2.51
alpha_1 0.279     0.119      0.0237     0.476
>
```

```
> #Bootstrap options
```

```
> rocreg(dataset="panCan", d="d", markers="y1", noccsamp=T, nsamp=5000)
ROC regression for markers: y1
```

```
Percentile value calculation
method: empirical
tie correction: no
```

```
GLM fit
link function: probit - binormal ROC
number of points: 10
on FPR interval: (0,1)
```

```
model coefficient bootstrap se's and CI's based on sampling
```



```
> #Multiple markers
> rocreg(dataset="panCan",d="dis",markers=c("y1","y2"), nsamp=5000, resfile="testResfileRocreg",
replace=T)
```

ROC regression for markers: y1, y2

Percentile value calculation

method: empirical

tie correction: no

GLM fit

link function: probit - binormal ROC

number of points: 10

on FPR interval: (0,1)

model coefficient bootstrap se's and CI's based on sampling
separately from cases and controls

bootstrap samples: 5000

Model results for marker: y1

ROC-GLM model

Bootstrap results

Number of strata = 1 Number of obs = 141

Replications = 5000

	Observed Coef.	Bootstrap Std. Err.	[95% Conf. Interval]	
alpha_0	1.19	0.174	0.896	1.57
alpha_1	0.478	0.113	0.288	0.729

Model results for marker: y2

ROC-GLM model

Bootstrap results

Number of strata = 1 Number of obs = 141

Replications = 5000

	Observed Coef.	Bootstrap Std. Err.	[95% Conf. Interval]	
alpha_0	0.789	0.2	0.401	1.19
alpha_1	1	0.194	0.695	1.47

```
> #Multiple markers - Try to overwrite existing file
> rocreg(dataset="panCan",d="dis",markers=c("y1","y2"), nsamp=5000, resfile="testResfileRocreg")
Error in rocreg(dataset = "panCan", d = "dis", markers = c("y1", "y2"), :
file specified by resfile already exists, use 'replace' option to replace existing file
```

```
>
> #Test replace option
> rocreg(dataset="panCan",d="dis",markers="y1", nsamp=5000, resfile="testResfileRocreg",
replace=T)
```

ROC regression for markers: y1

Percentile value calculation
method: empirical
tie correction: no

GLM fit
link function: probit - binormal ROC
number of points: 10
on FPR interval: (0,1)

model coefficient bootstrap se's and CI's based on sampling
separately from cases and controls

bootstrap samples: 5000

Model results for marker: y1

ROC-GLM model

Bootstrap results

Number of strata = 1 Number of obs = 141
Replications = 5000

	Observed Coef.	Bootstrap Std. Err.	[95% Conf. Interval]
alpha_0	1.19	0.174	0.896 1.57
alpha_1	0.478	0.113	0.288 0.729

```
> rocreg(dataset="panCan",d="dis",markers="y1", regcov="y2", nsamp=5000,
resfile="testResfileRocreg", replace=T)
```

```
ROC regression for markers: y1
Model intercept term covariates: y2
```

```
Percentile value calculation
method: empirical
tie correction: no
```

```
GLM fit
link function: probit - binormal ROC
number of points: 10
on FPR interval: (0,1)
```

```
model coefficient bootstrap se's and CI's based on sampling
separately from cases and controls
```

```
bootstrap samples: 5000
```

```
*****
```

```
Model results for marker: y1
```

```
ROC-GLM model
```

```
Bootstrap results
```

```
Number of strata = 1      Number of obs = 141
Replications = 5000
```

	Observed Coef.	Bootstrap Std. Err.	[95% Conf. Interval]	
alpha_0	1.14	0.188	0.788	1.52
alpha_1	0.48	0.115	0.289	0.736
y2	0.00128	0.00266	-0.00312	0.00811

```
There were 50 or more warnings (use warnings() to see the first 50)
```

```
> rocreg(dataset="panCan",d="dis",markers="y1", regcov="y2", sregcov="y2", nsamp=5000,
resfile="testResfileRocreg", replace=T)
```

```
ROC regression for markers: y1
Model intercept term covariates: y2
Model slope term covariates: y2
```

```
Percentile value calculation
method: empirical
tie correction: no
```

```
GLM fit
link function: probit - binormal ROC
number of points: 10
on FPR interval: (0,1)
```

```
model coefficient bootstrap se's and CI's based on sampling
separately from cases and controls
```

```
bootstrap samples: 5000
```

```
*****
```

```
Model results for marker: y1
```

```
ROC-GLM model
```

```
Bootstrap results
```

```
Number of strata = 1          Number of obs = 141
Replications = 5000
```

```
Observed Coef. Bootstrap Std. Err. [95% Conf. Interval]
alpha_0 1.14      0.191      0.768  1.52
alpha_1 0.49      0.123      0.259  0.734
y2  0.00118      0.00396      -0.00289  0.0115
s_y2 -0.000263      0.00268      -0.00264  0.0068
```

```
There were 50 or more warnings (use warnings() to see the first 50)
```

```
> rocreg(dataset="panCan",d="dis",markers=c("y1","y2"), nsamp=5000, resfile="testResfileRocreg",
replace=T)
```

```
ROC regression for markers: y1, y2
```

```
Percentile value calculation
```

```
method: empirical
```

```
tie correction: no
```

```
GLM fit
```

```
link function: probit - binormal ROC
```

```
number of points: 10
```

```
on FPR interval: (0,1)
```

```
model coefficient bootstrap se's and CI's based on sampling
separately from cases and controls
```

```
bootstrap samples: 5000
```

```
*****
```

```
Model results for marker: y1
```

```
ROC-GLM model
```

```
Bootstrap results
```

```
Number of strata = 1          Number of obs = 141
```

```
Replications = 5000
```

	Observed Coef.	Bootstrap Std. Err.	[95% Conf. Interval]
alpha_0	1.19	0.174	0.896 1.57
alpha_1	0.478	0.113	0.288 0.729

```
*****
```

```
Model results for marker: y2
```

```
ROC-GLM model
```

```
Bootstrap results
```

```
Number of strata = 1          Number of obs = 141
```

```
Replications = 5000
```

	Observed Coef.	Bootstrap Std. Err.	[95% Conf. Interval]
alpha_0	0.789	0.2	0.401 1.19
alpha_1	1	0.194	0.695 1.47

```
>
>
>
```



```
> rocreg(dataset="ovCan", d="d", markers="y1", tiecorr=T, pvcmeth="empirical", nsamp=5000)
ROC regression for markers: y1
```

```
Percentile value calculation
method:    empirical
tie correction: yes
```

```
GLM fit
link function:  probit - binormal ROC
number of points: 10
on FPR interval: (0,1)
```

```
model coefficient bootstrap se's and CI's based on sampling
separately from cases and controls
```

```
bootstrap samples: 5000
```

```
*****
```

```
Model results for marker: y1
```

```
ROC-GLM model
```

```
Bootstrap results
Number of strata = 1      Number of obs = 1200
Replications = 5000
```

```
Observed Coef. Bootstrap Std. Err. [95% Conf. Interval]
alpha_0 1.02      0.0986      0.842      1.23
alpha_1 0.953     0.0807     0.816     1.14
```

```
> rocreg(dataset="ovCan", d="d", markers="y1", link="logit", nsamp=5000)
ROC regression for markers: y1
```

```
Percentile value calculation
method:    empirical
tie correction: no
```

```
GLM fit
link function:  logit - bilogistic ROC
number of points: 10
on FPR interval: (0,1)
```

```
model coefficient bootstrap se's and CI's based on sampling
separately from cases and controls
bootstrap samples: 5000
```



```
> rocreg(dataset="adjCovDat", d="d", markers="y", level=95, nsamp=5000, adjcov = "z", adjmodel = "stratified")
```

```
ROC regression for markers: y
```

```
Percentile value calculation  
method: empirical  
tie correction: no
```

```
Covariate adjustment  
method: stratified  
covariates: z  
# of case-containing strata: 2
```

```
Stratum d=0 d=1 Total  
1 8991 5096 14087  
2 1009 4904 5913  
Total 10000 10000 20000
```

```
GLM fit  
link function: probit - binormal ROC  
number of points: 10  
on FPR interval: (0,1)
```

```
model coefficient bootstrap se's and CI's based on sampling  
separately from cases and controls  
and from within covariate strata
```

```
bootstrap samples: 5000
```

```
*****
```

```
Model results for marker: y
```

```
ROC-GLM model
```

```
Bootstrap results  
Number of strata = 2          Number of obs = 20000  
Replications = 5000
```

```
Observed Coef. Bootstrap Std. Err. [95% Conf. Interval]  
alpha_0 1.31    0.0227    1.27    1.36  
alpha_1 0.99    0.0207    0.949   1.03  
>  
>
```