

Package ‘partialOR’

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Title Partial Odds Ratio
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partialOR-package *PARTIAL ODDS RATIO ESTIMATION*

Description

Estimates odds ratio between two binary variables adjusted for a vector of covariates ("confounders"). It generalizes the Mantel-Haenszel procedure.

 fitOR

FITTING H- and F-MODELS

Description

Fits the multinomial logistic regression models. See partialOR() for details.

Usage

```
fitOR(dd)
```

Arguments

dd data frame with variables x,y,z1,...,zm

Value

fitH details of the H-model fit as returned by the optimization procedure optim()
 fitF details of the F-model fit as returned by the function summary.nnet()
 fit0 details of the null model, i.e. the model without covariates, as returned by
 nnet()

Author(s)

Vaclav.Fidler and Nico.Nagelkerke

Examples

```
## simulate example data
dd <- simData(50,2,1.5,123)
## fit the models
ff <- fitOR(dd)
## display parameter estimates of the H-model
ff$fitH$coefficients
```

 partialOR

PARTIAL ODDS RATIO ESTIMATION

Description

Estimates odds ratio adjusted for a vector of covariates

Usage

```
partialOR(dd,ci=0.95)
```

Arguments

dd	Data frame with binary 0/1 response variables x,y and covariates z1,...,zm (in that order)
ci	Confidence level (default ci=0.95)

Details

partialOR() estimates the adjusted odds ratio $OR(X,Y | Z_1, \dots, Z_m)$ between two binary variables X and Y adjusted for a vector (Z_1, \dots, Z_m) of m numerical covariates ("confounders"). It is based on fitting a multinomial logistic regression model to the data. In this model the categorical response variable corresponds to the four possible outcomes of (X,Y), namely (0,0), (0,1), (1,0) and (1,1). The program fits the null model (without covariates), the full F-model and the H-model with parameters restricted by the hypothesis of homogeneity of odds ratios. The homogeneity hypothesis is tested by comparing the two models by the Likelihood Ratio test. The program reports OR estimates under the respective models, the standard errors of $\log(OR)$ and confidence intervals. Note: to include categorical covariates the user has to transform them into dummy variables.

Value

The program prints information about the convergence of the optimizer, the model deviances, the LR-test and the adjusted odds ratios. It calls the function fitOR() which, when called separately, returns detailed information on model fitting.

Author(s)

Vaclav Fidler and Nico Nagelkerke

References

Fidler, V. and Nagelkerke, N.J.D. (2012) The Mantel-Haenszel procedure revisited: models and generalizations. Submitted.

Examples

```
## simulate data from the H-model
dd <- simData(n=50, m=2, rr=1.5, rseed=123)
## estimate the OR
partialOR(dd)
```

reportOR

REPORTING THE RESULTS

Description

Prints the results of fitOR().

Usage

```
reportOR(fit,dd,ci)
```

Arguments

```
fit          list containing output of fitOR()
dd           data frame used to fit the models
ci           confidence level (default 0.95)
```

Value

Prints the deviances of the null, F- and H-models, the LR-test, the odds ratio, standard error of log(OR) and confidence intervals based on parameters of the H- and F-models.

Examples

```
## generate data
dd <- simData(50,2,1.5,123)
## fit the models
fit <- fitOR(dd)
## report the results
reportOR(fit,dd,0.95)
```

simData

DATA SIMULATION

Description

Simulates data to be used as an example for partialOR.

Usage

```
simData(n=50, m=2, rr=1.5, rseed = 123)
```

Arguments

```
n           number of independent observations
m           number of covariates
rr          common Odds Ratio
rseed       seed for the random number generator (default 123)
```

Details

The covariates are i.i.d. $N(0,1)$ variables.

Value

Data frame with n columns and $m+2$ variables x, y, z_1, \dots, z_m ; x, y are 0/1 binary variables and z 's are the covariates.

Examples

```
dd <- simData(50, 2, 1.5, rseed=123)
head(dd)
```

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