Package 'BayesNI'

February 19, 2015

Type Package

Title BayesNI: Bayesian Testing Procedure for Noninferiority with
Binary Endpoints

Version 0.1

Date 2011-11-11

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Description A Bayesian testing procedure for noninferiority trials
with binary endpoints. The prior is constructed based on
Bernstein polynomials with options for both informative and
non-informative prior. The critical value of the test statistic
(Bayes factor) is determined by minimizing total weighted error
(TWE) criteria

License GPL-2

LazyLoad yes

Repository CRAN

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NeedsCompilation no

R topics documented:

BayesNI-package	*Semiparametric Bayesian Noninfereiority Testing*

Description

This package implements a Bayesian testing procedure for noninfeiority trials with binary endpoints. The prior is constructed based on Bernstein polynomials with options for both informative and non-informative prior. The critical value of the test statistic Bayes factor is determined by minimizing total weighted error criteria.

Details

Package:	BayesNI
Type:	Package
Version:	1.0
Date:	2011-11-08
License:	GPL-2
LazyLoad:	yes

Author(s)

Muhtarjan Osman and Sujit K. Ghosh

Maintainer: Muhtarjan Osman <mjosman@gmail.com>

References

Osman M. and Ghosh S. K. (2011) Semiparametric Bayesian Testing Procedure for Non-inferiority Trials with Binary Endpoints. Journal of Biopharmaceutical Statistics, 21, 920-937.

See Also

NA

Examples

```
bayesNI(x1=97,x2=98,n1=107,n2=106, dm='OR',rho=0.5, m=20,zeta=0.025, TWE=1)
```

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bayesNI	*Semiparametric Bayesian testing procedure for non-inferiority trials with binary endpoints*

Description

This function calculates the Bayes factor and the cut-off value for noninfeiority trials with binary endpoints. The prior is constructed based on Bernstein polynomials with options for both informative and non-informative prior. The critical value of the test statistic (Bayes factor) is determined by minimizing total weighted error (TWE) criteria.

Usage

```
bayesNI(x1, x2, n1, n2, dm = 'OR', rho, m = 10, noninform.prior = TRUE,
        w1, w2, TWE = 1, zeta = 0.5, plot.prior = FALSE)
```

Arguments

x1	The number of success events in the group 1
x2	The number of success events in the group 2
n1	The total number of subjects in the group 1
n2	The total number of subjects in the group 2
dm	The dissimilarity measure of two binomial parameters: "RD" risk difference ; "RR" relative risk ; "OR" odds ratio (default value)
rho	Noninferiority boundary
m	The order of Bernstein polynomials (default value m=10)
noninform.prior	
	"TRUE" (default) for using noninformative prior to determines weights in the mixture prior; "FALSE" user-specified weights in the mixture prior based on prior information
w1	If noninform.prior=FALSE, a user-specified vector of weights for the prior of theta_1. The length of this vector should be m.
w2	If noninform.prior=FALSE, a user-specified vector of weights for the prior of theta_2. The length of this vector should be m.
TWE	1 (default value): total weighted error conditioned on the hypotheses; 2 : total weighted error conditioned on the decisions
zeta	The weight the total weighted criteria
plot.prior	future functionality, under development.

Details

This function gives the Bayes factor and the cut-off value for noninfeiority trials with binary endpoints. The prior is constructed based on Bernstein polynomials with options for both informative and non-informative prior. The weights w1 and w2 are not necessary when using non-informative prior. For informative prior, users can refer to the correspondering section in Osman and Ghosh (2012) on how to construct weights based on historical data. The Bayes factor computed in this function is define in favor of alternative hypothesis. A larger Bayes factor indicates stronger evidence against the null hypothesis. The critical value of the test statistic (Bayes factor) is determined by minimizing total weighted error (TWE) criteria. Users can refer to Theorem 1 in Osman and Ghosh (2012) for specification of the weight zeta. A common approach is to set zeta=alpha=0.05.

Value

logBF	the observed (log) Bayes factor
L0	the cut-off critical value of (log) Bayes factor for the rejection region
w1	the weights used in the prior of theta_1
w2	the weights used in the prior of theta_2

Note

NA

Author(s)

Muhtarjan Osman and Sujit K. Ghosh

References

Osman M. and Ghosh S. K. (2011) Semiparametric Bayesian Testing Procedure for Non-inferiority Trials with Binary Endpoints. Journal of Biopharmaceutical Statistics, 21, 920-937.

See Also

NA

Examples

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bayesNI(x1=97,x2=98,n1=107,n2=106, dm='OR',rho=0.5, m=20,zeta=0.025, TWE=1)
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