Package 'ebdt'

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Type Package

Title Evaluation of Binary Diagnostic Test

Version 1.0.1

Description Calculate the point estimator and its confidence interval for the quality parameters of a binary diagnostic test, such as sensitivity, specificity, positive and negative predictive value, positive and negative likelihood ratio, weighted Kappa coefficient, a global diagnostic accuracy index, prevalence in a cross-sectional study, and sensitivity, specificity, positive and negative likelihood ratio, and a global diagnostic accuracy index in a retrospective study.

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Encoding UTF-8

Config/roxygen2/version 8.0.0

URL https://github.com/migmontal/ebdt, https://migmontal.github.io/ebdt/

Imports stats

Suggests knitr, readxl, rmarkdown, testthat (>= 3.0.0)

Config/testthat/edition 3

NeedsCompilation no

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Repository CRAN

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Contents

`ebdt` *Calculate all parameters of a binary diagnostic test in a traverse or Cross-sectional study.*

Description

This function calculate Sensitivity, Specificity, positive and negative predictive value, positive and negative Likelihood Ratio, Weighted Kappa coeficient, Youden Index, prevalence and their Confidence intervals in a traverse or Cross-sectional study, and Sensitivity, Specificity, Youden Index, positive and negative Likelihood Ratio in a Case Control or Retrospective study.

Usage

```
ebdt(
  s1,
  r1,
  s0,
  r0,
  conflev = 0.95,
  digits = 3,
  study = TRUE,
  verbose = TRUE,
  print_table = TRUE,
  quiet = FALSE
)
```

Arguments

`s1`	Non-negative numeric. TP - True positive (cases correctly classified as +).
`r1`	Non-negative numeric. FP - False positives (controls classified as +).
`s0`	Non-negative numeric. FN - False negatives (cases classified as -).

r0	Non-negative numeric. TN - True negatives (controls classified as -).
conflev	Confidence level (0,1). Default 0.95.
digits	Integer. Number of decimal places. Default 3.
study	Logical. If TRUE in a traverse or Cross-sectional study, FALSE in a Case Control or Retrospective study. Default TRUE.
verbose	Logical. If TRUE, it prints the execution time. Default is TRUE.
print_table	Logical. If TRUE, print 2x2 table. Default TRUE.
quiet	Logical. If TRUE, it reduces non-critical messages (maintains important warnings). Default is FALSE.

Details

Evaluating of Binary Diagnostic Test (EBDT)

Calculate the point estimate and confidence intervals of the quality measures of a binary diagnostic test.

Value

No return value; prints formatted results to the console. List with: Sensitivity, Specificity, Youden_Index, Prevalence, PPV, NPV, PLR, NLR, Weighted_Kappa and their Confidence intervals.

References

Agresti, A., (2002). Categorical Data Analysis. John Wiley and Sons, New York.

Agresti, A., Coull, B.A., (1998). Approximate is better than 'exact' for interval estimation of binomial proportions. The American Statistician, 52:119 – 126.

Gart, J.J., Nam J., (1988). Aproximate interval estimation of the ratio of binomial parameters: a review and corrections for skewness. Biometrics, 44: 323 – 338.

Montero-Alonso, M.Á.(2010). Intervalos de confianza y contrastes de hipótesis para parámetros de tests diagnósticos binarios, http://hdl.handle.net/10481/4879

Simel D.L., Samsa, G.P., Matchar, D.B., (1991). Likelihood ratios with confidence: sample size estimation for diagnostic test studies. J. Clin Epidemiology, 44(8): 763-770.

Roldán Nofuentes J.A., Luna del Castillo J.D., Montero Alonso, M.A., (2009). Confidence intervals of weighted kappa coefficient of a binary diagnostic test. Communications in Statistics. Simulation and Computation, 38: 1562 – 1578.

Pepe, M. S. (2003). The statistical evaluation of medical tests for classification and prediction. Oxford University Press.

Zhou, X.-H., Obuchowski, N. A., y McClish, D. K. (2011). Statistical Methods in Diagnostic Medicine (2.ª ed.). John Wiley & Sons.

Examples

```
ebdt(40, 5, 10, 45, conflev = 0.95, digits = 4)
```

ebdt_kap *Calculate the weighted Kappa coefficient*

Description

This function calculate the Weighted Kappa Coeficient estimator, their standard error estimated with Wald and Logit confidence interval in a traverse study.

Usage

```
ebdt_kap(s1, r1, s0, r0, conflev = 0.95, digits = 3, verbose = TRUE)
```

Arguments

s1	Non-negative numeric. TP - True positive (cases correctly classified as +).
r1	Non-negative numeric. FP - False positives (controls classified as +).
s0	Non-negative numeric. FN - False negatives (cases classified as -).
r0	Non-negative numeric. TN - True negatives (controls classified as -).
conflev	Confidence level (0,1). Default 0.95.
digits	Integer. Number of decimal places. Default 3.
verbose	Logical. If TRUE, it prints the execution time. Default is TRUE.

Details

Evaluating of Binary Diagnostic Test (EBDT)

This function calculates the "Kappa" coefficient weighted by c (0.1..0.9) with Wald and Logit ICs

Value

data.frame, in columns: c_index, Kappa, StdError, CI_Wald_L, CI_Wald_U, CI_Logit_L, CI_Logit_U

References

Agresti, A., (2002). Categorical Data Analysis. John Wiley and Sons, New York.

Agresti, A., Coull, B.A., (1998). Approximate is better than 'exact' for interval estimation of binomial proportions. The American Statistician, 52:119 – 126.

Montero-Alonso, M.Á.(2010). Intervalos de confianza y contrastes de hipótesis para parámetros de tests diagnósticos binarios, http://hdl.handle.net/10481/4879

Roldán Nofuentes J.A., Luna del Castillo J.D., Montero Alonso, M.A., (2009). Confidence intervals of weighted kappa coefficient of a binary diagnostic test. Communications in Statistics. Simulation and Computation, 38: 1562 – 1578.

Pepe, M. S. (2003). The statistical evaluation of medical tests for classification and prediction. Oxford University Press.

Zhou, X.-H., Obuchowski, N. A., y McClish, D. K. (2011). Statistical Methods in Diagnostic Medicine (2.ª ed.). John Wiley & Sons.

Examples

```
ebdt_kap(40, 5, 10, 45)
```

`ebdt_nlr` *Calculates the Negative likelihood ratio*

Description

This function calculate the Negative Likelihood Ratio estimator, their standard error estimated and a confidence interval in a traverse or Cross-sectional study.

Usage

```
ebdt_nlr(s1, r1, s0, r0, conflev = 0.95, digits = 3, verbose = TRUE)
```

Arguments

`s1`	Non-negative numeric. TP - True positive (cases correctly classified as +).
`r1`	Non-negative numeric. FP - False positives (controls classified as +).
`s0`	Non-negative numeric. FN - False negatives (cases classified as -).
`r0`	Non-negative numeric. TN - True negatives (controls classified as -).
`conflev`	Confidence level (0,1). Default 0.95.
`digits`	Integer. Number of decimal places. Default 3.
`verbose`	Logical. If TRUE, it prints the execution time. Default is TRUE.

Details

Evaluating of Binary Diagnostic Test (EBDT)

This function calculates the Negative likelihood ratio (LR-) with Simel and Gart - Nam ICs

Requires a ‘gn_nlr()‘ function in the environment and ‘rootall()‘ function in the environment (the robust version reviewed above is suitable).

Value

list with: - LinfGNLRn: lower limit of the IC GN for LR- - LsupGNLRn: upper limit of the IC GN for LR-

References

Agresti, A., (2002). Categorical Data Analysis. John Wiley and Sons, New York.

Gart, J.J., Nam J., (1988). Aproximate interval estimation of the ratio of binomial parameters: a review and corrections for skewness. Biometrics, 44: 323 – 338.

Montero-Alonso, M.Á.(2010). Intervalos de confianza y contrastes de hipótesis para parámetros de tests diagnósticos binarios, http://hdl.handle.net/10481/4879

Pepe, M. S. (2003). The statistical evaluation of medical tests for classification and prediction. Oxford University Press.

Zhou, X.-H., Obuchowski, N. A., y McClish, D. K. (2011). Statistical Methods in Diagnostic Medicine (2.ª ed.). John Wiley & Sons.

Examples

```
ebdt_nlr(40, 5, 10, 45)
```

`ebdt_npv` *Calculates the Negative Predictive Value (only Cross-sectional study)*

Description

This function calculate the Negative predictive value estimator, their standard error estimated and a confidence interval in a traverse.

Usage

```
ebdt_npv(s1, r1, s0, r0, conflev = 0.95, digits = 3, verbose = TRUE)
```

Arguments

`s1`	Non-negative numeric. TP - True positive (cases correctly classified as +).
`r1`	Non-negative numeric. FP - False positives (controls classified as +).
`s0`	Non-negative numeric. FN - False negatives (cases classified as -).
`r0`	Non-negative numeric. TN - True negatives (controls classified as -).
`conflev`	Confidence level (0,1). Default 0.95.
`digits`	Integer. Number of decimal places. Default 3.
`verbose`	Logical. If TRUE, it prints the execution time. Default is TRUE.

Details

Evaluating of Binary Diagnostic Test (EBDT)

This function calculates the Negative Predictive Value (NPV) with Simel and Gart - Nam ICs

Value

list with: - est: NPV = r0 / (s0 + r0) - StdError: binomial standard error of NPV - CI: vector c(inf, sup) IC for NPV - CI_Method: "Agresti-Coull"

References

Agresti, A., (2002). Categorical Data Analysis. John Wiley and Sons, New York.

Agresti, A., Coull, B.A., (1998). Approximate is better than 'exact' for interval estimation of binomial proportions. The American Statistician, 52:119 – 126.

Montero-Alonso, M.Á.(2010). Intervalos de confianza y contrastes de hipótesis para parámetros de tests diagnósticos binarios, http://hdl.handle.net/10481/4879

Pepe, M. S. (2003). The statistical evaluation of medical tests for classification and prediction. Oxford University Press.

Zhou, X.-H., Obuchowski, N. A., y McClish, D. K. (2011). Statistical Methods in Diagnostic Medicine (2.ª ed.). John Wiley & Sons.

Examples

```
ebdt_npv(40, 5, 10, 45)
```

`ebdt_plr` *Calculates the Positive likelihood ratio*

Description

This function calculate the Positive Likelihood Ratio estimator, their standard error estimated and a confidence interval in a traverse or Cross-sectional study.

Usage

```
ebdt_plr(s1, r1, s0, r0, conflev = 0.95, digits = 3, verbose = TRUE)
```

Arguments

`s1`	Non-negative numeric. TP - True positive (cases correctly classified as +).
`r1`	Non-negative numeric. FP - False positives (controls classified as +).
`s0`	Non-negative numeric. FN - False negatives (cases classified as -).
`r0`	Non-negative numeric. TN - True negatives (controls classified as -).
`conflev`	Confidence level (0,1). Default 0.95.
`digits`	Integer. Number of decimal places. Default 3.
`verbose`	Logical. If TRUE, it prints the execution time. Default is TRUE.

Details

Evaluating of Binary Diagnostic Test (EBDT)

This function calculates the Positive likelihood ratio (LR+) with Simel and Gart - Nam ICs

Requires a 'gn_plr()' function in the environment and 'rootall()' function in the environment (the robust version reviewed above is suitable).

Value

list with: - est: LR+ = Se / (1 - Sp) - std.err: EE(LR+) by delta method from the variance in log-LR+ - CI1.sl: lower limit (Simel, log-normal) - CI.su: upper limit (Simel, log-normal) - CI.gnl: lower limit (Gart & Nam) - CI.gnu: upper limit (Gart & Nam)

References

Agresti, A., (2002). Categorical Data Analysis. John Wiley and Sons, New York.

Agresti, A., Coull, B.A., (1998). Approximate is better than 'exact' for interval estimation of binomial proportions. The American Statistician, 52:119 – 126.

Gart, J.J., Nam J., (1988). Aproximate interval estimation of the ratio of binomial parameters: a review and corrections for skewness. Biometrics, 44: 323 – 338.

Montero-Alonso, M.Á.(2010). Intervalos de confianza y contrastes de hipótesis para parámetros de tests diagnósticos binarios, http://hdl.handle.net/10481/4879

Simel D.L., Samsa, G.P., Matchar, D.B., (1991). Likelihood ratios with confidence: sample size estimation for diagnostic test studies. J. Clin Epidemiology, 44(8): 763-770.

Pepe, M. S. (2003). The statistical evaluation of medical tests for classification and prediction. Oxford University Press.

Zhou, X.-H., Obuchowski, N. A., y McClish, D. K. (2011). Statistical Methods in Diagnostic Medicine (2.ª ed.). John Wiley & Sons.

Examples

```
ebdt_plr(40, 5, 10, 45)
```

---

ebdt_ppv *Calculates the Positive Predictive Value (only Cross-sectional study)*

Description

This function calculate the Positive predictive value estimator, their standard error estimated and a confidence interval in a traverse.

Usage

```
ebdt_ppv(s1, r1, s0, r0, conflev = 0.95, digits = 3, verbose = TRUE)
```

Arguments

s1	Non-negative numeric. TP - True positive (cases correctly classified as +).
r1	Non-negative numeric. FP - False positives (controls classified as +).
s0	Non-negative numeric. FN - False negatives (cases classified as -).
r0	Non-negative numeric. TN - True negatives (controls classified as -).
conflev	Confidence level (0,1). Default 0.95.
digits	Integer. Number of decimal places. Default 3.
verbose	Logical. If TRUE, it prints the execution time. Default is TRUE.

Details

Evaluating of Binary Diagnostic Test (EBDT)

This function calculates the Positive Predictive Value (PPV) with Simel and Gart - Nam ICs

Value

list with: - est: PPV = s1 / (s1 + r1) - StdError: binomial standard error of PPV - CI: vector c(inf, sup) IC for NPV - CI_Method: "Agresti-Coull"

References

Agresti, A., (2002). Categorical Data Analysis. John Wiley and Sons, New York.

Agresti, A., Coull, B.A., (1998). Approximate is better than 'exact' for interval estimation of binomial proportions. The American Statistician, 52:119 – 126.

Montero-Alonso, M.Á.(2010). Intervalos de confianza y contrastes de hipótesis para parámetros de tests diagnósticos binarios, http://hdl.handle.net/10481/4879

Simel D.L., Samsa, G.P., Matchar, D.B., (1991). Likelihood ratios with confidence: sample size estimation for diagnostic test studies. J. Clin Epidemiology, 44(8): 763-770.

Pepe, M. S. (2003). The statistical evaluation of medical tests for classification and prediction. Oxford University Press.

Zhou, X.-H., Obuchowski, N. A., y McClish, D. K. (2011). Statistical Methods in Diagnostic Medicine (2.ª ed.). John Wiley & Sons.

Examples

```
ebdt_ppv(40, 5, 10, 45)
```

ebdt_prev *Calculate Prevalence (only Cross-sectional study)*

Description

This function calculate prevalence estimator, their standard error estimated and a confidence interval in a traverse study.

Usage

```
ebdt_prev(s1, r1, s0, r0, conflev = 0.95, digits = 3, verbose = TRUE)
```

Arguments

s1	Non-negative numeric. TP - True positive (cases correctly classified as +).
r1	Non-negative numeric. FP - False positives (controls classified as +).
s0	Non-negative numeric. FN - False negatives (cases classified as -).
r0	Non-negative numeric. TN - True negatives (controls classified as -).
conflev	Confidence level (0,1). Default 0.95.
digits	Integer. Number of decimal places. Default 3.
verbose	Logical. If TRUE, it prints the execution time. Default is TRUE.

Details

Evaluating of Binary Diagnostic Test (EBDT)

This function calculates the Prevalence (proportion of cases), standard error & Agresti-Coull CI

Value

list with: - Prevalence: prevalence estimation prev = (s1 + s0)/(s1 + s0 + r1 + r0) - StdError: binomial standard error of prevalence - CI: vector c(inf, sup) IC for prevalence - CI_Method: "Agresti-Coull"

References

Agresti, A., (2002). Categorical Data Analysis. John Wiley and Sons, New York.

Agresti, A., Coull, B.A., (1998). Approximate is better than 'exact' for interval estimation of binomial proportions. The American Statistician, 52:119 – 126.

Montero-Alonso, M.Á.(2010). Intervalos de confianza y contrastes de hipótesis para parámetros de tests diagnósticos binarios, http://hdl.handle.net/10481/4879

Pepe, M. S. (2003). The statistical evaluation of medical tests for classification and prediction. Oxford University Press.

Zhou, X.-H., Obuchowski, N. A., y McClish, D. K. (2011). Statistical Methods in Diagnostic Medicine (2.ª ed.). John Wiley & Sons.

Examples

```
ebdt_prev(40, 5, 10, 45)
```

`ebdt_se` *Calculate Sensitivity*

Description

This function calculate the sensitivity estimator, their standard error estimated and a confidence interval in a traverse or Cross-sectional study.

Usage

```
ebdt_se(s1, r1, s0, r0, conflev = 0.95, digits = 3, verbose = TRUE)
```

Arguments

`s1`	Non-negative numeric. TP - True positive (cases correctly classified as +).
`r1`	Non-negative numeric. FP - False positives (controls classified as +).
`s0`	Non-negative numeric. FN - False negatives (cases classified as -).
`r0`	Non-negative numeric. TN - True negatives (controls classified as -).
`conflev`	Confidence level (0,1). Default 0.95.
`digits`	Integer. Number of decimal places. Default 3.
`verbose`	Logical. If TRUE, it prints the execution time. Default is TRUE.

Details

Evaluating of Binary Diagnostic Test (EBDT)

This function calculates the sensitivity, standard error & Agresti-Coull CI

- Apply continuity correction (Haldane–Anscombe) *in pairs* if there are zeros: (s1,s0) and/or (r1,r0), avoiding adding 0.5 to cells not related to the estimated proportion. - For Wilson, the standard center and half-width are used: center = (p + z^2/(2n)) / (1 + z^2/n) half = z/(1 + z^2/n) * sqrt(p(1-p)/n + z^2/(4n^2)) - For Agresti-Coull: n_tilde = n + z^2; p_tilde = (x + z^2/2)/n_tilde; half = z*sqrt(p_tilde(1-p_tilde)/n_tilde)

Value

list with: - Sensitivity: sensitivity estimation (Se = s1/(s1+s0)) - StdError: binomial standard error of Se - CI: vector c(inf, sup) IC for Se - CI_Method: "Agresti-Coull"

References

Agresti, A., (2002). Categorical Data Analysis. John Wiley and Sons, New York.

Agresti, A., Coull, B.A., (1998). Approximate is better than 'exact' for interval estimation of binomial proportions. The American Statistician, 52:119 – 126.

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Pepe, M. S. (2003). The statistical evaluation of medical tests for classification and prediction. Oxford University Press.

Zhou, X.-H., Obuchowski, N. A., y McClish, D. K. (2011). Statistical Methods in Diagnostic Medicine (2.ª ed.). John Wiley & Sons.

Examples

```
ebdt_se(40, 5, 10, 45)
```

`ebdt_sp` *Calculate Specificity*

Description

This function calculate the specificity estimator, their standard error estimated and a confidence interval in a traverse or Cross-sectional study.

Usage

```
ebdt_sp(s1, r1, s0, r0, conflev = 0.95, digits = 3, verbose = TRUE)
```

Arguments

`s1`	Non-negative numeric. TP - True positive (cases correctly classified as +).
`r1`	Non-negative numeric. FP - False positives (controls classified as +).
`s0`	Non-negative numeric. FN - False negatives (cases classified as -).
`r0`	Non-negative numeric. TN - True negatives (controls classified as -).
`conflev`	Confidence level (0,1). Default 0.95.
`digits`	Integer. Number of decimal places. Default 3.
`verbose`	Logical. If TRUE, it prints the execution time. Default is TRUE.

Details

Evaluating of Binary Diagnostic Test (EBDT)

This function calculates the Specificity, standard error & Agresti-Coull CI

- Apply continuity correction (Haldane–Anscombe) *in pairs* if there are zeros: (r1,r0) y/o (s1,s0), +0.5 is added to both cells of the pair. - Agresti-Coull: n_tilde = n + z^2 p_tilde = (x + z^2/2)/n_tilde half = z * sqrt(p_tilde(1-p_tilde) / n_tilde)

Value

list with: - Specificity: Specificity estimation (Sp = r0/(r1+r0)) - StdError: binomial standard error of Sp - CI: vector c(inf, sup) IC for Sp - CI_Method: "Agresti-Coull

References

Agresti, A., (2002). Categorical Data Analysis. John Wiley and Sons, New York.

Agresti, A., Coull, B.A., (1998). Approximate is better than 'exact' for interval estimation of binomial proportions. The American Statistician, 52:119 – 126.

Montero-Alonso, M.Á.(2010). Intervalos de confianza y contrastes de hipótesis para parámetros de tests diagnósticos binarios, http://hdl.handle.net/10481/4879

Pepe, M. S. (2003). The statistical evaluation of medical tests for classification and prediction. Oxford University Press.

Zhou, X.-H., Obuchowski, N. A., y McClish, D. K. (2011). Statistical Methods in Diagnostic Medicine (2.ª ed.). John Wiley & Sons.

Examples

```
ebdt_sp(40, 5, 10, 45)
```

---

ebdt_you *Calculate Youden index*

Description

This function calculate Youden index estimator, their standard error estimated and a confidence interval in a traverse or Cross-sectional study.

Usage

```
ebdt_you(s1, r1, s0, r0, conflev = 0.95, digits = 3, verbose = TRUE)
```

Arguments

s1	Non-negative numeric. TP - True positive (cases correctly classified as +).
r1	Non-negative numeric. FP - False positives (controls classified as +).
s0	Non-negative numeric. FN - False negatives (cases classified as -).
r0	Non-negative numeric. TN - True negatives (controls classified as -).
conflev	Confidence level (0,1). Default 0.95.
digits	Integer. Number of decimal places. Default 3.
verbose	Logical. If TRUE, it prints the execution time. Default is TRUE.

Details

Evaluating of Binary Diagnostic Test (EBDT)

This function calculates the Youden Index, standard error & Agresti-Coull CI

- Corrección Haldane–Anscombe *in pairs* if there are zeros: (s1,s0) and/or (r1,r0), +0.5 is added to both cells of the pair. - EE(J) is calculated as: sqrt(Se*(1-Se)/n_cases + Sp*(1-Sp)/n_ctrls), valid under independence between cases and controls (common in diagnostic studies). - IC is constructed with normal approximation: J ± z * EE(J).

Value

list with: - YoudenIndex: Youden Index estimation J = Se + Sp - 1 - StdError: standard error of J by delta method assuming independence of cases and controls - CI: approximate normal confidence interval for J

References

Agresti, A., (2002). Categorical Data Analysis. John Wiley and Sons, New York.

Agresti, A., Coull, B.A., (1998). Approximate is better than 'exact' for interval estimation of binomial proportions. The American Statistician, 52:119 – 126.

Montero-Alonso, M.Á.(2010). Intervalos de confianza y contrastes de hipótesis para parámetros de tests diagnósticos binarios, http://hdl.handle.net/10481/4879

Pepe, M. S. (2003). The statistical evaluation of medical tests for classification and prediction. Oxford University Press.

Youden, W.J., (1950). Index for rating diagnostic tests. Cancer, 3: 32 – 35.

Zhou, X.-H., Obuchowski, N. A., y McClish, D. K. (2011). Statistical Methods in Diagnostic Medicine (2.ª ed.). John Wiley & Sons.

Examples

```
ebdt_you(40, 5, 10, 45)
```

---

gn_nlr *Calculate Gart-Nam CI for negative likelihood ratio*

Description

This function calculate Gart-Nam Confidence Interval for Negative Likelihood Ratio.

Usage

```
gn_nlr(s1, r1, s0, r0, conflev = 0.95, digits = 3)
```

Arguments

s1	Non-negative numeric. TP - True positive (cases correctly classified as +).
r1	Non-negative numeric. FP - False positives (controls classified as +).
s0	Non-negative numeric. FN - False negatives (cases classified as -).
r0	Non-negative numeric. TN - True negatives (controls classified as -).
conflev	Confidence level (0,1). Default 0.95.
digits	Integer. Number of decimal places. Default 3.

Details

Evaluating of Binary Diagnostic Test (EBDT)

Gart-Nam (GN) CI for negative likelihood ratio (LR-)

Requires a 'rootall()' function in the environment (the robust version reviewed above is suitable).

Value

list with: - LinfGNLRn: lower limit of the IC GN for LR- - LsupGNLRn: upper limit of the IC GN for LR-

References

Agresti, A., (2002). Categorical Data Analysis. John Wiley and Sons, New York.

Gart, J.J., Nam J., (1988). Aproximate interval estimation of the ratio of binomial parameters: a review and corrections for skewness. Biometrics, 44: 323 – 338.

Montero-Alonso, M.Á.(2010). Intervalos de confianza y contrastes de hipótesis para parámetros de tests diagnósticos binarios, http://hdl.handle.net/10481/4879

Pepe, M. S. (2003). The statistical evaluation of medical tests for classification and prediction. Oxford University Press.

Zhou, X.-H., Obuchowski, N. A., y McClish, D. K. (2011). Statistical Methods in Diagnostic Medicine (2.ª ed.). John Wiley & Sons.

Examples

```
gn_nlr(40, 5, 10, 45)
```

gn_plr *Calculate Gart-Nam CI for positive likelihood ratio*

Description

This function calculate Gart-Nam Confidence Interval for Positive Likelihood Ratio.

Usage

```
gn_plr(s1, r1, s0, r0, conflev = 0.95, digits = 3)
```

Arguments

s1	Non-negative numeric. TP - True positive (cases correctly classified as +).
r1	Non-negative numeric. FP - False positives (controls classified as +).
s0	Non-negative numeric. FN - False negatives (cases classified as -).
r0	Non-negative numeric. TN - True negatives (controls classified as -).
conflev	Confidence level (0,1). Default 0.95.
digits	Integer. Number of decimal places. Default 3.

Details

Evaluating of Binary Diagnostic Test (EBDT)

Gart-Nam (GN) CI for positive likelihood ratio (LR+)

Requires a 'rootall()' function in the environment (the robust version reviewed above is suitable).

Value

list with: - LinfGNLRp: lower limit of the IC GN for LR+ - LsupGNLRp: upper limit of the IC GN for LR+

References

Agresti, A., (2002). Categorical Data Analysis. John Wiley and Sons, New York.

Gart, J.J., Nam J., (1988). Aproximate interval estimation of the ratio of binomial parameters: a review and corrections for skewness. Biometrics, 44: 323 – 338.

Montero-Alonso, M.Á.(2010). Intervalos de confianza y contrastes de hipótesis para parámetros de tests diagnósticos binarios, http://hdl.handle.net/10481/4879

Pepe, M. S. (2003). The statistical evaluation of medical tests for classification and prediction. Oxford University Press.

Zhou, X.-H., Obuchowski, N. A., y McClish, D. K. (2011). Statistical Methods in Diagnostic Medicine (2.ª ed.). John Wiley & Sons.

Examples

```
gn_plr(40, 5, 10, 45)
```

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