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| SampleSizeGivenJ {RJafroc} | R Documentation |

Calculate number of cases for specified number of readers J to achieve the desired power

**Description**

Calculate required number of cases to achieve the desired power for specified number of readers and DBM or OR variability parameters.

**Usage**

SampleSizeGivenJ(numReaders, varTR, varTC, varErrDBM, cov1, cov2, cov3,

varErrOR, msTR, numCases, alpha = 0.05, effectSize = 0.05,

desiredPower = 0.8, randomOption = "ALL")

**Arguments**

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| numReaders | The number of readers. |
| varTR | The DBM variance component of treatment-by-reader interaction term. See "Details". |
| varTC | The DBM variance component of treatment-by-case interaction term. See "Details". |
| varErrDBM | The variance component of DBM error term. See "Details". |
| cov1 | The OR covariances of the figure of merit estimates of same reader and different modalities. See "Details". |
| cov2 | The OR covariances of the figure of merit estimates of same reader and different modalities. See "Details". |
| cov3 | The OR covariances of the figure of merit estimates of same reader and different modalities. See "Details". |
| varErrOR | The variance component of OR error term. See "Details". |
| msTR | Treatment(modality)-by-reader mean square of the figure of merit. See "Details". |
| numCases | The number of cases for the pilot study. It is required for the calculation with OR components. |
| alpha | The significance level of the study, default value is 0.05. |
| effectSize | The effect size to be used in the calculation, default value is 0.05. |
| desiredPower | The desired statistical power, default value is 0.8. |
| randomOption | The random option. It can be "ALL", "READERS" or "CASES", which indicate predictions for (1) random readers and random cases, (2) random readers only and (3) random cases only. |

**Details**

To calculate the sample size, either the DBM variance components ("varTR", "varTC", and "varErrDBM") or OR covariance matrix elements and mean squares and number of cases in pilot study should be specified. If both of them are given, DBM variance components are used and OR values are ignored. Specifically, either numeric values of varTR, varTC, varErrDBM can be supplied, or the function call must explicitly state cov1 = value1, cov2 = value2, cov3 = value3, varErrOR = value4, msTR = value5, numCases = value6, as is standard usage in R.

**Value**

A list of two elements:

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| numCases | The minimum number of cases to just achieve the desired statistical power. |
| power | The predicted statistical power. |

**References**

Hillis, S. L., Obuchowski, N. A., & Berbaum, K. S. (2011). Power Estimation for Multireader ROC Methods: An Updated and Unified Approach. Acad Radiol, 18, 129–142.

Hillis, S. L., Obuchowski, N. a, Schartz, K. M., & Berbaum, K. S. (2005). A comparison of the Dorfman-Berbaum-Metz and Obuchowski-Rockette methods for receiver operating characteristic (ROC) data. Statistics in Medicine, 24(10), 1579–607. doi:10.1002/sim.2024

**Examples**

## Following is an example of sample size calculation with DBM variance components.

ret <- DBMHAnalysis(data = vanDykeData, fom = "Wilcoxon")

varCompDBM <- ret$varCompTable

varTR <- varCompDBM$varComp[3]

varTC <- varCompDBM$varComp[4]

varErrDBM <- varCompDBM$varComp[6]

SampleSizeGivenJ(numReaders = 6, varTR = varTR, varTC = varTC, varErrDBM = varErrDBM,

alpha = 0.05, effectSize = 0.05, desiredPower = 0.8, randomOption = "ALL")

## Following is an example of sample size calculation with OR variance components.

ret <- ORHAnalysis(data = vanDykeData, fom = "Wilcoxon", covEstMethod = "Jackknife")

varCompOR <- ret$varCovTable

cov1 <- varCompOR$varCov[3]

cov2 <- varCompOR$varCov[4]

cov3 <- varCompOR$varCov[5]

varErrOR <- varCompOR$varCov[6]

msTR <- ret$msTR

numCases <- 114

SampleSizeGivenJ(numReaders = 6, cov1 = cov1, cov2 = cov2, cov3 = cov3, varErrOR= varErrOR,

msTR = msTR, numCases = 114,

alpha = 0.05, effectSize = 0.05, desiredPower = 0.8, randomOption = "ALL")

[Package *RJafroc* version 1.0 [Index](http://127.0.0.1:14208/help/library/RJafroc/html/00Index.html)]