Package ‘ssrm.logmer’

February 14, 2018

Title Sample Size Determination for Longitudinal Designs with Binary Outcome

Version 0.1

Description Provides the necessary sample size for a longitudinal study with binary outcome in order to attain a pre-specified power while strictly maintaining the Type I error rate. Kapur K, Bhaumik R, Tang XC, Hur K, Reda DJ, Bhaumik D (2014) <doi:10.1002/sim.6203>.

Depends R (>= 3.4.0)

License GPL-2

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LazyData true

Maintainer Kush Kapur <kush.kapur@childrens.harvard.edu>

Imports statmod, stats, sfsmisc

Suggests knitr, rmarkdown

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NeedsCompilation no

Author Kush Kapur [aut, cre]

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Sample Size Determination for Longitudinal Designs with Binary Outcome

**Description**

Provides the necessary sample size for a longitudinal study with binary outcome in order to attain a pre-specified power while strictly maintaining the Type I error rate. The sample size computation requires the user to define a column of design matrix relating to the slope of time as a monotonic function of time, such as linear, log, sqrt etc., along with the respective beta parameters. The underlying model is assumed to be a two-level logistic mixed-effects regression model with random intercept and/or slope of time to account for within-subject correlations and between-subject variability. Gaussian quadrature is used to compute the marginal likelihood integrals and to evaluate Fisher Information matrix.

**Usage**

```r
ssrm.logmer(nt = NULL, xd = NULL, betap = NULL, var.ri = NULL,
             var.rs = NULL, cov.is = NULL, ratio = NULL, xi1 = NULL, xi2 = NULL,
             ...)```

**Arguments**

- `nt`: number of time-points.
- `xd`: design column for the slope of time (monotonic function of time).
- `betap`: vector of beta parameters (b0=Intercept, b1=slope of time for control, b3=group difference at time 0 between treatment and control groups, b4=main parameter of interest which captures difference between the slope parameters of treatment and control groups).
- `var.ri`: variance of random intercept.
- `var.rs`: variance of random slope.
- `cov.is`: covariance of intercept and slope.
- `ratio`: proportion of subjects in the control group out of the total sample.
- `xi1`: attrition vector of the control group. The elements of attrition vector should sum to 1.
- `xi2`: attrition vector of the treatment group. The elements of attrition vector should sum to 1.
- `...`: optional arguments alpha, power, tail, num.quad.

**Details**

Attrition vector: This package allows for the specification of different attrition vectors for the control and treatment group. The element of attrition vector should sum to 1.
Value

results

References


Examples

```r
ssrm.logmer(nt=4,Xd=c(0,1,2,3),betap=c(1,0,0,1,0.3),var.ri=0.5, ratio=0.5,x1=c(0,0,0,1),x2=c(0.1,0.1,0.2,0.6))
ssrm.logmer(nt=4,Xd=c(0,1,2,3),betap=c(1,0,0.1,0.3),var.ri=0.5, var.rs=0.25,cov.is=0.1,power=0.90,tail=1,alpha=0.025)
```
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