Package 'RDSsamplesize'

August 15, 2023

Type Package

Title RDS Sample Size Estimation and Power Calculation

Version 0.5.0

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Description Provides functionality for carrying out sample size estimation and power calculation in Respondent-Driven Sampling.

License GPL-3

Depends R (>= 3.6.2)

Imports Rcpp

LinkingTo Rcpp

Encoding UTF-8

RoxygenNote 7.2.0

NeedsCompilation yes

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Suggests knitr, rmarkdown, dplyr, ggplot2, latex2exp, microbenchmark

VignetteBuilder knitr

Repository CRAN

Date/Publication 2023-08-15 15:00:02 UTC

R topics documented:

`calSize` *Calculating the accumulated sample size distribution by each wave.*

Description

Calculating the accumulated sample size distribution by each wave.

Usage

```
calSize(s, c, maxWave, rr, bruteMC, tol = 0.025)
```

Arguments

`s`	scalar; Number of seeds to initiate the sampling process.
`c`	scalar; Number of coupons issued to each participant.
`maxWave`	scalar; Planned field period scaled by wave, which does not include the initial round of recruiting seeds.
`rr`	scalar or vector; a (constant) recruitment rate or a vector of length *maxWave*, listing varying recruitment rates at each wave. The recruitment rate represents the average coupon use rate. For example, if *rr* is a vector, the *w*th element is the ratio of the number of successful recruits brought into the study at wave *w* by their recruiters (participants from wave *w-1*) to the total number of coupons issued to those recruiters, where *w* ranges from 1 to *maxWave*. Seeds are counted as participants at Wave 0.
`bruteMC`	logical; If TRUE then use a brute force Monte Carlo approach to obtain empirical data and estimate sample size distribution; If FALSE then compute the theoretical results of sample size distribution using an approximation algorithm.
`tol`	scalar; Accuracy loss limit control, which is set up for the approximation algorithm when *bruteMC*=FALSE, with default of 0.025. This parameter determines the acceptable level of accuracy loss in the approximate computation of the sample size distribution.

Value

a list consisting of the following elements:

`Pr_Extinction_list`
: vector; a vector of extinction probabilities, i.e., probability of not recruiting any new participants at each wave.

`Pr_Size_by_Wave_w`
: list; probability mass function and complementary cumulative distribution function of attaining a certain sample size (including seeds) by each wave, w=1,...,maxWave. The round of seed collection is counted as wave 0.

References

Raychaudhuri, Samik. *Introduction to monte carlo simulation*, 2008 Winter simulation conference. IEEE, 2008.

Examples

```
x <- calSize(s=10,c=3,maxWave=9,rr=0.3,bruteMC=FALSE,tol=0.025)
```

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nprobw *Summarizing the sample size estimation.*

Description

Summarizing the sample size estimation.

Usage

```
nprobw(x, n)
```

Arguments

x	an object class of "RDSsamplesize", results of estimated sample size distribution of a call to 'calSize'.
n	integer; target sample size.

Value

a table presenting the probability of the accumulated sample size (including seeds) reaching at least *n* by each wave, w=1,..., *maxWave*

Examples

```
x <- calSize(s=10,c=3,maxWave=9,rr=0.3,bruteMC=FALSE,tol=0.025)
nprobw(x,n=100)
```

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