

Package: RDSsamplesize (via r-universe)

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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.

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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

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Repository <https://yibboo.r-universe.dev>

RemoteUrl <https://github.com/cran/RDSsamplesize>

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| | |
|----------------------|---|
| <code>calSize</code> | <i>Calculating the accumulated sample size distribution by each wave.</i> |
|----------------------|---|

Description

Calculating the accumulated sample size distribution by each wave.

Usage

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

Arguments

| | |
|----------------------|--|
| <code>s</code> | scalar; Number of seeds to initiate the sampling process. |
| <code>c</code> | scalar; Number of coupons issued to each participant. |
| <code>maxWave</code> | scalar; Planned field period scaled by wave, which does not include the initial round of recruiting seeds. |
| <code>rr</code> | scalar or vector; a (constant) recruitment rate or a vector of length <i>maxWave</i> , listing varying recruitment rates at each wave. The recruitment rate represents the average coupon use rate. For example, if <i>rr</i> is a vector, the <i>w</i> th element is the ratio of the number of successful recruits brought into the study at wave <i>w</i> by their recruiters (participants from wave <i>w-1</i>) to the total number of coupons issued to those recruiters, where <i>w</i> ranges from 1 to <i>maxWave</i> . Seeds are counted as participants at Wave 0. |
| <code>bruteMC</code> | 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. |
| <code>tol</code> | scalar; Accuracy loss limit control, which is set up for the approximation algorithm when <i>bruteMC</i> =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, $w=1,\dots,maxWave$. 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)
```

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, $w=1,\dots, maxWave$

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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