

# Package ‘RDSsamplesize’

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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.

**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

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

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nprobw

*Summarizing the sample size estimation.*

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**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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