

# 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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calSize	<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

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 <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.
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 <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,...,*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	<i>Summarizing the sample size estimation.</i>
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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,..., *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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