Package 'OORRT'

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Title Estimator for Optimised Optional Randomised Response Technique

Version 0.1.0

Description Provides functions for estimation under the Randomised Response Technique for sensitive survey data, including Warner's estimator, Optional Randomised Response Technique estimator proposed by Chaudhuri and Mukerjee,and the Optimized Optional Randomised Response Technique estimator proposed by Pushadapu et al. The package also includes Monte Carlo simulation tools for evaluating estimator performance. The implemented methods are based on Warner (1965) <doi:10.1080/01621459.1965.10480775>, Chaudhuri and Mukerjee (1985),and Pushadapu et al. (2025) <doi:10.1111/insr.12581>.

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Encoding UTF-8

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NeedsCompilation no

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cm_estimator *Chaudhuri-Mukerjee Estimator*

Description

Chaudhuri-Mukerjee Estimator

Usage

```
cm_estimator(PIAOM1H, p, X2, n, n1)
```

Arguments

PIAOM1H	Observed proportion of "yes" responses among respondents who answered directly.
p	Warner probability
X2	Number of "yes" responses from the Warner group (group sensitive to question)
n	Sample size
n1	Number of respondents answering directly.

Value

CM estimator of PIA

Examples

```
## Example 5 from Pushadapu et al. (2025)
## COVID-19 prevalence survey among students

n <- 145
n1 <- 101
x1 <- 42
x2 <- 18
p <- 0.3

PIAOM1H <- x1 / n1

## Chaudhuri and Mukerjee estimator
cm_estimator(
PIAOM1H = PIAOM1H,
p = p,
X2 = x2,
n = n,
n1 = n1
)
```

oorrt_pushadapu_estimator
OORRT_Pushadapu Estimator

Description

OORRT_Pushadapu Estimator

Usage

```
oorrt_pushadapu_estimator(PIAOM1H, X2, p, n, n1)
```

Arguments

PIAOM1H	Observed proportion of "yes" responses among respondents who answered directly (group 1)
X2	Number of "yes" responses from the Warner group (group sensitive to question= group 2)
p	Warner probability
n	Sample size
n1	Number of respondents answering directly.

Value

A list with proposed estimator, ALPHA1H, ALPHA2H, MSE, CI bounds

Examples

```
## Example 5 from Pushadapu et al. (2025)
## COVID-19 prevalence survey among students

n <- 145
n1 <- 101
x1 <- 42
x2 <- 18
p <- 0.3

PIAOM1H <- x1 / n1

oorrt_pushadapu_estimator(
  PIAOM1H = PIAOM1H,
  X2 = x2,
  p = p,
  n = n,
  n1 = n1
)
```

orrt_simulation *OORRT Simulation Study*

Description

OORRT Simulation Study

Usage

```
orrt_simulation(
  nitr = 1000,
  p = 0.3,
  PIA_seq = seq(0.05, 0.45, 0.05),
  PIAOM1_seq = seq(0.2, 0.95, 0.05),
  n_seq = seq(150, 500, 50),
  W1_seq = seq(0.4, 0.7, 0.1)
)
```

Arguments

nitr	Number of Monte Carlo iterations
p	Warner probability
PIA_seq	Sequence of true proportions to test
PIAOM1_seq	Sequence of group 1 proportions
n_seq	Sequence of sample sizes
W1_seq	Sequence of weights for group 1

Value

Data frame with bias, MSE, RE, coverage, etc.

warner_estimator *Warner Estimator*

Description

Warner Estimator

Usage

```
warner_estimator(n, p, X)
```

Arguments

n	Sample size
p	Warner probability
X	no. of "yes" response

Value

Warner estimator of PIA

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