Package ‘PSpower’

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Type Package

Title Sample Size Calculation for Propensity Score Analysis

Version 0.1.1

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Description Sample size calculations in causal inference with observational data are increasingly desired. This package is a tool to calculate sample size under prespecified power with minimal summary quantities needed.

Depends ggplot2

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Contents

plot.PSpower 2
plot_overlap 2
print.PSpower 3
PSpower 3

Index 5

`plot.PSpower` *Plots PSpower object*

Description

Plots PSpower object

Usage

```
## S3 method for class 'PSpower'
plot(x, power = seq(0.6, 0.99, length.out = 100), ...)
```

Arguments

`x`	PSpower object
`power`	a range of powers to plot the power curve
`...`	ignored

Value

an object (class ggplot) containing a figure

Examples

```
obj <- PSpower(tau = 1/sqrt(20), sig.level = 0.05, power = 0.956,
               r = 0.5, phi = 0.99, rho_sq = 0.02)
plot(obj)
```

`plot_overlap` *Plot density of propensity scores given treatment probability and overlap coefficient*

Description

Plot density of propensity scores given treatment probability and overlap coefficient

Usage

```
plot_overlap(r, phi)
```

Arguments

`r`	treatment probability
`phi`	overlap coefficient

Value

a ggplot of the density of propensity scores in two treatment arms

Examples

```
plot_overlap(0.6, 0.9)
```

`print.PSpower` *Prints PSpower object*

Description

Prints PSpower object

Usage

```
## S3 method for class 'PSpower'
print(x, ...)
```

Arguments

`x`	PSpower object
`...`	ignored

Value

no return value; called for side effect to output a string

`PSpower` *Calculate sample size needed to achieve a prespecified power*

Description

Calculate sample size needed to achieve a prespecified power

Usage

```
PSpower(
  tau,
  sig.level = 0.05,
  power = NULL,
  sample.size = NULL,
  r,
  phi,
  rho_sq,
  test = "two-sided",
  estimand = "ATE"
)
```

Arguments

`tau`	the anticipated standardized treatment effect
`sig.level`	the significance level, or the type-I error rate (default 0.05)
`power`	the desired power to achieve (only specify for sample size calculation)
`sample.size`	the total sample size (only specify for power calculation)
`r`	the proportion of treated units
`phi`	the overlap coefficient (usually between 0.8 and 1); use function plot_overlap(r, phi) for visual aid
`rho_sq`	the squared correlation between propensity score and outcome; recommend treating as a sensitivity parameter: a grid of values between 0 and the R-squared statistic of predicting the outcomes with covariates.
`test`	whether one-sided or two-sided test is considered
`estimand`	the estimand (ATE, ATT, ATC or ATO), or a customized tilting function h(e(x))

Value

an object with the calculated sample size

Examples

```
PSpower(tau = 1/sqrt(20), sig.level = 0.05, power = 0.956, r = 0.5, phi = 0.99, rho_sq = 0.02)
```

Index

plot.PSpower, 2
plot_overlap, 2
print.PSpower, 3
PSpower, 3