Package ‘dsr’

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Type Package
Title Compute Directly Standardized Rates, Ratios and Differences
Version 0.2.2
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URL https://github.com/mattkumar/dsr
Description A set of functions to compute and compare directly standardized rates, rate differences and ratios. A variety of user defined options for analysis (e.g confidence intervals) and formatting are included.
Imports stats, dplyr (>= 0.7.8) , rlang, utils, frailtypack
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**dsr**  
*Compute Directly Standardized Rates*

**Description**

Computes crude and directly standardized rates by subgroup with confidence intervals.

**Usage**

```r
dsr(data, event, fu, subgroup, ..., refdata, mp, method = "normal", sig = 0.95, decimals)
```

**Arguments**

- `data`: A data frame with counts and unit-times summarized by the standardization variables.
- `event`: A variable within the input data that corresponds to the event counts.
- `fu`: A variable within the input data that corresponds to the unit-time.
- `subgroup`: A variable within the input data frame for which rates are calculated by.
- `...`: Variables(s) within the input data that for which rates are to be standardized by. The input data and ref data should both be summarized by these.
- `refdata`: A data frame with population unit-times summarized by the standardization variables. The unit-time variable name must named pop.
- `mp`: A constant to multiply rates by (e.g. mp=1000 for rates per 1000).
- `method`: Choose between normal, lognormal and gamma confidence intervals for crude and standardized rates. The default method is normal.
- `sig`: The desired level of confidence in computing confidence intervals. The default is 0.95 for 95 percent CIs.
- `decimals`: Round estimates to a desired decimal place.

**References**


Examples

# An example of calculating directly standardized rates
# Data from Table 1, Page 132 of Schoenbach (2000)

# State specific death counts and fu
df_study <- data.frame(state=rep(c('Miami', 'Alaska'), c(5,5)),
                        age=rep(c('00-14', '15-24', '25-44', '45-64', '65+'), 2),
                        deaths=c(136, 57, 208, 1016, 3605, 59, 18, 37, 90, 81),
                        fu=c(114350, 80259, 133440, 142670, 92168, 37164, 20036, 32693, 14947, 2077))

# US standard population
df_ref <- data.frame(age=c('00-14', '15-24', '25-44', '45-64', '65+'),
                        pop=c(23961000, 15420000, 21353000, 19601000, 10685000))

# Directly Standardized Rates (per 1000) - 95% CI's using the gamma method
my_results <- dsr(data=df_study,
                   event=deaths,
                   fu=fu,
                   subgroup=state,
                   age,
                   refdata=df_ref,
                   method="gamma",
                   sig=0.95,
                   mp=1000,
                   decimals=4)

# View results
my_results

---

dsr

**Compare Directly Standardized Rates by Ratios or Differences.**

**Description**

Compare directly standardized rates by ratios or differences.

**Usage**

dsrr(data, event, fu, subgroup, ..., refdata, estimate, refgroup, mp,
     sig = 0.95, decimals)

**Arguments**

data A data frame with counts and unit-times summarized by the standardization variables.

event A variable within the input data that corresponds to the event counts.

fu A variable within the input data that corresponds to the unit-time.

subgroup A variable within the input data frame for which rates are calculated by.
Variables(s) within the input data that for which rates are to be standardized by. The input data and ref data should both be summarized by these.

refdata A data frame with population unit-times summarized by the standardization variables. The unit-time variable name must named pop.

estimate Choose between difference or ratio in comparing directly standardized rates.

refgroup A level of the subgroup variable taken to be the reference in computing rate ratios or differences.

mp A constant to multiply rates by (e.g. mp=1000 for rates per 1000).

sig The desired level of confidence in computing confidence intervals. The default is 0.95 for 95 percent CIs.

decimals Round estimates to a desired decimal place.

References


Examples

#An example of comparing directly standardized rates
#Data from Table 1, Page 132 of Schoenbach (2000)

df_study <- data.frame(state=rep(c('Miami','Alaska'), c(5,5)),
  age=rep(c('00-14','15-24','25-44','45-64','65+'),2),
  deaths=c(136,57,208,1016,3605,59,18,37,90,81),
  fu=c(114350,80259,133440,142670,92168,37164,20036,32693,14947,2077))

df_ref <- data.frame(age=c('00-14','15-24','25-44','45-64','65+'),
  pop=c(23961000,15420000,21353000,19601000,10685000))

my_results2 <- dsrr(data=df_study,
  event=deaths, fu, subgroup=state, age,
  refdata=df_ref, refgroup="Alaska", estimate="ratio", sig=0.95)
dsrrec

Compute Directly Standardized Rates for Recurrent Events

Description

Computes directly standardized rates for recurrent events by subgroup with confidence intervals.

Usage

dsrrec(data, event, fu, subgroup, ..., refdata, sig = 0.95, mp, decimals)

Arguments

data A data frame with counts and unit-times summarized by the standardization variables.

event A variable within the input data that corresponds to the event counts.

fu A variable within the input data that corresponds to the unit-time.

subgroup A variable within the input data frame for which rates are calculated by.

Variables(s) within the input data that for which rates are to be standardized by. The input data and ref data should both be summarized by these.

refdata A data frame with population unit-times summarized by the standardization variables. The unit-time variable name must be named pop.

sig The desired level of confidence in computing confidence intervals. The default is 0.95 for 95 percent CIs.

mp A constant to multiply rates by (e.g. mp=1000 for rates per 1000).

decimals Round estimates to a desired decimal place.

References


Examples

#An example of directly standardized rates for recurrent events

library(frailtypack)
library(dplyr)
library(dsr)
data(readmission)

#Make an individual level dataset with total event counts and total observation times

treadm <- as.data.frame(readmission %>%
group_by(id) %>%
  filter(max(enum)==enum ) %>%
  mutate(events=enum-1, time=t.stop) %>%
  select(id, events, time, sex, dukes))

#Make the standard pop

tref <- as.data.frame(treadm %>%
group_by(sex) %>%
  mutate(pop=sum(time)) %>%
  select(sex, pop) %>%
  distinct(sex, pop))

#Get directly standardized rates (age-adjusted) for readmissions by Dukes' tumor grade.
analysis <- dsrrec(data=treadm,
  event=events,
  fu=time,
  refdata=tref,
  subgroup=dukes,
  sex,
  mp=1000,
  decimals=3)
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