Package 'epistandardiseR'

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Type Package

Title Direct Age, Sex and Deprivation Standardisation

Version 0.0.3

Description Allows computation of directly standardised rates using the 2013 European Standard Population, deprivation-standardised rates using a 10% per decile assumption, sex standardisation uses an assumed equal proportion of both males and females.
Package allows multivariable standardisation using Age, Sex or Deprivation using the above methods. The package calculates 95% confidence intervals using Byar's approximation. Functions support flexible grouping variables and age bands, enabling reproducible results.

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Encoding UTF-8

LazyData true

Imports dplyr, rlang, magrittr, stats, tidyr

Depends R (>= 3.5)

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BugReports https://github.com/JoeBlackford/epistandardiseR/issues

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`direct_age_dep_standardise`

Direct Age and Deprivation Standardisation with Confidence Intervals

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Description

Computes directly age and deprivation standardised rates with 95% confidence intervals using the 2013 European Standard Population with an equal 10% distribution across deprivation deciles. Confidence intervals are calculated using Byar's method. Lower confidence interval limits below zero are reported as zero.

Usage

```
direct_age_dep_standardise(
  data,
  var,
  ageband,
  deprivation,
  observed,
  population,
  multiplier = 1000
)
```

Arguments

`data`	Dataframe containing observed counts and population.
`var`	One or more grouping variables (quoted or unquoted).
`ageband`	Column specifying age bands.
`deprivation`	Column specifying deprivation deciles.
`observed`	Column containing observed counts.
`population`	Column containing denominator population.
`multiplier`	Scale for rates (default = 1,000).

Value

A tibble containing the grouping variables, total observed events, total population, crude rate, age- and deprivation- standardised rate, and 95% confidence intervals.

Examples

```
example_data <- data.frame(
  variable = c("A", "A", "A", "A"),
  ageband = c("0-4", "0-4", "5-9", "5-9"),
  deprivation = c(1, 2, 1, 2),
  observed = c(10, 12, 20, 22),
  population = c(1000, 1100, 1200, 1300)
)

direct_age_dep_standardise(
  data = example_data,
  var = "variable",
  ageband = "ageband",
  deprivation = "deprivation",
  observed = "observed",
  population = "population"
)
```

---

direct_age_sex_standardise

Direct Age and Sex Standardisation with Confidence Intervals

Description

Computes directly age- and sex-standardised rates with 95% confidence intervals using the 2013 European Standard Population with a 50:50 male/female distribution within each age band. Confidence intervals are calculated using Byar's method. Lower confidence interval limits below zero are reported as zero.

Usage

```
direct_age_sex_standardise(
  data,
  var,
  ageband,
  sex,
  observed,
  population,
  multiplier = 1000
)
```

Arguments

data	Dataframe containing observed counts and population.
var	One or more grouping variables (quoted or unquoted).
ageband	Column specifying age bands.
sex	Column specifying sex categories.
observed	Column containing observed counts.
population	Column containing denominator population.
multiplier	Scale for rates (default = 1,000).

Value

A tibble containing the grouping variables, total observed events, total population, crude rate, age- and sex-standardised rate, and 95% confidence intervals.

Examples

```
example_data <- data.frame(
  variable = c("A", "A", "A", "A"),
  ageband = c("0-4", "0-4", "5-9", "5-9"),
  sex = c("F", "M", "F", "M"),
  observed = c(10, 12, 20, 22),
  population = c(1000, 1100, 1200, 1300)
)

direct_age_sex_standardise(
  data = example_data,
  var = "variable",
  ageband = "ageband",
  sex = "sex",
  observed = "observed",
  population = "population"
)
```

`direct_age_standardise` *Direct Age Standardisation with Confidence Intervals*

Description

Computes directly age-standardised rates with 95% confidence intervals using the 2013 European Standard Population and Byar's method.

Usage

```
direct_age_standardise(
  data,
  var,
  ageband,
  observed,
  population,
  multiplier = 1000
)
```

Arguments

data	Dataframe with observed values and population
var	One or more grouping variables (quoted or unquoted)
ageband	Column specifying age bands
observed	Column with observed counts
population	Column with denominator population
multiplier	Scale for rates (default = 1,000)

Value

A tibble with directly standardised rates and 95% confidence intervals

Examples

```
example_data <- data.frame(
  variable = c("A", "A", "B", "B"),
  ageband = c("0-4", "5-9", "0-4", "5-9"),
  observed = c(10, 20, 15, 25),
  population = c(1000, 1200, 1100, 1300)
)

direct_age_standardise(
  data = example_data,
  var = "variable",
  ageband = "ageband",
  observed = "observed",
  population = "population"
)
```

`direct_dep_standardise` *Direct Deprivation Standardisation with Confidence Intervals*

Description

Computes directly deprivation-standardised rates with 95% confidence intervals using a standard national deprivation profile with equal population in each deprivation decile and Byar's method.

Usage

```
direct_dep_standardise(
  data,
  var,
  dep_decile,
  observed,
  population,
  multiplier = 1000
)
```

Arguments

`data`	Data frame containing observed counts and population denominators
`var`	One or more grouping variables (quoted or unquoted)
`dep_decile`	Column specifying deprivation deciles (1–10)
`observed`	Column with observed counts
`population`	Column with denominator population
`multiplier`	Scale for rates (default = 1,000)

Value

A tibble with deprivation-standardised rates and 95% confidence intervals

Examples

```
example_data <- data.frame(
  group = c("A", "A", "B", "B"),
  dep_decile = factor(c(1, 2, 1, 2)),
  observed = c(10, 20, 15, 25),
  population = c(1000, 1200, 1100, 1300)
)

direct_dep_standardise(
  data = example_data,
  var = "group",
  dep_decile = "dep_decile",
  observed = "observed",
```

```
  population = "population"
)
```

`direct_sex_standardise` *Direct Sex Standardisation with Confidence Intervals*

Description

Computes directly sex-standardised rates using a 50:50 male/female reference population. Confidence intervals are calculated using Byar's approximation. Lower confidence interval limits below zero are reported as zero.

Usage

```
direct_sex_standardise(
  data,
  var,
  sex,
  observed,
  population,
  multiplier = 1000,
  ref_population = std_sex
)
```

Arguments

`data`	Dataframe containing observed counts and population.
`var`	One or more grouping variable names supplied as a character vector, e.g. c("Region", "FinancialYear").
`sex`	Column containing sex categories.
`observed`	Column containing observed counts.
`population`	Column containing denominator population.
`multiplier`	Scale for rates, default is 1,000.
`ref_population`	Reference population containing Sex and StdPopulation columns. Defaults to `std_sex`.

Value

A tibble containing the grouping variables, sex-standardised rate, and 95% confidence intervals.

Examples

```
example_data <- data.frame(
  variable = c("A", "A", "B", "B"),
  sex = c("F", "M", "F", "M"),
  observed = c(10, 20, 15, 25),
  population = c(1000, 1200, 1100, 1300)
)

direct_sex_standardise(
  data = example_data,
  var = "variable",
  sex = "sex",
  observed = "observed",
  population = "population"
)
```

---

ref_population *European Standard Population 2013 (abridged)*

Description

A dataset containing abridged ESP 2013 standard population counts for use in age standardisation.

Usage

```
ref_population
```

Format

A data frame with 19 rows and 2 variables:

AgeBand Age group (character, e.g. "0-4", "5-9")

StdPopulation Standard population count for that age band

Source

Eurostat ESP 2013

std_age_dep *Standard Age and Deprivation Reference Population*

Description

A reference population derived from the 2013 European Standard Population, assigning equal weight to each deprivation decile within each age band. This reference population can be used for direct age and deprivation standardisation.

Usage

```
std_age_dep
```

Format

A data frame with age- and deprivation-specific standard population weights:

AgeBand Age band from the European Standard Population

DepDecile Deprivation decile

StdPopulation Standard population weight

Source

Derived from the 2013 European Standard Population using an equal 10% distribution across deprivation deciles.

std_age_sex *Standard Age and Sex Reference Population*

Description

A reference population derived from the European Standard Population, assigning equal weight to females and males within each age band. This 50:50 distribution can be used for direct age and sex standardisation.

Usage

```
std_age_sex
```

Format

A data frame with age and sex-specific standard population weights:

AgeBand Age band from the European Standard Population

Sex Sex category

StdPopulation Standard population weight

Source

Derived from the European Standard Population using a 50:50 female/male distribution.

---

std_dep_decile *Standard Deprivation Decile Population*

Description

Reference population weights for deprivation decile standardisation. Assumes an equal 10 percent population distribution across deprivation deciles.

Usage

```
std_dep_decile
```

Format

A data frame with 10 rows and 2 variables:

dep_decile Deprivation decile

std_population Standard population weight

Source

Internal package dataset

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std_sex *Standard Sex Reference Population*

Description

A reference population assigning equal weight to females and males. This 50:50 distribution can be used for direct sex standardisation.

Usage

```
std_sex
```

Format

A data frame with 2 rows and 2 variables:

Sex Sex category

StdPopulation Standard population weight

Source

Reference distribution defined for the epistandardiser package.

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