Package 'univacr'

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Title UNIVAC -- Vaccine policy decision support model

Version 2.0.1

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Description UNIVAC is a universal framework for evaluating vaccine policy options in low- and middle-income countries.

Depends R (>= 3.4.3)

Imports data.table, foreach

License GPL-3

Encoding UTF-8

LazyData true

RoxygenNote 6.1.1

Suggests knitr, rmarkdown

VignetteBuilder knitr

R topics documented:

`data.agespecificfert` *Age-specific fertility rate*

Description

Dataset containing age-specific fertility rate by country, age range, year and gender

Usage

```
data.agespecificfert
```

Format

A data frame with 20580 observations on the following 8 variables.

country_code_numeric a numeric vector

country_code country code

country name of country

age_from starting age

age_to end age

year year

gender gender

value fertility rate

Source

Demographic data from the Vaccine Impact Modelling Consortium (VIMC)

data.births *Number of Births*

Description

Dataset containing number of births by country, age range, year and gender

Usage

```
data.births
```

Format

A data frame with 14700 observations on the following 8 variables.

country_code_numeric a numeric vector

country_code country code

country name of country

age_from starting age

age_to end age

year year

gender gender

value number of births

Source

Demographic data from the Vaccine Impact Modelling Consortium (VIMC)

data.birthsbymaternalage *Number of births by age of mother*

Description

Dataset with the number of births by maternal by country, year and gender

Usage

```
data.birthsbymaternalage
```

Format

A data frame with 20580 observations on the following 8 variables.

country_code_numeric a numeric vector

country_code country code

country name of country

age_from starting age

age_to end age

year year

gender gender

value number of births

Source

Demographic data from the Vaccine Impact Modelling Consortium (VIMC)

`data.birthsquinquennial`

Number of births - quinquennial

Description

Dataset containing number of births occuring every 5 years by country, age range, year and gender

Usage

```
data.birthsquinquennial
```

Format

A data frame with 2940 observations on the following 8 variables.

country_code_numeric a numeric vector

country_code country code

country name of country

age_from starting age

age_to end age

year year

gender gender

value number of births occuring every 5 years

Source

Demographic data from the Vaccine Impact Modelling Consortium (VIMC)

data.centraldeathrateASMR *Central death rate*

Description

Dataset containing central death rate by country, age range, year and gender

Usage

```
data.centraldeathrateASMR
```

Format

A data frame with 55860 observations on the following 8 variables.

country_code_numeric a numeric vector

country_code country code

country name of country

age_from starting age

age_to end age

year year

gender gender

value central death rate

Source

Demographic data from the Vaccine Impact Modelling Consortium (VIMC)

data.crudebirthrate *Crude birth rate (CBR)*

Description

Dataset containing crude birth rate by country, age range, year and gender

Usage

```
data.crudebirthrate
```

Format

A data frame with 14700 observations on the following 8 variables.

country_code_numeric a numeric vector

country_code country code

country name of country

age_from starting age

age_to end age

year year

gender gender

value crude birth rate

Source

Demographic data from the Vaccine Impact Modelling Consortium (VIMC)

`data.crudedeathrate` *Crude death rate*

Description

Dataset containing crude death rate (CDR) by country, age range, year and gender

Usage

```
data.crudedeathrate
```

Format

A data frame with 14700 observations on the following 8 variables.

country_code_numeric a numeric vector

country_code country code

country name of country

age_from starting age

age_to end age

year year

gender gender

value crude death rate

Source

Demographic data from the Vaccine Impact Modelling Consortium (VIMC)

data.deathsbyage *Number of deaths by age*

Description

Dataset containing number of deaths by country, age range, year and gender

Usage

```
data.deathsbyage
```

Format

A data frame with 58800 observations on the following 8 variables.

country_code_numeric a numeric vector
country_code country code
country name of country
age_from starting age
age_to end age
year year
gender gender
value number of deaths

Source

Demographic data from the Vaccine Impact Modelling Consortium (VIMC)

data.growthrate *Growth rate*

Description

Dataset containing growth rate by country, age range, year and gender

Usage

```
data.growthrate
```

Format

A data frame with 2940 observations on the following 8 variables.

country_code_numeric a numeric vector
country_code country code
country name of country
age_from starting age
age_to end age
year year
gender gender
value growth rate

Source

Demographic data from the Vaccine Impact Modelling Consortium (VIMC)

---

data.Hib_DALY *Disability weights for Haemophilus influenzae type B*

Description

Dataset disability weights for Haemophilus influenzae type B by condition/sequelae

Usage

```
data.Hib_DALY
```

Format

A data frame with 24 observations on the following 3 variables.

Disease disease

Condition condition/sequelae

GBD_2015_mean Mean disability weight

Source

General Guidance for DALYs calculation VIMC with input from DOVE 2017-11-24 11:03:46

---

data.interpolatedpop *Interpolated population (1-year time and age)*

Description

Dataset containing population - interpolated (1-year time and age) by country, age range, year and gender

Usage

```
data.interpolatedpop
```

Format

A data frame with 170480 observations on the following 8 variables.

country_code_numeric a numeric vector

country_code country code

country name of country

age_from starting age

age_to end age

year year

gender gender

value population interpolated 1-year time and age

Source

Demographic data from the Vaccine Impact Modelling Consortium (VIMC)

`data.lifeexpectancy` *Life expectancy at birth*

Description

Dataset containing life expectancy at birth by country, age range, year and gender

Usage

```
data.lifeexpectancy
```

Format

A data frame with 1470 observations on the following 8 variables.

country_code_numeric a numeric vector

country_code country code

country name of country

age_from starting age

age_to end age

year year

gender gender

value expected remaining years of life

Source

Demographic data from the Vaccine Impact Modelling Consortium (VIMC)

`data.neonatalmortality` *Neonatal mortality rate*

Description

Dataset containing 28-day neonatal mortality rate by country, age range, year and gender

Usage

```
data.neonatalmortality
```

Format

A data frame with 14700 observations on the following 8 variables.

country_code_numeric a numeric vector

country_code country code

country name of country

age_from starting age

age_to end age

year year

gender gender

value 28-day neonatal mortality rate

Source

Demographic data from the Vaccine Impact Modelling Consortium (VIMC)

`data.netmigration` *Net migration rate*

Description

Dataset containing net migration rate by country, age range, year and gender

Usage

```
data.netmigration
```

Format

A data frame with 2940 observations on the following 8 variables.

country_code_numeric a numeric vector

country_code country code

country name of country

age_from starting age

age_to end age

year year

gender gender

value net migration rate

Source

Demographic data from the Vaccine Impact Modelling Consortium (VIMC)

data.PCV_DALY — *Disability weights for Pneumococcus (Pneumococcal conjugate vaccine)*

Description

Dataset disability weights for PCV by condition/sequelae

Usage

```
data.PCV_DALY
```

Format

A data frame with 27 observations on the following 3 variables.

Disease disease
Condition condition/sequelae
GBD_2015_mean Mean disability weight

Source

General Guidance for DALYs calculation VIMC with input from DOVE 2017-11-24 11:03:46

data.pdeathbyage — *Probability of dying by age*

Description

Dataset containing probability of dying by age by country, age range, year and gender

Usage

```
data.pdeathbyage
```

Format

A data frame with 52920 observations on the following 8 variables.

country_code_numeric a numeric vector
country_code country code
country name of country
age_from starting age
age_to end age
year year
gender gender
value probability of dying

Source

Demographic data from the Vaccine Impact Modelling Consortium (VIMC)

data.quinquennialpop *Quinquennial population (5-year time and age)*

Description

Dataset containing population - quinquennial population (5-year time and age) by country, age range, year and gender

Usage

```
data.quinquennialpop
```

Format

A data frame with 71442 observations on the following 8 variables.

country_code_numeric a numeric vector

country_code country code

country name of country

age_from starting age

age_to end age

year year

gender gender

value population quinquennial 5-year time and age

Source

Demographic data from the Vaccine Impact Modelling Consortium (VIMC)

data.remainingyearsoflife *Expected remaining years of life*

Description

Dataset containing expected remaining years of life by country, age range, year and gender

Usage

```
data.remainingyearsoflife
```

Format

A data frame with 64680 observations on the following 8 variables.

country_code_numeric a numeric vector
country_code country code
country name of country
age_from starting age
age_to end age
year year
gender gender
value expected remaining years of life

Source

Demographic data from the Vaccine Impact Modelling Consortium (VIMC)

---

data.rotacases_nonsevereD1

Event rates (cases) for Rotavirus D1 non-severe RVGE

Description

Dataset containing event rates (cases) for rotavirus D1 for non-severe RVGE

Usage

```
data.rotacases_nonsevereD1
```

Format

A data frame with 195 observations on the following 8 variables.

Country country
WHO region WHO region
WHO region2 WHO region country code
Income income level
Age age
Mid mid
Low low
High high

Source

Bilcke J. et al. Estimating the Incidence of Symptomatic Rotavirus Infections: A Systematic Review and Meta-Analysis. PLOS One, June 2009, Volume 4, Issue 6, e6060. Note: random effects model resulted in a global incidence estimate of 0.24 [0.17; 0.34] symptomatic RV infections per person year of observation for children below 2 years of age. Crudely extrapolating to children aged <5yrs, and assuming minimal incidence aged 2+yrs, gives an under-five incidence rate of 0.10 [0.07 - 0.14] or 10,000 [7,000 - 14,000] per 100,000 per year <5yrs. Severe incidence rates derived from Fischer-Walker (see source for severe RVGE incidence), were then subtracted to give non-severe RVGE incidence.

data.rotacases_severeD2

Event rates (cases) for Rotavirus D2 severe RVGE

Description

Dataset containing event rates (cases) for rotavirus D2 for severe RVGE

Usage

```
data.rotacases_severeD2
```

Format

A data frame with 195 observations on the following 8 variables.

Country country

WHO region WHO region

WHO region2 WHO region country code

Income income level

Age age

Mid mid

Low low

High high

Source

Fischer-Walker C. et al, Table 1: Global and regional burden of diarrhoea and pneumonia per year in children aged 0–4 years, by WHO region. Global burden of childhood pneumonia and diarrhoea. Lancet 2013; 381: 1405–16. Notes: Episodes per child per year <5yrs (2010) by WHO region were multiplied by the proportion of episodes that were severe by WHO region (approximately 2 by the rotavirus-positive proportion <5yrs by WHO region, reported among hospitalised diarrhoea cases in CHERG (Lanata C. et al, Global Causes of Diarrheal Disease Mortality in Children <5 Years of Age: A Systematic Review. PLOS One. September 2013, Volume 8, Issue 9, e72788). The uncertainty range only reflects uncertainty in the incidence of diarrhoea episodes.

data.rotadeaths_severeD2

Event rates (deaths) for Rotavirus D2 severe RVGE

Description

Dataset containing event rates (deaths) for rotavirus D2 for severe RVGE

Usage

```
data.rotadeaths_severeD2
```

Format

A data frame with 195 observations on the following 8 variables.

Country country

WHO region WHO region

WHO region2 WHO region country code

Income income level

Age age

Mid mid

Low low

High high

Source

See Clark et al, TRIVAC, Vaccine, Appendix

---

data.rotahosps_severeD2

Event rates (hospital) for Rotavirus D2 severe RVGE

Description

Dataset containing event rates (hospitals) for rotavirus D2 for severe RVGE

Usage

```
data.rotahosps_severeD2
```

Format

A data frame with 195 observations on the following 8 variables.

Country country

WHO region WHO region

WHO region2 WHO region country code

Income income level

Age age

Mid mid

Low low

High high

Source

See Clark et al, TRIVAC, Vaccine, Appendix

data.rotavisits_nonsevereD1

Event rates (visits) for Rotavirus D1 non-severe RVGE

Description

Dataset containing event rates (visits) for rotavirus D1 for non-severe RVGE

Usage

```
data.rotavisits_nonsevereD1
```

Format

A data frame with 195 observations on the following 8 variables.

Country country

WHO region WHO region

WHO region2 WHO region country code

Income income level

Age age

Mid mid

Low low

High high

Source

Assume 1 visit for every 2 non-severe cases

data.rotavisits_severeD2

Event rates (visits) for Rotavirus D2 severe RVGE

Description

Dataset containing event rates (visits) for rotavirus D2 for severe RVGE

Usage

```
data.rotavisits_severeD2
```

Format

A data frame with 195 observations on the following 8 variables.

Country country

WHO region WHO region

WHO region2 WHO region country code

Income income level

Age age

Mid mid

Low low

High high

Source

Clark A et al, unpublished update of the IHME/MCEE/WHOCDC estimates. Median/Min/Max 2015 estimates were used or the estimate for the most recent pre-vax year (using WUENIC 15th July 2017).

---

data.Rota_DALY *Disability weights for Rotavirus*

Description

Dataset disability weights for Rotavirus by condition/sequelae

Usage

```
data.Rota_DALY
```

Format

A data frame with 3 observations on the following 3 variables.

Disease disease

Condition condition/sequelae

GBD_2015_mean Mean disability weight

Source

General Guidance for DALYs calculation VIMC with input from DOVE 2017-11-24 11:03:46

data.sexratio *Sex ratio at birth*

Description

Dataset containing sex-ratio at birth by country, age range, year and gender

Usage

```
data.sexratio
```

Format

A data frame with 2940 observations on the following 8 variables.

country_code_numeric a numeric vector
country_code country code
country name of country
age_from starting age
age_to end age
year year
gender gender
value sex-ratio

Source

Demographic data from the Vaccine Impact Modelling Consortium (VIMC)

data.survival *Survivors from a birth-cohort of 100k*

Description

A data frame with 64680 observations on the following 8 variables.

Usage

```
data.survival
```

Format

A data frame with 20580 observations on the following 8 variables.

country_code_numeric a numeric vector
country_code country code
country name of country
age_from starting age
age_to end age
year year
gender gender
value number of survivors

Source

Demographic data from the Vaccine Impact Modelling Consortium (VIMC)

---

data.totaldeaths *Deaths in total*

Description

Dataset containing total number of deaths by country, age range, year and gender

Usage

```
data.totaldeaths
```

Format

A data frame with 14700 observations on the following 8 variables.

country_code_numeric a numeric vector

country_code country code

country name of country

age_from starting age

age_to end age

year year

gender gender

value number of deaths

Source

Demographic data from the Vaccine Impact Modelling Consortium (VIMC)

---

data.totalfert *Total fertility rate*

Description

Dataset containing total fertility rate by country, age range, year and gender

Usage

```
data.totalfert
```

Format

A data frame with 14700 observations on the following 8 variables.

country_code_numeric a numeric vector

country_code country code

country name of country

age_from starting age

age_to end age

year year

gender gender

value total fertility rate

Source

Demographic data from the Vaccine Impact Modelling Consortium (VIMC)

`data.totalpop` *Total population*

Description

Dataset containing total population country, age range, year and gender

Usage

```
data.totalpop
```

Format

A data frame with 14798 observations on the following 8 variables.

country_code_numeric a numeric vector

country_code country code

country name of country

age_from starting age

age_to end age

year year

gender gender

value total population

Source

Demographic data from the Vaccine Impact Modelling Consortium (VIMC)

data.u1mortality *Under 1 mortality rate*

Description

Dataset containing under 1 mortality rate by country, age range, year and gender

Usage

```
data.u1mortality
```

Format

A data frame with 14700 observations on the following 8 variables.

country_code_numeric a numeric vector
country_code country code
country name of country
age_from starting age
age_to end age
year year
gender gender
value under 1 mortality rate

Source

Demographic data from the Vaccine Impact Modelling Consortium (VIMC)

data.u5mortality *Under 5 mortality rate*

Description

Dataset containing under 5 mortality rate by country, age range, year and gender

Usage

```
data.u5mortality
```

Format

A data frame with 20580 observations on the following 8 variables.

country_code_numeric a numeric vector
country_code country code
country name of country
age_from starting age
age_to end age
year year
gender gender
value fertility rate

Source

Demographic data from the Vaccine Impact Modelling Consortium (VIMC)

`data.vaccine_schedules` *Disability weights for Haemophilus influenzae type B*

Description

Dataset containing disability weights for Haemophilus influenzae type B by condition/sequelae (UNIVAC model)

Usage

```
data.vaccine_schedules
```

Format

A data frame with 195 observations on the following 6 variables.

Country country

BCG BCG target age in weeks

DTP1 DTP1 target age in weeks

DTP2 DTP2 target age in weeks

DTP3 DTP3 target age in weeks

Meas1 Measles target age in weeks

Source

www.who.int/immunization/monitoring_surveillance/data/schedule_data.xls

---

`univacr` *univacr: UNIVAC decision support model*

Description

A universal framework for evaluating vaccine policy options in low- and middle-income countries. This R package is based of the spreadsheet-based tool that is accessible at https://www.paho.org/provac-toolkit/.

Vaccine impact model

Estimate the health impact and cost-effectiveness of vaccination.

Hib, pneumococcal and rotavirus vacccination can be separately analysed.

writelog *Simulation log reporting*

Description

Appends message of simulation run (x) to log file (logname).

Usage

```
writelog(logname, x)
```

Arguments

logname	log filename
x	message of simulation run

Value

None

Examples

```
#
```

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