# Package ‘Families’

July 8, 2022

**Type** Package  
**Title** Kinship Ties in Virtual Populations  
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**BuildResaveData** best  
**VignetteBuilder** knitr  
**LazyData** true  
**Date** 2022-07-06  
**Maintainer** Frans Willekens <willekens@nidi.nl>  
**Description** Tools to study kinship networks, grandparenthood, and double burden (presence of children and oldest old parents) in virtual population produced by ‘VirtualPop’.  
**License** GPL-2  
**NeedsCompilation** no  
**Encoding** UTF-8  
**BugReports** [https://github.com/willekens/VirtualPop/issues](https://github.com/willekens/VirtualPop/issues)  
**RoxygenNote** 7.2.0  
**Author** Frans Willekens [aut, cre] (<https://orcid.org/0000-0001-6125-0212>)  
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**dataLH_F**

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**Families-package**  
*Kinship Ties in Virtual Populations*

**Description**

Tools to study kinship networks, grandparenthood, and double burden (presence of children and oldest old parents) in virtual population produced by `VirtualPop`.

**Author(s)**

Frans Willekens <Willekens@nidi.nl>

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**dataLH_F**  
*dataLH_F data*

**Description**

Simulated population of four generations, produced by `VirtualPop`.

**Format**

A data frame with data on 2965 individuals (1000 in initial cohort).

- **ID**  Identification number
- **gen**  Generation
- **sex**  Sex. A factor with levels Males and Females
- **bdated**  Date of birth (decimal date)
- **ddated**  Date of death (decimal date)
- **x_D**  Age at death (decimal number)
- **IDpartner**  ID of partner
- **IDmother**  ID of mother
- **IDfather**  ID of father
- **jch**  Child’s line number in the household
- **nch**  Number of children ever born
id.1  ID of first child  
id.2  ID of 2nd child  
id.3  ID of 3rd child  
id.4  ID of 4th child  
id.5  ID of 5th child  
id.6  ID of 6th child  
id.7  ID of 7th child  
id.8  ID of 8th child  
id.9  ID of 9th child  
age.1  Age of mother at birth of first child  
age.2  Age of mother at birth of 2nd child  
age.3  Age of mother at birth of 3rd child  
age.4  Age of mother at birth of 4th child  
age.5  Age of mother at birth of 5th child  
age.6  Age of mother at birth of 6th child  
age.7  Age of mother at birth of 7th child  
age.8  Age of mother at birth of 8th child  
age.9  Age of mother at birth of 9th child  

Source

Simulation uses period mortality rates and fertility rates by birth order from the United States 2019. The data are downloaded from the Human Mortality Database (HMD) and the Human Fertility Database (HFD).

\[
\text{Db} \quad \text{Retrieves the date(s) of birth in decimal format}
\]

Description

Retrieves the date(s) of birth from the database

Usage

\[
\text{Db}(\text{idego}, \text{dLH})
\]

Arguments

- \(\text{idego}\) vector of IDs of egos
- \(\text{dLH}\) Name of database. If \(\text{dLH}\) is missing, dataLH_F is used.
Value

Returns the dates of birth

Author(s)

Frans Willekens

Examples

# Date of birth of first individual in database
data(dataLH_F, package = "Families")
Db(idego=1)

Dd

Retrieves the date(s) of death in decimal format

Description

Retrieves the date(s) of death from the database

Usage

Dd(idego, dLH)

Arguments

idego vector of IDs of egos
dLH Name of database. If dLH is missing, dataLH_F is used.

Value

Returns the date of death

Author(s)

Frans Willekens

Examples

# Date of death of first individual in database
data(dataLH_F, package = "Families")
Dd(idego=1)
**dpopus**

**Description**

dpopus data

Population of the United States in 2019 reported in the HMD (Population.txt file)

**Format**

A data frame with 111 age groups (single years of age).

**Females** Female population

**Males** Male population

**Source**

The data are downloaded from the Human Mortality Database (HMD). Country: USA. Year: 2019

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**e0**

Computes (a) Life expectancy at birth, (b) Probability of surviving at age 65, and (c) Probability of surviving at age 85

**Description**

Computes (a) Life expectancy at birth, (b) Probability of surviving at age 65, and (c) Probability of surviving at age 85

**Usage**

e0(dLH)

**Arguments**

dLH The name of the database. If missing, dataLH_F is used.

**Value**

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<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>e0</td>
<td>Mean ages at death</td>
</tr>
<tr>
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<tr>
<td>Prob85</td>
<td>Probability of surviving at age 85</td>
</tr>
</tbody>
</table>

**Author(s)**

Frans Willekens
**Examples**

```r
data(dataLH_F, package = "Families")
e0(dLH=dataLH_F)
```

---

**IDch** | *Retrieves ID of children of ego*

---

**Description**

Retrieves ID of children of ego or children of vector of egos

**Usage**

`IDch(idego, dLH, keep_ego = FALSE)`

**Arguments**

- **idego**: ID of ego(s)
- **dLH**: Name of database. If dLH is missing, dataLH_F is used.
- **keep_ego**: Option to link show ID of ego together with ID of mother

**Value**

ID of children. If ego has no children or IDs of children are not included in database, numeric(0) is returned. If keep_ego=TRUE, a data frame is returned with the following columns: IDego, ID of mother of children, ID of father of children, ID of children, sex of children.

**Author(s)**

Frans Willekens

**Examples**

```r
data(dataLH_F, package = "Families")
IDch(idego=1)
id <- sample(dataLH_F$ID[dataLH_F$gen==1], 10)
IDch(idego=sort(id), keep_ego=TRUE)
```
**IDfather**

*Retrieves ID of father of ego*

**Description**

Function to retrieve the ID of father of ego or fathers of vector of egos

**Usage**

```
IDfather(idego, dLH, keep_ego = FALSE)
```

**Arguments**

- `idego` ID
- `dLH` Name of database. If missing, dataLH_F is used.
- `keep_ego` Option to link show ID of ego together with ID of father

**Value**

ID of father or (if keep_ego=TRUE, object with ID of ego and ID of father). Returns NA if ID of father is not included in the database

**Author(s)**

Frans Willekens

**Examples**

```
data(dataLH_F, package = "Families")
IDfather(idego=sample(dataLH_F$ID, 10))
```

---

**IDmother**

*Retrieves ID of mother of ego*

**Description**

Retrieves the ID of mother of ego or mothers of vector of egos

**Usage**

```
IDmother(idego, dLH, keep_ego = FALSE)
```
**IDpartner**

**Arguments**

- **idego**: ID
- **dLH**: Name of database. If missing, dataLH_F is used.
- **keep_ego**: Option to show ID of ego together with ID of mother

**Value**

ID of mother or (if keep_ego=TRUE, object with ID of ego and ID of mother). Returns NA if ID of mother is not included in the database

**Author(s)**

Frans Willekens

**Examples**

```r
data(dataLH_F, package = "Families")
IDmother(sample(dataLH_F$ID, 10))
IDmother(sample(dataLH_F$ID, 10), keep_ego=TRUE)
```

---

**Description**

Retrieves ID of partners of vector of egos or randomly allocates partners to egos

**Usage**

```r
IDpartner(idego, dLH)
```

**Arguments**

- **idego**: vector of ID of egos. If idego is missing, then the function allocates partners (from opposite sex) to egos. The allocation is random.
- **dLH**: Name of database. If missing, dataLH_F is used.

**Value**

IDs of partners. If the argument idego is missing, then a data frame similar to 'dLH' is returned with IDs of partners completed.

**Author(s)**

Frans Willekens
Examples

data(dataLH_F, package = "Families")
IDpartner(idego=1)
# Allocate partner to egos with ID 4, 9, 30.
IDpartner(idego=dataLH_F$ID[c(4, 9, 30)])

Multistate  Multistate life table

Description
Computes fertility table by birth order

Usage
Multistate(rates, mortality = 1)

Arguments
rates rates by age and sex and birth rates by age and birth order (or parity)
mortality Indicator variable. Mortality accounted for if mortality=1, else mortality omitted.

Details
The multistate life table is computed using the functions MSLT.S and MLST.e from the Biograph package. The two functions are included in the Multistate function as MSLT_S and MSLT_e.

Value
A list of two objects: itemS the multistate survival function (S) and multistate transition probabilities (P) itemmsltother measures of the multistate life table: person-years (L); expectation at birth of sojourn times in the various states (e0); expectation at age x of the remaining expected sojourn times in the various states: population-based measures (e.p); expectation at age x of the remaining expected sojourn times in the various states: status-based measures (e.p

Author(s)
Frans Willekens

Examples

data(rates, package = "Families")
z=Multistate(rates)
Description

Mortality rates by age and sex: fertility rates by age and birth order

Format

A list of three objects.

ASDR  Mortality rates
ASFR  Fertility rates
ratesM  Multistate transition rates

Source

The data are downloaded from the Human Mortality Database (HMD) and the Human Fertility Database (HFD). Country: USA. Year: 2019
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