

# Package ‘Families’

October 12, 2022

**Type** Package

**Title** Kinship Ties in Virtual Populations

**Version** 1.0.1

**Depends** R (>= 3.5.0)

**Imports** msm,reshape

**Suggests** knitr, rmarkdown,ggplot2,lubridate,xml2

**BuildResaveData** best

**VignetteBuilder** knitr

**LazyData** true

**Date** 2022-07-06

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**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>

**RoxygenNote** 7.2.0

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Families-package	<i>Kinship Ties in Virtual Populations</i>
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### 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	<i>dataLH_F data</i>
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### 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).

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Db *Retrieves the date(s) of birth in decimal format*

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### Description

Retrieves the date(s) of birth from the database

### Usage

Db(idego, dLH)

### Arguments

idego                    vector of IDs of egos  
 dLH                        Name of database. If 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)
```

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dpopus	<i>dpopus data Population of the United States in 2019 reported in the HMD (Population.txt file)</i>
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**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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$e_0$	<i>Computes (a) Life expectancy at birth, (b) Probability of surviving at age 65, and (c) Probability of surviving at age 85</i>
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**Description**

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

**Usage** $e_0(\text{dLH})$ **Arguments****dLH** The name of the database. If missing, dataLH\_F is used.**Value** $e_0$  Mean ages at death

Prob65 Probability of surviving at age 65

Prob85 Probability of surviving at age 85

**Author(s)**

Frans Willekens

**Examples**

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

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IDch	<i>Retrieves ID of children of ego</i>
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**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**

```
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)
```

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IDfather	<i>Retrieves ID of father of ego</i>
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**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	<i>Retrieves ID of mother of ego</i>
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---

**Description**

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

**Usage**

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

**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**

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

---

IDpartner

*Retrieves ID of partner of ego or allocate partner to ego*

---

**Description**

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

**Usage**

```
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)])
```

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Multistate

*Multistate life table*


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**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) `itemmsl` other measures of the multistate life table: person-years (L); expectation at birth of sojourn times in the various states ( $e_0$ ); 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)
```

---

rates

*rates data*

---

**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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