

# Package: dfertility (via r-universe)

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**Type** Package

**Title** District level estimation of age-specific fertility

**Version** 0.1.666

**Description** This package estimates district-level estimates of age-specific fertility from nationally representative household survey data.

**Depends** R (>= 2.10)

**License** MIT + file LICENSE

**Encoding** UTF-8

**LazyData** true

**Roxygen** list(markdown = TRUE)

**RoxygenNote** 7.1.2

**Imports** Matrix, countrycode, R6, TMB, ggplot2, here, magrittr, dplyr, parallel, mvtnorm, rdhs, sf, spdep, tidyr, zip, zoo, methods, utils, rlang

**Suggests** tidyverse

**LinkingTo** RcppEigen, TMB

**Repository** <https://mrc-ide.r-universe.dev>

**RemoteUrl** <https://github.com/mrc-ide/dfertility>

**RemoteRef** master

**RemoteSha** e3b480d0fd14a828776c2a197c559cb2b5e76814

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area_populations	<i>Aggregate district level populations</i>
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### Description

Aggregate district level populations to all levels of area hierarchy

### Usage

```
area_populations(population, areas_wide, project, naomi_level)
```

### Arguments

population	Age/sex/space/time stratified population
areas_wide	Area hierarchy in wide format

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assign_cluster_area	<i>Aggregate district level cluster dataframe</i>
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### Description

Aggregate a dataframe of survey clusters geolocated to an administrative to any higher administrative level

### Usage

```
assign_cluster_area(clusters, areas_wide, area_level)
```

**Arguments**

- `clusters`      Dataframe of geolocated survey clusters
- `areas_wide`    Area hierarchy in wide format
- `area_level`    Integer referring to administrative level, where 0 is national, 1 is provincial etc.

**Value**

Dataframe list of clusters by administrative area, one list item per survey

**See Also**

[get\\_areas](#)

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`calculate_dhs_fertility`

*Calculate fertility rates from DHS, MIS, AIS data*

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**Description**

Calculate fertility rates from DHS, MIS, AIS data

**Usage**

```
calculate_dhs_fertility(iso3, surveys, clusters, areas_wide)
```

---

`calculate_mics_fertility`

*Calculate fertility rates from MICS data*

---

**Description**

Calculate fertility rates from MICS data

**Usage**

```
calculate_mics_fertility(iso3, mics_wm, mics_births_to_women)
```

create\_surveys\_mics     *Download MICS surveys*

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**Description**

Download MICS surveys

**Usage**

```
create_surveys_mics(iso3, mics_indicators)
```

**Arguments**

iso3                    ISO3 code

---

filter\_mics             *Filter MICS datasets*

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**Description**

Filter MICS household, women, and birth history datasets to key variables, and rename to ensure consistent column names between surveys

**Usage**

```
filter_mics(dat, mics_indicators, survey_id_i)
```

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fit\_sample\_tmb           *Fit TMB model*

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**Description**

Fit TMB model

**Usage**

```
fit_sample_tmb(data, par, random)
```

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get_areas	<i>Make area dataframes</i>
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**Description**

Create area hierarchy dataframes in the Naomi package format. The function will always return the area hierarchy in long format, with arguments additionally to return full and wide hierarchies

**Usage**

```
get_areas(iso3_current, naomi_data_path, full = FALSE, wide = TRUE)
```

**Arguments**

iso3_current	A string of one or more ISO-3 codes
naomi_data_path	A path to directory containing input data files
full	Boolean to return the full area heirarchy
wide	Boolean to return the area hierarchy in wide format

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get_boundaries	<i>Get populations</i>
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**Description**

Returns a dataframe of area boundaries

**Usage**

```
get_boundaries(iso3_current, naomi_data_path)
```

**Arguments**

iso3_current	A string of one or more ISO-3 codes
naomi_data_path	A path to directory containing input data files

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get_input_files	<i>Extract area, population, boundary files from target directory</i>
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**Description**

Extract area, population, boundary files from target directory

**Usage**

```
get_input_files(iso3_current, naomi_data_path)
```

**Arguments**

iso3\_current    A string of one or more ISO-3 codes  
naomi\_data\_path    A path to directory containing input data files

**Value**

A named list of file paths

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get_populations	<i>Get populations</i>
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**Description**

Returns a dataframe of population by district, five year age group, and sex

**Usage**

```
get_populations(iso3_current, naomi_data_path)
```

**Arguments**

iso3\_current    A string of one or more ISO-3 codes  
naomi\_data\_path    A path to directory containing input data files

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ir_by_area	<i>Join individual recode survey datasets by area</i>
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**Description**

Join individual recode survey datasets by area

**Usage**

```
ir_by_area(ir, area_list, n, total)
```

**Arguments**

ir	Individual recode survey dataset
area_list	List of areas

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join_survey_areas	<i>Join household datasets with area hierarchy</i>
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**Description**

Join household datasets with area hierarchy

**Usage**

```
join_survey_areas(fertility_mics_data, areas, warn = FALSE)
```

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make_adjacency_matrix	<i>Neighbor list</i>
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**Description**

Neighbor list

**Usage**

```
make_adjacency_matrix(areas, model_level)
```

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make_asfr_inputs	<i>Transform survey datasets into inputs for calc_asfr</i>
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### Description

Transform survey datasets into inputs for calc\_asfr

### Usage

```
make_asfr_inputs(mics_survey_areas, mics_survey_data)
```

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make_model_frames_batch	<i>Make model frames for batch running</i>
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### Description

Create model frames and aggregation matrices for TMB model.

### Usage

```
make_model_frames_batch(lvl_map, population, asfr, areas_list, project = 2020)
```

### Arguments

population	Age/sex/space stratified population
asfr	ASFRs by district and time
areas_list	List of area files
project	Model will by default produce estimates up to year of last survey. Integer projection year if desired, else FALSE
lvl	Dataframe of district and province levels



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make\_model\_frames\_dev *Make model frames*

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### Description

Create model frames and aggregation matrices for TMB model.

### Usage

```
make_model_frames_dev(
  iso3,
  population,
  asfr,
  areas,
  naomi_level,
  project = 2020
)
```

### Arguments

iso3	iso3 code for country
population	Age/sex/space stratified population
asfr	ASFRs by district and time
areas	Area hierarchy
naomi_level	Area level to produce estimates at
project	Model will by default produce estimates up to year of last survey. Integer projection year if desired, else FALSE

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make\_rw\_structure\_matrix

*Make random walk structure matrices*

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### Description

Make random walk structure matrices

### Usage

```
make_rw_structure_matrix(x, order, adjust_diagonal = TRUE)
```

### Arguments

x	Matrix size
order	Random walk order
adjust_diagonal	Add 1E-6 to the matrix diagonal to make the matrix proper. Default = TRUE

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`sample_tmb`*Sample TMB*

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**Description**

Sample TMB

**Usage**

```
sample_tmb(  
  fit,  
  nsample = 1000,  
  rng_seed = NULL,  
  random_only = TRUE,  
  verbose = FALSE  
)
```

---

`transform_mics`*Transform MICS dataframes*

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**Description**

Convert lists by survey to lists by dataset type

**Usage**

```
transform_mics(mics_survey_data, mics_indicators)
```

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