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Database: Model outputs for dissemination

Deliverable 8.3

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History of changes

Version	Date	Changes
1.0	31 July 2023	First version submitted as official deliverable to the EC
1.1	4 August 2023	Updated version submitted to the EC

Suggested citation

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Dissemination level

PU Public

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1. Database Description

This cover note describes Deliverable D8.3: Database of Model Outputs for Dissemination. D8.3 is a database on QuantMig-Mic microsimulation model inputs and outputs, comprised of five datasets and the QuantMig-Mic model code. The database and the code are available through Zenodo repository, DOI: 10.5281/zenodo.7728049.

Potančoková, M., Marois, G., González-Leonardo, M. (2023) QuantMig microsimulation population projection model and migration scenarios for 31 European countries. Zenodo. https://doi.org/ 10.5281/zenodo.7728049

1.1 Description of Datasets

The repository contains the following datasets:

1. Baseline population (BasePop.csv)

2. Immigration database (ImmigDataBase.csv)

3. Scenarios outputs database, contains two separate files: QuantMigScenariosResults_demography.csv, QuantMigScenariosResults_components.csv

1.2 Description of Variables

1.2.1 Baseline population (BasePop.csv)

Description

The base population of QuantMig-Mic microsimulation model contains population estimates by age, sex, country of residence, place of birth, educational attainment and labour force status for 2011 and 2020. The initial synthetic baseline population is estimated for 2011 combining data from the 2011 Census, the EU-LFS and the European Social Survey (ESS). A pre-simulation then reproduces the population dynamic from 2011 to 2019 and provides a synthetic base population for 2020 with the same dimensions. Scenarios start diverging only after 2020.

Variables

SEX – Sex

Code	*Description*
S_FEM	Female
S_MAL	Male

YEAR – Year of estimates

Numerical variable (2011 and 2020)

AGE – Age

Five-year age groups between 0, 5, 10,…, 95+. The value indicates the first age of the 5-year age group.

COUNTRY – Country of residence

Code	*Description*
C_AT	Austria
C_BE	Belgium
C_BG	Bulgaria
C_CH	Switzerland
C_CY	Cyprus
C_CZ	Czechia
C_DE	Germany
C_DK	Denmark
C_EE	Estonia
C_ES	Spain
C_FI	Finland
C_FR	France
C_GR	Greece
C_HR	Croatia
C_HU	Hungary
C_IE	Ireland
C_IS	Iceland
C_IT	Italy
C_LT	Lithuania
C_LU	Luxembourg
C_LV	Latvia
C_MT	Malta
C_NL	Netherlands
C_NO	Norway
C_PL	Poland
C_PT	Portugal
C_RO	Romania
C_SE	Sweden
C_SI	Slovenia
C_SK	Slovakia
C_UK	United Kingdom

EDU – Educational attainment

Code	*Description*
EL_LOW	Lower secondary or less (no education, ISCED 0, 1 ,and 2)
EL_MED	Upper secondary completed (ISCED 3)
EL_HIG	Post-secondary (ISCED 4, 5, 6, 7, 8)

POB – Place of birth

Code	*Description*
POB_AT	Austria
POB_BE	Belgium
POB_BG	Bulgaria
POB_CH	Switzerland
POB_CY	Cyprus
POB_CZ	Czechia
POB_DE	Germany
POB_DK	Denmark
POB_EE	Estonia
POB_ES	Spain
POB_FI	Finland
POB_FR	France
POB_GR	Greece
POB_HR	Croatia
POB_HU	Hungary
POB_IE	Ireland
POB_IS	Iceland
POB_IT	Italy
POB_LT	Lithuania
POB_LU	Luxembourg
POB_LV	Latvia
POB_MT	Malta
POB_NL	Netherlands
POB_NO	Norway
POB_PL	Poland
POB_PT	Portugal
POB_RO	Romania
POB_SE	Sweden
POB_SI	Slovenia
POB_SK	Slovakia
POB_UK	United Kingdom
POB_EAS	East Asia
POB_NAF	North Africa
POB_LAT	Latin America
POB_NAM	Northern America + Oceania
POB_NEU	Other Europe (including Turkey)
POB_SSA	Sub-Saharan Africa
POB_SSEAS	South & South-East Asia
POB_WASI	West Asia

LABOUR – Labor force status

Code	*Description*
L_INA	Inactive
L_ACT	Active

POP – Population estimates

Numerical variable

1.2.2 Immigration database (ImmigDataBase.csv)

Description

The immigration database contains the immigration counts by age, sex, country of destination, place of birth, and educational attainment for the periods 2011-2015 to 2055-2059, for all 29 QuantMig migration scenarios.

SCENARIO – Scenario

Code	*Description*
Baseline	Baseline
PHME_East_Asia	Persistent high-migration event from East Asia
PHME_West_Asia	Persistent high-migration event from West Asia
PHME_SSE_Asia	Persistent high-migration event from South and South-East Asia
PHME_Other_Europe	Persistent high-migration event from Other Europe
PHME_Latin_America	Persistent high-migration event from Latin America
PHME_North_Africa	Persistent high-migration event from North Africa
PHME_SSA	Persistent high-migration event from Sub-Saharan Africa
PME_East_Asia	Persistent migration event from East Asia
PME_West_Asia	Persistent migration event from West Asia
PME_SSE_Asia	Persistent migration event from South and South-East Asia
PME_Other_Europe	Persistent migration event from Other Europe
PME_Latin_America	Persistent migration event from Latin America
PME_North_Africa	Persistent migration event from North Africa
PME_SSA	Persistent migration event from Sub-Saharan Africa
SHME_East_Asia	Short high-migration event from East Asia
SHME_West_Asia	Short high-migration event from West Asia
SHME_SSE_Asia	Short high-migration event from South and South-East Asia
SHME_Other_Europe	Short high-migration event from Other Europe
SHME_Latin_America	Short high-migration event from Latin America
SHME_North_Africa	Short high-migration event from North Africa
SHME_SSA	Short high-migration event from Sub-Saharan Africa
SME_East_Asia	Short migration event from East Asia
SME_West_Asia	Short migration event from West Asia
SME_SSE_Asia	Short migration event from South and South-East Asia

SME_Other_Europe	Short migration event from Other Europe
SME_Latin_America	Short migration event from Latin America
SME_North_Africa	Short migration event from North Africa
SME_SSA	Short migration event from Sub-Saharan Africa

Variables

AGE – Age

Categorical variable; Five-year age groups, (min, 5), [5, 10), …, [95, max) for age groups 0-4, 5-9, …, 95+.

COUNTRY – Country of destination

Code	*Description*
C_AT	Austria
C_BE	Belgium
C_BG	Bulgaria
C_CH	Switzerland
C_CY	Cyprus
C_CZ	Czechia
C_DE	Germany
C_DK	Denmark
C_EE	Estonia
C_ES	Spain
C_FI	Finland
C_FR	France
C_GR	Greece
C_HR	Croatia
C_HU	Hungary
C_IE	Ireland
C_IS	Iceland
C_IT	Italy
C_LT	Lithuania
C_LU	Luxembourg
C_LV	Latvia
C_MT	Malta
C_NL	Netherlands
C_NO	Norway
C_PL	Poland
C_PT	Portugal
C_RO	Romania
C_SE	Sweden
C_SI	Slovenia
C_SK	Slovakia
C_UK	United Kingdom

EDU – Educational attainment

Code	*Description*
EL_LOW	Lower secondary or less (no education, ISCED 0, 1 ,and 2)
EL_MED	Upper secondary completed (ISCED 3)
EL_HIG	Post-secondary (ISCED 4, 5, 6, 7, 8)

PERIOD – Period of immigration

Numerical variable (2011, 2015, 2020,…,2055). The value indicates the first year of the 5-year period (4-year for 2011).

POB – Place of birth for population born outside EU+

Code	*Description*
POB_EAS	East Asia
POB_NAF	North Africa
POB_LAT	Latin America
POB_NAM	Northern America + Oceania
POB_NEU	Other Europe (including Turkey)
POB_SSA	Sub-Saharan Africa
POB_SSEAS	South & South-East Asia
POB_WASI	West Asia

SEX – Sex

Code	*Description*
S_FEM	Female
S_MAL	Male

POP – Number of immigrants

Numerical variable

1.2.3 Scenario outputs database

Scenarios outputs database, contains two separate files with simulation outputs.

Description

The model outputs are stored in two output tables:

QuantMigScenariosResults_demography.csv

QuantMigScenariosResults_components.csv

QuantMigScenariosResults_demography.csv

Modelled population stocks by Scenario, Year, Age, Sex, Country (of residence), Education, Place of Birth and Labour force status

Variables

SCENARIO – Scenario

Code	*Description*
Baseline	Baseline
PHME_East_Asia	Persistent high-migration event from East Asia
PHME_West_Asia	Persistent high-migration event from West Asia
PHME_SSE_Asia	Persistent high-migration event from South and South-East Asia
PHME_Other_Europe	Persistent high-migration event from Other Europe
PHME_Latin_America	Persistent high-migration event from Latin America
PHME_North_Africa	Persistent high-migration event from North Africa
PHME_SSA	Persistent high-migration event from Sub-Saharan Africa
PME_East_Asia	Persistent migration event from East Asia
PME_West_Asia	Persistent migration event from West Asia
PME_SSE_Asia	Persistent migration event from South and South-East Asia
PME_Other_Europe	Persistent migration event from Other Europe
PME_Latin_America	Persistent migration event from Latin America
PME_North_Africa	Persistent migration event from North Africa
PME_SSA	Persistent migration event from Sub-Saharan Africa
SHME_East_Asia	Short high-migration event from East Asia
SHME_West_Asia	Short high-migration event from West Asia
SHME_SSE_Asia	Short high-migration event from South and South-East Asia
SHME_Other_Europe	Short high-migration event from Other Europe
SHME_Latin_America	Short high-migration event from Latin America
SHME_North_Africa	Short high-migration event from North Africa
SHME_SSA	Short high-migration event from Sub-Saharan Africa
SME_East_Asia	Short migration event from East Asia
SME_West_Asia	Short migration event from West Asia
SME_SSE_Asia	Short migration event from South and South-East Asia
SME_Other_Europe	Short migration event from Other Europe
SME_Latin_America	Short migration event from Latin America
SME_North_Africa	Short migration event from North Africa
SME_SSA	Short migration event from Sub-Saharan Africa

YEAR – Year of estimates

Numerical variable (2020, 2025, …, 2060)

SEX – Sex

Code	*Description*
S_FEM	Female
S_MAL	Male

AGE – Age

Five-year age groups: 0-4, 5-9, …, 95+. Non-numeric categorical variable.

COUNTRY – Country of residence

Code	*Description*
C_AT	Austria
C_BE	Belgium
C_BG	Bulgaria
C_CH	Switzerland
C_CY	Cyprus
C_CZ	Czechia
C_DE	Germany
C_DK	Denmark
C_EE	Estonia
C_ES	Spain
C_FI	Finland
C_FR	France
C_GR	Greece
C_HR	Croatia
C_HU	Hungary
C_IE	Ireland
C_IS	Iceland
C_IT	Italy
C_LT	Lithuania
C_LU	Luxembourg
C_LV	Latvia
C_MT	Malta
C_NL	Netherlands
C_NO	Norway
C_PL	Poland
C_PT	Portugal
C_RO	Romania
C_SE	Sweden
C_SI	Slovenia
C_SK	Slovakia
C_UK	United Kingdom
EU27	EU27
EU+	all countries in the model
UK+EFTA	UK, Iceland, Norway and Switzerland

EDU – Educational attainment

Code	*Description*
EL_LOW	Lower secondary or less (no education, ISCED 0, 1 ,and 2)
EL_MED	Upper secondary completed (ISCED 3)
EL_HIG	Post-secondary (ISCED 4, 5, 6, 7, 8)

POB – Place of birth

Categorical variable, 10 categories:

Native-born

EU+ (born in another EU+ country than the country of residence)

Other Europe

North Africa

Sub-Saharan Africa

East Asia

West Asia

South&South-East Asia

Latin America

North America&Oceania

LABOUR – Labor force status

Code	*Description*
L_INA	Inactive
L_ACT	Active

POP – Population estimates

Numerical variable

QuantMigScenariosResults_components.csv

Events and aggregates from the model outputs for all scenarios.

Population, Births, Deaths, Natural increase, Emigrants to other EU+ country (Exists), Emigrants to Rest of the World (Emigration), Immigrants from other EU+ country (Entrances), Immigrants from the Rest of the World (Immigration), Net migration with EU+, Net migration with Rest of the World, Total Net Migration

Variable components codes:

Population
Births
Deaths
Natural increase
Exists (Emigrants to EU+)

Emigration (Emigrants to Rest of the World)
Entrances (Immigrants from other EU+ country)
Immigration (Immigrants from the Rest of the World)
Net International Migration (Net migration with Rest of the World)

By: scenario, year, sex, period, country (of residence), educational attainment

Same variable codings as in QuantMigScenariosResults_demography.csv

1.3 QuantMig-Mic model code

Code of the QuantMig-Mic microsimulation model is deposited in Zenodo repository in a zip file which contains the model code and the Baseline scenario parameters. Users need to install MODGEN to view the Baseline scenario. Model code can also be viewed using Visual Studio. For more information about MODGEN and installation of the software we refer the reader to the Deliverable 8.1:

Marois, G. and Potančoková, M. (2022) QuantMig-mic microsimulation tool. QuantMig Project Deliverable D8.1. International Institute for Applied Systems Analysis (IIASA). http://quantmig.eu/res/files/QuantMig_IIASA_Deliverable%20D8.1%20v1.1.pdf