

Population Projections in the European Demographic Data Sheet 2016

Population projections have always been an important aspect of the European Demographic Data Sheet since its first edition in 2006 as they illustrate the long-term effect of the present population trends and shed a light on changes due to population ageing. Projections in each data sheet are built on regularly updated data on population by age and sex, and take into account up-to-date trends in fertility, mortality and migration. The standard cohort-component model is used to project the population by age and sex from 2015 to 2050. For simplicity, a scenario with and without migration is presented in the data sheet. In this issue, the scenario with migration also considers the impact of asylum seekers.

In terms of scope, the projections are carried out for the following 43 countries: Albania, Armenia, Austria, Azerbaijan, Belarus, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France (metropolitan, excluding overseas territories), Georgia, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Macedonia FYR, Malta, Moldova, Montenegro, Netherlands, Norway, Poland, Portugal, Romania, Russia, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, United Kingdom. Countries with a total population below 100,000 (Andorra, Liechtenstein, Monaco and San Marino), are excluded from the projection effort, just as countries with unavailable detailed data (Bosnia-Herzegovina and Kosovo). For Japan and the USA this Data Sheet features results from the United Nations population projections (UN 2015).

Baseline data

Two scenarios are produced: with and without migration. The initial baseline data – population by age and sex as of 1 January 2015 – are mostly collected from Eurostat database. Data for Armenia, Azerbaijan, Belarus, France, Georgia, Russia and Ukraine were retrieved from the national statistical offices. For Georgia we derive distribution by single-year of age from 5-year age groups. Data for Moldova are taken from a recent comprehensive paper by Penina et al. (2015). For Belarus and Azerbaijan the starting projection year is 2014, the last year for which the population by sex and single year was available at the time of extraction.

The total fertility rates (TFR) and the age schedule for fertility for the starting year rely on the information available for 2014. For a limited number of countries the latest available data pertain to 2013 (Armenia, Azerbaijan, Belarus, and Moldova) and 2010 (Georgia). The 2014 fertility data are based on the official vital statistics and population data, reported by Eurostat (2016), except for Armenia, Moldova and Ukraine (HFC 2016), France (INSEE 2016), and Russia (The Russian Fertility and Mortality Database 2016).

The information for life expectancy at birth by sex for the base year was mostly retrieved from the Eurostat database (2016) and refers to the year 2014 (for Belarus and Azerbaijan it is 2013). Mortality data for Armenia, France, Georgia, Russia and Ukraine were collected from the national statistical offices. Data for Moldova were taken from Penina et al. (2015).

Probabilities of death by age and sex originate mostly from Eurostat as well. The last available year at the time of extraction is 2014, except for Azerbaijan (2013), Belarus (2013), Ukraine (2012)

and Georgia (2011). For the following countries data are from national statistical offices: Russia (2014), France (2011–2013) and Armenia (2012). Data for Moldova are from Penina et al. (2015).

Reliable harmonised migration estimates for all countries are difficult to obtain, as the starting data on the total number of net migrants rely on different sources of information. For the following countries we consider the number of net migrants available from Eurostat for 2014: Austria, Belgium, Cyprus, Denmark, Finland, France (metropolitan), Germany, Greece, Iceland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Sweden, Switzerland and United Kingdom. For Albania, Azerbaijan, Belarus, Bulgaria, Croatia, the Czech Republic, Georgia, Hungary, Ireland, Macedonia FYR, Moldova, Montenegro, Poland, Romania, Serbia, Slovakia, Slovenia and Ukraine we estimate the number of net migrants based on the information on the population by country of birth for the years 2014 and 2015, available at Eurostat, for different EU countries. For Armenia and Russia the number of net migrants for 2014 is based on the estimation by the Wittgenstein Centre for Population and Global Human Capital (see Lutz, Butz and KC 2014). For Estonia, Latvia and Lithuania we use the EUROPOP 2013 values. For Spain and Turkey we assume net migration to be zero for the starting year.

The distribution of net migrants by sex and age relies on information from EUROPOP 2013.

Assumptions

The assumptions for the future trends of fertility, mortality and migration used in the 2016 edition of the European Demographic Data Sheet are further detailed below.

The projection assumptions for future trends of fertility are based on the results of the global expert-based projections prepared by the Wittgenstein Centre for Population and Global Human Capital (see Lutz, Butz and KC 2014 for details). Namely, the period total fertility rate (TFR) for 2015–2050 rely on the Medium Demographics scenario within the Global Education Trend scenario (Medium-GET Scenario) by Lutz, Butz and KC (2014). The fertility rates distribution by age is kept constant throughout the projection period.

Life expectancy at birth is assumed to increase by two years per decade (Lutz et al. 1997 and 2001; Sanderson and Scherbov 2004), an assumption supported also by Oeppen and Vaupel (2002). The Brass relational model is used to adjust the age-specific mortality schedule.

Regarding migration assumptions, we elaborate two migration scenarios: a) with migration b) without migration. The scenario with migration follows, after the year 2030, either EUROPOP 2013 assumptions or the assumptions developed within the global expert-based projections prepared by the Wittgenstein Centre for Population and Global Human Capital (see Lutz, Butz and KC 2014 for details), i.e. the Medium Demographics scenario with Global Education Trend scenario (Medium-GET Scenario) by Lutz, Butz and KC (2014). Migration assumptions for most of the countries we converge linearly from the baseline values to EUROPOP 2013 values in 2030 and then follow Eurostat assumptions. For the following countries we rely, after the projection year 2030, on the assumptions of the Wittgenstein Centre for Population and Global Human Capital: Albania, Armenia (whole projection period), Azerbaijan, Belarus, Metropolitan France, Georgia, Macedonia FYR, Moldova, Montenegro, Russia (whole projection period), Serbia and Ukraine. For Ireland after 2016 we rely on the assumptions by the CSO Ireland. For Turkey we assume zero net migration for the whole projection period.

Due to new migration situation in Europe associated with an increased inflow of asylum seekers since 2015, we top up the projected net migration during 2015–2019 with an additional stock of asylum seekers in order to account for the possible impact of asylum seekers. We do so for a subset of the following 15 European countries where the majority of asylum seekers apply for protection: Germany, Sweden, Austria, Netherlands, Belgium, Finland, Switzerland, Norway, Denmark, United Kingdom, France, Spain, Greece, Italy and Luxembourg (listed starting from the highest number of first-time asylum applicants in 2015). Again, we rely on data collected by Eurostat (2016). The number of applications in the countries of central and eastern Europe is low, with the exception of Hungary, where a significant number of asylum seekers was registered in 2015; however, there is little evidence that a majority of them actually remained in the country. Therefore, we have proportionally redistributed this stock of first-time asylum applicants to Hungary in 2015 into the top 5 receiving countries. Furthermore, not all asylum seekers are granted refugee or other protection status and acceptance rates differ significantly depending on the country of origin of the asylum seekers. Thus, we have included only those arriving from the top 5 countries with highest recognition rates in 2015: Iraq, Syria, Eritrea, Afghanistan and stateless persons (authors’ own estimates, based on Dublin Statistics available from Eurostat 2016).

To sum up, the number of asylum seekers added as in-migration flow was calculated from the Eurostat data on first-time asylum applicants in 2015, with adjustments for those who applied in Hungary, and taking only those with highest chances to be granted asylum and stay in their destination country. We assume increased irregular migration for the first five projection years. Estimates for 2016–2019 follow a declining linear trend and no asylums seekers are considered from 2020 onwards. Table 1 summarises estimated totals for the 15 countries in 2015–2019. We assume the same composition by sex as in 2015. The migration age profile remains constant.

Table 1: Estimated number of asylum seekers for the migration scenario, 2015–2019 (thousands)

	2015	2016	2017	2018	2019	2015– 2019
Germany	289	231	173	115	58	866
Sweden	155	124	93	62	31	466
Austria	80	64	48	32	16	239
Netherlands	42	34	25	17	8	126
Belgium	34	27	20	14	7	102
Finland	33	26	20	13	7	98
Switzerland	31	25	18	12	6	92
Norway	30	24	18	12	6	90
Denmark	19	15	12	8	4	58
United Kingdom	16	12	9	6	3	47
France	14	11	8	6	3	42
Spain	6	5	4	2	1	18
Greece	6	5	4	2	1	17
Italy	6	5	3	2	1	17
Luxemburg	2	1	1	1	0	5

References

- EUROPOP 2013. European Population Projections, base year 2013, Eurostat.
- EUROSTAT 2016. *Eurostat Statistics Database*. Available at <http://epp.eurostat.ec.europa.eu> (data downloaded on 10.3.2016).
- HFC 2016. Human Fertility Collection. Max Planck Institute for Demographic Research and Vienna Institute of Demography. Available at <http://www.fertilitydata.org> (data downloaded on 4.5.2016).
- INSEE 2016. Institut national de la statistique et des études économiques. Online data available at <http://www.insee.fr> (data downloaded on 4.5.2016).
- Lutz, W., W. P. Butz and S. KC. (Eds.) 2014. *World Population and Human Capital in the 21st Century*. Oxford: Oxford University Press.
- Lutz, W., W. Sanderson, and S. Scherbov. 1997. "Doubling of world population unlikely." *Nature* 387: 803–805.
- Oeppen, J. and J. W. Vaupel. 2002. "Broken limits to life expectancy." *Science* 296: 1029-1031.
- Penina, O., D. A. Jdanov and P. Grigoriev. 2015, "Producing reliable mortality estimates in the context of distorted population statistics: the case of Moldova", MPIDR WP 2015-011.
- Russian Fertility and Mortality Database. 2016. Available at: http://demogr.nes.ru/index.php/en/demogr_indicat (data downloaded on 10.3.2016).
- Sanderson, W. and S. Scherbov. 2004. "Putting Oeppen and Vaupel to work: On the road to new stochastic mortality forecasts." *IIASA Interim Report IR-04-049*, Laxenburg, IIASA.
- United Nations, Department of Economic and Social Affairs, Population Division. 2015. *World Population Prospects: The 2015 Revision, DVD Edition*.