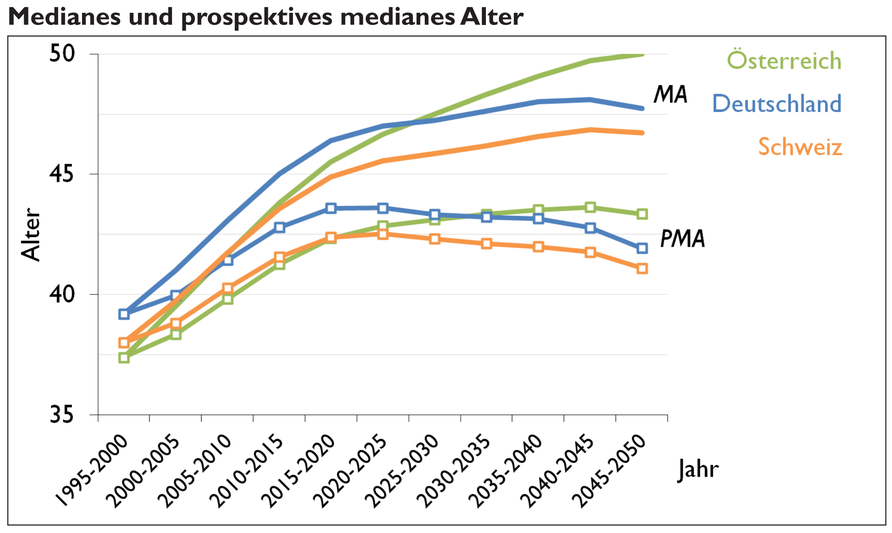
ALTERNSFORSCHUNG AM WITTGENSTEIN CENTRE

ALTERNATIVE MASSE FÜR ALTER UND BEVÖLKERUNGSALTERUNG

Prof. Wolfgang Lutz, Dr. Sergei Scherbov

- Traditionelles Maß des Alters ist retrospektiv und liefert unvollständiges Bild
- Prospektives Alter: stetig steigende Lebenserwartung berücksichtigt
- Prospektives Altersmaß wichtig auf der persönlichen Ebene (z.B.: Konsum, Sparen) und auf der gesellschaftlichen Ebene (z.B.: Voraussage von Medizinkosten)
- Weiteres Maß: Anteil der Bevölkerung mit einer Lebenserwartung von 15 oder weniger Jahren

Medianes und prospektives medianes Alter

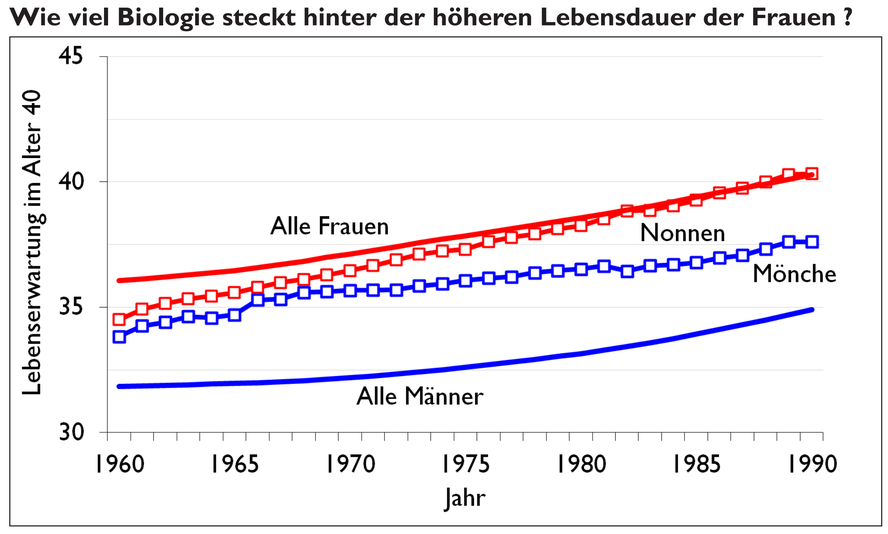


Medianes Alter (MA) und prospektives medianes Alter (PMA) für Frauen und Männer in Österreich, Deutschland und der Schweiz; Vergleichszeitraum für PMA: 1995-2000 (eigene Berechnungen); Sanderson & Scherbov (2005)

GESCHLECHTERDIFFERENZEN IN GESUNDHEIT UND LEBENSDAUER

Dr. Marc Luy, Dr. Paola Di Giulio, Christian Wegner-Siegmundt

Wie viel Biologie steckt hinter der höheren Lebensdauer der Frauen ?



Die Werte beziehen sich auf die westdeutsche Allgemeinbevölkerung sowie die Mitglieder aus 11 westdeutschen Ordensgemeinschaften; Perioden-Sterbetafeln für jeweils 30 Kalenderjahre; eigene Berechnungen mit Daten der Kloster-studie sowie des Deutschen Statistischen Bundesamts

- Analyse der Unterschiede zwischen Frauen und Männern in der Lebenserwartung in der Allgemeinbevölkerung und bei katholischen Ordensmitgliedern
- Erweiterung der Analyse auf den Gesundheitszustand sowie die Übergänge zwischen Gesundheit, Krankheit und Lebensende (ERC Starting Grant-Projekt HEMOX)
- Schätzung des Einflusses von bestimmten Risikofaktoren wie z.B. Rauchen, Stress und mangelnde Bildung auf Gesundheit und Lebensdauer von Frauen und Männer

GESUNDHEIT, KONSUM UND ARBEITSANGEBOT ÜBER DEN LEBENSZYKLUS

Prof. Alexia Fürnkranz-Prskawetz, Prof. Gustav Feichtinger, Dr. Michael Kuhn, Dr. Stefan Wrzaczek

- Ökonomische Analyse des Verhaltens über den individuellen Lebenszyklus
- Wie wählen Individuen Konsum, Ersparnisse, Gesundheitsinvestitionen und Arbeitsangebot um ihren Lebensnutzen zu maximieren, wenn dieser positiv mit dem Konsumniveau (pro Lebensjahr), der Freizeit und der Lebenserwartung korreliert?
- Wie werden individuelle Entscheidungen durch institutionelle Begebenheiten und Politik beeinflusst?
- Welche Ineffizienzen im individuellen Verhalten treten auf und wie können diese gegebenenfalls durch Politikinterventionen behoben werden?

Zu hohe oder zu geringe Gesundheitsinvestitionen?

- Gesundheitsinvestitionen beeinflussen auch Überlebenschancen anderer (positiv: Impfungen, höher-er Forschungsaufwand in großen Märkten; negativ: Überlastung des Gesundheitssystems, mikrobielle Resistenz)
- Ineffiziente Gesundheitsinvestitionen mit Konsequenzen für Lebenserwartung und Konsum
- Korrigierende altersabhängige Transfers

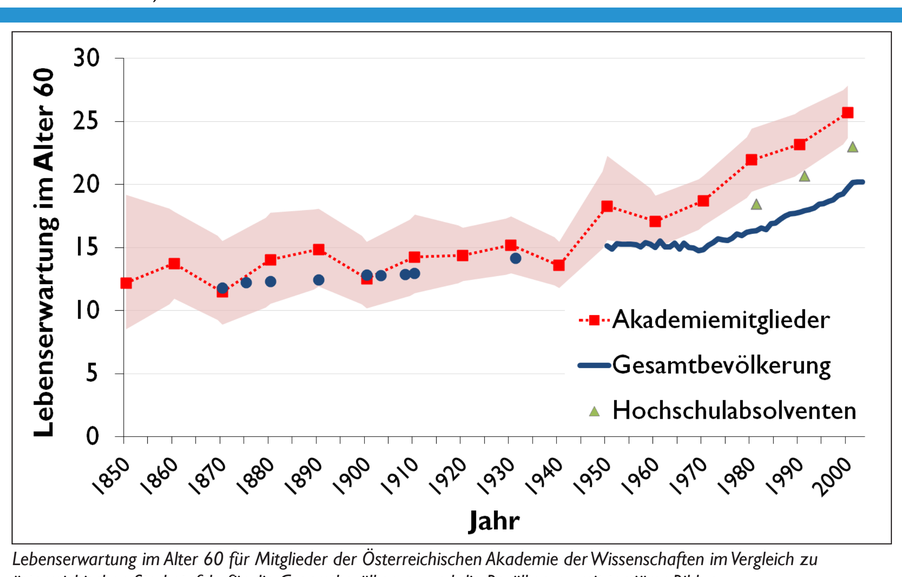
Zusammenhang Renteneintritt und Gesundheitsausgaben bei Moral Hazard

- Renteneintritt in Abhängigkeit von Gesundheitszustand (Lebenserwartung und Arbeitsleid-/produktivität)
- Anreize in Gesundheit zu investieren in Abhängigkeit des Renteneintritts
- Fehlanreize durch Moral Hazard: Individuen berücksichtigen nicht die (negative) Wirkung der Lebenserwartung auf das Konsumniveau
- Exzessive Gesundheitsausgaben und zu später Renteneintritt

LANGLEBIGKEIT VON GELEHRTEN

Dr. Maria Winkler-Dworak

- Bevölkerungsgruppen mit besonders guten Gesundheitsprofilen geben Hinweise, wie sich die Lebenserwartung in einem Land zukünftig entwickeln könnte.
- Mitglieder einer Gelehrtengesellschaft weisen eine deutlich niedrigere Sterblichkeit auf als die Gesamtbevölkerung und sogar als Hochschulabsolventen.
- Ein Grund könnte die bei Gelehrten besonders ausgeprägte geistige Aktivität im hohen Alter sein.
- Internationale Vergleiche mit Daten weiterer europäischen Gelehrtengesellschaften (Royal Society, Russische Akademie der Wissenschaften, französische Académie des sciences, u.a.)

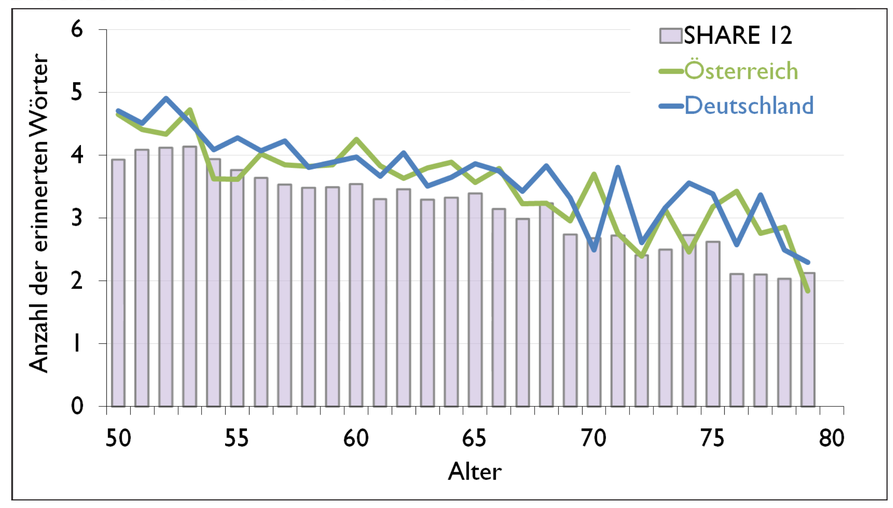


Lebenserwartung im Alter 60 für Mitglieder der Österreichischen Akademie der Wissenschaften im Vergleich zu österreichischen Sterbetafeln für die Gesamtbevölkerung und die Bevölkerung mit tertiärer Bildung.

KOGNITIVE FÄHIGKEITEN, MENTALE GESUNDHEIT

Dr. Vegard Skirbekk, Dr. Isabella Buber-Ennser, Prof. Alexia Fürnkranz-Prskawetz

Durchschnittliche Zahl der erinnerten Wörter



- Kognitive Fähigkeiten nach Alter, Geschlecht und Geburtskohorten
- Veränderte Bedeutung kognitiver Fähigkeiten auf dem Arbeitsmarkt
- Soziales Engagement als Einflussfaktor für kognitive Fähigkeiten im Alter
- Arbeiten zu intergenerationalen Transfers (z.B.: Kinderbetreuung durch Großeltern)
- Einflussfaktoren für Depressionen im Alter
- Auswertung des Alterspanels SHARE (Survey of Health, Ageing and Retirement in Europe) mit Mikrodaten für knapp 20 europäische Länder

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Vienna Institute of Demography
ÖAW Austrian Academy of Sciences

IIASA International Institute for Applied Systems Analysis
www.iiasa.ac.at

European Demographic **Data Sheet** 2012


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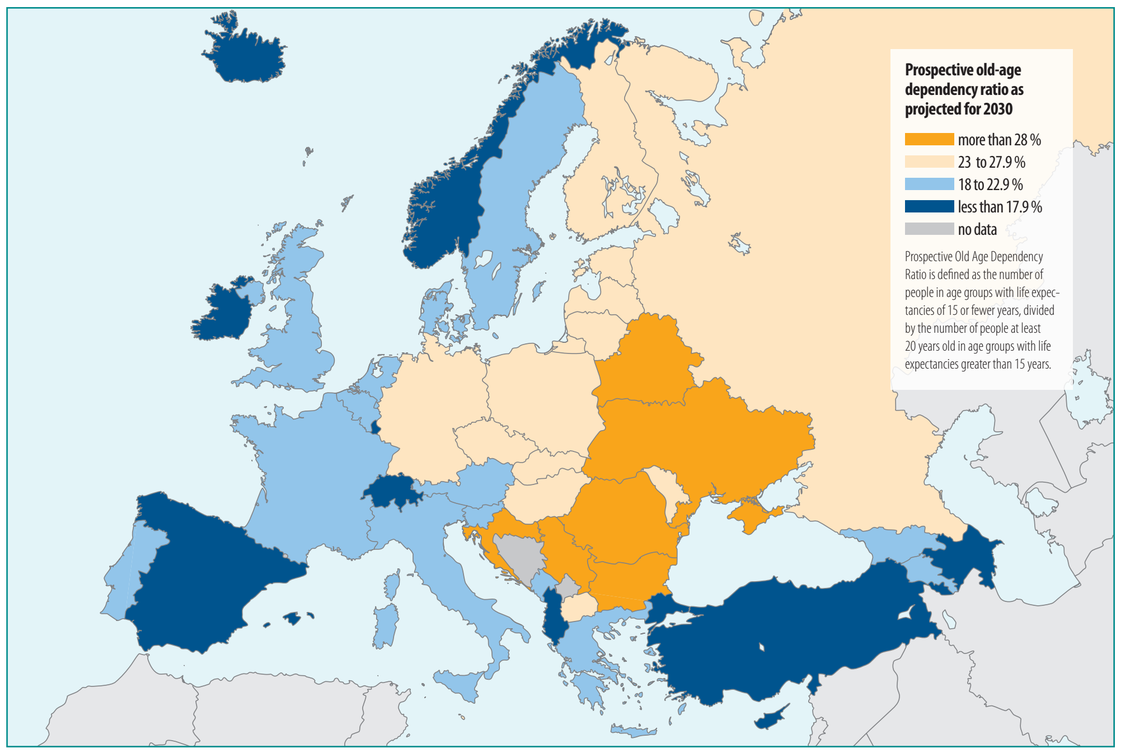


Re-evaluating **population ageing** in European countries

More information: www.populationeurope.org

Country	Population size on January 1st, 2011 (millions)	Projected population size, 2050 (millions)	Projected population size (zero migration), 2050 (millions)	Number of live births, 2010 (thousands)	Number of deaths, 2010 (thousands)	Average net migration 2004–2008 (thousands)	Net migration (estimates), 2010 (thousands)	Total fertility rate, 2010	Tempo and parity adjusted total fertility, 2008	Completed cohort fertility, women born 1970 (children per woman)	Mean age at first birth, 2010 (years)	Male life expectancy at birth, 2010 (years)	Female life expectancy at birth, 2010 (years)	Male life expectancy at age 65, 2010 (years)	Female life expectancy at age 65, 2010 (years)	Proportion of the population aged 65+, 2011 (%)	Proportion with a remaining life expectancy of 15 years or less, 2011 (%)	Projected proportion of the population aged 65+, 2050 (%)	Projected proportion with a remaining life expectancy of 15 years or less, 2050 (%)	Population median age, 2011 (years)	Projected population median age, 2050 (years)	Old-age dependency ratio 65+/20-64, 2011 (%)	Prospective old-age dependency ratio (see box), 2011 (%)	Projected old-age dependency ratio 65+/20-64, 2050 (%)	Projected prospective old-age dependency ratio (see box), 2050 (%)	Labour force participation rate (55-64 years), 2011 (%) F	Labour force participation rate (55-64 years), 2011 (%) M	Country
Albania	3.3	3.0	3.5	36.3	16.1	-7.7	*-5.5*	1.41	2.10*	2.6*	*23.4**	*72.9*	*77.8*	-	-	11.3	9.7	28.3	16.4	31.0	52.1	19.4	16.2	50.4	24.2	30.6	65.5	Albania
Andorra	0.1	-	-	0.8	0.2	1.9	0.3	1.22	1.57*	-	-	-	-	-	-	13.3	-	-	-	39.1	-	19.7	-	-	-	-	-	Andorra
Armenia	3.2	3.1	3.4	44.8	27.9	-6.9	-0.7	1.56	*1.63**	-	24.1	*70.5*	*76.7*	*13.3*	*16.0*	10.1	10.2	25.3	16.8	32.6	49.4	16.1	16.4	45.2	26.1	54.3	79.7	Armenia
Austria	8.4	9.7	7.8	78.7	77.2	39.4	27.4	1.44	1.67	1.62	28.2	77.9	83.5	17.9	21.4	17.6	11.5	30.2	16.6	42.0	48.3	28.5	17.0	58.1	25.4	33.7	52.6	Austria
Azerbaijan	9.1	11.2	11.1	165.6	53.6	33.0	1.4	1.92	1.84*	-	24.4	71.2	76.0	14.1	16.0	5.8	5.9	21.1	13.8	29.1	43.7	9.3	9.5	36.2	21.0	56.3	62.3	Azerbaijan
Belarus	9.5	7.3	7.8	108.1	137.1	4.5	10.3	1.49	1.68	1.66	24.6	64.6	76.5	11.7	16.7	13.8	15.9	27.6	20.8	39.0	49.4	21.2	25.2	50.4	33.9	29.7	54.4	Belarus
Belgium	11.0	13.5	10.9	127.0	104.5	51.5	89.3	*1.84*	*1.93**	1.82	*27.8*	77.6	83.0	17.6	21.3	17.2	12.2	27.3	14.8	41.0	45.5	28.7	18.9	52.2	22.8	33.0	47.8	Belgium
Bosnia & Herzegovina	3.8	-	-	33.5	35.1	0.9	0.7	-	-	-	25.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15.6	44.8	Bosnia & Herzegovina
Bulgaria	7.5	5.7	5.9	75.5	110.2	*-1.1*	-24.2	1.48	1.64	1.68	25.6	70.3	77.4	13.6	17.0	17.7	17.4	29.9	21.7	41.6	49.2	28.0	27.4	57.1	35.9	42.4	55.3	Bulgaria
Croatia	4.4	3.5	3.8	43.4	52.1	8.0	-4.9	1.47	1.75*	-	27.5	73.5	79.9	14.6	18.2	17.2	15.4	33.4	21.1	41.5	53.0	27.7	24.2	65.9	33.5	29.2	53.3	Croatia
Cyprus	0.8	1.2	0.9	10.0	5.4	10.0	-3.3	*1.51*	1.73*	2.24	28.5	*78.6*	*83.6*	*18.1*	*20.9*	13.4	8.6	23.6	12.4	36.8	40.1	21.2	12.7	44.2	19.2	43.1	73.6	Cyprus
Czech Republic	10.5	10.9	9.5	117.2	106.8	49.1	15.6	1.49	1.81	1.88	27.6	74.5	80.9	15.5	19.0	15.5	12.3	29.5	17.3	39.6	47.8	24.1	18.1	57.0	27.1	39.4	62.6	Czech Republic
Denmark	5.6	6.5	5.9	63.4	54.4	13.5	16.8	1.87	1.98*	1.97	-	77.2	81.4	17.0	19.7	16.8	11.5	26.5	14.4	40.6	44.6	28.5	17.9	51.3	22.6	58.0	68.3	Denmark
Estonia	1.3	1.3	1.3	15.8	15.8	0.1	0.0	1.63	1.93	1.87	26.3	70.6	80.8	14.2	19.4	17.0	14.4	29.0	16.7	39.7	48.2	27.4	22.3	55.4	25.9	62.9	67.1	Estonia
Finland	5.4	6.1	5.5	61.0	50.9	11.1	13.8	1.87	1.91	1.88	28.3	76.9	83.5	17.5	21.5	17.5	11.7	27.7	14.9	42.1	45.2	29.3	17.8	54.5	23.5	60.4	61.4	Finland
France	63.1	73.4	69.3	797.0	535.0	129.1	75.0	2.00	2.12*	2.00	*28.0**	78.3	85.3	18.9	23.4	16.9	10.8	28.6	14.5	40.2	45.9	28.8	16.6	56.5	22.6	41.8	47.1	France
Georgia	4.5	4.5	4.5	62.6	47.9	7.7	18.1	1.87	1.89*	-	24.5	70.0	78.8	14.5	18.3	13.8	13.0	25.4	16.1	36.7	46.0	22.2	20.7	46.3	25.1	66.8	84.1	Georgia
Germany	81.8	77.4	70.0	677.9	858.8	36.2	130.2	1.39	1.68*	1.50	28.8	78.0	83.0	17.8	20.9	20.6	14.5	33.5	19.8	44.6	51.4	33.8	21.6	67.7	31.3	56.7	71.7	Germany
Greece	11.3	12.1	10.2	114.8	109.1	39.5	-0.9	1.50	1.66*	1.60	28.9	78.4	82.8	18.5	20.4	19.3	13.9	33.0	16.8	42.2	50.4	31.4	20.8	67.3	25.8	29.7	57.3	Greece
Hungary	10.0	9.3	8.2	90.3	130.5	17.6	11.5	1.25	1.66	1.86	27.7	70.7	78.6	14.1	18.2	16.7	15.0	29.8	18.5	40.1	50.2	26.6	23.2	55.9	28.6	35.2	44.0	Hungary
Iceland	0.3	0.4	0.4	4.9	2.0	3.2	-2.1	2.20	2.41*	2.29	26.9	79.8	84.1	18.3	21.5	12.3	7.8	24.9	12.4	35.0	43.3	20.7	12.2	47.3	19.2	79.1	88.3	Iceland
Ireland	4.5	6.6	5.7	73.7	27.1	45.4	-33.6	2.07	2.10	2.11	28.9	78.7	83.2	18.1	21.1	11.6	7.4	26.5	11.3	34.7	43.2	19.2	11.5	51.8	17.1	45.6	65.0	Ireland
Italy	60.6	69.3	53.4	561.9	587.5	432.5	311.7	1.40	1.51*	1.46	-	*79.4*	*84.6*	*18.3*	*22.1*	20.3	13.9	33.7	17.9	43.5	51.3	33.3	20.6	67.9	27.4	28.9	50.7	Italy
Kosovo	*2.2*	-	-	34.5	7.0	5.1	-	*2.0**	-	3.0*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Kosovo
Latvia	2.2	1.8	1.8	19.2	30.0	-1.5	-7.9	1.17	1.70	1.73	26.0	68.6	78.4	13.3	18.2	17.4	16.2	30.2	19.7	40.4	52.0	27.5	25.3	56.2	30.7	57.2	63.0	Latvia
Liechtenstein	0.04	-	-	0.3	0.2	0.1	0.2	1.40	1.57*	-	-	79.5	84.3	19.6	21.8	13.9	-	-	-	40.2	-	21.6	-	-	-	-	-	Liechtenstein
Lithuania	3.2	2.7	2.8	35.6	42.1	-7.2	-77.9	1.55	1.84	1.74	26.6	68.0	78.9	13.5	18.4	16.5	14.9	25.3	18.3	40.0	46.4	26.8	23.6	45.8	29.4	53.4	64.8	Lithuania
Luxembourg	0.5	0.8	0.5	5.9	3.8	5.9	7.7	1.63	2.05*	1.87	-	77.9	83.5	17.3	21.6	13.9	9.7	27.0	14.0	39.0	46.0	22.2	14.5	51.3	21.3	32.1	48.4	Luxembourg
Macedonia, FYR	2.1	2.0	2.0	24.3	19.1	-0.4	-0.6	1.55	1.72*	2.23	26.0	72.9	77.2	13.9	16.0	11.7	11.8	27.5	18.7	36.1	49.3	18.5	18.5	50.1	29.4	31.7	67.7	Macedonia, FYR
Malta	0.4	0.4	0.4	4.0	3.0	2.0	2.2	1.38	1.60*	-	27.4	79.2	83.6	18.4	21.1	15.5	9.7	35.9	17.4	39.5	55.3	24.7	14.1	73.0	25.9	14.2	51.5	Malta
Moldova	3.6	2.9	3.1	40.5	43.6	-3.2	-0.1	1.30	1.49*	-	24.1	64.9	73.5	11.9	14.8	10.0	12.3	24.0	19.3	34.2	49.5	15.2	19.4	40.7	30.3	35.1	53.7	Moldova
Monaco	0.04	-	-	1.0	0.5	-0.04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Monaco
Montenegro	0.6	0.6	0.6	7.4	5.6	-0.1	0.0	1.69	1.78*	-	26.3	73.5	78.4	15.0	17.1	12.7	11.5	26.5	16.5	36.5	47.6	20.7	18.5	48.2	25.3	-	-	Montenegro
Netherlands	16.7	17.8	17.0	184.4	136.1	-5.7	32.5	1.79	1.83	1.75	29.2	78.9	83.0	17.7	21.0	15.6	10.3	29.9	17.1	41.0	48.0	25.6	15.6	59.0	27.0	48.4	68.6	Netherlands
Norway	4.9	6.6	5.6	61.4	41.5	27.6	42.2	1.95	2.08*	2.07	28.0	79.0	83.3	18.0	21.2	15.1	9.8	26.3	13.3	38.7	44.3	25.3	15.1	50.8	20.7	66.9	73.9	Norway
Poland	38.2	34.8	34.1	413.3	378.5	-18.7	-2.1	1.38	1.60*	1.81	26.4	72.1	80.7	15.1	19.5	13.6	11.2	31.0	17.5	38.0	51.7	20.9	16.6	58.6	26.5	29.1	51.6	Poland
Portugal	10.6	11.3	9.6	101.4	106.0	28.1	3.8	1.36	1.61	1.67	28.1	76.7	82.8	17.1	20.6	18.2	13.2	33.2	17.4	41.1	50.8	29.5	19.8	66.7	26.5	46.5	61.6	Portugal
Romania	21.4	17.9	17.9	212.2	259.7	-4.4	-0.8	1.32	1.46*	1.67	*25.2*	*69.8*	*77.4*	*14.0*	*17.2*	15.0	14.3	28.5	20.3	39.2	53.9	23.6	22.2	48.8	30.4	32.7	51.6	Romania
Russia	141.9	129.2	116.3	1788.9	2028.5	178.9	191.3	1.54	1.66	1.60	*24.6*	*62.8*	*74.7*	*12.0*	*16.5*	12.6	14.7	23.5	18.0	37.9	44.5	18.9	22.7	41.6	29.0	38.2	58.5	Russia
San Marino	*0.03*	-	-	0.3	0.2	0.3	*-0.9*	1.38	-	-	29.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	San Marino
Serbia	7.3	5.9	5.9	68.3	103.2	5.1	4.4	1.40	1.76*	-	26.9	71.8	77.0	14.0	16.2	16.8	17.1	29.1	20.0	41.5	49.6	26.9	27.5	54.4	32.0	27.8	53.7	Serbia
Slovakia	5.4	5.2	4.8	60.4	53.4	4.8	3.4	1.40	1.70	1.93	27.0	71.7	79.3	14.0	18.0	12.4	11.4	29.2	19.5	37.2	50.5	18.8	17.0	54.0	30.6	34.7	58.9	Slovakia
Slovenia	2.1	2.2	1.9	22.3	18.6	9.5	-0.5	1.57	1.71	1.71	28.4	76.4	83.1	16.8	21.0	16.5	12.0	32.6	17.5	41.7	50.3	25.7	17.5	66.0	27.1	23.7	42.7	Slovenia
Spain	46.2	56.0	43.5	485.6	381.4	593.8	59.8	1.39	1.54	1.47	29.8	79.1	85.3	18.6	22.7	17.1	11.1	30.7	15.7	40.3	46.0	27.0	16.0	61.6	24.2	41.7	63.7	Spain
Sweden	9.4	11.7	10.1	115.6	90.5	42.5	49.7	1.99	1.97	2.00	28.9	79.6	83.6	18.3	21.2	18.5	11.7	26.0	13.5	40.8	43.7	31.6	18.0	49.9	21.1	71.8	79.9	Sweden
Switzerland	7.9	9.8	7.6	80.3	62.6	54.2	60.6	1.51	1.69	1.64	30.0	80.2	84.8	19.0	22.4	17.0	10.3	31.3	15.9	41.7	49.8	27.4	14.9	61.7	24.2	62.1	81.7	Switzerland
Turkey	73.7	97.3	95.0	1239.0	459.0	42.8	381.7	2.04	2.31*	2.9*	*22.3**	*73.3*	*78.8*	*15.2*	*18.4*	7.2	5.9	22.1	12.5	29.3	43.3	12.3	9.9	38.7	18.8	18.1	48.1	Turkey
Ukraine	45.6	33.5	36.0	497.7	698.2	8.6	16.1	1.43	1.60*	1.55	24.4	65.2	75.3	12.2	16.1	15.3	17.0	28.8	22.1	39.4	50.7	23.6	27.0	53.4	36.3	33.8	52.6	Ukraine
United Kingdom	62.4	79.5	68.3	807.3	561.7	207.3	163.1	1.98	2.12*	1.90	27.8	78.7	82.6	18.3	20.9	16.6	11.1	24.9	13.6	39.7	42.6	27.8	17.0	47.1	21.3	51.3	68.5	United Kingdom
EU-27	**500.5**	**545.1**	**477.0**	**5331.6**	**4837.8**	**1730.9**	**862.2**	**1.59**	**1.77**	**1.71**	**28.0**	***76.7***	***82.6***	***17.3***	***20.9***	**17.5**	**12.4**	**30.0**	**16.6**	**41.3**	**48.0**	**28.6**	**18.7**	**58.7**	**25.7**	**42.8**	**59.5**	**EU-27**
United States	310.5	439.0	322.9	*4000.3*	*2465.9*	933.9	*703.8*	1.93	*2.14**	2.12	*25.7*	*75.4*	*80.4*	*17.2*	*19.9*	13.2	-	20.2	-	36.3	38.0	22.0	-	37.3	-	59.5	69.3	United States
Japan	127.8	97.1	-	1071.3	1197.0	19.4	-23.3	1.39	1.47	1.46	29.3	79.6	86.4	18.9	23.9	23.3	-	38.8	-	44.3	56.0	39.5	-	81.1	-	53.7	83.3	Japan

Note: Numbers in italics refer to years different from the one in the column heading. Asterisks indicate different calculation methods applied by the Wittgenstein Centre. Apart from US and Japan, population projections were calculated by the Wittgenstein Centre. EU-27 total population excludes French overseas departments. Some indicators for the EU-27 are computed as weighted averages. For further information about projection assumptions, data sources, country-specific definitions and notes see www.populationeurope.org.

Re-measuring **ageing in Europe**

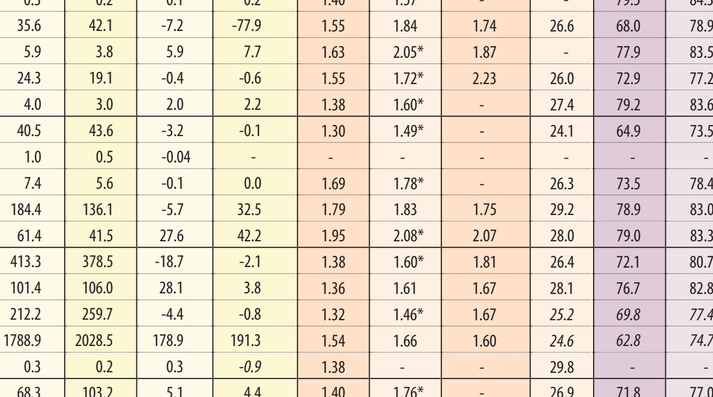
Ageing is considered one of the major problems most European countries will face in the near future. There are serious concerns about the challenges an ever more elderly population poses to current economic and social arrangements. Although the interest in population ageing has grown, the concepts used for analysing it have remained unchanged. For example, the old age dependency ratio is still often used as an indicator of the elderlies' financial burden on the working population. The conventional old-age dependency ratio (OADR) is defined as the ratio of the number of people aged 65 or older to the number of people aged 20 to 64:

$$\text{OADR} = \frac{\text{Number of people aged 65 years or older}}{\text{Number of people aged 20 to 64}}$$

In the OADR, the threshold of old age is set at 65. Other versions use the share of people aged 60 or older in the numerator or decrease the lower age bound in the denominator to 15. Sometimes the ratio is multiplied by 100.

The map in this box shows the OADR for European countries as projected for 2030. Two distinct groups of countries clearly stand out: western Europe, where most countries have a relatively high OADR, and eastern Europe, where the OADR is considerably lower.

Using the OADR as an indicator of ageing for comparative purposes over a long time span entails a conceptual problem, because the OADR is based on the assumption that persons aged 65 at present are functionally the same as their 65-year old peers in the past and in the future. However, people aged 65 nowadays are not in the same stage of their life cycle as people at age 65 several decades ago. As they are typically healthier and can expect to live many more years, their social and economic behaviour is different. Hence, both the biological and social dimensions of age are not only a function of the time people have lived since birth but also of the time they expect to live until their death. For this reason, the traditional definition of old age and traditional measures of population ageing such as the OADR have to be complemented by measures that also take into account the changing life expectancy.



The map in the upper right corner of this Data Sheet depicts European ageing calculated by a new measure recently developed at the VID and IIASA: the prospective old-age dependency ratio. In the POADR, the threshold of being old is not fixed but linked to life expectancy. People are considered old when the average remaining life expectancy in their age group is less than 15 years.

$$\text{POADR} = \frac{\text{Number of people older than the old-age threshold}}{\text{Number of people aged 20 to the old-age threshold}}$$

This new measure yields a picture of European ageing that is diametrically opposed to the one shown in the map in this box. Because life expectancy is lower in eastern Europe, the populations of these countries will be much older in 2030 than those in western Europe! This example shows that disregarding differences in the characteristics of people over space and time generates misleading measures of ageing that can lead to inappropriate policies.

Further reading:

Sanderson, W. and S. Scherbov 2005. Average remaining lifetimes can increase as human populations age. *Nature* 435: 811-813.

Sanderson, W. and S. Scherbov 2008. Conventional and prospective measures of population aging, 1995, 2005, 2025, and 2045. Population Reference Bureau, http://www.prb.org/excel08/age-aging_table.xls.

Lutz, W., W. Sanderson and S. Scherbov 2008. The coming acceleration of global population ageing. *Nature* 451: 716-719.

Sanderson, W. and S. Scherbov 2010. Remeasuring aging. *Science* 329: 1287-1288.

Tempo effect and **adjusted total fertility**

The period level of fertility is usually measured by the total fertility rate (TFR), which reflects the interplay of two components: tempo (timing) and quantum (level) of fertility. Changes in the age at which women give birth affect the TFR. In many European countries, women have put off births until higher ages for several decades. The postponement of childbearing lowers the number of births in a given period and thus depresses the TFR even if the number of children women have over their entire life course does not change. This tempo effect can also be envisaged as an expansion of the interval between generations that leads to fewer births per calendar year. In addition, the TFR is also affected by changes in the parity composition (i.e. the number of children ever born) of women of reproductive ages.

Alternative indicators were proposed to obtain a measure of the level of fertility that is undistorted by the tempo effect and hence more suitable than the TFR for calculating the average number of children per woman in a given year. Ever since its first publication, the *European Demographic Data Sheet* has used the *tempo-adjusted TFR* (adjTFR), an indicator proposed by Bongaarts and Feeney (1998) that is based on fertility data by birth order. The current Data Sheet utilises *tempo and parity-adjusted total fertility* (TFRp*), a more recent Bongaarts and Feeney (2006) indicator (for details see Bongaarts and Sobotka 2012). The TFRp* offers several improvements over the previous measure. It takes into account the parity composition of women of reproductive age and thus controls for an additional source of distortion in the TFR. Moreover, it yields considerably more stable results than the adjTFR, which had to be smoothed in previous Data Sheets. The TFRp* does not require such adjustments. However, the limited availability of detailed data hampers its utilisation. Wherever possible, we show the results for the TFRp* for 2008, which could be calculated for 18 European countries and Japan. Note that the TFRp* level cannot be directly compared with the adjTFR level reported in earlier Data Sheets. For the countries lacking the required data, the current Data Sheet features the adjTFR or its estimate, averaged over the 3-year period of 2007-2009 (data marked by asterisk), which is directly comparable to the adjTFR published in the previous editions.

Figures 1-3 illustrate trends in the conventional TFR and its alternatives in three European countries exhibiting different fertility patterns. The graphs also show the difference between the adjTFR and the new indicator. The values are mostly similar, but the adjTFR clearly suffers from considerable year-to-year instability. The graphs also depict the long-term course of fertility postponement as measured by the rise in the mean age at first birth.

In the Czech Republic, the shift to later childbearing was particularly vigorous after 1990. The TFR fell sharply to 1.13 in 1999, whereas the TFRp* declined gradually, reaching levels around 1.8 since the late 1990s. This shows how much the TFR can be depressed when women postpone childbearing to later ages. Between 2000 and 2008, the TFR recovered to 1.5, closing much of the 'gap' between it and the TFRp*.

In Austria, the postponement of childbearing started earlier but progressed more gradually. The TFR and the TFRp* have been relatively stable since the mid-1980s, hovering around 1.4 and 1.6-1.7, respectively.

Spain shows yet another pattern: conventional and adjusted total fertility both fell considerably in the 1980s and 1990s. The decline in the period TFR bottomed out at 1.15 in 1998 and modestly recovered until 2008, whereas the TFRp* continued to decline until 2006 and briefly converged with the TFR level before rising sharply in the subsequent two years. Most recently, fertility trends have been affected by the economic recession, which is discussed on the reverse side of this Data Sheet.

References:

Bongaarts, J. and G. Feeney 1998. On the quantum and tempo of fertility. *Population and Development Review* 24(2): 271-291.

Bongaarts, J. and T. Sobotka 2012. A demographic explanation for the recent rise in European fertility. *Population and Development Review* 38(1): 83-120.

Bongaarts, J. and G. Feeney 2006. The quantum and tempo of life cycle events. *Vienna Yearbook of Population Research* 2006 (vol. 4): 115-151.

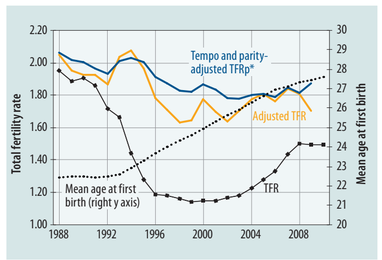


Figure1: Fertility trends in the Czech Republic, 1988-2010

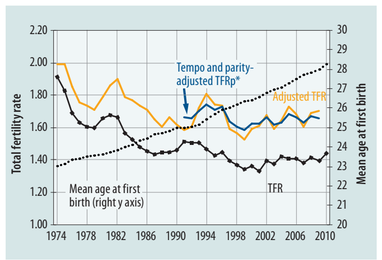


Figure 2: Fertility trends in Austria, 1974-2010

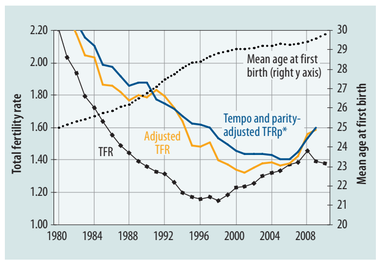


Figure 3: Fertility trends in Spain, 1980-2010

Regional overview

POPULATION CHANGE

Region	Population size on January 1st, 2011 (millions)	Projected population size, 2050 (millions)	Annual rate of population change, 2004-2008 (per 1000)	Projected annual rate of population change, 2011-2050 (per 1000)
Southern Europe	130.0	150.3	6.6	3.9
Western Europe	158.2	191.6	5.0	5.3
German-speaking countries	98.0	97.0	-0.4	-0.3
Nordic countries	25.6	31.3	5.9	5.6
Central-Eastern Europe	77.4	71.7	0.4	-1.8
South-Eastern Europe	42.1	35.1	-1.8	-4.1
Eastern Europe	200.5	172.9	-2.1	-3.4
Caucasus	16.8	18.8	7.8	2.9
EU-27	**500.5**	**545.1**	**3.2**	**2.2**
EU-15	397.4	451.8	4.1	3.4
EU-12 (new members)	103.1	93.3	-0.2	-2.4

POPULATION AGEING

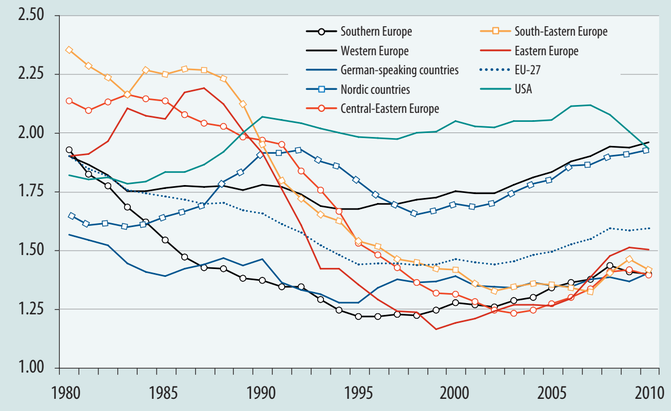
Region	Proportion of the population aged 65+, 2011 (%)	Projected proportion of the population aged 65+, 2050 (%)	Old-age dependency ratio 65+/20-64, 2011 (%)	Projected old-age dependency ratio 65+/20-64, 2050 (%)
Southern Europe	18.8	32.4	30.5	65.2
Western Europe	16.5	27.0	27.8	52.3
German-speaking countries	20.1	32.9	32.8	66.1
Nordic countries	17.2	26.5	29.1	51.2
Central-Eastern Europe	14.7	30.4	23.0	57.7
South-Eastern Europe	15.3	28.7	24.3	51.3
Eastern Europe	13.2	24.7	20.0	44.2
Caucasus	8.8	22.8	14.0	40.1
EU-27	**17.5**	**29.9**	**28.7**	**58.7**
EU-15	18.2	30.0	30.1	59.3
EU-12 (new members)	14.9	29.8	23.3	55.5

FERTILITY INDICATORS

Region	Total fertility rate, 2010	Tempo-parity adjusted TFR, 2008	Mean age at first birth, 2010	Completed cohort fertility rate, women born 1970
Southern Europe	1.40	1.54	29.4	1.50
Western Europe	1.96	2.08	28.1	1.92
German-speaking countries	1.40	1.68	28.8	1.52
Nordic countries	1.93	1.98	28.5	1.98
Central-Eastern Europe	1.40	1.67	26.9	1.83
South-Eastern Europe	1.42	1.61	25.5	1.87
Eastern Europe	1.51	1.65	24.5	1.59
Caucasus	1.84	1.81	24.4	-
EU-27	**1.59**	**1.77**	**28.0**	**1.71**
EU-15	1.65	1.81	28.6	1.69
EU-12 (new members)	1.38	1.62	26.4	1.79

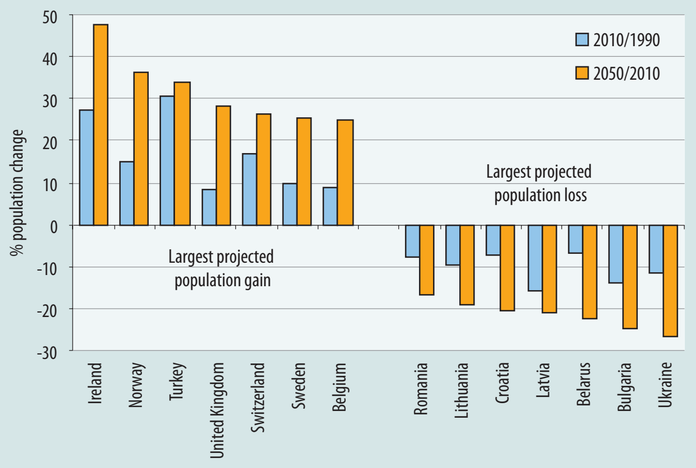
Total fertility rate in selected regions of Europe and in the USA

Total fertility rate, 1980–2010



Population change in selected countries of Europe

Population change in selected countries of Europe, 1990–2050



Note: Countries with population below 1 million, Caucasus countries, Kosovo and Bosnia & Herzegovina were excluded.

Country rankings

POPULATION SIZE

Rank	Population size on January 1st, 2011 (millions)		Projected population size, 2050 (millions)		Rank
	EU-27	**500.5**	**EU-27**	**545.1**	
	USA	*310.5*	*USA*	*439.0*	
1	Russia	141.9	Russia	129.2	1
	Japan	*127.8*	Turkey	97.3	2
2	Germany	81.8	*Japan*	*97.1*	
3	Turkey	73.7	United Kingdom	79.5	3
4	France	63.1	Germany	77.4	4
5	United Kingdom	62.4	France	73.4	5
6	Italy	60.6	Italy	69.3	6
7	Ukraine	46.2	Spain	56.0	7
8	Spain	45.6	Poland	34.8	8
9	Poland	38.2	Ukraine	33.5	9
10	Romania	21.4	Romania	17.9	10

TOTAL FERTILITY RATE 2010

Rank	Total fertility rate, 2010		Adjusted TFRp*, 2008
1	Ireland	2.07	2.10
2	Turkey	2.04	2.31
3	France	2.00	2.12
4	Sweden	1.99	1.97
5	United Kingdom	1.98	2.12
	EU-27	**1.59**	**1.77**
34	Portugal	1.36	1.61
35	Romania	1.32	1.46
36	Moldova	1.30	1.49
37	Hungary	1.25	1.66
38	Latvia	1.17	1.70

MEAN AGE OF MOTHER AT FIRST BIRTH

Rank	Mean age of mother at first birth, 2010 (years)	
1	Switzerland	30.0
2	Spain	29.9
	Japan	*29.3*
3	Netherlands	29.2
4-5	Greece	28.9
4-5	Sweden	28.9
	EU-27	**28.0**
32	Belarus	24.6
33	Ukraine	24.4
34	Moldova	24.1
35	Albania	23.4
36	Turkey	22.3

NET MIGRATION

Rank	Net migration, 2010 (thousands)	
	EU-27	**862.2**
	USA	*703.8*
1	Turkey	381.7
2	Italy	311.7
3	Russia	191.3
4	United Kingdom	163.1
5	Germany	130.2
35	Albania	-5.5
36	Latvia	-7.9
	Japan	*-23.3*
37	Bulgaria	-24.2
38	Ireland	-33.6
39	Lithuania	-77.9

LIFE EXPECTANCY AT BIRTH, MEN

Rank	Male life expectancy at birth, 2010 (years)	
1	Switzerland	80.2
2	Sweden	79.6
	Japan	*79.6*
3	Italy	79.4
4	Spain	79.1
5	Norway	79.0
	EU-27	**76.7**
34	Lithuania	68.0
35	Ukraine	65.2
36	Moldova	64.9
37	Belarus	64.6
38	Russia	62.8

LIFE EXPECTANCY AT BIRTH, WOMEN

Rank	Female life expectancy at birth, 2010 (years)	
	Japan	*86.4*
1-2	France	85.3
1-2	Spain	85.3
3	Switzerland	84.8
4	Italy	84.6
5	Cyprus	83.6
	EU-27	**82.6**
34	Serbia	77.0
35	Belarus	76.5
36	Ukraine	75.3
37	Russia	74.7
38	Moldova	73.5

DIFFERENCE IN MALE AND FEMALE LIFE EXPECTANCY

Rank	Difference in male and female life expectancy at birth, 2010 (years)	
1-2	Russia	11.9
1-2	Belarus	11.9
3	Lithuania	10.9
4	Estonia	10.2
5	Ukraine	10.1
	EU-27	**5.9**
34	Norway	4.3
35	Denmark	4.2
36	Netherlands	4.1
37	Sweden	4.0
38	United Kingdom	3.9

POPULATION MEDIAN AGE

Rank	Population median age, 2011 (years)		Rank	Projected population median age, 2050 (years)	
1	Germany	44.6		*Japan*	*56.0*
	Japan	*44.3*	*1*	Romania	53.9
2	Italy	43.5	2	Croatia	53.0
3	Greece	42.2	3	Albania	52.1
4	Finland	42.1	4	Latvia	52.0
5	Austria	42.0	5	Poland	51.7
	EU-27	**41.3**		**EU-27**	**48.0**
34	Macedonia. FYR	36.1	34	Sweden	43.7
35	Ireland	34.7	35	Turkey	43.3
36	Moldova	34.2	36	Ireland	43.2
37	Albania	31.0	37	United Kingdom	42.6
38	Turkey	29.3	38	Cyprus	40.1
				USA	*38.0*

OLD-AGE DEPENDENCY RATIO (65+/20–64)

Rank	Old-age dependecy ratio, 2011 (years)		Rank	Projected old-age dependecy ratio, 2050 (years)	
	Japan	*39.5*		*Japan*	*81.1*
1	Germany	33.8	1	Italy	67.9
2	Italy	33.3	2	Germany	67.7
3	Sweden	31.6	3	Greece	67.3
4	Greece	31.4	4	Portugal	66.7
5	Portugal	29.5	5	Slovenia	66.0
	EU-27	**28.6**		**EU-27**	**58.7**
34	Russia	18.9	34	Lithuania	45.8
35	Slovakia	18.8	35	Cyprus	44.2
36	Macedonia. FYR	18.5	36	Russia	41.6
37	Moldova	15.2	37	Moldova	40.7
38	Turkey	12.3	38	Turkey	38.7
				USA	*37.3*

PROSPECTIVE OLD-AGE DEPENDENCY RATIO (SEE BOX ON THE FRONT SIDE)

Rank	Prospective old-age dependecy ratio, 2011 (years)		Rank	Projected prospective old-age dependecy ratio, 2050 (years)	
1	Serbia	27.5	1	Ukraine	36.3
2	Bulgaria	27.4	2	Bulgaria	35.9
3	Ukraine	27.0	3	Belarus	33.9
4	Latvia	25.3	4	Croatia	33.5
5	Belarus	25.2	5	Serbia	32.0
	EU-27	**18.7**		**EU-27**	**25.7**
34	Switzerland	14.9	34	Sweden	21.1
35	Luxembourg	14.5	35	Norway	20.7
36	Cyprus	12.7	36	Cyprus	19.2
37	Ireland	11.5	37	Turkey	18.8
38	Turkey	9.9	38	Ireland	17.1

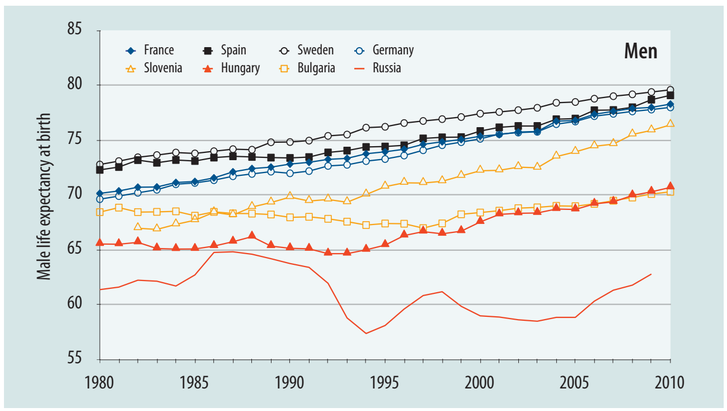
PROPORTION OF THE POPULATION THAT HAS A REMAINING LIFE EXPECTANCY OF 15 YEARS OR LESS

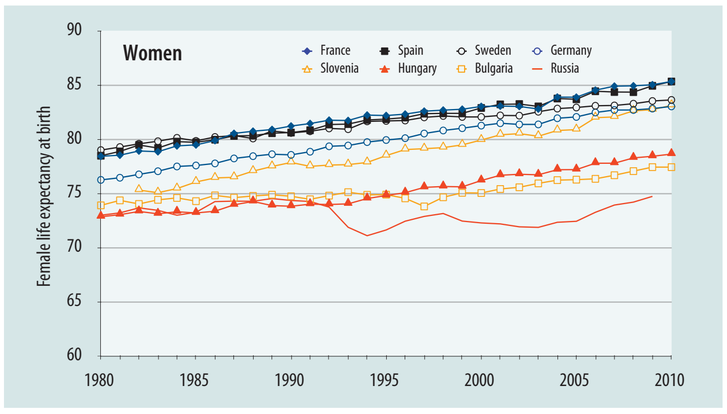
Rank	Proportion of the population with a remaining life expectancy of 15 years or less, 2011 (%)*		Population 65+, 2011 (%)	Rank	Projected proportion of the population with a remaining life expectancy of 15 years or less, 2050 (%)*		Projected population 65+, 2050 (%)
1	Bulgaria	17.4	17.7	1	Ukraine	22.1	28.8
2	Serbia	17.1	16.8	2	Bulgaria	21.7	29.9
3	Ukraine	17.0	15.3	3	Croatia	21.1	33.4
4	Latvia	16.2	17.4	4	Belarus	20.8	27.6
5	Belarus	15.9	13.8	5	Romania	20.3	28.5
34-35	Albania	9.7	11.3	34	Sweden	13.5	26.0
34-35	Luxembourg	9.7	13.9	35	Norway	13.3	26.3
36	Cyprus	8.6	13.4	36	Turkey	12.5	22.1
37	Ireland	7.4	11.6	37	Cyprus	12.4	23.6
38	Turkey	5.9	7.2	38	Ireland	11.3	26.5

* Ranked according to the % of the population with a remaining life expectancy of 15 years or less

Data for the USA and Japan are shown in italics and displayed only when their values fall between top five or bottom five European countries. Caucasus countries, countries with total population below 500 000 (Andorra, Iceland, Liechtenstein, Malta, Monaco and San Marino) and Kosovo are not ranked. The proportion of the population that has a remaining life expectancy of 15 years or less is calculated as follows: from a period life table we select all single-year age groups that have a remaining life expectancy of 15 or less years and calculate what proportion of the total population has ages that fall into this category.

Life expectancy at birth, selected European countries





Future life expectancy in developed countries

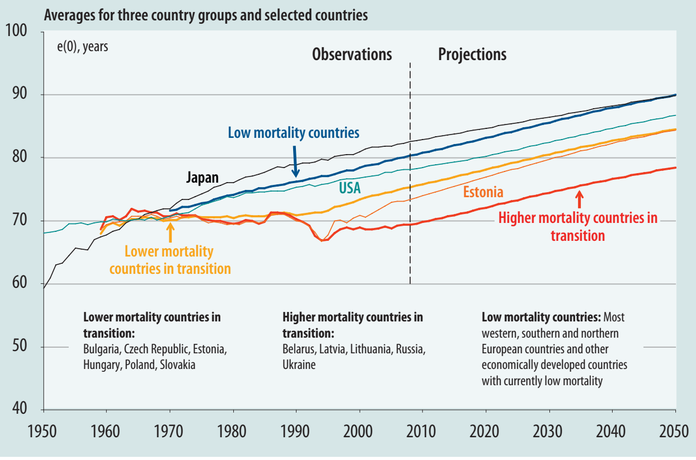
In recent times, the human lifespan has shown a stable growth of more than two years per decade in economically developed countries. Whether this development will also continue in the future is an issue debated between those who point to the lack of fundamental medical innovations extending the lifespan and those who argue that the discontinuity of this remarkably stable trend would be an (unfortunate) innovation in itself. The mortality projections used in this Data Sheet are based on a demographic trend often neglected in this discussion, namely that the currently younger cohorts are healthier than their older peers. When these young cohorts reach old age, their mortality rates may thus be lower than those of the currently old cohorts. In populations comprising a growing number of healthier cohorts, mortality will continue to decline. We call this *mortality inertia:* it implies the existence of a transitory period in the future, when age-specific mortality rates are likely to change if they change in the current period. We use these transient dynamics to forecast mortality. For low-mortality countries, we forecast the conventional period life expectancy at birth to be 90 years by 2050, which exceeds the UN forecast by about five years. The results obtained with our method are consistent with the previously reported linear trend in the conventional period life expectancy for low-mortality countries and in line with the assumptions used in previous editions of the Data Sheet.

Further reading:

Ediev, D. M. 2011. Life expectancy in developed countries is higher than conventionally estimated. Implications from improved measurement of human longevity. *Journal of Population Ageing* 4:5-32.

Ediev, D. M. 2012. A note on the compression of mortality. Paper presented at the annual meeting of the Population Association of America, San Francisco, 3-5 May 2012. http://paa2012.princeton.edu/download.aspx?submissionId=120026

Past trends and projected trajectories of period life expectancy at birth



Economic Recession and Recent Fertility Trends in Europe

The ongoing economic recession has left its imprint on demographic trends, particularly on migration, but also on fertility, union formation and, to a smaller extent, on health and mortality. The availability of detailed data for 2009-2010, along with first results for 2011, permits us to analyse the initial impact of the recent economic downturn on fertility.

Past evidence shows that economic recessions have a negative effect on fertility rates. However, most of these fertility declines were relatively small, time-limited and had little effect on cohort fertility. Recession-related decreases are often concentrated around younger reproductive ages, suggesting that they are typically driven by the postponement of childbearing rather than constituting a durable change in fertility patterns. Research based on individual data shows, however, that women and men react differently to economic recessions, as do people of different ages and with different numbers of children and different partnership and social statuses. Hence the observed aggregate change in fertility is a 'net effect' of these often contradictory individual responses.

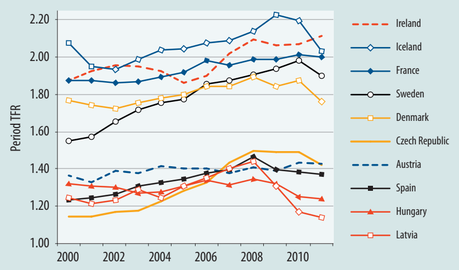


Figure 1: Period TFR in selected countries, 2000–2011

Note: 2011 data reported by national statistical offices and own estimates based on preliminary data by Eurostat (data for Hungary, Iceland, Ireland, Latvia, and Spain).

How do fertility trends unfold in the current recession? By and large, they are in line with past evidence. The economic downturn terminated the Europe-wide increase in period total fertility recorded in the early 21st century. After peaking in 2008, fertility rates stagnated or declined in many countries. In the European Union, the total fertility rate (TFR) rose from 1.44 to 1.59 between 2002 and 2008, but remained at the same level in the subsequent two years (see graph of Total fertility rate in selected regions of Europe and in the USA on this side of the Data Sheet). All EU countries except Germany exhibited an increase in their TFR in 2008, but only 11 out of 27 did so in 2009. Outside Europe, the United States experienced an early onset of the recession, with the TFR falling below 2 in 2010.

Yet more compelling evidence of the fertility trend reversal is furnished by 31 European countries that either reported data or for which we calculated estimates for 2011. Across these countries, the TFR peaked at 1.59 in 2008 and stabilised in 2009-10 before dropping below 1.55 in 2011. Preliminary data suggest that the TFR declined in as many as 25 out of these 31 countries in 2011, while the number of countries recording an increase in their TFR plummeted from 30 in 2008 to 14 in 2009 and 5 in 2011. These data also indicate that countries struck by a more severe recession in terms of declining GDP and rising unemployment rates in 2008-10 also faced more pronounced fertility reductions earlier than countries hit less hard.

These aggregate statistics mask great differences in country-specific trajectories. Only a few countries experienced sudden downturns in fertility in 2009-2010. Latvia stands out for its immediate 'shock-like' reaction to the very severe recession: its TFR plummeted to an estimated low of 1.16 in 2011. Fertility rates in Spain and Hungary also dropped rather early (Figure 1). The Czech Republic is an example for a more typical pattern of stagnating fertility in 2008-10, followed by a decline in 2011. In other countries such as Iceland and Sweden, the TFR continued to rise for one or two years after 2008 before it fell in 2011. A few countries, among them Austria and France, had relatively stable TFRs in 2008-11, while others such as Denmark showed an irregular pattern of decline. In contrast, Ireland recorded a continued increase in its TFR through 2011 despite its relatively severe economic recession. Surprisingly, all Nordic countries, known for their generous welfare and family policies, experienced fertility declines in 2011.

Figure 2 depicts the renewed trend towards delayed childbearing. A clear age gradient of fertility decline emerges after 2008. Following a slight rise in the pre-recession period, fertility rates dropped most among women below age 25. In contrast, the fertility of women in their late reproductive years continuously increased after 2008, albeit at a slower pace than in the previous period. This age gradient was particularly pronounced in the countries hit hardest by the economic downturn.

As the recession persists in parts of the European continent and government budgets are vigorously cut, fertility may decline even further in the coming years.

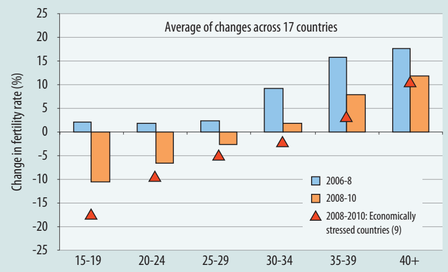


Figure 2: Average change in fertility rates by age prior to (2006–2008) and after (2008–10) the onset of economic recession (17 countries)

Note: Data for the following countries were used (asterisk denotes the „economically stressed"): Austria, Bulgaria, Czech Republic, Denmark*, Estonia*, Greece*, Hungary*, Ireland*, Latvia*, the Netherlands, Norway, Poland, Portugal*, Slovenia, Spain*, Sweden, Ukraine*.

Notes: EU-15 refers to the EU member states prior to 2004; EU-12 (new members) covers 12 countries accessing the EU in 2004 and 2007. Countries with total population below 100 000, Bosnia and Herzegovina and Kosovo are not included in regional overview tables. Countries with total population below 500 000, Bosnia and Herzegovina, Kosovo and Caucasus countries are not included in the ranking tables. Data for France exclude overseas departments. Data for Cyprus and Moldova refer to the government controlled area only. Definition of regions in the regional overview take into account geo-political criteria as well as similarity in demographic trends in countries they cover. Countries split into regions as follows: Southern Europe (Cyprus, Greece, Italy, Malta, Portugal); Western Europe (Belgium, France, Ireland, Luxembourg, the Netherlands, the United Kingdom); German-speaking countries (Austria, Germany, Switzerland); Nordic countries (Denmark, Finland, Iceland, Norway, Sweden); Central-Eastern Europe (Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia, Slovenia); South-Eastern Europe (Albania, Bulgaria, FYR Macedonia, Montenegro, Romania, Serbia); Eastern Europe (Belarus, Moldova, Russia, Ukraine); Caucasus (Armenia, Azerbaijan, Georgia).