



ACTUARIAL ASSOCIATION OF EUROPE

Demographic Projections

David Bogataj

Population projections

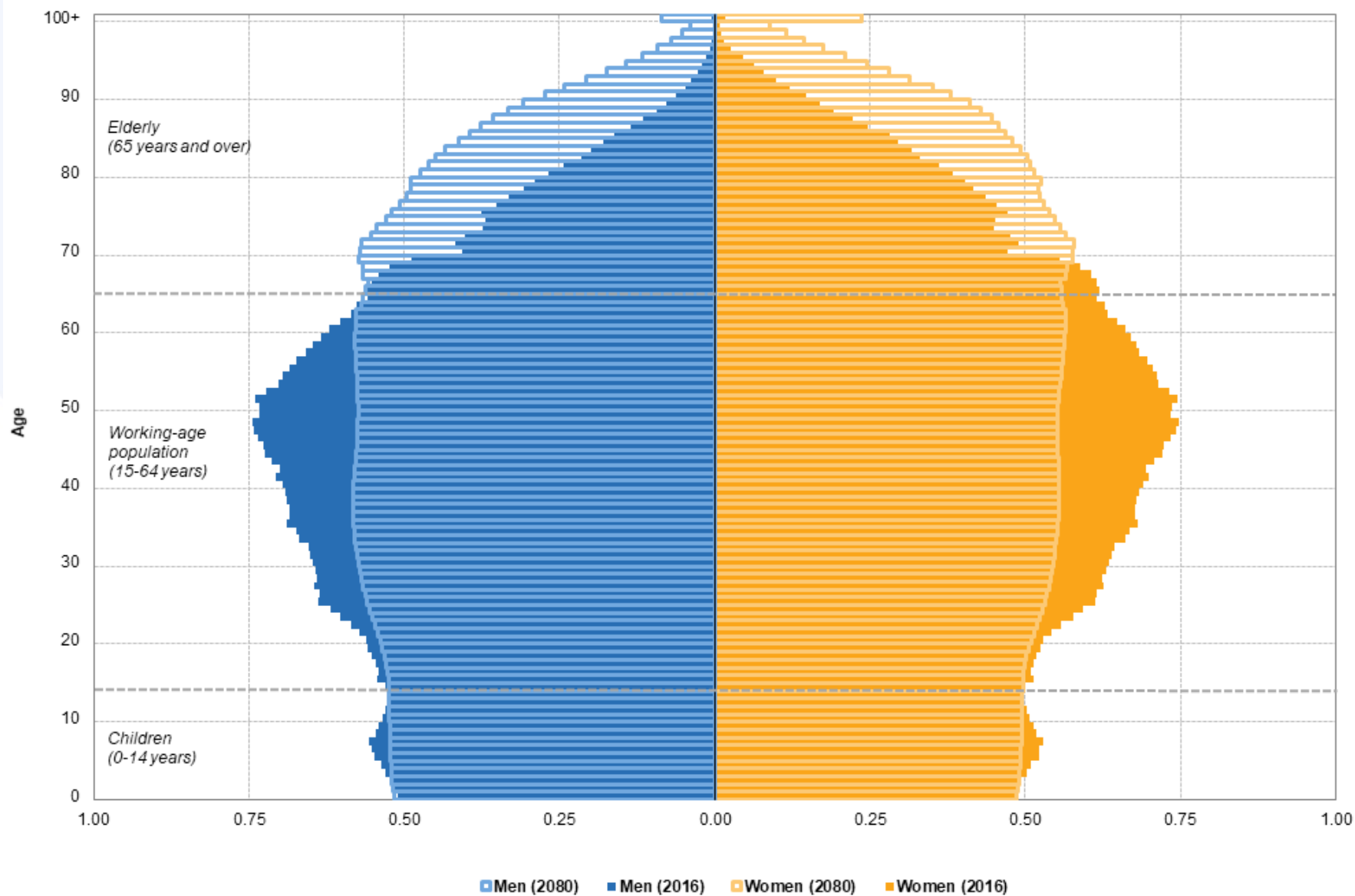
The population projections which are used as the basis for Ageing Report 2018 are the ESSPOP2015 projections prepared by Eurostat and published in February 2017

The latest population projections released by Eurostat, provide a main scenario and four variants for population developments from 2015 to 2080 across 29 European countries: all of the EU-28 Member States, as well as Norway. These projections were produced using data for 1 January 2015 as a starting point and therefore include any modifications made to demography statistics resulting from the 2011 population census exercise.

Member states with the largest populations in 2015 and 2080

<u>2015 (millions)</u>		<u>2080 (millions)</u>		<u>Increase 2015-2080</u>
Germany	81.2	France	78.7	+18.5%
France	66.4	Germany	77.8	-4.2%
UK	64.9	Italy	53.8	-11.5%
Italy	60.8	Spain	51.0	9.8%
Spain	46.4	Poland	29.0	-23.6%
Poland	38.0	Netherlands	19.7	16.7%
Romania	19.9	Romania	14.5	-26.9%
Total EU	508.4	Total EU	436.4	-14.2%

Source ESSPOP2015, Eurostat



Note: 2016, estimates. 2080: projections.

Source: Eurostat (online data codes: demo_pjan and proj_15npms)

Population projections

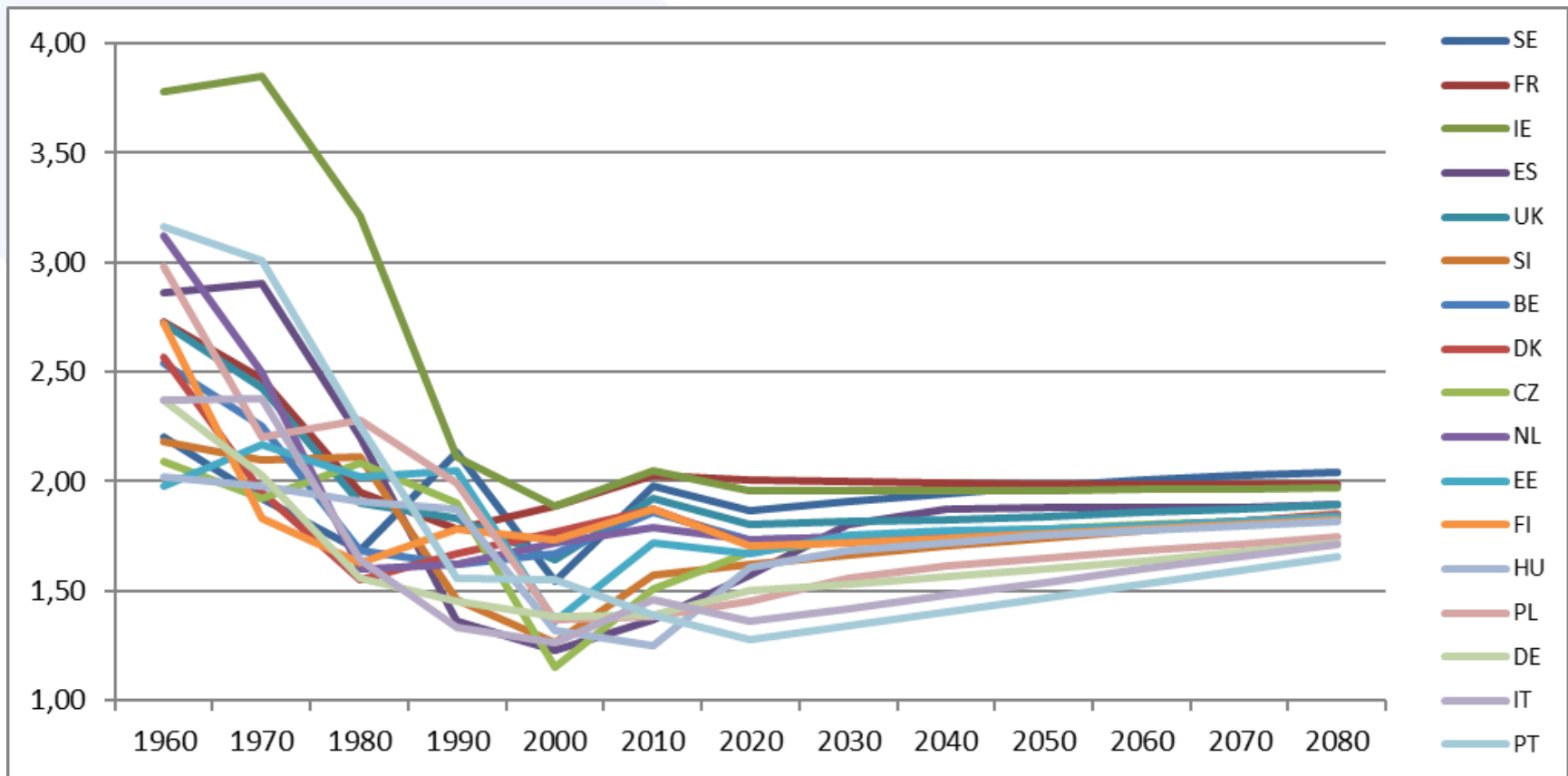
Eurostat's population projections result from the application of a set of assumptions on future developments for

- fertility,
- mortality and
- net migration.

The projections seek to blend short-term trends with long-term assumptions and reflect some quite strong assumptions about how the population of the EU will develop in the very long-term future.

Source: ESSPOP2015, Eurostat

Total fertility rates 1960-2080 for selection of EU member states:



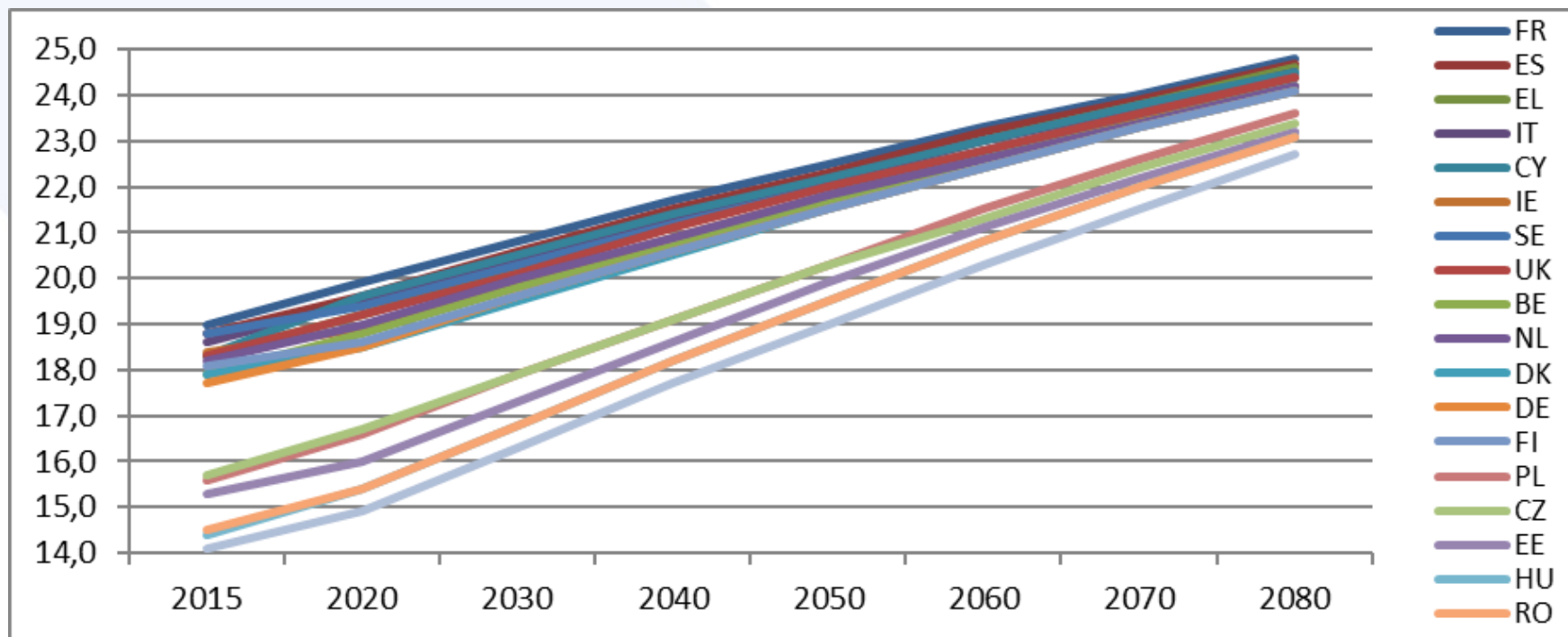
Source: ESSPOP2015, Eurostat

Projection of net migration flows, 2010 and 2020 to 2060

	Cumulative net migration 2001-2015	Cumulative net migration 2001-15 as % of 2016 popn	Projection of net migration flows (000s)			Cumulative net migration 2020-2060	Cumulative net migration 2020-60 as % of 2016 popn
			2020	2040	2060		
LT	-423.3	-14.6%	-23.8	-6.3	0.2	-328.9	-11.3%
LV	-240.9	-12.0%	-8.0	-1.5	0.0	-98.5	-4.9%
RO	-1951.0	-9.9%	-65.1	-8.9	1.6	-814.5	-4.1%
BG	-405.7	-5.7%	-11.9	0.5	0.7	-98.0	-1.4%
PL	-203.6	-0.5%	0.0	16.2	11.6	483.5	1.3%
EL	1.7	0.0%	-16.8	7.9	10.5	148.9	1.4%
EE	-43.4	-3.3%	2.3	1.2	0.1	46.5	3.6%
HR	48.5	1.2%	-1.7	5.0	5.2	174.4	4.2%
SK	5.8	0.1%	5.9	6.8	3.8	226.7	4.2%
FR	1584.1	2.4%	77.0	77.3	62.2	3035.9	4.5%
PT	81.6	0.8%	2.4	18.2	14.6	559.4	5.4%
CZ	336.3	3.2%	21.5	20.5	8.8	650.8	6.1%
HU	205.5	2.1%	19.9	20.8	13.8	681.8	7.0%
SI	72.2	3.4%	4.2	4.3	2.8	154.2	7.3%
FI	181.5	3.3%	15.8	10.7	7.8	444.2	8.1%
IE	251.4	5.3%	9.9	11.4	12.2	430.2	9.2%
NL	287.4	1.7%	66.9	43.7	28.6	1808.2	10.6%
UK	3746.0	5.7%	251.5	181.0	121.1	7235.5	11.0%
DE	3828.3	4.6%	327.3	206.0	175.0	9243.9	11.2%
ES	4681.2	10.1%	51.2	163.4	153.8	5570.8	12.0%
IT	4307.9	7.1%	161.2	217.7	176.7	7919.1	13.0%
DK	248.1	4.4%	33.4	18.9	11.4	789.2	13.8%
BE	755.8	6.7%	53.2	41.5	29.5	1643.6	14.5%
CY	95.9	10.7%	1.7	3.9	4.4	148.3	16.5%
NO	457.1	8.8%	27.3	23.7	18.1	928.4	17.9%
SE	732.2	7.4%	67.9	44.7	27.4	1803.3	18.2%
AT	644.6	7.4%	67.8	40.3	24.8	1683.4	19.3%
MT	30.6	7.7%	3.2	2.0	1.3	83.1	20.8%
LU	108.8	18.1%	10.2	7.0	4.5	280.8	46.8%
EU	18967.2	3.7%	976.3	1363.8	1036.7	43905.8	8.6%

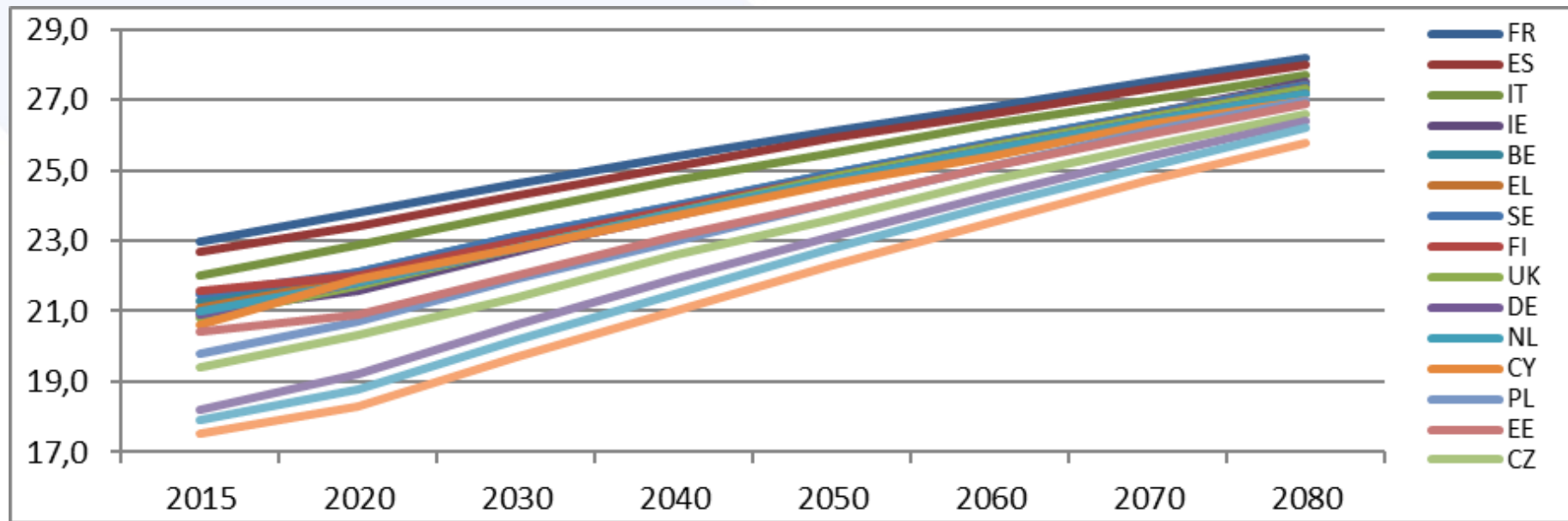
Source: ESSPOP2015, Eurostat

Male expectation of life at age 65 to 2080 for selected member states



Source: ESSPOP2015, Eurostat

Female expectation of life at age 65 to 2080 for selected member states



Source: ESSPOP2015, Eurostat

Cohort and period expectations of life for 2015 and 2060 in the UK

Age	Males 2015		Males 2060		Females 2015		Females 2060	
	Cohort	Period	Cohort	Period	Cohort	Period	Cohort	Period
60	24.9	22.4	29.9	27.7	27.3	25.0	32.0	29.7
65	20.4	18.4	25.1	23.3	22.6	20.8	27.0	25.1
70	16.1	14.6	20.4	19.1	18.0	16.7	22.1	20.7
75	12.2	11.2	16.1	15.2	13.8	12.9	17.6	16.6
80	8.8	8.2	12.2	11.6	10.0	9.5	13.4	12.7

Source: Principal 2016-based population projections of the United Kingdom

Period and cohort expectations life at 65, Males, 2015-2045

	Period expectation of life			Cohort expectation of life					Difference
	2015	2020	2045	2015	2025	2035	2045		2015
Bulgaria	14.1	14.9	18.4	15.6	17.2	18.7	20.1		1.5
Hungary	14.4	15.4	18.9	16.1	17.7	19.2	20.6		1.7
Poland	15.6	16.6	19.7	17.3	18.7	20.1	21.3		1.7
Czech Rep.	15.7	16.7	19.7	17.4	18.8	20.1	21.3		1.7
Germany	17.7	18.5	21.1	19.4	20.5	21.5	22.5		1.7
Belgium	17.9	18.8	21.2	19.6	20.7	21.7	22.7		1.7
Portugal	17.9	18.6	21.1	19.4	20.5	21.5	22.5		1.5
Finland	18.1	18.6	21.1	19.4	20.5	21.5	22.5		1.3
Netherlands	18.2	19.0	21.4	19.9	20.9	21.9	22.8		1.7
Greece	18.3	19.2	21.7	19.9	21.0	22.1	23.0		1.6
Cyprus	18.3	19.6	21.8	20.4	21.5	22.4	23.2		2.1
UK	18.3	19.2	21.6	20.0	21.1	22.0	23.0		1.7
Italy	18.6	19.5	21.7	20.3	21.3	22.3	23.1		1.7
Spain	18.8	19.6	21.9	20.4	21.4	22.4	23.3		1.6
Sweden	18.8	19.4	21.6	20.3	21.2	22.2	23.0		1.5
France	19.0	19.9	22.1	20.6	21.6	22.5	23.4		1.6

Source: ESSPOP2015, Eurostat

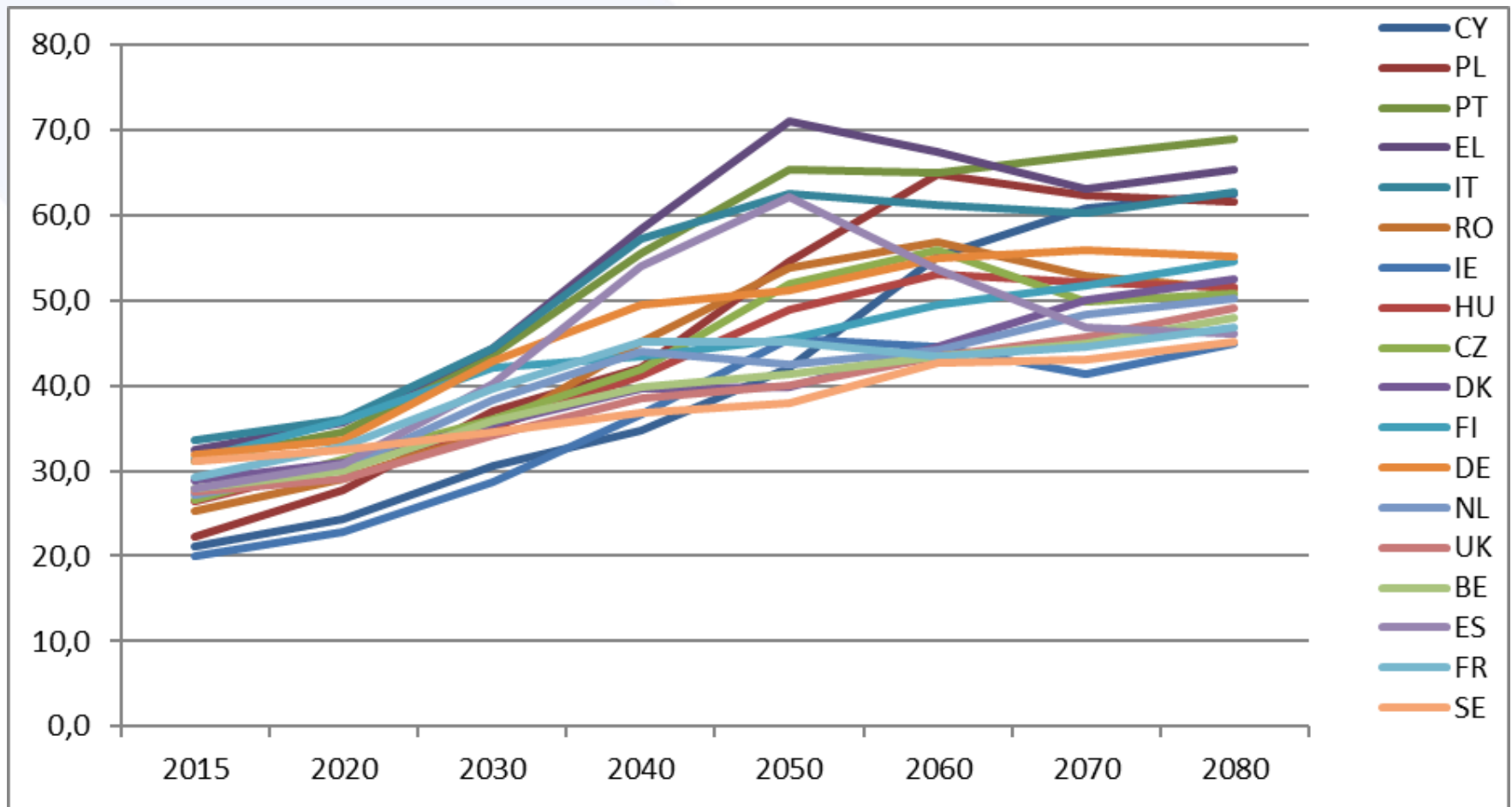
Period and cohort expectations life at 65, Females, 2015-2045

	Period expectation of life			Cohort expectation of life					Difference
	2015	2020	2045	2015	2025	2035	2045		2015
Bulgaria	17.5	18.3	21.7	19.6	21.1	22.5	23.8		2.1
Hungary	18.2	19.2	22.5	20.4	21.9	23.2	24.5		2.2
Poland	19.4	20.3	23.1	21.5	22.8	23.9	25.0		2.1
Czech Rep.	19.8	20.7	23.6	22.1	23.5	24.6	25.4		2.3
Germany	20.6	21.9	24.2	23.1	24.1	25.0	25.9		2.5
Belgium	20.8	21.7	24.3	22.9	24.0	25.0	26.0		2.1
Portugal	20.9	21.8	24.2	22.9	24.0	25.0	25.9		2.0
Netherlands	21.0	21.8	24.3	22.9	24.0	25.0	26.0		1.9
Greece	21.1	21.9	24.4	23.1	24.2	25.1	26.1		2.0
Cyprus	21.3	22.1	24.5	23.2	24.3	25.2	26.1		1.9
UK	21.5	22.1	24.5	23.3	24.3	25.2	26.1		1.8
Finland	21.6	22.0	24.4	23.2	24.2	25.2	26.1		1.4
Italy	21.6	22.2	24.3	23.4	24.4	25.4	26.2		1.8
Spain	22.0	22.9	25.1	24.0	25.0	25.8	26.6		2.0
Sweden	22.7	23.4	25.5	24.6	25.4	26.2	27.0		1.9
France	23.0	23.8	25.8	24.8	25.7	26.4	27.2		1.8

Source: AR18 cross-country tables

Source: ESSPOP2015, Eurostat

Ratio of projected population aged 65 and over to projected population aged 15 to 64 from 2015 to 2080 for selected member



Source: ESSPOP2015, Eurostat

Evolution of pension entitlement age for the UK to maintain the cohort life expectancy at that age (20.4 for males and 22.6 for females)

Year	Pension entitlement age for males	Pension entitlement age for females
2015	65.0	65.0
2020	65.6	65.6
2030	66.8	66.6
2040	67.9	67.6
2050	69.0	68.6
2060	70.0	69.5

Source: Own calculations based on Principal 2016-based UK population projections

Projected change in population aged from 15 to 64, 2015 to 2080

	% Change		% Change		% Change
LT	-52.0	EE	-26.9	MT	-0.7
BG	-47.2	HU	-26.7	NL	0.3
EL	-45.7	CZ	-22.3	DK	4.8
LV	-45.5	SI	-22.2	FR	6.4
PT	-42.2	DE	-19.2	BE	11.0
PL	-41.2	EU*	-16.9	IE	17.8
RO	-39.7	FI	-11.7	SE	33.3
HR	-36.3	CY	-6.5	LU	55.2
SK	-32.8	ES	-5.8		
IT	-26.9	AT	-3.0	[UK	10.9]

*EU excluding UK in both 2015 and 2080
 Source ESSPOP2015, Eurostat

Ratio of projected population aged 65 and over to projected population aged 15 to X from 2015 to 2060, where X increases linearly from 65 to 70 by 2060

Source: ESSPOP2015, Eurostat

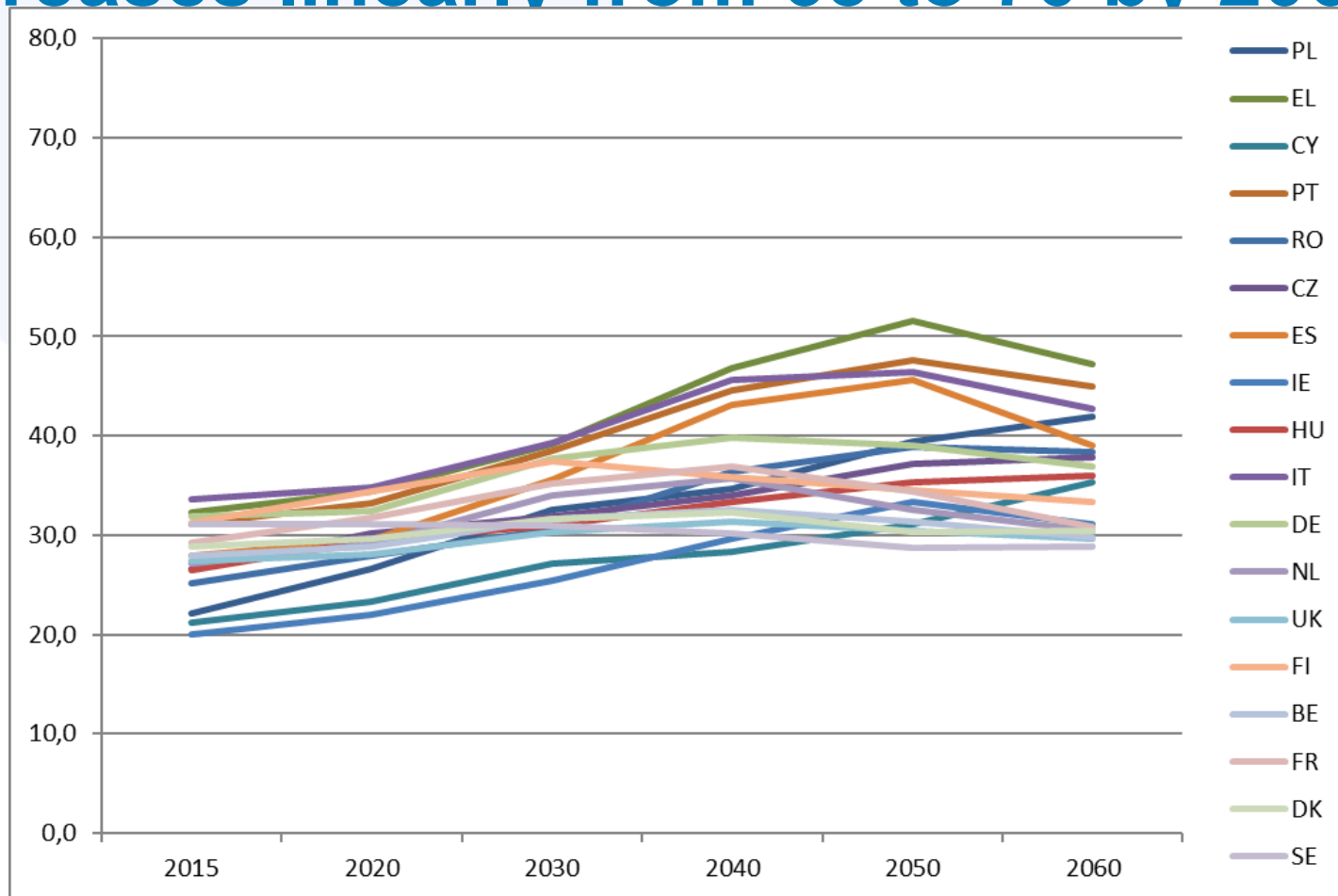
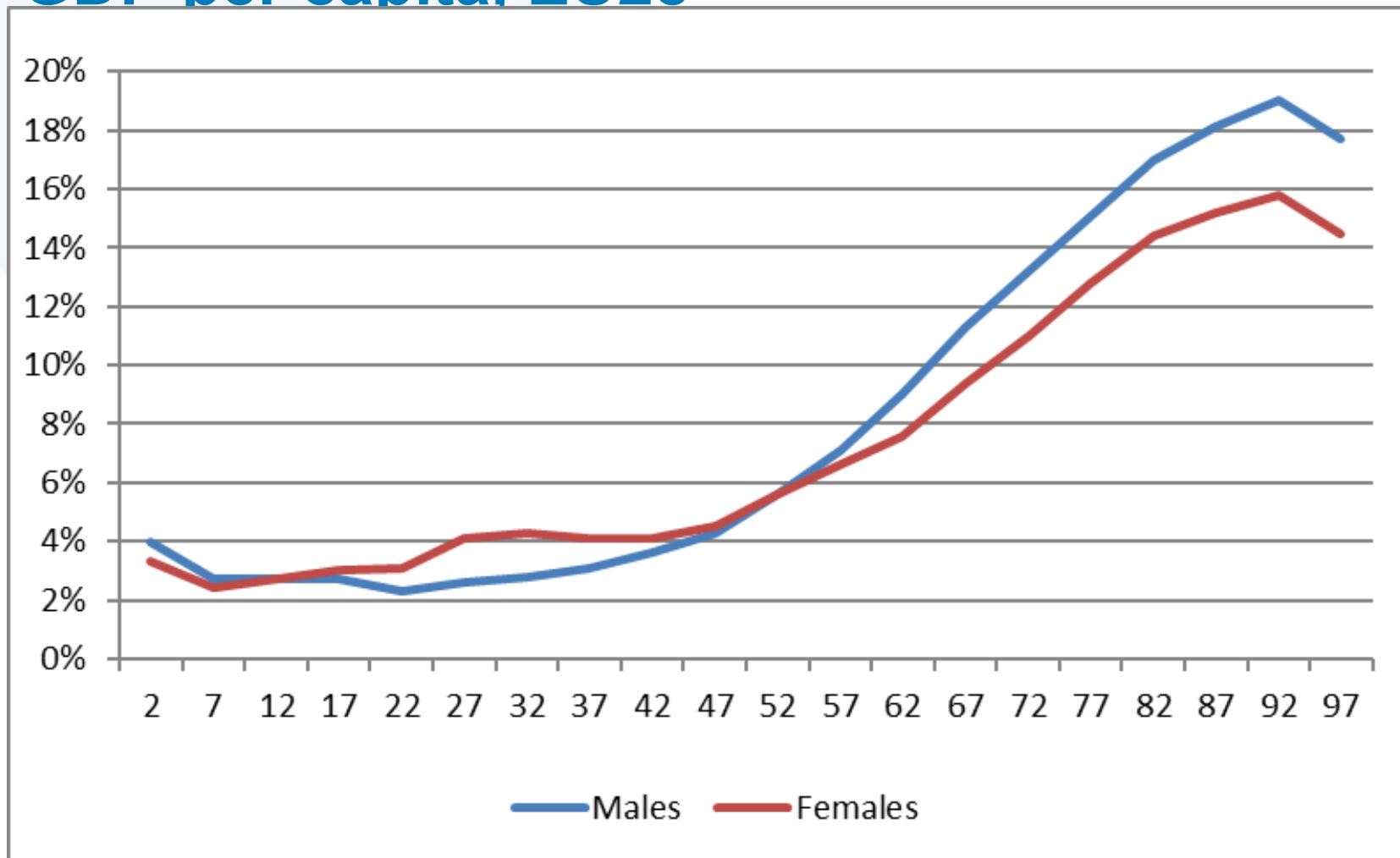


Table 17: Health care spending as % of GDP

AWG reference scenario					AWG risk scenario	TFP risk scenario
Country	Ch 16-70	2016	2040	2070	2070	2070
MT	2.7	5.6	7.3	8.3	9.9	8.2
PT	2.4	5.9	7.5	8.3	9.2	8.2
UK	1.4	7.9	8.8	9.4	10.3	9.3
AT	1.3	7.0	7.7	8.3	9.1	8.2
NO	1.2	7.7	8.4	8.9	9.8	8.8
SK	1.2	5.6	6.6	6.8	8.1	6.7
EL	1.2	5.0	5.9	6.2	6.9	6.1
LU	1.2	3.9	4.4	5.1	5.6	5.0
CZ	1.1	5.4	6.2	6.5	7.3	6.4
SI	1.0	5.6	6.7	6.7	7.6	6.6
DK	1.0	6.9	7.4	7.9	8.7	7.8
IE	1.0	4.1	4.9	5.1	5.8	5.2
RO	0.9	4.3	5.1	5.2	6.4	5.1
HU	0.8	4.9	5.6	5.7	6.7	5.7
PL	0.8	4.3	4.8	5.2	6.0	5.1
NL	0.8	6.2	6.9	7.0	7.6	7.0
FI	0.8	6.1	6.6	6.9	7.5	6.8
SE	0.7	6.9	7.4	7.7	8.5	7.6
DE	0.7	7.4	8.0	8.1	8.9	8.1
HR	0.7	5.2	5.7	5.9	6.7	5.9
IT	0.7	6.3	6.9	7.0	7.5	7.0
LV	0.6	3.7	4.4	4.3	5.5	4.3
ES	0.5	5.9	6.7	6.4	7.1	6.4
FR	0.5	7.9	8.4	8.3	9.1	8.3
LT	0.4	4.1	4.6	4.5	5.3	4.4
BE	0.4	5.9	6.2	6.3	6.9	6.3
CY	0.4	2.8	3.0	3.2	3.4	3.2
BG	0.3	5.0	5.5	5.2	6.3	5.2
EE	0.3	5.3	5.4	5.6	6.4	5.5
EU*	0.9	6.8	7.4	7.7	8.4	7.6
EA	0.7	6.8	7.4	7.4	8.1	7.4
EU27	0.7	6.6	7.2	7.3	8.0	7.3

Source AR18

Age-related expenditure profiles of health care provision (per capita spending as % of GDP per capita, EU28)



Source: Ageing report 2018

Average annual growth rate (AAGR) of long-term care spending as % of GDP, 2016-2070, in different scenarios

Source: Ageing report 2018

Country	AWG ref.	AWG risk	AWG TFP risk	Demo-graphic	Base case	High life expect.	Healthy ageing	Shift to formal care	Coverage converg.	cost con-verg.	cost+cov. converg.
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI
BE	1.02	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
BG	0.59	1.71	1.02	1.01	1.12	1.34	0.91	1.29	1.12	1.84	1.84
CZ	1.43	2.31	0.57	0.41	0.60	0.66	0.35	1.51	1.87	1.09	2.46
DK	1.16	1.89	1.41	1.27	1.50	1.73	1.19	1.85	1.57	2.00	2.06
DE	0.73	1.99	1.16	1.16	1.27	1.45	1.07	1.54	2.09	1.27	2.09
EE	0.78	1.81	1.35	1.27	1.41	1.63	1.18	1.91	1.79	1.54	1.94
IE	1.67	2.70	0.77	0.75	0.86	0.98	0.52	1.14	0.86	2.86	2.86
EL	1.05	2.37	1.68	1.66	1.71	1.94	1.48	1.99	2.50	1.71	2.50
ES	1.60	7.49	1.03	1.36	1.10	1.29	0.88	1.48	1.87	6.80	7.61
FR	0.59	2.90	1.59	1.63	1.62	1.95	1.45	1.83	2.11	2.53	3.01
HR	0.60	1.79	0.62	0.70	0.71	0.88	0.54	1.06	1.56	1.01	1.88
IT	1.00	1.53	0.59	0.70	0.73	0.82	0.30	1.30	1.16	1.22	1.72
CY	1.14	1.54	0.99	1.04	1.05	1.24	0.86	1.33	1.17	1.51	1.64

Further research

ACTUARIAL ASSOCIATION OF EUROPE

Actuarial House

1 Place du Samedi

1000 Brussels

Belgium

www.actuary.eu

Follow us on twitter: @InfoAAE