

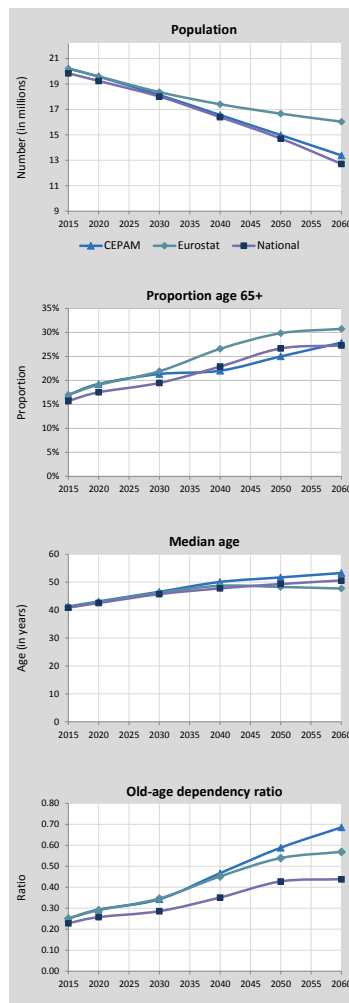
Romania

Detailed Human Capital projections to 2060

Comparison of CEPAM projections with other sources

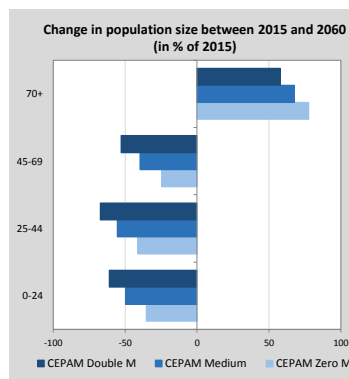
Demographic indicators - CEPAM Medium Scenario (SSP2), Eurostat and national projections		2015	2020	2030	2040	2050	2060
Population (in millions)	CEPAM	19.87	19.25	17.80	16.23	14.64	13.05
	Eurostat	19.87	19.26	18.02	17.07	16.33	15.70
	National	19.50	18.90	17.67	16.06	14.37	12.38
Proportion age 65+	CEPAM	17.0%	19.3%	21.3%	22.0%	25.0%	27.9%
	Eurostat	17.0%	19.1%	21.9%	26.6%	29.8%	30.8%
	National	15.7%	17.5%	19.5%	22.9%	26.7%	27.3%
Proportion below age 20	CEPAM	20.9%	20.5%	18.9%	17.3%	16.6%	16.0%
	Eurostat	20.9%	20.6%	19.8%	19.7%	19.8%	20.3%
	National	21.0%	20.1%	17.5%	16.4%	15.5%	14.7%
Median age	CEPAM	41.3	43.1	46.6	50.1	51.7	53.3
	Eurostat	41.1	42.9	46.3	48.7	48.3	47.7
	National	40.9	42.5	45.7	47.8	49.3	50.6
Old-age dependency ratio (65+/15-64)	CEPAM	0.25	0.29	0.34	0.47	0.59	0.69
	Eurostat	0.25	0.29	0.35	0.45	0.54	0.57
	National	0.23	0.26	0.29	0.35	0.43	0.44
Young-age dependency ratio (0-14/15-64)	CEPAM	0.23	0.23	0.21	0.21	0.22	0.22
	Eurostat	0.23	0.23	0.23	0.25	0.27	0.28
	National	0.23	0.21	0.18	0.18	0.18	0.17
Parent support ratio (85+/50-64)	CEPAM	0.09	0.10	0.11	0.20	0.28	0.49
	Eurostat	0.08	0.10	0.11	0.18	0.25	0.40
	National	-	-	-	-	-	-

Demographic assumptions underlying projections		2010-2015	2015-2020	2025-2030	2035-2040	2045-2050	2055-2060
Total fertility rate	CEPAM	1.50	1.51	1.50	1.51	1.51	1.51
	Eurostat	1.64	1.75	1.80	1.85	1.87	1.88
	National	1.34	1.32	1.30	1.27	1.25	1.25
Life expectancy at birth (in years)							
Male	CEPAM	72.2	73.2	74.3	76.5	78.7	80.9
	Eurostat	72.2	73.6	74.8	77.2	79.4	81.4
	National	72.3	73.0	73.7	74.6	75.3	75.5
Female	CEPAM	79.1	80.1	81.1	83.1	85.2	87.2
	Eurostat	79.3	80.4	81.3	83.2	84.9	86.5
	National	79.4	80.1	80.7	81.6	82.3	82.5
Five-year net migration flow (in thousands)	CEPAM	-289.1	-277.5	-264.9	-237.2	-209.5	-182.5
	Eurostat	-314.4	-329.0	-298.8	-25.0	8.1	14.1
	National	-21.9	-14.1	-12.8	-2.5	0.7	3.0



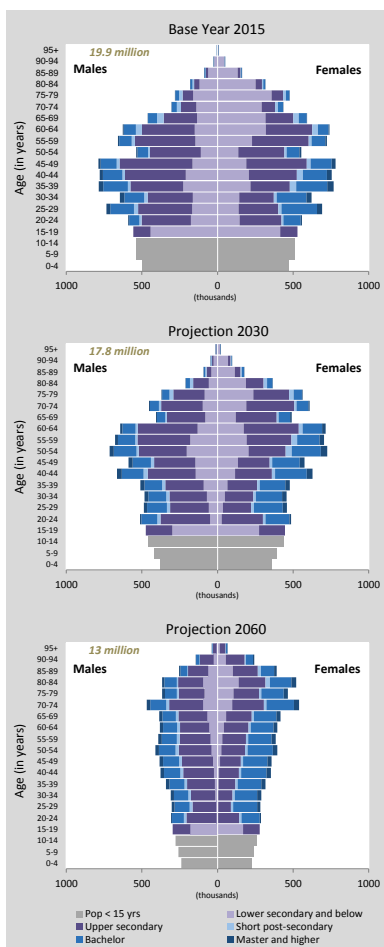
Changes in population size and structure according to CEPAM scenarios (impact of migration)

Population size according to CEPAM projections to 2060		2015	2020	2030	2040	2050	2060
Population (in millions)	Zero M	19.87	19.55	18.76	17.84	16.86	15.83
	Medium	19.87	19.25	17.80	16.23	14.64	13.05
	Double M	19.87	18.94	16.86	14.73	12.67	10.69
Population 0-24 (in millions)	Zero M	5.30	5.10	4.67	4.17	3.75	3.42
	Medium	5.30	5.01	4.37	3.67	3.10	2.68
	Double M	5.30	4.91	4.07	3.20	2.53	2.07
Population 25-44 (in millions)	Zero M	5.78	5.37	4.66	4.11	3.83	3.41
	Medium	5.78	5.19	4.17	3.48	3.11	2.57
	Double M	5.78	5.01	3.70	2.92	2.50	1.90
Population 45-69 (in millions)	Zero M	6.47	6.62	6.40	6.22	5.40	4.87
	Medium	6.47	6.59	6.24	5.77	4.63	3.90
	Double M	6.47	6.56	6.08	5.33	3.93	3.06
Population 70+ (in millions)	Zero M	2.32	2.46	3.03	3.34	3.88	4.13
	Medium	2.32	2.46	3.02	3.31	3.80	3.89
	Double M	2.32	2.46	3.01	3.28	3.72	3.67



Romania (Continued)

Pyramids by education, CEPAM Medium

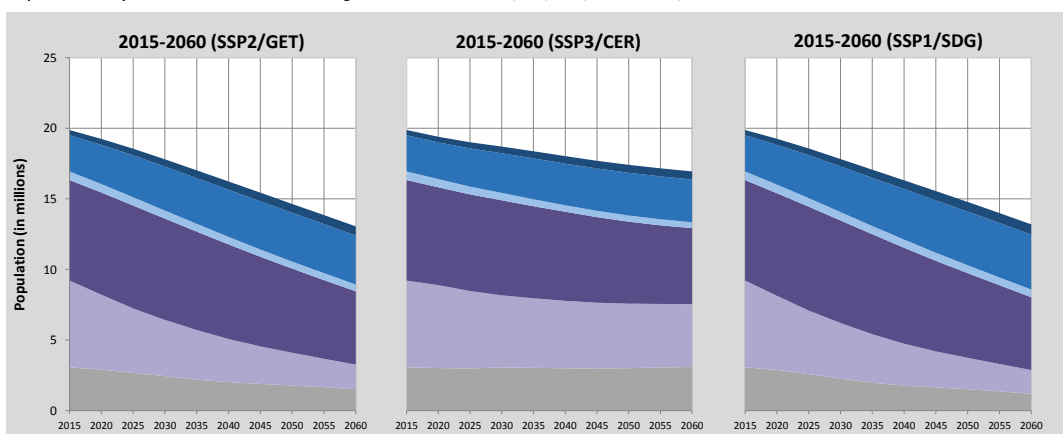


Detailed Human Capital projections to 2060

Human Capital indicators, CEPAM Medium (SSP2)

	2015	2020	2030	2040	2050	2060
Population age 25+: highest educational attainment (columns sum to 100%)						
E1-E4 - lower secondary and below	34.1%	30.7%	24.8%	20.2%	16.6%	13.4%
E5 - upper secondary	43.1%	44.5%	46.3%	46.7%	45.9%	44.6%
E6 - short post-secondary	4.0%	4.0%	4.0%	3.9%	4.1%	4.3%
E7 - bachelor	16.3%	18.0%	21.3%	24.7%	28.2%	31.6%
E8 - master and higher	2.4%	2.9%	3.6%	4.5%	5.3%	6.0%
Mean years of schooling (in years)	10.91	11.21	11.71	12.09	12.42	12.71
Age gap: highest educational attainment (ratio 35-44/50-64)						
E1-E4 - lower secondary and below	0.98	1.10	0.70	0.48	0.44	0.42
E5 - upper secondary	0.80	0.71	0.94	1.13	1.04	0.98
E6 - short post-secondary	0.99	1.30	1.06	1.14	1.20	1.16
E7 - bachelor	1.70	1.73	1.43	1.22	1.19	1.16
E8 - master and higher	2.98	2.38	1.51	1.22	1.19	1.16
Mean years of schooling (35-44 minus 50-64)	0.50	0.44	0.83	0.97	0.77	0.56
Gender gap (population age 25+): highest educational attainment (ratio male/female)						
E1-E4 - lower secondary and below	0.74	0.76	0.83	0.92	1.00	1.05
E5 - upper secondary	1.32	1.29	1.25	1.24	1.27	1.33
E6 - short post-secondary	1.03	1.00	0.95	0.95	0.99	1.04
E7 - bachelor	0.90	0.86	0.79	0.74	0.70	0.67
E8 - master and higher	0.88	0.88	0.86	0.84	0.82	0.81
Mean years of schooling (male minus female)	0.55	0.37	0.05	-0.19	-0.35	-0.46
Women age 20-39: highest educational attainment (columns sum to 100%)						
E1-E4 - lower secondary and below	25%	19%	9%	5%	3%	1%
E5 - upper secondary	39%	41%	45%	44%	41%	37%
E6 - short post-secondary	4%	3%	4%	4%	4%	5%
E7 - bachelor	29%	32%	37%	41%	46%	50%
E8 - master and higher	4%	5%	5%	6%	7%	7%
Mean years of schooling (in years)	11.97	12.37	13.00	13.38	13.68	13.90
Age gap among women: highest educational attainment (ratio 35-44/50-64)						
E1-E4 - lower secondary and below	0.82	0.97	0.61	0.40	0.36	0.32
E5 - upper secondary	0.78	0.67	0.94	1.13	0.98	0.89
E6 - short post-secondary	1.53	1.52	0.70	0.94	1.23	1.20
E7 - bachelor	1.95	1.87	1.57	1.28	1.23	1.20
E8 - master and higher	3.59	2.43	1.40	1.20	1.23	1.20
Mean years of schooling (35-44 minus 50-64)	1.26	1.12	1.27	1.40	1.10	0.84

Population size by educational attainment according to three scenarios: SSP2/GET, SSP3/CER and SSP1/SDG



Colour legend as in pyramids above

Education scenarios

SSP2/GET : Global Education Trend Scenario (Medium assumption)

SSP3/CER : Constant Enrollment Rates Scenario (assumption of no future improvements)

SSP1/SDG : Sustainable Development Goal Scenario (universal primary and secondary education by 2030)

Romania (Continued)

Alternative scenarios to 2100

Projection results by scenario (SSP1-SSP3)

	2015	2020	2030	2050	2060	2075	2100
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Population (in millions)

SSP1 - Rapid Development	19.88	19.25	17.82	14.78	13.20	10.78	7.50
SSP2 - CEPAM Zero Migration	19.88	19.56	18.76	16.86	15.83	14.19	12.04
SSP2 - CEPAM Medium	19.88	19.25	17.80	14.64	13.05	10.73	7.93
SSP2 - CEPAM Double Migration	19.88	18.94	16.86	12.67	10.69	8.01	5.18
SSP3 - Stalled Development	19.88	19.40	18.71	17.41	16.94	16.52	17.20

Proportion age 65+

SSP1 - Rapid Development	17.0%	19.4%	22.9%	36.3%	41.9%	48.1%	58.1%
SSP2 - CEPAM Zero Migration	17.0%	19.0%	21.0%	29.2%	32.2%	34.5%	39.1%
SSP2 - CEPAM Medium	17.0%	19.3%	22.0%	32.5%	36.0%	38.3%	43.3%
SSP2 - CEPAM Double Migration	17.0%	19.5%	23.1%	36.4%	40.4%	42.5%	47.3%
SSP3 - Stalled Development	17.0%	19.0%	20.2%	24.6%	24.4%	22.2%	21.9%

Proportion below age 20

SSP1 - Rapid Development	20.9%	20.3%	17.9%	14.0%	12.8%	10.8%	8.9%
SSP2 - CEPAM Zero Migration	20.9%	20.5%	19.3%	17.4%	16.9%	15.9%	15.0%
SSP2 - CEPAM Medium	20.9%	20.5%	18.9%	16.6%	16.0%	14.8%	14.0%
SSP2 - CEPAM Double Migration	20.9%	20.5%	18.5%	15.6%	15.0%	13.6%	13.0%
SSP3 - Stalled Development	20.9%	20.9%	21.4%	23.0%	24.2%	25.0%	25.6%

Proportion of women age 20-39 with post-secondary education

SSP1 - Rapid Development	30.8%	34.7%	41.6%	56.5%	62.4%	70.0%	77.5%
SSP2 - CEPAM Zero Migration	30.8%	33.8%	38.9%	47.2%	51.2%	56.8%	63.8%
SSP2 - CEPAM Medium	30.8%	33.7%	38.7%	46.9%	50.8%	56.4%	63.2%
SSP2 - CEPAM Double Migration	30.8%	33.6%	38.4%	46.6%	50.3%	55.8%	62.4%
SSP3 - Stalled Development	30.8%	28.6%	27.6%	27.5%	27.6%	27.4%	27.3%

Mean years of schooling, age 25+

SSP1 - Rapid Development	10.9	11.2	11.7	12.5	12.8	13.3	14.0
SSP2 - CEPAM Zero Migration	10.9	11.2	11.7	12.5	12.8	13.3	13.8
SSP2 - CEPAM Medium	10.9	11.2	11.7	12.4	12.7	13.2	13.7
SSP2 - CEPAM Double Migration	10.9	11.2	11.7	12.3	12.6	13.0	13.6
SSP3 - Stalled Development	10.9	11.1	11.4	11.7	11.7	11.7	11.7

Demographic assumptions underlying SSPs

	2015-2020	2020-2025	2030-2035	2050-2055	2060-2065	2075-2080	2095-2100
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Total fertility rate

SSP1 - Rapid Development	1.45	1.39	1.33	1.30	1.30	1.40	1.36
SSP2 - CEPAM Zero Migration	1.50	1.51	1.50	1.51	1.51	1.61	1.56
SSP2 - CEPAM Medium	1.50	1.51	1.50	1.51	1.51	1.61	1.56
SSP2 - CEPAM Double Migration	1.50	1.51	1.50	1.51	1.51	1.61	1.56
SSP3 - Stalled Development	1.64	1.82	1.99	2.12	2.13	2.23	2.18

Life expectancy at birth for females (in years)

SSP1 - Rapid Development	79.6	81.1	84.1	90.2	93.2	97.8	103.8
SSP2 - CEPAM Zero Migration	79.1	80.1	82.1	86.2	88.2	91.3	95.3
SSP2 - CEPAM Medium	79.1	80.1	82.1	86.2	88.2	91.2	95.3
SSP2 - CEPAM Double Migration	79.1	80.1	82.1	86.2	88.2	91.2	95.3
SSP3 - Stalled Development	78.5	79.0	80.0	82.0	83.0	84.4	86.3

Migration – net flow over five years (in thousands)

SSP1 - Rapid Development	-289.7	-278.9	-254.3	-202.5	-176.4	-137.9	-98.6
SSP2 - CEPAM Zero Migration	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SSP2 - CEPAM Medium	-289.1	-277.5	-251.2	-195.9	-168.9	-132.1	-97.6
SSP2 - CEPAM Double Migration	-578.2	-544.9	-471.7	-327.9	-261.8	-177.8	-108.1
SSP3 - Stalled Development	-192.4	-93.1	-0.2	-0.2	-0.2	-0.2	-0.2

Ageing indicators by scenario

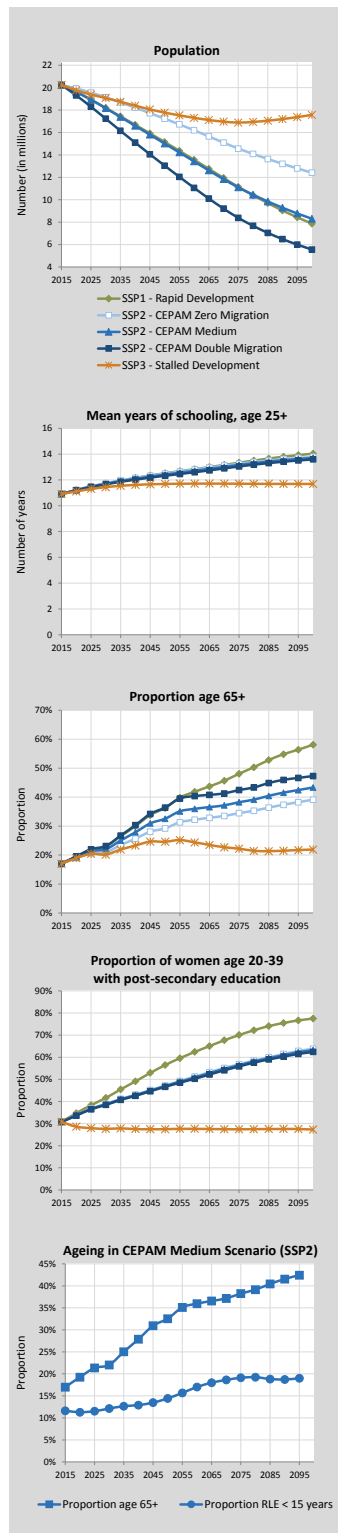
	2015	2020	2030	2050	2060	2075	2095
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Median age

SSP1 - Rapid Development	41.3	43.2	47.3	55.1	58.3	63.5	70.6
SSP2 - CEPAM Zero Migration	41.3	42.8	45.2	49.2	50.6	52.7	55.0
SSP2 - CEPAM Medium	41.3	43.1	46.6	51.7	53.3	55.8	58.4
SSP2 - CEPAM Double Migration	41.3	43.5	48.0	55.0	56.5	59.1	61.9
SSP3 - Stalled Development	41.3	42.8	44.4	43.6	41.9	40.5	39.9

Proportion with less than 15 years of remaining life expectancy (RLE)

SSP1 - Rapid Development	11.6%	11.3%	12.1%	14.4%	17.0%	19.1%	19.0%
SSP2 - CEPAM Zero Migration	12.0%	12.0%	12.8%	14.2%	15.3%	15.3%	14.8%
SSP2 - CEPAM Medium	12.0%	12.2%	13.5%	16.1%	18.0%	18.1%	17.4%
SSP2 - CEPAM Double Migration	12.0%	12.3%	14.2%	18.3%	21.3%	21.5%	20.2%
SSP3 - Stalled Development	12.4%	12.9%	14.1%	15.2%	14.8%	12.3%	10.3%



Romania (Continued)

Labour force projections to 2060

Labour force indicators

	2015	2020	2030	2040	2050	2060
Labour force size, by participation and migration scenario (in millions)						
Constant (CEPAM Zero Migration)	9.26	9.03	8.50	7.83	7.15	6.54
Constant (CEPAM Medium)	9.26	8.85	7.92	6.90	5.91	5.09
Constant (CEPAM Double Migration)	9.26	8.66	7.37	6.03	4.82	3.89
Swedish (CEPAM Zero Migration)	9.26	9.26	9.16	8.83	8.41	7.96
Swedish (CEPAM Medium)	9.26	9.07	8.57	7.82	6.99	6.23
Swedish (CEPAM Double Migration)	9.26	8.88	7.99	6.88	5.73	4.78
Equalization (CEPAM Zero Migration)	9.26	9.16	8.84	8.33	7.75	7.18
Equalization (CEPAM Medium)	9.26	8.97	8.25	7.35	6.42	5.60
Equalization (CEPAM Double Migration)	9.26	8.78	7.68	6.44	5.24	4.28
Constant (CEPAM Medium-low fertility)	9.26	8.85	7.93	6.86	5.69	4.62
Swedish (CEPAM Medium-low fertility)	9.26	9.07	8.57	7.75	6.69	5.65
Equalization (CEPAM Medium-low fertility)	9.26	8.97	8.26	7.30	6.17	5.09

Labour force participation rates, age 15+, by participation scenario (CEPAM Medium)

TOTAL (Constant)	55.1%	54.2%	51.6%	48.5%	46.0%	44.2%
TOTAL (Swedish)	55.1%	55.5%	55.8%	55.0%	54.3%	54.0%
TOTAL (Equalization)	55.1%	54.9%	53.8%	51.7%	49.9%	48.5%
MALE (Constant)	64.7%	63.4%	60.4%	56.7%	53.5%	51.1%
MALE (Swedish)	64.7%	64.3%	63.4%	61.5%	59.8%	58.7%
MALE (Equalization)	64.7%	63.4%	60.4%	56.7%	53.5%	51.1%
FEMALE (Constant)	46.2%	45.6%	43.5%	41.0%	39.0%	37.7%
FEMALE (Swedish)	46.2%	47.4%	48.8%	49.1%	49.3%	49.6%
FEMALE (Equalization)	46.2%	47.1%	47.6%	47.1%	46.5%	46.1%

Labour force (15+) by highest level of educational attainment. Columns sum to 100%.

(CEPAM Medium; Constant participation)

TOTAL E1-E4 - lower secondary and below	24.2%	21.9%	17.9%	14.0%	10.1%	6.7%
TOTAL E5 - upper secondary	46.9%	46.0%	44.1%	43.2%	43.1%	42.4%
TOTAL E6 - short post-secondary	3.6%	3.7%	4.0%	4.1%	4.5%	4.8%
TOTAL E7 - bachelor	21.8%	24.2%	28.9%	32.8%	35.9%	39.0%
TOTAL E8 - master and higher	3.5%	4.1%	5.2%	5.9%	6.4%	7.0%
MALE E1-E4 - lower secondary and below	24.7%	23.0%	19.8%	16.0%	12.0%	8.4%
MALE E5 - upper secondary	51.9%	51.4%	50.0%	49.7%	50.7%	51.4%
MALE E6 - short post-secondary	2.9%	3.1%	3.6%	4.1%	4.5%	4.9%
MALE E7 - bachelor	17.7%	19.2%	22.5%	25.2%	27.3%	29.4%
MALE E8 - master and higher	2.8%	3.3%	4.2%	4.9%	5.5%	5.9%
FEMALE E1-E4 - lower secondary and below	23.4%	20.6%	15.5%	11.4%	7.8%	4.6%
FEMALE E5 - upper secondary	40.4%	39.2%	36.5%	35.0%	33.4%	31.2%
FEMALE E6 - short post-secondary	4.4%	4.5%	4.5%	4.1%	4.3%	4.7%
FEMALE E7 - bachelor	27.2%	30.5%	37.1%	42.4%	46.8%	51.0%
FEMALE E8 - master and higher	4.5%	5.2%	6.4%	7.0%	7.7%	8.4%

Labour force size by educational attainment according to three migration scenarios, 2015-2060

(Labour force participation = Constant scenario)

