Online Appendix
Inequality in Life Expectancies across Europe and the US

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Appendix A: Estimation

In order to reduce the uncertainty of estimated parameters from surveys with a small number of observed transitions, we rely on Bayesian techniques by constraining the space of possible $\boldsymbol{\beta}$ to satisfy a set of five regularity conditions $r_1(\boldsymbol{\beta}|a)$ to $r_5(\boldsymbol{\beta}|a)$ that we re-write as a prior for $\boldsymbol{\beta}$ with pdf:

$$p(\beta) = \prod_{a=50}^{\bar{a}} r_1(\boldsymbol{\beta}|a) \cdot r_2(\boldsymbol{\beta}|a) \cdot r_3(\boldsymbol{\beta}|a) \cdot r_4(\boldsymbol{\beta}|a) \cdot r_5(\boldsymbol{\beta}|a) \tag{A.1}$$

These five regularity conditions are:

$$r_1(\boldsymbol{\beta}|a) = \begin{cases} 1 & \text{if } \dfrac{p_{22}(a)}{1-p_{20}(a)} \geq \dfrac{p_{22}(a+1)}{1-p_{20}(a+1)}, \\ 0 & \text{otherwise} \end{cases} \tag{A.2}$$

$$r_2(\boldsymbol{\beta}|a) = \begin{cases} 1 & \text{if } \dfrac{p_{12}(a)}{1-p_{10}(a)} \geq \dfrac{p_{12}(a+1)}{1-p_{10}(a+1)}, \\ 0 & \text{otherwise} \end{cases} \tag{A.3}$$

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$$r_3(\boldsymbol{\beta}|a) = \begin{cases} 1 & \text{if } p_{20}(a+1) \geq p_{20}(a), \\ 0 & \text{otherwise} \end{cases} \tag{A.4}$$

$$r_4(\boldsymbol{\beta}|a) = \begin{cases} 1 & \text{if } p_{10}(a+1) \geq p_{10}(a), \\ 0 & \text{otherwise} \end{cases} \tag{A.5}$$

$$r_5(\boldsymbol{\beta}|a) = \begin{cases} 1 & \text{if } p_{10}(a) \geq p_{20}(a), \\ 0 & \text{otherwise} \end{cases} \tag{A.6}$$

and allow us to restrict the parameter space such that: conditional on surviving, the probability of remaining in good health decreases with age, equation (A.2); conditional on surviving, the probability of moving from bad to good health decreases with age, equation (A.3); the probability of surviving (conditional on both good and bad health) decreases with age, equations (A.4) and (A.5); and the probability of dying is larger when in bad health than in good health, equation (A.6).

The posterior distribution of $\boldsymbol{\beta}$ is

$$p(\boldsymbol{\beta}|H) \propto p(H|\boldsymbol{\beta}) \cdot p(\boldsymbol{\beta}), \tag{A.7}$$

In order to sample from the posterior distribution, we use Markov Chain Monte-Carlo (MCMC) methods with a random-walk Metropolis algorithm:

1. Initialize at $\boldsymbol{\beta}^{t=0}$
2. Propose candidate $\boldsymbol{\beta}^c = \boldsymbol{\beta}^t + \epsilon$, where $\epsilon \sim N(0, \sigma_\epsilon^2)$
3. Accept $\boldsymbol{\beta}^c$ with probability:

$$\alpha(\boldsymbol{\beta}^c|\boldsymbol{\beta}^t) = \min\left\{1, \frac{p(\boldsymbol{\beta}^c|H)}{p(\boldsymbol{\beta}^t|H)}\right\}$$

4. If candidate is accepted $\boldsymbol{\beta}^{t+1} = \boldsymbol{\beta}^c$, otherwise $\boldsymbol{\beta}^{t+1} = \boldsymbol{\beta}^t$.
5. Set $t = t + 1$ and go back to 2 until convergence in the posterior distribution.

The empirical results are based on 500,000 draws for each sample. The first 40,000 draws are disregarded as burn-in and the remaining 460,000 provide a posterior distribution of the vector of parameters $\boldsymbol{\beta}$ for each country-gender-education sample. We adjust the variance σ_ε^2 of the proposal for every country-gender-education sample to ensure acceptance rates are around 30%.

Appendix B: Building life expectancies

In this Appendix we explain how we compute the life expectancy, the healthy life expectancy and the unhealthy life expectancy from our estimated multi-state life tables. Given the parameter estimates, we recover $p_{ij}(a)$, the probability that an individual with health $i \in \{1,2\}$ transits into health $j \in \{0,1,2\}$ from age a to age $a+1$. We define Γ_a as the three-state transition matrix containing these probabilities,

$$\Gamma_a = \begin{bmatrix} p_{11}(a) & p_{21}(a) & 0 \\ p_{12}(a) & p_{22}(a) & 0 \\ p_{10}(a) & p_{20}(a) & 1 \end{bmatrix}$$

where each matrix entry is the probability of transiting between any two states at age a (of course, dead is an absorbing state). Now, let's define the 3×1 vector z_a as the vector describing the fraction of individuals in each state $(z_0(a), z_1(a), z_2(a))$. Given an initial health distribution at age $a = 50$ (our initial age) we can compute, $z_{a+1} = \Gamma_a z_a$ for all ages.[1]

To derive the expected duration in each health status, we start by computing the expected years lived in each health status in the interval $(a, a+1)$. The expected years lived in status $i \in \{1,2\}$ is

$$z_i(a)p_{ii}(a) + \frac{1}{2}z_i(a)\Big[p_{ij}(a) + p_{i0}(a)\Big] + \frac{1}{2}z_j(a)p_{ji}(a)$$

where $j \in \{1,2\}$ and $j \neq i$. The first term counts a full year for those individuals who were in health i at age a and remain in health i at age $a+1$, the second term counts half-year for those individuals who were in health i at age a and change state (either to health j or to death) before age $a+1$, and the third term counts half-year for those individuals who were in health j at age a and transit to state i before age $a+1$. Thus

[1] To compute the health distribution at age 50 we use the average share of individuals in good health between ages 50 and 54

the expected duration at age 50 in status i is given by

$$ED_i = \sum_{a=50}^{\bar{a}} z_i(a)p_{ii}(a) + \frac{1}{2}z_i(a)\Big[p_{ij}(a) + p_{i0}(a)\Big] + \frac{1}{2}z_j(a)p_{ji}(a)$$

where $\bar{a} = 90$. Keeping with our notation, HLE $\equiv ED_2$, ULE $\equiv ED_1$, and LE = HLE+ULE.

Appendix C: Education data

In this Appendix we examine the education distribution in our samples.

First, in Table C.1 we report the educational attainment for each gender and age groups that could be matched in Eurostat data and our SHARE-ELSA-HRS samples. The three age groups we can build (45-54, 55-64, and 55-74) show the evolution of educational attainment across cohorts in our sampling period of 2002–2015. Importantly, to focus on the quality of the cross-sectional sampling, we only use data from individuals in their first (baseline) interview. The age group 50-90 represents the sample used in all estimations in the paper. In particular, Table C.1 presents the percentage of males and females in each age group with tertiary education (ISCED11 levels 5-8) in SHARE and ELSA countries and completed college education in the HRS. For both data and sample attainment, each percentage is the average attainment weighted by the number of baseline respondents in that year, country, gender and age group in the respective SHARE, ELSA or HRS sample.[2]

We can highlight the following patterns. First, the results from the Eurostat data show that educational attainment—especially among females—is lower for older age groups in all countries.[3] For instance, in Italy, Poland and Spain, female tertiary education is more than twice as large in age group 45-54 than in age group 55-74. This shows that college education is a more selective measure of socio-economic status for older cohorts, especially for females, and that there is substantial cross-country heterogeneity in this respect. Second, comparing educational attainment between our samples and the Eurostat data, we first note that, on average across countries, education attainment is very similar, around 1.5% higher in our samples than in Eurostat. Importantly, this difference is not linked to age—and hence it is unlikely to be connected with nursing home entry—because educational attainment falls with age in a similar way in Eurostat data and in our samples. For instance, both in Eurostat and in our samples, the average fraction of college educated females declines by around 6 percent between age group 45-54 and age group 55-64, and by around 9 percent between age group 45-54 and age group 55-74. Finally, the comparison between Eurostat data and our samples is more mixed for data for individual countries. In Estonia, Poland, Slovenia, Spain, the fraction of college educated individuals in our

[2] This implies that the attainment, both in Eurostat and our samples, is biased towards years in which the sample was drawn. England and the United States have their dominant baseline sample earlier (2002) than Italy and Poland (2007), Austria, the Czech Republic, Estonia, France, and Slovenia (2011), and Denmark, Spain, and Sweden (2013).

[3] There are a few exceptions. In Estonia, Germany, Poland, Slovenia and the US, educational attainment for males rises slightly between two but not the three age groups.

Table C.1: Educational Attainment by Gender and Age Group (in %)

	Males							Females						
	Data			Sample				Data			Sample			
	45-54	55-64	55-74	45-54	55-64	55-74	50-90	45-54	55-64	55-74	45-54	55-64	55-74	50-90
Austria*	22.7	20.4	19.9	25.3	23.6	22.1	21.6	14.7	10.6	8.6	20.2	15.9	14.2	14.6
Belgium	29.4	25.7	22.9	35.6	35.9	34.9	32.7	30.5	22.1	18.0	37.5	32.5	28.3	28.8
Czechia*	17.6	14.7	14.7	19.2	17.6	20.1	20.8	15.2	9.6	8.9	19.8	13.1	12.6	12.7
Denmark*	28.1	26.6	24.9	42.2	41.4	38.5	38.9	35.4	27.3	23.3	52.7	46.2	40.2	40.2
Estonia*	27.8	28.3	27.7	23.0	22.0	23.7	22.2	46.7	39.1	34.7	31.8	26.9	23.3	21.6
France*	19.9	17.9	15.6	28.5	24.2	21.5	20.6	21.2	16.1	13.1	27.1	21.4	17.9	16.8
Germany	30.8	31.5	30.7	34.4	40.7	39.8	36.8	23.4	18.6	15.4	28.9	23.7	20.7	21.7
Greece	22.8	15.8	13.2	27.8	24.1	19.6	19.4	15.7	8.4	6.0	20.6	10.5	7.2	10.1
Italy*	11.6	10.7	9.2	15.0	11.4	10.4	10.0	12.2	8.8	6.9	14.2	9.0	7.3	7.9
Netherlands	32.5	29.8	27.7	34.8	31.2	26.0	27.4	25.5	18.2	15.3	29.1	20.3	16.0	18.3
Poland*	11.3	12.9	12.8	8.2	7.5	6.7	6.6	14.2	11.8	10.3	12.9	5.5	4.5	5.4
Slovenia*	19.2	16.4	17.4	18.6	13.8	14.7	15.1	25.3	17.7	15.7	15.1	14.6	13.2	11.7
Spain*	25.6	21.1	18.7	17.6	14.2	11.9	11.3	24.6	14.8	11.5	19.4	12.1	9.2	9.3
Sweden*	22.8	22.7	21.1	32.7	27.3	25.7	25.4	34.7	30.1	27.3	43.4	36.7	32.7	30.5
Switzerland	39.4	34.9	33.5	27.2	23.3	23.4	22.8	23.0	16.7	13.6	17.0	15.9	13.6	13.1
England*	30.0	25.1	24.5	26.1	21.8	18.3	18.9	28.9	22.1	21.6	22.5	17.9	14.3	15.8
US*	30.4	32.1	29.1	33.8	31.0	29.3	29.7	29.6	24.1	20.3	30.8	24.6	21.8	23.1
Average	24.8	22.7	21.4	26.5	24.2	22.7	22.4	24.8	18.6	15.9	26.1	20.4	17.5	17.7

Notes: An * mark indicates that the country sample has been selected for the main analysis of the paper. Age group 50-90 years is used in all estimations. In each column, the average attainment is weighted by the sample population with a baseline interview in each year between 2002-2015. Data sources: Eurostat (Population by educational attainment level, sex and age [edat_lfs_9903]), tertiary education ISCED11 (levels 5-8). For the US at least bachelor's degree in Census.gov: Educational Attainment in the United States. Table 1. Educational Attainment of the Population 15 Years and Over, by Age, Sex, Race, and Hispanic Origin. Sample: In continental Europe, tertiary education ISCED11 (levels 5-8) and at least 15 years of education. In England, share of population with finished full-time education after age 19. In the US, share of population with completed college.

samples is indeed smaller than in Eurostat, while the opposite is true for the rest. Again, the difference between Eurostat and our samples remains more or less constant across age groups.

Next, in Table C.2 we report the income distribution by education in each country. In particular, we report the median household income for individuals with and without college, separately for males and females, see Table footnotes for details. In addition, we report the percentile location of those medians in the overall household income distribution for the given gender. Finally, we also report the ratio of those median and the difference in those locations across education groups.

Table C.2: Median household income by education

	A. Males						B. Females					
	College		Non-College		Difference		College		Non-College		Difference	
	Med	Loc	Med	Loc	Med	Loc	Med	Loc	Med	Loc	Med	Loc
Austria	26,744	63	20,261	44	1.32	19	26,410	67	18,234	44	1.45	23
Czechia	17,725	66	12,449	45	1.42	11	15,155	64	11,366	47	1.33	17
Denmark	29,264	64	19,722	39	1.48	25	26,296	66	16,965	34	1.55	32
Estonia	12,855	69	8,570	45	1.50	24	12,239	69	7,713	43	1.59	26
France	31,832	73	19,257	40	1.65	33	29,456	73	16,910	41	1.74	32
Italy	26,444	76	17,629	50	1.50	26	26,444	78	15,866	49	1.67	29
Poland	12,217	61	10,796	48	1.13	13	19,104	77	10,526	48	1.81	29
Slovenia	22,933	65	15,747	46	1.46	19	23,620	68	13,714	45	1.72	23
Spain	24,778	70	13,450	46	1.84	24	21,519	65	13,517	47	1.59	18
Sweden	31,468	66	23,601	45	1.33	21	25,974	68	17,701	41	1.47	27
England	439	73	275	44	1.60	29	405	74	258	45	1.57	29
US	36,810	75	16,857	42	2.18	33	33,459	78	13,552	43	2.47	35

Notes: Columns labelled "Med" report the median household income for the particular education-gender group. Columns labelled "Loc" report the percentile location of those medians in the household income distribution for the particular gender. In panels "Difference", "Med" denotes the ratio of the median income between college and non-college and "Loc" denotes the difference in the percentile location of the medians between college and non-college. Population aged between 50 and 90 for all countries. Household income is expressed in net terms, in PPP-adjusted 2010 euros for SHARE countries, in £ for UK and 1992 $ for US. It refers to the year 2010 for all countries. For the US and SHARE countries, it is expressed in annual terms. For the UK, it is expressed in weekly terms. For all countries, this is equivalized HH income. The equivalence scale used for UK and SHARE countries is an OECD equivalence scale (it assigns a weight of 0.5 to second adults and dependent children aged 14 and over and a weight of 0.3 to children under 14 years of age). For US, the equivalisation is just given by the square root of the household size. Weighted results using cross-sectional weights for SHARE countries. Unweighted results for UK and US.

Appendix D: Additional Tables

Table D.1: Sample statistics

	Waves	First year	Last year	Individuals
Austria*	6	2004	2015	5139
Belgium	6	2004	2015	6557
Czechia*	5	2006	2015	6441
Denmark*	6	2004	2015	4453
Estonia*	3	2010	2015	6322
France*	6	2004	2015	5964
Germany	6	2004	2015	5723
Greece	4	2004	2015	3394
Israel	4	2005	2015	3041
Italy*	6	2004	2015	5248
Netherlands	5	2004	2013	3474
Poland*	4	2006	2015	2175
Slovenia*	3	2011	2015	3035
Spain*	6	2004	2015	6927
Sweden*	6	2004	2015	5242
Switzerland	6	2004	2015	3557
England*	6	2002	2013	14242
US*	6	2002	2013	27198

Notes: "First year" and "Last year" refer to year of interview or death in our sample. An * mark indicates that the country sample has been selected for the main analysis of the paper.

Table D.2: Life expectancies: College

	A. Males			B. Females			C. Difference		
	LE	HLE	ULE	LE	HLE	ULE	LE	HLE	ULE
Western Europe	34.1	30.9	3.2	35.6	31.9	3.7	-1.5	-1.0	-0.5
	(0.6)	(0.6)	(0.3)	(0.6)	(0.6)	(0.4)	(0.8)	(0.8)	(0.5)
Austria	33.5	30.3	3.2	34.3	31.1	3.2	-0.8	-0.8	-0.0
	(0.8)	(0.8)	(0.4)	(0.9)	(0.9)	(0.5)	(1.2)	(1.2)	(0.7)
France	34.7	31.4	3.3	36.7	32.5	4.2	-2.0	-1.1	-0.9
	(0.8)	(0.9)	(0.5)	(0.7)	(0.8)	(0.6)	(1.1)	(1.2)	(0.8)
Eastern Europe	30.2	26.9	3.3	35.7	31.8	3.9	-5.5	-4.9	-0.6
	(0.7)	(0.6)	(0.3)	(0.5)	(0.5)	(0.3)	(0.9)	(0.8)	(0.4)
Czechia	29.6	26.6	2.9	36.9	32.1	4.7	-7.3	-5.5	-1.8
	(1.2)	(1.1)	(0.4)	(0.9)	(1.1)	(0.8)	(1.5)	(1.5)	(0.9)
Estonia	30.1	26.5	3.5	35.2	31.3	3.9	-5.1	-4.8	-0.4
	(1.1)	(1.0)	(0.4)	(0.6)	(0.7)	(0.4)	(1.3)	(1.2)	(0.6)
Poland	30.8	26.1	4.5	31.6	26.7	4.7	-0.9	-0.6	-0.1
	(1.8)	(1.8)	(1.1)	(2.5)	(2.5)	(1.7)	(3.1)	(3.0)	(2.0)
Slovenia	32.1	29.3	2.7	37.0	34.5	2.3	-4.8	-5.2	0.4
	(1.5)	(1.4)	(0.7)	(1.4)	(1.6)	(0.9)	(2.0)	(2.1)	(1.1)
Mediterranean	33.0	30.6	2.4	34.4	32.7	1.6	-1.3	-2.1	0.8
	(0.9)	(0.9)	(0.5)	(1.1)	(1.1)	(0.4)	(1.4)	(1.5)	(0.6)
Italy	33.5	30.3	3.1	36.3	34.5	1.6	-2.7	-4.2	1.5
	(1.3)	(1.4)	(0.8)	(1.6)	(1.8)	(0.8)	(2.0)	(2.2)	(1.1)
Spain	32.5	30.5	1.9	33.4	31.5	1.9	-0.9	-1.0	0.1
	(1.3)	(1.3)	(0.5)	(1.3)	(1.4)	(0.6)	(1.9)	(1.9)	(0.7)
Scandinavia	32.7	30.2	2.5	34.6	32.2	2.4	-1.9	-2.0	0.1
	(0.5)	(0.5)	(0.3)	(0.5)	(0.5)	(0.3)	(0.7)	(0.8)	(0.4)
Denmark	31.6	29.3	2.3	33.1	31.3	1.7	-1.4	-2.0	0.5
	(0.8)	(0.8)	(0.3)	(0.8)	(0.8)	(0.3)	(1.1)	(1.1)	(0.4)
Sweden	33.6	30.8	2.7	36.0	32.9	3.1	-2.4	-2.0	-0.4
	(0.7)	(0.7)	(0.4)	(0.6)	(0.7)	(0.4)	(0.9)	(1.0)	(0.6)
England	32.6	28.2	4.4	33.9	28.5	5.4	-1.3	-0.3	-0.9
	(0.5)	(0.5)	(0.3)	(0.5)	(0.5)	(0.4)	(0.7)	(0.7)	(0.5)
US	31.0	28.2	2.8	33.9	29.8	4.1	-2.9	-1.5	-1.4
	(0.4)	(0.4)	(0.1)	(0.3)	(0.3)	(0.2)	(0.5)	(0.5)	(0.2)

Notes: LE stands for life expectancy, HLE for healthy life expectancy, and ULE for unhealthy life expectancy. For each country we report the median (and the standard deviation in parenthesis) of the distribution of the corresponding life expectancies that arises from the posterior distribution of the estimated $\boldsymbol{\beta}$ parameters.

Table D.3: Life expectancies: No College

	A. Males			B. Females			C. Difference		
	LE	HLE	ULE	LE	HLE	ULE	LE	HLE	ULE
Western Europe	30.2	26.2	4.0	33.9	28.9	5.0	-3.7	-2.6	-1.0
	(0.5)	(0.4)	(0.2)	(0.3)	(0.3)	(0.2)	(0.6)	(0.5)	(0.2)
Austria	29.6	26.2	3.4	32.6	28.4	4.2	-3.0	-2.2	-0.8
	(0.7)	(0.7)	(0.3)	(0.5)	(0.5)	(0.2)	(0.9)	(0.8)	(0.4)
France	30.7	26.3	4.4	34.9	29.2	5.7	-4.2	-2.9	-1.3
	(0.6)	(0.5)	(0.2)	(0.4)	(0.4)	(0.2)	(0.7)	(0.6)	(0.3)
Eastern Europe	26.2	22.6	3.6	31.8	26.6	5.2	-5.6	-4.1	-1.6
	(0.4)	(0.3)	(0.1)	(0.3)	(0.2)	(0.1)	(0.4)	(0.4)	(0.2)
Czechia	26.0	22.6	3.5	31.0	26.4	4.5	-4.9	-3.8	-1.1
	(0.6)	(0.5)	(0.2)	(0.4)	(0.4)	(0.2)	(0.7)	(0.7)	(0.3)
Estonia	25.5	21.9	3.6	32.7	26.8	5.9	-7.3	-4.9	-2.4
	(0.7)	(0.6)	(0.2)	(0.5)	(0.4)	(0.3)	(0.8)	(0.7)	(0.3)
Poland	25.4	21.6	3.8	30.6	25.4	5.3	-5.3	-3.8	-1.5
	(0.8)	(0.7)	(0.3)	(0.6)	(0.6)	(0.4)	(1.0)	(0.9)	(0.5)
Slovenia	29.6	25.6	3.9	34.0	29.2	4.7	-4.4	-3.5	-0.8
	(0.9)	(0.8)	(0.4)	(0.7)	(0.7)	(0.4)	(1.2)	(1.1)	(0.5)
Mediterranean	30.0	27.2	2.8	33.6	28.6	5.1	-3.7	-1.4	-2.3
	(0.3)	(0.3)	(0.1)	(0.3)	(0.2)	(0.1)	(0.4)	(0.4)	(0.2)
Italy	30.9	28.2	2.7	33.7	28.6	5.1	-2.8	-0.4	-2.4
	(0.4)	(0.4)	(0.2)	(0.3)	(0.3)	(0.2)	(0.6)	(0.5)	(0.3)
Spain	29.0	26.2	2.8	33.4	28.5	5.0	-4.4	-2.3	-2.1
	(0.5)	(0.5)	(0.2)	(0.4)	(0.4)	(0.2)	(0.6)	(0.6)	(0.3)
Scandinavia	30.5	27.3	3.2	32.3	28.5	3.8	-1.8	-1.2	-0.6
	(0.4)	(0.4)	(0.2)	(0.4)	(0.4)	(0.2)	(0.5)	(0.5)	(0.3)
Denmark	29.6	26.3	3.3	31.0	27.3	3.7	-1.3	-0.9	-0.4
	(0.6)	(0.6)	(0.3)	(0.6)	(0.6)	(0.3)	(0.9)	(0.9)	(0.4)
Sweden	31.1	27.9	3.2	33.2	29.3	3.9	-2.1	-1.4	-0.7
	(0.5)	(0.5)	(0.2)	(0.4)	(0.5)	(0.2)	(0.7)	(0.7)	(0.3)
England	29.2	23.5	5.7	32.7	25.5	7.2	-3.5	-2.0	-1.5
	(0.3)	(0.3)	(0.1)	(0.2)	(0.2)	(0.2)	(0.3)	(0.3)	(0.2)
US	27.5	23.0	4.5	30.7	24.6	6.1	-3.3	-1.6	-1.6
	(0.2)	(0.2)	(0.1)	(0.2)	(0.2)	(0.1)	(0.3)	(0.3)	(0.1)

Notes: LE stands for life expectancy, HLE for healthy life expectancy, and ULE for unhealthy life expectancy. For each country we report the median (and the standard deviation in parenthesis) of the distribution of the corresponding life expectancies that arises from the posterior distribution of the estimated $\boldsymbol{\beta}$ parameters.

Table D.4: Life expectancies: Pooled education

	A. Males			B. Females			C. Difference		
	LE	HLE	ULE	LE	HLE	ULE	LE	HLE	ULE
Western Europe	31.3	27.4	3.8	34.3	29.5	4.8	-3.0	-2.0	-1.0
	(0.4)	(0.3)	(0.2)	(0.3)	(0.3)	(0.2)	(0.5)	(0.4)	(0.2)
Austria	30.8	27.5	3.3	32.9	28.9	4.0	-2.1	-1.4	-0.7
	(0.6)	(0.5)	(0.2)	(0.5)	(0.4)	(0.2)	(0.7)	(0.7)	(0.3)
France	31.7	27.4	4.2	35.2	29.8	5.4	-3.5	-2.3	-1.2
	(0.5)	(0.4)	(0.2)	(0.3)	(0.3)	(0.2)	(0.6)	(0.6)	(0.3)
Eastern Europe	26.9	23.3	3.6	32.4	27.4	5.0	-5.5	-4.0	-1.4
	(0.3)	(0.3)	(0.1)	(0.2)	(0.2)	(0.1)	(0.4)	(0.4)	(0.2)
Czechia	26.7	23.3	3.3	31.5	27.0	4.5	-4.8	-3.7	-1.2
	(0.5)	(0.5)	(0.2)	(0.4)	(0.4)	(0.2)	(0.7)	(0.6)	(0.3)
Estonia	26.4	22.9	3.5	33.3	27.9	5.5	-6.9	-5.0	-1.9
	(0.6)	(0.5)	(0.2)	(0.4)	(0.4)	(0.2)	(0.7)	(0.6)	(0.3)
Poland	26.0	22.1	3.8	30.8	25.6	5.2	-4.8	-3.4	-1.4
	(0.7)	(0.7)	(0.3)	(0.6)	(0.6)	(0.4)	(0.9)	(0.9)	(0.5)
Slovenia	30.1	26.4	3.7	34.3	29.8	4.5	-4.2	-3.4	-0.8
	(0.8)	(0.8)	(0.3)	(0.6)	(0.6)	(0.3)	(1.1)	(1.0)	(0.5)
Mediterranean	30.2	27.5	2.8	33.7	28.8	4.9	-3.4	-1.3	-2.1
	(0.3)	(0.3)	(0.1)	(0.2)	(0.2)	(0.1)	(0.4)	(0.4)	(0.2)
Italy	31.2	28.4	2.8	33.8	28.8	5.0	-2.7	-0.4	-2.2
	(0.4)	(0.4)	(0.2)	(0.3)	(0.3)	(0.2)	(0.5)	(0.5)	(0.3)
Spain	29.4	26.6	2.8	33.4	28.6	4.8	-4.1	-2.0	-2.0
	(0.5)	(0.4)	(0.1)	(0.4)	(0.3)	(0.2)	(0.6)	(0.5)	(0.2)
Scandinavia	31.1	28.2	3.0	33.0	29.7	3.3	-1.9	-1.5	-0.3
	(0.3)	(0.3)	(0.1)	(0.3)	(0.3)	(0.1)	(0.4)	(0.4)	(0.2)
Denmark	30.3	27.4	2.9	31.8	28.8	3.0	-1.5	-1.4	-0.1
	(0.5)	(0.5)	(0.2)	(0.5)	(0.5)	(0.2)	(0.7)	(0.7)	(0.3)
Sweden	31.8	28.8	3.0	33.9	30.4	3.5	-2.1	-1.6	-0.5
	(0.4)	(0.4)	(0.2)	(0.3)	(0.4)	(0.2)	(0.5)	(0.6)	(0.3)
England	29.8	24.4	5.4	32.8	26.0	6.9	-3.0	-1.6	-1.5
	(0.2)	(0.2)	(0.1)	(0.2)	(0.2)	(0.1)	(0.3)	(0.3)	(0.2)
US	28.3	24.3	4.1	31.3	25.5	5.8	-3.0	-1.3	-1.7
	(0.2)	(0.2)	(0.1)	(0.2)	(0.2)	(0.1)	(0.3)	(0.2)	(0.1)

Notes: LE stands for life expectancy, HLE for healthy life expectancy, and ULE for unhealthy life expectancy. For each country we report the median (and the standard deviation in parenthesis) of the distribution of the corresponding life expectancies that arises from the posterior distribution of the estimated $\boldsymbol{\beta}$ parameters.

Table D.5: Education gradients

	A. Males			B. Females			C. Difference		
	LE	HLE	ULE	LE	HLE	ULE	LE	HLE	ULE
Western Europe	3.9	4.6	-0.8	1.7	3.0	-1.3	2.2	1.6	0.6
	(0.7)	(0.7)	(0.4)	(0.6)	(0.7)	(0.4)	(1.0)	(1.0)	(0.6)
Austria	3.8	4.1	-0.3	1.7	2.7	-1.0	2.2	1.4	0.8
	(1.1)	(1.0)	(0.5)	(1.1)	(1.0)	(0.5)	(1.5)	(1.4)	(0.7)
France	3.9	5.0	-1.1	1.8	3.2	-1.5	2.2	1.8	0.4
	(1.0)	(1.0)	(0.5)	(0.8)	(0.9)	(0.7)	(1.3)	(1.4)	(0.9)
Eastern Europe	4.0	4.3	-0.3	3.9	5.1	-1.2	0.1	-0.8	0.9
	(0.8)	(0.7)	(0.3)	(0.6)	(0.6)	(0.4)	(1.0)	(0.9)	(0.5)
Czechia	3.5	4.0	-0.5	5.9	5.7	0.1	-2.3	-1.6	-0.7
	(1.3)	(1.2)	(0.5)	(1.0)	(1.1)	(0.8)	(1.7)	(1.7)	(0.9)
Estonia	4.6	4.6	-0.0	2.5	4.5	-2.0	2.1	0.1	2.0
	(1.3)	(1.2)	(0.5)	(0.8)	(0.8)	(0.5)	(1.5)	(1.4)	(0.7)
Poland	5.4	4.5	0.8	1.0	1.3	-0.6	4.4	3.2	1.3
	(2.0)	(1.9)	(1.1)	(2.6)	(2.6)	(1.7)	(3.2)	(3.2)	(2.0)
Slovenia	2.5	3.7	-1.3	3.0	5.3	-2.5	-0.5	-1.6	1.2
	(1.7)	(1.6)	(0.8)	(1.5)	(1.7)	(1.0)	(2.3)	(2.4)	(1.2)
Mediterranean	3.0	3.4	-0.4	0.7	4.1	-3.5	2.3	-0.7	3.1
	(1.0)	(1.0)	(0.5)	(1.1)	(1.1)	(0.4)	(1.5)	(1.5)	(0.7)
Italy	2.5	2.1	0.3	2.5	5.9	-3.6	0.1	-3.8	3.9
	(1.3)	(1.4)	(0.8)	(1.6)	(1.8)	(0.8)	(2.1)	(2.3)	(1.2)
Spain	3.4	4.3	-0.9	-0.0	3.0	-3.1	3.5	1.3	2.2
	(1.4)	(1.4)	(0.5)	(1.4)	(1.5)	(0.6)	(2.0)	(2.0)	(0.8)
Scandinavia	2.1	2.9	-0.8	2.3	3.7	-1.4	-0.1	-0.8	0.7
	(0.7)	(0.7)	(0.3)	(0.6)	(0.6)	(0.3)	(0.9)	(0.9)	(0.4)
Denmark	2.0	3.0	-1.0	2.1	4.0	-1.9	-0.1	-1.0	0.9
	(1.0)	(1.0)	(0.4)	(1.0)	(1.0)	(0.4)	(1.4)	(1.4)	(0.6)
Sweden	2.5	2.9	-0.5	2.8	3.6	-0.8	-0.3	-0.7	0.3
	(0.8)	(0.9)	(0.5)	(0.8)	(0.8)	(0.5)	(1.1)	(1.2)	(0.7)
England	3.4	4.7	-1.3	1.2	3.0	-1.8	2.2	1.7	0.5
	(0.6)	(0.6)	(0.3)	(0.6)	(0.6)	(0.4)	(0.8)	(0.8)	(0.5)
US	3.6	5.3	-1.7	3.2	5.1	-2.0	0.4	0.1	0.3
	(0.4)	(0.4)	(0.2)	(0.4)	(0.4)	(0.2)	(0.6)	(0.6)	(0.3)
Average	3.4	4.0	-0.6	2.2	3.9	-1.7	1.2	0.1	1.1
	(0.4)	(0.3)	(0.2)	(0.4)	(0.4)	(0.2)	(0.5)	(0.5)	(0.3)

Notes: LE stands for life expectancy, HLE for healthy life expectancy, and ULE for unhealthy life expectancy, all at age 50. The education gradient is the difference in the corresponding life expectancy between college and non-college individuals. Panel A refers to males, Panel B to females, and Panel C is the difference between the male and female gradients. For each country we report the median (and the standard deviation in parenthesis) of the distribution of the corresponding life expectancy gradient that arises from the posterior distribution of the estimated $\boldsymbol{\beta}$ parameters.

Table D.6: Gender Gaps

	A. Low educated			B. High educated			C. Difference		
	LE	HLE	ULE	LE	HLE	ULE	LE	HLE	ULE
Western Europe	3.7	2.6	1.0	1.5	1.0	0.5	2.2	1.6	0.6
	(0.6)	(0.5)	(0.2)	(0.8)	(0.8)	(0.5)	(1.0)	(1.0)	(0.6)
Eastern Europe	5.6	4.1	1.6	5.5	4.9	0.6	0.1	-0.8	0.9
	(0.4)	(0.4)	(0.2)	(0.9)	(0.8)	(0.4)	(1.0)	(0.9)	(0.5)
Mediterranean	3.7	1.4	2.3	1.3	2.1	-0.8	2.3	-0.7	3.1
	(0.4)	(0.4)	(0.2)	(1.4)	(1.5)	(0.6)	(1.5)	(1.5)	(0.7)
Scandinavia	1.8	1.2	0.6	1.9	2.0	-0.1	-0.1	-0.8	0.7
	(0.5)	(0.5)	(0.3)	(0.7)	(0.8)	(0.4)	(0.9)	(0.9)	(0.4)
England	3.5	2.0	1.5	1.3	0.3	0.9	2.2	1.7	0.5
	(0.3)	(0.3)	(0.2)	(0.7)	(0.7)	(0.5)	(0.8)	(0.8)	(0.5)
US	3.3	1.6	1.6	2.9	1.5	1.4	0.4	0.1	0.3
	(0.3)	(0.3)	(0.1)	(0.5)	(0.5)	(0.2)	(0.6)	(0.6)	(0.3)
Average	3.9	2.5	1.4	2.7	2.4	0.3	1.2	0.1	1.1
	(0.2)	(0.2)	(0.1)	(0.5)	(0.5)	(0.3)	(0.5)	(0.5)	(0.3)

Notes: LE stands for life expectancy, HLE for healthy life expectancy, and ULE for unhealthy life expectancy, all at age 50. The gender gap is the difference in the corresponding life expectancy between females and males. Panel A refers to individuals without college, Panel B to individuals with a college degree, and Panel C is the difference between the non-college and the college gender gaps. For each country we report the median (and the standard deviation in parenthesis) of the distribution of the corresponding life expectancy gap that arises from the posterior distribution of the estimated $\boldsymbol{\beta}$ parameters.

Table D.7: Decomposition of LE education gradients (bad health: ADL2+)

	A. Males				B. Females			
	LE	LE_D	LE_T	LE_S	LE	LE_D	LE_T	LE_S
Western Europe	4.0	0.0	0.5	3.6	1.8	0.0	0.9	1.3
	(0.7)	(0.0)	(0.2)	(0.7)	(0.6)	(0.0)	(0.2)	(0.7)
Eastern Europe	3.9	0.1	0.5	3.1	3.8	0.0	0.7	2.8
	(0.8)	(0.0)	(0.2)	(0.8)	(0.6)	(0.0)	(0.1)	(0.6)
Mediterranean	3.0	0.0	0.6	2.6	0.2	0.0	1.0	-1.2
	(1.0)	(0.0)	(0.3)	(1.0)	(1.1)	(0.0)	(0.3)	(1.1)
Scandinavia	2.0	0.0	0.4	1.7	2.2	0.0	0.7	1.3
	(0.7)	(0.0)	(0.2)	(0.7)	(0.6)	(0.0)	(0.2)	(0.6)
England	3.4	0.1	0.8	2.1	1.1	0.0	0.4	0.7
	(0.6)	(0.0)	(0.2)	(0.6)	(0.6)	(0.0)	(0.1)	(0.6)
US	3.6	0.1	1.2	2.2	3.1	0.1	1.1	1.9
	(0.4)	(0.0)	(0.1)	(0.5)	(0.4)	(0.0)	(0.1)	(0.4)
Average	3.4	0.1	0.6	2.8	2.3	0.0	0.7	1.3
	(0.4)	(0.0)	(0.1)	(0.4)	(0.4)	(0.0)	(0.1)	(0.4)

Notes: LE: education gradient in life expectancy at age 50. Counterfactual education gradients when education types differ only in: health distribution at age 50 (LE_D), health transition conditional on being alive (LE_T), probability of survival (LE_S). Bad health defines as having problems with at least 2 activities of daily living. For each country we report the median (and the standard deviation in parenthesis) of the distribution of the corresponding life expectancy gradient that arises from the posterior distribution of the estimated $\boldsymbol{\beta}$ parameters.

Table D.8: Decomposition of HLE education gradients (bad health: ADL2+)

	A. Males				B. Females			
	HLE	HLE_D	HLE_T	HLE_S	HLE	HLE_D	HLE_T	HLE_S
Western Europe	4.3	0.1	1.2	3.1	2.8	0.1	2.0	0.8
	(0.7)	(0.0)	(0.4)	(0.6)	(0.7)	(0.0)	(0.4)	(0.5)
Eastern Europe	4.1	0.1	1.0	2.7	4.9	0.0	2.0	2.5
	(0.8)	(0.0)	(0.4)	(0.7)	(0.6)	(0.0)	(0.3)	(0.5)
Mediterranean	3.0	0.1	1.0	2.1	2.2	0.0	2.7	-0.5
	(0.9)	(0.0)	(0.5)	(0.8)	(1.1)	(0.0)	(0.8)	(0.8)
Scandinavia	2.2	0.1	0.7	1.4	3.1	0.1	1.5	1.3
	(0.7)	(0.0)	(0.4)	(0.6)	(0.6)	(0.0)	(0.4)	(0.6)
England	4.3	0.3	1.8	2.0	1.9	0.2	1.3	0.5
	(0.6)	(0.0)	(0.3)	(0.5)	(0.6)	(0.0)	(0.4)	(0.5)
US	4.6	0.2	2.3	2.0	4.4	0.2	2.5	1.6
	(0.4)	(0.0)	(0.2)	(0.4)	(0.4)	(0.0)	(0.2)	(0.3)
Average	3.7	0.1	1.1	2.4	3.3	0.1	2.0	1.2
	(0.4)	(0.0)	(0.2)	(0.3)	(0.4)	(0.0)	(0.2)	(0.3)

Notes: HLE: education gradient in healthy life expectancy at age 50. Counterfactual education gradients when education types differ only in: health distribution at age 50 (HLE_D), health transition conditional on being alive (HLE_T), probability of survival (HLE_S). Bad health defines as having problems with at least 2 activities of daily living. For each country we report the median (and the standard deviation in parenthesis) of the distribution of the corresponding life expectancy gradient that arises from the posterior distribution of the estimated $\boldsymbol{\beta}$ parameters.

Table D.9: Decomposition of ULE education gradients (bad health: ADL2+)

	A. Males				B. Females			
	ULE	ULE_D	ULE_T	ULE_S	ULE	ULE_D	ULE_T	ULE_S
Western Europe	-0.3	-0.0	-0.7	0.5	-1.0	-0.0	-1.2	0.4
	(0.3)	(0.0)	(0.2)	(0.2)	(0.3)	(0.0)	(0.2)	(0.2)
Eastern Europe	-0.2	-0.1	-0.5	0.4	-1.1	-0.0	-1.3	0.3
	(0.2)	(0.0)	(0.2)	(0.2)	(0.2)	(0.0)	(0.2)	(0.2)
Mediterranean	-0.1	-0.0	-0.4	0.5	-2.0	-0.0	-1.7	-0.6
	(0.4)	(0.0)	(0.2)	(0.2)	(0.4)	(0.0)	(0.5)	(0.4)
Scandinavia	-0.1	-0.0	-0.3	0.3	-0.8	-0.1	-0.8	-0.0
	(0.2)	(0.0)	(0.2)	(0.1)	(0.2)	(0.0)	(0.2)	(0.2)
England	-0.9	-0.2	-1.0	0.2	-0.8	-0.1	-0.9	0.2
	(0.2)	(0.0)	(0.2)	(0.2)	(0.3)	(0.0)	(0.3)	(0.2)
US	-1.0	-0.1	-1.1	0.2	-1.3	-0.1	-1.4	0.3
	(0.1)	(0.0)	(0.1)	(0.1)	(0.2)	(0.0)	(0.1)	(0.1)
Average	-0.3	-0.1	-0.5	0.3	-1.2	-0.1	-1.2	0.1
	(0.1)	(0.0)	(0.1)	(0.1)	(0.2)	(0.0)	(0.2)	(0.1)

Notes: ULE: education gradient in unhealthy life expectancy at age 50. Counterfactual education gradients when education types differ only in: health distribution at age 50 (ULE_D), health transition conditional on being alive (ULE_T), probability of survival (ULE_S). Bad health defines as having problems with at least 2 activities of daily living. For each country we report the median (and the standard deviation in parenthesis) of the distribution of the corresponding life expectancy gradient that arises from the posterior distribution of the estimated $\boldsymbol{\beta}$ parameters.

Table D.10: Decomposition of LE education gradients (bad health: MBL3+)

	A. Males				B. Females			
	LE	LE_D	LE_T	LE_S	LE	LE_D	LE_T	LE_S
Western Europe	4.4	0.2	1.4	3.5	2.1	0.0	0.9	1.2
	(0.8)	(0.0)	(0.3)	(0.8)	(0.8)	(0.0)	(0.2)	(0.8)
Eastern Europe	4.2	0.2	1.1	3.1	4.6	0.0	1.0	3.5
	(0.9)	(0.0)	(0.3)	(0.9)	(0.7)	(0.0)	(0.2)	(0.8)
Mediterranean	3.1	0.0	1.3	2.3	-0.2	0.0	0.8	-1.3
	(1.1)	(0.0)	(0.4)	(1.2)	(1.2)	(0.0)	(0.3)	(1.3)
Scandinavia	2.3	0.1	1.2	1.2	2.2	0.1	0.5	1.5
	(0.8)	(0.0)	(0.3)	(0.8)	(0.7)	(0.0)	(0.2)	(0.7)
England	3.2	0.2	1.3	1.8	1.1	0.0	0.6	0.5
	(0.6)	(0.0)	(0.2)	(0.6)	(0.6)	(0.0)	(0.1)	(0.6)
US	3.6	0.2	2.0	1.1	3.1	0.1	1.5	1.8
	(0.4)	(0.0)	(0.1)	(0.5)	(0.4)	(0.0)	(0.1)	(0.4)
Average	3.7	0.1	1.2	2.6	2.5	0.0	0.9	1.5
	(0.4)	(0.0)	(0.2)	(0.4)	(0.4)	(0.0)	(0.1)	(0.5)

Notes: LE: education gradient in life expectancy at age 50. Counterfactual education gradients when education types differ only in: health distribution at age 50 (LE_D), health transition conditional on being alive (LE_T), probability of survival (LE_S). Bad health defines as having problems with at least 3 mobility activities. For each country we report the median (and the standard deviation in parenthesis) of the distribution of the corresponding life expectancy gradient that arises from the posterior distribution of the estimated $\boldsymbol{\beta}$ parameters.

Table D.11: Decomposition of HLE education gradients (bad health: MBL3+)

	A. Males				B. Females			
	HLE	HLE_{D}	HLE_{T}	HLE_{S}	HLE	HLE_{D}	HLE_{T}	HLE_{S}
Western Europe	5.5	0.3	3.3	2.1	5.2	0.3	4.3	0.5
	(0.8)	(0.0)	(0.7)	(0.5)	(0.8)	(0.0)	(0.7)	(0.4)
Eastern Europe	4.5	0.4	2.4	1.7	6.6	0.4	4.2	1.5
	(0.8)	(0.0)	(0.6)	(0.6)	(0.7)	(0.0)	(0.6)	(0.3)
Mediterranean	4.3	0.1	3.1	1.3	3.9	0.2	4.2	-0.3
	(1.1)	(0.0)	(0.8)	(0.7)	(1.3)	(0.0)	(1.3)	(0.4)
Scandinavia	3.7	0.2	2.8	0.8	3.9	0.4	2.5	1.0
	(0.8)	(0.0)	(0.6)	(0.6)	(0.8)	(0.0)	(0.6)	(0.5)
England	5.3	0.6	3.6	1.1	3.7	0.4	3.2	0.1
	(0.6)	(0.0)	(0.5)	(0.4)	(0.6)	(0.0)	(0.5)	(0.3)
US	7.1	0.7	5.6	0.6	7.1	0.7	5.8	0.6
	(0.4)	(0.0)	(0.3)	(0.3)	(0.4)	(0.0)	(0.3)	(0.1)
Average	4.7	0.4	2.8	1.6	5.0	0.4	4.0	0.7
	(0.4)	(0.0)	(0.3)	(0.3)	(0.5)	(0.0)	(0.4)	(0.2)

Notes: HLE: education gradient in healthy life expectancy at age 50. Counterfactual education gradients when education types differ only in: health distribution at age 50 (HLE_{D}), health transition conditional on being alive (HLE_{T}), probability of survival (HLE_{S}). Bad health defines as having problems with at least 3 mobility activities. For each country we report the median (and the standard deviation in parenthesis) of the distribution of the corresponding life expectancy gradient that arises from the posterior distribution of the estimated $\boldsymbol{\beta}$ parameters.

Table D.12: Decomposition of ULE education gradients (bad health: MBL3+)

	A. Males				B. Females			
	ULE	ULE_D	ULE_T	ULE_S	ULE	ULE_D	ULE_T	ULE_S
Western Europe	-1.0	-0.2	-1.9	1.4	-3.1	-0.2	-3.4	0.7
	(0.6)	(0.0)	(0.4)	(0.4)	(0.7)	(0.0)	(0.6)	(0.5)
Eastern Europe	-0.4	-0.2	-1.3	1.4	-1.9	-0.4	-3.2	2.0
	(0.5)	(0.0)	(0.3)	(0.4)	(0.7)	(0.0)	(0.5)	(0.5)
Mediterranean	-1.3	-0.1	-1.8	1.1	-4.2	-0.1	-3.3	-1.0
	(0.7)	(0.0)	(0.5)	(0.5)	(1.1)	(0.0)	(1.0)	(0.9)
Scandinavia	-1.4	-0.1	-1.6	0.4	-1.8	-0.4	-1.9	0.5
	(0.4)	(0.0)	(0.3)	(0.3)	(0.6)	(0.0)	(0.5)	(0.3)
England	-2.1	-0.4	-2.3	0.8	-2.6	-0.4	-2.6	0.4
	(0.4)	(0.0)	(0.3)	(0.3)	(0.5)	(0.0)	(0.4)	(0.4)
US	-3.6	-0.5	-3.6	0.5	-4.0	-0.6	-4.4	1.3
	(0.3)	(0.0)	(0.2)	(0.3)	(0.3)	(0.0)	(0.2)	(0.3)
Average	-1.1	-0.2	-1.6	1.0	-2.7	-0.4	-3.1	0.8
	(0.3)	(0.0)	(0.2)	(0.2)	(0.4)	(0.0)	(0.3)	(0.3)

Notes: ULE: education gradient in unhealthy life expectancy at age 50. Counterfactual education gradients when education types differ only in: health distribution at age 50 (ULE_D), health transition conditional on being alive (ULE_T), probability of survival (ULE_S). Bad health defines as having problems with at least 3 mobility activities. For each country we report the median (and the standard deviation in parenthesis) of the distribution of the corresponding life expectancy gradient that arises from the posterior distribution of the estimated $\boldsymbol{\beta}$ parameters.

Table D.13: Counterfactual education gradients without health recovery

	A. Males			B. Females		
	LE	HLE	ULE	LE	HLE	ULE
Western Europe	5.2	4.5	0.6	2.4	4.1	-1.7
	(1.0)	(1.0)	(1.1)	(1.1)	(0.9)	(1.2)
Eastern Europe	4.3	3.9	0.4	4.1	5.7	-1.6
	(1.0)	(0.9)	(1.0)	(0.9)	(0.8)	(1.0)
Mediterranean	4.6	4.4	0.2	-0.2	4.4	-4.6
	(1.2)	(1.3)	(1.2)	(1.5)	(2.0)	(1.5)
Scandinavia	3.3	3.1	0.1	2.5	3.7	-1.3
	(0.9)	(1.0)	(1.0)	(1.0)	(1.0)	(1.1)
England	3.9	4.2	-0.3	1.2	3.5	-2.3
	(0.8)	(0.6)	(0.9)	(0.9)	(0.6)	(1.0)
US	4.2	6.8	-2.7	4.0	4.8	-0.8
	(0.5)	(0.5)	(0.5)	(0.6)	(0.5)	(0.6)
Average	4.1	4.4	-0.3	2.2	3.8	-1.8
	(0.5)	(0.5)	(0.5)	(0.6)	(0.7)	(0.7)

Notes: Counterfactual education gradients when probability of recovery from bad health is switched to zero and survival probability conditional on bad health is unchanged. LE: education gradient in totsl life expectancy at age 50, HLE: education gradient in healthy life expectancy at age 50, ULE: education gradient in unhealthy life expectancy at age 50. For each country we report the median (and the standard deviation in parenthesis) of the distribution of the corresponding life expectancy gradient that arises from the posterior distribution of the estimated $\boldsymbol{\beta}$ parameters.

Appendix E: Validation Appendix

E.1 Introduction

The use of survey data such as SHARE, HRS, or ELSA for survival analysis is not without problems. Despite the careful design of their sampling frames, there is a variety of reasons that may cause the survival rates computed with survey data not to align well with the ones computed in the population. For instance, there is the possibility of biases in sample design, in the response rates at baseline, or in the sample retention, which are all problems inherent in survey data. The importance of these potential problems is likely to differ across countries. Therefore, this Appendix explores the quality for survival analysis of each SHARE country data alongside the ELSA and HRS surveys. Section E.2 compares non-parametric Kaplan-Meier survival functions from our survey data to those obtained from the population, showing that HRS, ELSA, and several SHARE country samples do quite well. Next, Section E.3 provides another set of results assessing the quality of a parametric logit model to approximate the non-parametric survival functions. Section E.4 discusses the HRS sample frames. Finally, in Section E.5 we discuss the observed attrition in the SHARE country samples and to which extent it may be correlated with survival.

E.2 Validation

In this Section we compare the Kaplan-Meier survival functions computed on the survey data for each country-gender to the ones obtained in the population. Our *long sample* uses all observations of any individual, even if they are non-consecutive, as we do in the main paper (see Section 3 of the main paper). SHARE samples suffered substantial attrition in the first two waves and a special effort was undertaken to recover lost households. This effort to recover individuals lost to attrition may have potentially added new sources of bias if its success is related to the survival status of the individual. For this reason, we also use a second sample (*short sample*) that only uses the first set of consecutive observations.

The data for the survival functions in the population are extracted from different sources. For each country we use the life tables of the range of years for which we have survey data and take the unweighted average.[4]

[4]We use EUROSTAT data for all European countries. Data for England comes from the Office of National Statistics, data for Israel comes from the Central Bureau of Statistics, and data for the US comes from the Center for Disease Control and Prevention. See Table D.1 in the main paper for the range of years that applies to each country.

We display the survival functions for every country and gender in Figures E.1 to E.18 and the associated life expectancies at ages 50 and 65 in Table E.1. The results from the validation exercise are the following.

First, the survival curves of the *short sample* are systematically above the ones of the *long sample* for all SHARE countries except for Greece, Israel and Spain—as well as for the non-SHARE countries England and the US—where the opposite is true.[5] This difference is clearly reflected in the life expectancies computed with each sample. The differences between the survival functions computed with the different samples is large for some cases, like in Greece, Israel, Denmark, Netherlands, and Sweden.

Second, the survival curves of both the *short sample* and the *long sample* are above the ones in the population for all countries except for England, Israel, Spain, and the US. All in all, the *long sample* produces a better approximation to the population life tables in England, the US, and all SHARE countries except Greece and Spain. Given this and that by construction the *long sample* contains more transitions than the *short sample*, we conclude that the *long sample* is preferred for survival analysis.

Third, the difference between the survival functions computed with the *long sample* and the ones from the population tends to be substantially larger for males than females.

And fourth, we observe a large amount of heterogeneity in the difference between the survival functions computed in the population and the ones computed with the *long sample*. We use life expectancies at age 50 as a way to quantify these differences. In particular, we classify our country samples as producing an excellent, good, or poor approximation to the population survival functions if the difference in life expectancy at age 50 is 1 or less, above 1 and up to 2.5, or above 2.5. According to this criterion the excellent country samples are: Austria females, Czech Republic, Denmark females, England, Italy, Israel females, Poland, Spain, and the US; the good country samples are: Austria males, Denmark males, Estonia, France, Greece females, Israel males, Slovenia, Sweden, and Switzerland females; and the poor country samples are Belgium, Germany, Greece males, Netherlands, and Switzerland males. For our main analysis we drop the countries where at least one of the sexes has a poor approximation to life tables: Belgium, Germany, Greece, Netherlands, and Switzerland. In addition, we drop Israel because there is a large incidence of errors in the dates of death.[6] Therefore, the list of countries we

[5]The distinction between *short sample* and *long sample* for England and the US is not so easy to interpret because these surveys experienced neither the strong attrition suffered by SHARE nor the posterior effort to recover individuals.

[6]These errors are uncovered because more than 10% of recorded death events have a date of death previous to an actual interview where the respondent was alive. We set these dates of death to missing, but other errors in the date of death are impossible to detect. This problem may be behind the odd fact

work with is given by: Austria, Czech Republic, Denmark, England, Estonia, France, Italy, Poland, Slovenia, Spain, Sweden, and the US.

E.3 Parametric versus non-parametric survival functions

The non-parametric Kaplan-Meier survival functions give plenty of degrees of freedom to adjust the age-profile of survival functions. However, when exploring the socio-economic gradient of survival functions we need a more parsimonious approach. For this reason, in this Section we compare the Kaplan-Meier survival functions to the estimates based on a logit model. We do so only for the *long sample* in each country-gender group. In Figures E.1 to E.18 we plot for each country and gender the Kaplan-Meier survival functions together with a logit survival function estimated with a linear term in age. In Table E.1 we summarize these survival functions with the life expectancies at age 50 and 65. Our results are very clear: the logit model produces survival functions that follow very well the non-parametric Kaplan-Meier estimates, and the differences in life expectancies computed with one or the other method are very similar.

E.4 Sampling frames

Not all waves in the HRS-like samples provide refreshments. This may raise concerns that, by using non-refreshment waves, the age-representativeness is lost and some age cells may be scarcely populated. We think this is not a problem in our analysis for two reasons. First, our estimates are conditional on age, which means that age-representativeness is not a problem. Second, regarding the risk of some age cells being scarcely populated, note that in order to estimate age-specific health transitions and age-specific mortality rates, we pool individuals of different birth cohorts observed in different years. In this manner, even if some waves do not entail sample refreshments, all age cells should be largely populated. Furthermore, while we estimate different health transitions and survival rates for every education $\times$ gender $\times$ country group, we model the age-dependence of these objects as a linear age term within a logit function (see E.3 above for the suitability of this parametric assumption). This means that, even if some age cells were scarcely populated, adjacent cells would provide useful information for the estimation. Indeed, given this parametric approach, we treat age as a continuous variable given by the difference between year-month of interview (or year-month of death event) and the year-month of birth (this is true for all countries except for England, because the ELSA data set does not provide

that Israel is the only SHARE country where the survival rate in the sample is clearly below the one in the population.

month of birth). One way to dispel doubts here is by looking at the age distribution of our "main" HRS sample (waves 6 to 11) and compare it to the age distribution of a "restricted" HRS sample that only includes refreshments (waves 7 and 10). In Figure E.19 we plot the histograms of these age distributions for males and females. It is clear from these histograms that all age cells are well populated. Yet, the age distributions are slightly different. For the "restricted" HRS sample we have the density of the age distribution decaying monotonically with age (after age 52), as it happens for the whole population. This is not exactly the case for our "main" HRS sample, where the density has a maximum around 70 years of age. This difference comes from the fact that the refresher HRS waves 7 and 10 are designed to be representative of the overall population, while our "main" HRS sample is not. Yet, our "main" HRS sample has the benefit of being twice as big.

That being said, we also have re-estimated our model with the "restricted" HRS sample. In Table E.2 we provide the gradients and their decompositions computed with both samples. We can see that most point estimates are very similar and that their standard errors are somewhat larger with the smaller "restricted" HRS sample. Perhaps the largest discrepancy to be found is in the LE and the HLE gradients for females. Nevertheless, all discrepancies are not statistically significant as they fall well within the confidence intervals of two standard deviations.

E.5 Attrition

One potential problem regarding the use of SHARE data for survival analysis is that panel attrition rates for those who survive might be different from those who die. If for instance panel attrition rates are larger among deceased respondents, then our survival estimates would be upward biased. Since it is difficult to know the survival status of those who attrite between waves, implementing a formal test for the existence of that bias is not possible. Alternatively, and assuming that subjective survival probabilities correlate with actual mortality, we can exploit the data that SHARE collects on respondents' survival expectations to explore the relationship between attrition and survival.[7]

SHARE respondents' expectations are elicited as point expectations through the following question: "What are the chances that you will live to be age [75/80/85/90/95/100/105/110/120]? We analyse whether panel attrition, conditional on age and education, cor-

[7] Using HRS data, Hurd, McFadden and Merrill (1999) show that subjective survival probabilities correlate with actual mortality. Other studies also based on the HRS have also shown that these indicators are highly correlated with other measures of expected longevity such as smoking and body mass index (Hurd and McGarry (1995)).

relates with subjective survival probability through the estimation of logit models where the dependent variable is given by a binary indicator that equals to one if the respondent did not participate in the next wave ("attrited"). This binary variable is regressed on the respondent's own subjective survival probability ("explive_dm"), which has been demeaned using for each observation the sample mean for its country and age group in order to account for the fact that the target age in the SHARE question on survival expectation varies by the respondent's age. Additional controls are given by a quadratic function on age and a dummy variable for less than tertiary education.

Regarding the interpretation of the results, a negative and significant coefficient of the subjective survival probability would imply that individuals with higher survival expectations have a lower likelihood to drop out from the survey. The estimates shown in Panel A of Table 3 are based on the pool of observations for all waves at the country-gender level. Our results provide evidence that, conditional on age and education, subjective survival probability predicts panel attrition only in some cases. Among our country-gender samples, the coefficient of the variable "explive_dm" is negative and significant for Austria females, Germany females, Italy females, Greece males, Switzerland both males and females, Poland males, and Estonia females, which means that "survivors" are less likely to attrit in those cases. As mentioned above, this suggests that panel attrition might bias (upwards) the estimates of life expectancy based on these samples. Instead, country samples like Belgium or Netherlands, whose life expectancies are clearly above their population counterparts, do not show any evidence of survival-related attrition.

An additional important issue is whether attrition could induce biases in the education gradient for life expectancy. This would happen as long as panel attrition differentials between "survivors" and "deceased" individuals varied by education level. To check this out, we include in our logit regressions an interaction term between the subjective survival probability and the dummy for low educated ("exp_educ"). A significant coefficient would suggest that subjective survival probability predicts attrition differently for different education groups which would bias the gradient. Panel B shows the estimated coefficients of interest for this version of the logit model. In particular, we get significant, or close to significant coefficients only for Austria females, France females, and Belgium females. For Austria females the sign is positive, which would imply that we might be overestimating the education gradient in life expectancy. For France females and Belgium females the sign is negative, hence the bias would run in the opposite direction.

E.6 Tables and Figures

Table E.1: Life expectancies

Country	G	A. Life expectancy at 50 Pop	km_S	km_L	Logit	B. Life expectancy at 65 Pop	km_S	km_L	Logit
Austria	m	28.9	3.2	1.7	1.4	16.6	2.6	1.6	1.6
Austria	f	33.0	0.9	0.0	0.0	19.5	1.4	0.6	0.5
Belgium	m	28.7	4.3	2.9	2.8	16.4	3.6	2.4	2.5
Belgium	f	32.6	3.1	2.3	2.2	19.4	2.7	2.1	2.0
Czech	m	26.2	1.1	0.6	0.3	14.7	0.8	0.8	0.6
Czech	f	31.0	1.3	0.8	0.6	17.8	1.0	0.6	0.5
Denmark	m	28.3	3.7	2.1	2.2	16.0	1.9	1.0	1.0
Denmark	f	31.4	2.3	0.7	0.7	18.3	1.8	0.5	0.4
Estonia	m	24.8	1.5	1.3	1.5	14.1	1.3	1.3	1.0
Estonia	f	31.7	2.1	1.5	1.3	18.6	1.9	1.6	1.5
France	m	29.4	3.1	2.5	2.6	17.4	2.8	2.2	2.1
France	f	34.1	2.1	1.6	1.6	20.6	1.5	1.0	1.1
Germany	m	28.8	4.6	4.0	4.1	16.5	3.8	3.3	3.4
Germany	f	32.6	2.8	2.7	2.6	19.3	1.8	1.8	1.9
Greece	m	29.1	2.8	4.2	4.3	16.8	2.4	3.0	3.1
Greece	f	32.9	2.0	2.3	2.4	19.2	1.7	1.8	1.8
Israel	m	30.3	-3.0	-1.5	-1.6	17.5	-1.7	-0.5	-0.6
Israel	f	33.0	-1.8	-0.3	-0.5	19.3	-1.0	0.0	0.0
Italy	m	30.1	1.5	1.0	1.0	17.2	1.2	0.6	0.8
Italy	f	33.7	0.9	0.1	0.1	20.0	0.5	-0.2	-0.3
Netherlands	m	29.3	3.9	2.4	2.2	16.4	3.5	2.3	2.2
Netherlands	f	32.4	4.1	3.2	3.0	19.1	3.3	2.4	2.4
Poland	m	24.8	0.4	0.3	0.5	14.3	0.0	0.0	0.3
Poland	f	30.9	0.1	-0.8	-0.6	18.1	-0.1	-0.8	-0.7
Slovenia	m	28.3	2.3	1.8	1.6	16.2	1.8	1.5	1.4
Slovenia	f	33.0	2.2	1.5	1.5	19.5	2.0	1.6	1.8
Spain	m	29.5	-0.7	-0.6	-0.6	17.1	0.2	0.1	0.1
Spain	f	34.1	0.1	-0.6	-0.6	20.3	-0.1	-0.4	-0.4
Sweden	m	30.2	3.7	1.8	1.7	17.2	2.5	1.1	1.2
Sweden	f	33.0	3.3	1.2	1.1	19.5	2.4	0.8	1.0
Switzerland	m	30.6	4.1	3.1	3.2	17.7	3.0	2.6	2.5
Switzerland	f	33.9	3.1	2.5	2.6	20.2	2.6	2.4	2.3
England	m	29.3	-1.3	-0.6	0.2	16.7	-0.7	-0.2	0.2
England	f	32.2	-0.3	0.2	0.6	18.8	-0.3	0.0	0.4
US	m	28.4	-0.7	-0.4	-0.3	16.6	-0.2	-0.2	-0.1
US	f	31.5	-0.3	-0.2	-0.3	18.6	-0.4	-0.3	-0.2

Table E.2: Education gradients and decompositions in the HRS

	A. Males				B. Females			
	LE	LE_D	LE_T	LE_S	LE	LE_D	LE_T	LE_S
Main sample	3.6	0.1	1.4	1.9	3.2	0.1	1.3	2.0
	(0.4)	(0.0)	(0.1)	(0.5)	(0.4)	(0.0)	(0.1)	(0.4)
Restricted sample	3.9	0.1	1.6	2.4	3.9	0.2	1.3	2.9
	(0.7)	(0.0)	(0.2)	(0.8)	(0.6)	(0.0)	(0.2)	(0.7)
	A. Males				**B. Females**			
	HLE	HLE_D	HLE_T	HLE_S	HLE	HLE_D	HLE_T	HLE_S
Main sample	5.3	0.3	3.2	1.5	5.1	0.4	3.5	1.3
	(0.4)	(0.0)	(0.3)	(0.4)	(0.4)	(0.0)	(0.3)	(0.3)
Restricted sample	5.5	0.3	3.5	1.7	5.8	0.5	3.6	1.8
	(0.6)	(0.0)	(0.4)	(0.6)	(0.6)	(0.0)	(0.4)	(0.4)
	A. Males				**B. Females**			
	ULE	ULE_D	ULE_T	ULE_S	ULE	ULE_D	ULE_T	ULE_S
Main sample	-1.7	-0.2	-1.8	0.4	-2.0	-0.3	-2.2	0.7
	(0.2)	(0.0)	(0.1)	(0.1)	(0.2)	(0.0)	(0.2)	(0.2)
Restricted sample	-1.6	-0.2	-1.9	0.7	-1.9	-0.3	-2.3	1.1
	(0.3)	(0.0)	(0.2)	(0.2)	(0.3)	(0.0)	(0.3)	(0.3)

Notes: “Main” sample are waves 6 to 11 of HRS, and corresponds to the HRS sample used in the main text. “Restricted” sample corresponds to waves 7 and 10 only. LE: education gradient in life expectancy at age 50. Counterfactual education gradients when education types differ only in: health distribution at age 50 (LE_D), health transition conditional on being alive (LE_T), probability of survival (LE_S). For each country we report the median (and the standard deviation in parenthesis) of the distribution of the corresponding life expectancy gradient that arises from the posterior distribution of the estimated $\boldsymbol{\beta}$ parameters. HLE and ULE are the education gradient in healthy and unhealthy life expectancy at age 50 respectivley.

Table E.3: Attrition analysis

	A. Specification 1		B. Specification 2			
	explive_dm		explive_dm		exp_educ	
Country	Males	Females	Males	Females	Males	Females
AT	-0.0031	-0.0066**	-0.0037	-0.0172***	0.0008	0.0136**
	(0.0028)	(0.0026)	(0.0058)	(0.0044)	(0.0065)	(0.0054)
DE	-0.0006	-0.0032*	-0.0003	-0.0070	-0.0004	0.0047
	(0.0020)	(0.0019)	(0.0035)	(0.0043)	(0.0042)	(0.0048)
SE	-0.0027	-0.0009	0.0035	-0.0031	-0.0073	0.0028
	(0.0025)	(0.0025)	(0.0063)	(0.0050)	(0.0069)	(0.0058)
NL	-0.0037	0.0017	-0.0081	0.0069	0.0062	-0.0063
	(0.0037)	(0.0045)	(0.0080)	(0.0101)	(0.0089)	(0.0114)
ES	0.0020	-0.0006	0.0056	0.0037	-0.0039	-0.0046
	(0.0029)	(0.0026)	(0.0080)	(0.0090)	(0.0086)	(0.0094)
IT	-0.0040	-0.0044**	-0.0042	-0.0119*	0.0003	0.0083
	(0.0024)	(0.0021)	(0.0087)	(0.0070)	(0.0090)	(0.0073)
FR	-0.0022	-0.0029	-0.0016	0.0061	-0.0007	-0.0102
	(0.0022)	(0.0019)	(0.0053)	(0.0065)	(0.0058)	(0.0068)
DK	-0.0010	-0.0005	-0.0014	-0.0082	0.0006	0.0104
	(0.0035)	(0.0033)	(0.0057)	(0.0067)	(0.0072)	(0.0076)
GR	-0.0086**	-0.0024	-0.0027	0.0038	-0.0083	-0.0071
	(0.0041)	(0.0040)	(0.0076)	(0.0100)	(0.0091)	(0.0110)
CH	-0.0061**	-0.0044*	-0.0040	-0.0030	-0.0032	-0.0018
	(0.0025)	(0.0026)	(0.0043)	(0.0054)	(0.0053)	(0.0062)
BE	-0.0028	-0.0055	0.0011	0.0067	-0.0049	-0.0152*
	(0.0027)	(0.0041)	(0.0054)	(0.0079)	(0.0062)	(0.0091)
IL	0.0030	-0.0002	0.0048	0.0031	-0.0068	-0.0080
	(0.0068)	(0.0058)	(0.0087)	(0.0067)	(0.0133)	(0.0124)
CZ	0.0023	-0.0011	0.0086*	0.0020	-0.0077	-0.0036
	(0.0020)	(0.0019)	(0.0048)	(0.0047)	(0.0053)	(0.0051)
PL	-0.0069**	-0.0012	-0.0067	-0.0078	-0.0002	0.0073
	(0.0028)	(0.0025)	(0.0077)	(0.0093)	(0.0082)	(0.0097)
SI	0.0000	-0.0002	0.0001	-0.0021	-0.0001	0.0022
	(0.0025)	(0.0023)	(0.0062)	(0.0067)	(0.0067)	(0.0071)
EE	-0.0011	-0.0045***	0.0014	-0.0068***	-0.0040	0.0040
	(0.0018)	(0.0017)	(0.0029)	(0.0026)	(0.0037)	(0.0034)

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Logit regressions that control for age, age squared, and low education. Weighted results. Explive_dm represents subjective survival probability and a dummy for exp_educ low education, respectively.

Figure E.1: Survival rates: Austria

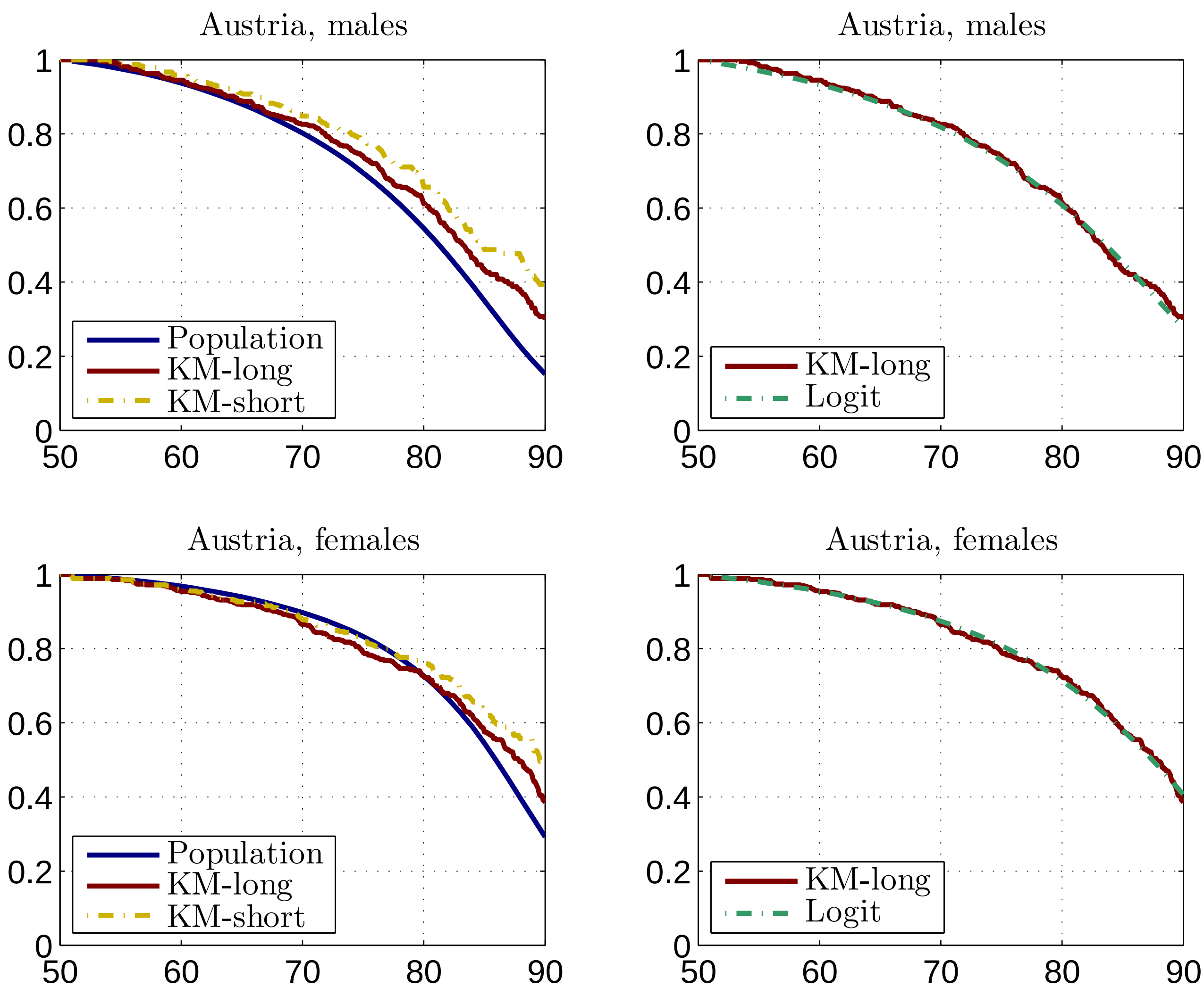


Figure E.2: Survival rates: Belgium

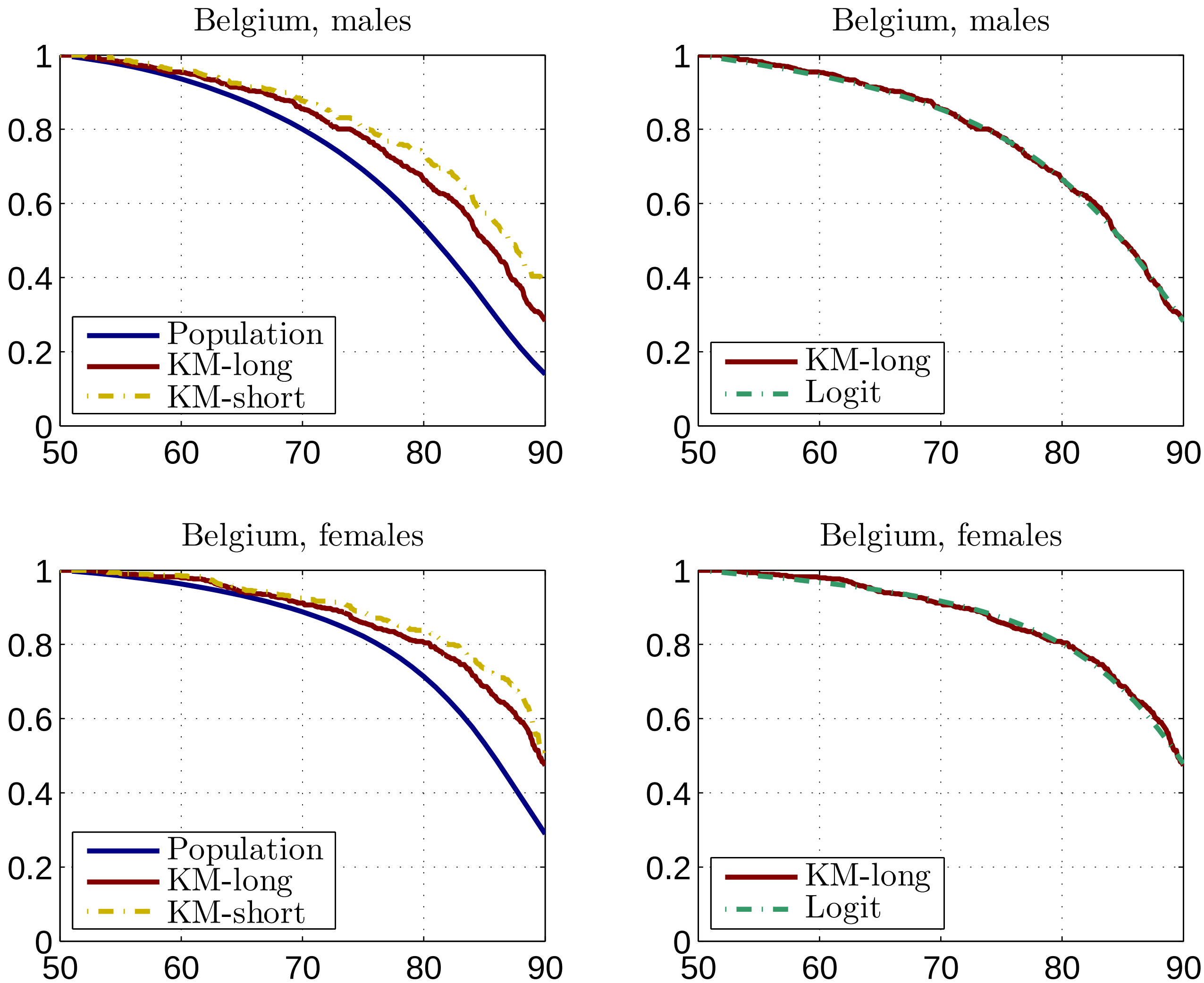


Figure E.3: Survival rates: Czech

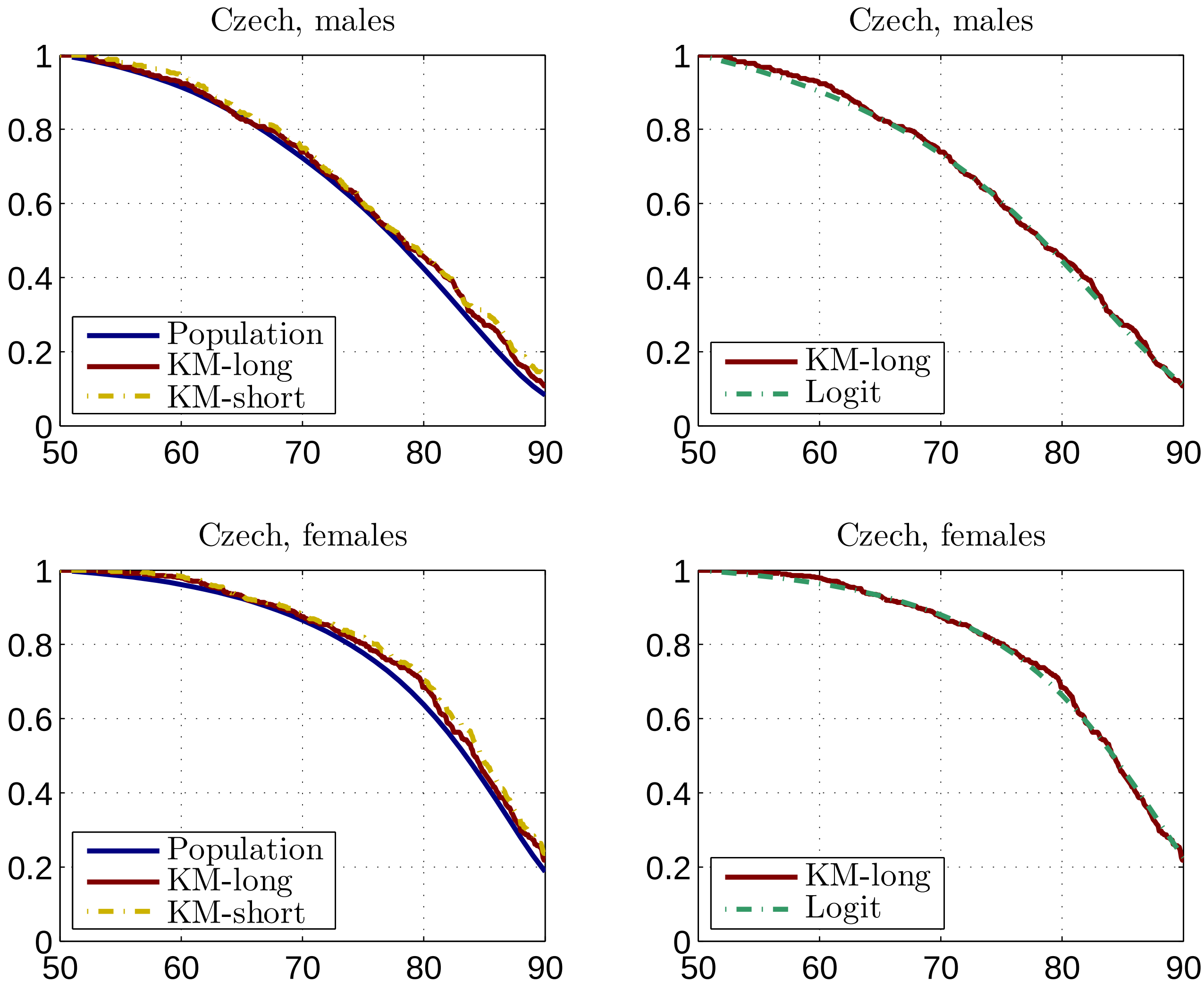


Figure E.4: Survival rates: Denmark

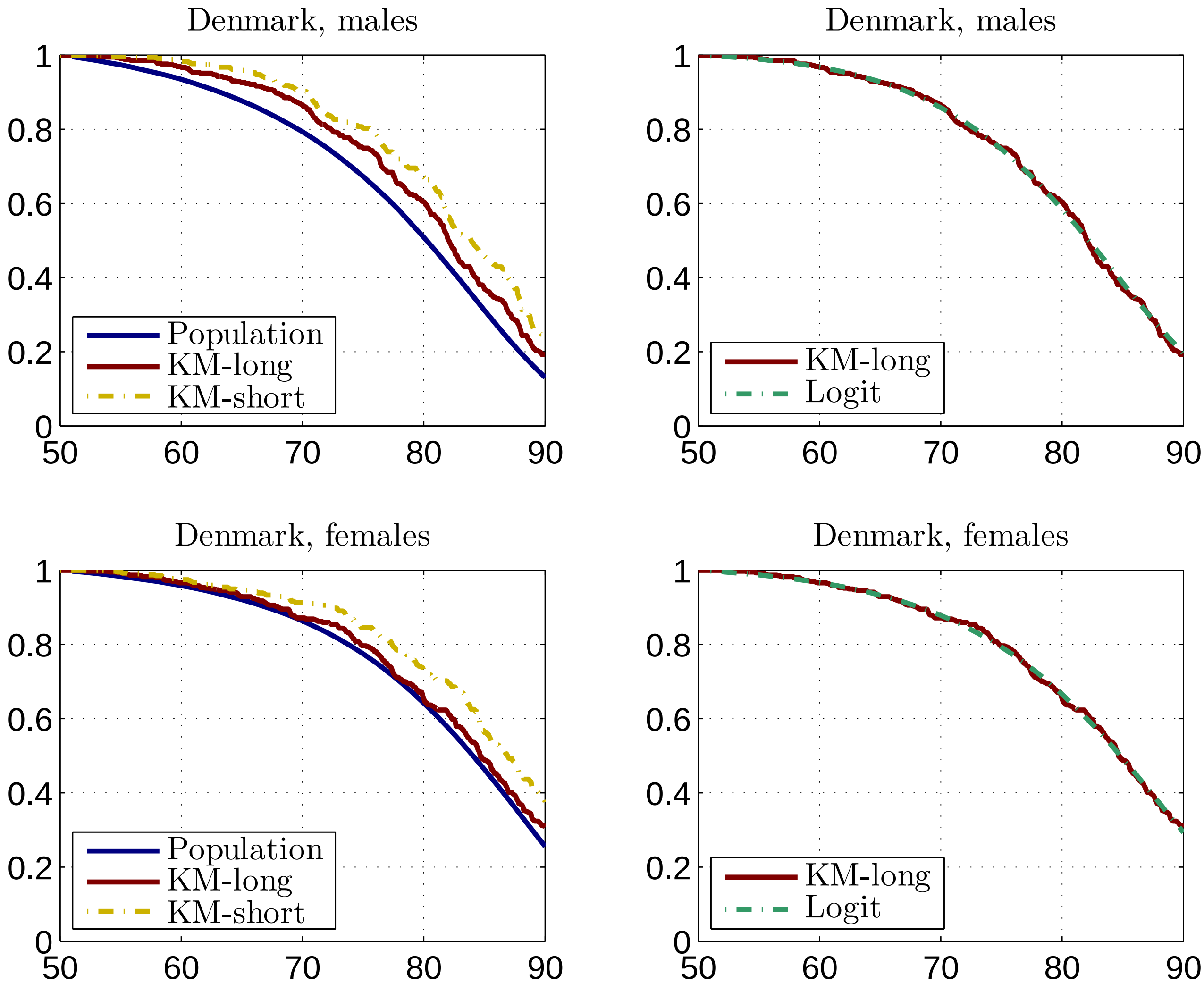


Figure E.5: Survival rates: Estonia

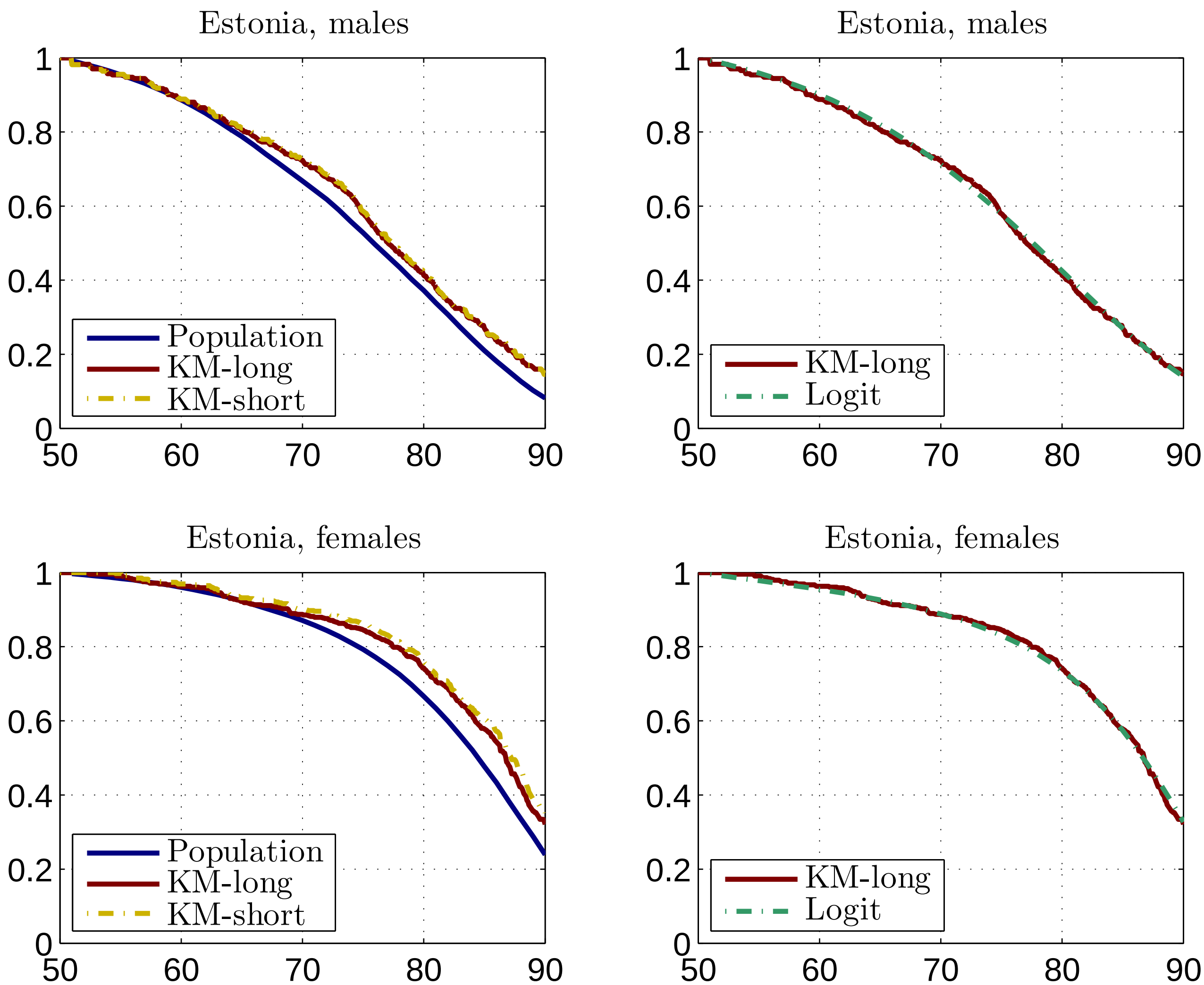


Figure E.6: Survival rates: France

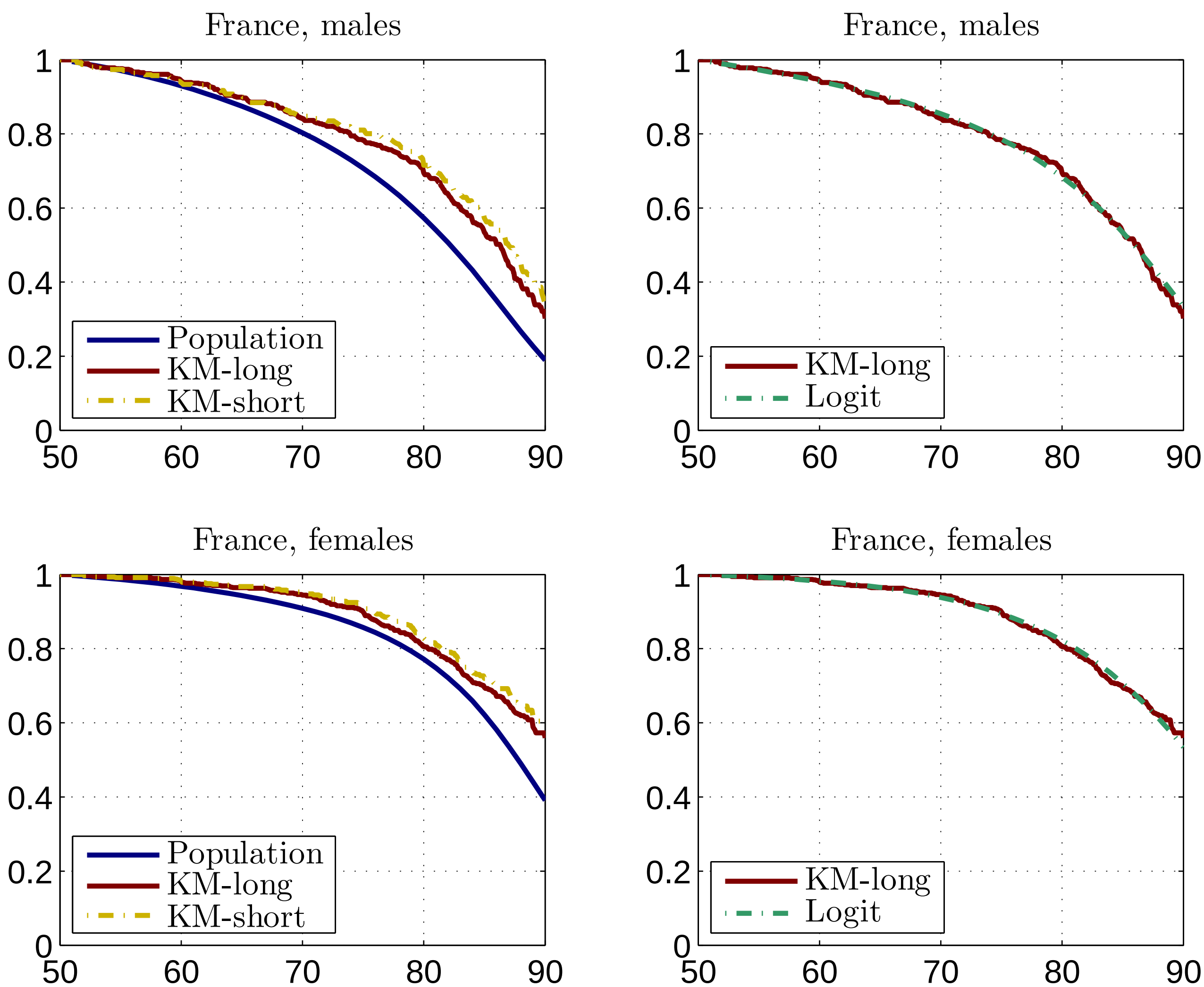


Figure E.7: Survival rates: Germany

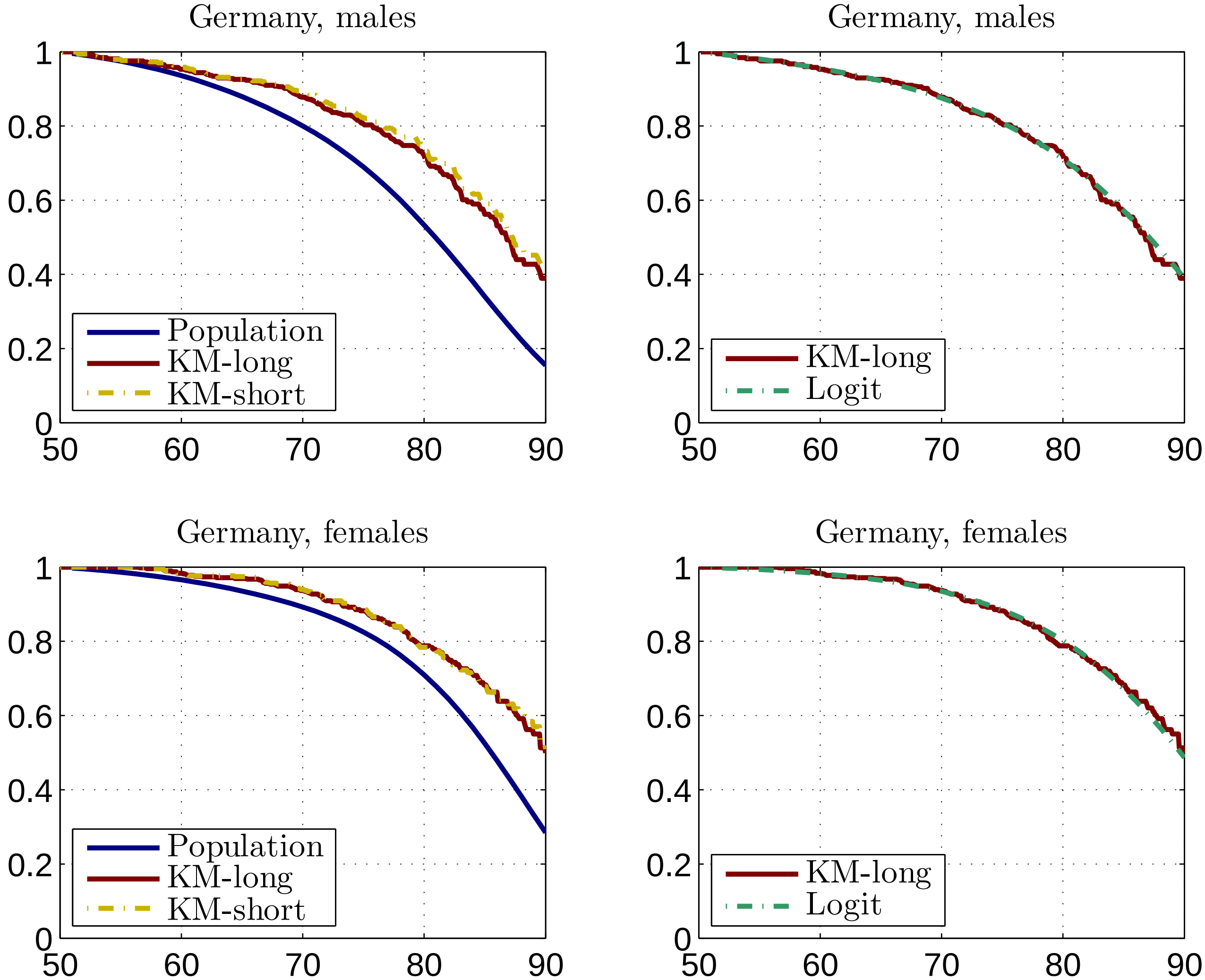


Figure E.8: Survival rates: Greece

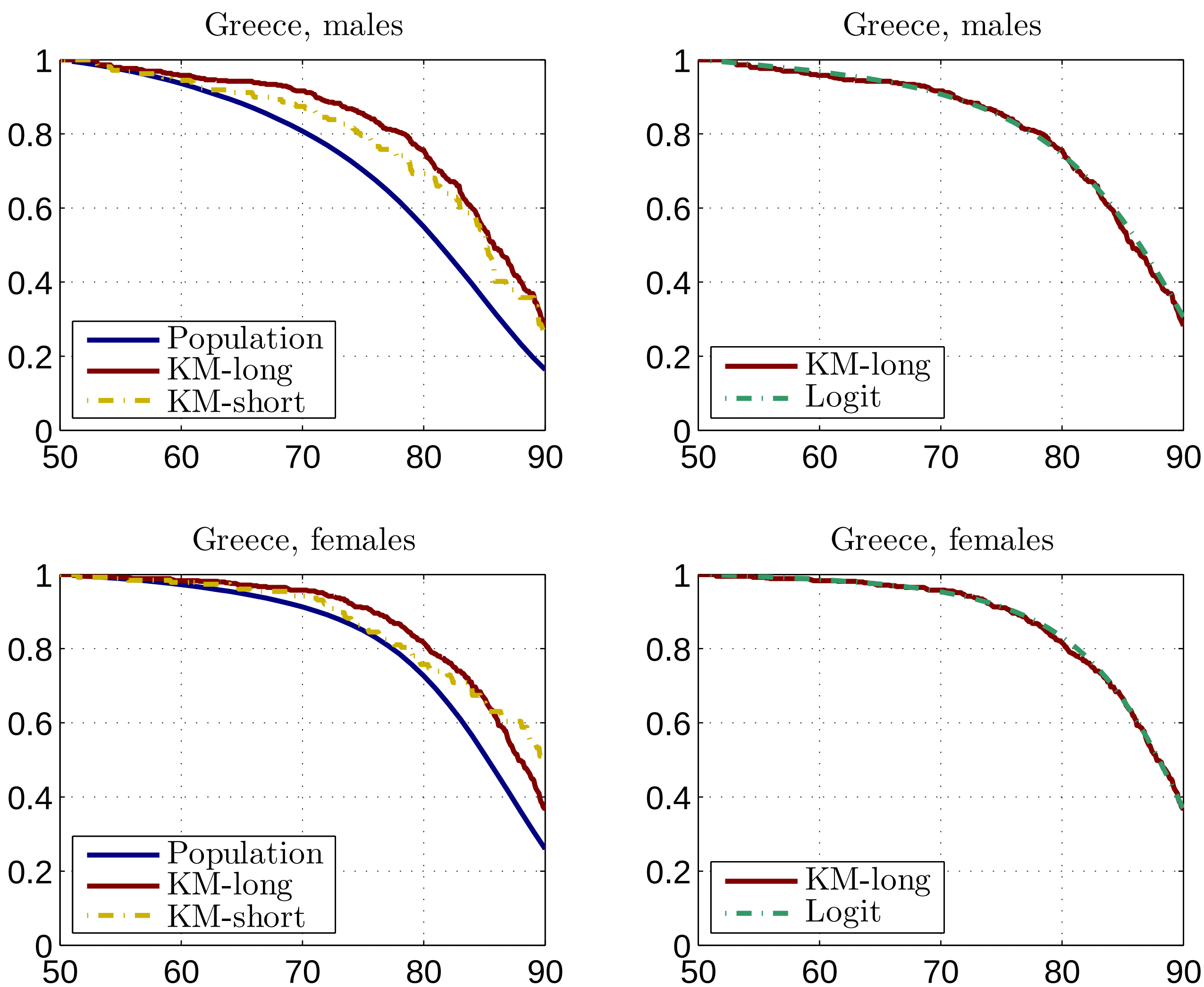


Figure E.9: Survival rates: Israel

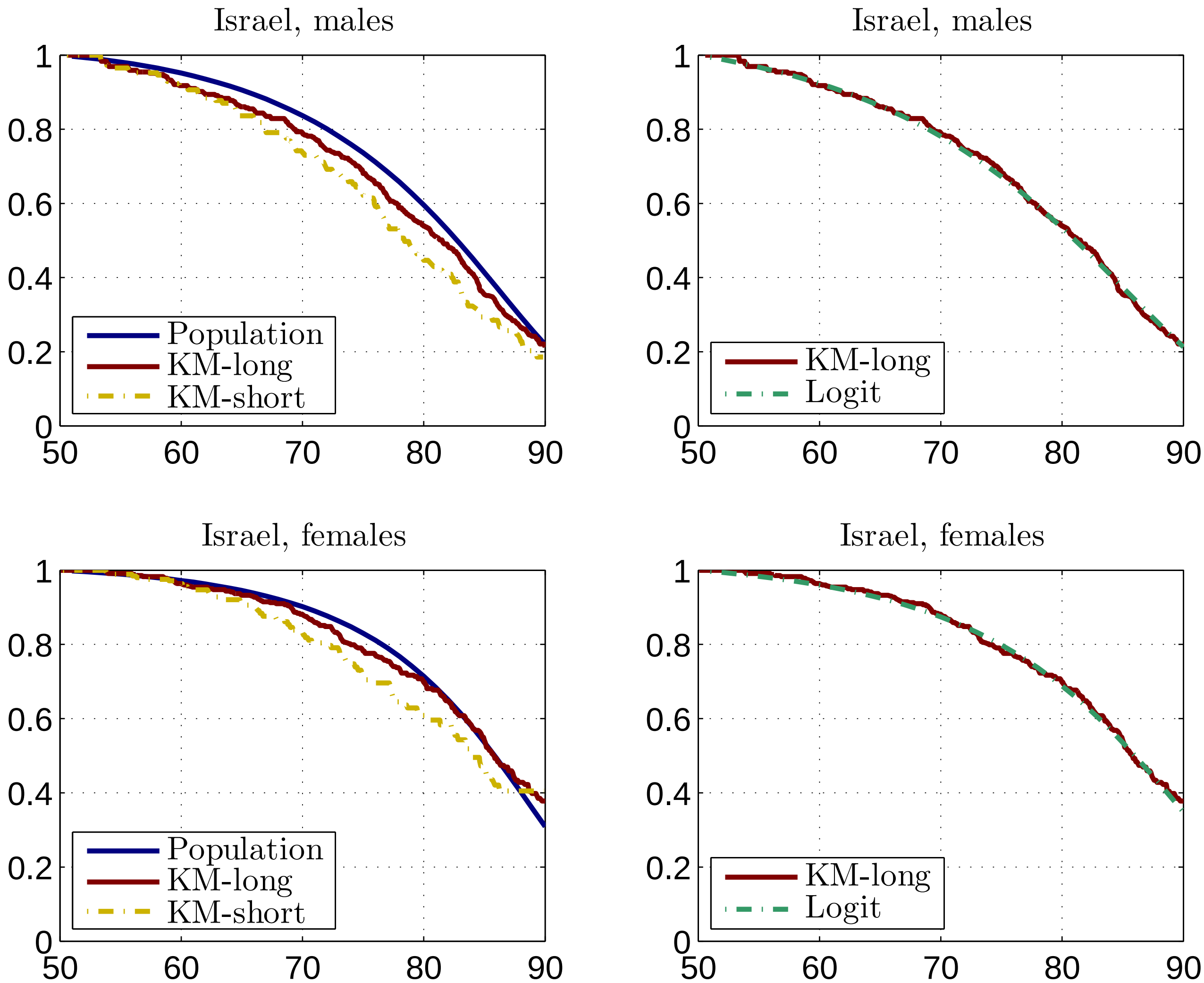


Figure E.10: Survival rates: Italy

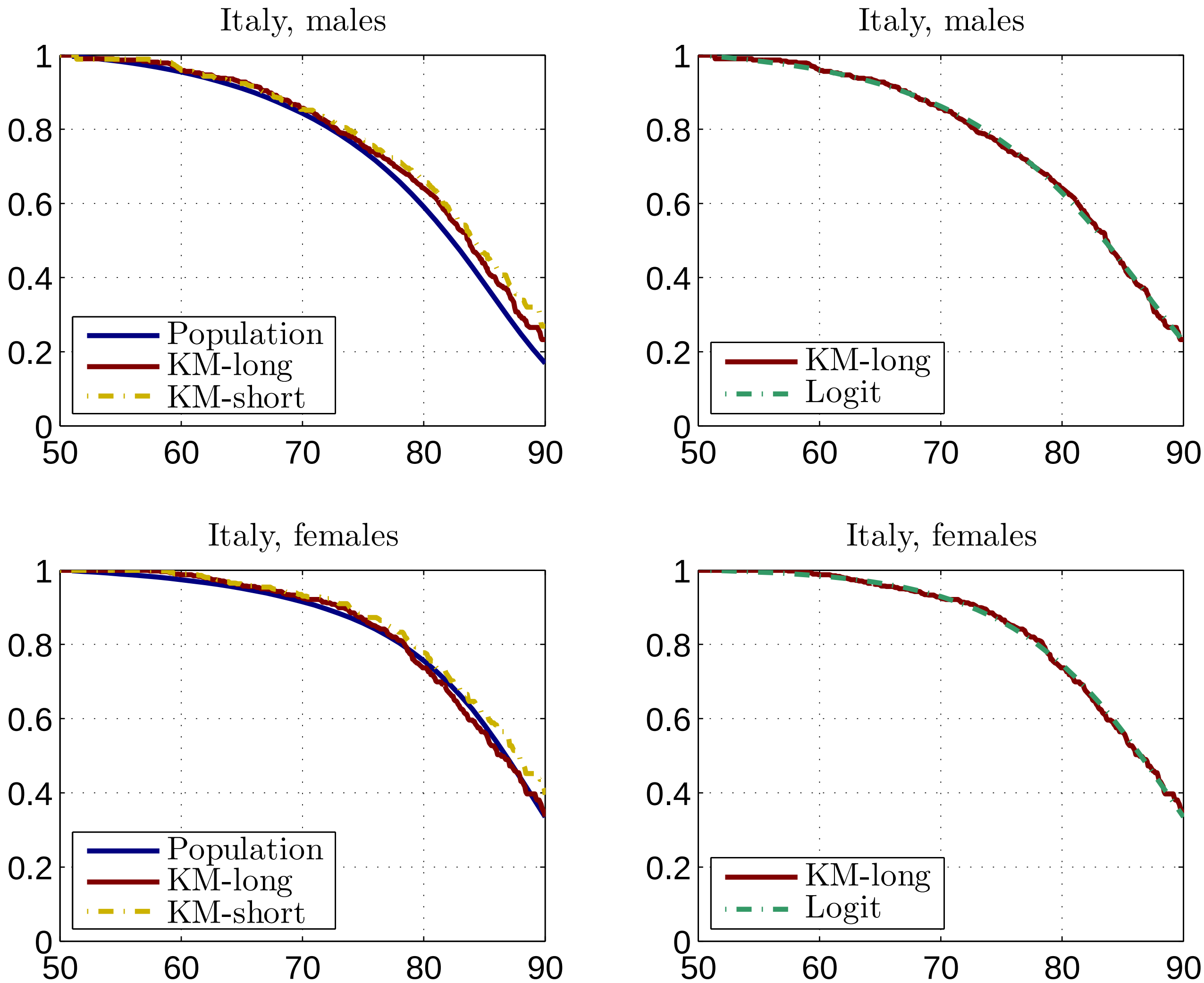


Figure E.11: Survival rates: Netherlands

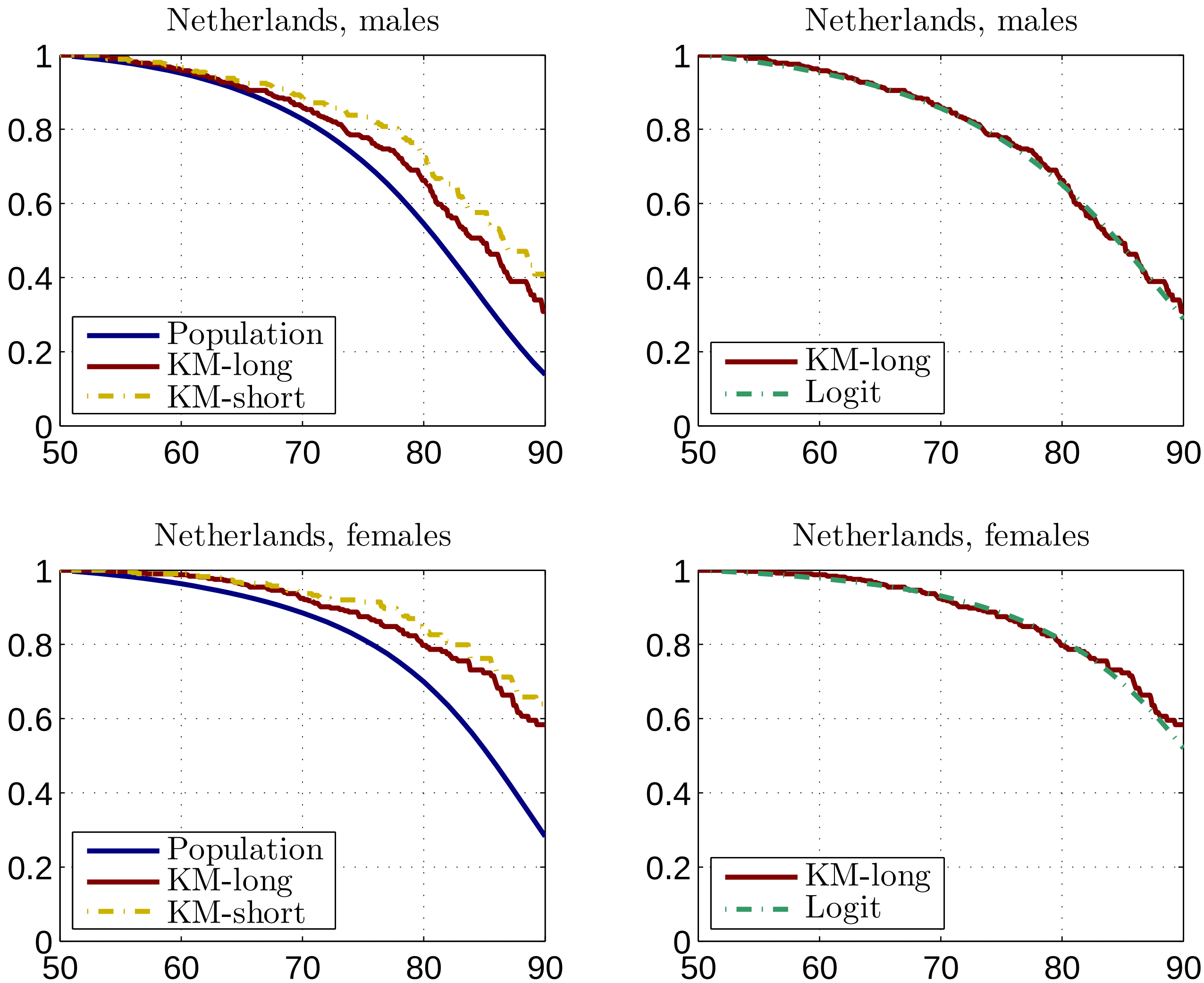


Figure E.12: Survival rates: Poland

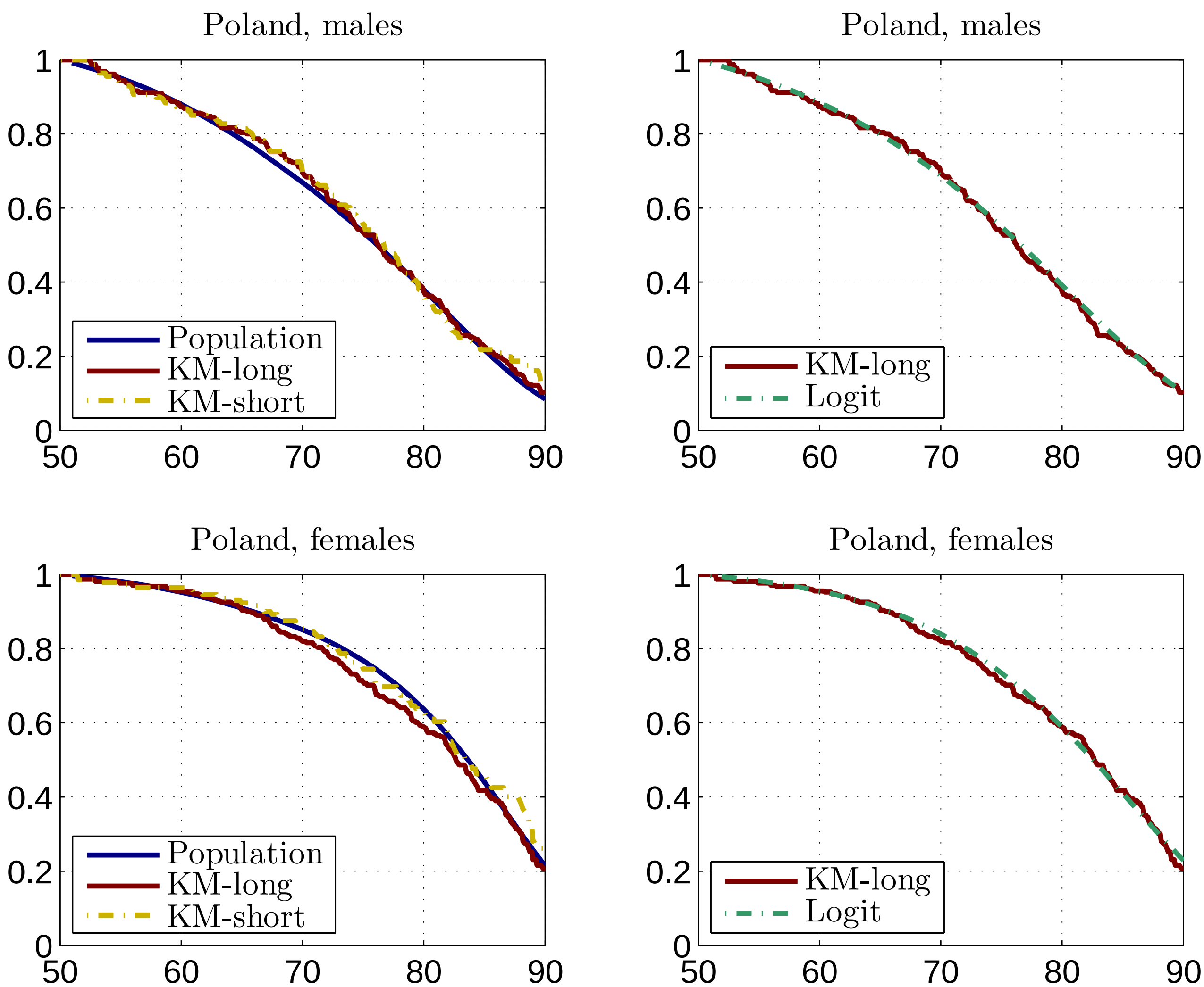


Figure E.13: Survival rates: Slovenia

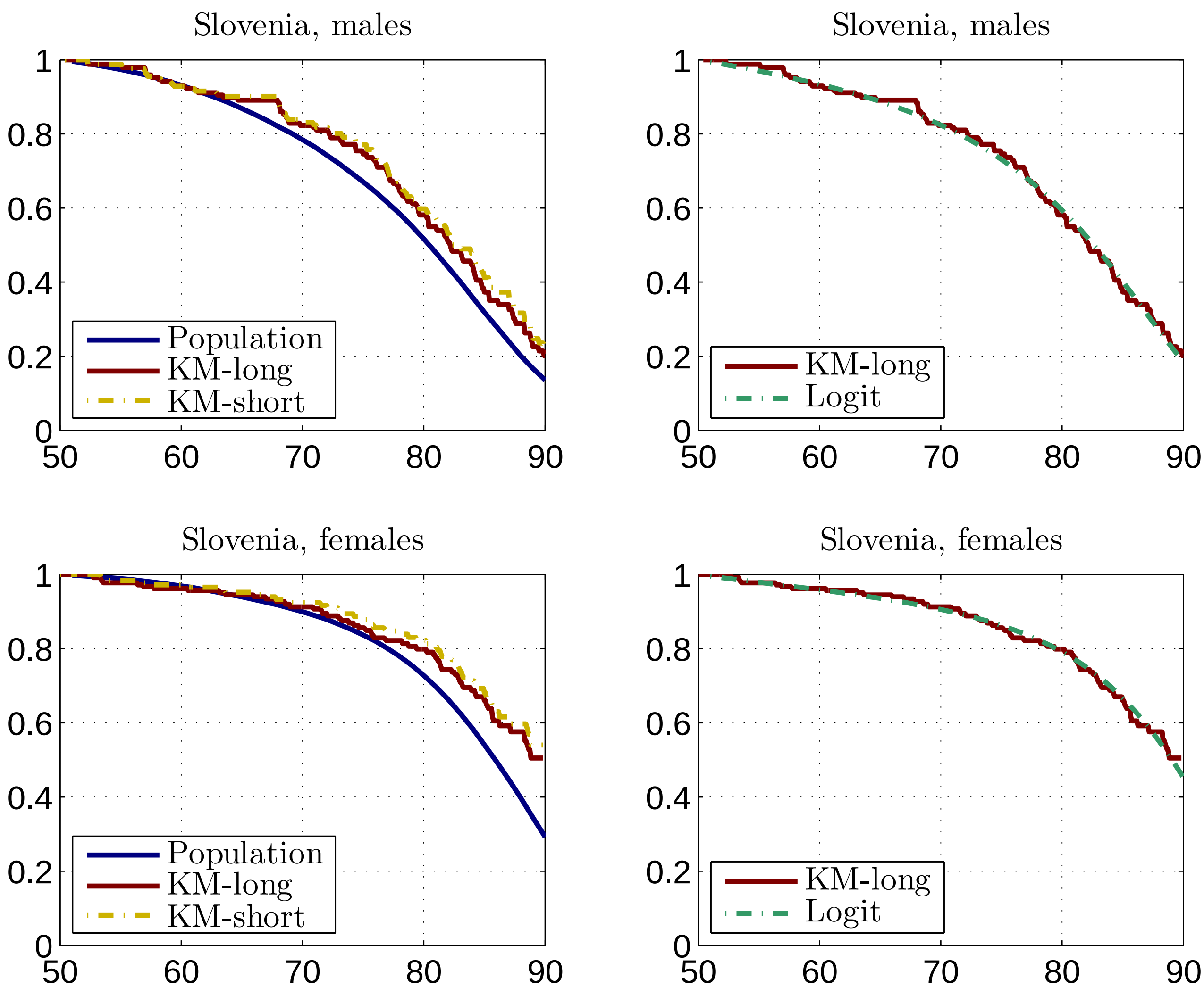


Figure E.14: Survival rates: Spain

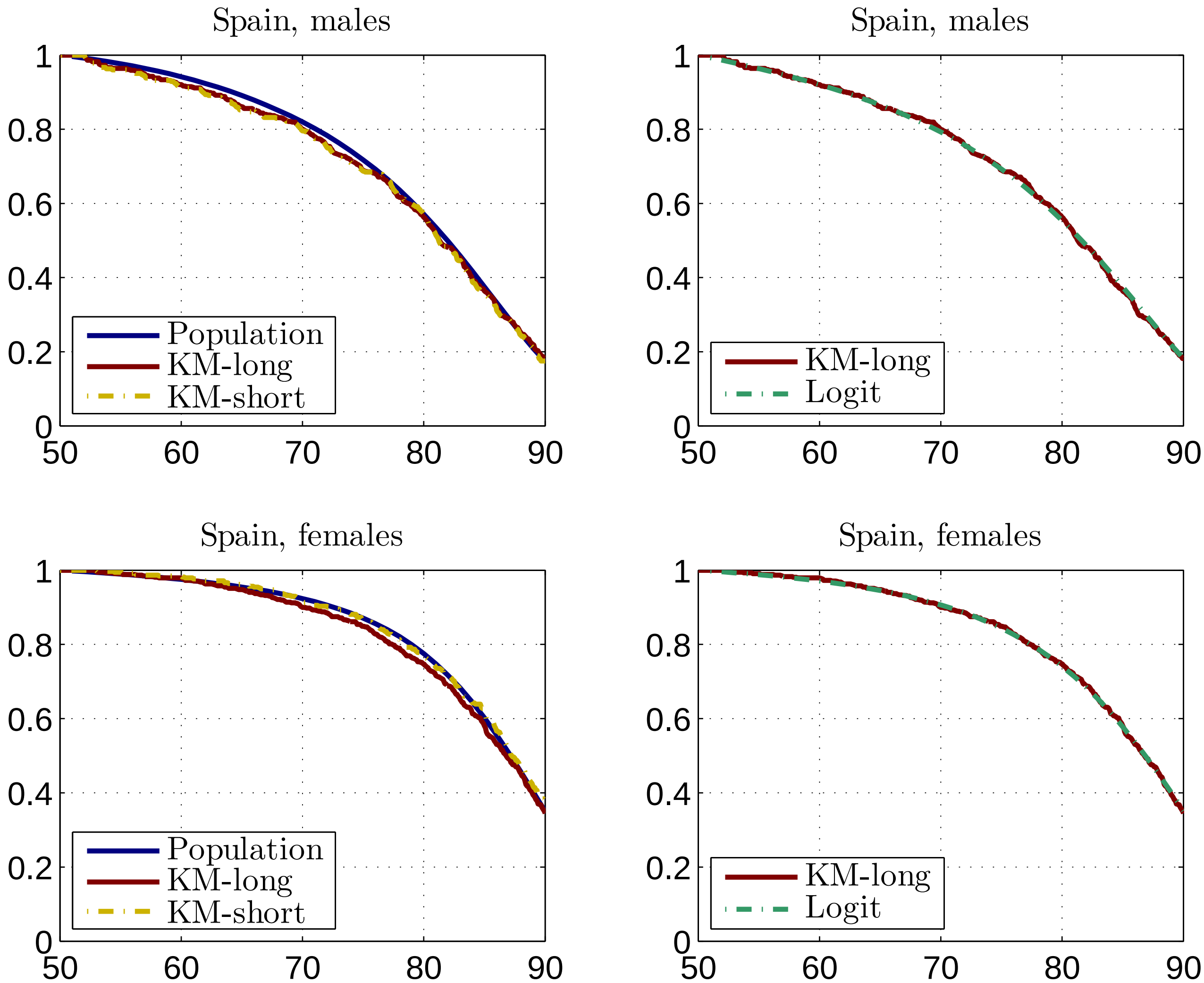


Figure E.15: Survival rates: Sweden

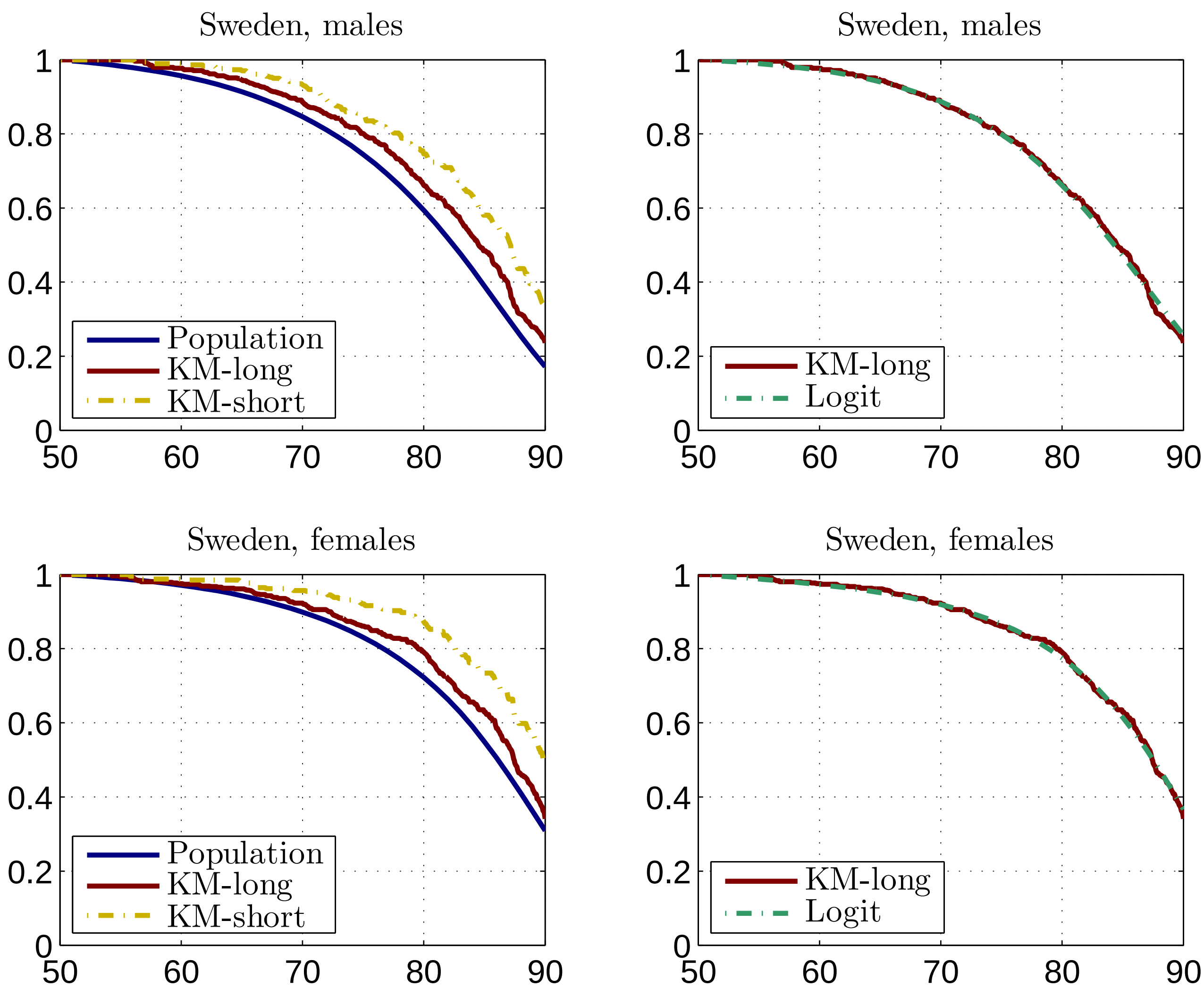


Figure E.16: Survival rates: Switzerland

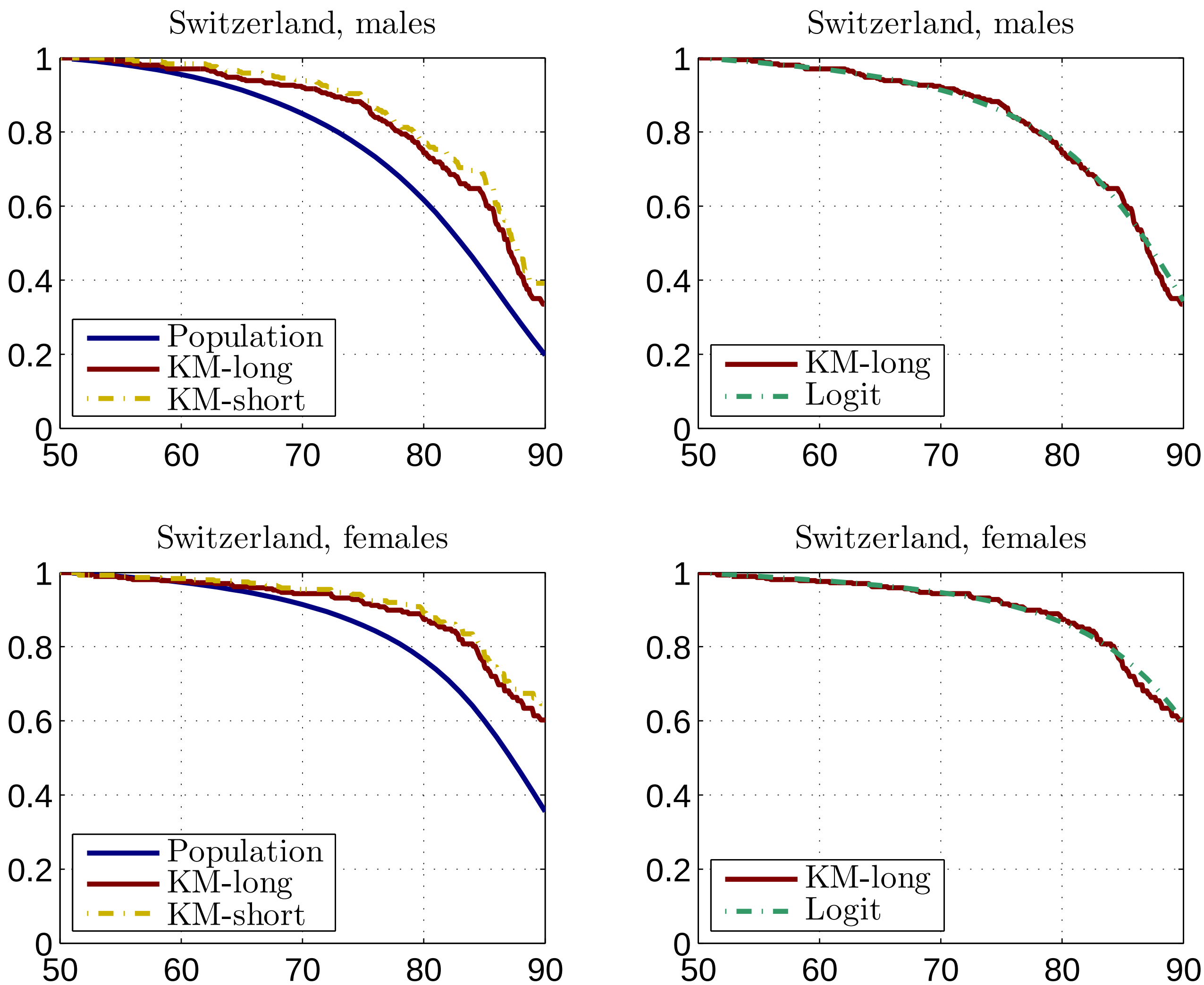


Figure E.17: Survival rates: England

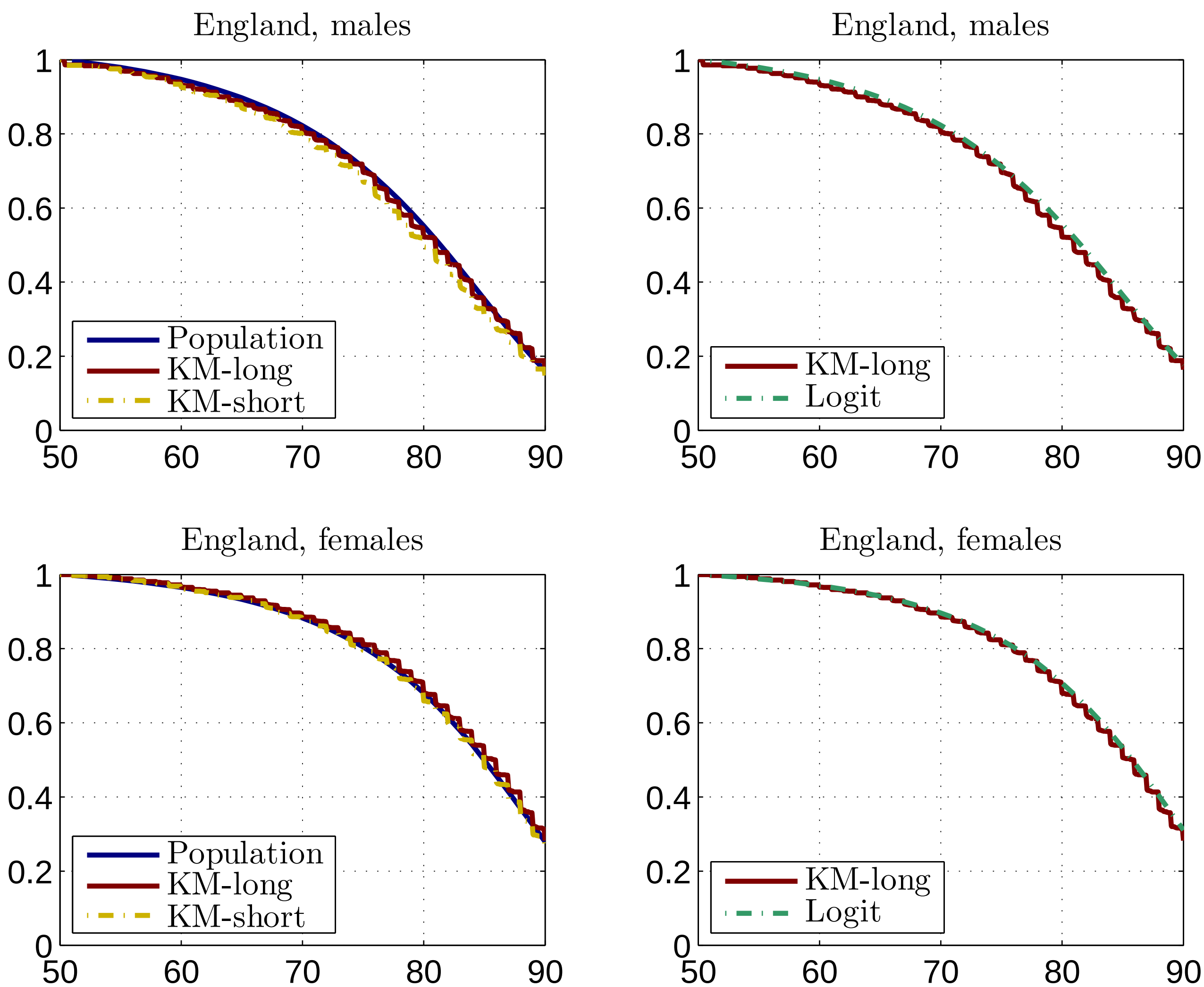


Figure E.18: Survival rates: US

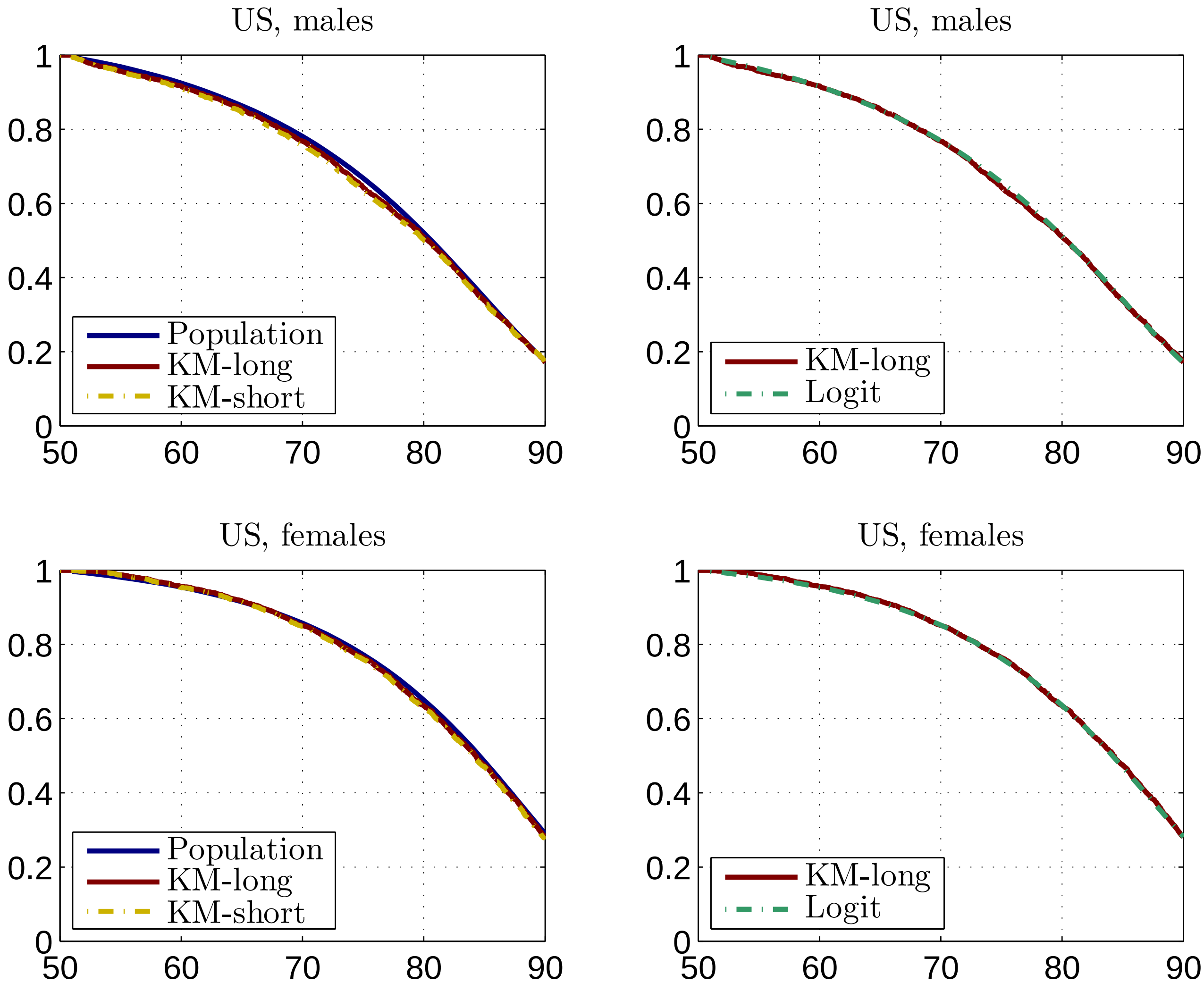
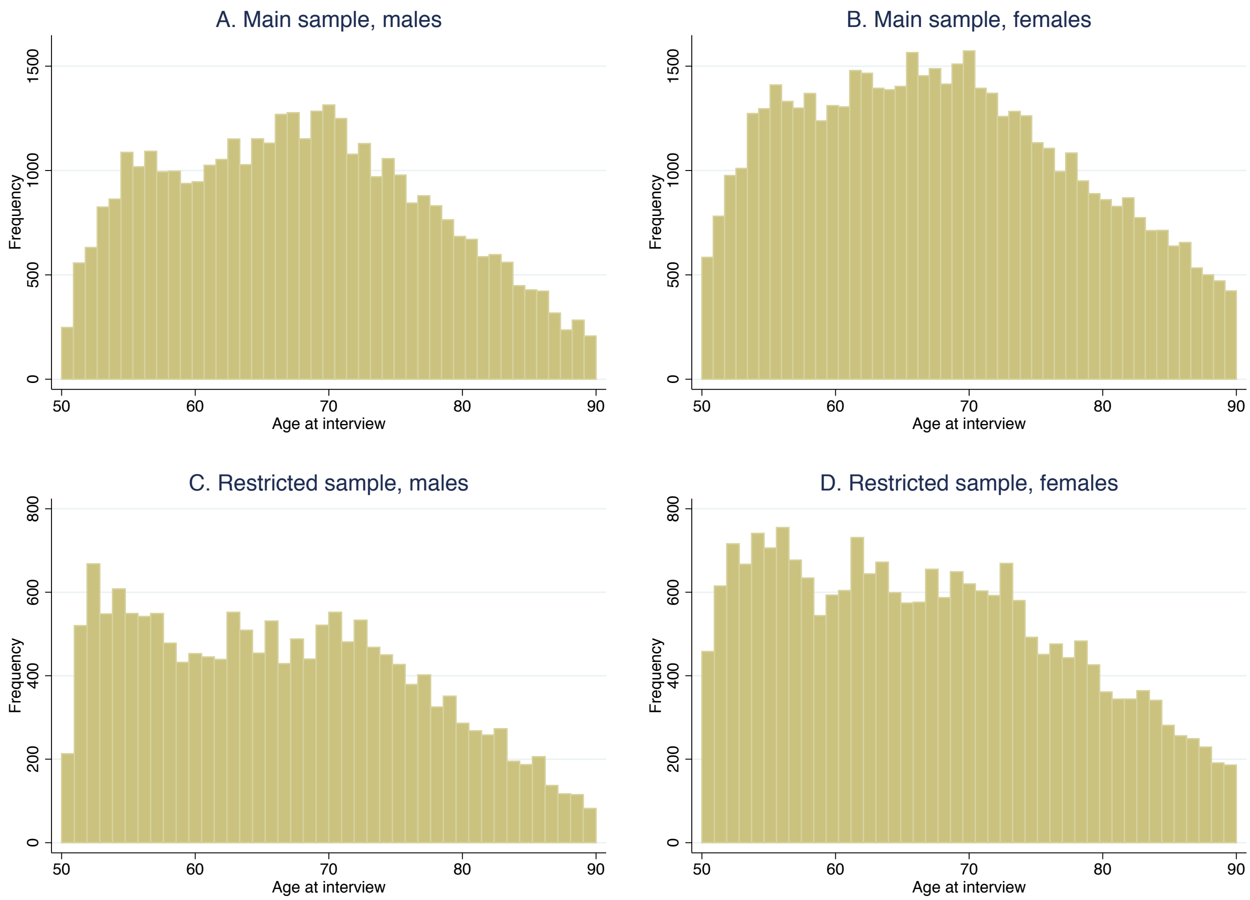


Figure E.19: Age distribution in the HRS



Notes: Histogram of age distribution at interview time. “Main” sample are waves 6 to 11 of HRS, and corresponds to the HRS sample used in the main text. “Restricted” sample corresponds to waves 7 and 10 only.