

Supplementary Materials: Biometeorological Assessment of Mortality from Extreme Temperatures in Helsinki Region, Finland, in 1972-2014

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Figure S1. Scatterplots of 7-day mean of relative mortality in different age groups and 7-day mean values of PET at Helsinki-Vantaa airport district in 1972–2014, and two 21-year time periods, 1972–1992 and 1994–2014 and their relationships fitted with the generalized additive model, GAM (95% CI).

Figure S2. Scatterplots of 14-day means of relative mortality in different age groups and 14-day mean values of PET at Helsinki-Vantaa airport district in 1972–2014 and two 21-year time periods, 1972–1992 and 1994–014, and their relationships fitted with the generalized additive model, GAM (95% CI).

Table S1. 7-day mean values of relative mortality (95% CI) of different age groups in the percentiles of 7-day mean values of PET at Helsinki-Vantaa airport in 1972–2014, and in two 21-year sub-periods, 1972–1992 and 1994–2014, and the statistical significance of the differences in relative mortality between the sub-periods.

Table S2. 14-day mean values of relative mortality (95% CI) of different age groups in the percentiles of 14-day mean values of PET at Helsinki-Vantaa airport in 1972–2014, and in two 21-year sub-periods, 1972–1992 and 1994–2014, and the statistical significance of the differences in relative mortality between the sub-periods.

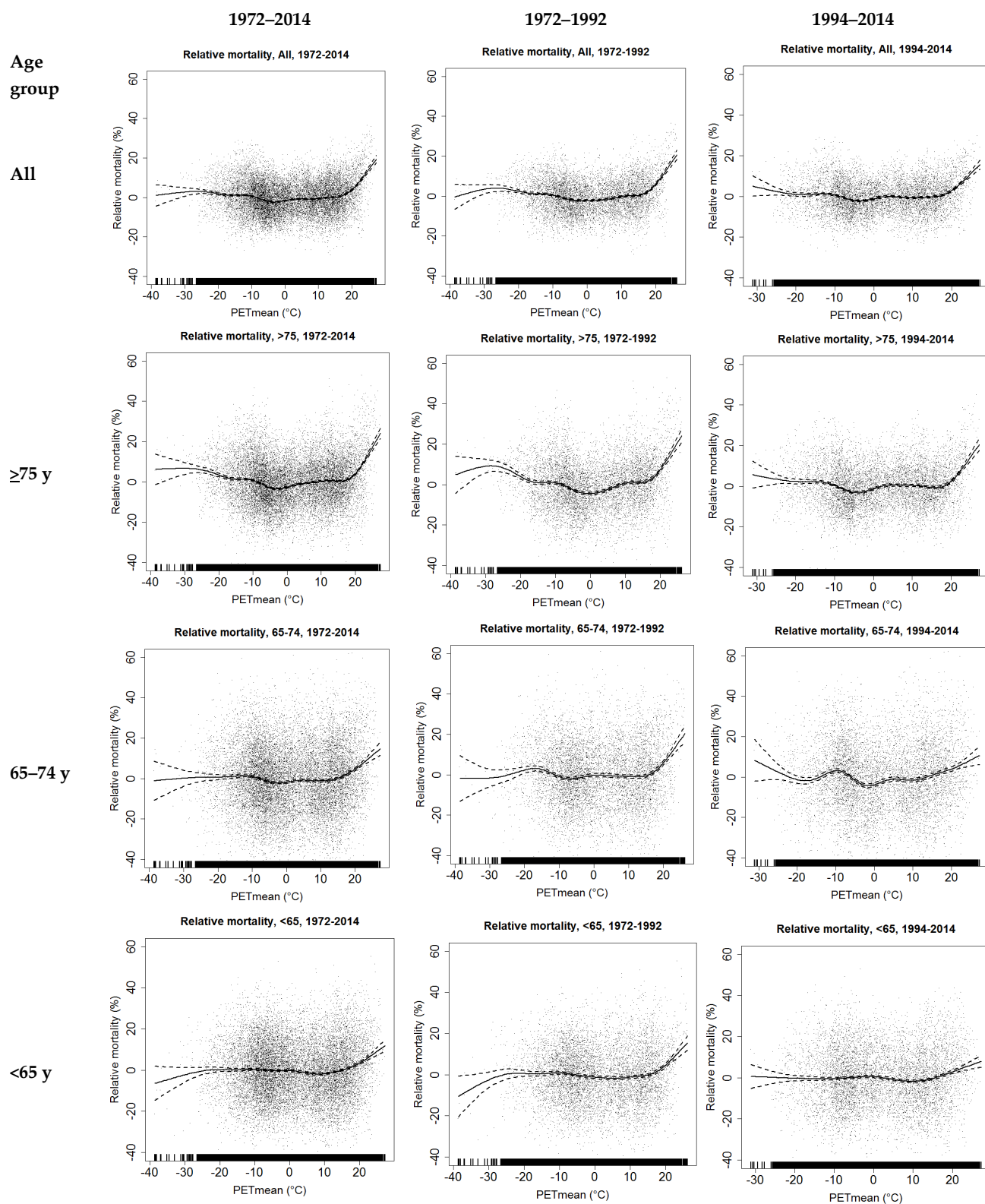


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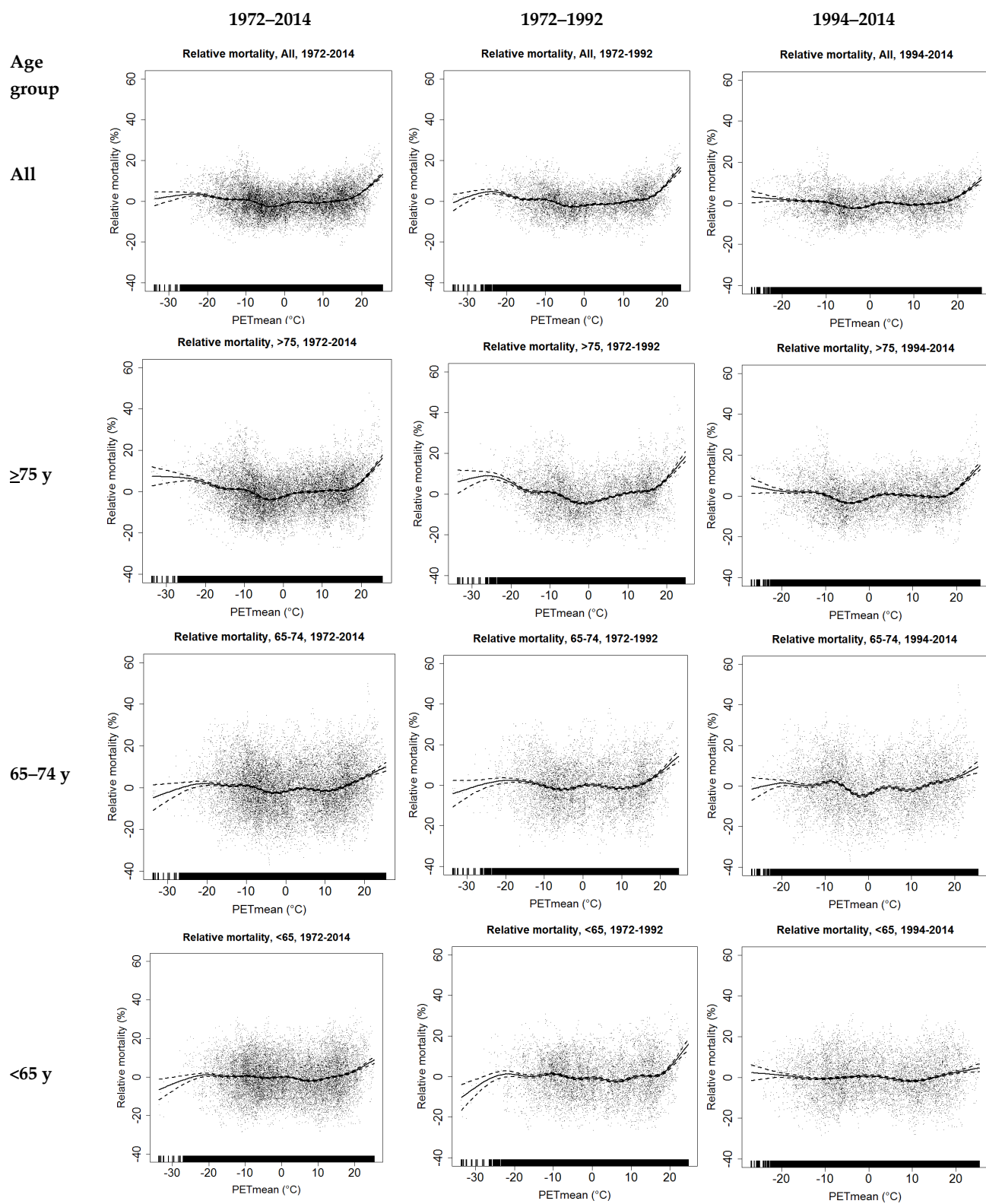


Figure S2. Scatterplots of 14-day means of relative mortality in different age groups and 14-day mean values of PET at Helsinki-Vantaa airport district in 1972–2014 and two 21-year time periods, 1972–1992 and 1994–014, and their relationships fitted with the generalized additive model, GAM (95% CI).

Table S1. 7-day mean values of relative mortality (95% CI) of different age groups in the percentiles of 7-day mean values of PET at Helsinki-Vantaa airport in 1972–2014, and in two 21-year sub-periods, 1972–1992 and 1994–2014, and the statistical significance of the differences in relative mortality between the sub-periods.* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

a) All

Percentiles	PETmean range	Relative Mortality 1972–2014 [%]			Relative Mortality 1972–1992 [%]			Relative Mortality 1994–2014 [%]			t-test
0–1	-38.7, -22.2	1.7	(0.5, 2.9)		1.6	(0.2, 3.1)		1.8	(-0.3, 3.9)		
1–2.5	-22.2, -18.9	2.9	(1.9, 3.9)		4.7	(3.4, 6.0)		1.1	(-0.3, 2.6)		***
2.5–5	-18.9, -15.9	1.1	(0.2, 1.9)		1.6	(0.4, 2.8)		0.6	(-0.6, 1.7)		
5–10	-15.9, -12.5	1.1	(0.4, 1.7)		0.8	(0.0, 1.6)		1.4	(0.4, 2.4)		
10–25	-12.5, -7.4	0.5	(0.2, 0.8)		0.3	(-0.2, 0.8)		0.5	(0.1, 1.0)		
25–50	-7.4, 0.4	-1.9	(-2.1, -1.6)		-1.7	(-2.1, -1.4)		-2.0	(-2.3, -1.6)		
50–75	0.4, 11.6	-0.9	(-1.1, -0.6)		-1.3	(-1.7, -1.0)		-0.4	(-0.8, -0.1)		***
75–90	11.6, 16.8	0.3	(0.0, 0.7)		0.7	(0.3, 1.2)		-0.2	(-0.7, 0.3)		**
90–95	16.8, 19.4	1.7	(1.1, 2.2)		2.5	(1.7, 3.3)		1.0	(0.2, 1.7)		**
95–97.5	19.4, 21.3	4.1	(3.3, 4.9)		5.1	(3.7, 6.5)		3.5	(2.5, 4.5)		
97.5–99	21.3, 23.0	6.1	(4.8, 7.3)		7.9	(5.8, 10.0)		4.8	(3.3, 6.3)		*
99–100	23.0, 27.3	13.7	(11.8, 15.6)		21.5	(17.9, 25.2)		10.5	(8.5, 12.4)		***

b) Age ≥ 75 years

Percentiles	PETmean range	Relative Mortality 1972–2014 [%]			Relative Mortality 1972–1992 [%]			Relative Mortality 1994–2014 [%]			t-test
0–1	-38.7, -22.2	4.3	(2.8, 5.9)		5.3	(3.5, 7.1)		2.9	(0.2, 5.7)		
1–2.5	-22.2, -18.9	4.6	(3.3, 5.9)		6.7	(5.0, 8.4)		2.5	(0.7, 4.4)		**
2.5–5	-18.9, -15.9	2.0	(1.0, 3.1)		2.4	(0.8, 4.0)		1.7	(0.3, 3.1)		
5–10	-15.9, -12.5	1.5	(0.6, 2.3)		0.6	(-0.5, 1.8)		2.5	(1.2, 3.7)		*
10–25	-12.5, -7.4	0.3	(-0.1, 0.8)		0.4	(-0.3, 1.1)		0.2	(-0.4, 0.9)		
25–50	-7.4, 0.4	-2.8	(-3.1, -2.5)		-2.9	(-3.4, -2.4)		-2.8	(-3.2, -2.3)		
50–75	0.4, 11.6	-0.5	(-0.9, -0.2)		-1.5	(-2.0, -0.9)		0.2	(-0.2, 0.7)		***
75–90	11.6, 16.8	0.6	(0.2, 1.1)		1.7	(1.0, 2.3)		-0.3	(-0.9, 0.3)		***
90–95	16.8, 19.4	1.6	(0.8, 2.4)		3.4	(2.2, 4.5)		0.1	(-0.8, 1.1)		***
95–97.5	19.4, 21.3	4.7	(3.5, 6.0)		7.3	(4.9, 9.7)		3.2	(1.7, 4.6)		**
97.5–99	21.3, 23.0	6.7	(4.7, 8.7)		10.5	(6.6, 14.3)		4.2	(2.2, 6.2)		**
99–100	23.0, 27.3	16.7	(14.2, 19.1)		23.5	(19.0, 28.1)		13.8	(11.1, 16.6)		***

c) Age 65–74 years

Percentiles	PETmean range	Relative Mortality 1972–2014 [%]			Relative Mortality 1972–1992 [%]			Relative Mortality 1994–2014 [%]			t-test
0–1	-38.7, -22.2	-0.6	(-2.9, 1.7)		-2.0	(-4.9, 0.8)		1.4	(-2.5, 5.2)		
1–2.5	-22.2, -18.9	2.3	(0.2, 4.3)		5.3	(2.7, 7.8)		-0.7	(-3.8, 2.5)		**
2.5–5	-18.9, -15.9	-0.3	(-1.8, 1.3)		2.3	(0.1, 4.6)		-2.9	(-5.1, -0.7)		**
5–10	-15.9, -12.5	1.5	(0.5, 2.6)		2.4	(0.8, 3.9)		0.7	(-0.9, 2.3)		
10–25	-12.5, -7.4	1.1	(0.5, 1.7)		-1.0	(-1.8, -0.1)		3.1	(2.2, 4.0)		***
25–50	-7.4, 0.4	-1.9	(-2.4, -1.4)		-1.2	(-1.8, -0.6)		-2.5	(-3.2, -1.7)		*
50–75	0.4, 11.6	-1.2	(-1.7, -0.7)		-0.9	(-1.6, -0.2)		-1.6	(-2.3, -0.9)		
75–90	11.6, 16.8	0.2	(-0.5, 0.9)		-0.2	(-1.1, 0.7)		0.5	(-0.5, 1.5)		
90–95	16.8, 19.4	2.7	(1.6, 3.8)		2.8	(1.2, 4.4)		2.7	(1.1, 4.3)		
95–97.5	19.4, 21.3	4.6	(3.0, 6.2)		5.4	(2.6, 8.1)		4.2	(2.1, 6.2)		
97.5–99	21.3, 23.0	6.3	(4.1, 8.5)		8.1	(5.2, 11.0)		5.0	(1.9, 8.2)		
99–100	23.0, 27.3	11.8	(9.0, 14.5)		20.0	(14.6, 25.5)		8.4	(5.4, 11.4)		***

d) Age <65 years

Percentiles	PETmean range		Relative Mortality 1972–2014 [%]			Relative Mortality 1972–1992 [%]			Relative Mortality 1994–2014 [%]			t- test
0–1	-38.7,	-22.2	-1.0	(-2.9,	0.9)	-1.5	(-4.2,	1.3)	-0.4	(-3.0,	2.1)	**
1–2.5	-22.2,	-18.9	0.7	(-0.9,	2.4)	2.0	(-0.2,	4.2)	-0.5	(-2.9,	2.0)	
2.5–5	-18.9,	-15.9	0.3	(-1.0,	1.6)	0.2	(-1.6,	2.0)	0.4	(-1.5,	2.4)	
5–10	-15.9,	-12.5	-0.1	(-1.1,	0.9)	0.2	(-1.1,	1.4)	-0.7	(-2.3,	0.9)	
10–25	-12.5,	-7.4	0.3	(-0.2,	0.9)	0.9	(0.2,	1.7)	-0.6	(-1.4,	0.2)	
25–50	-7.4,	0.4	-0.2	(-0.6,	0.2)	-0.5	(-1.1,	0.1)	0.3	(-0.4,	0.9)	
50–75	0.4,	11.6	-1.5	(-1.9,	-1.0)	-1.6	(-2.2,	-1.0)	-1.0	(-1.6,	-0.5)	
75–90	11.6,	16.8	0.1	(-0.5,	0.7)	0.1	(-0.7,	1.0)	-0.5	(-1.3,	0.4)	
90–95	16.8,	19.4	1.2	(0.2,	2.3)	1.2	(-0.2,	2.6)	1.3	(-0.3,	2.8)	
95–97.5	19.4,	21.3	3.4	(2.1,	4.8)	2.3	(0.2,	4.4)	4.1	(2.3,	5.8)	***
97.5–99	21.3,	23.0	5.6	(3.8,	7.4)	5.6	(2.9,	8.2)	5.6	(3.2,	8.0)	
99–100	23.0,	27.3	8.6	(6.2,	10.9)	19.9	(15.4,	24.4)	4.0	(1.7,	6.3)	

Table S2. 14-day mean values of relative mortality (95% CI) of different age groups in the percentiles of 14-day mean values of PET at Helsinki-Vantaa airport in 1972–2014, and in two 21-year sub-periods, 1972–1992 and 1994–2014, and the statistical significance of the differences in relative mortality between the sub-periods.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

a) All

Percentiles	PETmean range	Relative Mortality 1972–2014 [%]			Relative Mortality 1972–1992 [%]			Relative Mortality 1994–2014 [%]			t-test
0–1	-33.7, -20.8	2.7	(1.7, 3.6)		2.8	(1.9, 3.8)		2.3	(-0.2, 4.7)		
1–2.5	-20.8, -17.7	2.5	(1.7, 3.3)		3.6	(2.4, 4.8)		1.4	(0.3, 2.6)		*
2.5–5	-17.7, -15.5	1.9	(1.2, 2.5)		1.7	(0.8, 2.7)		2.1	(1.2, 2.9)		
5–10	-15.5, -12.4	0.7	(0.2, 1.2)		1.0	(0.3, 1.6)		0.4	(-0.3, 1.0)		
10–25	-12.4, -7.6	0.6	(0.3, 0.8)		0.4	(0.0, 0.8)		0.5	80.1, 0.9)		
25–50	-7.6, 0.4	-1.9	(-2.1, -1.8)		-2.0	(-2.2, -1.8)		-1.8	(-2.1, -1.6)		
50–75	0.4, 11.6	-0.7	(-0.9, -0.5)		-1.1	(-1.3, -0.8)		-0.4	(-0.6, -0.1)		***
75–90	11.6, 16.6	0.5	(0.3, 0.8)		1.1	(0.7, 1.4)		-0.1	(-0.4, 0.3)		***
90–95	16.6, 18.8	1.7	(1.3, 2.1)		2.1	(1.5, 2.7)		1.4	(0.8, 1.9)		
95–97.5	18.8, 20.5	3.4	(2.8, 4.1)		5.6	(4.7, 6.6)		2.0	(1.2, 2.8)		***
97.5–99	20.5, 22.0	4.2	(3.3, 5.1)		4.1	(2.2, 6.1)		4.3	(3.2, 5.3)		
99–100	22.0, 25.4	12.0	(10.8, 13.1)		16.8	(14.8, 18.8)		9.4	(8.2, 10.5)		***

b) Age ≥ 75 years

Percentiles	PETmean range	Relative Mortality 1972–2014 [%]			Relative Mortality 1972–1992 [%]			Relative Mortality 1994–2014 [%]			t-test
0–1	-33.7, -20.8	5.3	(4.0, 6.6)		6.4	(5.3, 7.6)		2.8	(-0.4, 6.1)		*
1–2.5	-20.8, -17.7	3.4	(2.3, 4.4)		5.0	(3.5, 6.4)		1.8	(0.3, 3.2)		**
2.5–5	-17.7, -15.5	3.1	(2.3, 3.8)		2.9	(1.8, 4.0)		3.2	(2.1, 4.3)		
5–10	-15.5, -12.4	1.2	(0.6, 1.8)		1.4	(0.4, 2.3)		1.0	(0.2, 1.9)		
10–25	-12.4, -7.6	0.5	(0.1, 0.9)		0.3	(-0.3, 0.8)		0.6	(0.1, 1.2)		
25–50	-7.6, 0.4	-2.8	(-3.0, -2.6)		-2.9	(-3.3, -2.6)		-2.7	(-3.0, -2.4)		
50–75	0.4, 11.6	-0.4	(-0.6, -0.1)		-1.3	(-1.6, -0.9)		0.4	(0.1, 0.7)		***
75–90	11.6, 16.6	0.9	(0.6, 1.2)		2.2	(1.7, 2.6)		-0.4	(-0.8, 0.0)		***
90–95	16.6, 18.8	1.5	(1.0, 2.1)		2.6	(1.7, 3.5)		0.7	(0.0, 1.5)		**
95–97.5	18.8, 20.5	3.8	(2.9, 4.7)		6.6	(4.8, 8.4)		2.0	(1.0, 3.0)		***
97.5–99	20.5, 22.0	4.4	(3.2, 5.6)		4.9	(2.2, 7.6)		4.2	(2.9, 5.6)		
99–100	22.0, 25.4	14.5	(12.6, 16.4)		19.9	(16.3, 23.5)		11.5	(9.5, 13.5)		***

c) Age 65–74 years

Percentiles	PETmean range	Relative Mortality 1972–2014 [%]			Relative Mortality 1972–1992 [%]			Relative Mortality 1994–2014 [%]			t-test
0–1	-33.7, -20.8	0.6	(-0.6, 1.8)		0.4	(-1.1, 1.9)		1.0	(-0.9, 3.0)		
1–2.5	-20.8, -17.7	1.9	(0.5, 3.3)		3.4	(1.5, 5.3)		0.4	(-1.6, 2.4)		*
2.5–5	-17.7, -15.5	2.3	(1.1, 3.5)		2.6	(1.0, 4.2)		2.0	(0.3, 3.7)		
5–10	-15.5, -12.4	0.2	(-0.6, 1.0)		1.0	(-0.1, 2.2)		-0.8	(-1.8, 0.3)		*
10–25	-12.4, -7.6	0.8	(0.4, 1.2)		-0.2	(-0.8, 0.4)		1.8	(1.1, 2.5)		***
25–50	-7.6, 0.4	-1.8	(-2.1, -1.5)		-1.7	(-2.1, -1.3)		-1.9	(-2.4, -1.3)		
50–75	0.4, 11.6	-1.0	(-1.4, -0.7)		-0.5	(-0.9, 0.0)		-1.7	(-2.2, -1.2)		***
75–90	11.6, 16.6	0.5	(0.0, 0.9)		0.1	(-0.5, 0.7)		1.0	(0.3, 1.6)		*
90–95	16.6, 18.8	2.6	(1.8, 3.3)		2.4	(1.3, 3.6)		2.7	(1.7, 3.8)		
95–97.5	18.8, 20.5	4.1	(3.0, 5.2)		7.1	(5.7, 8.6)		2.1	(0.6, 3.5)		***
97.5–99	20.5, 22.0	4.8	(3.2, 6.4)		3.9	(1.5, 6.3)		5.1	(3.1, 7.2)		
99–100	22.0, 25.4	10.8	(9.1, 12.5)		14.8	(12.2, 17.4)		8.6	(6.5, 10.7)		***

d) Age <65 years

Percentiles	PETmean range	Relative Mortality 1972–2014 [%]	Relative Mortality 1972–1992 [%]	Relative Mortality 1994–2014 [%]	t- test
0–1	-33.7, -20.8	-0.3 (-1.7, 1.1)	-1.2 (-2.9, 0.5)	1.8 (1.8, 2.5)	*
1–2.5	-20.8, -17.7	2.0 (0.8, 3.2)	2.3 (0.5, 4.2)	1.7 (1.7, 1.5)	
2.5–5	-17.7, -15.5	-0.2 (-1.2, 0.7)	-0.1 (-1.6, 1.3)	-0.4 -0.4, 1.2)	
5–10	-15.5, -12.4	0.3 (-0.4, 0.9)	0.5 (-0.4, 1.4)	-0.2 (-0.2, 0.9)	
10–25	-12.4, -7.6	0.3 (-0.1, 0.7)	1.0 (0.5, 1.5)	-0.7 (-0.7, 0.6)	***
25–50	-7.6, 0.4	-0.4 (-0.6, -0.1)	-0.8 (-1.2, -0.4)	0.3 (0.3, 0.4)	
50–75	0.4, 11.6	-1.4 (-1.7, -1.1)	-1.5 (-1.9, -1.1)	-1.1 (-1.1, 0.4)	***
75–90	11.6, 16.6	0.4 (-0.1, 0.8)	0.4 (-0.2, 1.0)	-0.1 (-0.1, 0.6)	
90–95	16.6, 18.8	1.3 (0.6, 2.0)	1.0 (0.1, 1.9)	1.5 (1.5, 1.0)	
95–97.5	18.8, 20.5	2.7 (1.6, 3.7)	3.5 (2.1, 5.0)	2.1 (2.1, 1.4)	
97.5–99	20.5, 22.0	3.5 (2.2, 4.8)	3.3 (0.7, 5.9)	3.6 (3.6, 1.5)	***
99–100	22.0, 25.4	8.2 (6.9, 9.6)	15.5 (14.0, 17.1)	4.3 (4.3, 1.4)	