

eTable1. Sensitivity analysis of RR estimates to changing degree of smoothing in the time trend function

eTable1	Effect of short lasting COLD extremes									
	300 df	350 df	400 df	450 df	500 df	300 df	350 df	400 df	450 df	500 df
	Model 1	Model 1	Model 1	Model 1	Model 1	Model 2	Model 2	Model 2	Model 2	Model 2
	RR (95% CI)	RR (95% CI)	RR (95% CI)	RR (95% CI)	RR (95% CI)	RR (95% CI)	RR (95% CI)	RR (95% CI)	RR (95% CI)	RR (95% CI)
1901-09	1.28 (1.15-1.43)	1.28 (1.15-1.43)	1.27 (1.14-1.41)	1.25 (1.12-1.40)	1.24 (1.11-1.39)	1.11 (1.04-1.18)	1.11 (1.04-1.18)	1.10 (1.03-1.16)	1.08 (1.02-1.15)	1.09 (1.02-1.16)
1910-19	1.02 (0.95-1.09)	1.00 (0.94-1.07)	1.01 (0.94-1.09)	1.01 (0.95-1.09)	1.04 (0.97-1.12)	1.01 (0.94-1.07)	0.99 (0.93-1.06)	1.01 (0.94-1.07)	1.01 (0.95-1.08)	1.04 (0.97-1.11)
1920-29	1.13 (1.06-1.20)	1.12 (1.05-1.19)	1.10 (1.04-1.17)	1.08 (1.01-1.15)	1.08 (1.02-1.15)	1.13 (1.06-1.20)	1.12 (1.05-1.18)	1.10 (1.03-1.17)	1.08 (1.01-1.14)	1.08 (1.01-1.15)
1930-39	NA	NA	NA	NA	NA	1.05 (0.99-1.11)	1.06 (1.00-1.12)	1.07 (1.01-1.14)	1.05 (0.99-1.12)	1.04 (0.98-1.11)
1940-49	1.17 (1.11-1.22)	1.18 (1.12-1.23)	1.17 (1.12-1.23)	1.17 (1.12-1.23)	1.19 (1.13-1.25)	1.06 (1.00-1.12)	1.07 (1.01-1.13)	1.06 (1.00-1.12)	1.07 (1.01-1.13)	1.05 (0.99-1.11)
1950-59	0.95 (0.90-1.01)	0.94 (0.88-1.00)	0.95 (0.89-1.01)	0.95 (0.89-1.01)	0.97 (0.90-1.03)	0.97 (0.93-1.02)	0.96 (0.92-1.01)	0.97 (0.92-1.02)	0.97 (0.93-1.02)	0.99 (0.94-1.04)
1960-69	1.06 (1.02-1.10)	1.06 (1.02-1.11)	1.02 (0.98-1.07)	1.02 (0.98-1.07)	1.03 (0.98-1.07)	1.05 (1.00-1.09)	1.05 (1.00-1.09)	1.02 (0.97-1.07)	1.02 (0.98-1.07)	1.02 (0.98-1.07)
1970-79	0.99 (0.94-1.04)	0.99 (0.94-1.04)	0.99 (0.95-1.04)	0.98 (0.94-1.03)	0.97 (0.92-1.02)	0.99 (0.95-1.04)	0.99 (0.94-1.04)	1.00 (0.95-1.05)	0.99 (0.95-1.04)	0.98 (0.93-1.03)
1980-89	1.09 (1.05-1.13)	1.08 (1.04-1.12)	1.08 (1.05-1.12)	1.08 (1.04-1.12)	1.06 (1.02-1.10)	1.09 (1.05-1.13)	1.07 (1.03-1.11)	1.07 (1.03-1.12)	1.07 (1.03-1.12)	1.05 (1.00-1.10)
1990-99	1.09 (1.01-1.18)	1.06 (0.99-1.14)	1.07 (0.99-1.15)	1.08 (1.00-1.17)	1.05 (0.98-1.13)	1.05 (1.00-1.09)	1.03 (0.99-1.08)	1.05 (1.00-1.09)	1.05 (1.01-1.09)	1.03 (0.99-1.07)
2000-09	1.08 (0.98-1.19)	1.09 (0.99-1.22)	1.09 (0.98-1.20)	1.07 (0.96-1.18)	1.05 (0.95-1.16)	1.04 (1.00-1.08)	1.04 (1.00-1.08)	1.03 (0.99-1.07)	1.02 (0.98-1.06)	1.01 (0.97-1.05)
1901-2009	1.07 (1.04-1.09)	1.06 (1.04-1.08)	1.06 (1.03-1.08)	1.05 (1.03-1.08)	1.05 (1.03-1.07)	1.04 (1.03-1.06)	1.04 (1.02-1.06)	1.04 (1.02-1.05)	1.03 (1.02-1.05)	1.03 (1.01-1.04)
	Effect of short lasting HEAT extremes									
	300 df	350 df	400 df	450 df	500 df	300 df	350 df	400 df	450 df	500 df
	Model 1	Model 1	Model 1	Model 1	Model 1	Model 2	Model 2	Model 2	Model 2	Model 2
	RR (95% CI)	RR (95% CI)	RR (95% CI)	RR (95% CI)	RR (95% CI)	RR (95% CI)	RR (95% CI)	RR (95% CI)	RR (95% CI)	RR (95% CI)
1901-09	1.19 (1.10-1.28)	1.18 (1.09-1.27)	1.18 (1.09-1.28)	1.18 (1.10-1.28)	1.18 (1.09-1.28)	1.16 (1.09-1.24)	1.15 (1.08-1.23)	1.16 (1.08-1.24)	1.16 (1.09-1.24)	1.15 (1.08-1.23)
1910-19	1.12 (1.04-1.21)	1.13 (1.05-1.22)	1.14 (1.06-1.23)	1.10 (1.02-1.19)	1.09 (1.01-1.18)	1.12 (1.05-1.19)	1.13 (1.06-1.20)	1.14 (1.07-1.21)	1.11 (1.04-1.18)	1.11 (1.04-1.19)
1920-29	1.30 (1.18-1.43)	1.29 (1.17-1.42)	1.29 (1.17-1.42)	1.29 (1.18-1.42)	1.28 (1.17-1.41)	1.24 (1.16-1.33)	1.24 (1.16-1.32)	1.23 (1.15-1.31)	1.23 (1.15-1.31)	1.23 (1.15-1.31)
1930-39	1.18 (1.11-1.25)	1.18 (1.11-1.26)	1.17 (1.10-1.25)	1.16 (1.09-1.24)	1.17 (1.10-1.25)	1.17 (1.1-1.24)	1.18 (1.11-1.25)	1.17 (1.10-1.24)	1.16 (1.09-1.23)	1.17 (1.10-1.24)
1940-49	1.15 (1.09-1.21)	1.15 (1.09-1.21)	1.15 (1.10-1.22)	1.13 (1.08-1.20)	1.15 (1.09-1.21)	1.21 (1.14-1.27)	1.20 (1.14-1.27)	1.20 (1.14-1.27)	1.19 (1.13-1.25)	1.20 (1.14-1.26)
1950-59	1.11 (1.05-1.17)	1.11 (1.05-1.17)	1.11 (1.05-1.17)	1.11 (1.05-1.17)	1.11 (1.05-1.17)	1.09 (1.04-1.14)	1.09 (1.04-1.15)	1.09 (1.04-1.15)	1.10 (1.04-1.15)	1.10 (1.04-1.15)
1960-69	1.15 (1.10-1.21)	1.16 (1.10-1.21)	1.16 (1.10-1.21)	1.13 (1.08-1.19)	1.14 (1.09-1.20)	1.14 (1.10-1.19)	1.14 (1.10-1.19)	1.14 (1.10-1.19)	1.12 (1.08-1.17)	1.13 (1.08-1.18)
1970-79	1.15 (1.10-1.20)	1.16 (1.11-1.21)	1.15 (1.10-1.20)	1.13 (1.08-1.17)	1.12 (1.08-1.17)	1.16 (1.12-1.21)	1.17 (1.12-1.21)	1.16 (1.12-1.21)	1.14 (1.09-1.18)	1.13 (1.09-1.18)
1980-89	1.07 (1.02-1.11)	1.06 (1.02-1.11)	1.05 (1.01-1.10)	1.05 (1.00-1.09)	1.04 (0.99-1.08)	1.07 (1.03-1.11)	1.07 (1.03-1.11)	1.06 (1.02-1.10)	1.05 (1.01-1.09)	1.04 (1.00-1.08)
1990-99	1.03 (0.99-1.07)	1.04 (1.00-1.07)	1.03 (0.99-1.06)	1.01 (0.97-1.05)	1.01 (0.97-1.05)	1.08 (1.04-1.13)	1.09 (1.05-1.13)	1.07 (1.03-1.12)	1.05 (1.01-1.10)	1.05 (1.01-1.10)
2000-09	1.04 (1.00-1.08)	1.04 (1.00-1.08)	1.04 (1.00-1.09)	1.03 (0.99-1.07)	1.03 (0.99-1.07)	1.07 (1.03-1.11)	1.07 (1.03-1.12)	1.08 (1.04-1.12)	1.07 (1.03-1.11)	1.06 (1.02-1.11)
1901-2009	1.11 (1.08-1.13)	1.11 (1.09-1.13)	1.10 (1.08-1.13)	1.09 (1.07-1.11)	1.09 (1.07-1.11)	1.12 (1.11-1.14)	1.12 (1.11-1.14)	1.12 (1.10-1.14)	1.11 (1.09-1.12)	1.11 (1.09-1.12)

eTable 2. Regression coefficients

eTable 2	Regression coefficients for short lasting Cold Extremes over time		Regression coefficients for short lasting Heat Extremes over time	
	Model 1	Model 2	Model 1	Model 2
	β -coefficient (95% CI)	β -coefficient (95% CI)	β -coefficient (95% CI)	β -coefficient (95% CI)
Total	-0.0082 (0.9742-1.0098)	-0.0034 (0.9889-1.0044)	-0.0180 (0.9735-0.9908)	-0.0123 (0.9799-0.9957)
Men	-0.0080 (0.9748-1.0097)	-0.0023 (0.9877-1.0077)	-0.0186 (0.9687-0.9946)	-0.0153 (0.9758-0.9939)
Women	-0.0090 (0.9707-1.0118)	-0.0055 (0.9860-1.0030)	-0.0176 (0.9727-0.9925)	-0.0095 (0.9780-1.0033)
0-14	-0.0354 (0.9369-0.9943)	-0.0345 (0.9455-0.9870)	-0.0346 (0.9347-0.9984)	-0.0277 (0.9445-1.0018)
15-64	-0.0069 (0.9691-1.0178)	-0.0060 (0.9778-1.0106)	-0.0171 (0.9691-0.9971)	-0.0093 (0.9786-1.0030)
65+	-0.0103 (0.9695-1.0104)	-0.0050 (0.9857-1.0045)	-0.0156 (0.9753-0.9939)	-0.0138 (0.9773-0.9954)
65-79	-0.0160 (0.9707-0.9977)	-0.0101 (0.9786-1.0014)	-0.0153 (0.9753-0.9944)	-0.0137 (0.9771-0.9959)
80+	-0.0042 (0.9757-1.0164)	-0.0042 (0.9757-1.0164)	-0.0203 (0.9642-0.9959)	-0.0150 (0.9728-0.9975)

eTable3. R code

To analyse the effect of temperature extremes on mortality the following code in R were used

```
#Analysis of temperature extremes per decade:
RR <- glm (N_dayi ~ as.factor(wday) + as.factor(hday)+ ns(trend,df=400) +
complete + pandemic + cw_lag025k:as.factor(decade) +
hw_lag01k:as.factor(decade),data=analys, family=quasipoisson)

#Analysis of temperature extremes 1901-2009:
RR <- glm (N_dayi ~ as.factor(wday) + as.factor(hday)+ ns(trend,df=400) +
pandemic + complete + cw_lag025k+ hw_lag01k,data=analys,family=quasipoisson)
```

where:

N_day_i is the number of daily deaths occurring in each of the investigated groups,
i=1-8 (1=total, 2=men, 3=women, 4=0-14, 5=15-64, 6=65+, 7=65-79, 8=80+),
wday is a categorical variable indicating day of week,
hday is a binary variable indicating public Swedish holiday or not,
complete is a binary variable indicating when the data is complete,
pandemic is a binary variable indicating time of pandemics,
decade is a categorical variable indicating decade of investigation,
trend is a trend variable used in the smooth function for trend with 400 degrees of freedom. In the sensitivity analyses 300,350,450 and 500 degrees of freedom were used,
cw_lag025_k is a binary variable indicating cold extreme or not,
hw_lag01_k is a binary variable indicating heat extreme or not
k=1-2 (1=model1, 2=model2).

To analyse trend over time of the estimates the following code in R were used:

```
#Analysis of trend over time
tid <- glm (RRijk ~ decade, weights=wijk)
```

where:

RR_{ijk} is a vector of the decadal estimates of the RRs,
w_{ijk} is a vector of the inverse of the decadal variances;
i=1-8 (1=total, 2=men, 3=women, 4=0-14, 5=15-64, 6=65+, 7=65-79, 8=80+),
j=1-2 (1=cold extremes, 2=heat extremes),
k=1-2 (1=model1, 2=model 2).

Supplementary digital content

eFigure 1: Title “Mortality Related to Temperature Extremes 1901–2009, presented per decade for Men”

eFigure 2: Title “Mortality Related to Temperature Extremes 1901–2009, presented per decade for Women “

eFigure 3: Title “ Mortality Related to Temperature Extremes 1901–2009, presented per decade for age group 0-14”

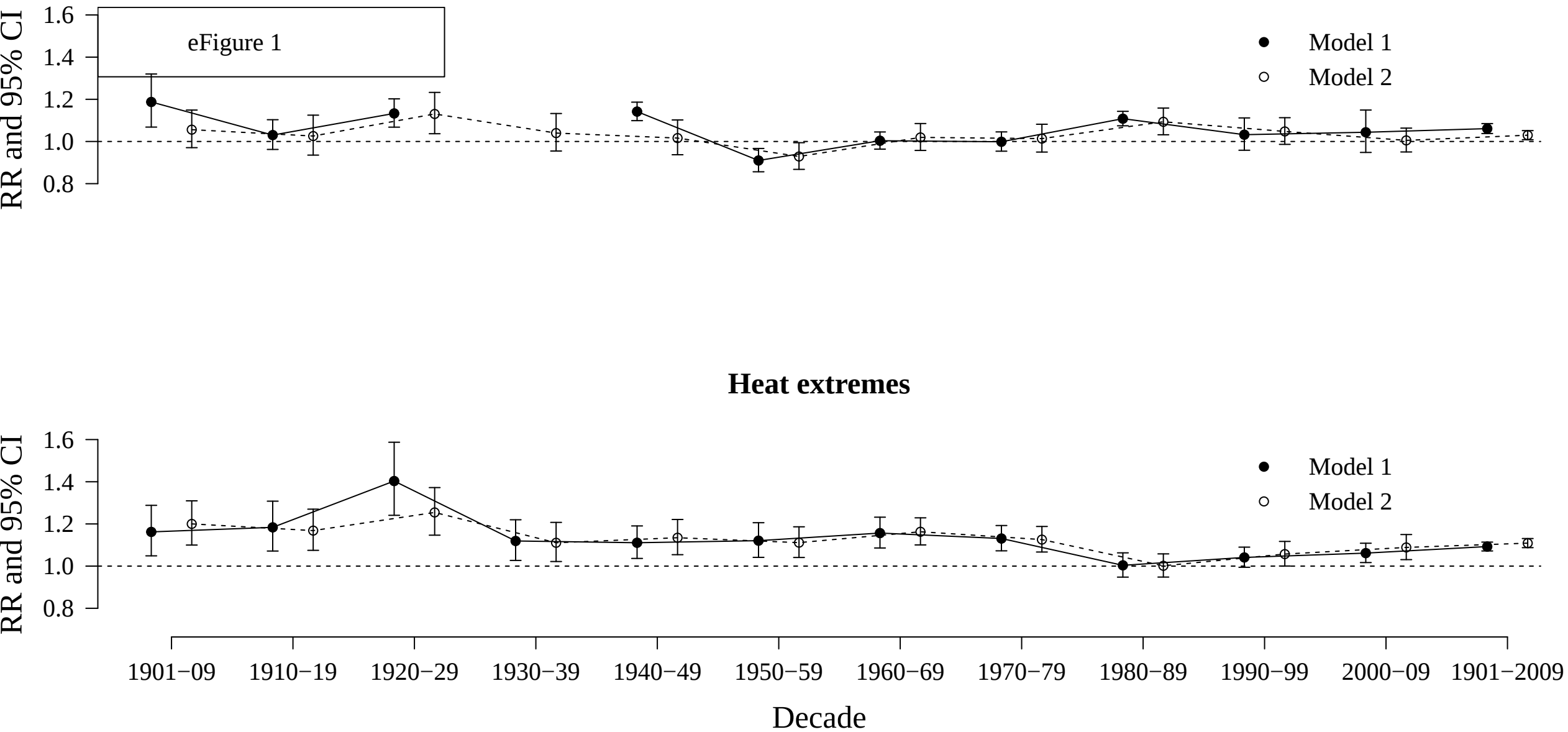
eFigure 4: Title “ Mortality Related to Temperature Extremes 1901–2009, presented per decade for age group 15-64”

eFigure 5: Title “ Mortality Related to Temperature Extremes 1901–2009, presented per decade for age group 65+”

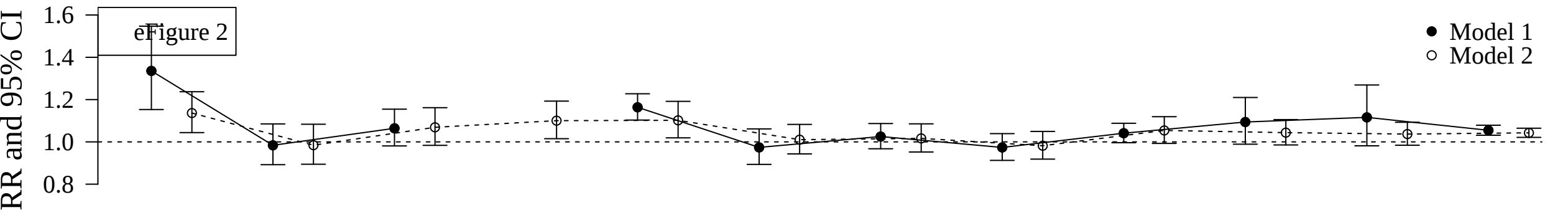
eFigure 6: Title “ Mortality Related to Temperature Extremes 1901–2009, presented per decade for age group 65-79”

eFigure 7: Title “ Mortality Related to Temperature Extremes 1901–2009, presented per decade for age group 80+”

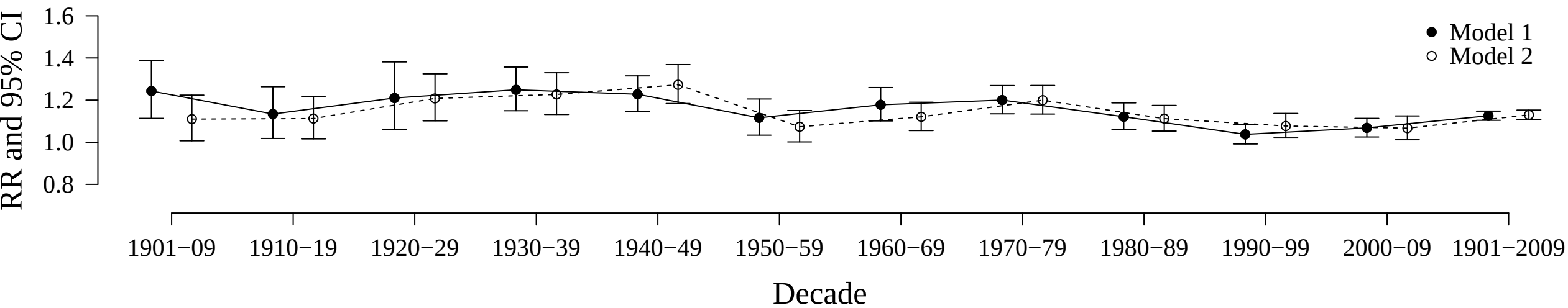
Cold extremes



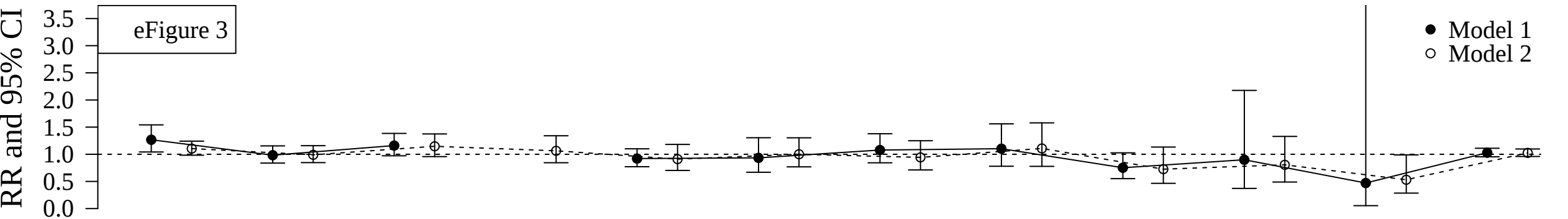
Cold extremes



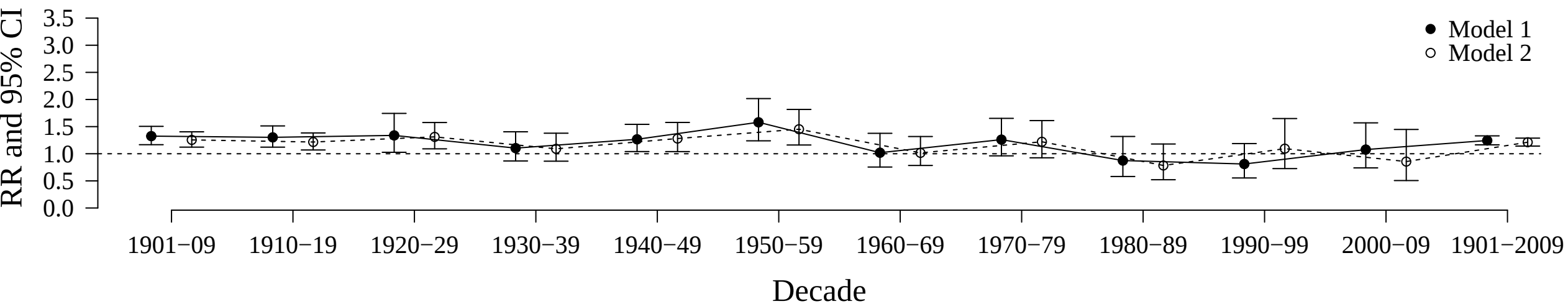
Heat extremes



Cold extremes

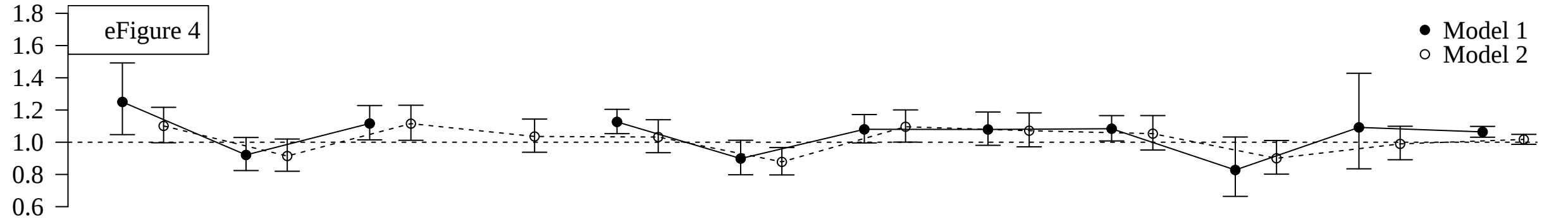


Heat extremes



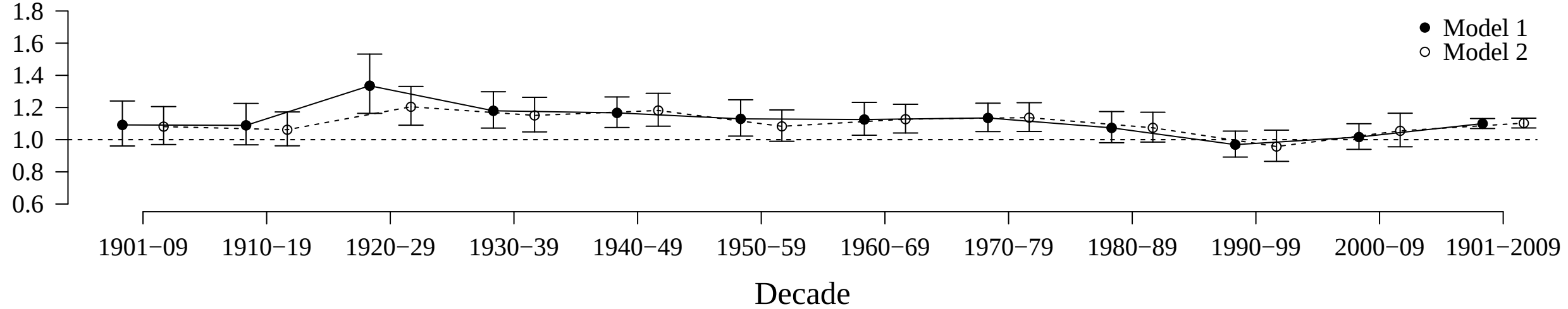
Cold extremes

RR and 95% CI

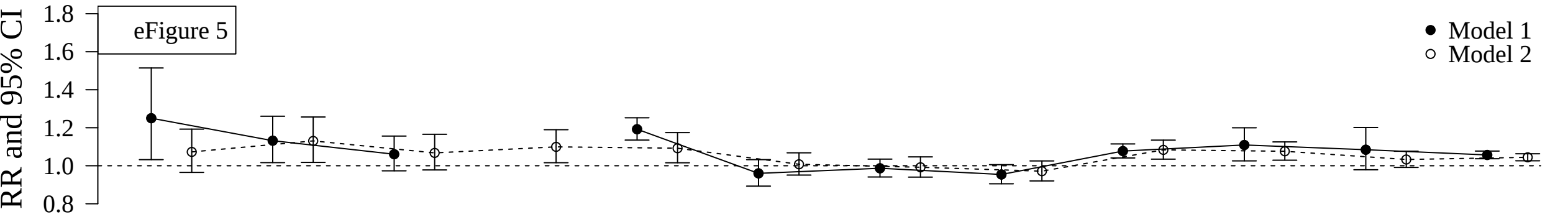


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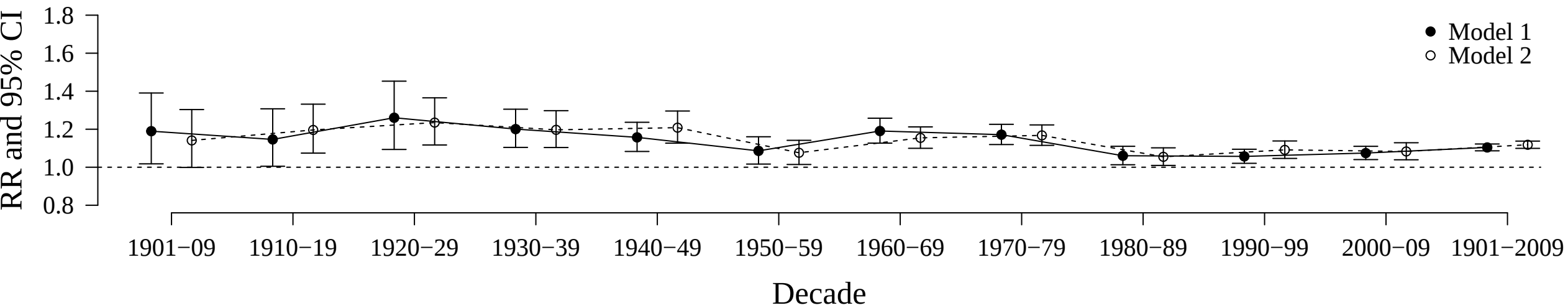
RR and 95% CI



Cold extremes

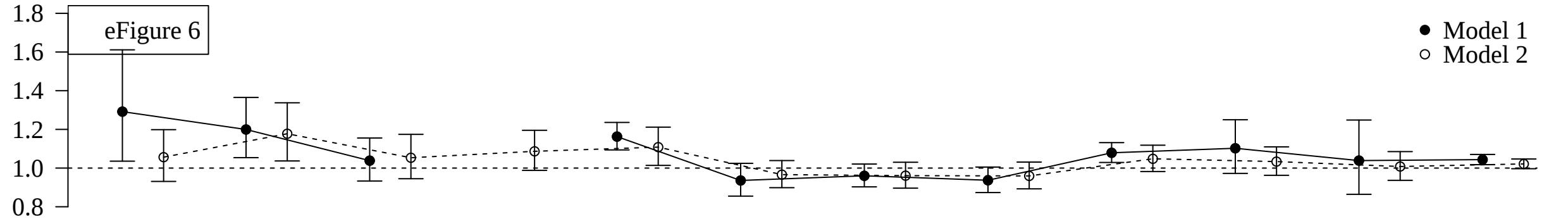


Heat extremes



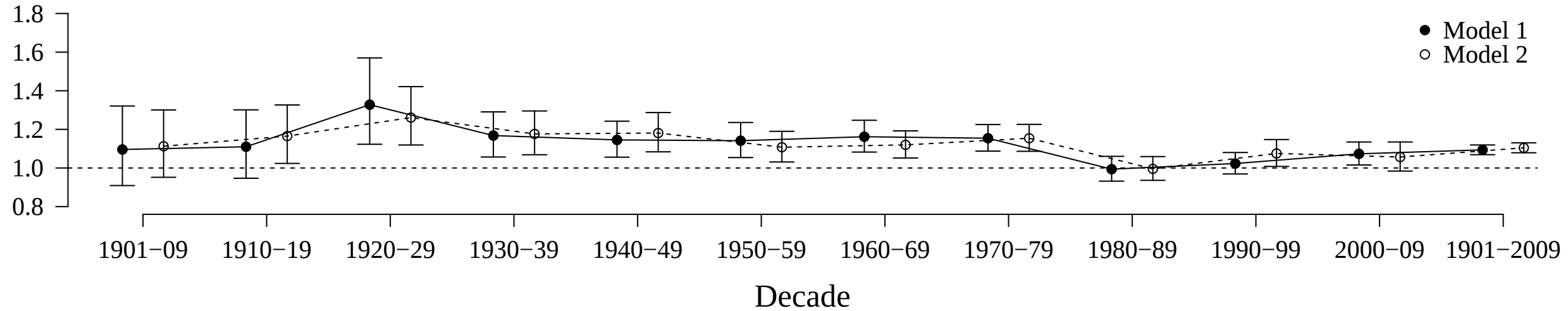
Cold extremes

RR and 95% CI

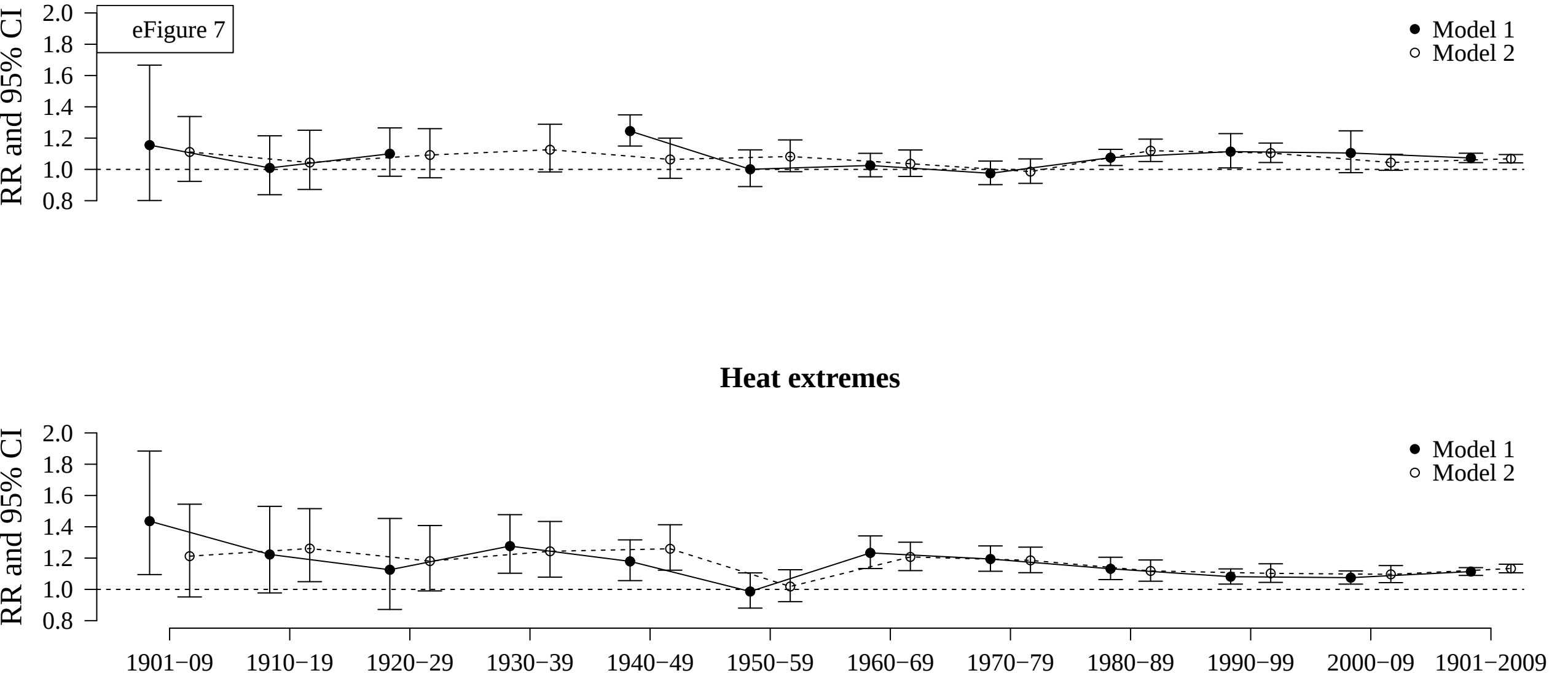


Heat extremes

RR and 95% CI



Cold extremes



Heat extremes

