

**Supplementary table 1.** The association of 25(OH)D level with all-cause mortality in different models in secondary analyses (n = 6377)

	Model 2		Model 3		Model 4	
	HR	95% CI	HR	95% CI	HR	95% CI
25(OH)D level quartiles (nmol/L)						
1 <sup>st</sup> (<34.5)	1.34	(1.15–1.56)	1.30	(1.11–1.51)	1.33	(1.14–1.56)
2 <sup>nd</sup> (34.5–45.1)	0.97	(0.84–1.13)	0.94	(0.81–1.09)	0.98	(0.84–1.14)
3 <sup>rd</sup> (45.2–58.0)	1.07	(0.92–1.25)	1.05	(0.90–1.22)	1.08	(0.93–1.25)
4 <sup>th</sup> (≥58.1)	1.00		1.00		1.00	
25(OH)D level nmol/L						
<25.0	1.51	(1.23–1.87)	1.47	(1.19–1.82)	1.52	(1.23–1.88)
25.0–49.9	1.08	(0.96–1.21)	1.05	(0.93–1.18)	1.08	(0.96–1.21)
50.0–74.9	1.00		1.00		1.00	
≥75.0	1.07	(0.85–1.33)	1.06	(0.85–1.32)	1.06	(0.85–1.33)

25(OH)D: 25-hydroxyvitamin D; CI: confidence interval; HR: hazard ratio

Secondary analyses: missing values ('unknown' in Tables 1 and 2) in covariates body mass index, daily smoker, alcohol consumption, physical activity, education, economic difficulties, and chronic illness (1<sup>st</sup> and 2<sup>nd</sup> definitions) were imputed by using multivariable chained imputation with fully conditional specification.

Model 2 adjusted for season of blood draw, age, sex, BMI, smoking, alcohol consumption, physical activity, education and economic difficulties; Model 3 adjusted for chronic illness (1<sup>st</sup> definition) at baseline in addition to Model 2; Model 4 adjusted for chronic illness (2<sup>nd</sup> definition) at baseline in addition to Model 2.

**Supplementary table 2.** The association of 25(OH)D level with all-cause mortality stratified by chronic illness in Model 2 in secondary analyses (n = 6377)

	25(OH)D nmol/L quartiles 1 <sup>st</sup> vs. 4 <sup>th</sup> (reference)		25(OH)D nmol/L <25.0 vs. 50.0–74.9 (reference)	
	HR	95% CI	HR	95% CI
Chronic illness (1 <sup>st</sup> definition)				
No	1.36	(1.11–1.66)	1.27	(0.95–1.69)
Yes	1.26	(0.97–1.65)	1.72	(1.25–2.37)
Chronic illness (2 <sup>nd</sup> definition)				
No	1.19	(0.91–1.54)	1.18	(0.80–1.75)
Yes	1.42	(1.16–1.73)	1.71	(1.32–2.20)

25(OH)D: 25-hydroxyvitamin D; CI: confidence interval; HR: hazard ratio

Secondary analyses: missing values ('unknown' in Tables 1 and 2) in covariates body mass index, daily smoker, alcohol consumption, physical activity, education, economic difficulties, and chronic illness (1<sup>st</sup> and 2<sup>nd</sup> definitions) were imputed by using multivariable chained imputation with fully conditional specification.

Model 2 adjusted for season of blood draw, age, sex, BMI, smoking, alcohol consumption, physical activity, education and economic difficulties.

**Supplementary table 3.** The association of 25(OH)D level with all-cause mortality in subjects without chronic illness (1<sup>st</sup> definition) in Model 2, with further exclusion of the first 3 years of follow-up in secondary analyses

	HR	95% CI
25(OH)D level quartiles (nmol/L)		
1 <sup>st</sup> (<34.5)	1.40	(1.13–1.73)
2 <sup>nd</sup> (34.5–45.1)	0.97	(0.78–1.20)
3 <sup>rd</sup> (45.2–58.0)	1.12	(0.92–1.37)
4 <sup>th</sup> (≥58.1)	1.00	
25(OH)D level nmol/L		
<25.0	1.32	(0.96–1.80)
25.0–49.9	1.08	(0.92–1.27)
50.0–74.9	1.00	
≥75.0	1.02	(0.76–1.38)

25(OH)D: 25-hydroxyvitamin D; CI: confidence interval; HR: hazard ratio

Secondary analyses: missing values (‘unknown’ in Tables 1 and 2) in covariates body mass index, daily smoker, alcohol consumption, physical activity, education, economic difficulties, and chronic illness (1<sup>st</sup> and 2<sup>nd</sup> definitions) were imputed by using multivariable chained imputation with fully conditional specification.

Model 2 adjusted for season of blood draw, age, sex, BMI, smoking, alcohol consumption, physical activity, education and economic difficulties.