Electronic Supplementary Material 1. Examples of interaction calculations.

Abbreviations
25(OH)D = 25-hydroxyvitamin D, LCA = Lung cancer, PCA = Prostate cancer, CI: Confidence interval, RR = Relative risk, OR = Odds ratio, RD = Risk difference, and SE = Standard error.

Table E1. Lung cancer among non-smokers.

Smoking	Low 25(OH)D	No	LCA	Risk	95% CI	
No	No	1177	17	0.0142	0.0089–0.0227	P00
	Yes	552	10	0.0178	0.0097–0.0324	P01

Note. 95% CIs for R_{00} and R_{01} are the Wilson intervals (Brown et al. 2001).

The effect of low 25(OH)D concentrations in the absence of smoking: RR (95% CI) = 1.25 (0.58, 2.71), OR (95% CI) = 1.25 (0.57, 2.76), and RD (95% CI) = 0.0036 (-0.0082–0.0191).

SE for ln(RR) = $\sqrt{\frac{1}{10}+\frac{1}{17}-\frac{1}{10+552}-\frac{1}{17+1177}} = 0.3952$

Lower 95% CI for RR = $e^{(\ln(1.2497)-1.96\times0.3952)}$ = 0.5760
Upper 95% CI for RR = $e^{(\ln(1.2497)+1.96\times0.3952)}$ = 2.7115

SE for ln(OR) = $\sqrt{\frac{1}{10}+\frac{1}{552}+\frac{1}{17}+\frac{1}{1177}} = 0.4019$

Lower 95% CI for OR = $e^{(\ln(1.2543)-1.96\times0.4019)}$ = 0.5706
Upper 95% CI for OR = $e^{(\ln(1.2543)+1.96\times0.4019)}$ = 2.7574

Lower 95% CI for RD
= 0.0036$-\sqrt{(0.0178-0.0097)^2+(0.0227-0.0142)^2} = -0.0082$

Upper 95% CI for RD
= 0.0036$-\sqrt{(0.0142-0.0089)^2+(0.0324-0.0178)^2} = -0.0191$

References

Brown, L. D., Cai, T. T., & DasGupta, A. (2001). Interval estimation for a binomial proportion. *Statististical Science, 16*(2), 101–133. https://doi.org/10.1214/ss/1009213286

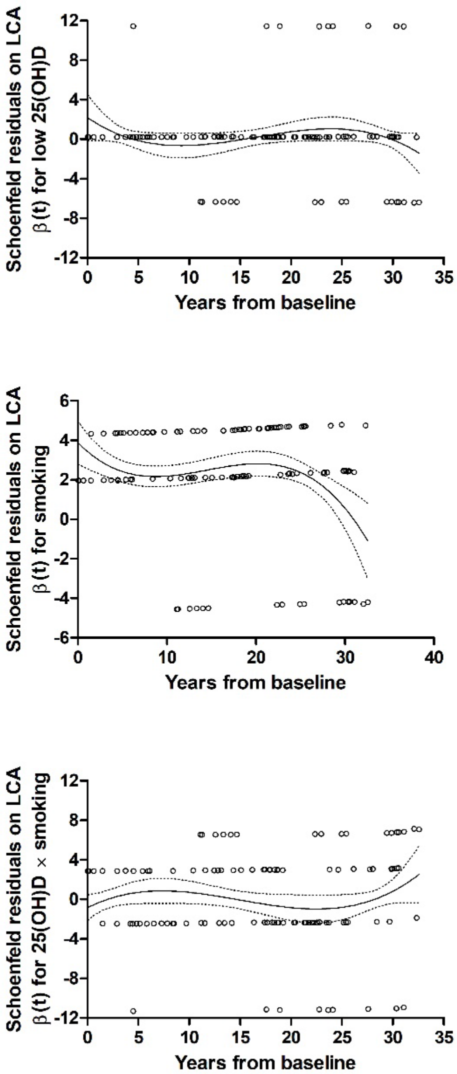

Figure E1. Schoenfeld residuals for the Cox proportional hazards model of lung cancer (LCA) with respect to circulating 25-hydroxyvitamin D [25(OH)D] concentrations (low vs. high, subfigure on the left, $p = 0.977$ for H0: $\beta = 0$), smoking status (smoking vs. no smoking, subfigure in the middle, $p = 0.003$), and the interaction between circulating 25(OH)D concentrations and smoking status (subfigure on the right, $p = 0.325$). Lines represent 3rd order polynomial regressions, and dotted lines represent 95% confidence bands for the regressions.

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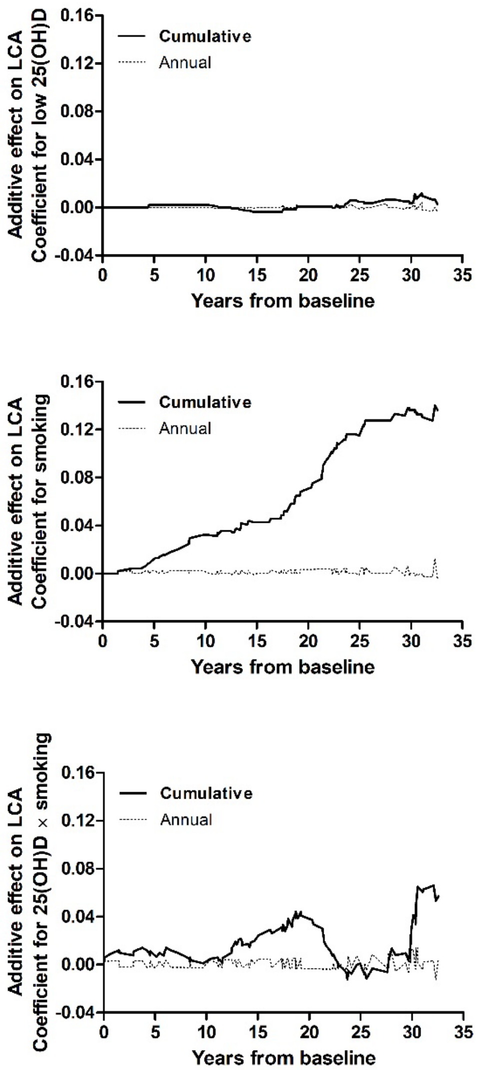

Figure E2. Additive effects of circulating 25-hydroxyvitamin D [25(OH)D] concentrations (low vs. high, subfigure on the left, $p = 0.571$ for H0: $\beta = 0$), smoking status (smoking vs. no smoking, subfigure in the middle, $p < 0.001$), and the interaction between circulating 25(OH)D concentrations and smoking status (subfigure on the right, $p = 0.309$) on the hazard of incident lung cancer (LCA).

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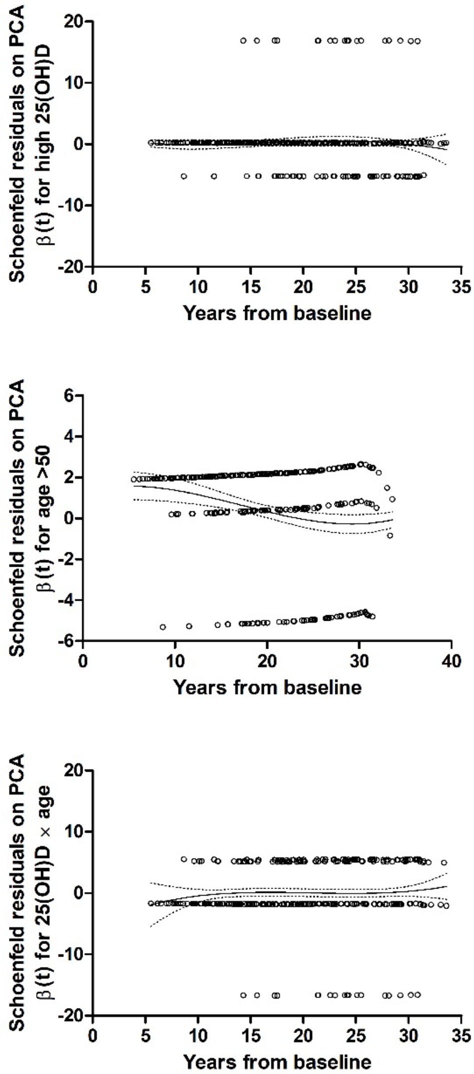

Figure E3. Schoenfeld residuals for the Cox proportional hazards model of prostate cancer (PCA) with respect to circulating 25-hydroxyvitamin D [25(OH)D] concentrations (high vs. low, subfigure on the left, p = 0.247 for H0: β = 0), age (>50 vs. <50 years, subfigure in the middle, p = <0.001), and the interaction between circulating 25(OH)D concentrations and age (subfigure on the right, p = 0.762). Lines represent 3rd order polynomial regressions, and dotted lines represent 95% confidence bands for the regressions.

https://doi.org/10.1024/0300-9831/a000780

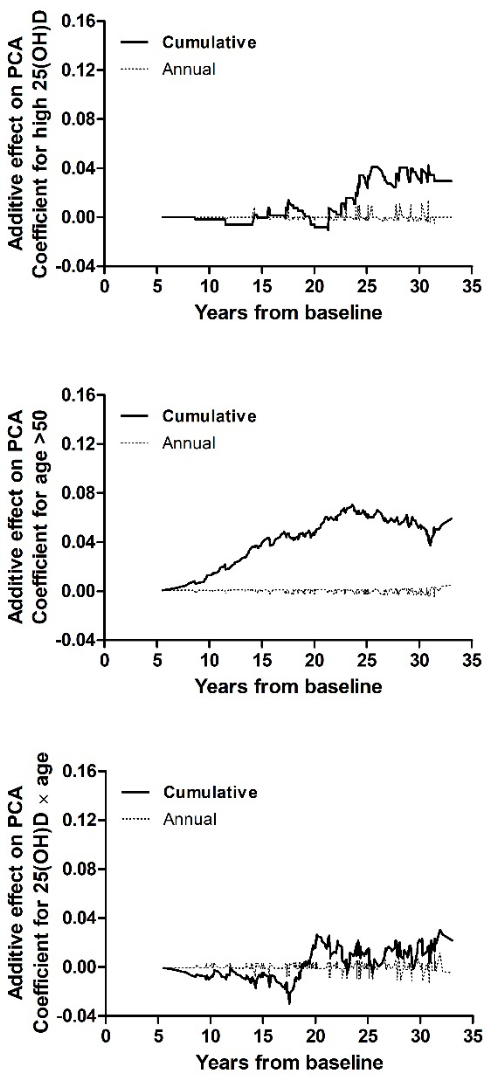

Figure E4. Additive effects of circulating 25-hydroxyvitamin D [25(OH)D] concentrations (high vs. low, subfigure on the left, $p = 0.452$ for H0: $\beta = 0$), age (>50 vs. <50 years, subfigure in the middle, $p = 0.003$), and the interaction between circulating 25(OH)D concentrations and age (subfigure on the right, $p = 0.760$) on the hazard of prostate cancer (PCA).

https://doi.org/10.1024/0300-9831/a000780