Specific vegetable types are associated with lower long-term risk for late-life dementia: the Perth Longitudinal Study of Aging Women

Supplementary materials

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Supplementary Figure 1. Hazard ratios (95% CI) for the relationship of the intake of (a) total vegetable, (b) yellow/orange/red vegetables, (c) cruciferous vegetables, (d) allium vegetables, (e) green leafy vegetables, and (f) legume vegetables with any late-life dementia hospitalisations over 14.5 years.

Supplementary Figure 2. Hazard ratios (95% CI) for the relationship of the intake of (a) total vegetable, (b) yellow/orange/red vegetables, (c) cruciferous vegetables, (d) allium vegetables, (e) green leafy vegetables, and (f) legume vegetables with any late-life dementia death over 14.5 years.

Supplementary Table 1: Hazard ratios (95% CI) for any late-life dementia events after truncation of follow-up to 13 years by quartiles of cruciferous and legume vegetables.

	Quartiles for intake of cruciferous vegetables			
	Q1 ≤16 g/d	Q2 >16 – 28 g/d	Q3 >28 – 44 g/d	Q4 >44 g/d
Events	Ref.	0.94 (0.67,1.31)	0.99 (0.70,1.42)	0.94 (0.62,1.42)
	Quartiles for intake of legume vegetables			
	Q1 ≤15 g/d	Q2 >15 – 24 g/d	Q3 >24 – 36 g/d	Q4 >36 g/d
Events	Ref.	0.97 (0.71,1.32)	0.92 (0.66,1.29)	0.98 (0.64,1.51)

Estimated hazard ratios and 95% CIs from Cox proportional hazards analysis, comparing the median intake of cruciferous and legume vegetables from each quartile compared to Q1. Multivariable-adjusted model for treatment code (calcium or placebo), Framingham Risk Score, apolipoprotein E genotype, energy intake, prescription of statin medications, use of low-dose aspirin, prevalent atherosclerotic vascular disease, physical activity, alcohol intake, socio-economic status.

Supplementary Table 2: Hazard ratios (95% CI) for any late-life dementia events, hospitalisations, and deaths over 14.5 years by quartiles of vegetable intake including the additional adjustment for diet quality.

Late-life dementia	Quartiles for intake of total vegetables			
	Q1 ≤143 g/d	Q2 >143 – 190 g/d	Q3 >190 – 243 g/d	Q4 >243 g/d
Deaths	Ref.	0.84 (0.60,1.17)	0.67 (0.41,1.09)	0.61 (0.32,1.15)
	Quartiles for intake of yellow/orange/red vegetables			
	Q1 ≤33 g/d	Q2 >33 – 48 g/d	Q3 >48 – 68 g/d	Q4 >68 g/d
Events	Ref.	0.93 (0.74,1.16)	**0.70 (0.52,0.95)**	**0.63 (0.42,0.94)**
Hospitalisations	Ref.	1.01 (0.79,1.30)	0.75 (0.54,1.05)	**0.64 (0.42,0.98)**
Deaths	Ref.	0.87 (0.62,1.24)	**0.60 (0.37,0.95)**	0.56 (0.30,1.06)
	Quartiles for intake of allium vegetables			
	Q1 ≤3 g/d	Q2 >3 – 6 g/d	Q3 >6 – 11 g/d	Q4 >11 g/d
Events	Ref.	0.84 (0.63,1.11)	0.76 (0.57,1.02)	0.75 (0.51,1.09)
Deaths	Ref.	0.82 (0.53,1.26)	0.66 (0.41,1.04)	0.56 (0.30,1.03)
	Quartiles for intake of green leafy vegetables			
	Q1 ≤10 g/d	Q2 >10 – 17 g/d	Q3 >17 - 25.5 g/d	Q4 >25.5 g/d
Deaths	Ref.	0.87 (0.57,1.33)	**0.59 (0.36,0.97)**	0.61 (0.34,1.10)

Estimated hazard ratios and 95% CIs from Cox proportional hazards analysis, comparing the median intake of total vegetable intake and vegetable types in quartiles (Q) 2, 3 and 4, with Q1. Bolded indicates $p<0.05$ compared to Q1. Multivariable-adjusted for treatment code (calcium or placebo), apolipoprotein E genotype, general Framingham Risk Score, energy intake, prescription of statin medications, use of low-dose aspirin, prevalent atherosclerotic vascular disease, physical activity, alcohol intake, socio-economic status), plus Dietary Guideline Index (DGI). Excludes energy and alcohol intake as these are included in the DGI score.

Supplementary Table 3: Hazard ratios (95% CI) for any late-life dementia events, hospitalisations, and deaths over 14.5 years by quartiles of yellow/orange/red vegetables intake further adjusted for non-yellow/orange/red vegetables intake.

Late-life dementia	Quartiles for intake of yellow/orange/red vegetables			
	Q1 ≤33 g/d	Q2 >33 – 48 g/d	Q3 >48 – 68 g/d	Q4 >68 g/d
Events	Ref.	0.88 (0.70,1.12)	**0.64 (0.46,0.88)**	**0.55 (0.36,0.84)**
Hospitalisations	Ref.	0.95 (0.74,1.24)	**0.67 (0.48,0.95)**	**0.53 (0.34,0.84)**
Deaths	Ref.	0.88 (0.61,1.27)	0.60 (0.36,1.00)	0.59 (0.29,1.17)

Estimated hazard ratios and 95% CIs from Cox proportional hazards analysis, comparing the median intake of yellow/orange/red vegetable intake in quartiles (Q) 2, 3 and 4, with Q1. Bolded indicates $p<0.05$ compared to Q1. Multivariable-adjusted for treatment code (calcium or placebo), apolipoprotein E genotype, general Framingham Risk Score, energy intake, prescription of statin medications, use of low-dose aspirin, prevalent atherosclerotic vascular disease, physical activity, alcohol intake, socio-economic status plus non-yellow/orange/red vegetable intake.

Supplementary Table 4: Hazard ratios (95% CI) for any late-life dementia events, hospitalisations, and deaths over 14.5 years by

categories of vegetable diversity.

Late-life dementia		Vegetable diversity (number of different vegetables consumed each day)		
		≤3	4	≥ 5
	Events, n (%)	75 (19.3)	61 (16.2)	71 (16.1)
Events	Model 1	Ref.	0.76 (0.54 – 1.06)	0.82 (0.59 – 1.13)
	Model 2	Ref.	0.73 (0.52 – 1.04)	0.78 (0.56 – 1.10)
Hospitalisations	Model 1	Ref.	0.76 (0.52 – 1.09)	0.87 (0.61 – 1.23)
	Model 2	Ref.	0.74 (0.51 – 1.07)	0.85 (0.59 – 1.21)
Deaths	Model 1	Ref.	0.66 (0.38 – 1.12)	0.68 (0.41 – 1.14)
	Model 2	Ref.	0.65 (0.38 – 1.13)	0.67 (0.40 – 1.14)

Estimated hazard ratios and 95% CIs from Cox proportional hazards analysis for late-life dementia events, hospitalisation, and deaths by vegetable diversity intakes. Model 1: Multivariable adjusted for treatment code (calcium or placebo), Framingham Risk Score and apolipoprotein E genotype. Model 2: Model 1 plus energy intake, prescription of statin medications, use of low-dose aspirin, prevalent atherosclerotic vascular disease, physical activity, alcohol intake, and socio-economic status.

Supplementary Table 5: Hazard ratios (95% CI) for any late-life dementia events, hospitalisations, and deaths over 14.5 years by quartiles of

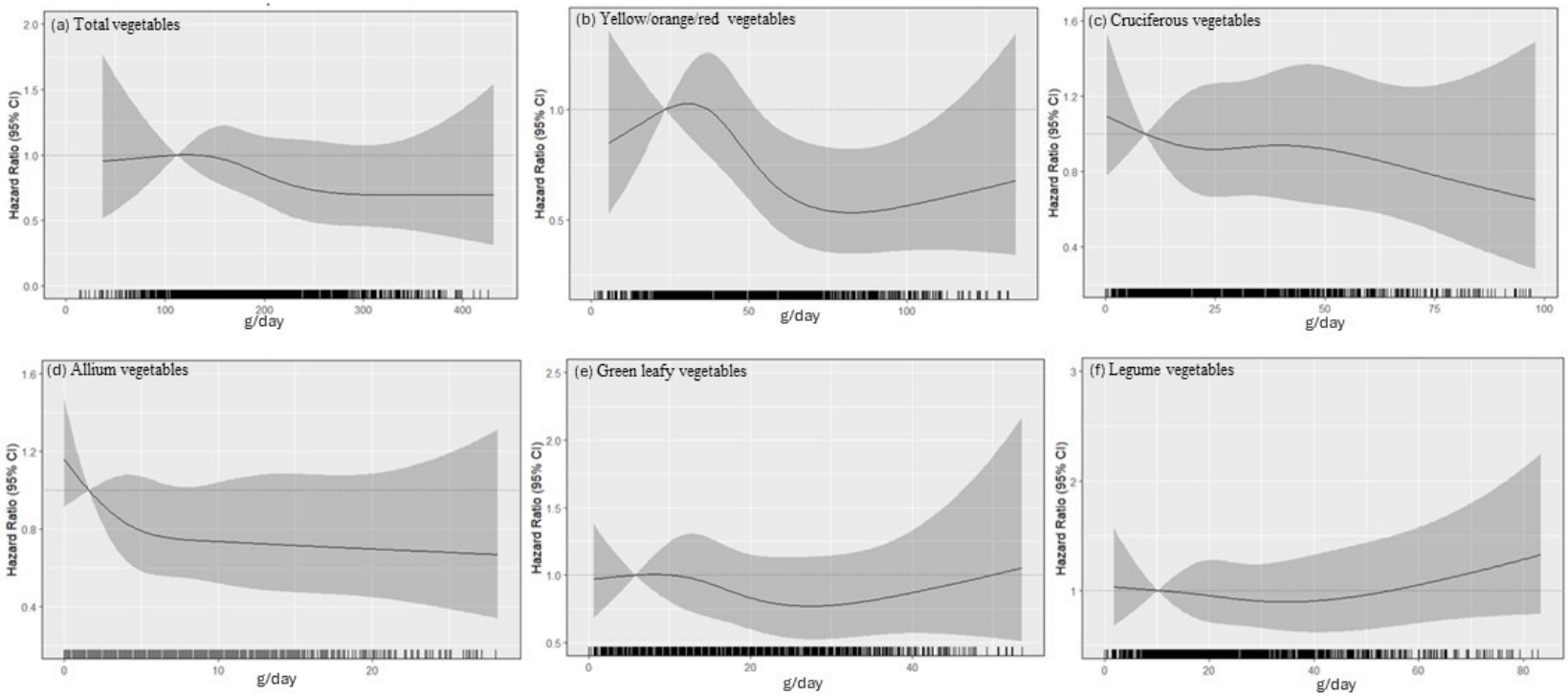
vegetable type intake including the additional adjustments for individual variables of the Framingham Risk Score.

Late-life dementia		Quartiles for intake of total vegetables			
		Q1 ≤143 g/d	Q2 >143 – 190 g/d	Q3 >190 – 243 g/d	Q4 >243 g/d
	Events, n (%)	61 (20.1)	50 (16.6)	49 (16.3)	47 (15.7)
Events	*Model 1*	Ref.	0.90 (0.72,1.11)	0.78 (0.58,1.05)	0.74 (0.51,1.08)
	Model 2	Ref.	0.88 (0.70,1.10)	0.77 (0.56,1.06)	0.71 (0.48,1.06)
Hospitalisations	*Model 1*	Ref.	0.98 (0.76,1.25)	0.82 (0.59,1.13)	0.74 (0.50,1.10)
	Model 2	Ref.	0.97 (0.76,1.25)	0.83 (0.59,1.17)	0.75 (0.48,1.15)
Deaths	*Model 1*	Ref.	0.83 (0.60,1.15)	**0.62 (0.39,0.99)**	**0.53 (0.29,0.97)**
	Model 2	Ref.	0.82 (0.59,1.14)	**0.60 (0.37,0.99)**	0.52 (0.28,1.00)
		Quartiles for intake of yellow/orange/red vegetables			
		Q1 ≤33 g/d	Q2 >33 – 48 g/d	Q3 >48 – 68 g/d	Q4 >68 g/d
	Events, n (%)	58 (19.2)	61 (20.1)	47 (15.6)	41 (13.7)
Events	*Model 1*	Ref.	0.94 (0.75,1.18)	**0.66 (0.49,0.88)**	**0.57 (0.39,0.82)**
	Model 2	Ref.	0.93 (0.74,1.18)	**0.64 (0.47,0.87)**	**0.54 (0.36,0.80)**
Hospitalisations	*Model 1*	Ref.	1.01 (0.79,1.30)	**0.70 (0.51,0.96)**	**0.56 (0.37,0.84)**
	Model 2	Ref.	1.02 (0.79,1.31)	**0.69 (0.50,0.97)**	**0.54 (0.35,0.83)**
Deaths	*Model 1*	Ref.	0.88 (0.63,1.25)	**0.55 (0.35,0.88)**	**0.50 (0.27,0.91)**
	Model 2	Ref.	0.90 (0.63,1.29)	**0.55 (0.34,0.89)**	**0.49 (0.26,0.93)**
		Quartiles for intake of cruciferous vegetables			
		Q1 ≤16 g/d	Q2 >16 – 28 g/d	Q3 >28 – 44 g/d	Q4 >44 g/d
	Events, n (%)	56 (18.5)	56 (18.5)	51 (17)	43 (14.4)
Events	*Model 1*	Ref.	0.90 (0.67,1.21)	0.84 (0.62,1.14)	0.76 (0.53,1.09)
	Model 2	Ref.	0.93 (0.69,1.24)	0.88 (0.65,1.20)	0.79 (0.54,1.15)
Hospitalisations	*Model 1*	Ref.	0.90 (0.66,1.24)	0.89 (0.64,1.23)	0.83 (0.57,1.23)
	Model 2	Ref.	0.94 (0.69,1.29)	0.96 (0.68,1.33)	0.90 (0.61,1.34)
Deaths	*Model 1*	Ref.	0.75 (0.49,1.15)	0.67 (0.42,1.06)	0.56 (0.32,1.00)
	Model 2	Ref.	0.78 (0.51,1.19)	0.69 (0.43,1.11)	0.59 (0.33,1.06)
		Quartiles for intake of allium vegetables			

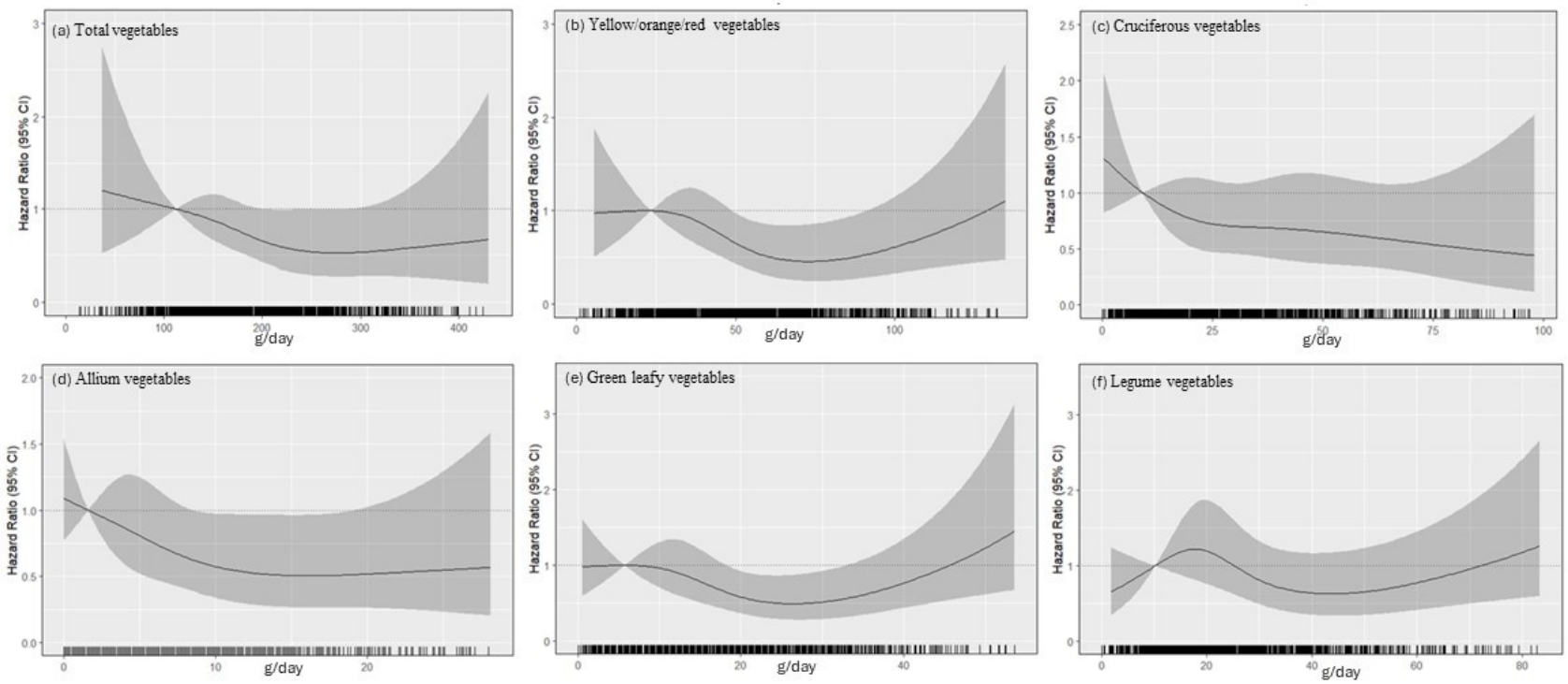
		Q1	Q2	Q3	Q4
		≤3 g/d	>3 – 6 g/d	>6 – 11 g/d	>11 g/d
	Events, n (%)	65 (20.7)	50 (17.2)	44 (14.6)	48 (16.1)
Events	*Model 1*	Ref.	0.87 (0.66,1.15)	0.80 (0.60,1.06)	0.77 (0.54,1.12)
	Model 2	Ref.	0.86 (0.65,1.13)	0.75 (0.56,1.01)	0.69 (0.47,1.03)
Hospitalisations	*Model 1*	Ref.	0.84 (0.62,1.12)	0.83 (0.61,1.13)	0.85 (0.57,1.25)
	Model 2	Ref.	0.82 (0.61,1.11)	0.78 (0.57,1.07)	0.77 (0.51,1.17)
Deaths	*Model 1*	Ref.	0.89 (0.58,1.37)	0.70 (0.44,1.11)	0.57 (0.31,1.04)
	Model 2	Ref.	0.87 (0.56,1.34)	0.70 (0.43,1.12)	0.57 (0.30,1.09)
		Quartiles for intake of green leafy vegetables			
		Q1	Q2	Q3	Q4
		≤10 g/d	>10 – 17 g/d	>17 - 25.5 g/d	>25.5 g/d
	Events, n (%)	58 (19.1)	54 (18.1)	44 (14.5)	51 (17)
Events	*Model 1*	Ref.	0.99 (0.75,1.30)	0.84 (0.62,1.15)	0.81 (0.56,1.15)
	Model 2	Ref.	0.97 (0.74,1.27)	0.82 (0.60,1.12)	0.80 (0.56,1.16)
Hospitalisations	*Model 1*	Ref.	1.06 (0.78,1.42)	0.87 (0.63,1.22)	0.80 (0.55,1.17)
	Model 2	Ref.	1.02 (0.76,1.37)	0.84 (0.60,1.18)	0.80 (0.54,1.17)
Deaths	*Model 1*	Ref.	0.89 (0.59,1.35)	**0.55 (0.34,0.90)**	**0.52 (0.29,0.93)**
	Model 2	Ref.	0.89 (0.59,1.35)	**0.54 (0.33,0.88)**	**0.52 (0.29,0.94)**
		Quartiles for intake of legume vegetables			
		Q1	Q2	Q3	Q4
		≤15 g/d	>15 – 24 g/d	>24 - 36 g/d	>36 g/d
	Events, n (%)	51 (16.8)	49 (16.2)	59 (19.5)	28 (16.1)
Events	*Model 1*	Ref.	1.01 (0.78,1.32)	0.97 (0.73,1.28)	0.96 (0.67,1.39)
	Model 2	Ref.	1.01 (0.77,1.32)	0.92 (0.68,1.23)	0.86 (0.58,1.27)
Hospitalisations	*Model 1*	Ref.	1.01 (0.76,1.34)	1.00 (0.73,1.35)	1.04 (0.70,1.53)
	Model 2	Ref.	1.00 (0.75,1.34)	0.95 (0.70,1.31)	0.95 (0.63,1.43)
Deaths	*Model 1*	Ref.	1.28 (0.83,1.98)	0.93 (0.58,1.50)	0.68 (0.37,1.26)
	Model 2	Ref.	1.35 (0.86,2.11)	0.91 (0.56,1.50)	0.62 (0.33,1.18)

Estimated hazard ratios and 95% CIs from Cox proportional hazards analysis, comparing the median intake of total vegetable and vegetable types from each quartile with Q1. Median intake of vegetables (in g/day) for Quartiles 1- 4 was: total vegetables (112.3, 168.2, 213.9, 284.3), yellow/orange/red (23.55, 40.70, 56.80, 86.05), cruciferous (9.20, 22.80, 35, 57.65), allium (1.60, 4.80, 8.45, 14.60), green leafy vegetables

(5.80, 13.40, 20.90, 32.35), and legumes (10.20, 19.40, 28.90, 47.28) respectively. Bolded indicates $p<0.05$ compared to Q1. Model 1: treatment code (calcium or placebo), age, BMI, and apolipoprotein E genotype. Model 2: Model 1 plus energy intake, prescription of statin medications, use of low-dose aspirin, previous diabetes, systolic blood pressure, prevalent atherosclerotic vascular disease, physical activity, alcohol intake, smoking status, socio-economic status.



Supplementary Figure 1. Hazard ratios (95% CI) for the relationship of the intake of (a) total vegetable, (b) yellow/orange/red vegetables, (c) cruciferous vegetables, (d) allium vegetables, (e) green leafy vegetables, and (f) legume vegetables with any late-life dementia hospitalisations over 14.5 years, multivariable-adjusted for treatment code (calcium or placebo), apolipoprotein E genotype, general Framingham Risk Score, energy intake, prescription of statin medications, use of low-dose aspirin, prevalent atherosclerotic vascular disease, physical activity, alcohol intake, and socio-economic status. Solid lines are the estimated hazard ratio and shaded areas represent the 95% CI (confidence intervals).



Supplementary Figure 2. Hazard ratios (95% CI) for the relationship of the intake of (a) total vegetable, (b) yellow/orange/red vegetables, (c) cruciferous vegetables, (d) allium vegetables, (e) green leafy vegetables, and (f) legume vegetables with any late-life dementia death over 14.5 years, multivariable-adjusted for treatment code (calcium or placebo), apolipoprotein E genotype, Framingham Risk Score, energy intake, prescription of statin medications, use of low-dose aspirin, prevalent atherosclerotic vascular disease, physical activity, alcohol intake, and socio-economic status. Solid lines are the estimated hazard ratio and shaded areas represent the 95% CI (confidence intervals).