Supplemental File: Batty et al. The Truth About Cats and Dogs: Associations of Pet Ownership with Biomarkers of Ageing in the English Longitudinal Study of Ageing

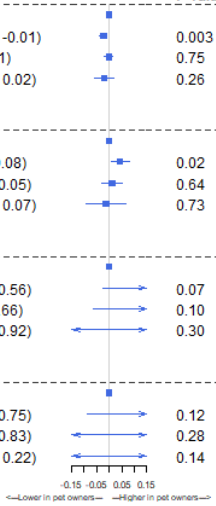
Contents

Impact of separate adjustment for confounding and mediating variables on the association of pet ownership with biomarkers of ageing

Supplemental Figure 1. Beta coefficients (part A) and relative risks (part B) for the relation of pet ownership with ageing biomarkers: physical functioning (N=8785)

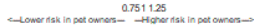
Part A.

	Model 1		Model 1 + confounders		Model 1 + mediators		All covariates	
Gait speed (m/sec)	**β (95% CI)**	**P-value**	**β (95% CI)**	**P-value**	**β (95% CI)**	**P-value**	**β (95% CI)**	**P-value**
No pet	0 (ref.)		0 (ref.)		0 (ref.)		0 (ref.)	
Dog	-0.03 (-0.05 to -0.02)	< 0.001	-0.02 (-0.04 to -0.01)	0.004	-0.03 (-0.05 to -0.02)	< 0.001	-0.02 (-0.04 to -0.01)	0.003
Cat (no dog)	0.004 (-0.02 to 0.02)	0.71	-0.001 (-0.02 to 0.02)	0.91	-0.001 (-0.02 to 0.02)	0.90	0 (-0.02 to 0.01)	0.75
Other pet	-0.04 (-0.08 to -0.002)	0.04	-0.02 (-0.06 to 0.01)	0.21	-0.03 (-0.07 to 0.01)	0.11	-0.02 (-0.06 to 0.02)	0.26
FEV1 (L/sec)								
No pet	0 (ref.)		0 (ref.)		0 (ref.)		0 (ref.)	
Dog	-0.004 (-0.04 to 0.04)	0.87	0.04 (0.01 to 0.08)	0.02	0.01 (-0.03 to 0.05)	0.55	0.04 (0.01 to 0.08)	0.02
Cat (no dog)	0.01 (-0.03 to 0.05)	0.65	0.01 (-0.03 to 0.05)	0.61	0.01 (-0.04 to 0.05)	0.82	0.01 (-0.03 to 0.05)	0.64
Other pet	-0.06 (-0.14 to 0.03)	0.18	-0.02 (-0.10 to 0.06)	0.70	-0.03 (-0.11 to 0.05)	0.43	-0.01 (-0.09 to 0.07)	0.73
Chair rise (secs)								
No pet	0 (ref.)		0 (ref.)		0 (ref.)		0 (ref.)	
Dog	0.58 (0.26 to 0.90)	< 0.001	0.27 (-0.03 to 0.57)	0.08	0.42 (0.11 to 0.72)	0.01	0.27 (-0.03 to 0.56)	0.07
Cat (no dog)	0.25 (-0.13 to 0.63)	0.19	0.30 (-0.06 to 0.66)	0.10	0.30 (-0.07 to 0.67)	0.11	0.3 (-0.06 to 0.66)	0.10
Other pet	0.75 (0.10 to 1.39)	0.02	0.35 (-0.25 to 0.96)	0.25	0.48 (-0.14 to 1.09)	0.13	0.32 (-0.28 to 0.92)	0.30
Grip strength (kg)								
No pet	0 (ref.)		0 (ref.)		0 (ref.)		0 (ref.)	
Dog	0.04 (-0.40 to 0.48)	0.87	0.36 (-0.07 to 0.79)	0.10	0.18 (-0.24 to 0.61)	0.39	0.33 (-0.09 to 0.75)	0.12
Cat (no dog)	0.43 (-0.14 to 0.99)	0.14	0.33 (-0.22 to 0.88)	0.24	0.37 (-0.18 to 0.91)	0.19	0.29 (-0.25 to 0.83)	0.28
Other pet	-1.08 (-2.00 to -0.16)	0.02	-0.59 (-1.48 to 0.30)	0.19	-0.94 (-1.84 to -0.05)	0.04	-0.67 (-1.55 to 0.22)	0.14



Part B.

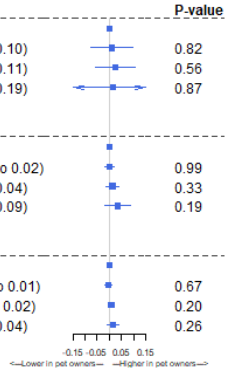
	Model 1		Model 1 + confounders		Model 1 + mediators		All covariates	
Leg raise failure	**RR (95% CI)**	**P-value**	**RR (95% CI)**	**P-value**	**RR (95% CI)**	**P-value**	**RR (95% CI)**	**P-value**
No pet	1 (ref.)		1 (ref.)		1 (ref.)		1 (ref.)	
Dog	1.05 (0.97 to 1.13)	0.19	1.02 (0.94 to 1.09)	0.67	1.02 (0.95 to 1.10)	0.55	1 (0.93 to 1.08)	0.94
Cat (no dog)	1.08 (1.00 to 1.16)	0.06	1.08 (1.00 to 1.17)	0.04	1.09 (1.01 to 1.17)	0.03	1.09 (1.01 to 1.17)	0.03
Other pet	1.04 (0.90 to 1.21)	0.57	0.99 (0.86 to 1.14)	0.88	1.01 (0.87 to 1.16)	0.94	0.98 (0.85 to 1.13)	0.79
Balance failure								
No pet	1 (ref.)		1 (ref.)		1 (ref.)		1 (ref.)	
Dog	1.07 (0.96 to 1.19)	0.25	0.99 (0.88 to 1.10)	0.83	1.03 (0.92 to 1.15)	0.59	0.98 (0.88 to 1.10)	0.77
Cat (no dog)	1.01 (0.88 to 1.15)	0.90	1.01 (0.89 to 1.16)	0.84	1.03 (0.90 to 1.17)	0.66	1.03 (0.90 to 1.17)	0.67
Other pet	1.39 (1.11 to 1.75)	0.004	1.25 (1.00 to 1.58)	0.05	1.3 (1.04 to 1.63)	0.02	1.24 (0.99 to 1.55)	0.06



Model 1: age and sex; Confounders: wealth, self-reported health, smoking status, and alcohol consumption; Mediators: social isolation, loneliness, physical activity, and body mass index; All covariates: all above covariates

Supplemental Figure 2. Beta coefficients (95% confidence interval) for the relation of pet ownership with ageing biomarkers: immune functioning (N=8785)

	Model 1		Model 1 + confounders		Model 1 + mediators		All covariates	
C-reactive protein (log[mg/L])	**β (95% CI)**	**P-value**	**β (95% CI)**	**P-value**	**β (95% CI)**	**P-value**	**β (95% CI)**	**P-value**
No pet	0 (ref.)		0 (ref.)		0 (ref.)		0 (ref.)	
Dog	0.09 (-0.003 to 0.18)	0.06	0.03 (-0.06 to 0.12)	0.47	0.04 (-0.04 to 0.13)	0.31	0.01 (-0.08 to 0.10)	0.82
Cat (no dog)	0.02 (-0.07 to 0.11)	0.61	0.03 (-0.06 to 0.12)	0.52	0.03 (-0.05 to 0.11)	0.46	0.02 (-0.06 to 0.11)	0.56
Other pet	0.11 (-0.08 to 0.29)	0.26	0.04 (-0.14 to 0.22)	0.66	0.04 (-0.14 to 0.21)	0.68	0.01 (-0.16 to 0.19)	0.87
WBC (log[x10^9 cells/litre])								
No pet	0 (ref.)		0 (ref.)		0 (ref.)		0 (ref.)	
Dog	0.02 (0.001 to 0.04)	0.04	0.003 (-0.02 to 0.02)	0.75	0.01 (-0.01 to 0.03)	0.15	0.0001 (-0.02 to 0.02)	0.99
Cat (no dog)	0.02 (-0.01 to 0.04)	0.26	0.01 (-0.01 to 0.04)	0.34	0.02 (-0.01 to 0.04)	0.20	0.01 (-0.01 to 0.04)	0.33
Other pet	0.05 (-0.004 to 0.10)	0.07	0.04 (-0.01 to 0.09)	0.15	0.04 (-0.02 to 0.09)	0.16	0.03 (-0.02 to 0.09)	0.19
Fibrinogen (log[g/L])								
No pet	0 (ref.)		0 (ref.)		0 (ref.)		0 (ref.)	
Dog	0.01 (-0.01 to 0.02)	0.48	-0.001 (-0.02 to 0.02)	0.90	0.001 (-0.02 to 0.02)	0.86	-0.003 (-0.02 to 0.01)	0.67
Cat (no dog)	0.01 (-0.01 to 0.02)	0.22	0.01 (-0.005 to 0.02)	0.20	0.01 (-0.003 to 0.02)	0.15	0.01 (-0.004 to 0.02)	0.20
Other pet	0.02 (-0.002 to 0.05)	0.07	0.02 (-0.01 to 0.04)	0.17	0.02 (-0.01 to 0.04)	0.23	0.01 (-0.01 to 0.04)	0.26

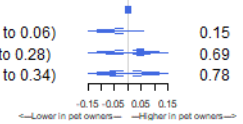


Model 1: age and sex; Confounders: wealth, self-reported health, smoking status, and alcohol consumption; Mediators: social isolation, loneliness, physical activity, and body mass index; All covariates: all above covariates

Supplemental Figure 3. Beta coefficients (part A) and relative risks (part B) for the relation of pet ownership with biomarkers of ageing: psychological functioning (N=8785)

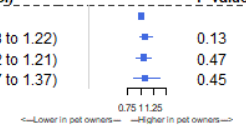
Part A.

Memory	Model 1 β (95% CI)	P-value	Model 1 + confounders β (95% CI)	P-value	Model 1 + mediators β (95% CI)	P-value	All covariates β (95% CI)	P-value
No pet	0 (ref.)		0 (ref.)		0 (ref.)		0 (ref.)	
Dog	-0.31 (-0.52 to -0.09)	0.01	-0.15 (-0.37 to 0.06)	0.16	-0.23 (-0.45 to -0.02)	0.03	-0.16 (-0.37 to 0.06)	0.15
Cat (no dog)	0.10 (-0.15 to 0.35)	0.43	0.05 (-0.18 to 0.29)	0.66	0.08 (-0.16 to 0.32)	0.53	0.05 (-0.19 to 0.28)	0.69
Other pet	-0.28 (-0.70 to 0.14)	0.19	-0.05 (-0.46 to 0.35)	0.79	-0.18 (-0.59 to 0.23)	0.39	-0.06 (-0.46 to 0.34)	0.78



Part B.

Depressive symptoms	Model 1 RR (95% CI)	P-value	Model 1 + confounders RR (95% CI)	P-value	Model 1 + mediators RR (95% CI)	P-value	All covariates RR (95% CI)	P-value
No pet	1 (ref.)		1 (ref.)	0	1 (ref.)	0	1 (ref.)	
Dog	1.28 (1.14 to 1.44)	< 0.001	1.13 (1.01 to 1.27)	0.03	1.16 (1.04 to 1.30)	0.01	1.09 (0.98 to 1.22)	0.13
Cat (no dog)	1.05 (0.90 to 1.22)	0.54	1.06 (0.92 to 1.22)	0.43	1.05 (0.91 to 1.21)	0.47	1.05 (0.92 to 1.21)	0.47
Other pet	1.24 (0.95 to 1.60)	0.11	1.08 (0.84 to 1.39)	0.56	1.14 (0.91 to 1.44)	0.26	1.09 (0.87 to 1.37)	0.45

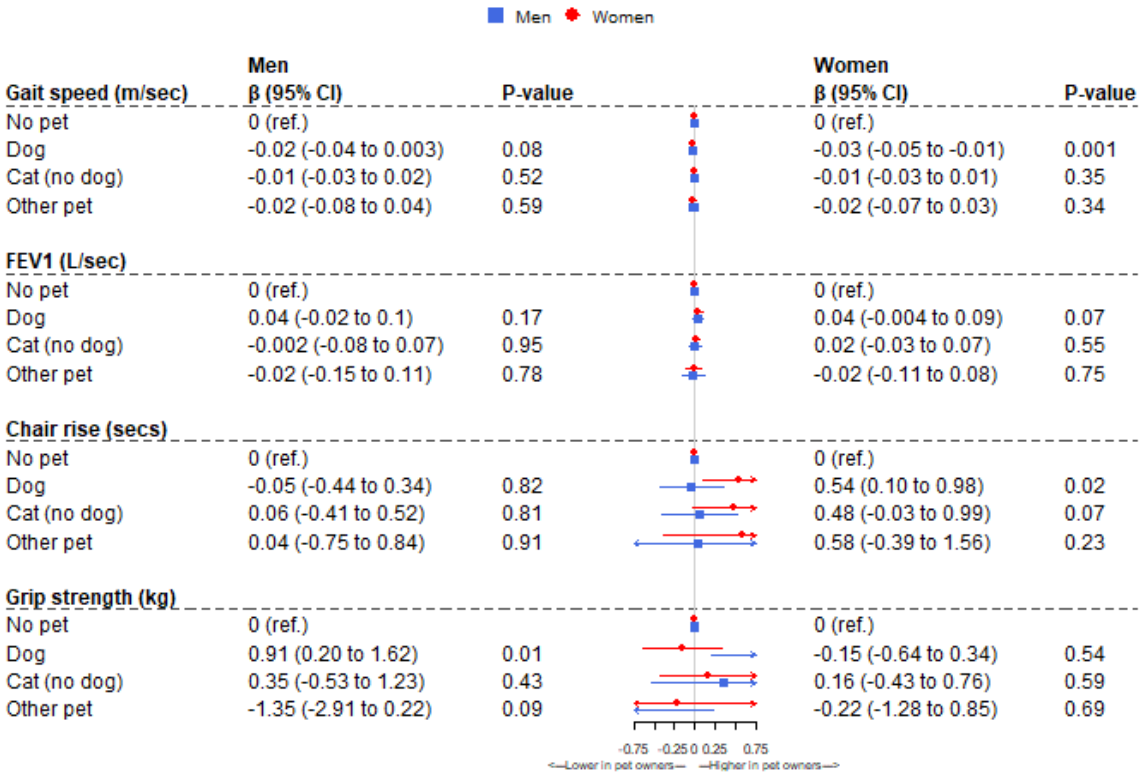


Model 1: age and sex; Confounders: wealth, self-reported health, smoking status, and alcohol consumption; Mediators: social isolation, loneliness, physical activity, and body mass index; All covariates: all above covariates

Effect modification by gender in the association of pet ownership with biomarkers of ageing

Supplemental Figure 4. Beta coefficients (part A) and relative risks (part B) for the relation of pet ownership with ageing biomarkers: physical functioning according to gender (3922 men, 4863 women)

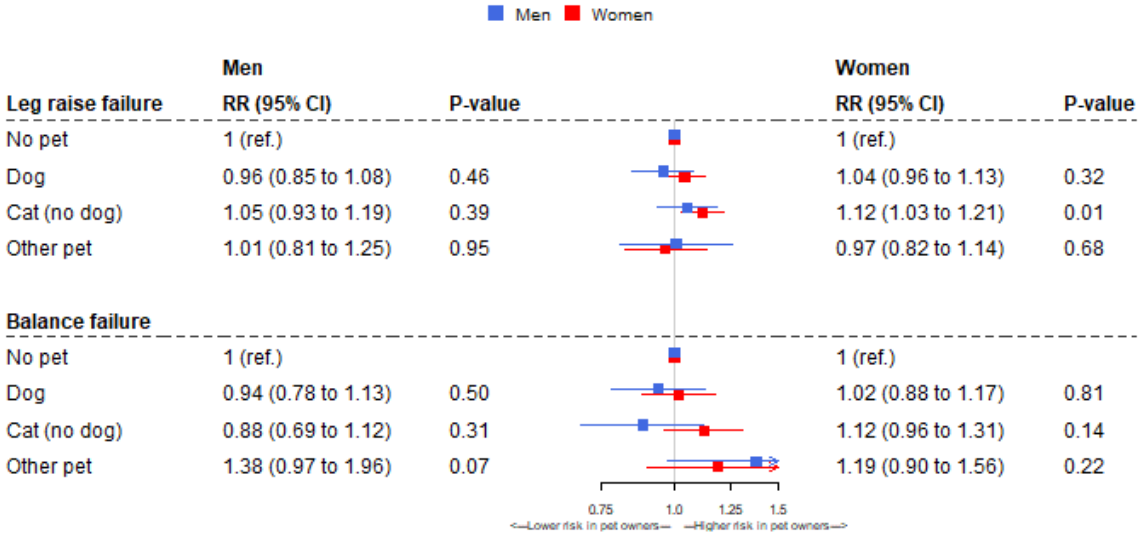
Part A.



	Men		Women	
Gait speed (m/sec)	**β (95% CI)**	**P-value**	**β (95% CI)**	**P-value**
No pet	0 (ref.)		0 (ref.)	
Dog	-0.02 (-0.04 to 0.003)	0.08	-0.03 (-0.05 to -0.01)	0.001
Cat (no dog)	-0.01 (-0.03 to 0.02)	0.52	-0.01 (-0.03 to 0.01)	0.35
Other pet	-0.02 (-0.08 to 0.04)	0.59	-0.02 (-0.07 to 0.03)	0.34
FEV1 (L/sec)				
No pet	0 (ref.)		0 (ref.)	
Dog	0.04 (-0.02 to 0.1)	0.17	0.04 (-0.004 to 0.09)	0.07
Cat (no dog)	-0.002 (-0.08 to 0.07)	0.95	0.02 (-0.03 to 0.07)	0.55
Other pet	-0.02 (-0.15 to 0.11)	0.78	-0.02 (-0.11 to 0.08)	0.75
Chair rise (secs)				
No pet	0 (ref.)		0 (ref.)	
Dog	-0.05 (-0.44 to 0.34)	0.82	0.54 (0.10 to 0.98)	0.02
Cat (no dog)	0.06 (-0.41 to 0.52)	0.81	0.48 (-0.03 to 0.99)	0.07
Other pet	0.04 (-0.75 to 0.84)	0.91	0.58 (-0.39 to 1.56)	0.23
Grip strength (kg)				
No pet	0 (ref.)		0 (ref.)	
Dog	0.91 (0.20 to 1.62)	0.01	-0.15 (-0.64 to 0.34)	0.54
Cat (no dog)	0.35 (-0.53 to 1.23)	0.43	0.16 (-0.43 to 0.76)	0.59
Other pet	-1.35 (-2.91 to 0.22)	0.09	-0.22 (-1.28 to 0.85)	0.69

FEV1, Forced Expiratory Volume in one second

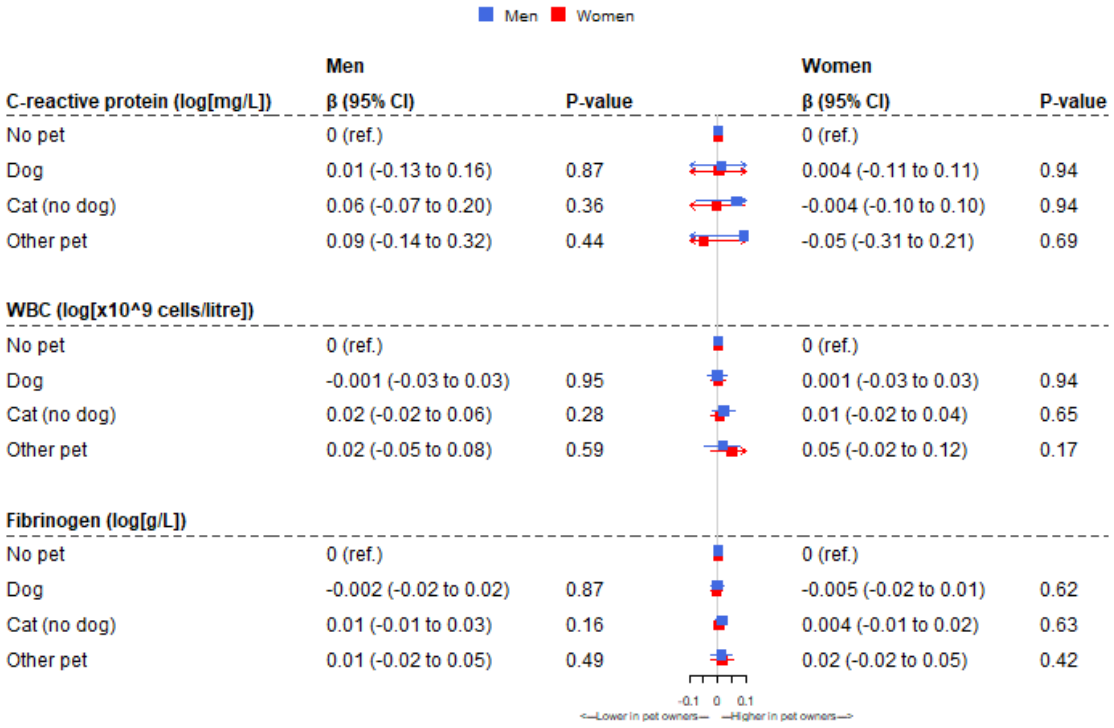
Part B.



	Men		Women	
Leg raise failure	**RR (95% CI)**	**P-value**	**RR (95% CI)**	**P-value**
No pet	1 (ref.)		1 (ref.)	
Dog	0.96 (0.85 to 1.08)	0.46	1.04 (0.96 to 1.13)	0.32
Cat (no dog)	1.05 (0.93 to 1.19)	0.39	1.12 (1.03 to 1.21)	0.01
Other pet	1.01 (0.81 to 1.25)	0.95	0.97 (0.82 to 1.14)	0.68
Balance failure				
No pet	1 (ref.)		1 (ref.)	
Dog	0.94 (0.78 to 1.13)	0.50	1.02 (0.88 to 1.17)	0.81
Cat (no dog)	0.88 (0.69 to 1.12)	0.31	1.12 (0.96 to 1.31)	0.14
Other pet	1.38 (0.97 to 1.96)	0.07	1.19 (0.90 to 1.56)	0.22

Effect estimates are adjusted for all covariates (as in Supplemental Figure 3)

Supplemental Figure 5. Beta coefficients (95% confidence interval) for the relation of pet ownership with ageing biomarkers: immune functioning according to gender (3922 men, 4863 women)

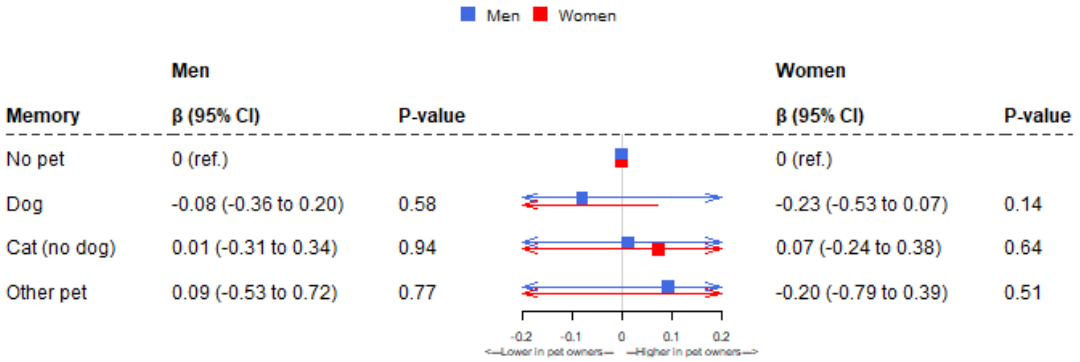


	Men		Women	
C-reactive protein (log[mg/L])	**β (95% CI)**	**P-value**	**β (95% CI)**	**P-value**
No pet	0 (ref.)		0 (ref.)	
Dog	0.01 (-0.13 to 0.16)	0.87	0.004 (-0.11 to 0.11)	0.94
Cat (no dog)	0.06 (-0.07 to 0.20)	0.36	-0.004 (-0.10 to 0.10)	0.94
Other pet	0.09 (-0.14 to 0.32)	0.44	-0.05 (-0.31 to 0.21)	0.69
WBC (log[x10^9 cells/litre])				
No pet	0 (ref.)		0 (ref.)	
Dog	-0.001 (-0.03 to 0.03)	0.95	0.001 (-0.03 to 0.03)	0.94
Cat (no dog)	0.02 (-0.02 to 0.06)	0.28	0.01 (-0.02 to 0.04)	0.65
Other pet	0.02 (-0.05 to 0.08)	0.59	0.05 (-0.02 to 0.12)	0.17
Fibrinogen (log[g/L])				
No pet	0 (ref.)		0 (ref.)	
Dog	-0.002 (-0.02 to 0.02)	0.87	-0.005 (-0.02 to 0.01)	0.62
Cat (no dog)	0.01 (-0.01 to 0.03)	0.16	0.004 (-0.01 to 0.02)	0.63
Other pet	0.01 (-0.02 to 0.05)	0.49	0.02 (-0.02 to 0.05)	0.42

Effect estimates are adjusted for all covariates (as in Supplemental Figure 3). WBC, white blood cell count

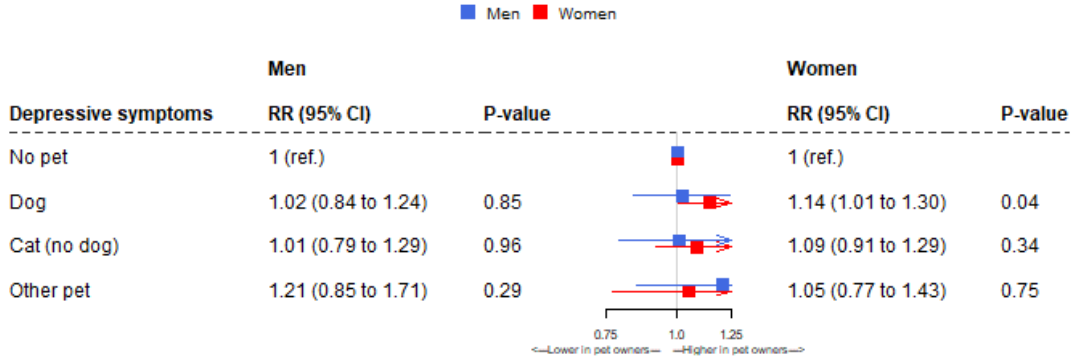
Supplemental Figure 6. Beta coefficients (part A) and relative risks (part B) for the relation of pet ownership with biomarkers of ageing: psychological functioning according to gender (3922 men, 4863 women)

Part A.



	Men		Women	
Memory	**β (95% CI)**	**P-value**	**β (95% CI)**	**P-value**
No pet	0 (ref.)		0 (ref.)	
Dog	-0.08 (-0.36 to 0.20)	0.58	-0.23 (-0.53 to 0.07)	0.14
Cat (no dog)	0.01 (-0.31 to 0.34)	0.94	0.07 (-0.24 to 0.38)	0.64
Other pet	0.09 (-0.53 to 0.72)	0.77	-0.20 (-0.79 to 0.39)	0.51

Part B.



	Men		Women	
Depressive symptoms	**RR (95% CI)**	**P-value**	**RR (95% CI)**	**P-value**
No pet	1 (ref.)		1 (ref.)	
Dog	1.02 (0.84 to 1.24)	0.85	1.14 (1.01 to 1.30)	0.04
Cat (no dog)	1.01 (0.79 to 1.29)	0.96	1.09 (0.91 to 1.29)	0.34
Other pet	1.21 (0.85 to 1.71)	0.29	1.05 (0.77 to 1.43)	0.75

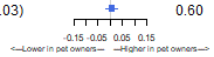
Effect estimates are adjusted for all covariates (as in Supplemental Figure 3)

Association of pet ownership with other later health indices

Supplemental Figure 7. Beta coefficients (part A) and relative risks (part B) for the relation of pet ownership with later risk indices (N=8785)

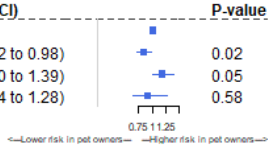
Part A.

	Model 1		Model 1 + confounders		Model 1 + mediators		All covariates	
Systolic blood pressure (mmHg)	**β (95% CI)**	**P-value**	**β (95% CI)**	**P-value**	**β (95% CI)**	**P-value**	**β (95% CI)**	**P-value**
No pet	0 (ref.)		0 (ref.)		0 (ref.)		0 (ref.)	
Dog	0.84 (-0.35 to 2.02)	0.17	0.90 (-0.28 to 2.08)	0.13	0.67 (-0.5 to 1.84)	0.26	0.73 (-0.44 to 1.89)	0.22
Cat (no dog)	0.04 (-1.32 to 1.4)	0.96	0.14 (-1.22 to 1.50)	0.84	0 (-1.36 to 1.36)	> 0.999	0.06 (-1.29 to 1.41)	0.93
Other pet	-1.32 (-4 to 1.36)	0.33	-1.52 (-4.20 to 1.16)	0.26	-1.53 (-4.21 to 1.14)	0.26	-1.65 (-4.33 to 1.03)	0.22
BMI (kg/m^2)								
No pet	0 (ref.)		0 (ref.)		0 (ref.)		0 (ref.)	
Dog	0.46 (0.13 to 0.79)	0.01	0.39 (0.07 to 0.71)	0.02	0.07 (-0.14 to 0.28)	0.50	0.07 (-0.14 to 0.28)	0.48
Cat (no dog)	0.06 (-0.33 to 0.45)	0.75	0.19 (-0.20 to 0.57)	0.34	0.11 (-0.11 to 0.34)	0.32	0.12 (-0.10 to 0.35)	0.28
Other pet	0.60 (-0.11 to 1.31)	0.10	0.28 (-0.41 to 0.97)	0.43	-0.02 (-0.49 to 0.46)	0.94	-0.03 (-0.51 to 0.44)	0.88
Waist circumference (cm)								
No pet	0 (ref.)		0 (ref.)		0 (ref.)		0 (ref.)	
Dog	1.57 (0.81 to 2.32)	< 0.001	1.21 (0.48 to 1.93)	1E-3	0.60 (0.13 to 1.07)	0.01	0.46 (-0.01 to 0.94)	0.06
Cat (no dog)	0.76 (-0.26 to 1.78)	0.14	1.01 (0.01 to 2.01)	0.05	0.91 (0.30 to 1.51)	0.004	0.87 (0.27 to 1.47)	0.01
Other pet	1.38 (-0.37 to 3.12)	0.12	0.52 (-1.19 to 2.23)	0.55	-0.13 (-1.51 to 1.25)	0.85	-0.19 (-1.59 to 1.2)	0.78
Total cholesterol (mmol/L)								
No pet	0 (ref.)		0 (ref.)		0 (ref.)		0 (ref.)	
Dog	0.05 (-0.03 to 0.13)	0.19	0.08 (0.004 to 0.16)	0.04	0.07 (-0.01 to 0.15)	0.07	0.09 (0.01 to 0.16)	0.03
Cat (no dog)	0.05 (-0.04 to 0.14)	0.27	0.04 (-0.05 to 0.12)	0.39	0.05 (-0.04 to 0.13)	0.29	0.04 (-0.05 to 0.13)	0.36
Other pet	-0.02 (-0.18 to 0.15)	0.83	0.02 (-0.14 to 0.18)	0.78	0.01 (-0.16 to 0.18)	0.91	0.03 (-0.14 to 0.19)	0.74
HDL cholesterol (mmol/L)								
No pet	0 (ref.)		0 (ref.)		0 (ref.)		0 (ref.)	
Dog	-0.03 (-0.06 to -0.01)	0.02	-0.02 (-0.04 to 0.01)	0.21	-0.02 (-0.04 to 0.01)	0.26	-0.01 (-0.03 to 0.02)	0.60
Cat (no dog)	0.004 (-0.03 to 0.04)	0.83	-0.003 (-0.04 to 0.03)	0.85	0.002 (-0.03 to 0.04)	0.91	-0.0009 (-0.03 to 0.03)	0.96
Other pet	-0.02 (-0.09 to 0.05)	0.61	0.002 (-0.07 to 0.07)	0.95	0.01 (-0.07 to 0.08)	0.87	0.01 (-0.06 to 0.08)	0.77
LDL cholesterol (mmol/L)								
No pet	0 (ref.)		0 (ref.)		0 (ref.)		0 (ref.)	
Dog	0.05 (-0.03 to 0.12)	0.22	0.07 (-0.004 to 0.15)	0.06	0.06 (-0.02 to 0.14)	0.12	0.07 (0 to 0.15)	0.06
Cat (no dog)	0.03 (-0.05 to 0.11)	0.43	0.02 (-0.05 to 0.10)	0.54	0.03 (-0.05 to 0.10)	0.48	0.02 (-0.05 to 0.1)	0.53
Other pet	-0.04 (-0.19 to 0.10)	0.57	-0.01 (-0.15 to 0.14)	0.94	-0.02 (-0.17 to 0.12)	0.75	-0.01 (-0.15 to 0.14)	0.95
Triglycerides (mmol/L)								
No pet	0 (ref.)		0 (ref.)		0 (ref.)		0 (ref.)	
Dog	0.05 (0.01 to 0.09)	0.01	0.03 (-0.004 to 0.07)	0.08	0.03 (-0.005 to 0.07)	0.08	0.02 (-0.01 to 0.06)	0.21
Cat (no dog)	0.02 (-0.02 to 0.06)	0.30	0.02 (-0.01 to 0.06)	0.20	0.02 (-0.01 to 0.06)	0.21	0.02 (-0.01 to 0.06)	0.21
Other pet	0.07 (-0.01 to 0.16)	0.09	0.05 (-0.04 to 0.14)	0.24	0.05 (-0.03 to 0.14)	0.22	0.04 (-0.04 to 0.13)	0.30
HbA1c (log[mmol/mol])								
No pet	0 (ref.)		0 (ref.)		0 (ref.)		0 (ref.)	
Dog	0.02 (0.005 to 0.03)	0.01	0.01 (0 to 0.02)	0.09	0.01 (0.0007 to 0.02)	0.04	0.01 (-0.004 to 0.02)	0.17
Cat (no dog)	0.02 (0.001 to 0.03)	0.04	0.02 (0 to 0.03)	0.02	0.02 (0.003 to 0.03)	0.02	0.02 (0.003 to 0.03)	0.02
Other pet	0.02 (-0.01 to 0.04)	0.17	0.01 (-0.01 to 0.03)	0.44	0.01 (-0.02 to 0.03)	0.49	0.01 (-0.02 to 0.03)	0.60



Part B.

	Model 1		Model 1 + confounders		Model 1 + mediators		All covariates	
Type 2 diabetes	**RR (95% CI)**	**P-value**	**RR (95% CI)**	**P-value**	**RR (95% CI)**	**P-value**	**RR (95% CI)**	**P-value**
No pet	1 (ref.)		1 (ref.)		1 (ref.)		1 (ref.)	
Dog	0.95 (0.81 to 1.11)	0.52	0.87 (0.74 to 1.02)	0.08	0.89 (0.76 to 1.04)	0.13	0.84 (0.72 to 0.98)	0.02
Cat (no dog)	1.13 (0.94 to 1.34)	0.19	1.17 (0.98 to 1.39)	0.07	1.16 (0.98 to 1.37)	0.09	1.18 (1.00 to 1.39)	0.05
Other pet	1.07 (0.76 to 1.52)	0.70	0.96 (0.68 to 1.35)	0.81	0.95 (0.67 to 1.34)	0.76	0.91 (0.64 to 1.28)	0.58



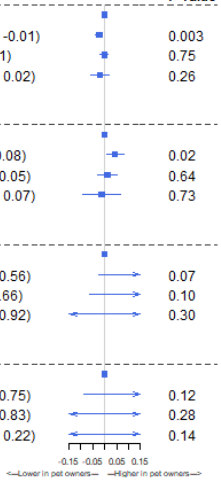
Model 1: age and sex; Confounders: wealth, self-reported health, smoking status, and alcohol consumption; Mediators: social isolation, loneliness, physical activity, and body mass index; All covariates: all above covariates. BMI, body mass index; HDL, High-density lipoprotein; LDL, Low-density lipoprotein; HbA1c, Glycated haemoglobin

Impact of adjustment of baseline assessment of each ageing biomarker on the association of pet ownership with biomarkers of ageing

Supplemental Figure 8. Beta coefficients (part A) and relative risks (part B) for the relation of pet ownership with ageing biomarkers: physical functioning (N=8785)

Part A.

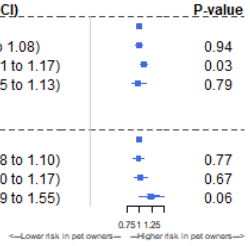
	Model 1		Model 1 + confounders		Model 1 + mediators		All covariates	
Gait speed (m/sec)	**β (95% CI)**	**P-value**	**β (95% CI)**	**P-value**	**β (95% CI)**	**P-value**	**β (95% CI)**	**P-value**
No pet	0 (ref.)		0 (ref.)		0 (ref.)		0 (ref.)	
Dog	-0.03 (-0.05 to -0.02)	< 0.001	-0.02 (-0.04 to -0.01)	0.004	-0.03 (-0.05 to -0.02)	< 0.001	-0.02 (-0.04 to -0.01)	0.003
Cat (no dog)	0.004 (-0.02 to 0.02)	0.71	-0.001 (-0.02 to 0.02)	0.91	-0.001 (-0.02 to 0.02)	0.90	0 (-0.02 to 0.01)	0.75
Other pet	-0.04 (-0.08 to -0.002)	0.04	-0.02 (-0.06 to 0.01)	0.21	-0.03 (-0.07 to 0.01)	0.11	-0.02 (-0.06 to 0.02)	0.26
FEV1 (L/sec)								
No pet	0 (ref.)		0 (ref.)		0 (ref.)		0 (ref.)	
Dog	-0.004 (-0.04 to 0.04)	0.87	0.04 (0.01 to 0.08)	0.02	0.01 (-0.03 to 0.05)	0.55	0.04 (0.01 to 0.08)	0.02
Cat (no dog)	0.01 (-0.03 to 0.05)	0.65	0.01 (-0.03 to 0.05)	0.61	0.01 (-0.04 to 0.05)	0.82	0.01 (-0.03 to 0.05)	0.64
Other pet	-0.06 (-0.14 to 0.03)	0.18	-0.02 (-0.10 to 0.06)	0.70	-0.03 (-0.11 to 0.05)	0.43	-0.01 (-0.09 to 0.07)	0.73
Chair rise (secs)								
No pet	0 (ref.)		0 (ref.)		0 (ref.)		0 (ref.)	
Dog	0.58 (0.26 to 0.90)	< 0.001	0.27 (-0.03 to 0.57)	0.08	0.42 (0.11 to 0.72)	0.01	0.27 (-0.03 to 0.56)	0.07
Cat (no dog)	0.25 (-0.13 to 0.63)	0.19	0.30 (-0.06 to 0.66)	0.10	0.30 (-0.07 to 0.67)	0.11	0.3 (-0.06 to 0.66)	0.10
Other pet	0.75 (0.10 to 1.39)	0.02	0.35 (-0.25 to 0.96)	0.25	0.48 (-0.14 to 1.09)	0.13	0.32 (-0.28 to 0.92)	0.30
Grip strength (kg)								
No pet	0 (ref.)		0 (ref.)		0 (ref.)		0 (ref.)	
Dog	0.04 (-0.40 to 0.48)	0.87	0.36 (-0.07 to 0.79)	0.10	0.18 (-0.24 to 0.61)	0.39	0.33 (-0.09 to 0.75)	0.12
Cat (no dog)	0.43 (-0.14 to 0.99)	0.14	0.33 (-0.22 to 0.88)	0.24	0.37 (-0.18 to 0.91)	0.19	0.29 (-0.25 to 0.83)	0.28
Other pet	-1.08 (-2.00 to -0.16)	0.02	-0.59 (-1.48 to 0.30)	0.19	-0.94 (-1.84 to -0.05)	0.04	-0.67 (-1.55 to 0.22)	0.14



FEV1, Forced Expiratory Volume in one second

Part B.

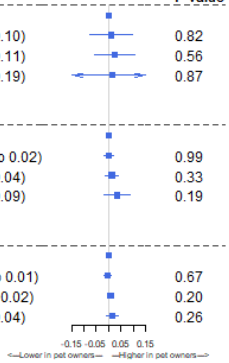
	Model 1		Model 1 + confounders		Model 1 + mediators		All covariates	
Leg raise failure	**RR (95% CI)**	**P-value**	**RR (95% CI)**	**P-value**	**RR (95% CI)**	**P-value**	**RR (95% CI)**	**P-value**
No pet	1 (ref.)		1 (ref.)		1 (ref.)		1 (ref.)	
Dog	1.05 (0.97 to 1.13)	0.19	1.02 (0.94 to 1.09)	0.67	1.02 (0.95 to 1.10)	0.55	1 (0.93 to 1.08)	0.94
Cat (no dog)	1.08 (1.00 to 1.16)	0.06	1.08 (1.00 to 1.17)	0.04	1.09 (1.01 to 1.17)	0.03	1.09 (1.01 to 1.17)	0.03
Other pet	1.04 (0.90 to 1.21)	0.57	0.99 (0.86 to 1.14)	0.88	1.01 (0.87 to 1.16)	0.94	0.98 (0.85 to 1.13)	0.79
Balance failure								
No pet	1 (ref.)		1 (ref.)		1 (ref.)		1 (ref.)	
Dog	1.07 (0.96 to 1.19)	0.25	0.99 (0.88 to 1.10)	0.83	1.03 (0.92 to 1.15)	0.59	0.98 (0.88 to 1.10)	0.77
Cat (no dog)	1.01 (0.88 to 1.15)	0.90	1.01 (0.89 to 1.16)	0.84	1.03 (0.90 to 1.17)	0.66	1.03 (0.90 to 1.17)	0.67
Other pet	1.39 (1.11 to 1.75)	0.004	1.25 (1.00 to 1.58)	0.05	1.3 (1.04 to 1.63)	0.02	1.24 (0.99 to 1.55)	0.06



Model 1: age, sex, and baseline (wave 4) assessment of biomarker outcome; Confounders: wealth, self-reported health, smoking status, and alcohol consumption; Mediators: social isolation, loneliness, physical activity, and body mass index; All covariates: all above covariates.

Supplemental Figure 9. Beta coefficients (95% confidence interval) for the relation of pet ownership with ageing biomarkers: immune functioning (N=8785)

	Model 1		Model 1 + confounders		Model 1 + mediators		All covariates	
C-reactive protein (log[mg/L])	**β (95% CI)**	**P-value**	**β (95% CI)**	**P-value**	**β (95% CI)**	**P-value**	**β (95% CI)**	**P-value**
No pet	0 (ref.)		0 (ref.)		0 (ref.)		0 (ref.)	
Dog	0.09 (-0.003 to 0.18)	0.06	0.03 (-0.06 to 0.12)	0.47	0.04 (-0.04 to 0.13)	0.31	0.01 (-0.08 to 0.10)	0.82
Cat (no dog)	0.02 (-0.07 to 0.11)	0.61	0.03 (-0.06 to 0.12)	0.52	0.03 (-0.05 to 0.11)	0.46	0.02 (-0.06 to 0.11)	0.56
Other pet	0.11 (-0.08 to 0.29)	0.26	0.04 (-0.14 to 0.22)	0.66	0.04 (-0.14 to 0.21)	0.68	0.01 (-0.16 to 0.19)	0.87
WBC (log[x10^9 cells/litre])								
No pet	0 (ref.)		0 (ref.)		0 (ref.)		0 (ref.)	
Dog	0.02 (0.001 to 0.04)	0.04	0.003 (-0.02 to 0.02)	0.75	0.01 (-0.01 to 0.03)	0.15	0.0001 (-0.02 to 0.02)	0.99
Cat (no dog)	0.02 (-0.01 to 0.04)	0.26	0.01 (-0.01 to 0.04)	0.34	0.02 (-0.01 to 0.04)	0.20	0.01 (-0.01 to 0.04)	0.33
Other pet	0.05 (-0.004 to 0.10)	0.07	0.04 (-0.01 to 0.09)	0.15	0.04 (-0.02 to 0.09)	0.16	0.03 (-0.02 to 0.09)	0.19
Fibrinogen (log[g/L])								
No pet	0 (ref.)		0 (ref.)		0 (ref.)		0 (ref.)	
Dog	0.01 (-0.01 to 0.02)	0.48	-0.001 (-0.02 to 0.02)	0.90	0.001 (-0.02 to 0.02)	0.86	-0.003 (-0.02 to 0.01)	0.67
Cat (no dog)	0.01 (-0.01 to 0.02)	0.22	0.01 (-0.005 to 0.02)	0.20	0.01 (-0.003 to 0.02)	0.15	0.01 (-0.004 to 0.02)	0.20
Other pet	0.02 (-0.002 to 0.05)	0.07	0.02 (-0.01 to 0.04)	0.17	0.02 (-0.01 to 0.04)	0.23	0.01 (-0.01 to 0.04)	0.26

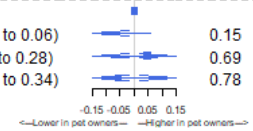


Model 1: age, sex, and baseline (wave 4) assessment of biomarker outcome; Confounders: wealth, self-reported health, smoking status, and alcohol consumption; Mediators: social isolation, loneliness, physical activity, and body mass index; All covariates: all above covariates.

Supplemental Figure 10. Beta coefficients (part A) and relative risks (part B) for the relation of pet ownership with biomarkers of ageing: psychological functioning (N=8785)

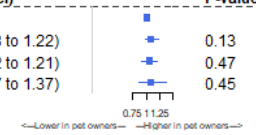
Part A.

Memory	Model 1 β (95% CI)	P-value	Model 1 + confounders β (95% CI)	P-value	Model 1 + mediators β (95% CI)	P-value	All covariates β (95% CI)	P-value
No pet	0 (ref.)		0 (ref.)		0 (ref.)		0 (ref.)	
Dog	-0.31 (-0.52 to -0.09)	0.01	-0.15 (-0.37 to 0.06)	0.16	-0.23 (-0.45 to -0.02)	0.03	-0.16 (-0.37 to 0.06)	0.15
Cat (no dog)	0.10 (-0.15 to 0.35)	0.43	0.05 (-0.18 to 0.29)	0.66	0.08 (-0.16 to 0.32)	0.53	0.05 (-0.19 to 0.28)	0.69
Other pet	-0.28 (-0.70 to 0.14)	0.19	-0.05 (-0.46 to 0.35)	0.79	-0.18 (-0.59 to 0.23)	0.39	-0.06 (-0.46 to 0.34)	0.78



Part B.

Depressive symptoms	Model 1 RR (95% CI)	P-value	Model 1 + confounders RR (95% CI)	P-value	Model 1 + mediators RR (95% CI)	P-value	All covariates RR (95% CI)	P-value
No pet	1 (ref.)		1 (ref.)	0	1 (ref.)	0	1 (ref.)	
Dog	1.28 (1.14 to 1.44)	< 0.001	1.13 (1.01 to 1.27)	0.03	1.16 (1.04 to 1.30)	0.01	1.09 (0.98 to 1.22)	0.13
Cat (no dog)	1.05 (0.90 to 1.22)	0.54	1.06 (0.92 to 1.22)	0.43	1.05 (0.91 to 1.21)	0.47	1.05 (0.92 to 1.21)	0.47
Other pet	1.24 (0.95 to 1.60)	0.11	1.08 (0.84 to 1.39)	0.56	1.14 (0.91 to 1.44)	0.26	1.09 (0.87 to 1.37)	0.45

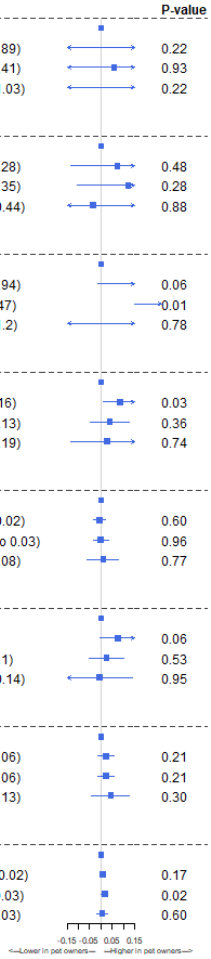


Model 1: age, sex, and baseline (wave 4) assessment of biomarker outcome; Confounders: wealth, self-reported health, smoking status, and alcohol consumption; Mediators: social isolation, loneliness, physical activity, and body mass index; All covariates: all above covariates.

Supplemental Figure 11. Beta coefficients (part A) and relative risks (part B) for the relation of pet ownership with later risk indices (N=8785)

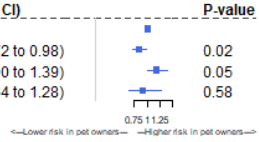
Part A.

	Model 1		Model 1 + confounders		Model 1 + mediators		All covariates	
Systolic blood pressure (mmHg)	**β (95% CI)**	**P-value**	**β (95% CI)**	**P-value**	**β (95% CI)**	**P-value**	**β (95% CI)**	**P-value**
No pet	0 (ref.)		0 (ref.)		0 (ref.)		0 (ref.)	
Dog	0.84 (-0.35 to 2.02)	0.17	0.90 (-0.28 to 2.08)	0.13	0.67 (-0.5 to 1.84)	0.26	0.73 (-0.44 to 1.89)	0.22
Cat (no dog)	0.04 (-1.32 to 1.4)	0.96	0.14 (-1.22 to 1.50)	0.84	0 (-1.36 to 1.36)	> 0.999	0.06 (-1.29 to 1.41)	0.93
Other pet	-1.32 (-4 to 1.36)	0.33	-1.52 (-4.20 to 1.16)	0.26	-1.53 (-4.21 to 1.14)	0.26	-1.65 (-4.33 to 1.03)	0.22
BMI (kg/m^2)								
No pet	0 (ref.)		0 (ref.)		0 (ref.)		0 (ref.)	
Dog	0.46 (0.13 to 0.79)	0.01	0.39 (0.07 to 0.71)	0.02	0.07 (-0.14 to 0.28)	0.50	0.07 (-0.14 to 0.28)	0.48
Cat (no dog)	0.06 (-0.33 to 0.45)	0.75	0.19 (-0.20 to 0.57)	0.34	0.11 (-0.11 to 0.34)	0.32	0.12 (-0.10 to 0.35)	0.28
Other pet	0.60 (-0.11 to 1.31)	0.10	0.28 (-0.41 to 0.97)	0.43	-0.02 (-0.49 to 0.46)	0.94	-0.03 (-0.51 to 0.44)	0.88
Waist circumference (cm)								
No pet	0 (ref.)		0 (ref.)		0 (ref.)		0 (ref.)	
Dog	1.57 (0.81 to 2.32)	< 0.001	1.21 (0.48 to 1.93)	1E-3	0.60 (0.13 to 1.07)	0.01	0.46 (-0.01 to 0.94)	0.06
Cat (no dog)	0.76 (-0.26 to 1.78)	0.14	1.01 (0.01 to 2.01)	0.05	0.91 (0.30 to 1.51)	0.004	0.87 (0.27 to 1.47)	0.01
Other pet	1.38 (-0.37 to 3.12)	0.12	0.52 (-1.19 to 2.23)	0.55	-0.13 (-1.51 to 1.25)	0.85	-0.19 (-1.59 to 1.2)	0.78
Total cholesterol (mmol/L)								
No pet	0 (ref.)		0 (ref.)		0 (ref.)		0 (ref.)	
Dog	0.05 (-0.03 to 0.13)	0.19	0.08 (0.004 to 0.16)	0.04	0.07 (-0.01 to 0.15)	0.07	0.09 (0.01 to 0.16)	0.03
Cat (no dog)	0.05 (-0.04 to 0.14)	0.27	0.04 (-0.05 to 0.12)	0.39	0.05 (-0.04 to 0.13)	0.29	0.04 (-0.05 to 0.13)	0.36
Other pet	-0.02 (-0.18 to 0.15)	0.83	0.02 (-0.14 to 0.18)	0.78	0.01 (-0.16 to 0.18)	0.91	0.03 (-0.14 to 0.19)	0.74
HDL cholesterol (mmol/L)								
No pet	0 (ref.)		0 (ref.)		0 (ref.)		0 (ref.)	
Dog	-0.03 (-0.06 to -0.01)	0.02	-0.02 (-0.04 to 0.01)	0.21	-0.02 (-0.04 to 0.01)	0.26	-0.01 (-0.03 to 0.02)	0.60
Cat (no dog)	0.004 (-0.03 to 0.04)	0.83	-0.003 (-0.04 to 0.03)	0.85	0.002 (-0.03 to 0.04)	0.91	-0.0009 (-0.03 to 0.03)	0.96
Other pet	-0.02 (-0.09 to 0.05)	0.61	0.002 (-0.07 to 0.07)	0.95	0.01 (-0.07 to 0.08)	0.87	0.01 (-0.06 to 0.08)	0.77
LDL cholesterol (mmol/L)								
No pet	0 (ref.)		0 (ref.)		0 (ref.)		0 (ref.)	
Dog	0.05 (-0.03 to 0.12)	0.22	0.07 (-0.004 to 0.15)	0.06	0.06 (-0.02 to 0.14)	0.12	0.07 (0 to 0.15)	0.06
Cat (no dog)	0.03 (-0.05 to 0.11)	0.43	0.02 (-0.05 to 0.10)	0.54	0.03 (-0.05 to 0.10)	0.48	0.02 (-0.05 to 0.1)	0.53
Other pet	-0.04 (-0.19 to 0.10)	0.57	-0.01 (-0.15 to 0.14)	0.94	-0.02 (-0.17 to 0.12)	0.75	-0.01 (-0.15 to 0.14)	0.95
Triglycerides (mmol/L)								
No pet	0 (ref.)		0 (ref.)		0 (ref.)		0 (ref.)	
Dog	0.05 (0.01 to 0.09)	0.01	0.03 (-0.004 to 0.07)	0.08	0.03 (-0.005 to 0.07)	0.08	0.02 (-0.01 to 0.06)	0.21
Cat (no dog)	0.02 (-0.02 to 0.06)	0.30	0.02 (-0.01 to 0.06)	0.20	0.02 (-0.01 to 0.06)	0.21	0.02 (-0.01 to 0.06)	0.21
Other pet	0.07 (-0.01 to 0.16)	0.09	0.05 (-0.04 to 0.14)	0.24	0.05 (-0.03 to 0.14)	0.22	0.04 (-0.04 to 0.13)	0.30
HbA1c (log[mmol/mol])								
No pet	0 (ref.)		0 (ref.)		0 (ref.)		0 (ref.)	
Dog	0.02 (0.005 to 0.03)	0.01	0.01 (0 to 0.02)	0.09	0.01 (0.0007 to 0.02)	0.04	0.01 (-0.004 to 0.02)	0.17
Cat (no dog)	0.02 (0.001 to 0.03)	0.04	0.02 (0 to 0.03)	0.02	0.02 (0.003 to 0.03)	0.02	0.02 (0.003 to 0.03)	0.02
Other pet	0.02 (-0.01 to 0.04)	0.17	0.01 (-0.01 to 0.03)	0.44	0.01 (-0.02 to 0.03)	0.49	0.01 (-0.02 to 0.03)	0.60



Part B.

	Model 1		Model 1 + confounders		Model 1 + mediators		All covariates	
Type 2 diabetes	**RR (95% CI)**	**P-value**	**RR (95% CI)**	**P-value**	**RR (95% CI)**	**P-value**	**RR (95% CI)**	**P-value**
No pet	1 (ref.)		1 (ref.)		1 (ref.)		1 (ref.)	
Dog	0.95 (0.81 to 1.11)	0.52	0.87 (0.74 to 1.02)	0.08	0.89 (0.76 to 1.04)	0.13	0.84 (0.72 to 0.98)	0.02
Cat (no dog)	1.13 (0.94 to 1.34)	0.19	1.17 (0.98 to 1.39)	0.07	1.16 (0.98 to 1.37)	0.09	1.18 (1.00 to 1.39)	0.05
Other pet	1.07 (0.76 to 1.52)	0.70	0.96 (0.68 to 1.35)	0.81	0.95 (0.67 to 1.34)	0.76	0.91 (0.64 to 1.28)	0.58



Model 1: age, sex, and baseline (wave 4) assessment of biomarker outcome; Confounders: wealth, self-reported health, smoking status, and alcohol consumption; Mediators: social isolation, loneliness, physical activity, and body mass index; All covariates: all above covariates. BMI, body mass index; HDL, High-density lipoprotein; LDL, Low-density lipoprotein; HbA1c, Glycated haemoglobin