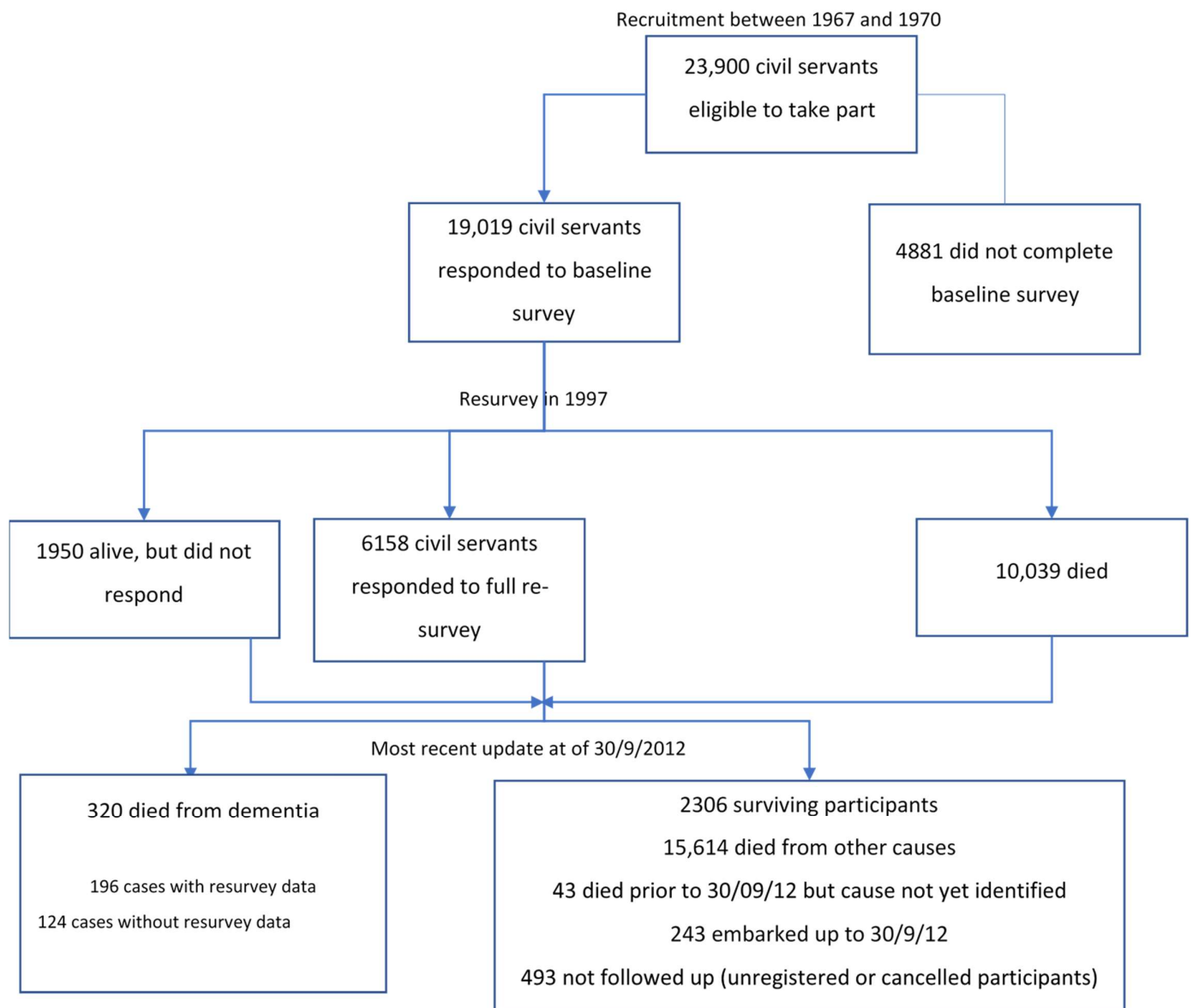


Adiposity in middle and old age and risk of death from dementia: 40-year follow-up of 19,000 men in the Whitehall study

Supplementary materials

Appendix 1. Descriptive summary of anthropometric variables and deaths from dementia



Appendix 2. Descriptive summary of anthropometric variables and deaths from dementia

Baseline participants				Resurvey participants			
Exposure variable	Number of individuals	Person-years of follow-up (1000s)	Deaths from dementia	Exposure variable	Number of individuals	Person-years of follow-up (1000s)	Deaths from dementia
Age (years)							
<45	3135	110.9	44	<75	2570	103.9	38
45-49	5051	158.2	87	75-79	2506	96.3	73
50-54	4210	110.1	85	80-84	1330	47.8	56
55-59	3919	84.2	72	≥85	620	21.1	29
60-64	2194	37.9	28	Missing	4	-	0
≥65	484	6.6	4				
Missing	0	-	0				
Smoking habit							
Never	3502	108.6	78	Never	1790	75.8	44
Ex-smoker	6934	192.8	130	Ex-smoker	3245	136.8	88
1-10 cigarettes/day	2489	64.0	40	1-5 cigarettes/day	423	15.9	10
11-20 cigarettes/day	3792	88.7	44	6-10 cigarettes/day	80	3.0	1
>20 cigarettes/day	1637	35.3	13	≥10 cigarettes/day	164	6.1	4
Missing	665	-	15	Missing	863	-	14
Employment grade							
Administrative	967	29.7	24	-	-	-	-
Clerical	3007	67.3	44	-	-	-	-
Executive	12350	350.8	211	-	-	-	-
Science or technology	1809	35.1	23	-	-	-	-
British Council/ Diplomatic Service	886	25.0	18	-	-	-	-
Missing	0		0	-	-	-	-
Marital Status							
Married	16737	451.7	293	Married	4810	186.9	131
Widowed	324	6.4	0	Widowed	888	32.7	24
Single	1643	42.1	21	Single	306	11.7	4
Other	311	7.6	6	Other	129	4.9	2
Missing	4		0	Missing	897		35
Total (per category)	19019		320		7030		196

Appendix 3. Association of anthropometric measurements at baseline with mortality from dementia

Exposure variable	Model 1 - Hazard ratio (95% CI) * adjusted for age and period	Model 2 - Hazard ratio (95% CI)** additional adjustment for employment grade, smoking and marital status
Height at baseline (cm)		
<170	1	1
170-174	0.86 (0.62-1.20)	0.79 (0.56-1.11)
175-179	0.85 (0.62-1.17)	0.74 (0.53-1.06)
≥180	0.73 (0.52-1.02)	0.54 (0.37-0.88)
P value for heterogeneity	0.28	0.05
Per change in cm	0.98 (0.97-1.00)	0.98 (0.97-1.00)
P value for linear trend	0.10	0.13
Weight at baseline (kg)		
<65	1	1
65-74	0.75 (0.54-1.05)	0.79 (0.56-1.12)
75-84	0.73 (0.52-1.02)	0.75 (0.53-1.06)
≥85	0.56 (0.36-0.85)	0.57 (0.37-0.88)
P value for heterogeneity	0.06	0.08
Change per kg	0.98 (0.97-0.99)	0.98 (0.97-0.99)
P value for linear trend	0.02	0.03
BMI at baseline (kg/m²)		
<22	1	1
22-23.9	0.85 (0.61-1.19)	0.81 (0.58-1.14)
24-25.4	0.83 (0.59-1.16)	0.80 (0.56-1.14)
25.5-26.9	0.77 (0.53-1.11)	0.75 (0.52-1.10)
≥27	0.80 (0.55-1.17)	0.81 (0.55-1.20)
P value for heterogeneity	0.59	0.64
Change per BMI value	0.97 (0.93-1.00)	0.97 (0.93-1.01)
P value for linear trend	0.12	0.14
BMI at baseline – WHO definition (kg/m²)		
<18.5	1	1
18.5-25	0.79 (0.40-1.48)	0.86 (0.45-1.42)
25-30	0.69 (0.36-1.25)	0.73 (0.41-1.19)
30+	0.47 (0.23-0.99)	0.54 (0.27-0.94)
P value for heterogeneity	0.06	0.09
Change per BMI group value	0.85 (0.76-0.97)	0.88 (0.79-0.99)
P value for linear trend	0.03	0.04

All models based on same subset of 19019 individuals with 320 deaths

* Model 1 adjusts for age at baseline and period.

**Model 2 adjusts for age at baseline, period, employment grade, marital status and smoking habit.

Appendix 4. Association of anthropometric measurements at resurvey with mortality from dementia

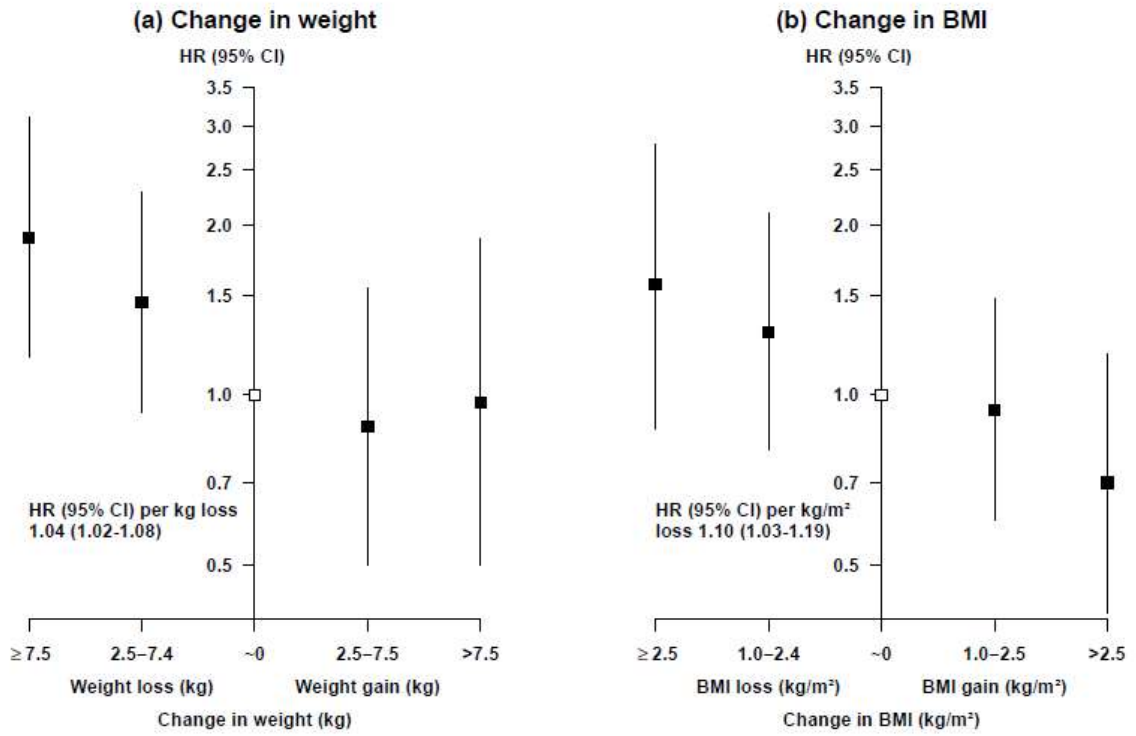
Exposure variable	Model 1 - Hazard ratio (95% CI) * adjusted for age and period	Model 2 - Hazard ratio (95% CI) ** additional adjustment for employment grade, smoking and marital status
Height at resurvey(cm)		
<170	1	1
170-174	0.75 (0.52-1.09)	0.70 (0.47-1.05)
175-179	0.64 (0.41-1.00)	0.66 (0.42-1.04)
≥180	0.56 (0.31-1.04)	0.54 (0.28-1.02)
P value for heterogeneity	0.21	0.08
Per change in cm	0.97 (0.95-0.99)	0.97 (0.94-0.99)
P value for linear trend	0.01	0.009
Weight at resurvey (kg)		
<65	1	1
65-74	0.81 (0.55-1.20)	0.80 (0.54-1.19)
75-84	0.43 (0.27-0.69)	0.33 (0.20-0.55)
≥85	0.45 (0.25-0.83)	0.41 (0.23-0.76)
P value for heterogeneity	0.006	<0.001
Change per kg	0.94 (0.89-0.99)	0.96 (0.95-0.98)
P value for linear trend	0.02	<0.001
BMI at resurvey (kg/m²)		
<22	1	1
22-23.9	0.73 (0.46-1.16)	0.75 (0.46-1.23)
24-25.4	0.74 (0.46-1.19)	0.70 (0.42-1.17)
25.5-26.9	0.48 (0.27-0.84)	0.40 (0.22-0.75)
≥27	0.56 (0.34-0.92)	0.47 (0.27-0.81)
P value for heterogeneity	0.20	0.02
Change per BMI unit increase	0.95 (0.90-1.00)	0.91 (0.86-0.97)
P value for linear trend	0.09	0.002
BMI at baseline – WHO definition (kg/m²)		
<18.5	1	1
18.5-25	0.49 (0.19-1.24)	0.51 (0.21-1.27)
25-30	0.32 (0.12-0.84)	0.35 (0.17-0.87)
30+	0.54 (0.19-1.51)	0.55 (0.20-1.52)
P value for heterogeneity	0.23	0.14
Change per BMI group value	0.85 (0.61-1.05)	0.87 (0.63-1.02)
P value for linear trend	0.10	0.3

All models based on same subset of 6158 individuals with 161 deaths

* Model 1 adjusts for age at resurvey and period.

**Model 2 adjusts for age at resurvey, period, employment grade, marital status and smoking habit.

Appendix 5: HR (95% CI) of death from dementia associated with change in weight or BMI between middle age and old age



Appendix 6. Sensitivity analysis 1. Using baseline data of only those who completed the resurvey

Exposure variable	Hazard ratio (95% CIs)
Height at baseline (cm)*	
<170	1
170-174	0.60 (0.38-0.95)
175-179	0.66 (0.43-1.00)
≥180	0.60 (0.39-0.93)
P value for heterogeneity	0.01
Per cm increase	0.94 (0.89-0.99)
P value for linear trend	0.09
Weight at baseline (kg)**	
<65	1
65-74	0.62 (0.41-0.96)
75-84	0.60 (0.39-0.93)
≥85	0.51 (0.30-0.89)
P value for heterogeneity	0.08
Change per kg increase	0.98 (0.96-0.99)
P value for linear trend	0.02
BMI at baseline (kg/m²)**	
<22	1
22-23.9	0.74 (0.47-1.15)
24-25.4	0.78 (0.49-1.23)
25.5-26.9	0.68 (0.41-1.15)
≥27	0.71 (0.41-1.21)
P value for heterogeneity	0.26
Change per BMI value	0.96 (0.90-1.02)
P value for linear trend	0.21

Based on the subset of 6158 individuals with 161 deaths

*adjusted for age at resurvey, period, employment grade, smoking habit and difficulty with activities of daily living, systolic blood pressure diabetes, cholesterol level

**adjusted for age, period employment grade, smoking habit and difficulty with activities of daily living

Appendix 7. Sensitivity analysis 2 Resurvey data, excluding those who died within 5 years of resurvey (106 deaths from dementia)

Exposure variable	Hazard ratio (95% CIs)
Height at resurvey (cm)*	
<170	1
170-174	0.78 (0.50-1.22)
175-179	0.58 (0.22-1.02)
≥180	0.56 (0.26-1.19)
P value for heterogeneity	0.16
Per 1 cm increase	0.96 (0.93-0.99)
P value for linear trend	0.01
Weight at resurvey (kg)**	
<65	1
65-74	0.62 (0.41-0.96)
75-84	0.31 (0.18 -0.53)
≥85	0.31 (0.15-0.61)
P value for heterogeneity	<0.001
Change per kg	0.95 (0.94-0.97)
P value for linear trend	<0.001
BMI at resurvey (kg/m²)**	
<22	1
22-23.9	0.73 (0.44-1.23)
24-25.4	0.66 (0.38-1.15)
25.5-26.9	0.41 (0.21-0.78)
≥27	0.37 (0.20-0.67)
P value for heterogeneity	0.006
Change per BMI value	0.89 (0.84-0.95)
P value for linear trend	0.001

*adjusted for age, period employment grade, period, smoking habit and difficulty with activities of daily living, systolic blood pressure diabetes, cholesterol level

**adjusted for age, period employment grade, period, smoking habit and difficulty with activities of daily living

Appendix 8. Sensitivity analysis 3. Difference between baseline and resurvey data, excluding those who died within 5 years of resurvey (106 deaths from dementia)

Exposure variable	Hazard ratio (95% CIs)
Decrease in height (cm) *	
<2.5	1
2.5 -4.9	1.70 (1.02-2.83)
5- 7.4	1.70 (0.95-3.03)
≥7.5	1.77 (0.74-4.22)
P value for heterogeneity	0.16
Per cm decrease	1.05 (0.99-1.12)
P value for linear trend	0.12
Change in weight (kg)**	
>7.5	0.91 (0.44-1.87)
7.5-2.4	0.88 (0.48-1.60)
2.5- -2.4	1
-2.5 – 7.4	1.60 (0.99-2.57)
≥-7.5	1.83 (1.06-3.15)
P value for heterogeneity	0.04
Change per kg loss	1.04 (1.01-1.08)
P value for linear trend	0.002
Change in BMI (kg/m²)**	
>2.5	0.66 (0.37-1.16)
2.5-0.9	0.99 (0.62-1.60)
1 - -0.9	1
-1 - -2.4	1.37 (0.82-2.30)
≥-2.5	1.48 (0.76-2.91)
P value for heterogeneity	0.15
Change per BMI unit loss	1.11 (1.03-1.20)
P value for linear trend	0.007

*adjusted for age, period employment grade, period, smoking habit and difficulty with activities of daily living, systolic blood pressure diabetes, cholesterol level

**adjusted for age, period employment grade, period, smoking habit and difficulty with activities of daily living