

SUPPLEMENTARY MATERIAL

Hypertension in pregnancy and in midlife and the risk of dementia: prospective study of 1.3 million UK women

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Table A1 Self-reported and measured blood pressure by self-reported hypertension at recruitment (using data from the Disease Susceptibility in Women sub-cohort of the Million Women Study)

	Self-reported hypertension requiring treatment at recruitment	
	No	Yes
Reported systolic BP in mmHg (n=1975), mean (SD)	132 (15)	139 (16)
Reported diastolic BP in mmHg (n=1948), mean (SD)	78 (9)	81 (9)
Measured systolic BP in mmHg (n=3937), mean (SD)	134 (16)	140 (16)
Measured diastolic BP in mmHg (n=3935), mean (SD)	78 (10)	80 (10)

Table A2: Characteristics of 1,363,457 participants at recruitment by self-reported current treatment for hypertension and details of follow-up

Characteristics at recruitment*	Hypertension	
	Yes	No
No. of women (%)	219319 (16.1)	1144138 (83.9)
Mean age (SD)	58.3 (5.0)	56.4 (4.8)
Deprivation quintile, n (%)		
Q1, Least deprived	37761 (17.3)	234469 (20.6)
Q2	40219 (18.5)	231358 (20.4)
Q3	42213 (19.4)	227766 (20.1)
Q4	45676 (21.0)	224510 (19.8)
Q5, Most deprived	51886 (23.8)	217583 (19.2)
Education attainment†, n (%)		
Tertiary	21314 (10.0)	154548 (13.9)
Secondary	48242 (22.7)	298990 (26.8)
Technical	36314 (17.1)	185969 (16.7)
None, completed compulsory schooling	100237 (47.1)	448943 (40.3)
None, did not complete compulsory schooling	6554 (3.1)	25755 (2.3)
Smoking, n (%)		
Never	109202 (50.2)	546373 (48.1)
Past	61934 (28.5)	303928 (26.8)
Current <10 cigarettes/day	8785 (4.0)	57827 (5.1)
Current 10-19 cigarettes/day	16351 (7.5)	114425 (10.1)
Current 20+ cigarettes/day	8458 (3.9)	56817 (5.0)
Not current‡	12710 (5.8)	56326 (5.0)
Alcohol, drinks per week, n (%)		
0	65421 (30.1)	260838 (23.0)
1-2	68243 (31.4)	349657 (30.8)
3-6	40362 (18.6)	250704 (22.1)
7-14	33819 (15.6)	216116 (19.0)
>14	9593 (4.4)	58057 (5.1)
MHT use, n (%)		
never	108797 (50.4)	564494 (49.9)
past	36946 (17.1)	191935 (17.0)
current	70330 (32.5)	374626 (33.1)
Strenuous exercise, times/week, n (%)		
Rarely/never	118657 (56.5)	522680 (47.4)
<1	23608 (11.3)	139076 (12.6)
1-3	57310 (27.3)	369318 (33.5)
>3	10261 (4.9)	71774 (6.5)
BMI, kg/m ² , n (%)		
<20	3832 (1.9)	45295 (4.2)
20-	57646 (27.9)	494494 (45.6)
25-	79355 (38.4)	380706 (35.1)
≥30	66031 (31.9)	164942 (15.2)
Treatment for diabetes at recruitment, n (%)		
no	203741 (92.9)	1125994 (98.4)
yes	15578 (7.1)	18144 (1.6)
Treatment for high cholesterol at recruitment, n (%)		

no	193460 (88.2)	1116205 (97.6)
yes	25859 (11.8)	27933 (2.4)
Follow-up		
Mean years of follow-up per woman	19.9	21.1
No. of dementia cases over full follow-up	19273	65456

*Percentages calculated among those with complete data for each variable. The following variables had small proportions of missing data: deprivation (0.7%), education (2.7%), smoking (0.8%), alcohol (0.8%), MHT use (1.2%), strenuous exercise (3.7%), body mass index (5.2%).

† See publication for full explanation of the educational qualifications variable: Floud, S., Balkwill, A., Moser, K. et al. The role of health-related behavioural factors in accounting for inequalities in coronary heart disease risk by education and area deprivation: prospective study of 1.2 million UK women. BMC Med 14, 145 (2016). <https://doi.org/10.1186/s12916-016-0687-2>

‡ Not current smoker refers to women who reported that they were not currently smoking but did not say if they were an ex-smoker or never smoker.

Table A3. Associations of self-reported treatment for hypertension with first hospital record of all-cause dementia, by period of follow-up (N=1,363,457)

	Interval after reporting hypertension (years)	
	<10	10+
Cases exposed/unexposed	1075/3328	18198/62128
Follow-up years (mean for cases)	7.20	18.68
HR (95% CI)*	1.12 (1.04-1.21)	1.18 (1.16-1.20)
Test for heterogeneity	Chi-square=1.62 p=0.20	

* stratified by year of birth, year reporting exposure and region, and adjusted for area deprivation, educational qualifications, smoking, alcohol intake, MHT, strenuous exercise, body mass index, self-reported treatment for diabetes and high cholesterol

Table A4. Associations of self-reported treatment for hypertension with first hospital record of all-cause dementia, including dementia mentioned on death certificates (N=1,363,457)

	Cases exposed/unexposed	HR	95% CI
	20,021/68,022		
Minimally adjusted†		1.28	(1.26-1.30)
Fully adjusted‡		1.18	(1.16-1.19)

† stratified by year of birth, year reporting exposure and region

‡ stratified by year of birth, year reporting exposure and region and adjusted for area deprivation, educational qualifications, smoking, alcohol intake, MHT, strenuous exercise, body mass index, self-reported treatment for diabetes and high cholesterol

Table A5 Results underlying Figure 2 (Joint associations of self-reported treatment for hypertension and body mass index, diabetes, high cholesterol and family history of AD with first hospital record of all-cause dementia, and its subtypes) **showing conventional and group-specific confidence intervals.**

		ALL CAUSE DEMENTIA			ALZHEIMER'S DISEASE			VASCULAR DEMENTIA			DEMENTIA, UNSPECIFIED		
		HR (95% CI)		HR (95% g-s CI)	HR (95% CI)		HR (95% g-s CI)		HR (95% CI)		HR (95% g-s CI)		
HT and BMI (kg/m²)													
No	<25	1.00	-	1.00 (0.99-1.01)	1.00	-	1.00 (0.98-1.02)	1.00	-	1.00 (0.97-1.03)	1.00	-	1.00 (0.98-1.02)
Yes	<25	1.22 (1.18-1.26)		1.22 (1.19-1.25)	1.02 (0.96-1.07)		1.02 (0.97-1.07)	1.66 (1.55-1.77)		1.66 (1.56-1.76)	1.27 (1.21-1.32)		1.27 (1.22-1.32)
No	25+	1.00 (0.98-1.02)		1.00 (0.99-1.01)	0.94 (0.92-0.97)		0.94 (0.93-0.96)	1.09 (1.04-1.13)		1.09 (1.06-1.12)	1.03 (1.00-1.05)		1.03 (1.01-1.04)
Yes	25+	1.16 (1.14-1.19)		1.16 (1.14-1.19)	0.95 (0.92-0.99)		0.95 (0.92-0.99)	1.59 (1.51-1.67)		1.59 (1.52-1.65)	1.21 (1.17-1.25)		1.21 (1.18-1.24)
HT and DM													
No	No	1.00	-	1.00 (0.99-1.01)	1.00	-	1.00 (0.98-1.02)	1.00	-	1.00 (0.98-1.02)	1.00	-	1.00 (0.99-1.01)
Yes	No	1.19 (1.17-1.22)		1.19 (1.18-1.21)	1.01 (0.98-1.05)		1.01 (0.99-1.04)	1.55 (1.49-1.61)		1.55 (1.50-1.60)	1.23 (1.20-1.26)		1.23 (1.20-1.26)
No	Yes	2.13 (2.04-2.22)		2.13 (2.04-2.22)	1.55 (1.42-1.70)		1.55 (1.43-1.69)	2.78 (2.53-3.05)		2.78 (2.53-3.04)	2.42 (2,28-2.57)		2.42 (2.28-2.56)
Yes	Yes	1.98 (1.88-2.08)		1.98 (1.89-2.07)	1.45 (1.32-1.60)		1.45 (1.32-1.60)	2.98 (2.71-3.29)		2.98 (2.71-3.28)	2.07 (1.93-2.22)		2.07 (1.93-2.21)
HT and HC													
No	No	1.00	-	1.00 (0.99-1.01)	1.00	-	1.00 (0.98-1.02)	1.00	-	1.00 (0.98-1.02)	1.00	-	1.00 (0.99-1.01)
Yes	No	1.19 (1.17-1.21)		1.19 (1.17-1.21)	1.02 (0.99-1.06)		1.02 (1.00-1.05)	1.51 (1.45-1.58)		1.51 (1.46-1.57)	1.22 (1.18-1.25)		1.22 (1.19-1.24)
No	Yes	1.34 (1.29-1.39)		1.34 (1.30-1.39)	1.36 (1.28-1.45)		1.36 (1.28-1.45)	1.48 (1.36-1.62)		1.48 (1.36-1.61)	1.30 (1.23-1.37)		1.30 (1.23-1.37)
Yes	Yes	1.42 (1.37-1.47)		1.42 (1.37-1.47)	1.20 (1.12-1.29)		1.20 (1.12-1.29)	2.12 (1.96-2.29)		2.12 (1.97-2.28)	1.36 (1.28-1.44)		1.36 (1.29-1.43)
HT and FH													
No	No	1.00	-	1.00 (0.99-1.01)	1.00	-	1.00 (0.98-1.02)	1.00	-	1.00 (0.97-1.03)	1.00	-	1.00 (0.98-1.02)
Yes	No	1.22 (1.19-1.24)		1.22 (1.19-1.24)	1.03 (0.98-1.07)		1.03 (0.99-1.07)	1.58 (1.50-1.67)		1.58 (1.51-1.66)	1.24 (1.20-1.29)		1.24 (1.21-1.28)
No	Yes	1.67 (1.62-1.72)		1.67 (1.62-1.71)	1.94 (1.86-2.04)		1.94 (1.86-2.03)	1.42 (1.31-1.53)		1.42 (1.32-1.53)	1.56 (1.49-1.63)		1.56 (1.49-1.62)
Yes	Yes	1.80 (1.70-1.91)		1.80 (1.70-1.91)	1.85 (1.67-2.05)		1.85 (1.67-2.04)	1.98 (1.72-2.28)		1.98 (1.72-2.27)	1.75 (1.60-1.91)		1.75 (1.60-1.91)

HT - hypertension: DM - diabetes: HC - high cholesterol: FH - family history of AD

LR test - likelihood ratio test

Table A6 Results underlying Figure 3 (Associations of duration of hypertension treatment with first hospital record of all-cause dementia, and its subtypes (N=833012)) **showing conventional and group-specific confidence intervals**

	ALL CAUSE DEMENTIA			ALZHEIMER'S DISEASE		VASCULAR DEMENTIA		DEMENTIA, UNSPECIFIED				
Duration of treatment	HR* (95% CI)	HR* (95% g-s CI)	HR* (95% CI)	HR* (95% CI)	HR* (95% CI)	HR* (95% CI)	HR* (95% CI)	HR* (95% CI)	HR* (95% CI)			
None	1.00	-	1.00 (0.99-1.01)	1.00	-	1.00 (0.98-1.02)	1.00	-	1.00 (0.97-1.03)	1.00	-	1.00 (0.98-1.02)
< 4 years	1.14	(1.11-1.18)	1.14 (1.12-1.17)	1.02	(0.97-1.08)	1.02 (0.98-1.07)	1.45	(1.36-1.55)	1.45 (1.37-1.54)	1.15	(1.11-1.20)	1.15 (1.11-1.20)
5-9 years	1.12	(1.08-1.17)	1.12 (1.08-1.16)	0.97	(0.91-1.05)	0.97 (0.91-1.04)	1.50	(1.37-1.64)	1.50 (1.38-1.63)	1.13	(1.07-1.20)	1.13 (1.07-1.20)
10+ years	1.18	(1.14-1.22)	1.18 (1.14-1.21)	0.97	(0.91-1.03)	0.97 (0.91-1.02)	1.66	(1.55-1.79)	1.66 (1.56-1.77)	1.20	(1.15-1.26)	1.20 (1.15-1.26)

* stratified by year of birth, year reporting exposure and region, and adjusted for area deprivation, educational qualifications, smoking, alcohol intake, MHT, strenuous exercise, body mass index, self-reported treatment for diabetes and high cholesterol

Table A7 Results underlying Figure 5 (Associations of self-reported history of hypertension in pregnancy and treatment for hypertension at baseline with first hospital record of all-cause dementia, and its subtypes, in parous women (N=1210181)) **showing conventional and group-specific confidence intervals**

	ALL CAUSE DEMENTIA			ALZHEIMER'S DISEASE			VASCULAR DEMENTIA			DEMENTIA, UNSPECIFIED		
Hypertension diagnosed	HR* (95% CI)		HR* (95% g-s CI)	HR* (95% CI)		HR* (95% g-s CI)	HR* (95% CI)		HR* (95% g-s CI)	HR* (95% CI)		HR* (95% g-s CI)
In neither pregnancy nor midlife	1.00	-	1.00 (0.99-1.01)	1.00	-	1.00 (0.98-1.02)	1.00	-	1.00 (0.98-1.03)	1.00	-	1.00 (0.99-1.01)
In pregnancy only	1.04 (1.01-1.06)		1.04 (1.02-1.05)	0.98 (0.95-1.02)		0.98 (0.96-1.02)	1.08 (1.03-1.14)		1.08 (1.04-1.13)	1.06 (1.03-1.09)		1.06 (1.03-1.08)
In midlife only	1.17 (1.14-1.20)		1.17 (1.15-1.20)	1.00 (0.96-1.04)		1.00 (0.96-1.04)	1.49 (1.42-1.57)		1.49 (1.42-1.56)	1.21 (1.17-1.25)		1.21 (1.18-1.25)
In both pregnancy and midlife	1.20 (1.17-1.23)		1.20 (1.18-1.23)	1.01 (0.97-1.06)		1.01 (0.97-1.06)	1.57 (1.49-1.66)		1.57 (1.50-1.65)	1.23 (1.18-1.27)		1.23 (1.19-1.27)