Supplementary Tables and Figures

Table S1. Association between 5 categories of systolic blood pressure and incidence of dementia.

	N dementia / N total	HR* (95%CI)
Systolic blood pressure at age 50 (mmHg)		
<110	56/1,735	1.00
110-119	91/2,272	1.15 (0.82, 1.61)
120-129	81/2,159	1.02 (0.72, 1.44)
130-139	83/1,420	1.49 (1.05, 2.11)
≥140	74/1,053	1.61 (1.13, 2.29)
Systolic blood pressure at age 60 (mmHg)		
<110	56/1,230	1.00
110-119	75/1,706	1.04 (0.72, 1.48)
120-129	80/1,875	1.08 (0.76, 1.54)
130-139	64/1,408	1.01 (0.70, 1.46)
≥140	65/1,339	1.20 (0.83, 1.74)
Systolic blood pressure at age 70 (mmHg)		
<110	35/558	1.00
110-119	34/905	0.56 (0.34, 0.93)
120-129	52/1,231	0.76 (0.46, 1.24)
130-139	55/1,028	0.83 (0.52, 1.34)
≥140	69/1,267	0.77 (0.49, 1.21)

* Analysis using inverse probability weighting in Cox regression, adjusted for age, sex, education, ethnicity, marital status, occupational position.

Table S2. Age & threshold of systolic/diastolic blood pressure: association between hypertension and incidence of dementia.[a]

	N cases/N total	Model 1 HR (95%CI)	Model 2 HR (95%CI)	Model 3 HR (95%CI)
Hypertension at age 50 Years (N=8,639)				
Systolic blood pressure ≥140 mmHg OR Diastolic blood pressure ≥90 mmHg				
No	287/7,046	1.00	1.00	1.00
Yes	98/1,593	1.34 (1.07, 1.69)	1.35 (1.08, 1.70)	1.26 (0.99, 1.59)
Systolic blood pressure ≥130 mmHg OR Diastolic blood pressure ≥90 mmHg				
No	222/5,984	1.00	1.00	1.00
Yes	163/2,655	1.45 (1.18, 1.78)	1.45 (1.18, 1.78)	1.37 (1.11, 1.69)
Systolic blood pressure ≥120 mmHg OR Diastolic blood pressure ≥90 mmHg				
No	147/3,985	1.00	1.00	1.00
Yes	238/4,654	1.19 (0.97, 1.47)	1.18 (0.95, 1.45)	1.09 (0.88, 1.35)
Hypertension at age 60 Years (N=7,558)				
Systolic blood pressure ≥140 mmHg OR Diastolic blood pressure ≥90 mmHg				
No	254/5,979	1.00	1.00	1.00
Yes	86/1,579	1.18 (0.92, 1.52)	1.17 (0.91, 1.51)	1.15 (0.89, 1.49)
Systolic blood pressure ≥130 mmHg OR Diastolic blood pressure ≥90 mmHg				
No	202/4,743	1.00	1.00	1.00
Yes	138/2,815	1.11 (0.89, 1.39)	1.11 (0.90, 1.40)	1.08 (0.85, 1.36)
Systolic blood pressure ≥120 mmHg OR Diastolic blood pressure ≥90 mmHg				
No	131/2,929	1.00	1.00	1.00
Yes	209/4,629	1.06 (0.85, 1.33)	1.07 (0.85, 1.34)	1.05 (0.83, 1.33)
Hypertension at age 70 Years (N=4,989)				
Systolic blood pressure ≥140 mmHg OR Diastolic blood pressure ≥90 mmHg				
No	175/3,696	1.00	1.00	1.00
Yes	70/1,293	0.97 (0.71, 1.33)	0.96 (0.70, 1.32)	1.02 (0.73, 1.42)
Systolic blood pressure ≥130 mmHg OR Diastolic blood pressure ≥90 mmHg				
No	121/ 2,687	1.00	1.00	1.00
Yes	124/2,302	1.06 (0.80, 1.40)	1.05 (0.79, 1.41)	1.14 (0.84, 1.53)
Systolic blood pressure ≥120 mmHg OR Diastolic blood pressure ≥90 mmHg				
No	69/1,463	1.00	1.00	1.00
Yes	176/3,526	1.07 (0.78, 1.46)	1.06 (0.78, 1.45)	1.19 (0.86, 1.64)

[a] Analysis using inverse probability weighting in Cox regression.
Model 1: Adjusted for age, sex, education, ethnicity, marital status, occupational position.
Model 2: Model 1 + smoking, alcohol consumption, fruit & vegetable consumption, physical activity.
Model 3: Model 2 + BMI, diabetes at start of follow-up + time-dependent cardiovascular disease (coronary heart disease, stroke), atrial fibrillation, heart failure and cardiovascular disease medication.

Table S3. Age & threshold of systolic blood pressure: association between hypertension (high systolic blood pressure OR Anti-hypertensive medication) and incidence of dementia.[a]

	N cases/N total	Model 1 HR (95%CI)	Model 2 HR (95%CI)	Model 3 HR (95%CI)
Hypertension at age 50 Years (N=8,639)				
Systolic blood pressure ≥140 mmHg OR Anti-hypertensive medication				
No	293/7,223	1.00	1.00	1.00
Yes	92/1,416	1.43 (1.13, 1.81)	1.43 (1.13, 1.82)	1.32 (1.03, 1.69)
Systolic blood pressure ≥130 mmHg OR Anti-hypertensive medication				
No	216/5,909	1.00	1.00	1.00
Yes	169//2,730	1.48 (1.21, 1.82)	1.48 (1.21, 1,82)	1.40 (1.14, 1.73)
Systolic blood pressure ≥120 mmHg OR Anti-hypertensive medication				
No	143/ 3,876	1.00	1.00	1.00
Yes	242/4,763	1.19 (0.96, 1.47)	1.17 (0.95, 1.45)	1.08 (0.87, 1.34)
Hypertension at age 60 Years (N=7,558)				
Systolic blood pressure ≥140 mmHg OR Anti-hypertensive medication				
No	225/5,069	1.00	1.00	1.00
Yes	115//2,489	1.37 (1.09, 1.72)	1.35 (1.07, 1.70)	1.36 (1.07, 1.74)
Systolic blood pressure ≥130 mmHg OR Anti-hypertensive medication				
No	173/3,964	1.00	1.00	1.00
Yes	167/3,594	1.26 (1.02, 1.57)	1.25 (1.01, 1.56)	1.24 (0.98, 1.56)
Systolic blood pressure ≥120 mmHg OR Anti-hypertensive medication				
No	115/2,479	1.00	1.00	1.00
Yes	225/5,079	1.12 (0.89, 1.41)	1.12 (0.90, 1.42)	1.11 (0.87, 1.41)
Hypertension at age 70 Years (N=4,989)				
Systolic blood pressure ≥140 mmHg OR Anti-hypertensive medication				
No	114/2,334	1.00	1.00	1.00
Yes	131/2,655	1.11 (0.84, 1.47)	1.08 (0.81, 1.43)	1.18 (0.85, 1.66)
Systolic blood pressure ≥130 mmHg OR Anti-hypertensive medication				
No	78/ 1,719	1.00	1.00	1.00
Yes	167/3,270	1.18 (0.87, 1.60)	1.15 (0.85, 1.56)	1.25 (0.89, 1.76)
Systolic blood pressure ≥120 mmHg OR Anti-hypertensive medication				
No	47/952	1.00	1.00	1.00
Yes	198/4,037	1.16 (0.82, 1.64)	1.13 (0.80, 1.60)	1.23 (0.84, 1.81)

[a] Analysis using inverse probability weighting in Cox regression.
Model 1: Adjusted for age, sex, education, ethnicity, marital status, occupational position.
Model 2: Model 1 + smoking, alcohol consumption, fruit & vegetable consumption, physical activity.
Model 3: Model 2 + BMI, diabetes at start of follow-up + time-dependent cardiovascular disease (coronary heart disease, stroke), atrial fibrillation, heart failure and cardiovascular disease medication.

Table S4. Estimation of trajectories of blood pressure: model fit statistics (group based trajectory models).

Group size [a]	Trajectory shape [b]	Allocated Group membership	BIC (sample) [c]	Average Posterior Probabilities [d]	AIC [e]	Odds correct classification [f]
1	2	100%	-17795.34		-17784.80	
2	2	56.7%	-15992.55	0.92	-15967.96	10.6
	2	43.3%		0.89		8.8
3	2	61.8%	-15835.09	0.91	-15796.44	6.7
	2	5.4%		0.64		27.9
	2	32.8%		0.90		17.5
4	2	33.9%	-15838.96	0.75	-15786.26	5.8
	2	22.7%		0.69		7.5
	2	16.6%		0.71		12.0
	2	26.9%		0.84		14.2
3	0	51.4%	-15873.28	0.87	-15841.67	7.0
	2	16.0%		0.68		12.0
	2	32.6%		0.94		27.9
3	1	47.7%	-15872.01	0.76	-15843.91	12.6
	1	18.9%		0.83		15.0
	1	33.8%		0.89		5.2
3	1	48.8%	-15851.15	0.76	-15819.53	5.2
	1	19.1%		0.82		11.7
	2	32.2%		0.91		19.6
3	**1**	**48.8%**	**-15844.26**	**0.76**	**-15809.13**	**5.0**
	2	**18.6%**		**0.78**		**11.2**
	2	**32.7%**		**0.96**		**40.9**

[a] Number of trajectory groups estimated (N=8,315); [b] Polynomial function of time (0 intercept only, 1 linear, 2 quadratic);
[c] Bayesian Information Criterion (BIC), a difference of 10 is strong evidence that the model with the lowest BIC (compared to null) has best fit;
[d] Posterior probabilities of group membership for individuals assigned to each group, an average > 0.7 demonstrates good classification accuracy;
[e] Akaike Information Criterion (AIC); [f] Odds of correct classification based on posterior probabilities and group membership, minimum threshold of 5.
Model selected based on fulfilment of criteria d & f and evidence of improved fit using lowest BIC/AIC score.

Table S5. Duration of hypertension (systolic blood pressure ≥130 mmHg OR Anti-hypertensive medication) trajectories[a] with incidence of dementia.[b]

N= 8,313	N cases/N total	Model 1 HR (95% CI)	Model 2 HR (95% CI)	Model 3 HR (95% CI)
Hypertension trajectories (data from 1985, 1991, 1997, 2003)				
Group 1: Low	109/3,607	1.00	1.00	1.00
Group 2: Increasing	70/1,686	1.12 (0.82, 1.51)	1.13 (0.83, 1.54)	1.18 (0.85, 1.62)
Group 3: High	179/3,020	1.37 (1.06, 1.76)	1.36 (1.06, 1.76)	1.38 (1.06, 1.81)

[a] The trajectories over a mean 16 year period were again determined using a group based trajectory method (1,2,2) as described previously.
[b] Analysis using inverse probability weighting in Cox regression.
Model 1: Adjusted for age, sex, education, ethnicity, marital status, occupational position.
Model 2: Model 1 + smoking, alcohol consumption, fruit & vegetable consumption, physical activity.
Model 3: Model 2 + BMI, diabetes at start of follow-up + time-dependent cardiovascular disease (coronary heart disease, stroke), atrial fibrillation, heart failure and cardiovascular disease medication.

Figure S1. Trajectory of global cognitive score [a] in dementia cases in the years leading to dementia diagnosis and dementia free participants until end of follow-up.
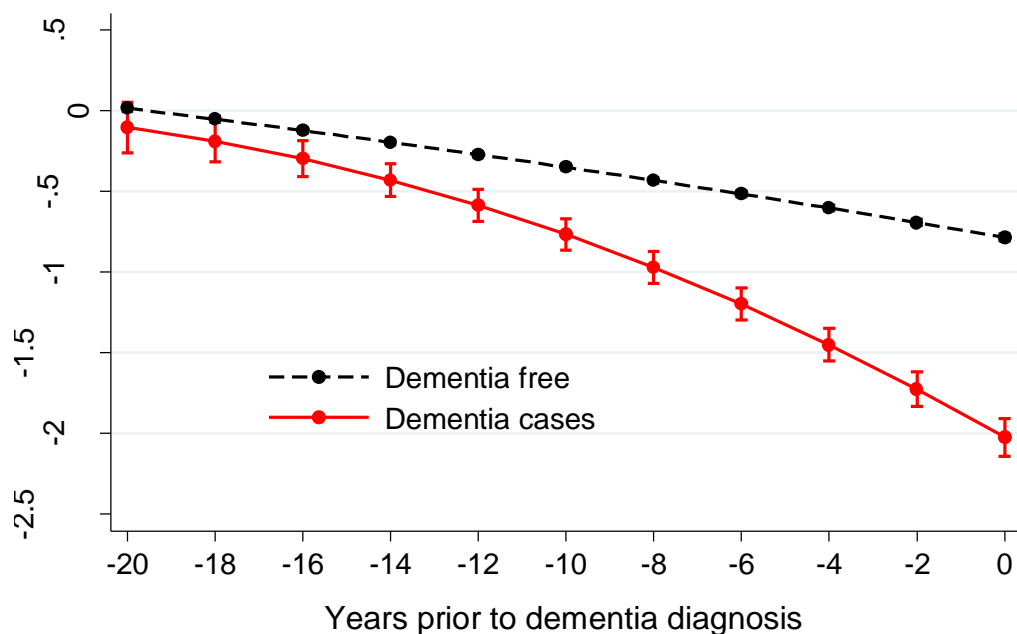
Number of observations in the analysis					
Years	**-20 to -16**	**-16 to -12**	**-12 to-8**	**-8 to-4**	**-4 to 0**
Dementia free (N=7237)	5136	5693	5130	5788	5768
Dementia cases (N=291)	88	125	167	177	145

[a] Composed of tests of memory, reasoning, phonemic and semantic fluency administered to the participants in 1997, 2003, 2007, 2012, and 2015.

Figure S2. Threshold: association of diastolic blood pressure[a,b] at age 50 (Panel A), 60 (Panel B), and 70 years (Panel C) with dementia.
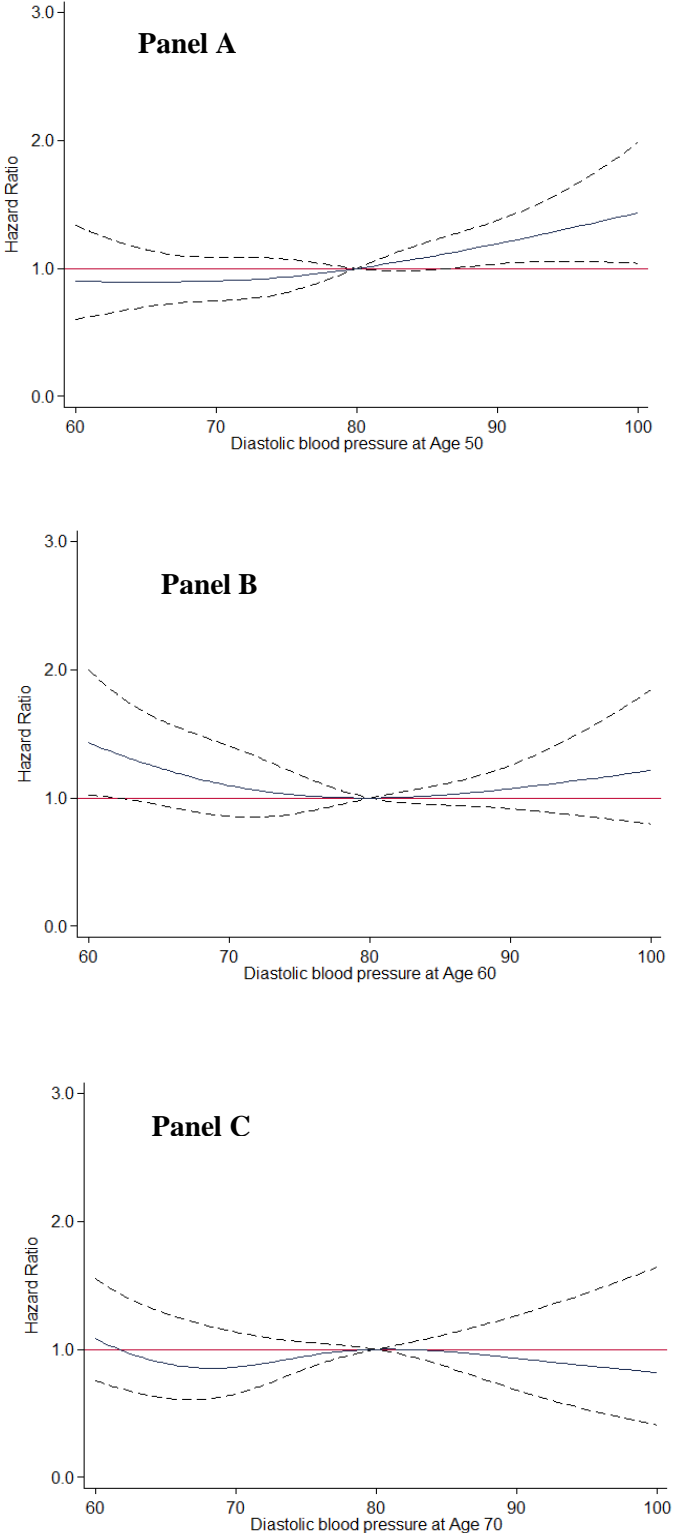
[a] Diastolic blood pressure was modelled by both-tail restricted cubic splines with four age-specific Harrell knots in a Cox regression model adjusted for age, sex, education, ethnicity, marital status, and occupational position. [b] The reference value for calculation of HRs is diastolic blood pressure 80 mmHg.

Figure S3. Trajectories of hypertension (data from 1985, 1991, 1997, 2003), defined using systolic blood pressure ≥130 mmHg.[a]
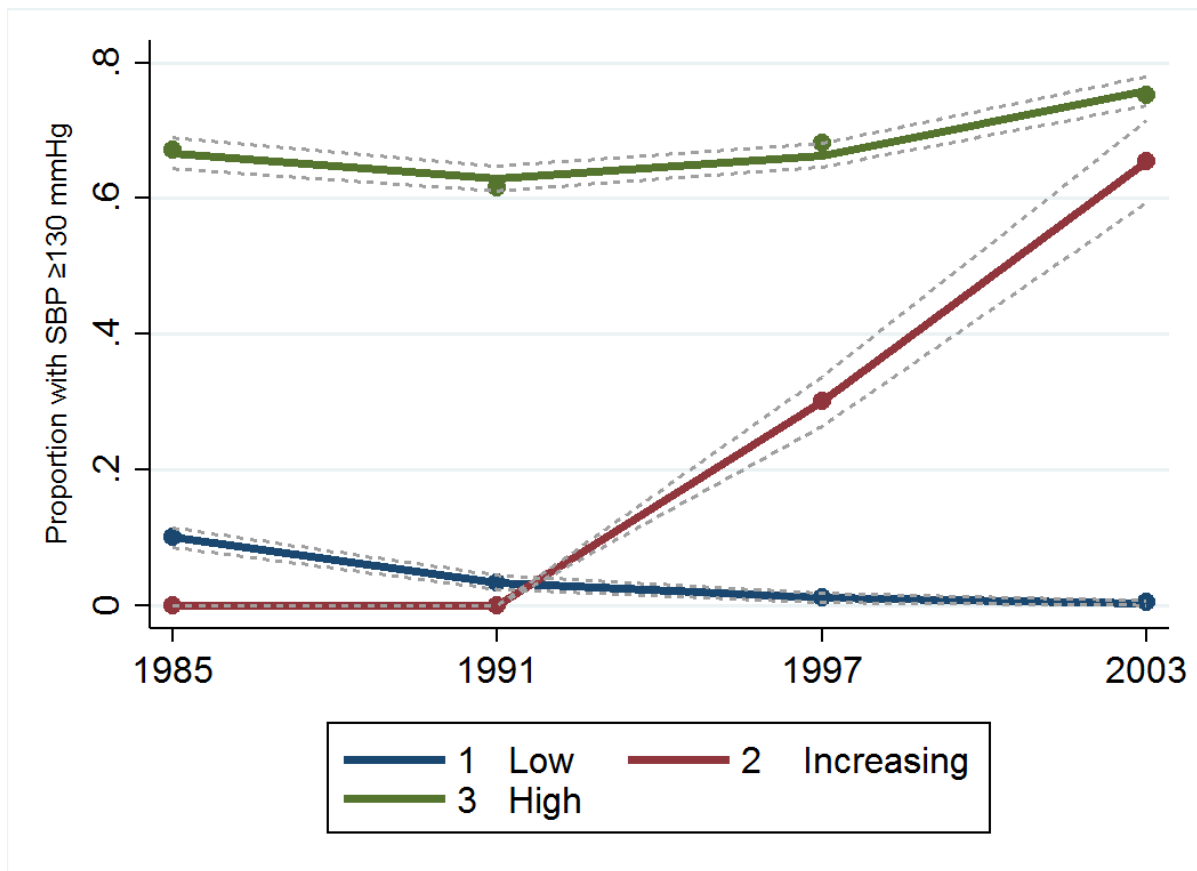
[a] Three group solution (1,2,2). N= 8,313 (excluding those who had dementia or who had died before 2003 and excluding those with only one blood pressure assessment between 1985 and 2003).