

Supplemental Material

Supplemental Table 1. Demographic and baseline characteristics of the patients, for the total population and for diastolic blood pressure quintiles

Population characteristics	N.	All population	DBP Q1 ≤68 mmHg	DBP Q2 69 to 72 mmHg	DBP Q3 73 to 76 mmHg	DBP Q4 77 to 81 mmHg	DBP Q5 >82 mmHg	p-value
Age (years)	28771	65.0 ± 11.5	67.6 ± 12.0	64.7 ± 11.9	64.0 ± 11.5	64.3 ± 10.8	63.5 ± 10.4	<0.0001
Female gender	28771	8582 (29.8 %)	1790 (32.3 %)	1519 (27.6 %)	1496 (27.1 %)	1566 (28.3 %)	1807 (32.7 %)	<0.0001
Heart rate (bpm)	28691	75.7 ± 12.8	75.8 ± 13.5	75.7 ± 13.0	75.5 ± 12.3	75.1 ± 12.3	75.5 ± 12.2	0.014
Mean SBP (mmHg)	27644	124.9 ± 14.9	112.4 ± 12.6	118.6 ± 11.3	123.7 ± 10.8	129.2 ± 10.2	140.4 ± 12.0	<0.0001
Mean DBP (mmHg)	27644	74.3 ± 8.0	63.1 ± 4.0	70.2 ± 1.3	74.4 ± 1.2	78.5 ± 1.3	85.3 ± 4.0	<0.0001
N. BP measures	28771	8.4 ± 3.7	7.7 ± 3.8	8.8 ± 3.5	9.1 ± 3.2	9.0 ± 3.2	9.2 ± 3.0	<0.0001
BMI (Kg/m ²)	28098	27.5 ± 4.8	26.6 ± 4.6	27.1 ± 5.3	27.5 ± 4.8	27.7 ± 4.5	28.5 ± 4.8	<0.0001
LVEF (%)	19903	34.3 ± 8.9	32.6 ± 9.5	34.0 ± 9.1	34.7 ± 8.4	35.2 ± 8.4	35.5 ± 8.3	<0.0001
eGFR (ml/min/1.73m ²)	27703	70.2 ± 36.8	68.8 ± 43.8	71.5 ± 39.8	70.8 ± 26.7	71.5 ± 38.0	70.1 ± 35.4	0.0006
Hemoglobin (g/L)	12862	133.5 ± 16.0	129.1 ± 16.5	132.5 ± 15.8	134.1 ± 15.6	135.2 ± 15.4	136.2 ± 15.7	<0.0001
Sodium (mmol/L)	13177	139.4 ± 3.8	138.5 ± 3.7	138.8 ± 3.4	139.4 ± 4.1	139.8 ± 3.6	140.1 ± 3.8	<0.0001
Potassium (mmol/L)	13115	4.2 ± 0.5	4.2 ± 0.5	4.2 ± 0.5	4.3 ± 0.5	4.3 ± 0.4	4.2 ± 0.5	0.79
Glucose (mmol/L)	13088	7.4 ± 3.4	7.8 ± 3.9	7.6 ± 3.7	7.3 ± 3.4	7.2 ± 3.1	7.2 ± 2.9	<0.0001
Current smoker, n. (%)	28735	9051 (31.5 %)	2059 (37.2 %)	1803 (32.8 %)	1746 (31.6 %)	1608 (29.1 %)	1439 (26.0 %)	<0.0001
Previous MI, n. (%)	28769	7490 (26.0 %)	1726 (31.1 %)	1391 (25.3 %)	1337 (24.2 %)	1311 (23.7 %)	1310 (23.7 %)	<0.0001
Atrial fibrillation, n. (%)	28771	3754 (13.0 %)	865 (15.6 %)	638 (11.6 %)	633 (11.4 %)	653 (11.8 %)	712 (12.9 %)	<0.0001
HF history, n. (%)	28771	11181 (38.9 %)	2407 (43.4 %)	2066 (37.5 %)	1930 (34.9 %)	1924 (34.8 %)	2040 (36.9 %)	<0.0001
Peripheral artery disease, n. (%)	28769	2357 (8.2 %)	590 (10.6 %)	446 (8.1 %)	398 (7.2 %)	415 (7.5 %)	381 (6.9 %)	<0.0001
Hypertension history, n. (%)	28771	15570 (54.1 %)	2181 (39.3 %)	2354 (42.8 %)	2773 (50.1 %)	3332 (60.2 %)	4209 (76.1 %)	<0.0001
Diabetes history, n. (%)	28771	7386 (25.7 %)	1552 (28.0 %)	1427 (25.9 %)	1284 (23.2 %)	1369 (24.7 %)	1392 (25.2 %)	<0.0001
Previous stroke, n. (%)	28771	2264 (7.9 %)	470 (8.5 %)	389 (7.1 %)	419 (7.6 %)	405 (7.3 %)	444 (8.0 %)	0.043
ACEi, n. (%)	23287	12935 (55.5 %)	2627 (56.7 %)	2408 (54.7 %)	2417 (55.7 %)	2447 (56.1 %)	2606 (58.8 %)	0.002
ARB, n. (%)	23287	346 (1.5 %)	95 (2.1 %)	59 (1.3 %)	70 (1.6 %)	52 (1.2 %)	52 (1.2 %)	0.002

Beta-blockers, n. (%)	26802	17824 (66.5 %)	3482 (66.9 %)	3493 (68.2 %)	3416 (66.6 %)	3373 (65.6 %)	3407 (67.0 %)	0.093
Diuretics, n. (%)	28761	13013 (45.2 %)	2869 (51.8 %)	2320 (42.2 %)	2323 (42.0 %)	2275 (41.1 %)	2461 (44.5 %)	<0.0001
CVM, n. (%)	28742	4380 (15.2%)	1424 (24.3 %)	840 (14.9 %)	659 (11.4 %)	775 (13.5 %)	682 (11.9 %)	<0.0001
HF hospitalization, n. (%)	28742	3385 (11.8 %)	974 (17.6 %)	706 (12.8 %)	587 (10.6 %)	524 (9.5 %)	483 (8.7 %)	<0.0001
MI, n. (%)	28742	3112 (10.8 %)	962 (16.4 %)	633 (11.2 %)	476 (8.3 %)	576 (10.0 %)	465 (8.1 %)	<0.0001
Stroke, n. (%)	28742	931 (3.2 %)	222 (3.8 %)	167 (3.0 %)	150 (2.6 %)	174 (3.0 %)	218 (3.8 %)	<0.0001
All-cause death, n. (%)	28742	5103 (17.8 %)	1663 (28.4 %)	998 (17.7 %)	789 (13.7 %)	871 (15.2 %)	782 (13.6 %)	<0.0001

Legend: SBP, systolic blood pressure; DBP, diastolic blood pressure; BMI, body mass index; LVEF, left ventricular ejection fraction; estimated glomerular filtration rate by CKD-EPI formula; HF, heart failure; ACEi, angiotensin converting enzyme inhibitors; ARB, angiotensin receptor blockers; CVM, cardiovascular mortality; MI, myocardial infarction.

Supplemental Table 2. Crude and adjusted hazard ratios for quintiles of diastolic blood pressure

Blood pressure quintiles	Crude HR (95%CI)	P-value	Adjusted* HR (95%CI)	P-value
Cardiovascular death				
Diastolic blood pressure				
≤68 mmHg	2.387 (2.178-2.616)	<0.0001	1.877 (1.704-2.068)	<0.0001
69 to 72 mmHg	1.264 (1.142-1.399)	0.001	1.227 (1.103-1.364)	<0.0001
73 to 76 mmHg	1	-	1	-
77 to 81 mmHg	1.169 (1.054-1.296)	0.003	1.197 (1.075-1.334)	0.001
>82 mmHg	1.014 (0.911-1.129)	0.80	1.018 (0.91-1.139)	0.75
Heart failure hospitalization				
Diastolic blood pressure				
≤68 mmHg	2.071 (1.856-2.310)	<0.0001	1.742 (1.553-1.954)	<0.0001
69 to 72 mmHg	1.217 (1.081-1.370)	0.001	1.216 (1.075-1.375)	0.002
73 to 76 mmHg	1	-	1	-
77 to 81 mmHg	0.980 (0.866-1.110)	0.76	0.973 (0.856-1.107)	0.68
>82 mmHg	0.850 (0.748-0.967)	0.013	0.778 (0.680-0.889)	0.0002
Myocardial infarction				
Diastolic blood pressure				
≤68 mmHg	2.276 (2.039-2.54)	<0.0001	1.920 (1.712-2.153)	<0.0001
69 to 72 mmHg	1.391 (1.235-1.566)	<0.0001	1.336 (1.182-1.51)	<0.0001
73 to 76 mmHg	1	-	1	-
77 to 81 mmHg	1.235 (1.094-1.394)	0.001	1.209 (1.066-1.37)	0.003
>82 mmHg	0.982 (0.864-1.116)	0.78	0.961 (0.842-1.097)	0.56
Stroke				
Diastolic blood pressure				
≤68 mmHg	1.642 (1.334-2.020)	<0.0001	1.397 (1.123-1.737)	0.003
69 to 72 mmHg	1.142 (0.917-1.424)	0.24	1.182 (0.943-1.481)	0.15
73 to 76 mmHg	1	-	1	-
77 to 81 mmHg	1.174 (0.944-1.459)	0.15	1.193 (0.953-1.494)	0.12
>82 mmHg	1.459 (1.186-1.795)	0.0004	1.408 (1.133-1.749)	0.002
All-cause death				
Diastolic blood pressure				
≤68 mmHg	2.351 (2.161-2.558)	<0.0001	1.835 (1.679-2.006)	<0.0001

69 to 72 mmHg	1.269 (1.156-1.393)	<0.0001	1.226 (1.113-1.351)	<0.0001
73 to 76 mmHg	1	-	1	-
77 to 81 mmHg	1.111 (1.009-1.223)	0.033	1.138 (1.03-1.258)	0.011
>82 mmHg	0.981 (0.888-1.083)	0.70	0.990 (0.892-1.098)	0.84

Models adjusted for age, gender, body mass index, estimated glomerular filtration rate, smoking status, history of hypertension, diabetes, heart failure history, previous myocardial infarction, previous stroke, peripheral artery disease, atrial fibrillation, heart rate, ACEi/ARB, beta-blockers, and diuretics (not adjusted for hemoglobin, glucose, electrolytes or left ventricular ejection fraction due to high % of missing values).

P for interaction with Age for DBP =0.11

Supplemental Table 3. Adjusted hazard ratios for quintiles of systolic blood pressure in sensitivity analysis excluding patients with diabetes mellitus, history of stroke and estimated glomerular filtration rate <45 ml/min/1.73m²

Blood pressure quintiles	Adjusted* HR (95% CI)	P-value
Cardiovascular death		
≤112 mmHg	2.445 (2.124-2.814)	<0.0001
113 to 120 mmHg	1.232 (1.058-1.434)	0.007
121 to 128 mmHg	1	-
129 to 137 mmHg	0.953 (0.812-1.117)	0.551
>137 mmHg	0.740 (0.624-0.877)	0.001
Heart failure hospitalization		
≤112 mmHg	3.602 (3.022-4.293)	<0.0001
113 to 120 mmHg	1.670 (1.386-2.012)	<0.0001
121 to 128 mmHg	1	-
129 to 137 mmHg	1.065 (0.871-1.301)	0.54
>137 mmHg	1.018 (0.832-1.246)	0.86
Myocardial infarction		
≤112 mmHg	1.642 (1.400-1.925)	<0.0001
113 to 120 mmHg	1.094 (0.929-1.290)	0.28
121 to 128 mmHg	1	-
129 to 137 mmHg	0.835 (0.700-0.996)	0.045
>137 mmHg	0.906 (0.759-1.080)	0.27
Stroke		
≤112 mmHg	1.528 (1.104-2.115)	0.011
113 to 120 mmHg	1.266 (0.924-1.736)	0.14
121 to 128 mmHg	1	-
129 to 137 mmHg	1.140 (0.829-1.568)	0.42
>137 mmHg	1.055 (0.763-1.458)	0.75
All-cause death		
≤112 mmHg	2.317 (2.037-2.636)	<0.0001
113 to 120 mmHg	1.257 (1.095-1.442)	0.001
121 to 128 mmHg	1	-
129 to 137 mmHg	0.937 (0.810-1.084)	0.38

>137 mmHg

0.768 (0.659-0.896)

0.001

Models adjusted for age, gender, body mass index, estimated glomerular filtration rate, smoking status, history of hypertension, diabetes, heart failure history, previous myocardial infarction, previous stroke, peripheral artery disease, atrial fibrillation, heart rate, ACEi/ARB, beta-blockers, and diuretics.

Supplemental Table 4. Adjusted hazard ratios for quintiles of systolic blood pressure with further adjustment on each study and oral anticoagulant use

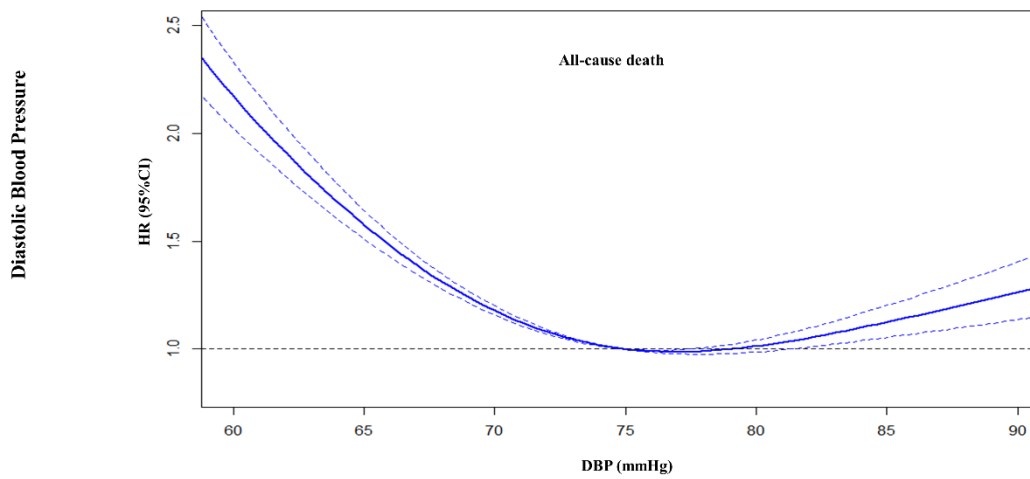
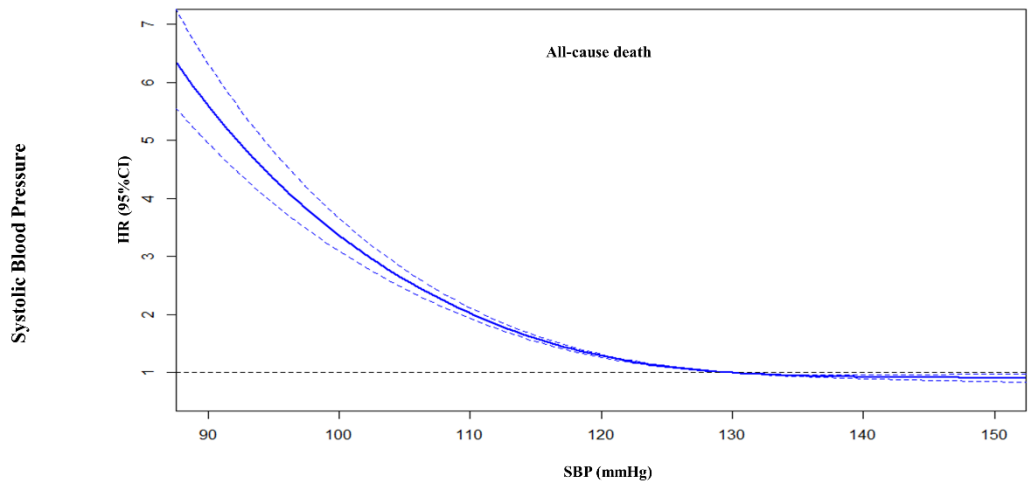
Blood pressure quintiles	Adjusted* HR (95% CI)	P-value
Cardiovascular death		
≤112 mmHg	2.488 (2.258-2.741)	<0.0001
113 to 120 mmHg	1.291 (1.164-1.432)	<0.0001
121 to 128 mmHg	1	-
129 to 137 mmHg	0.892 (0.800-0.995)	0.040
>137 mmHg	0.761 (0.682-0.849)	<0.0001
Heart failure hospitalization		
≤112 mmHg	2.705 (2.417-3.028)	<0.0001
113 to 120 mmHg	1.424 (1.265-1.602)	<0.0001
121 to 128 mmHg	1	-
129 to 137 mmHg	0.918 (0.810-1.040)	0.18
>137 mmHg	0.877 (0.776-0.991)	0.036
Myocardial infarction		
≤112 mmHg	1.986 (1.764-2.236)	<0.0001
113 to 120 mmHg	1.293(1.145-1.460)	<0.0001
121 to 128 mmHg	1	-
129 to 137 mmHg	0.953 (0.840-1.081)	0.45
>137 mmHg	1.017 (0.900-1.150)	0.78
Stroke		
≤112 mmHg	1.740 (1.378-2.195)	<0.0001
113 to 120 mmHg	1.256 (0.996-1.583)	0.054
121 to 128 mmHg	1	-
129 to 137 mmHg	1.149 (0.915-1.442)	0.23
>137 mmHg	1.329 (1.070-1.651)	0.010
All-cause death		
≤112 mmHg	2.405 (2.198-2.632)	<0.0001
113 to 120 mmHg	1.313 (1.194-1.445)	<0.0001
121 to 128 mmHg	1	-
129 to 137 mmHg	0.888 (0.803-0.982)	0.021
>137 mmHg	0.797 (0.721-0.881)	<0.0001

Models adjusted for age, gender, body mass index, estimated glomerular filtration rate, smoking status, history of hypertension, diabetes, heart failure history, previous myocardial infarction, previous stroke, peripheral artery disease, atrial fibrillation, heart rate, ACEi/ARB, beta-blockers, diuretics, study allocation, and oral anticoagulant use.

Supplemental Table 5. Patient characteristics and blood pressure analysis according to heart failure hospitalization, myocardial infarction and stroke events

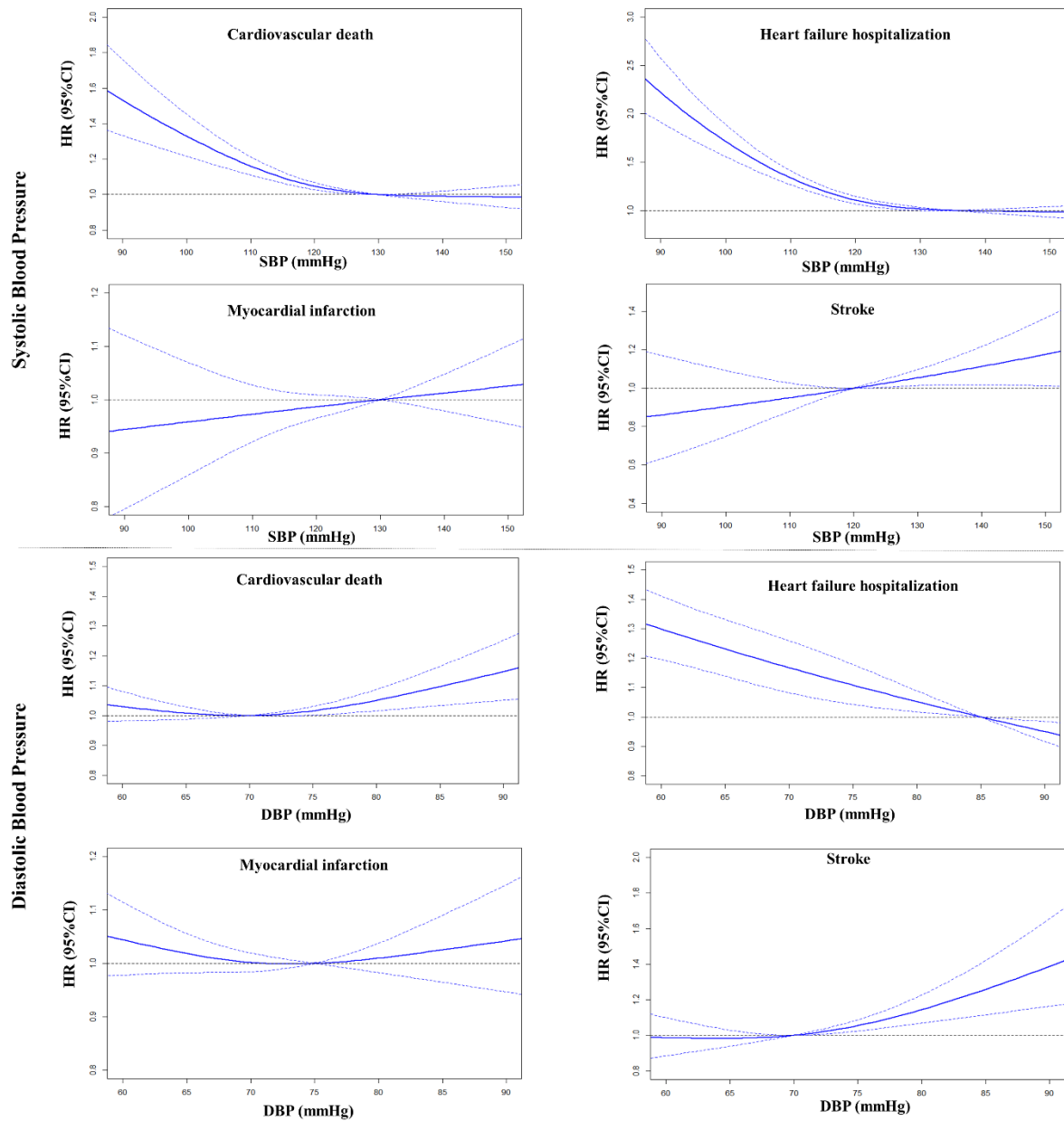
	No HFH (n=25386)	HFH (n=3385)	p-value
Hear failure hospitalization (HFH)	(n=25386)	(n=3385)	p-value
Mean SBP (mmHg)	124.9 ± 14.8	122.2 ± 16.3	<0.0001
Mean DBP (mmHg)	74.5 ± 8.0	71.7 ± 8.9	<0.0001
Baseline SBP (mmHg)	120.9 ± 16.6	121.2 ± 17.6	0.34
Baseline DBP (mmHg)	71.8 ± 10.7	70.5 ± 11.2	<0.0001
Last SBP (mmHg)	127.7 ± 20.2	123.3 ± 21.4	<0.0001
Last DBP (mmHg)	75.7 ± 11.3	72.7 ± 11.9	<0.0001
Number of BP measures	9.1 ± 3.3	4.4 ± 2.4	<0.0001
Follow-up (years)	1.9 ± 0.9	0.6 ± 0.6	<0.0001
	No MI (n=25645)	MI (n=3126)	p-value
Myocardial infarction (MI)	(n=25645)	(n=3126)	p-value
Mean SBP (mmHg)	124.8 ± 14.8	123.9 ± 16.1	0.002
Mean DBP (mmHg)	74.4 ± 7.9	72.1 ± 9.3	<0.0001
Baseline SBP (mmHg)	120.7 ± 16.6	122.7 ± 17.3	<0.0001
Baseline DBP (mmHg)	71.8 ± 10.7	71.1 ± 11.1	0.002
Last SBP (mmHg)	127.7 ± 20.2	124.8 ± 20.6	<0.0001
Last DBP (mmHg)	75.7 ± 11.2	72.9 ± 12.0	<0.0001
Number of BP measures	9.1 ± 3.2	4.1 ± 2.7	<0.0001
Follow-up (years)	1.9 ± 0.9	0.6 ± 0.7	<0.0001
	No Stroke (n=27832)	Stroke (n=939)	p-value
Stroke	(n=27832)	(n=939)	p-value
Mean SBP (mmHg)	124.5 ± 14.8	127.3 ± 16.5	<0.0001
Mean DBP (mmHg)	74.1 ± 8.0	74.4 ± 9.3	0.26
Baseline SBP (mmHg)	120.8 ± 16.7	124.3 ± 18.1	<0.0001
Baseline DBP (mmHg)	71.7 ± 10.8	72.4 ± 11.9	0.032
Last SBP (mmHg)	127.0 ± 20.4	129.1 ± 21.5	0.001
Last DBP (mmHg)	75.3 ± 11.5	75.9 ± 12.4	0.12
Number of BP measures	9.0 ± 3.3	5.1 ± 3.0	<0.0001
Follow-up (years)	1.9 ± 0.9	0.7 ± 0.8	<0.0001

Supplemental Figure 1. Adjusted associations between mean blood pressure and all-cause death



Legend: SBP, systolic blood pressure; DBP, diastolic blood pressure; HR, hazard ratio; CI, confidence interval.
All models are adjusted for age, gender, body mass index, estimated glomerular filtration rate, smoking status, history of hypertension, diabetes, heart failure history, previous myocardial infarction, previous stroke, peripheral artery disease, atrial fibrillation and heart rate.

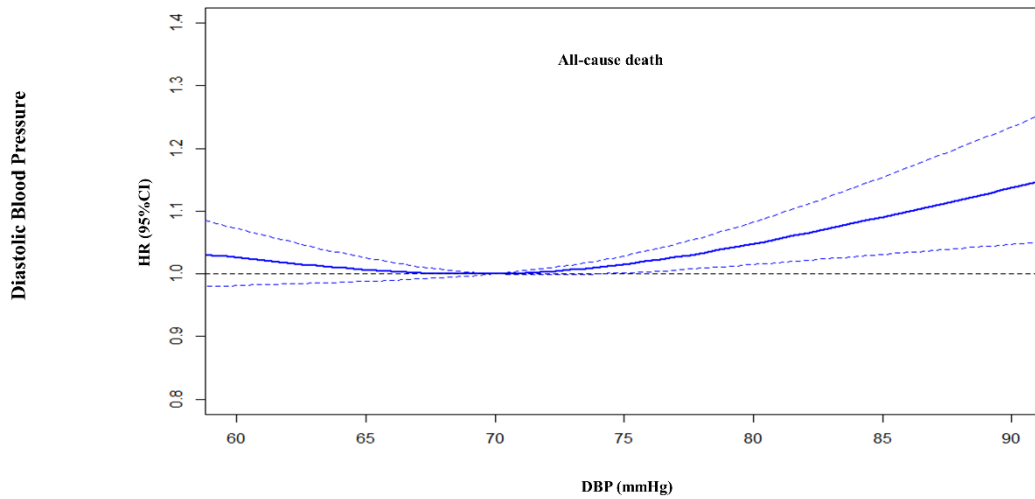
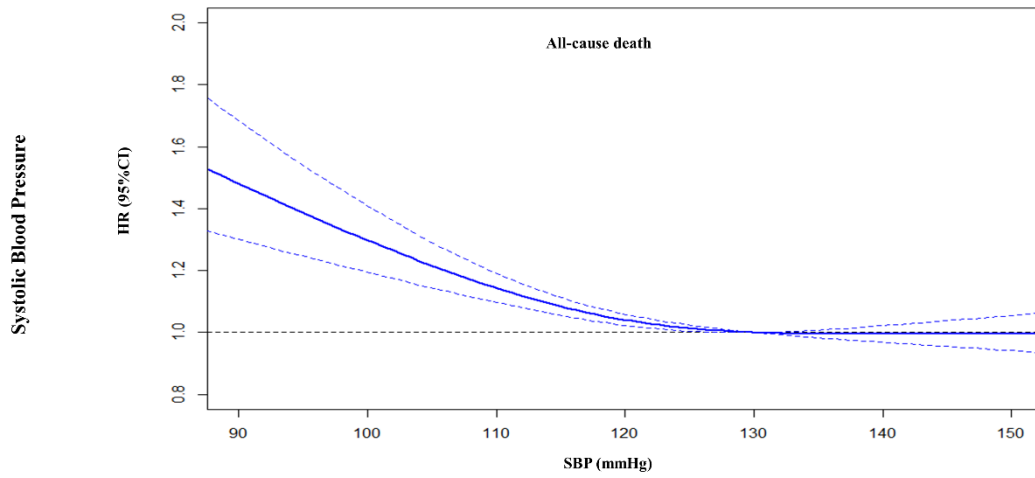
Supplemental Figure 2. Adjusted associations between baseline blood pressure and the studied outcomes



Legend: SBP, systolic blood pressure; DBP, diastolic blood pressure; HR, hazard ratio; CI, confidence interval.

All models are adjusted for age, gender, body mass index, estimated glomerular filtration rate, smoking status, history of hypertension, diabetes, heart failure history, previous myocardial infarction, previous stroke, peripheral artery disease, atrial fibrillation and heart rate.

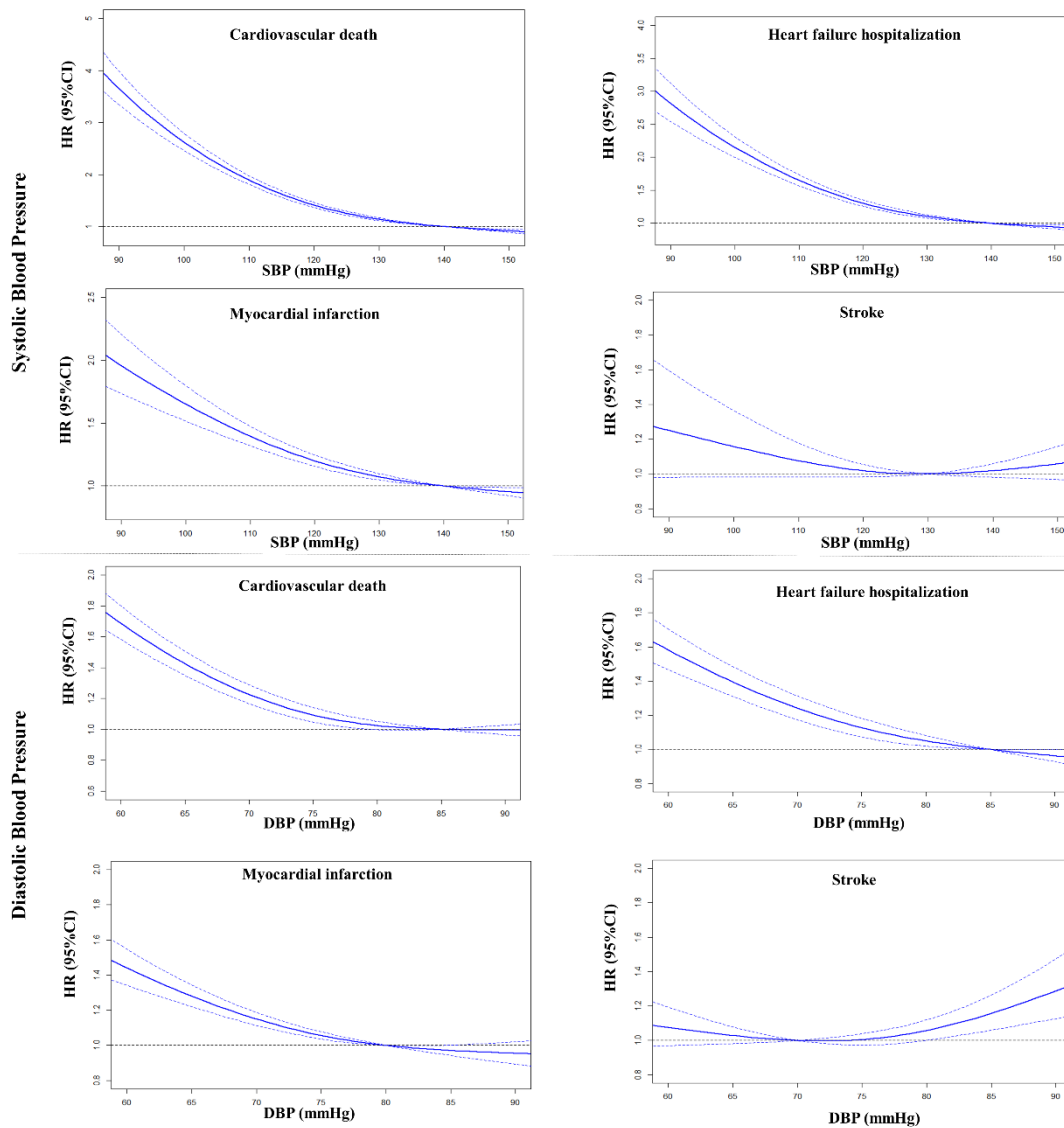
Supplemental Figure 3. Adjusted associations between baseline blood pressure and all-cause death



Legend: SBP, systolic blood pressure; DBP, diastolic blood pressure; HR, hazard ratio; CI, confidence interval.

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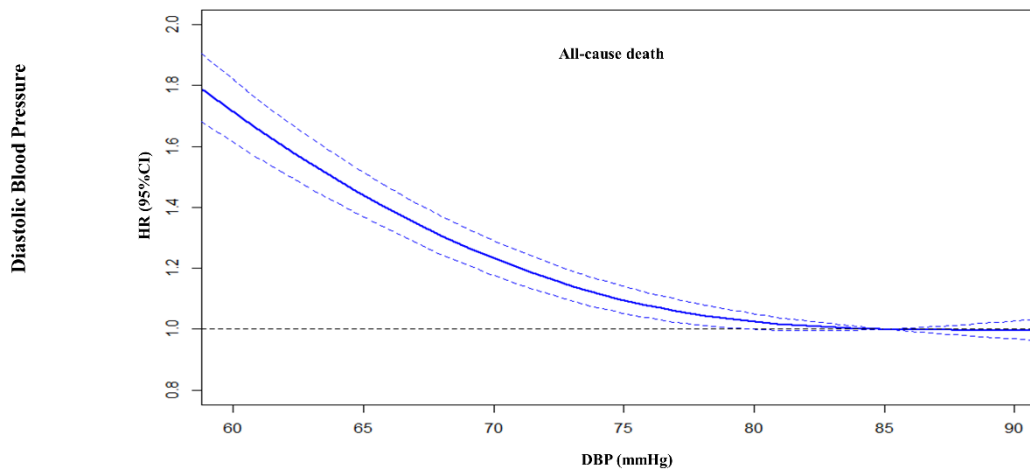
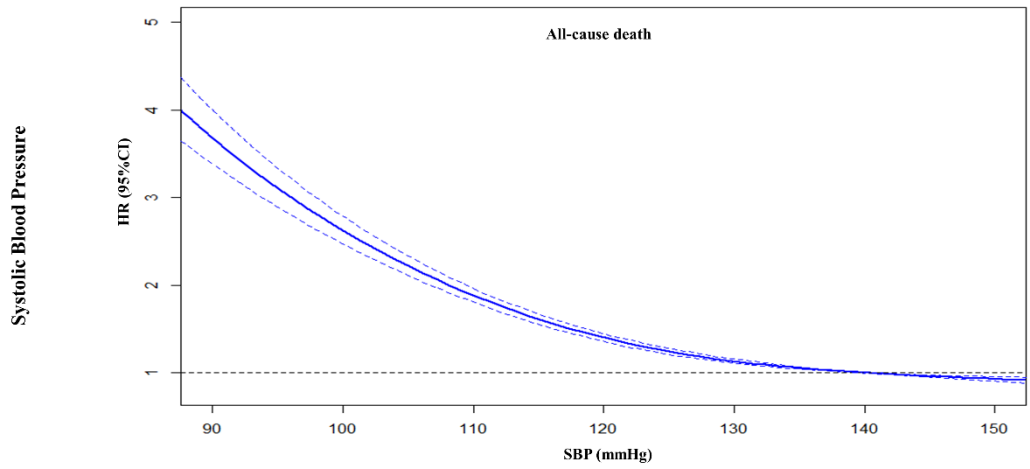
Supplemental Figure 4. Associations between the last blood pressure measurement and the studied outcomes



Legend: SBP, systolic blood pressure; DBP, diastolic blood pressure; HR, hazard ratio; CI, confidence interval.

All models are adjusted for age, gender, body mass index, estimated glomerular filtration rate, smoking status, history of hypertension, diabetes, heart failure history, previous myocardial infarction, previous stroke, peripheral artery disease, atrial fibrillation and heart rate.

Supplemental Figure 5. Associations between the last blood pressure measurement and all-cause death



Legend: SBP, systolic blood pressure; DBP, diastolic blood pressure; HR, hazard ratio; CI, confidence interval.

All models are adjusted for age, gender, body mass index, estimated glomerular filtration rate, smoking status, history of hypertension, diabetes, heart failure history, previous myocardial infarction, previous stroke, peripheral artery disease, atrial fibrillation and heart rate.