

Blood pressure lowering strategies in coronary artery disease patients



Artery

• *By*



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Restricted Blood Flow

• *M. Wafaie aboleineen, MD, FACC*

Plaque Buildup

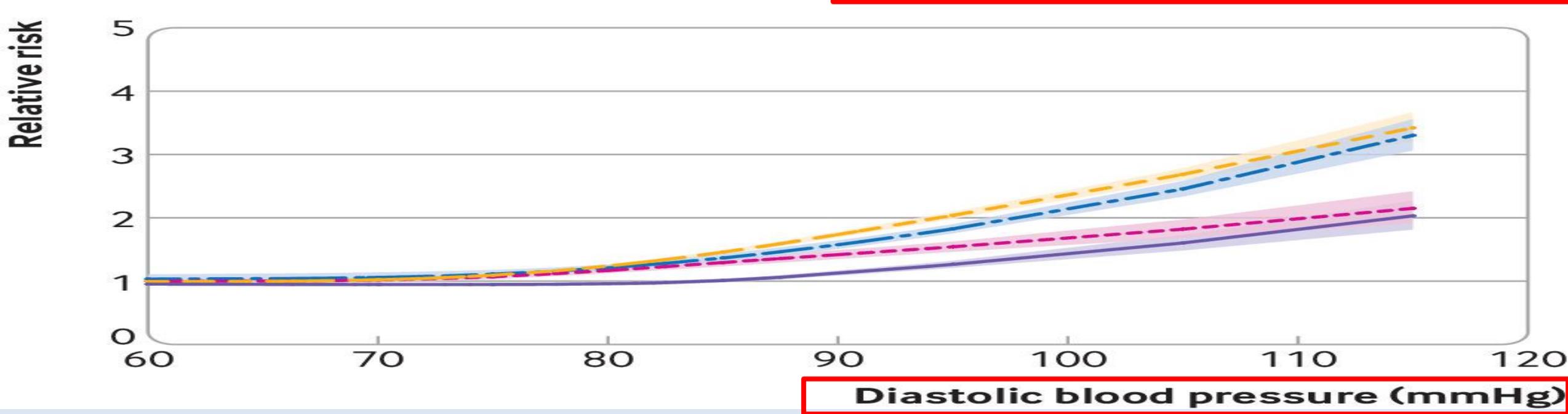
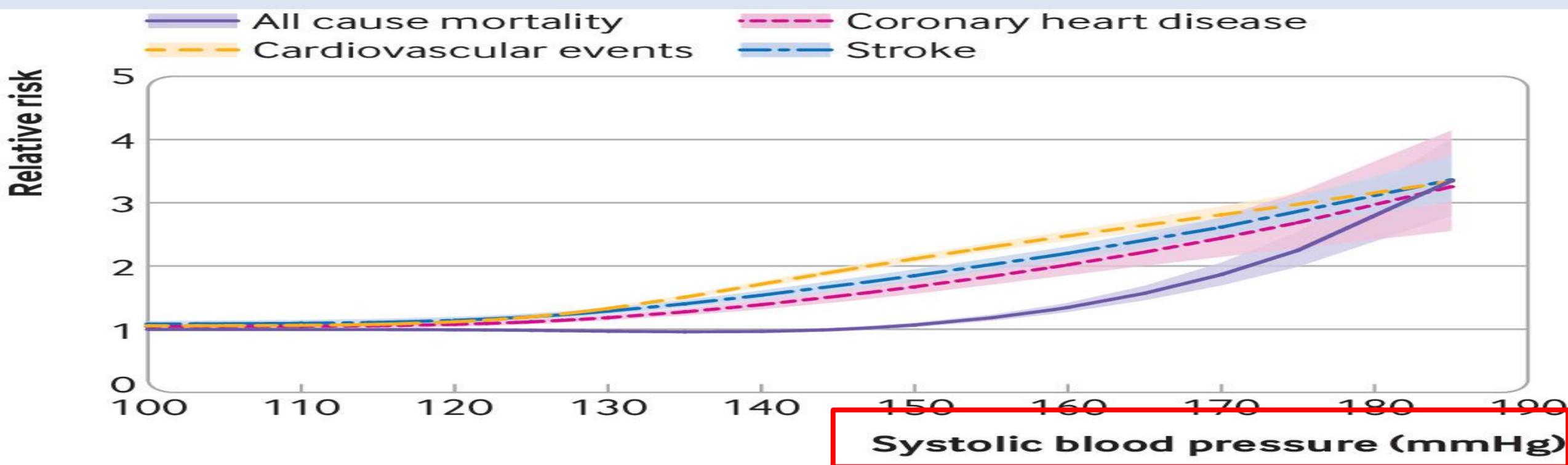
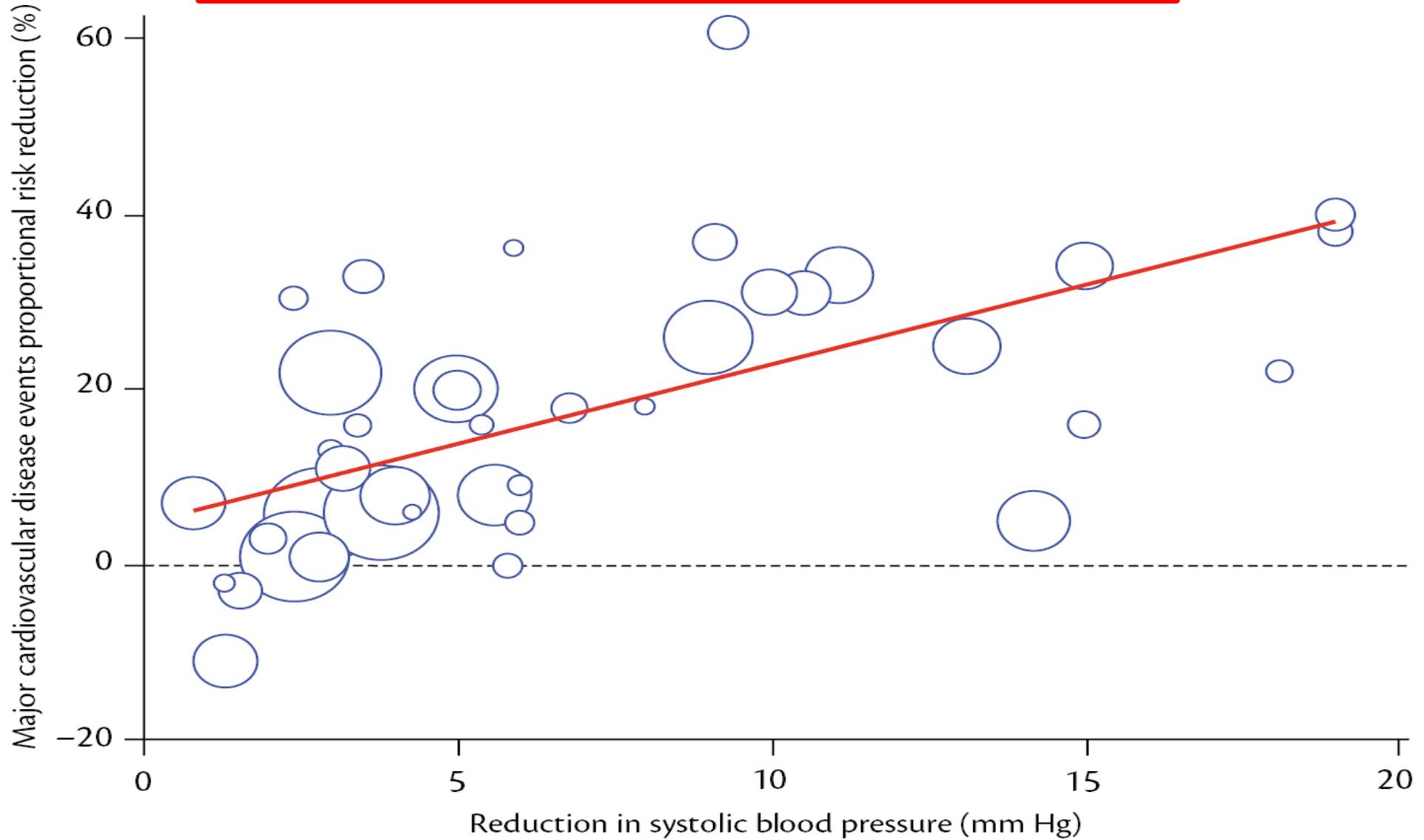


Figure 44.5.1 The reduction of major cardiovascular events according to reduction in systolic blood pressure in clinical outcome trials. The circles represent the volume of data per trial.



Chapter: Blood pressure thresholds for treatment and blood pressure treatment targets in hypertension **Author(s):** Bryan Williams **From:** ESC CardioMed

AHA/ACC/ASH SCIENTIFIC STATEMENT

Treatment of Hypertension in Patients With Coronary Artery Disease



CrossMark



A Scientific Statement from the American Heart Association, American College of Cardiology,
and American Society of Hypertension

Clive Rosendorff, MD, PhD, DScMed, FAHA, FACC, FASH,
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MANAGEMENT OF HTN IN PATIENTS
WITH CAD AND STABLE ANGINA
Pharmacological Therapy

1. a) ***b-Blockers*** are the drugs of first choice in patients with angina.

b) An ***ACE inhibitor*** or ARB if there is prior MI, LV systolic dysfunction, DM, or CKD; and

c) A ***thiazide*** or thiazide-like diuretic

(Class I; Level of Evidence: A).

2. The combination : should be considered .
(Class IIa; Level of Evidence: B).

3. If b-blockers are contraindicated or intolerated,
a nondihydropyridine CCB : may be
substituted, if there is no LV dysfunction

(Class IIa; Level of Evidence: B).

4. If angina or the hypertension remains uncontrolled, a long-acting dihydropyridine CCB can be added .

(Class IIa; Level of Evidence: B).

5. Target <140/90 mm Hg. (Class I; Level of Evidence: A). **lower target BP (<130/80 mm Hg)** may be considered with previous stroke or TIA, or with CAD risk equivalents (carotid artery disease, PAD, AAA)

(Class IIb; Level of Evidence: B).

6. Uncontrolled severe hypertension who are taking antiplatelet or anticoagulant drugs, the BP should be lowered without delay to reduce the risk of hemorrhagic stroke

(Class IIa;)

MANAGEMENT OF HYPERTENSION IN PATIENTS WITH ACS

1. A short-acting β_1 -selective β -blocker
(metoprolol tartrate or bisoprolol) orally within 24 hours
(Class I; Level of Evidence: A).

For severe hypertension or ongoing ischemia,

IV β -blocker (esmolol) can be considered
(Class IIa; Level of Evidence: B).

For hemodynamically unstable patients or decompensated HF, β -blocker therapy should be delayed until stabilization has been achieved (Class I; Level of Evidence: A).

MANAGEMENT OF HYPERTENSION IN PATIENTS WITH ACS

2. Nitrates lower BP and relieve ischemia or pulmonary congestion **(Class I; Level of Evidence: C)**. Sublingual or IV nitroglycerin for initial therapy, transitioned later to a **longer-acting preparation**.

3. If there is a contraindication to the use of a b-blocker or intolerable side effects, then a **nondihydropyridine CCB** may be substituted for patients with ongoing ischemia, . If the angina or hypertension is not controlled on a b-blocker alone, a longer-acting **dihydropyridine CCB** may be added after optimal use of an ACE inhibitor **(Class IIa; Level of Evidence: B)**.

4. An ACE inhibitor (Class I; Level of Evidence: A) or an ARB (Class I; Level of Evidence: B) should be added if the patient has an anterior MI , if the patient has evidence of LV dysfunction or HF.

(Class IIa; Level of Evidence: A).

5. Aldosterone antagonists are indicated for patients who are already receiving b-blockers and ACE inhibitors after MI and have LV dysfunction and either HF or diabetes mellitus.

(Class I; Level of Evidence: A).

6. Loop diuretics are preferred over thiazide in HF or CKD and GFR <30 mL/min. A thiazide may be added for BP control (Class I; Level of Evidence: B).

Table 44.5.1 Summary of office blood pressure thresholds for treatment according to the 2018 ESC/ESH hypertension guidelines

Age group	Office SBP treatment threshold (mmHg)					Diastolic treatment threshold (mmHg)
	Hypertension	+ Diabetes	+ CKD	+ CAD	+ Stroke/TIA	
18–65 years	≥140	≥140	≥140	≥140 ^a	≥140 ^a	≥90
65–79 years	≥140	≥140	≥140	≥140 ^a	≥140 ^a	≥90
≥80 years	≥160	≥160	≥160	≥160	≥160	≥90
Diastolic treatment threshold (mmHg)	≥90	≥90	≥90	≥90	≥90	

Table 44.5.2 Blood pressure thresholds for and goals of pharmacological therapy in patients with hypertension according to clinical conditions, from the 2017 US hypertension guideline

Clinical condition(s)	BP threshold (mmHg)	BP goal (mmHg)
General		
Clinical CVD or 10-year ASCVD risk $\geq 10\%$	$\geq 130/80$	$< 130/80$
No clinical CVD and 10-year ASCVD risk $< 10\%$	$> 140/90$	$< 130/80$
Older persons (≥ 65 years of age; non-institutionalized, ambulatory, community-living adults)	≥ 130 (SBP)	< 130 (SBP)
Specific co-morbidities		
Diabetes mellitus	$\geq 130/80$	$< 130/80$
Chronic kidney disease	$\geq 130/80$	$< 130/80$
Chronic kidney disease after renal transplantation	$\geq 130/80$	$< 130/80$
Heart failure	$\geq 130/80$	$< 130/80$
Stable ischaemic heart disease	$\geq 130/80$	$< 130/80$

CENTRAL ILLUSTRATION: Intensive BP Lowering and Cardiovascular and Safety Outcomes in Older Hypertensive Patients

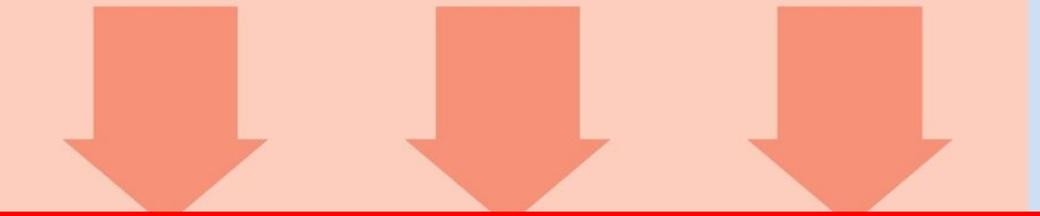
Effects of Intensive BP-lowering in Older (≥ 65 Years) Hypertensive Patients



Beneficial effects



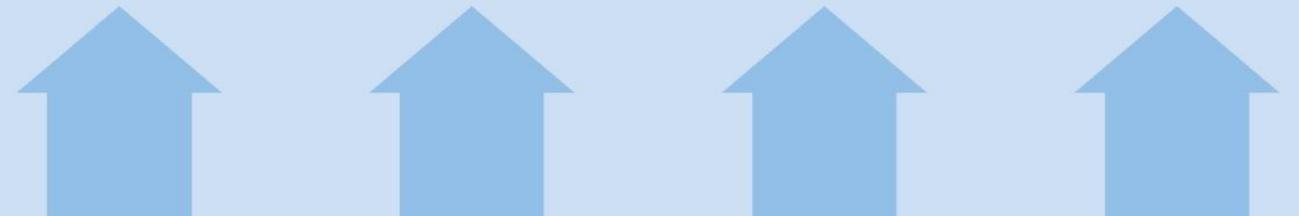
Drawbacks/concerns



29% reduction in major adverse cardiovascular (CV) events (MACE)

33% reduction in CV mortality

37% reduction in heart failure



Patients use an increased number of anti-hypertensive medications

Possible increase in renal failure

Possible increase in serious adverse events

Possible increase in hypotension, syncope and other adverse effects

Bavishi, C. et al. J Am Coll Cardiol. 2017;69(5):486-93.

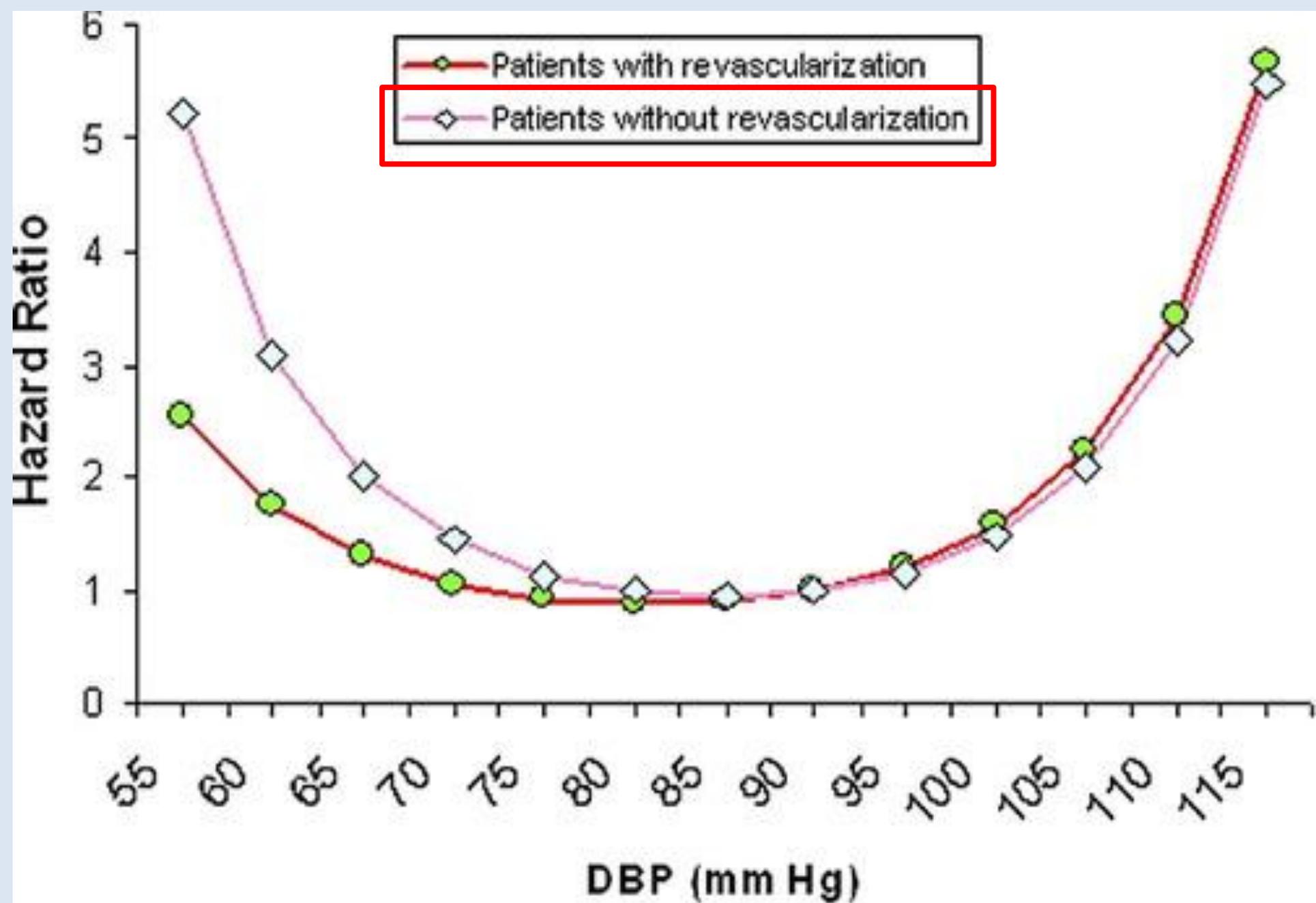


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There remains some inconsistency over the optimal BP target , and whether there is a J-curve relation between achieved BP and CV outcomes in CAD.

A SBP <120 mmHg was also associated with increased risk, as was a diastolic BP <70 mmHg.

Whether a J-curve phenomenon exists in patients with CAD who have been revascularized remains uncertain.

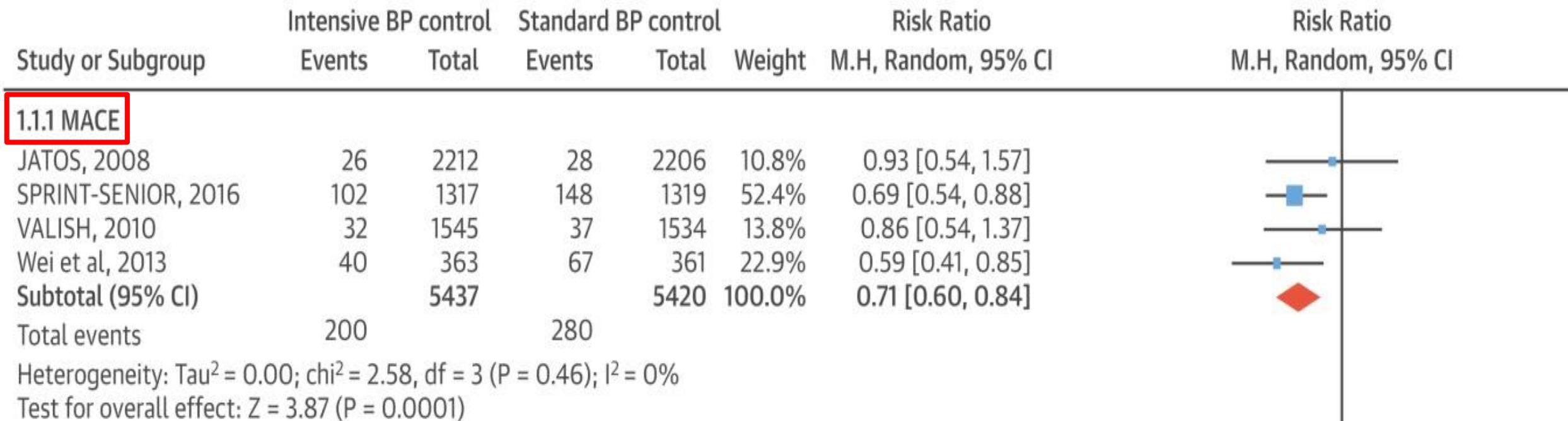


Franz H. Messerli et al. *J Am Coll Cardiol* 2009; 54:1827-1834.

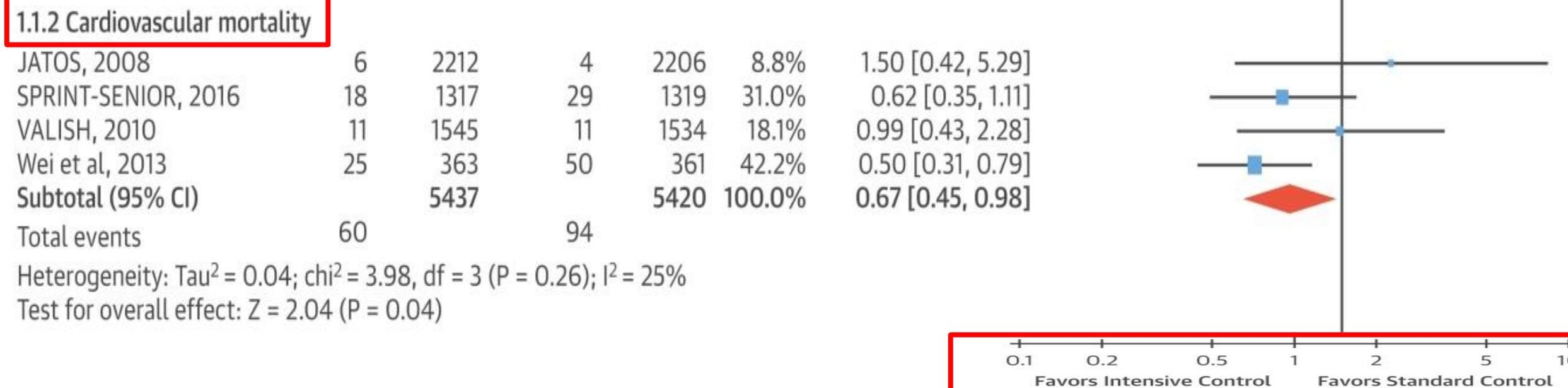


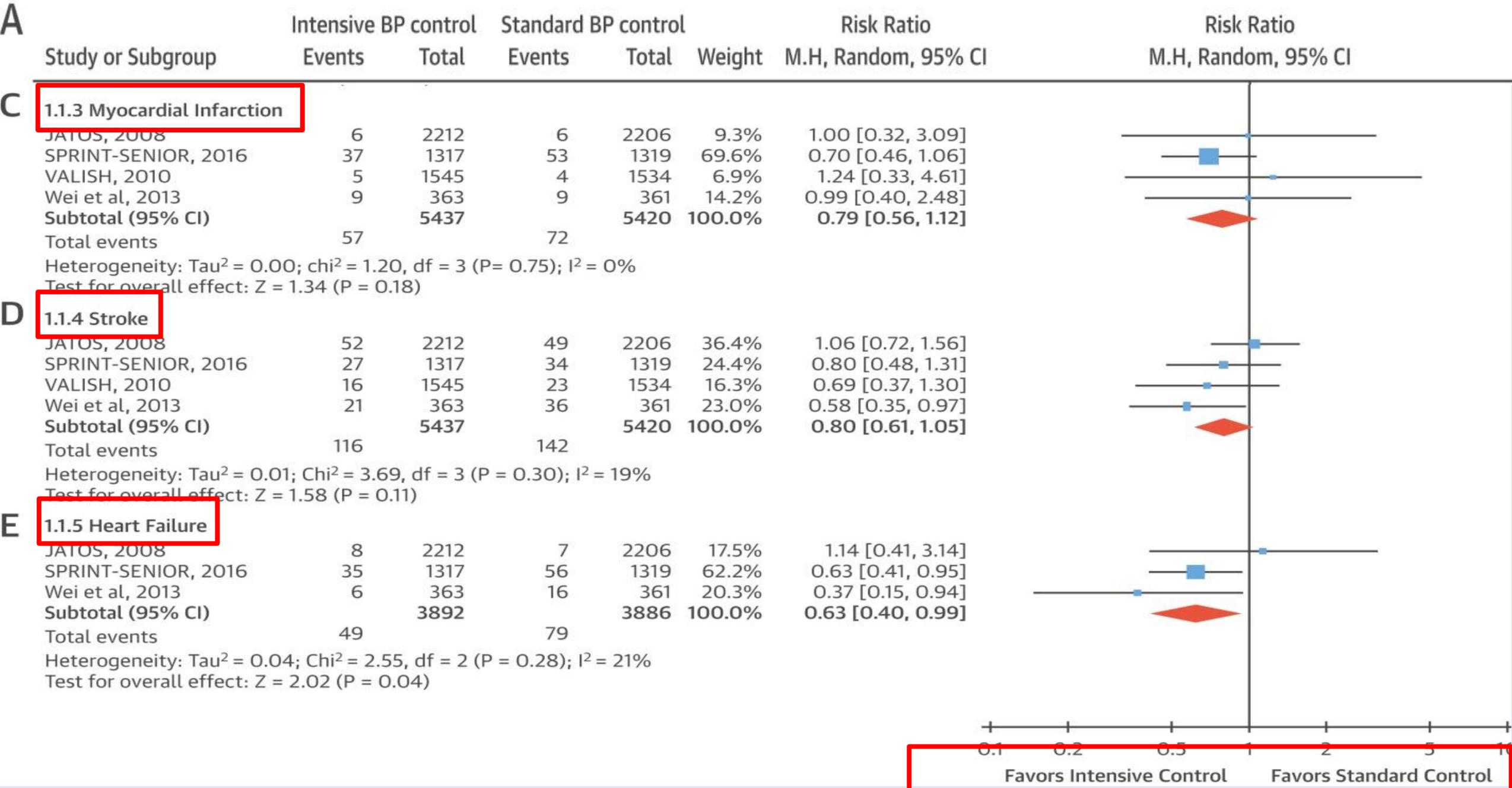
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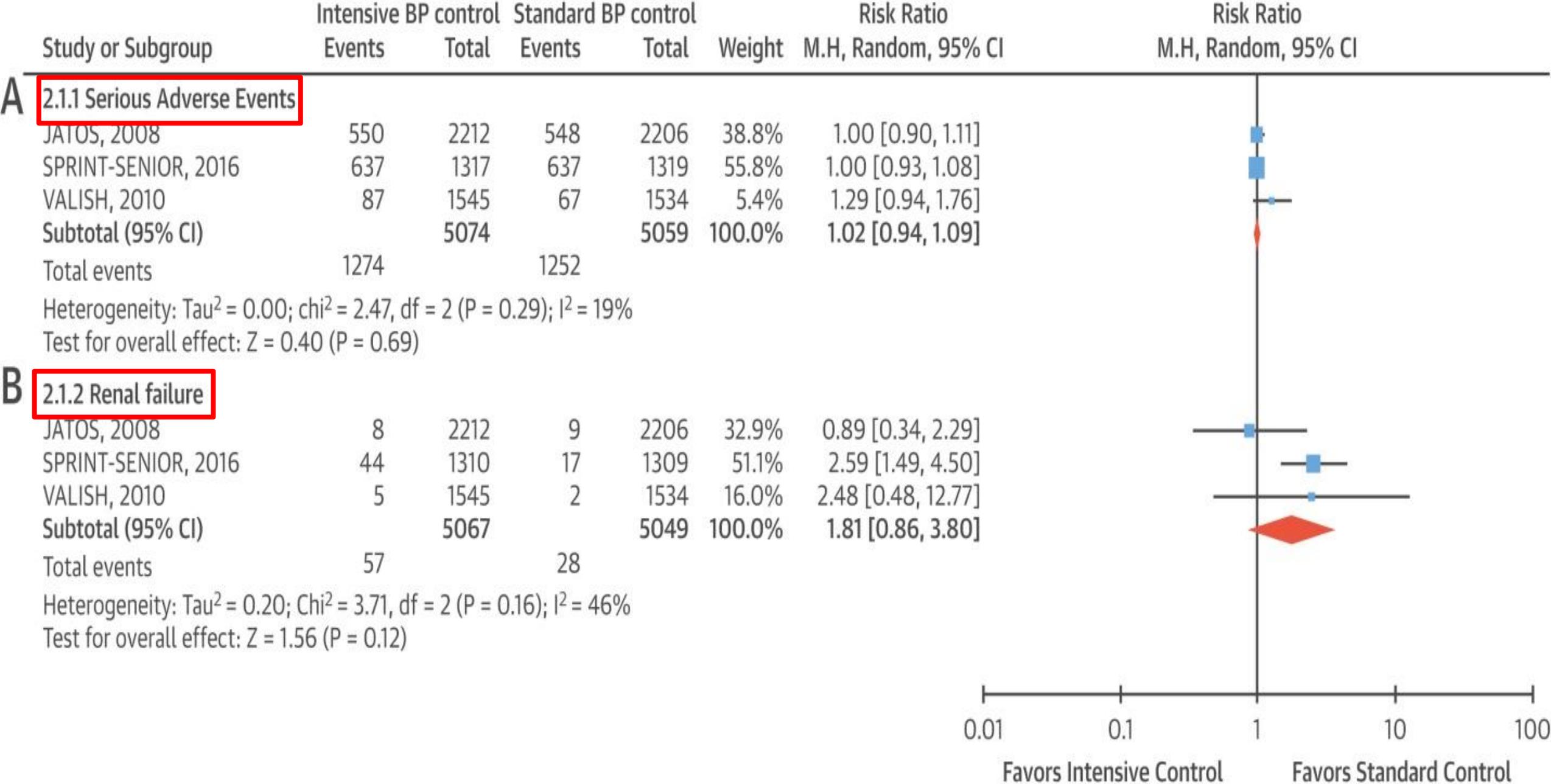
A



B



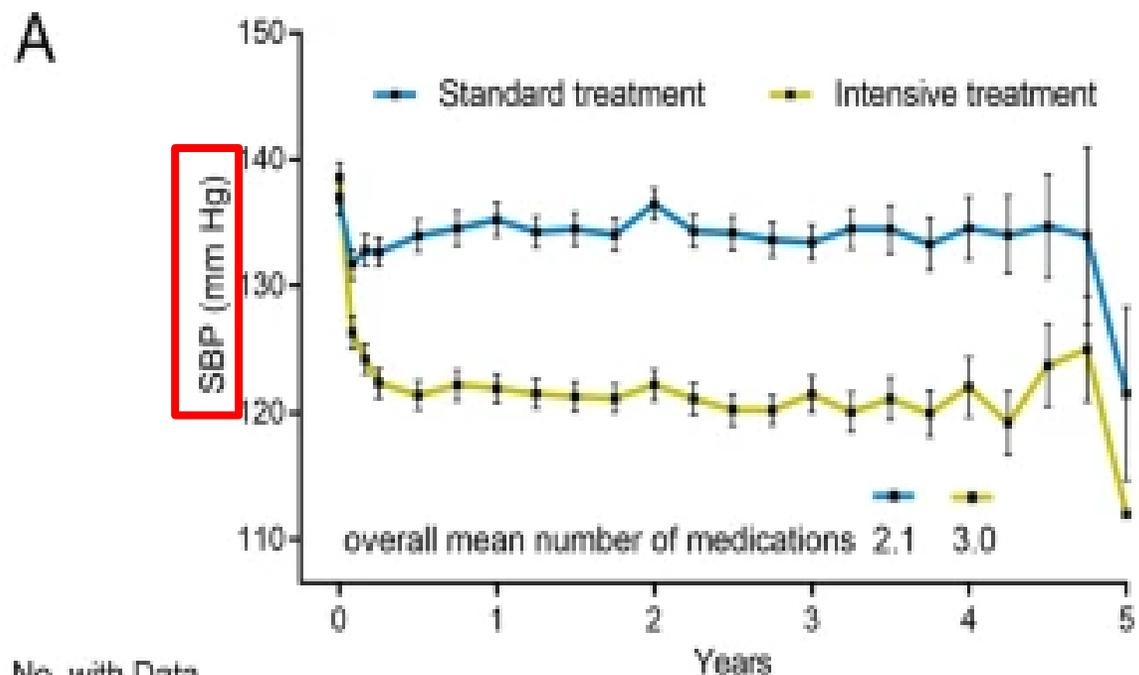




***Intensive blood pressure
treatment in coronary artery
disease: implications from the
Systolic Blood Pressure
Intervention Trial (SPRINT)***

*Giabin Zang, et al, Journal of Human
Hypertension (2021)*

Fig. 1: Blood pressure for participants with CAD through the 5-years follow-up visit.

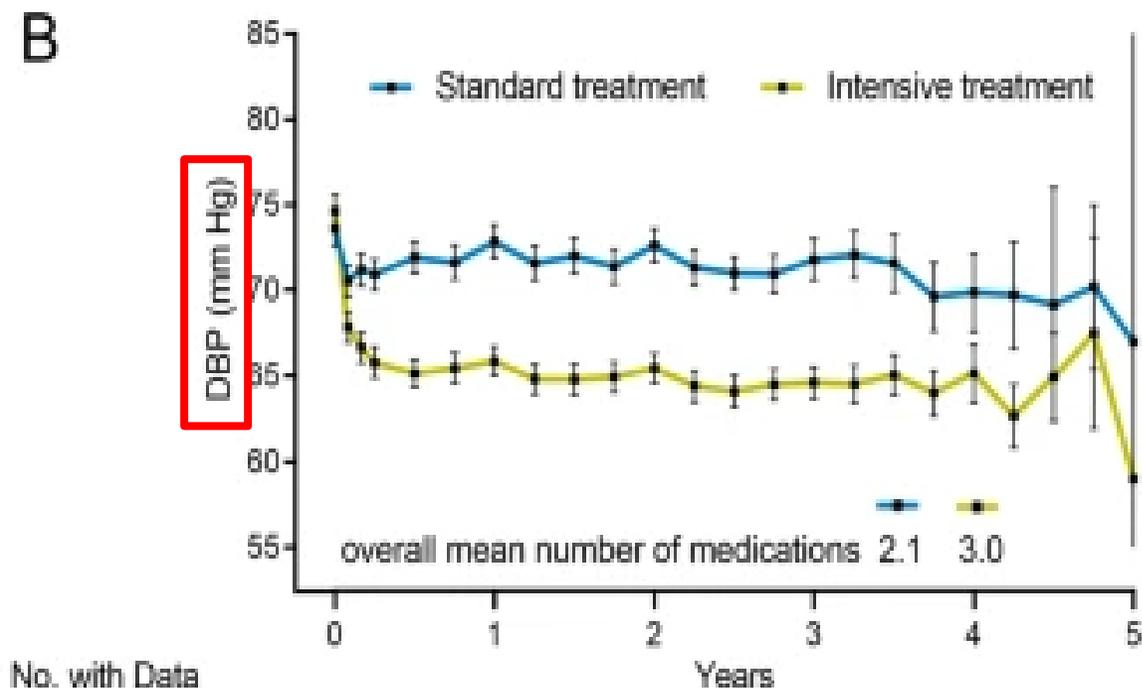


No. with Data

Standard treatment	584	542	519	500	490	464	398	254	136	55	2
Intensive treatment	622	587	569	548	535	525	452	319	166	71	1

Mean No. of Medications

Standard treatment	2.3	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.2	2.1	2.5
Intensive treatment	2.6	3.0	3.1	3.0	3.0	3.0	3.0	3.0	3.1	3.1	3.0



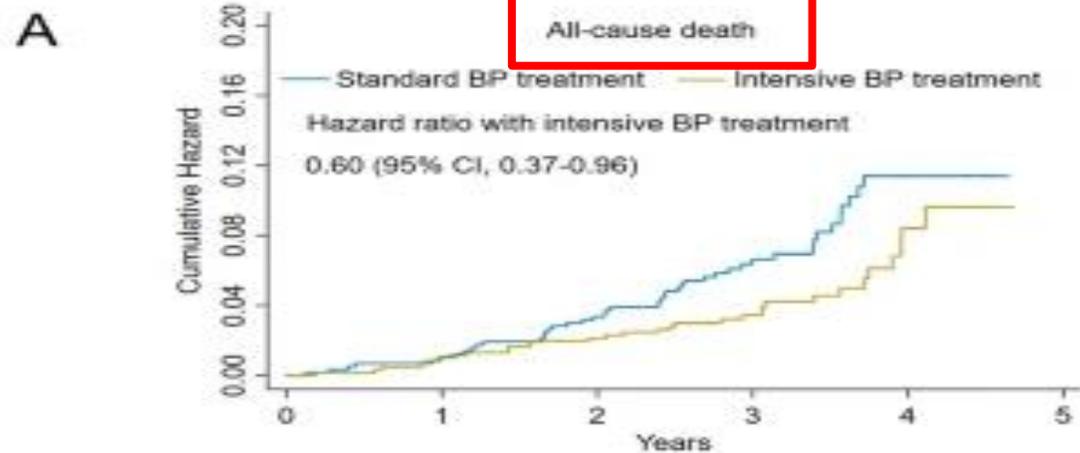
No. with Data

Standard treatment	584	542	519	500	490	464	398	254	136	55	2
Intensive treatment	622	587	569	548	535	525	452	319	166	71	1

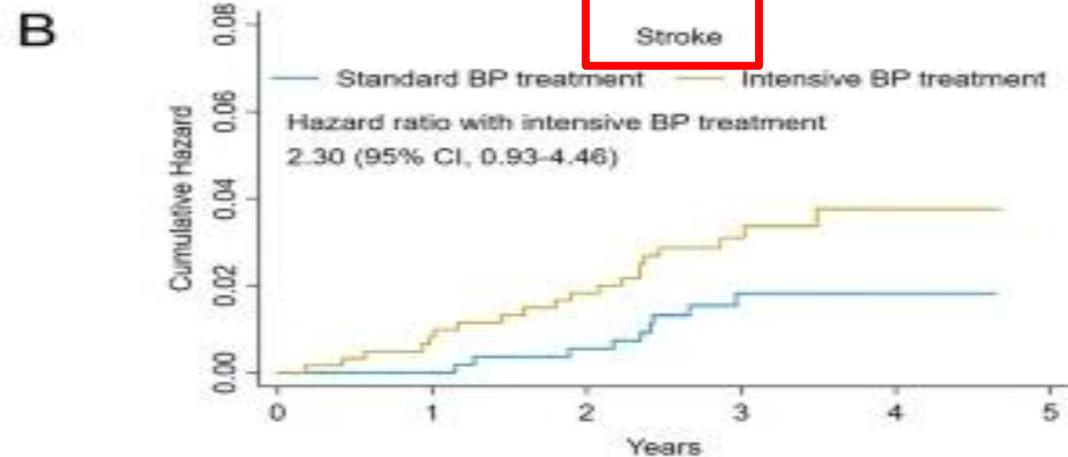
Mean No. of Medications

Standard treatment	2.3	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.2	2.1	2.5
Intensive treatment	2.6	3.0	3.1	3.0	3.0	3.0	3.0	3.0	3.1	3.1	3.0

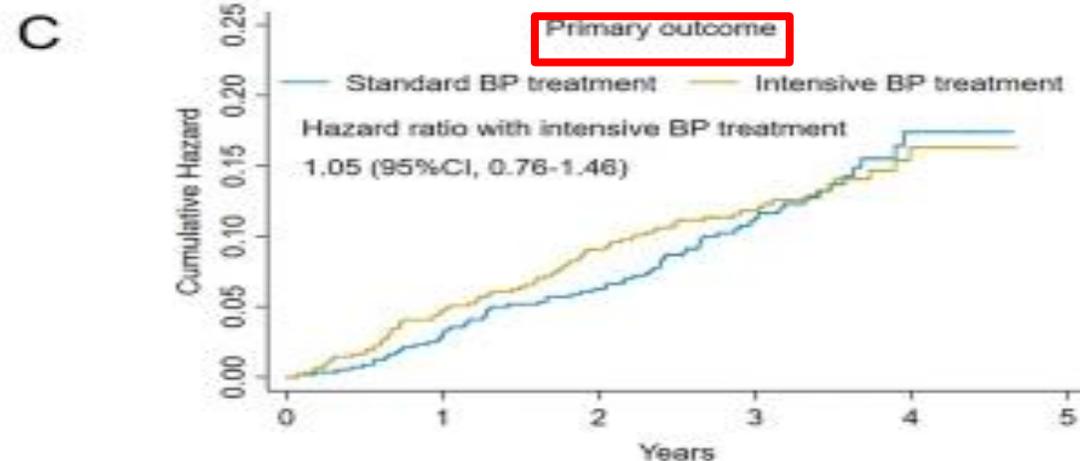
comparing treatment assignments.



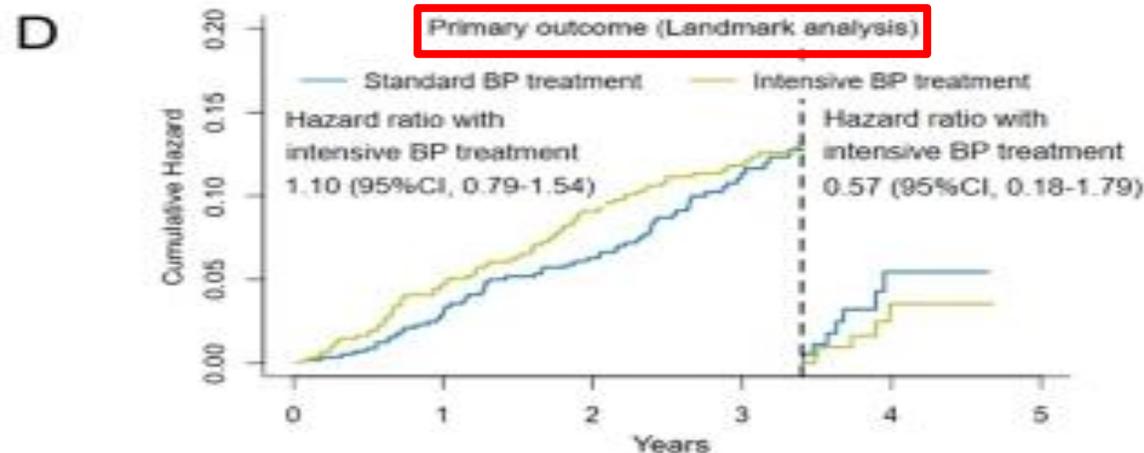
Number at risk		0	1	2	3	4	5
Standard BP treatment	576	563	540	334	91	0	0
Intensive BP treatment	619	604	585	387	97	0	0



Number at risk		0	1	2	3	4	5
Standard BP treatment	572	556	536	325	89	0	0
Intensive BP treatment	617	599	576	373	93	0	0

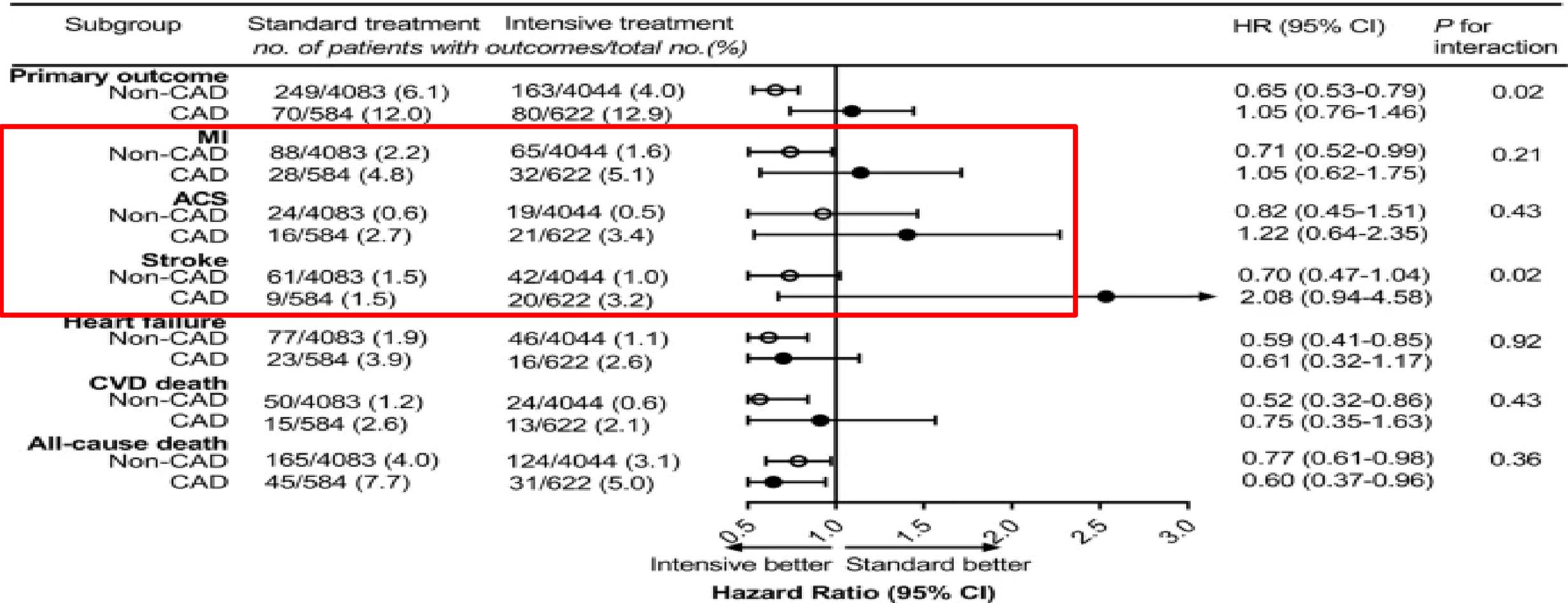


Number at risk		0	1	2	3	4	5
Standard BP treatment	572	544	511	300	72	0	0
Intensive BP treatment	618	579	538	347	87	0	0



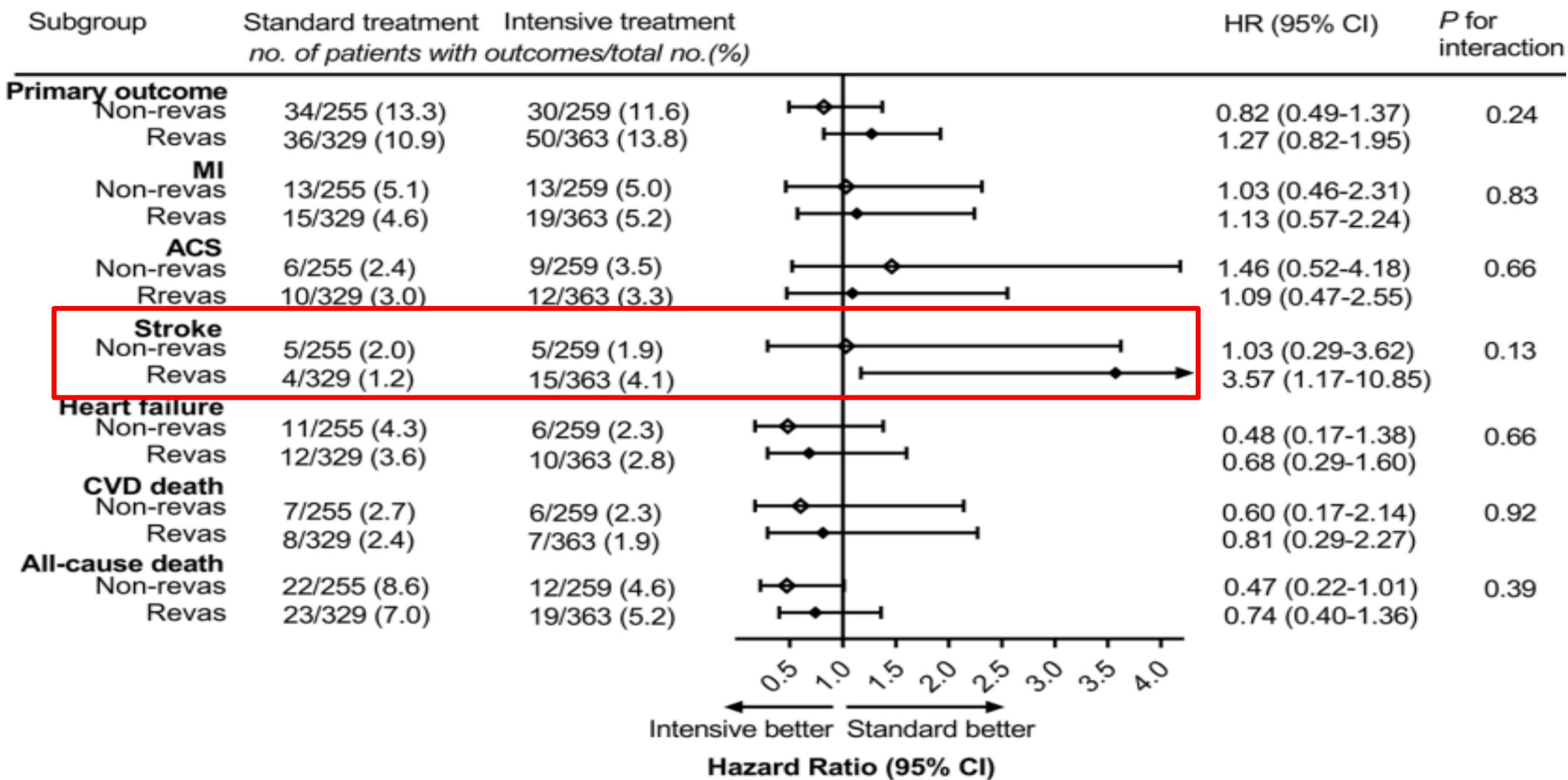
Number at risk		0	1	2	3	4	5
Standard BP treatment	572	544	511	300	72	0	0
Intensive BP treatment	618	579	538	347	87	0	0

Fig. 3: Test for interaction between BP treatment assignment and baseline CAD status.



BP blood pressure, CAD coronary artery disease, MI myocardial infarction, ACS acute coronary

Zang, et al, (2021)



Zang, et al, (2021)

Summary

What this study adds

- 1) The optimal SBP without CAD and diabetes mellitus is around 120 mm Hg.*
- 2) With CAD, the benefit from intensive BP treatment might be attenuated.*
- 3) The risk of stroke is increased by an SBP target of 120 mm Hg in patients with a history of coronary revascularization.*

***BP Targets for CAD : One
Size Does Not Fit All***

Addison A Taylor, MD. et al , JACC , 2015



Thank you