Longer term All-Cause and Cardiovascular Mortality with Intensive Blood Pressure Control

A Secondary Analysis of SPRINT

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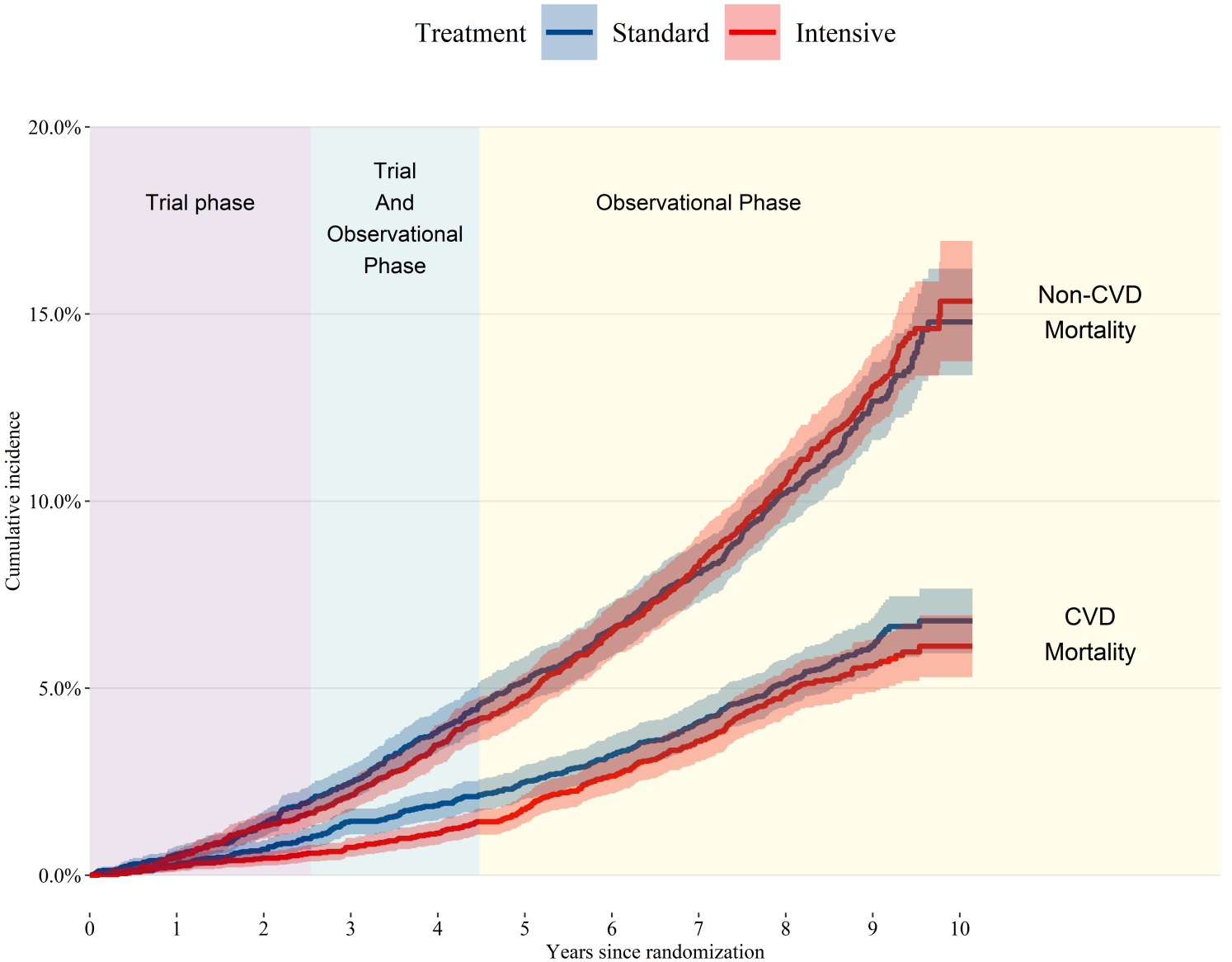
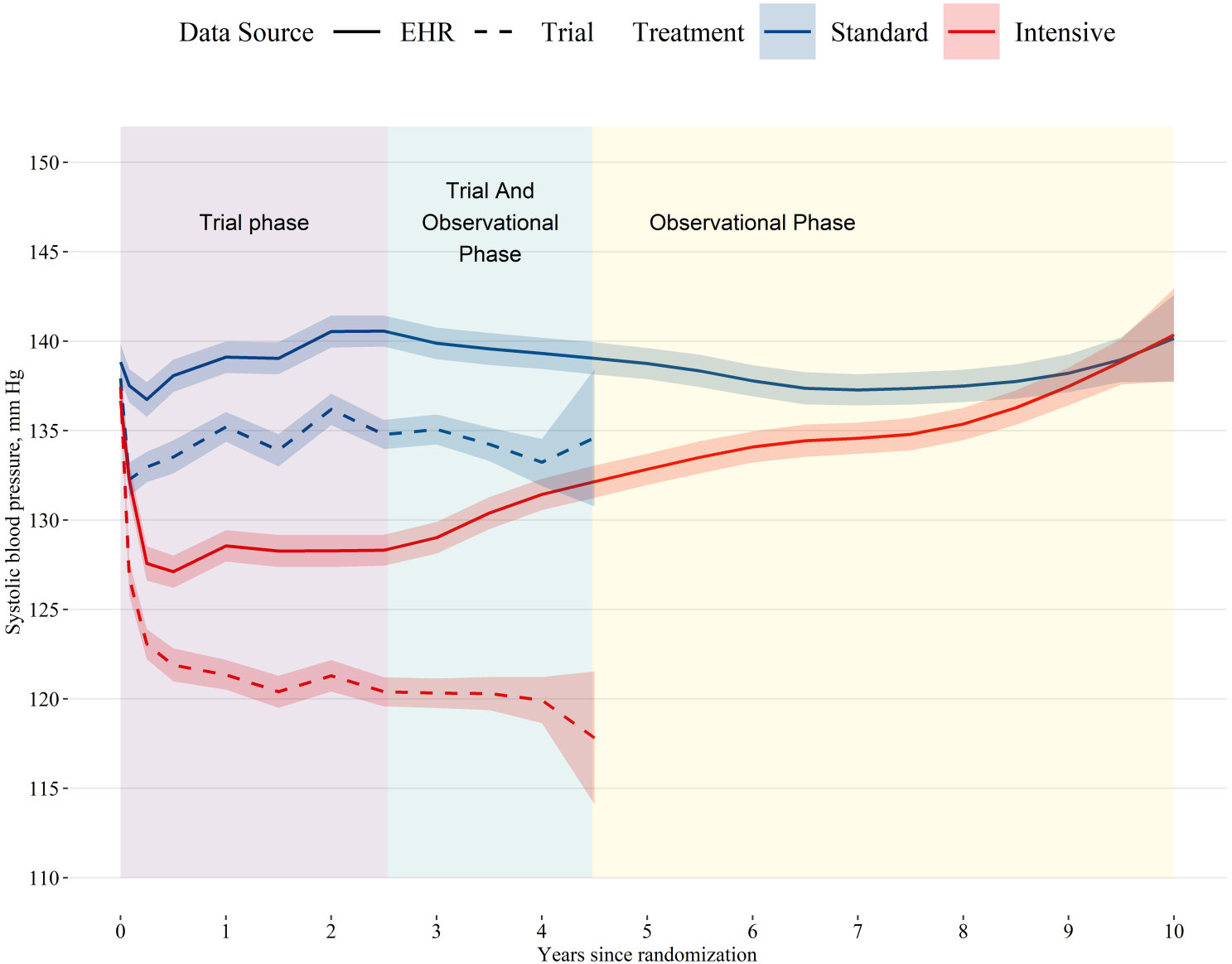
Importance and Background

- SPRINT showed that intensive treatment reduced the risk of cardiovascular and all-cause mortality.
- The trial began in 2010 and the last study closeout visit occurred in 2016.

Objective and Methods

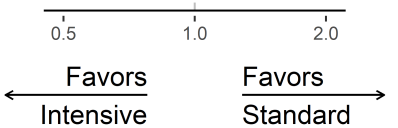
- We assessed whether the benefit of intensive treatment persisted after the final study closeout visit in 2016.
- We tracked cardiovascular and all-cause mortality events from the US National Death Index from 2016 to 2020.
- In a subset of participants, we examined outpatient systolic blood pressure levels measured in routine clinical practice after the trial.


Treatment
Standard
Intensive
Trial phase
Trial
And
Observational
Phase
Observational Phase
Non-CVD
Mortality
CVD
Mortality
Cumulative incidence
20.0%
15.0%
10.0%
5.0%
0.0%
0
1
2
3
4
5
6
7
8
9
10
Years since randomization


Data Source
EHR
Trial
Treatment
Standard
Intensive
Trial phase
Trial And Observational Phase
Observational Phase
Systolic blood pressure, mm Hg
150
145
140
135
130
125
120
115
110
0
1
2
3
4
5
6
7
8
9
10
Years since randomization

Observational phase

Characteristic	Intensive	Standard	Hazard ratio (95% CI)	P value
	no. of CVD deaths / no. at risk (%)			
Overall	183/4,274 (4.28)	181/4,260 (4.25)	1.02 (0.84, 1.24)	
Age group				0.04
<75 years	73/3,123 (2.34)	81/3,129 (2.59)	0.92 (0.66, 1.28)	
≥75 years	110/1,151 (9.56)	100/1,131 (8.84)	1.07 (0.81, 1.42)	
Sex				0.16
Male	125/2,745 (4.55)	119/2,743 (4.34)	1.09 (0.85, 1.38)	
Female	58/1,529 (3.79)	62/1,517 (4.09)	0.89 (0.63, 1.28)	
Race				0.61
Non-Black	135/2,953 (4.57)	126/2,897 (4.35)	1.10 (0.89, 1.37)	
Black	48/1,321 (3.63)	55/1,363 (4.04)	0.81 (0.54, 1.23)	
Chronic Kidney Disease				0.88
No	101/3,250 (3.11)	90/3,232 (2.78)	1.14 (0.84, 1.55)	
Yes	82/1,012 (8.10)	91/1,007 (9.04)	0.89 (0.67, 1.16)	
Cognitive Function				0.24
>10th percentile	122/3,125 (3.90)	128/3,101 (4.13)	0.93 (0.73, 1.19)	
≤10th percentile	58/1,131 (5.13)	52/1,135 (4.58)	1.18 (0.81, 1.72)	
Frailty Status				0.90
Fit	7/715 (0.98)	8/685 (1.17)	0.77 (0.31, 1.95)	
Pre-frail	81/2,193 (3.69)	75/2,244 (3.34)	1.07 (0.77, 1.50)	
Frail	95/1,349 (7.04)	98/1,317 (7.44)	1.01 (0.77, 1.33)	



Key findings

- Intensive treatment produced beneficial effects on mortality during the trial.
- The benefits associated with intensive treatment quickly attenuated as systolic blood pressure levels increased among participants who underwent intensive treatment after the trial.
- There was no evidence of sustained benefits after discontinuing the intervention protocol.

Conclusion

Maintaining intensive BP targets throughout adulthood is likely an essential component of long-term CVD risk management.