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Background

Identifying heart failure (HF) with preserved ejection fraction (HFpEF) can be challenging, and several probability-based scores have been proposed to assist diagnosis. Among them, the H₂FPEF and HFA-PEFF scores require echocardiographic assessment, whereas the **HFpEF-ABA score** is solely based on **age, body mass index (BMI), and a history of atrial fibrillation (AF)** (another version includes NT-proBNP).

$$\text{Log Odds} = -7.788751 + 0.062564 \times \text{Age (years)} + 0.135149 \times \text{BMI (kg/m}^2\text{)} + 2.040806 \times \text{AF (Yes-1, No-0)}$$

$$\text{HFpEF-ABA score (probability of HFpEF) (\%)} = \frac{\text{Odds}}{1 + \text{Odds}}$$

Recently, it has also been suggested that the HFpEF-ABA score has prognostic utility in HFpEF. Therefore, we investigated the HFpEF-ABA score among participants in the FINEARTS-HF trial, including the range of scores, its association with outcomes, and the effect of treatment with finerenone according to HFpEF-ABA score.

Methods

FINEARTS-HF investigated the efficacy and safety of finerenone compared with placebo in patients with HF and left ventricular ejection fraction (LVEF) $\geq 40\%$.

Baseline HFpEF-ABA score was calculated for each patient, and scores were categorized into three groups: **<75%, 75–90%, and >90%**. The prognostic value of the score and the effect of finerenone were examined by score category and also using the score as a continuous variable.

Primary outcome

- Composite of total HF events and cardiovascular death

Secondary outcome

- Total HF events, cardiovascular death, first HF event or cardiovascular death, first HF hospitalization or cardiovascular death, and all-cause death.

Results

Table 1. Baseline characteristics according to baseline HFpEF-ABA

	Score <75% N = 1,944	Score 75–90% N = 1,241	Score >90% N = 2,803	P for trend
Age (years)	67.1 \pm 10.3	71.5 \pm 8.6	75.6 \pm 7.9	<0.001
Male, n (%)	1,191 (61.3)	671 (54.1)	1,399 (49.9)	<0.001
BMI (kg/m ²)	27.3 \pm 4.5	29.8 \pm 6.5	31.8 \pm 6.2	<0.001
NYHA class III/IV	441 (22.7)	384 (30.9)	1,026 (36.6)	<0.001
KCCQ-TSS	72.4 \pm 22.8	67.1 \pm 23.9	63.3 \pm 24.0	<0.001
LVEF (%)	51.5 \pm 8.1	52.9 \pm 7.9	53.2 \pm 7.5	<0.001
LVEF $\geq 50\%$	1,051 (54.1)	807 (65.1)	1,952 (69.8)	<0.001
NT-proBNP (pg/ml)	559 (285–1,239)	921 (399–1,859)	1,412 (827–2,380)	<0.001
eGFR (ml/min/1.73m ²)	68.7 \pm 20.7	62.7 \pm 19.0	57.3 \pm 18.0	<0.001
Hypertension, n (%)	1,674 (86.1)	1,074 (86.5)	2,566 (91.5)	<0.001
AF or atrial flutter, n (%)	56 (2.9)	584 (47.1)	2,670 (95.3)	<0.001
ACE inhibitor, n (%)	740 (38.1)	449 (36.2)	958 (34.2)	0.006
ARB, n (%)	892 (45.9)	524 (42.2)	1,195 (42.6)	0.034
ARNI, n (%)	255 (13.1)	95 (7.7)	163 (5.8)	<0.001
Beta-blocker, n (%)	1,625 (83.6)	1,057 (85.2)	2,405 (85.8)	0.039
SGLT2 inhibitor, n (%)	274 (14.1)	165 (13.3)	374 (13.3)	0.48
Loop diuretic, n (%)	1,588 (81.7)	1,096 (88.3)	2,542 (90.7)	<0.001

Abbreviations: ACE inhibitor, Angiotensin-converting enzyme inhibitor; AF, atrial fibrillation; ARB, angiotensin receptor blocker; ARNI, angiotensin receptor neprilysin inhibitor; BMI, body mass index; eGFR, estimated glomerular filtration rate; HFpEF, heart failure with preserved ejection fraction; KCCQ-TSS, Kansas City Cardiomyopathy Questionnaire-Total symptom score; LVEF, left ventricular ejection fraction; NT-proBNP, N-terminal pro-B-type natriuretic peptide; New York Heart Association; and SGLT2, sodium-glucose cotransporter 2.

Figure 1. Cumulative incidence of clinical outcomes in FINEARTS-HF according to HFpEF-ABA score (analyzed as a categorical variable)

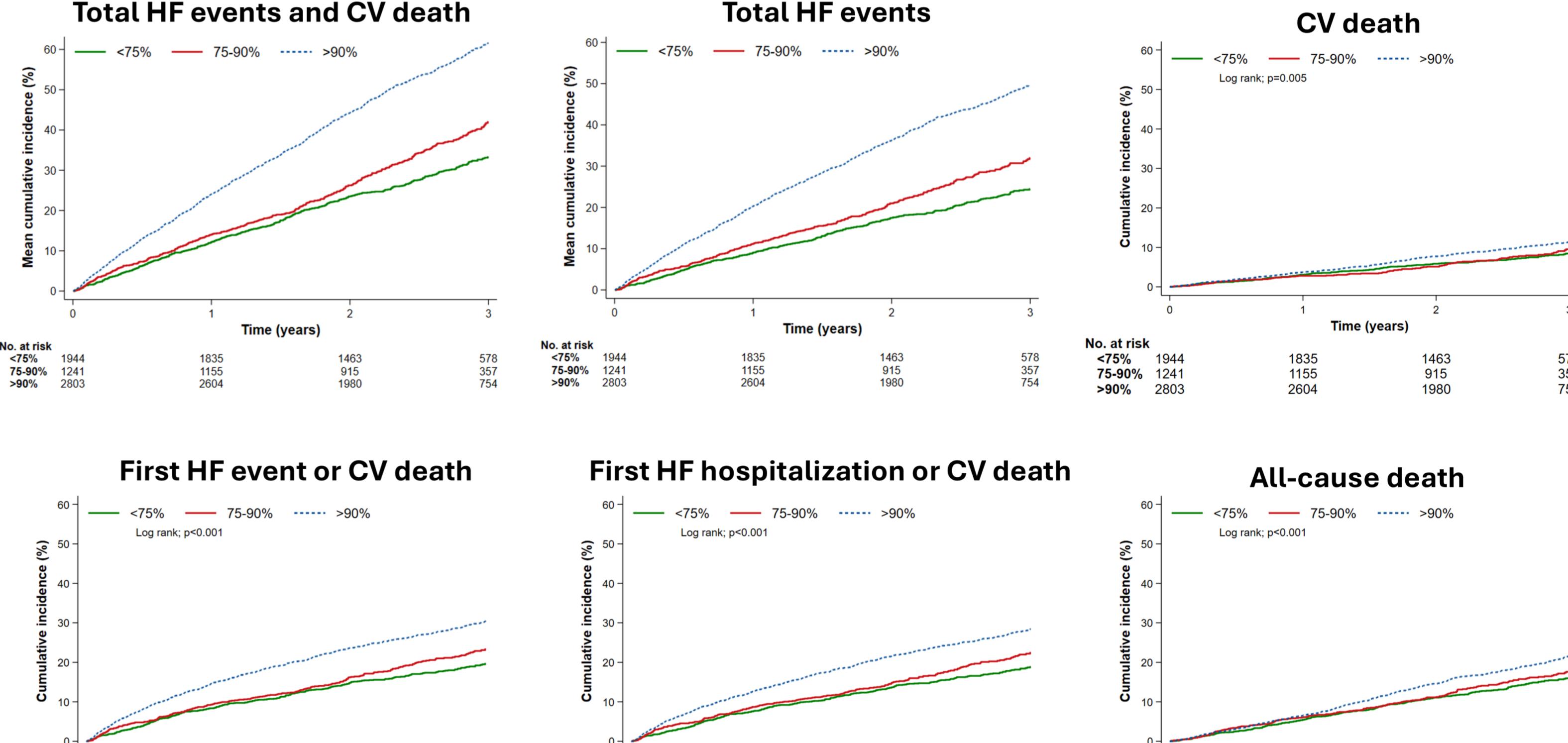


Figure 2. Incidence rates of clinical outcomes in FINEARTS-HF according to HFpEF-ABA score (analyzed as a continuous variable)

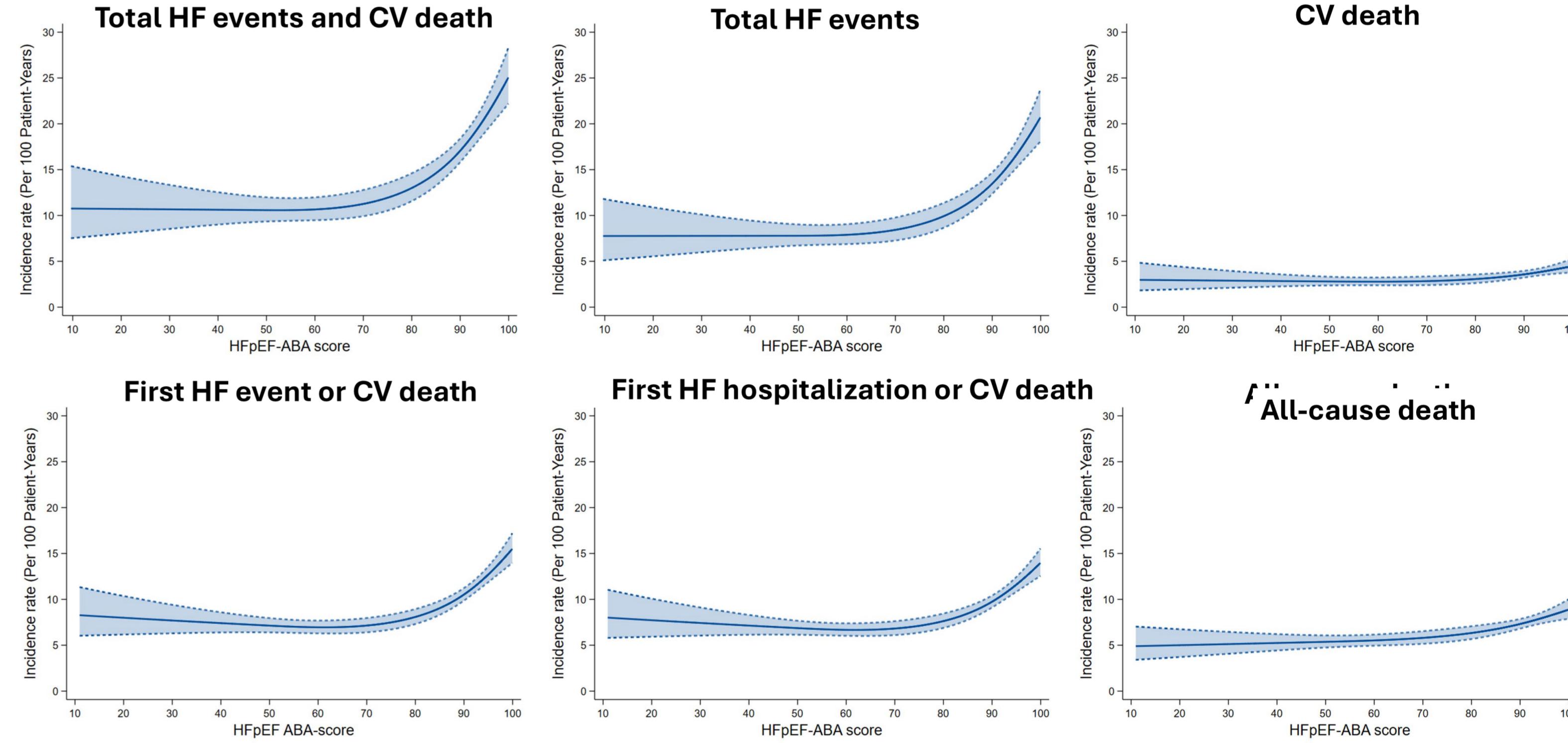


Figure 3. Effect of finerenone on outcomes in FINEARTS-HF according to baseline HFpEF-ABA score (analyzed as a continuous variable)

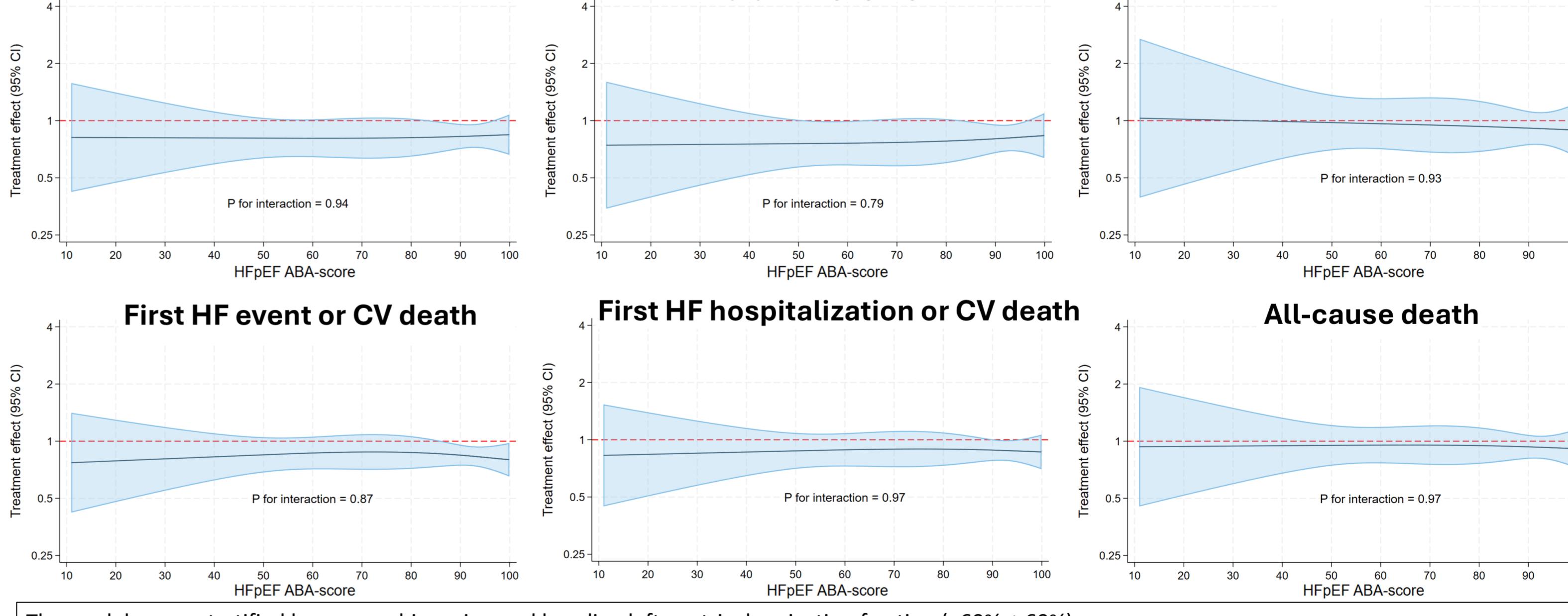


Table 2. Risk of Clinical Outcomes According to Baseline HFpEF-ABA Score

HFpEF-ABA score	<75% N = 1,944	75–90% N = 1,241	>90% N = 2,803
Total HF events and cardiovascular death			
Event rate (95% CI)	11.1 (9.8–12.6)	13.6 (11.8–15.6)	21.1 (19.3–23.0)
RR (95% CI)*	Reference	1.21 (1.00–1.47)	1.90 (1.63–2.22)
RR (95% CI)**	Reference	1.02 (0.84–1.24)	1.23 (1.03–1.47)
Total HF events			
Event rate (95% CI)	8.2 (7.0–9.5)	10.5 (9.0–12.4)	17.1 (15.5–18.8)
RR (95% CI)*	Reference	1.26 (1.01–1.57)	2.04 (1.70–2.45)
RR (95% CI)**	Reference	1.06 (0.85–1.33)	1.32 (1.07–1.63)
Cardiovascular death			
Event rate (95% CI)	2.9 (2.5–3.4)	3.0 (2.5–3.7)	4.1 (3.6–4.6)
RR (95% CI)*	Reference	1.08 (0.83–1.41)	1.51 (1.22–1.87)
RR (95% CI)**	Reference	0.91 (0.69–1.19)	0.97 (0.77–1.23)
First HF event or cardiovascular death			
Event rate (95% CI)	7.4 (6.6–8.2)	8.7 (7.7–9.9)	12.9 (12.0–13.8)
RR (95% CI)*	Reference	1.17 (0.99–1.39)	1.75 (1.53–2.01)
RR (95% CI)**	Reference	0.97 (0.82–1.15)	1.16 (1.00–1.34)
First HF hospitalization or cardiovascular death			
Event rate (95% CI)	7.0 (6.3–7.8)	8.3 (7.3–9.4)	11.7 (10.9–12.6)
RR (95% CI)*	Reference	1.18 (0.99–1.40)	1.70 (1.48–1.96)
RR (95% CI)**	Reference	0.97 (0.81–1.15)	1.11 (0.96–1.29)
All-cause death			
Event rate (95% CI)	5.8 (5.1–6.5)	6.3 (5.5–7.2)	8.1 (7.4–8.8)
RR (95% CI)*	Reference	1.09 (0.91–1.32)	1.42 (1.22–1.65)
RR (95% CI)**	Reference	0.91 (0.75–1.11)	0.88 (0.75–1.04)

*Stratified by/adjusted for geographic region, baseline LVEF (<60%, $\geq 60\%$), and treatment assignment.

**Further adjusted for sex, heart rate, systolic blood pressure, prior hospitalization for HF, NYHA functional class III/IV, left ventricular ejection fraction, estimated glomerular filtration rate, NT-proBNP (log-transformed), myocardial infarction, and diabetes mellitus.

Abbreviations: CI, confidence interval; HF, heart failure; HR, hazard ratio; and RR, rate ratio.

Conclusion

Despite a convincing clinical diagnosis of HFmrEF/HFpEF, approximately 1 in 3 participants in FINEARTS-HF had a HFpEF-ABA score indicating a probability of HFmrEF/HFpEF <75% (and 1 in 5, a score indicating a probability $\leq 60\%$), suggesting low sensitivity in this population. Patients with higher HFpEF-ABA scores had worse clinical outcomes, but notably so only if the probability score was >90%. However, finerenone significantly reduced events across the range of HFpEF-ABA scores in FINEARTS-HF. These data suggest that the HFpEF-ABA score may lead to misclassification of patients who benefit from disease-modifying therapy.