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BACKGROUND

Over the past decade, the rising global prevalence of HFpEF has underscored the need for accurate risk prediction. Recurrent HF hospitalizations impose substantial healthcare and economic burdens, making the identification of high-risk patients essential for optimizing resource allocation and guiding personalized therapeutic strategies in this heterogeneous syndrome.

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Recently developed HFpEF-specific risk models (e.g., HF-DANAS and ApHAC) have several limitations, including limited external validation and inadequate incorporation of contemporary HF therapies.

ESC Heart Fail. 2024;11:4104-4115. PLoS One. 2025;20:e0332913

The EMPEROR-Preserved risk model, derived from a large multinational randomized trial, represents a contemporary prognostic tool that incorporates established biomarkers (NT-proBNP and hs-cTnT) and information on SGLT2 inhibitor use and was externally validated in the PARAGON-HF trial.

Eur J Heart Fail. 2022;24:1869-1878.

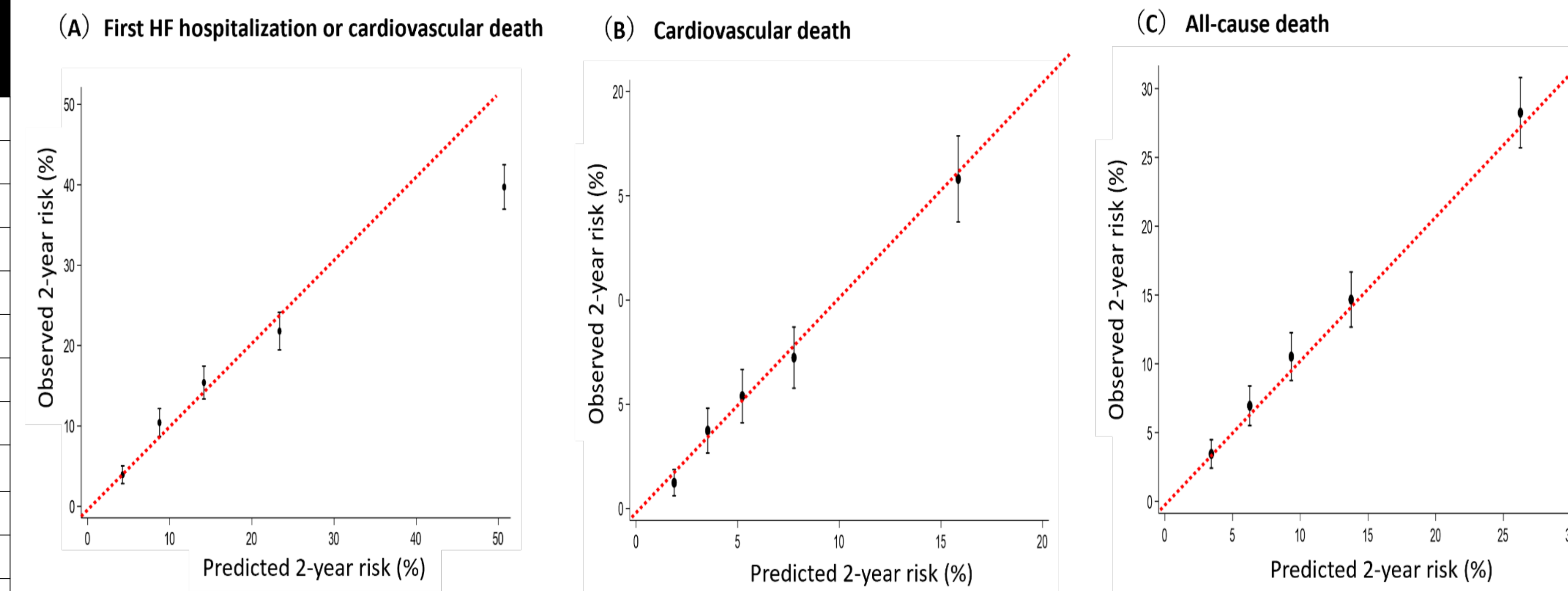
This study aimed to externally validate the EMPEROR-Preserved risk model in the FINEARTS-HF trial and to assess whether baseline risk modifies the treatment effect of finerenone.

RESULTS

Baseline characteristics by Quintiles of the EMPEROR-Preserved risk score for first HHF or CV death

	Quintile 1 Score: 2.3-4.6 (n = 1201)	Quintile 2 Score: 4.6-5.1 (n = 1200)	Quintile 3 Score: 5.1-5.7 (n = 1200)	Quintile 4 Score: 5.7-6.3 (n = 1200)	Quintile 5 Score: 6.3-9.9 (n = 1200)
Age, mean, (years)	67	71	73	74	75
Female, (%)	49	46	46	43	43
NYHA functional class III or IV, (%)	9	17	25	4	62
KCCQ total symptom score, mean	75	72	70	63	56
Time since last HHF (<6 months), (%)	21	32	44	60	79
LVEF, mean, (%)	53.4	52.8	52.9	52.2	51.5
Systolic blood pressure, mean, (mmHg)	131	130	130	128	127
eGFR, mean, (ml/min/1.73m ²)	73.2	65.8	61.8	57.4	52.3
NT-proBNP, median, (pg/mL)	297	717	1068	1491	2822
Hypertension, (%)	87	88	89	89	91
Atrial fibrillation or flutter at screening, (%)	11	33	43	51	52
ACEi / ARB / ARNI, (%)	85	82	80	77	73
SGLT2 inhibitors, (%)	12	13	13	14	15
Diuretics, (%)	77	83	90	93	94

Observed and predicted 2-year risk of clinical outcomes by the EMPEROR-Preserved risk score



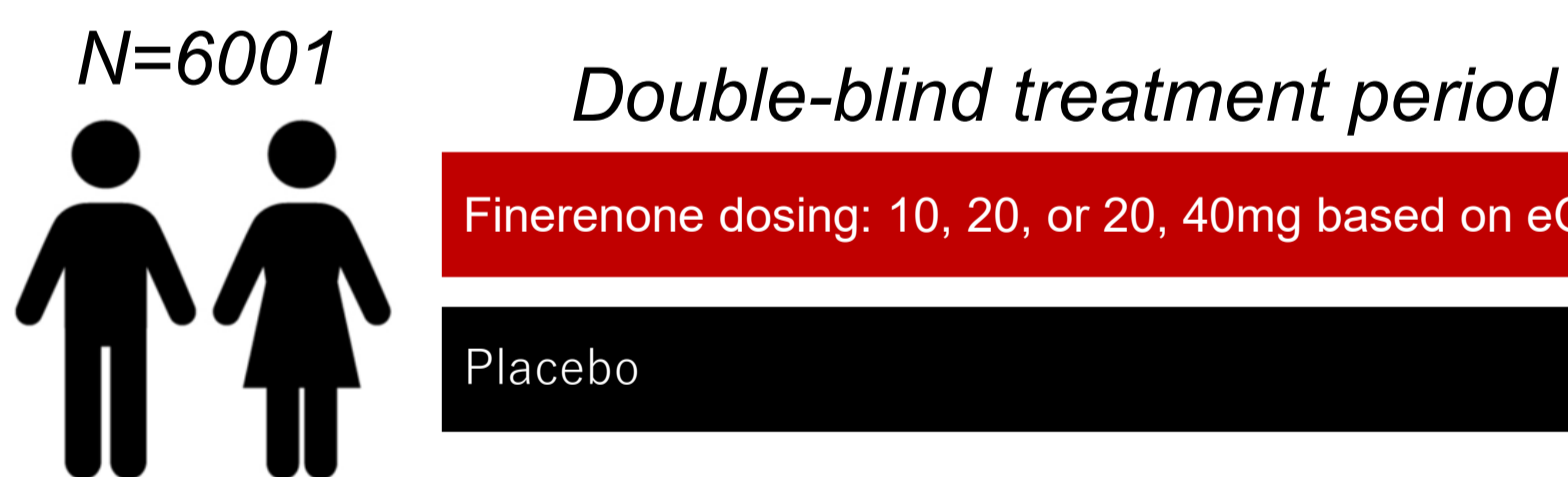
For the composite endpoint of first HHF or CV death, calibration was generally acceptable in the lower to middle quintiles, whereas in the highest quintile, the predicted 2-year risk modestly exceeded the observed risk. For both CV death and all-cause death, the observed 2-year risks closely aligned with the predicted risks across all quintiles.

METHODS

FINEARTS-HF trial: design

Key Inclusion Criteria

- LVEF \geq 40%
- NYHA functional class II-IV
- Elevated natriuretic peptide levels
- Structural heart disease (LA Enlargement or LVH)
- Hospitalized, recently hospitalized, or ambulatory
- Diuretics in the 30 day prior to randomization



Primary endpoint: Total (first and recurrent) HF events (unplanned HF hospitalizations or urgent HF visits) and CV death

EMPEROR-Preserved risk model

The EMPEROR-Preserved risk model was developed to predict the composite endpoint of first HF hospitalization (HHF) or CV death, as well as CV death and all-cause death, individually.

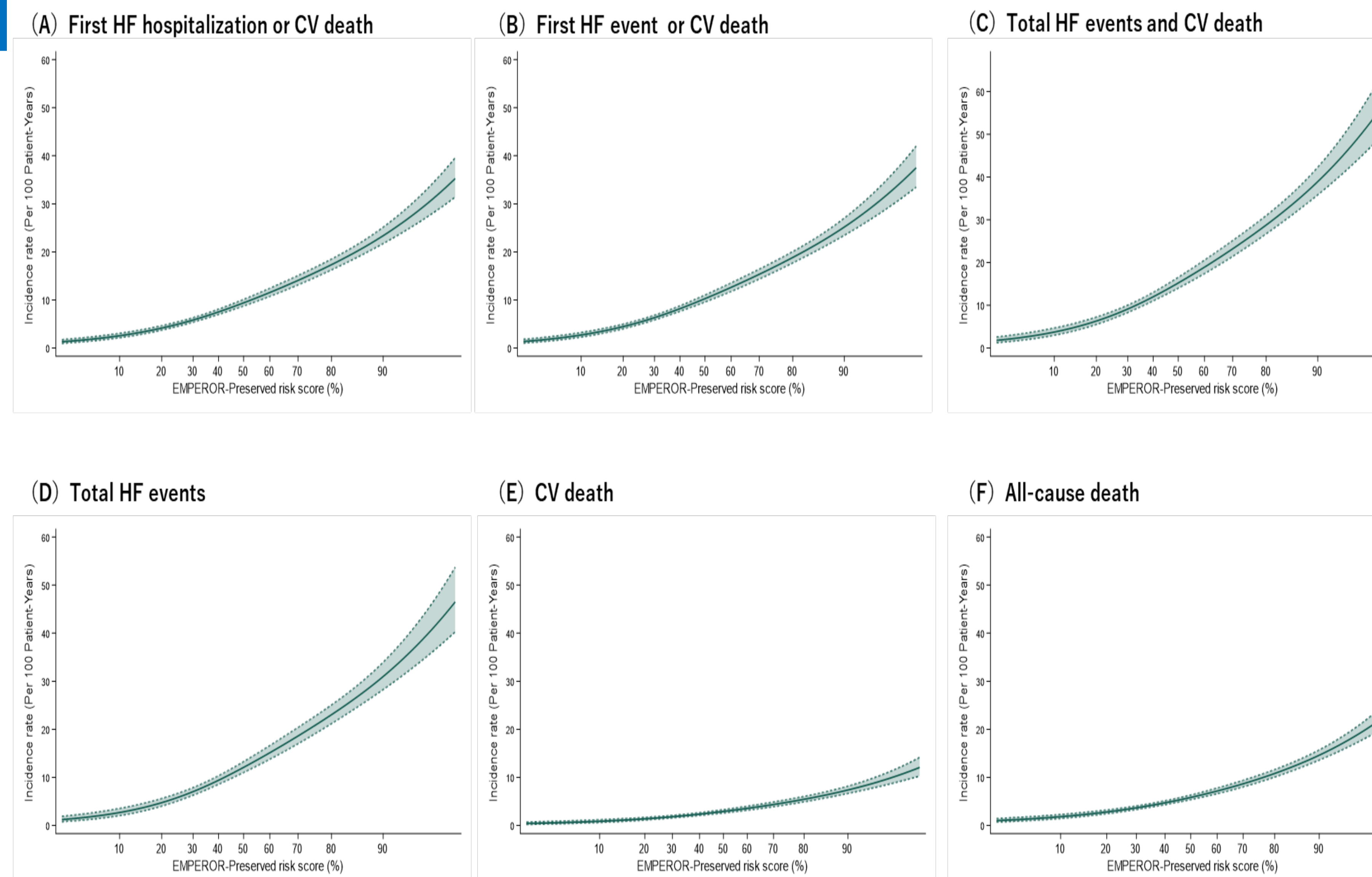
Prediction of CV death or first HHF with 8 variables

- NT-proBNP
- hs-cTnT
- Time since last HHF
- NYHA functional class III or IV
- History of COPD
- Insulin-treated diabetes
- Hemoglobin < 12 g/dL
- HF diagnosis \geq 1 year

Prediction of CV death and all-cause death with 8 variables

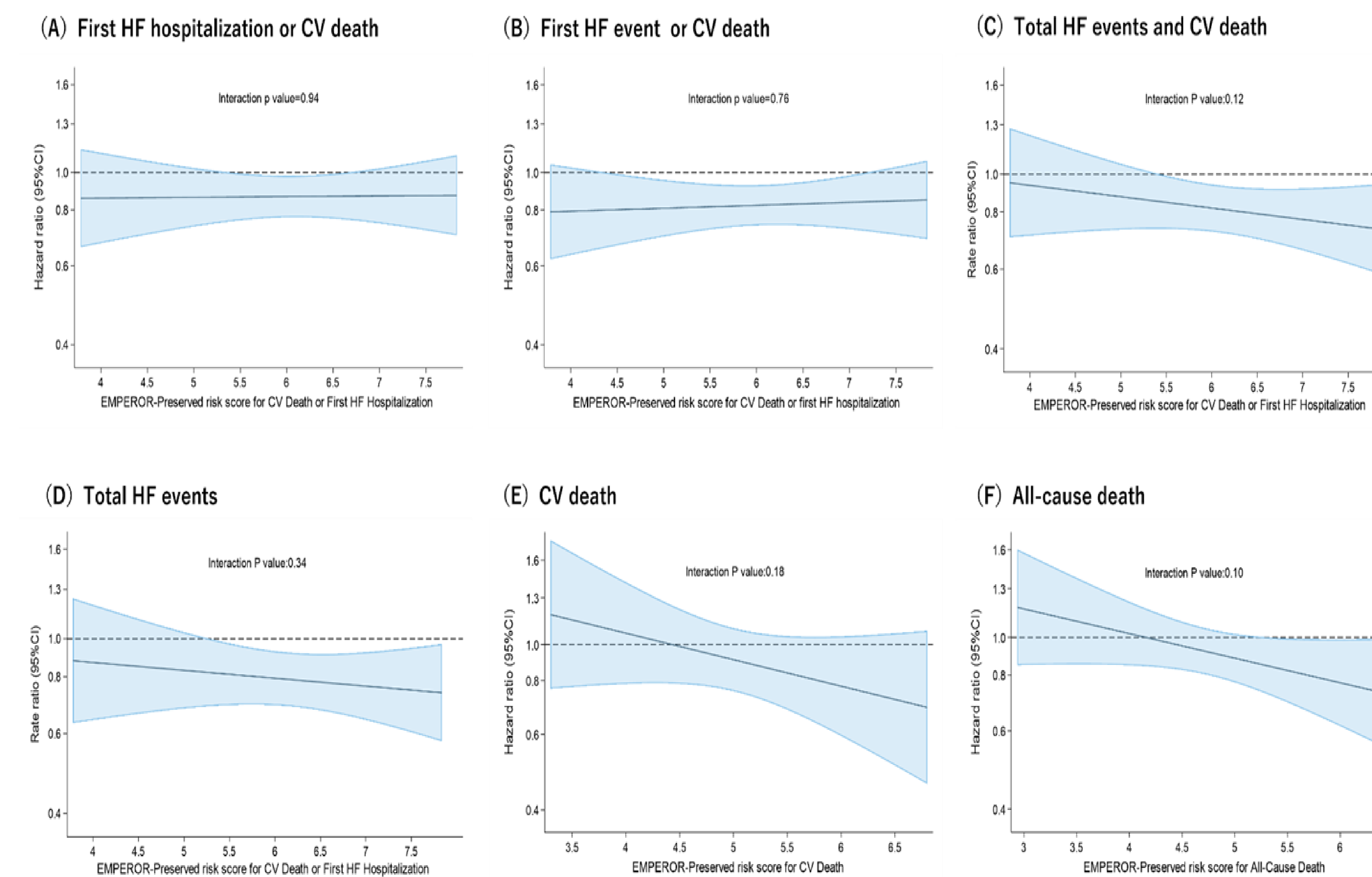
- NT-proBNP
- hs-cTnT
- History of COPD
- LVEF < 50%
- Albumin
- Insulin-treated diabetes
- NYHA functional class III or IV
- Age \geq 75 years

Incidence rate of key clinical outcomes across EMPEROR-Preserved risk score



When modeled as a continuous variable, the risk score demonstrated a clear graded association with a higher risk of events across all outcomes.

Effects of finerenone on clinical outcomes across EMPEROR-Preserved risk score



The treatment effect of finerenone was consistent across the spectrum of the EMPEROR-Preserved risk score for all observed outcomes when the score was analyzed as a continuous variable.

CONCLUSION

The EMPEROR-Preserved risk models demonstrated good predictive performance in FINEARTS-HF. Baseline risk did not modify the relative treatment effect of finerenone.