

Characteristics and Outcomes of Patients with Heart Failure with Reduced Ejection Fraction and a Worsening Heart Failure Event



Duke Clinical Research Institute

FROM THOUGHT LEADERSHIP TO CLINICAL PRACTICE

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Background

- A worsening heart failure (WHF) event can be defined as either hospitalization or ED visit for heart failure within the prior 12 months
- Recent clinical trials enrolling patients with heart failure with reduced ejection fraction (HFrEF) have required patients to have had a recent WHF event
- We aimed to describe characteristics and outcomes of patients with HFrEF and a recent WHF event in a general practice population

METHODS

Data sources:

- Electronic health records from Duke University Health System from January 2008 to December 2018
- Duke Echocardiography Laboratory Data

Definitions:

- HF encounter (to identify study population) = any inpatient or outpatient encounter with associated ICD-9 or ICD-10 HF diagnosis
- WHF event (to identify WHF cohort) = ED visit or hospitalization with HF as primary discharge diagnosis within 12 months prior to index echo
- Index echo = baseline echo at which time study follow-up begins

OVERALL HFrEF POPULATION

Inclusion criteria:

- Adult patients (age 18-85)
- HFrEF (ejection fraction $\leq 35\%$)
- ≥ 2 HF encounters within the prior 18 months

Exclusion criteria:

- eGFR $< 20\text{mL}/\text{min}/1.73\text{m}^2$
- History of durable left ventricular assist device
- History of heart or lung transplantation

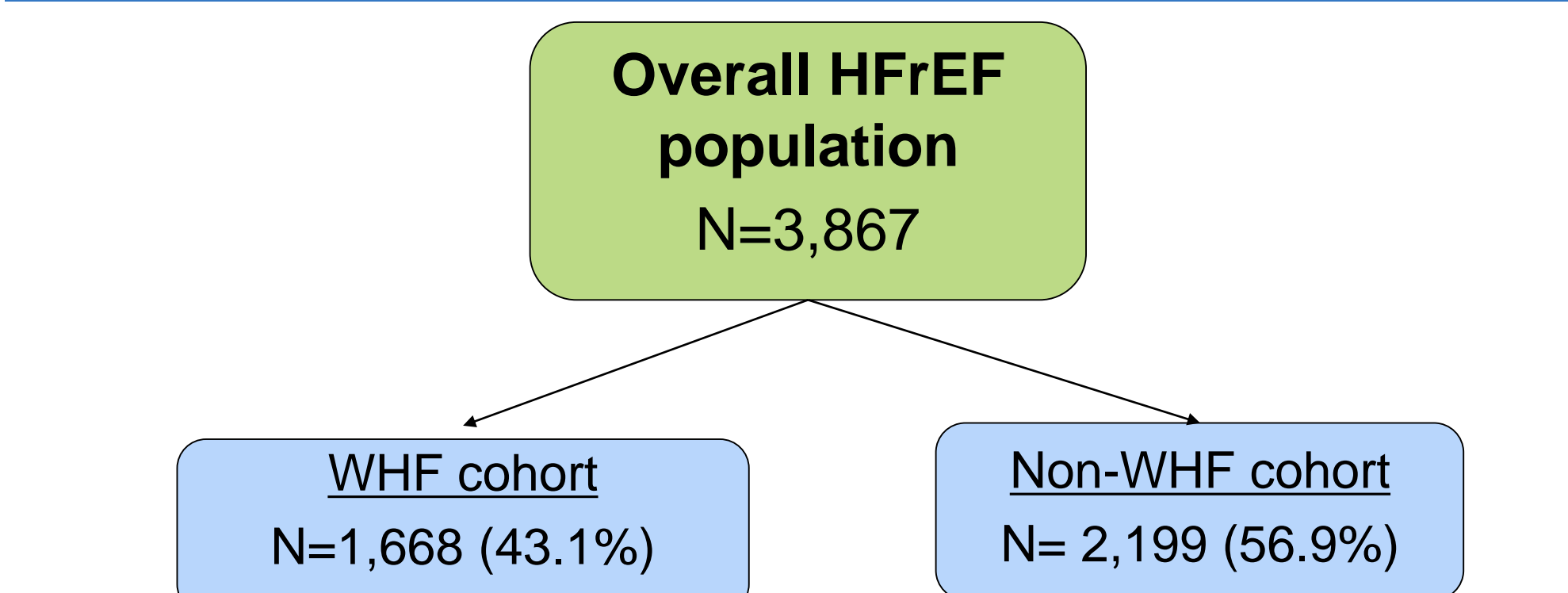
WHF cohort

Hospitalization or emergency department visit with primary diagnosis of heart failure within 12 months prior to index echo

Non-WHF cohort

Patients not meeting WHF cohort criteria

RESULTS

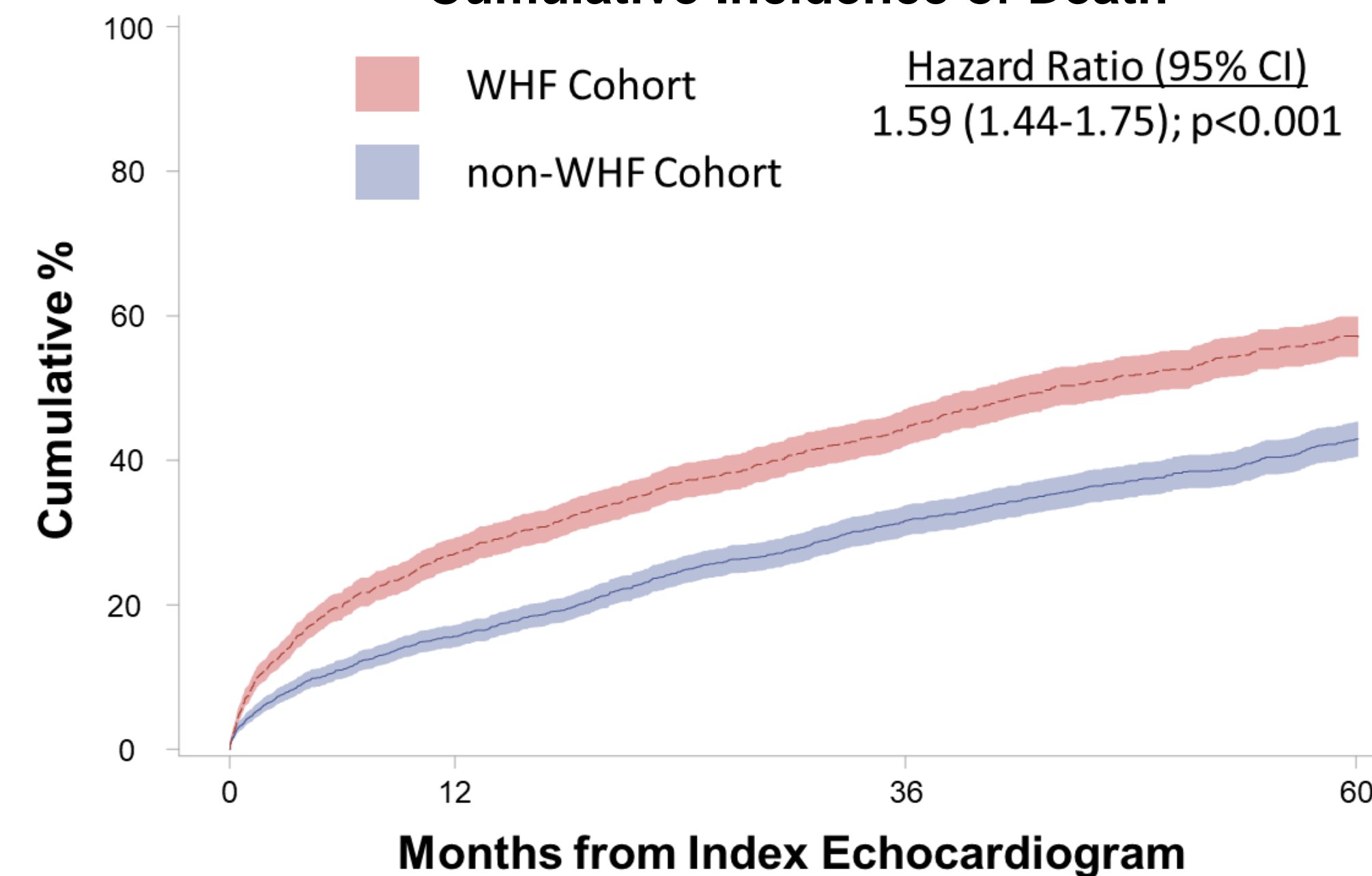


Baseline Characteristics at Index Echocardiogram.

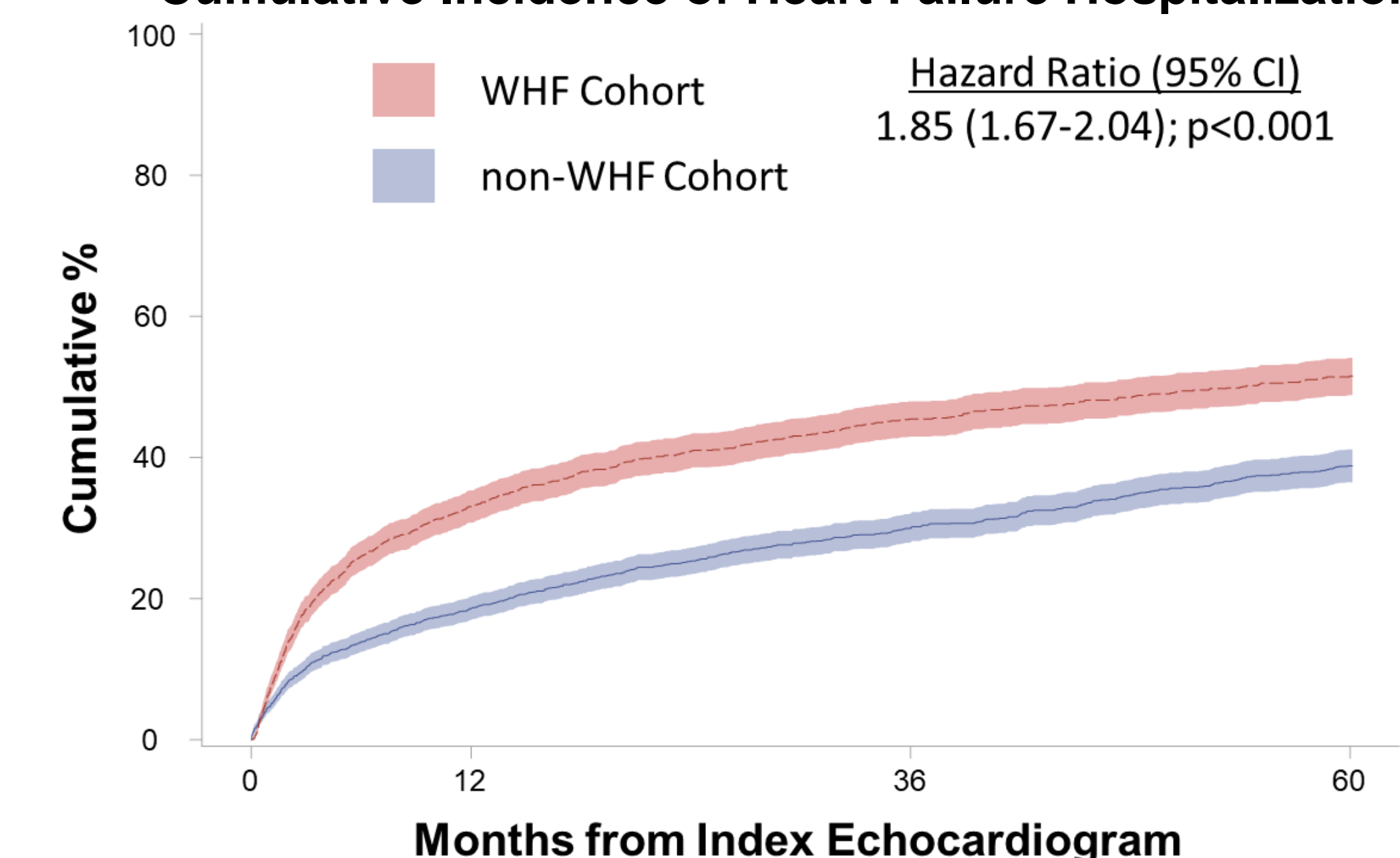
	Overall (n=3,867)	WHF (n=1,668)	Non-WHF (n=2,199)	P value
Female	31.9%	34.1%	30.3%	0.01
Age	64 (55,73)	64 (53,72)	65 (56,73)	<0.001
BMI	28.4 (24.5,33.7)	28.3 (24.2,34.1)	28.5 (24.8,33.5)	.72
Ejection Fraction				<0.001
<25%	55.0%	63.5%	48.4%	
25-35%	45.0%	36.5%	51.6%	
Hypertension	78.2%	79.7%	77.1%	0.048
Diabetes	41.6%	42.7%	40.7%	0.20
Coronary artery disease	64.8%	67.3%	69.2%	0.21
Renal disease	32.4%	40.5%	26.3%	<0.001
Laboratory studies				
eGFR (CKD-Epi)	60.4 (43.4,79.4)	56.7 (40.5,75.4)	63.1 (46.1,82.8)	<0.001
BNP	579 (234,1413)	774 (285,1723)	461 (203,1148)	<0.001
NTproBNP	3099 (933,9463)	3864 (1355,11818)	2443 (698,7644)	<0.001
Medications				
Beta blocker	81.6%	86.6%	77.7%	<0.001
ACEi/ARB	72.8%	75.7%	70.6%	<0.001
MRA	42.6%	52.5%	35.2%	<0.001
Any diuretic	82.6%	93.9%	74.0%	<0.001

Data presented as % or median (25th, 75th percentile)

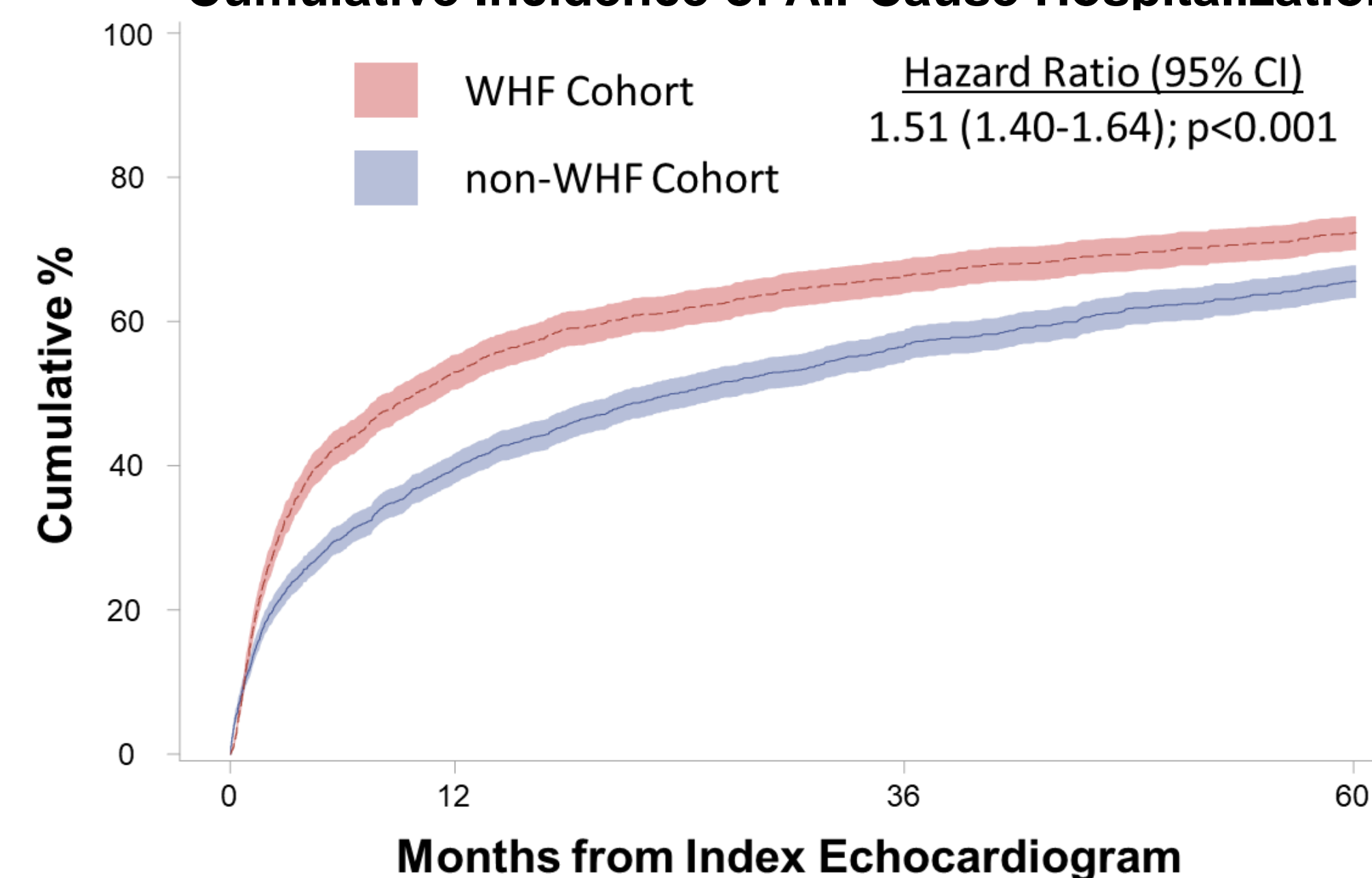
Cumulative Incidence of Death



Cumulative Incidence of Heart Failure Hospitalization



Cumulative Incidence of All-Cause Hospitalization



5-Year Cumulative Incidence

	WHF Cumulative Incidence (95% CI)	Non-WHF Cumulative Incidence (95% CI)
All-cause mortality	57.2 (54.3-59.9)	42.9 (40.5-45.4)
All-cause hospitalization	72.3 (69.9-74.6)	65.6 (63.2-67.8)
Heart failure hospitalization	51.5 (48.9-54.1)	38.8 (36.5-41.2)

LIMITATIONS

- Retrospective, observational data from a single large US referral center
- Other common clinical trial inclusion criteria (blood pressure, biomarkers) not used
- Unable to assess symptom burden and quality of life between groups

CONCLUSIONS

- 43.1% of Duke HFrEF patients without severe renal dysfunction, LVAD, or prior transplant met key eligibility criteria from contemporary heart failure trials
- Patients with recent WHF had more comorbidities, lower EF, and higher rates HF medication use than those without recent WHF
- Patients with WHF had higher rates of mortality and hospitalization than those without recent WHF
- Despite high HF medication use in patients with WHF, a significant unmet need remains for new and effective therapies

DISCLOSURES

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Note: All Kaplan-Meier curves account for death as competing risk. Hazard ratios are "cause-specific."