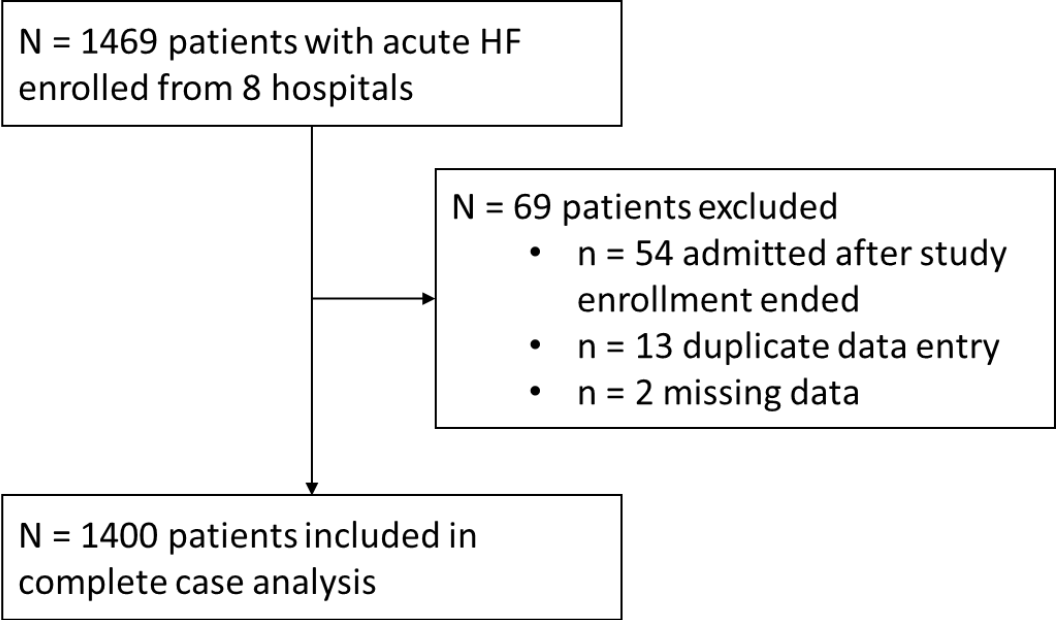**ONLINE SUPPLEMENT**

**Effect of a Quality Improvement Intervention for Acute Heart Failure in India:
An Interrupted Time Series Study**

Anubha Agarwal MD MSc, Padinhare P. Mohanan MD DM, Dimple Kondal PhD, Abigail Baldridge MS, Divin Davies BA, Raji Devarajan MS, Govindan Unni MD DM, Jabir Abdullakutty MD DM, Syam Natesan MD DM, Johny Joseph MD DM, Pathiyil B. Jayagopal MD DM, Stigi Joseph MD DM, Rajesh Gopinath MD DM, Mark D. Huffman MD MPH, Dorairaj Prabhakaran MD DM MSc

Online Figure 1. Flowchart of participants

N = 1469 patients with acute HF
enrolled from 8 hospitals

N = 69 patients excluded
- n = 54 admitted after study enrollment ended
- n = 13 duplicate data entry
- n = 2 missing data

N = 1400 patients included in
complete case analysis

Online Table 1. Characteristics of participating hospitals in HF QUIK.

Hospital characteristics	Hospital number = 8
Type, No. (%)	
Government	1 (12.5)
Nonprofit/charity	3 (37.5)
Private	4 (50.0)
NABH accreditation, No. (%)	3 (37.5)
Teaching hospital, No. (%)	5 (62.5)
Staff cardiologists, median (IQR)	4 (2.8 - 4.3)
Intensive care unit, No. (%)	8 (100.0)
Catheterization lab, No. (%)	7 (87.5)
Size, No. (%)	
$\geq$1000 hospital beds	1 (12.5)
500-999 hospital beds	4 (50.0)
$\leq$499 hospital beds	3 (37.5)
Heart-failure specific outpatient clinic, No. (%)	3 (37.5)

NABH: National Accreditation Board for Hospitals & Healthcare Providers

Online Table 2. Temporal trends models for guideline-directed medical therapy among patients with HFrEF.

| Covariate | OR (95% CI)[1] | | | |
	Unadjusted	Age and sex adjusted	Primary analysis[2]	MAGGIC adjusted analysis[3]
Intervention	0.93 (0.52, 1.66)	0.95 (0.53, 1.69)	0.93 (0.45, 1.94)	0.81 (0.36, 1.80)
Week	1.05 (1.01, 1.10)	1.05 (1.01, 1.10)	1.05 (0.997, 1.11)	1.07 (1.01, 1.13)
Age	-	1.00 (0.98, 1.01)	1.00 (0.98, 1.02)	1.01 (0.99, 1.03)
Female	-	1.27 (0.94, 1.72)	1.08 (0.73, 1.59)	0.69 (0.44, 1.06)
LVEF	-	-	-	1.01 (0.97, 1.05)
Serum creatinine	-	-	-	0.22 (0.14, 0.34)
Diabetes	-	-	-	1.41 (0.93, 2.12)

[1]Among participants discharged with LVEF <40%; N = 846 with 442 in control period and 404 in intervention period.
[2]Primary analysis models include adjustment for age and sex as well as a random cluster effect for hospital.
[3]Adjusted for age, sex, random cluster effect for hospital, and MAGGIC risk predictors including ejection fraction, serum creatinine, and diabetes mellitus.

Online Table 3. Assessment for form of temporal trends models for rate of guideline-directed medical therapy among patients with HFrEF.

Covariate	No Trend[1] Beta (95% CI)	R^2	Basic[2] Beta (95% CI)	R^2	Intervention Dependent Trend[3] Beta (95% CI)	R^2	Quadratic Trend[4] Beta (95% CI)	R^2
Intervention	14.10 (20.49, 34.54)	0.26	1.18 (18.18, 20.55)	0.34	46.90 (16.36, 77.44)	0.58	1.18 (-13.67, 17.58)	0.63
Week			0.99 (-.30, 2.28)				4.69 (2.60, 6.79)	
Week 1-13					2.82 (1.34, 4.30)			
Week 14-26					-0.84 (-2.32, 0.65)			
Week * Week							-0.15 (-0.22, -0.07)	

[1]Outcome = Intercept + B$_1$*Intervention (0/1)
[2]Outcome = Intercept + B$_1$*Intervention (0/1) + B$_2$ * Week (1-26)
[3]Outcome = Intercept + B$_1$*Intervention (0/1) + B$_2$ * Week (1-13) + B$_3$ * Week (14-26)
[4]Otucome = Intercept + B$_1$*Intervention (0/1) + B$_2$ * Week (1-26) * Week (1-26)

HEART FAILURE QUALITY IMPROVEMENT IN KERALA

Audit-and-feedback performance report

Hospital name:
Report date:
Performance period:
Total number of participants enrolled over performance period:

PROCESS MEASURES

In-hospital measure	Current period	Previous period
ECG		
BNP or NT pro-BNP		
Transthoracic echocardiogram		

Discharge measure	Current period	Previous period
Prescription of diuretic for symptoms of volume overload		
Prescription of ACE inhibitor or ARB or ARNI in patients with LVEF ≤ 35% and without contraindications		
Prescription of beta-blocker in patients with LVEF ≤ 35% and without contraindications		
Prescription of aldosterone antagonist in patients with LVEF ≤ 35% and without contraindications		
Prescription of aspirin in eligible patients and without contraindications		
Prescription of statin in eligible patients and without contraindications		
Tobacco cessation counseling		
Alcohol cessation counseling		
Diet counseling		
Home weight monitoring instructions		
Prescription of ICD or CRT or CRT-D therapy in patients with LVEF ≤ 35%		
Referral for outpatient cardiac rehabilitation		
Outpatient department follow-up scheduled		

OUTCOME MEASURES

In-hospital measure	Current period	Previous period
In-hospital mortality		

GOAL FOR NEXT PERIOD: _____