Facility Variation in Heart Failure Readmissions

Chuan-Fen Liu, PhD MPH

HERC Cyber Seminar

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- Study Team
  - Seattle: Chuan-Fen Liu, PhD; Paul Hebert, PhD; Chris Bryson, MD; David Au, MD; Stephan Fihn, MD; Edwin Wong, PhD; Mark Perkins, Pharm D; Pam Green, PhD; Jeff Todd-Stenberg; Margaret Nordstrom, MA; Jaclyn Lemon, BS
  - Durham: Matt Maciejewski, PhD
  - Los Angeles: Elizabeth Yano, PhD
  - Iowa City: Peter Kaboli, MD
  - Palo Alto: Paul Heidenreich, MD

Outline

- Background
- Objectives
- Methods
- Preliminary Results
  - Heart failure readmission rates and costs
  - Facility variation in health failure readmissions

Organizational Factors Related to Hospital Readmissions

Aim 1: Assess variation in hospital-level readmission rates and costs among VA inpatients, including both VA and Medicare readmissions, for the two most common medical conditions: heart failure (HF) and chronic obstructive pulmonary disease (COPD)

Aim 2: Identify VA hospital-level organizational factors associated with readmissions

Policy Issues

- Hospital readmissions are frequent, costly and reflect poor quality of care
- 30-day readmission rate in Medicare
  - Overall: 20%
  - HF: 25%
- Public reporting of Medicare readmission rates for HF, acute myocardial infraction, and pneumonia began in 2009
  - VA hospitals included Medicare Hospital Compare in 2011
- Medicare reimbursement penalty for excessive readmissions under Affordable Care Act began in 2012

Readmission Rates in VA

- Kaboli et al (2012): 30-day readmission rates decrease over time
  - Overall: 16.5% in 1997-1998 to 13.8% in 2009-2010
  - HF cohort: 20.5% in 1997-1998 to 19% in 2009-2010
- Heidenriech et al (2010): Improved HF hospital mortality, but slightly worsened HF readmission rates during 2002-2006
- VA Hospital Compare
  - HF 30-day readmission rate: 20.81% for over 65 years old in FY2007-2009
- Include readmissions in VA only

Reduce Hospital Readmissions

- Effective Interventions
  - Discharge Planning
  - Patient Education
  - Post-Discharge Management
- CHF QUERI: Hospital to Home Initiative (H2H)
- Debate over preventability of readmissions

Objective for Today's Talk

- Estimate the HF readmission rates and costs, accounting for readmissions in VA and Medicare
- Examine facility variation in HF readmission rates

Study Design

- Retrospective cohort study of HF inpatients

- Study Periods

  – Three cross-sectional patient cohorts identified in FY2007, 2008, and 2009

  – One year follow-up period for each cohort

Data Sources

- VA Administrative Data
  - Patient Treatment File, Outpatient Encounter Files, Fee-Basis File, Vital Status, DSS National Extracts (inpatient, outpatient, lab, pharmacy), CDW vital records
- Medicare Claims
  - MedPAR, Carrier, Hospital Outpatients
- Facility Surveys of CHF Practices
  - Conducted by CHF QUERI in 2008

Study Samples

- Patient identification specification based on Medicare HF readmission performance measure
- Identify patients with an index admission in VA hospitals based on principle discharge diagnosis
  - ICD-9 codes: 402.01, 402.11, 402.91, 404.01, 404.03, 404.11, 404.13, 404.91, 404.93, 428.0, and 428.xx
- Index admission: 1st admission in a VA facility for each patient in a given year

Outcomes – Readmission Rates

- Readmission
  - 1st hospitalization after the index admission
- Readmission rates
  - All-cause and HF specific
  - Main outcome: 30-day all-cause readmission rate
  - Secondary outcomes: 60-day, 90-day, 1-year
- Source of readmissions
  - VA
    - VA hospitals
    - Non-VA care via fee-basis (in process)
  - Medicare

Outcomes – Readmission Costs

- Includes costs of all readmissions in 1 year after the index admission
- Payers' perspective:
  - VA expenditures
    - DSS costs for VA care
    - VA payments for non-VA care (in process)
  - Medicare payments
- VA only and total (VA + Medicare)
- In 2009 dollars: inflation adjusted using Consumer Price Index

Patient Characteristics

- <u>Sociodemographic</u>: age, gender, race, marital status, income means test, disability rating
- <u>Access to VA care</u>: distance to the closest VA hospital/clinic
- <u>Health Status</u>: comorbidity (DCG), BMI
- <u>Health Behavior</u>: medication adherence, BMI
- <u>Clinical Factors (lab results and vital signs)</u>: blood pressure, respiratory rate, heart rate, sodium level, blood urea nitrogen, glucose, O_2 saturation, PO_2, PCO_2
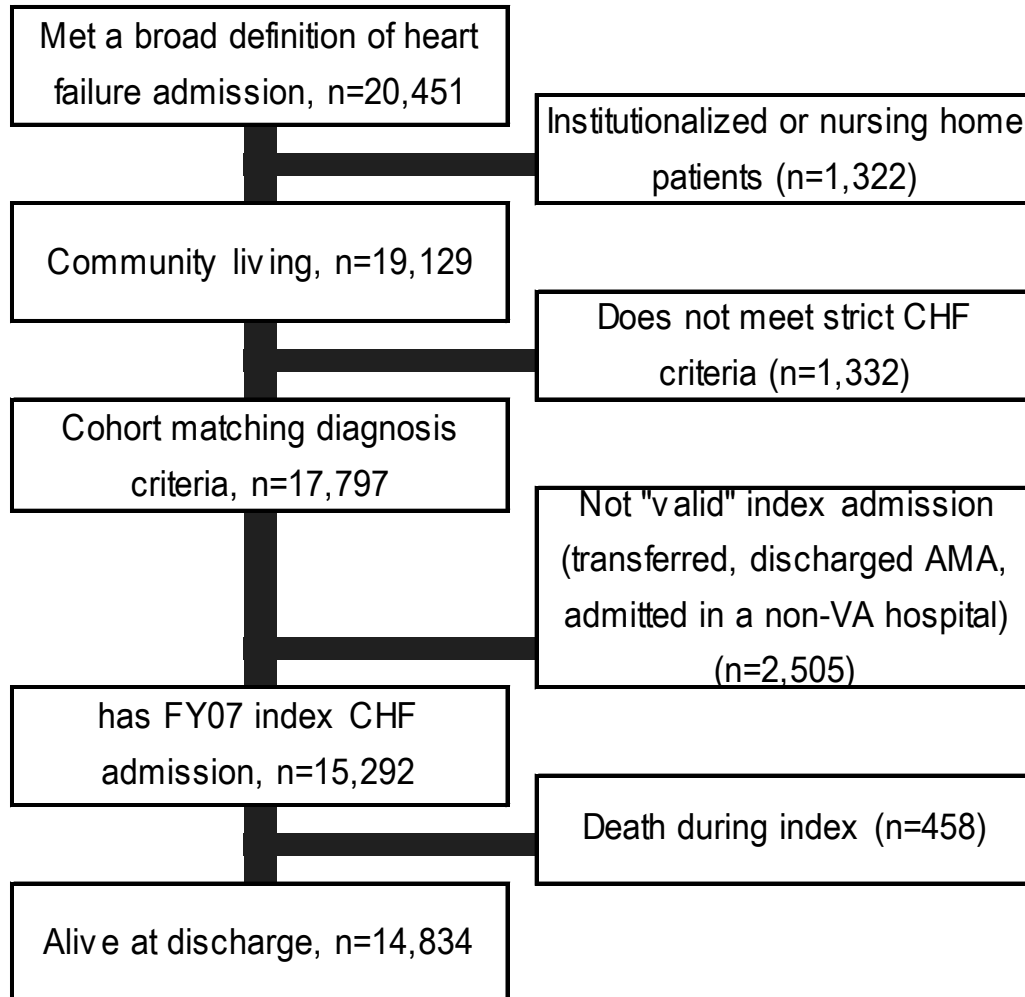
Analytical Approaches

- Descriptive analysis
- Adjusted readmission rates at the hospital level using the hierarchical models
  - GLIMMIX in SAS
  - Medicare HF readmission model
    - Adjust for age, gender, 35 HCC categories from DCG
- Further analysis
  - Alternative risk adjustment measures
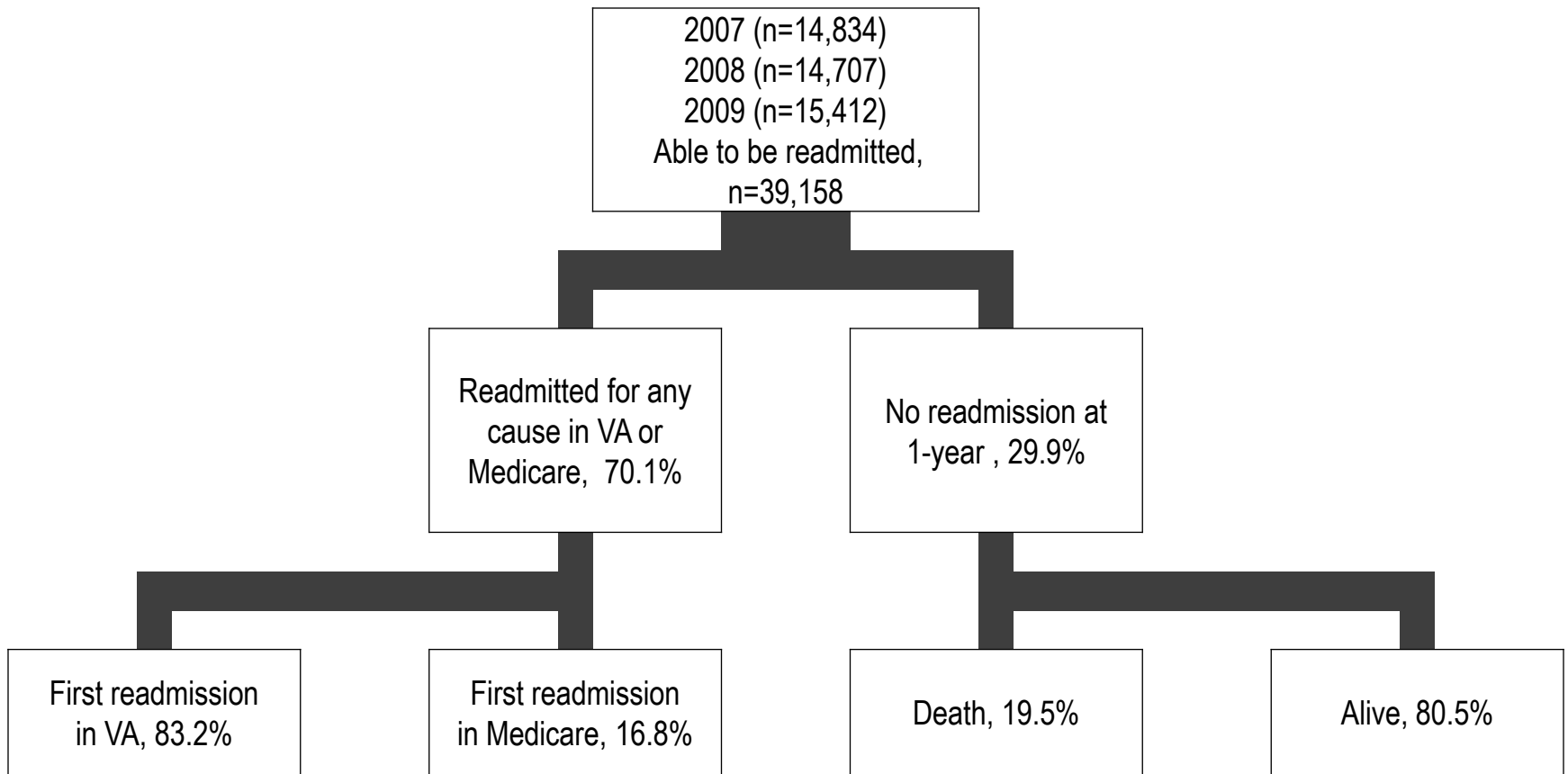 - Cost model – two-part model

Preliminary Results
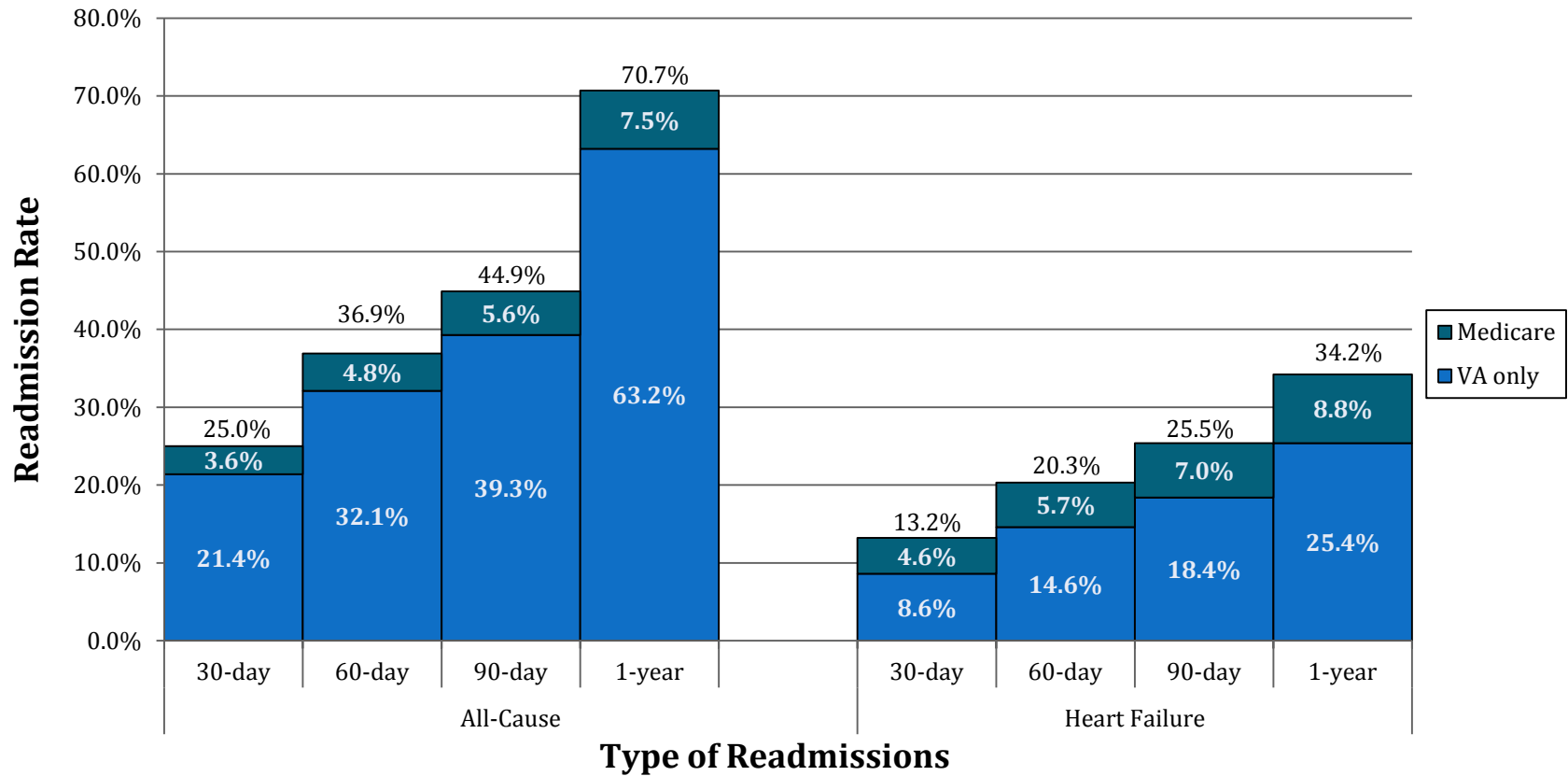
HF Cohort 2007

Readmission Status in 1 Year

Patient Characteristics

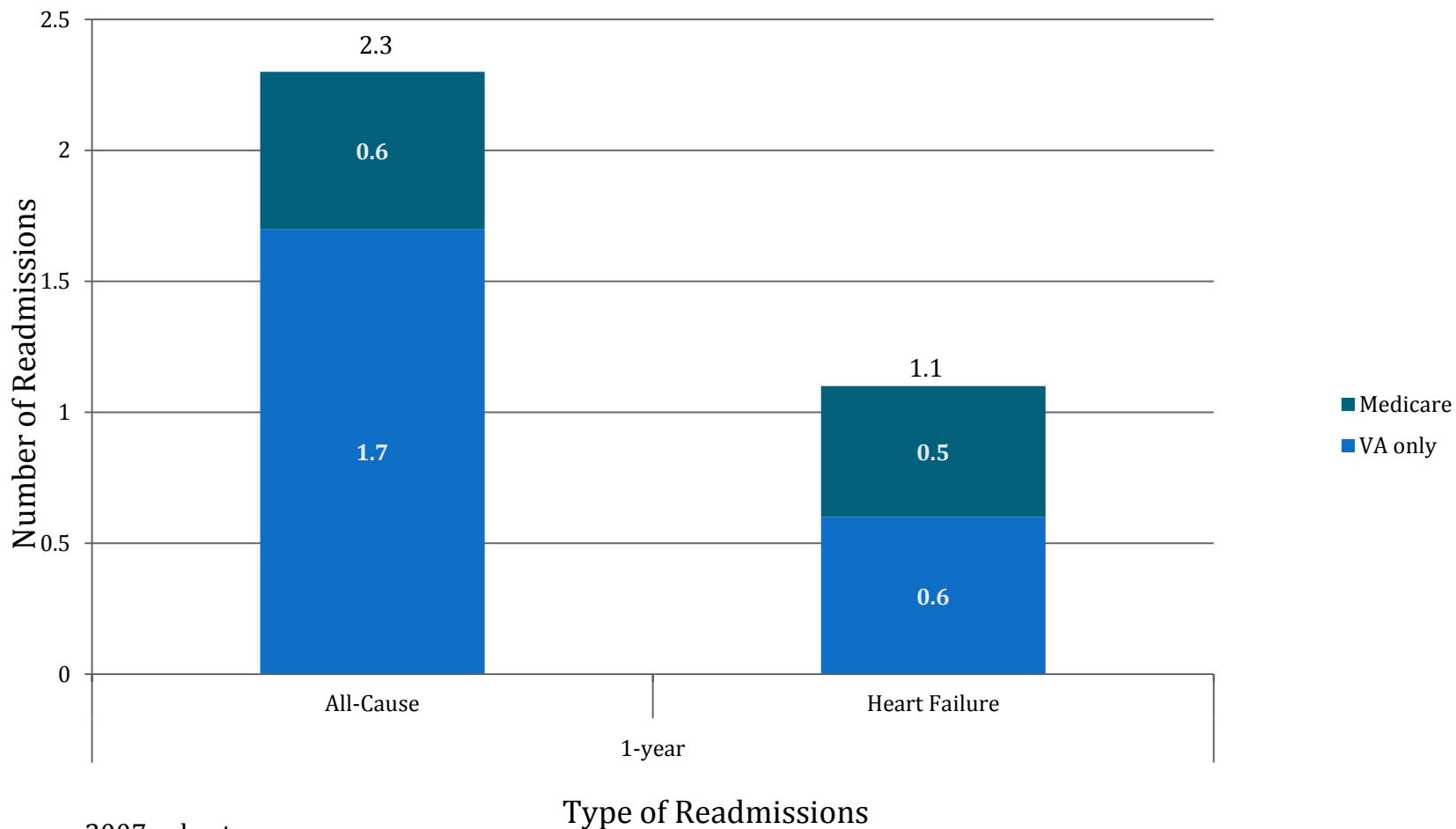| Patient Characteristics	Readmission* (n=10,488)	No readmission* (n=4,346)
Age (mean/SD)	71.1 (11.3)	70.1 (11.7)
≥65 years old (%)	67	61
Female (%)	2	2
Receive free VA care (%)	96	93
Medicare eligible in 2007 (%)	78	70
Mortality in 1 year (%)	32	21
DCG score (mean/SD)	2.6 (1.2)	2.3 (1.1)
Comorbid conditions		
Hypertension (%)	88	85
Ischemic heart disease (%)	75	64
Myocardial infarction (%)	21	15
Diabetes (%)	58	53
COPD (%)	52	46

*1-year readmission in VA or Medicare 2007 cohort
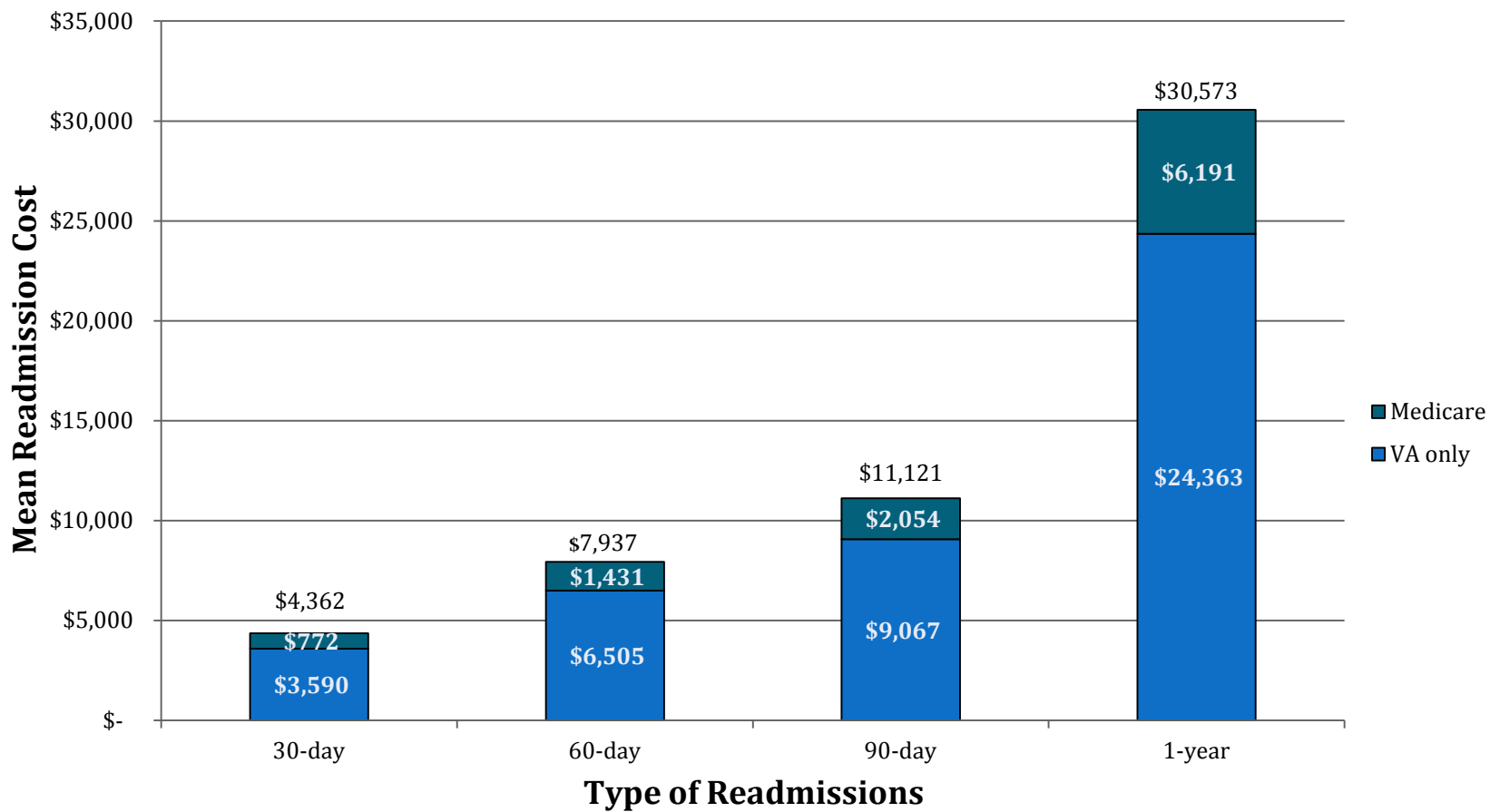
Unadjusted Readmission Rates

2007 cohort

Number of Readmissions in One Year

2007 cohort

Unadjusted Readmission Costs

2007 cohort

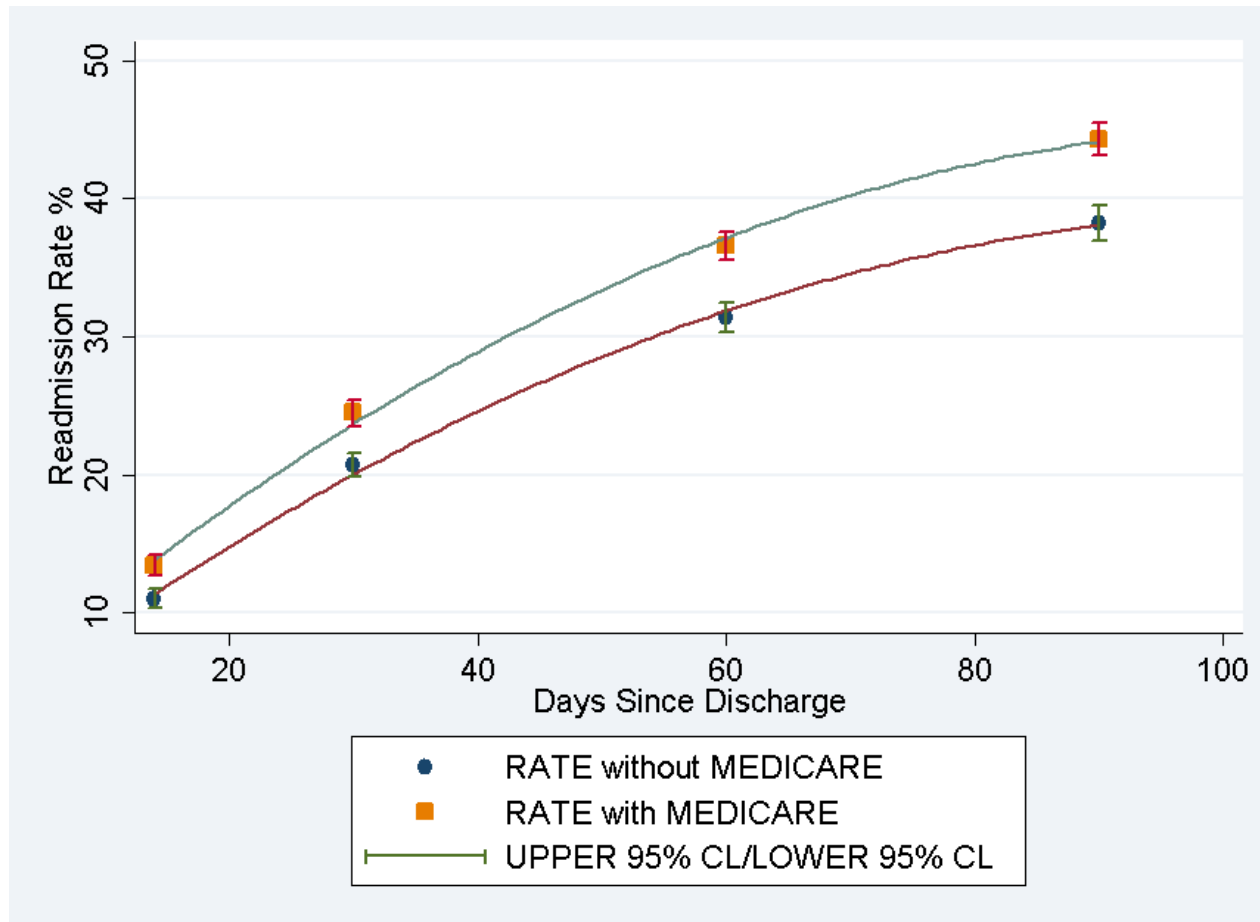# Facility Level Readmission Rates

Facility Level Readmission Rates

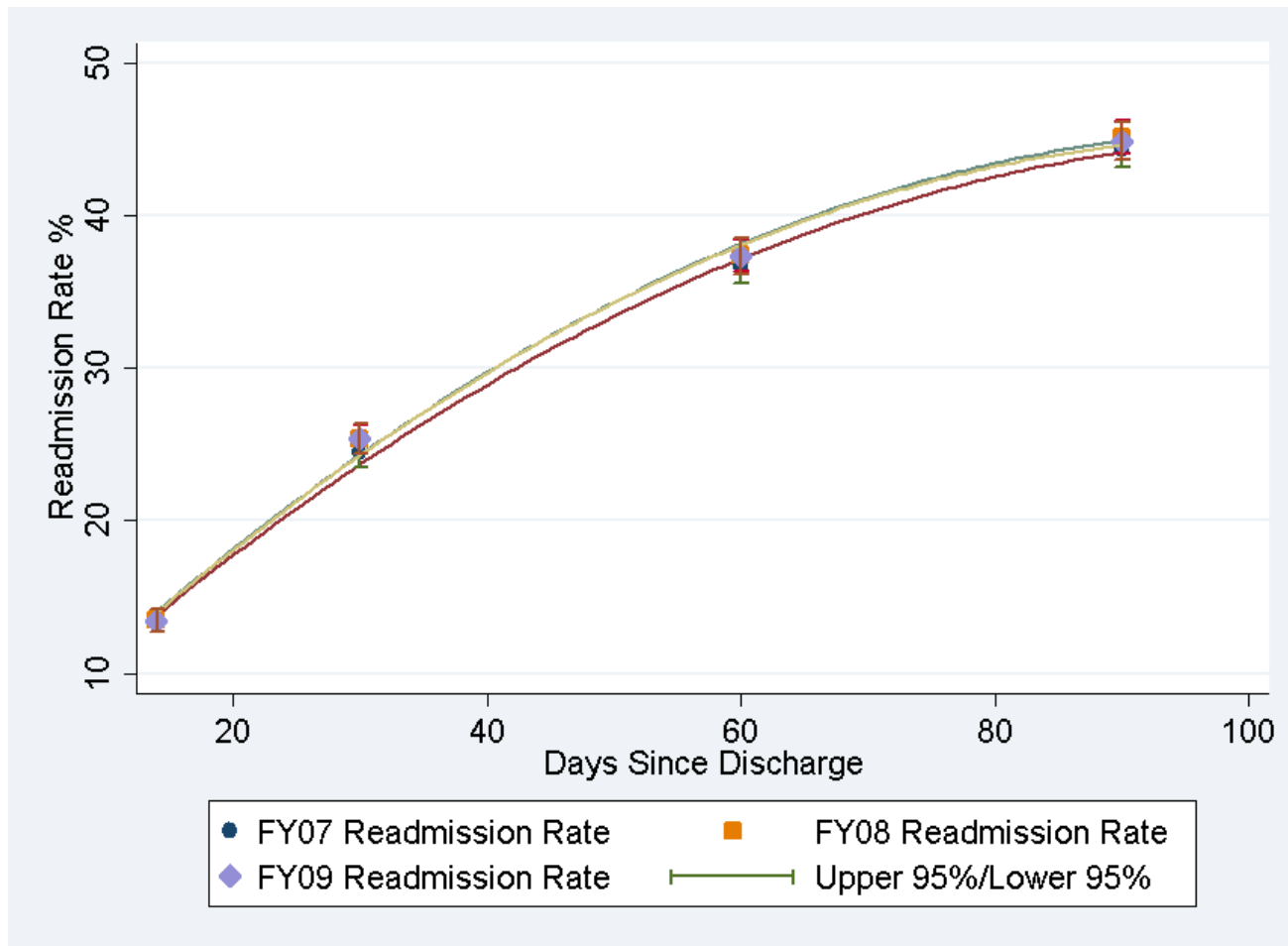|	Number of Patients (n= 127)	30-day Total All-cause Readmission Rate* (n=120)		30-day Total HF Specific Readmission Rate* (n=120)	
		Unadjusted	Adjusted	Unadjusted	Adjusted
Mean	117 (83)	24.5%	24.1%	12.7%	12.5%
Range (min – max)	1 - 543	12.5% - 39.8%	13.5% - 37.2%	3.0%-23.1%	4.3% -21.7%
25th percentile	56	21%	21.1%	10.6%	10.9%
50th percentile	104	24.8%	23.1%	13.0%	12.1%
75th percentile	160	27.5%	26.8%	15.0%	13.1%

*Exclude 7 facilities with fewer than 25 patients
2007 cohort

Higher readmission rates at the facility level after including Medicare data (unadjusted)

2007 cohort

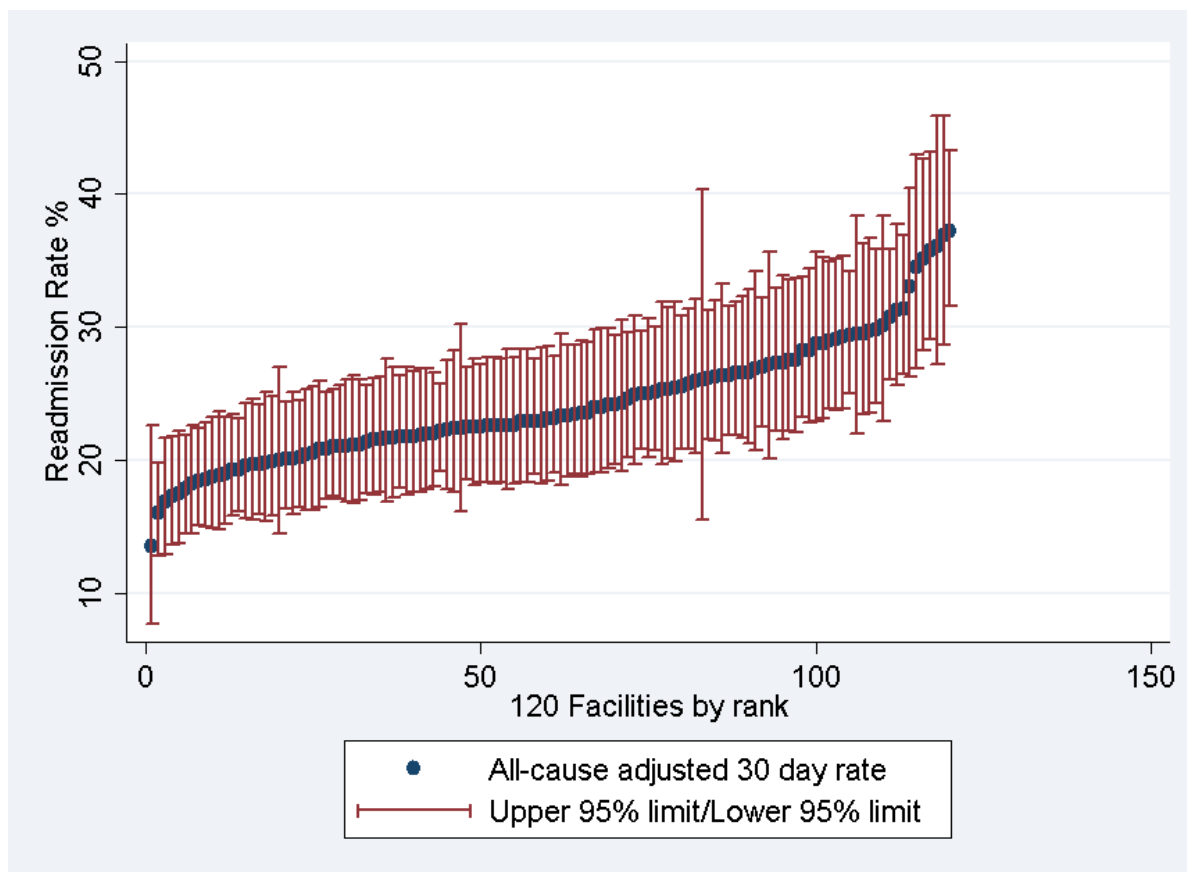# Stabled readmission rates overtime at facility level (unadjusted)

All-cause Readmission Rates

	Number of Patients (n= 127)	30-day Total All-cause Readmission Rate* (n=120)		30-day HF Specific Readmission Rate* (n=120)	
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2007 cohort

Adjusted 30-Day All-cause Readmission Rates
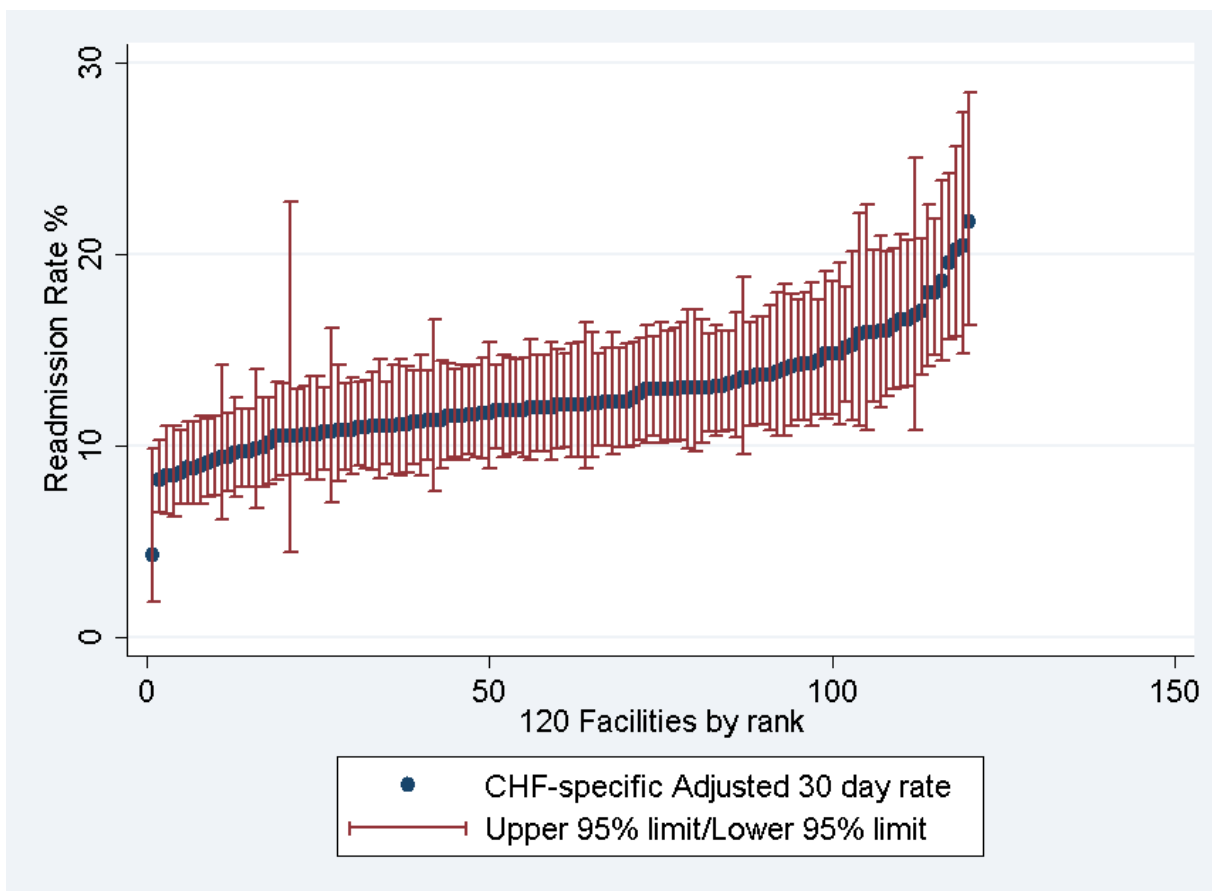

2007 cohort

HF Specific Readmission Rates

	Number of Patients (n= 127)	30-day Total Readmission Rate* (n=120)		30-day HF Specific Readmission Rate* (n=120)	
		Unadjusted	Adjusted	Unadjusted	Adjusted
Mean	117 (83)	24.5%	24.1%	12.7%	12.5%
Range (min – max)	1 - 543	12.5% - 39.8%	13.5% - 37.2%	3.0%-23.1%	4.3% -21.7%
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75th percentile	160	27.5%	26.8%	15.0%	13.1%

*Exclude 7 facilities with fewer than 25 patients
2007 cohort

Adjusted 30-Day HF Specific Readmission Rates

2007 cohort

Summary

- Accounting for VA only readmissions underestimates readmission rates and costs, especially for HF specific readmissions
- 25% were readmitted in 30 days and 70% were readmitted in one year
- Wide variation in readmission rates across VA hospitals

Next Steps

- Complete readmission rates and costs for HF cohorts

- Combine facility surveys and patient level data to examine organizational factors associated with HF readmissions