

## Introduction

- Heart failure (HF) is a highly prevalent, morbid, and costly disease with a poor long-term prognosis
- HF affects more than 6.6 million Americans and causes more than 275,000 deaths annually
- Evidence-based therapies utilized over the past 2 decades hold the promise of improved outcomes, yet few contemporary studies have examined survival trends in patients with acute decompensated heart failure (ADHF)

## Objectives

- The primary objective of this population-based study was to describe trends in short and long-term survival in patients hospitalized with ADHF
- A secondary objective was to examine patient characteristics associated with decreased long-term survival

## Methods

- We reviewed the medical records of 9,748 patients hospitalized with ADHF at all 11 medical centers in central Massachusetts during 1995, 2000, 2002, and 2004
- Information on patient's demographic, clinical, and treatment characteristics was analyzed using standard methods, including multivariable regression
- Mortality was assessed by reviewing statewide death certificates, the Social Security Death Index, and hospital medical records at participating medical centers

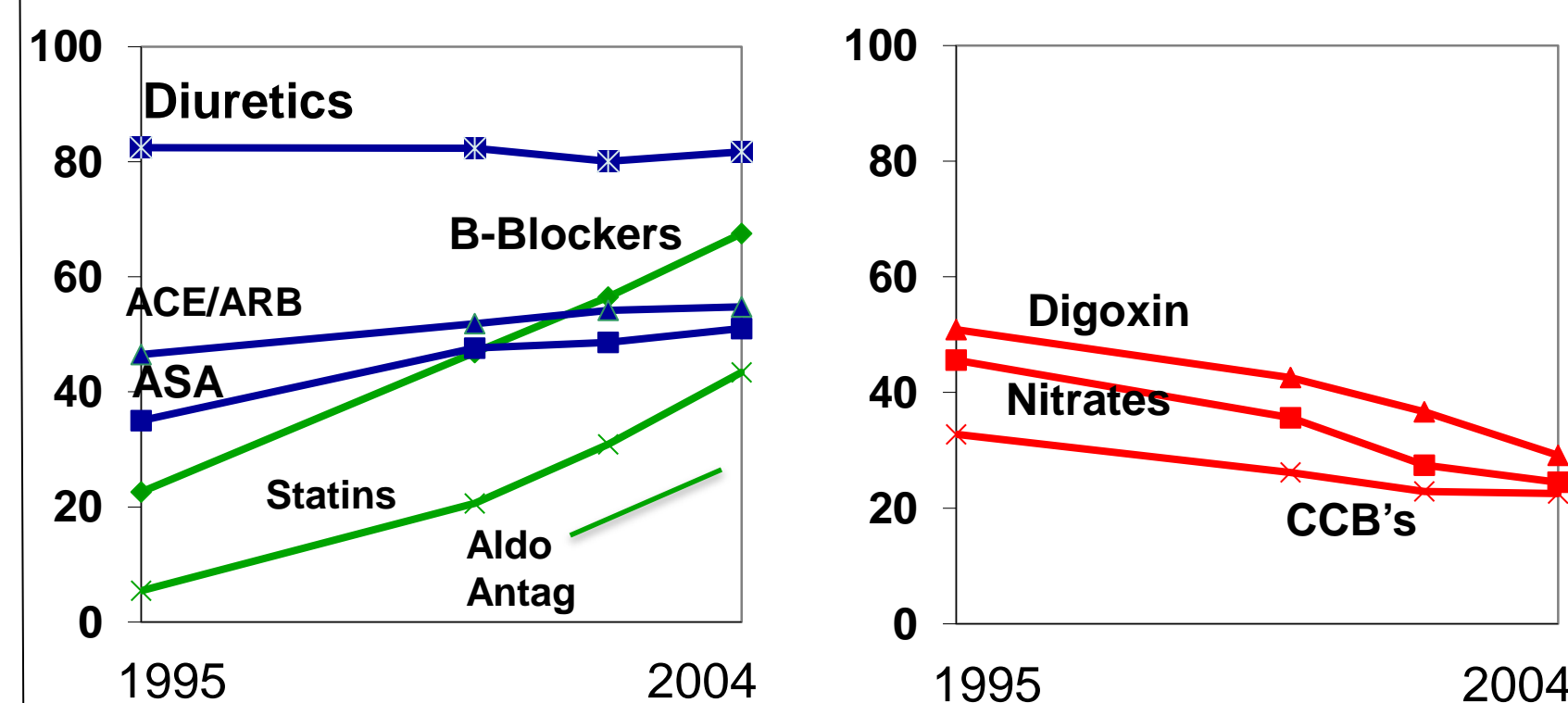
## HF Patients are Increasingly Elderly and Debilitated

Over ¼ of patients admitted with HF are >85 years old  
Control of cholesterol, BP, and glucose has improved over time

	Total Population (n=9,748)	1995 Cohort (n=1,949)	2004 Cohort (n=2,469)
Age (mean, years)	76.2	75.7	76.2
Age ≥85 years	25.7	21.4	28.4
Male (%)	43.9	42.9	46.9
Caucasian (%)	93.8	96.8	92.3
Incident event (%)	29	26.1	36.4
Systolic blood pressure (mmHg)	142.7	145.9	140.5
Diastolic blood pressure (mmHg)	74.7	79.1	72.5
Cholesterol (mg/dL)	162.5	175.6	150.4
Creatinine (mg/dL)	1.64	1.57	1.77
Blood Urea Nitrogen (mg/dl)	34.4	33.3	35.5
Glucose (mg/dL)	158.5	165.6	152.5
Ejection fraction (%)	45.4	41.7	46.9
LOS (days)	6.1	7.4	6.1
<b>Medical History (%)</b>			
Anemia	24.6	21.9	26.7
Coronary Heart Disease	56	57	55.7
Chronic Lung Disease	35.9	35.5	35.7
Diabetes	39	39.7	39.3
Hypertension	68.7	62.3	72.8
Peripheral Vascular Disease	19.7	20.2	21
Renal Failure/Disease	25.9	21.5	31.4
Stroke	13.2	14.3	11.5
<b>Symptoms (%)</b>			
Angina/Chest Pain	31.2	31.2	29.9
Dyspnea/Shortness of Breath	93.4	96.5	92.2
Swelling	70.3	63.8	72.7
Nausea/Vomiting	16	14.2	17.1
Orthopnea	35.4	29.2	38.4
Weakness	25.1	24.9	23.8
Weight Gain	8	6.8	8.9

## Evidence-Based Rx has Increased

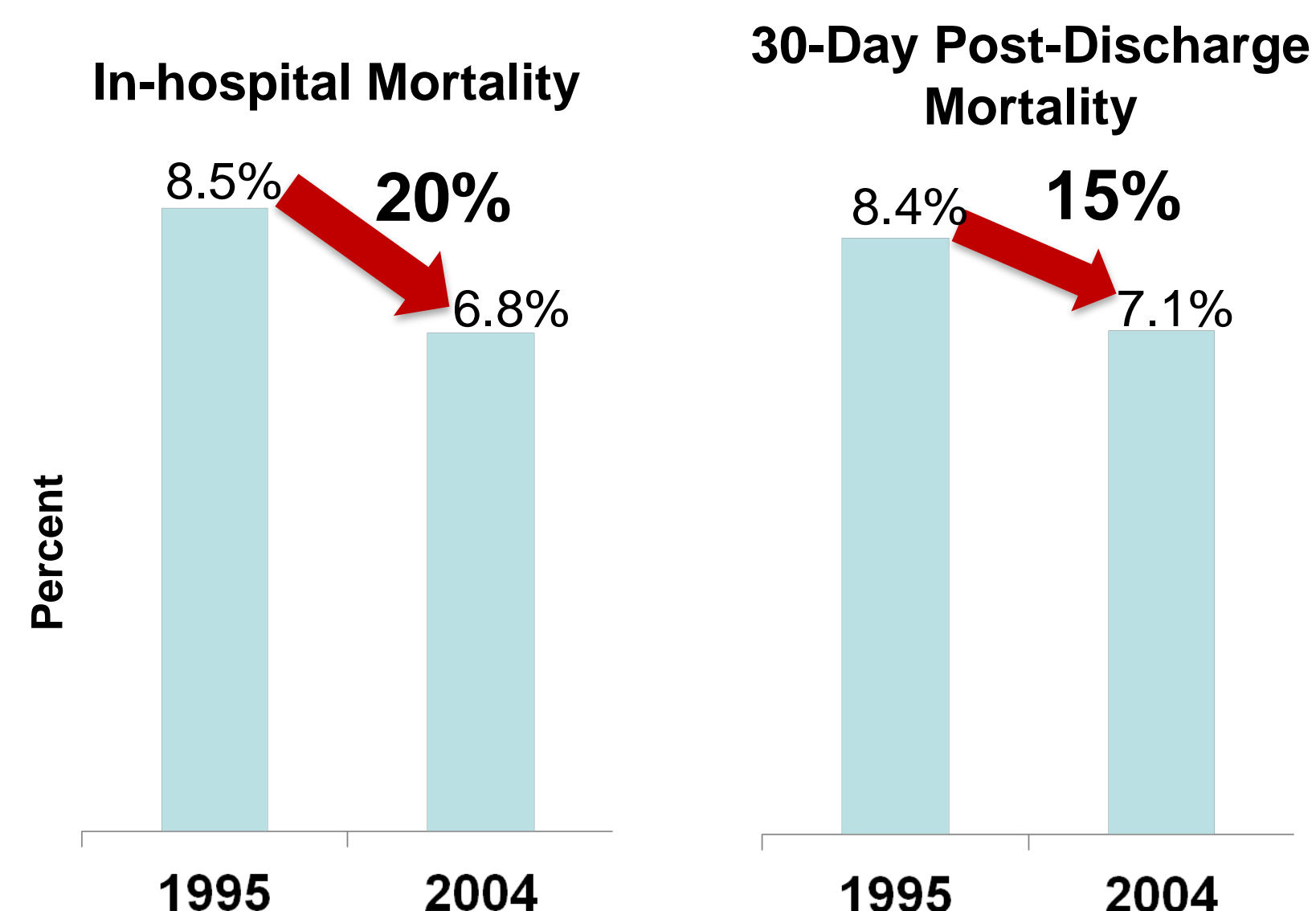
(% of patients receiving medication upon discharge)



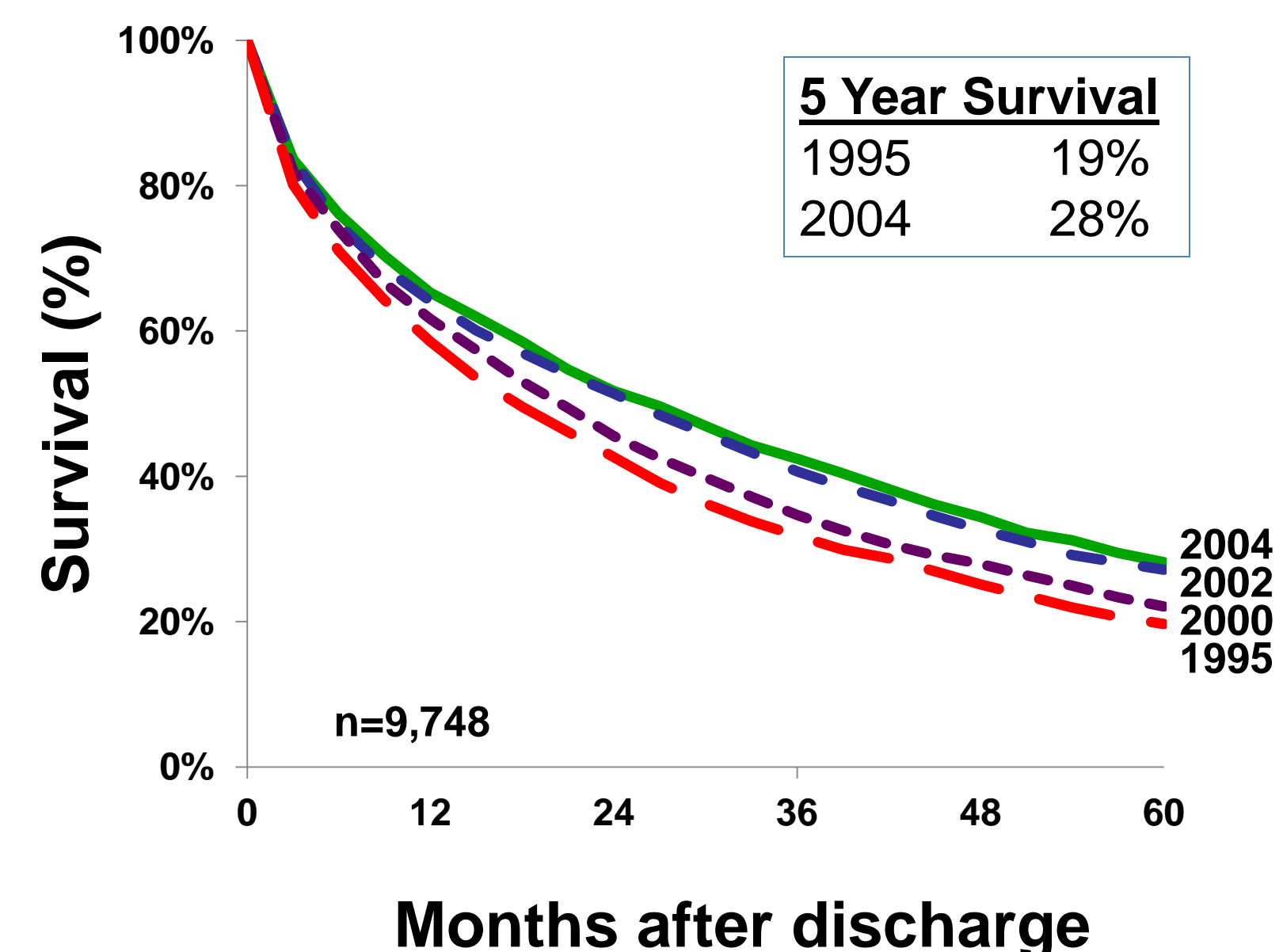
Beta Blocker, Statin and Aldosterone Antagonist use has increased markedly over time

n=9,748 \*Similar trends for inpatient medications

## In-hospital and 30-day Mortality have Decreased



## Long Term Survival Improving, but Still Poor



## Factors Associated with Post-Discharge Mortality

older age, male sex, prior HF, chronic kidney disease, COPD, diabetes, peripheral vascular disease, anemia and stroke were associated with poor long-term survival

Factor	All Patients (Hazard Ratio)	Incident Cases (Hazard Ratio)
<b>Age (yrs)</b>		
65-74	1.45	1.67
75-84	1.91	2.36
>85	2.72	3.48
<b>Sex</b>		
Male	1.06	1.23
White race	1.38	1.59
Incident case	0.71	--
<b>Medical History</b>		
Anemia	1.15	1.26
Coronary heart disease	1.02	1.02
Chronic obstructive pulmonary disease	1.27	1.52
Diabetes	1.1	1.1
Hypertension	0.9	0.88
Peripheral vascular disease	1.08	1.11
Renal disease	1.14	1.13
Stroke	1.2	1.26
<b>Serum glucose (mg/dl)</b>		
140-199	1	0.99
≥200	1	1.14
<b>Systolic BP (mmHg)</b>		
100-159	0.81	0.99
≥160	0.7	0.86
<b>Diastolic BP (mmHg)</b>		
60-89	1.01	0.95
≥90	0.99	1
<b>Heart rate (bpm)</b>		
60-99	1.04	1.14
≥100	1.11	1.12
Blood urea nitrogen (mg/dl) ≥43	1.43	1.31
Serum Sodium (mmol/L) <135	1.13	1.07

## Conclusions

- Patients with ADHF were increasingly elderly and had multiple comorbidities associated with poor outcomes
- Both short and long-term survival for these patients improved significantly between 1995 and 2004, but their long-term prognosis remains poor, as fewer than 1 in 3 patients hospitalized with ADHF in 2004 survived more than 5 years
- While there has been encouraging progress in the treatment and prognosis of patients hospitalized with ADHF, additional opportunity remains to improve the in-hospital and post-discharge management of patients with this common and debilitating clinical syndrome