

The Effects of Price Competition and Reduced Subsidies for Uncompensated Care on Hospital Mortality

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Market Reform and Outcomes

- There is substantial evidence that market-based reforms reduce the rate of increase in health care costs
- The evidence on effects of market-based reforms on outcomes is comparatively scant and inconclusive

What others have shown

- Cross-sectional analyses of hospital market concentration and mortality have shown no significant associations (Shortell and Hughes, 1988; Sari, 2002; Mukamel et al, 2001)
- Greater competition for HMO patients in Southern California was associated with decrease in AMI and pneumonia mortality but opposite effects among Medicare patients (Gowrisankaran and Town 2003)

Changes in market competitiveness may affect outcomes

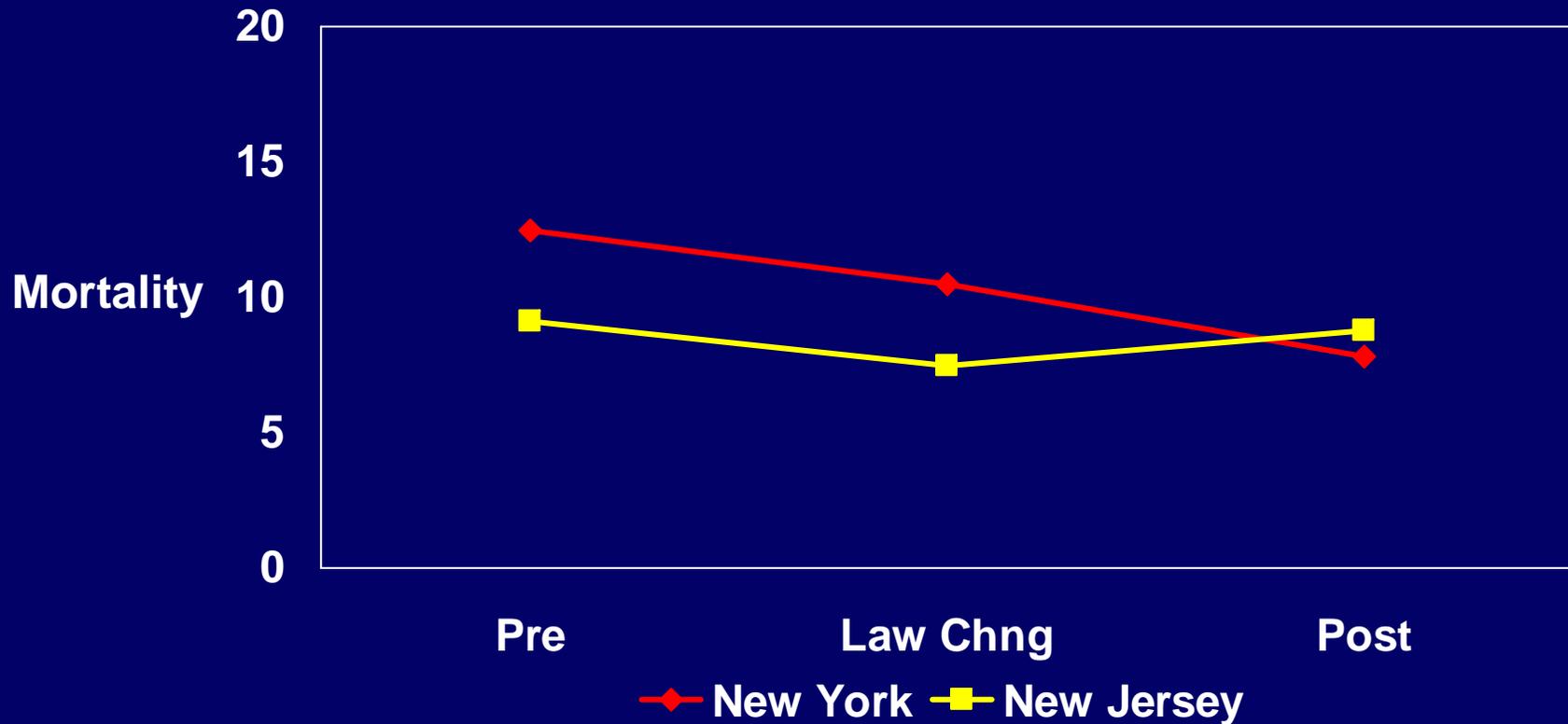
- Ho and Hamilton (2000) showed no effects of mergers on mortality for AMI, stroke
- Kessler and McClellan (2000) showed increases in competition after 1990 lowered costs and reduced AMI mortality
 - competition only affected mortality in states with HMO penetration above median

Price Competition in a nascent price competitive market

- New Jersey Health Care Reform Act of 1992 dissolved hospital rate-setting system and gave insurers new ability to negotiate price discounts with hospitals beginning 1993
- Reduced charity care subsidy

\$700 million	1992
\$350 million	1996
- Changed hospital incentives from competing on quality to a mixture of quality and price

Our previous work showed adverse effects on uninsured NJ AMI patients



Relative to New York, mortality for the uninsured in New Jersey increased by 4.9 percentage points

Goals of this study

- To examine whether market-based reform in NJ led to relative increases in mortality among patients with medical conditions other than AMI
- To determine whether patients treated at hospitals with more difficult market conditions experienced larger increases in inpatient mortality

Conceptual Framework

- Not for profit hospitals derive utility from profits, uncompensated care, and quality
- Reductions in net revenues force hospitals to make tradeoffs between these objectives
- Largest revenue impact expected in less concentrated hospital markets with largest HMO Share
- Impact greatest on uninsured

Study Population

- All patients under age 65 admitted to hospitals in New Jersey or New York from 1990-96 (N=469,629)
 - AMI
 - Stroke
 - Pulmonary embolism
 - Hip fracture
 - Gastrointestinal bleeding
 - Congestive heart failure
 - Pneumonia

Data used

- Patient discharge data from New Jersey and New York
- New York chosen as control state because had rate-setting system from 1990-96, similar data, adjacent state
- We verified that the mortality time trends prior to passage of reform were similar in both states

Defining markets

- Health Services area
 - fixed boundaries so not endogenous
 - 9 HSAs in New Jersey, 22 in New York
- Variable market area based on patient flow
 - defined using 1992 data
 - 84 hospital markets in New Jersey, 222 in New York
- Hospitals divided in 3 groups
 - High Competition: $HHI < \text{median}$, $\%HMO > \text{median}$
 - Low Competition: $HHI > \text{median}$, $\% HMO < \text{median}$
 - Average Competition: mixed groups

Measuring reductions in uncompensated care subsidy

- Under hospital rate-setting hospitals were compensated in full for care for the uninsured
- The size of the state-wide subsidy that provided uncompensated care was reduced by \$350 million over 4 years, about 4% of hospital net revenues
- Hospital-level data on change in subsidy is not available, so we use % uninsured in 1992 at each hospital as a proxy for this

Measuring overall changes in mortality

$$y_i = X_i \beta + \alpha^{NJ} \delta_i^{nj} + \sum_{t=1991}^{1996} \alpha^t \delta^t + \alpha^{NJ,POST} \delta^{NJ,POST}$$

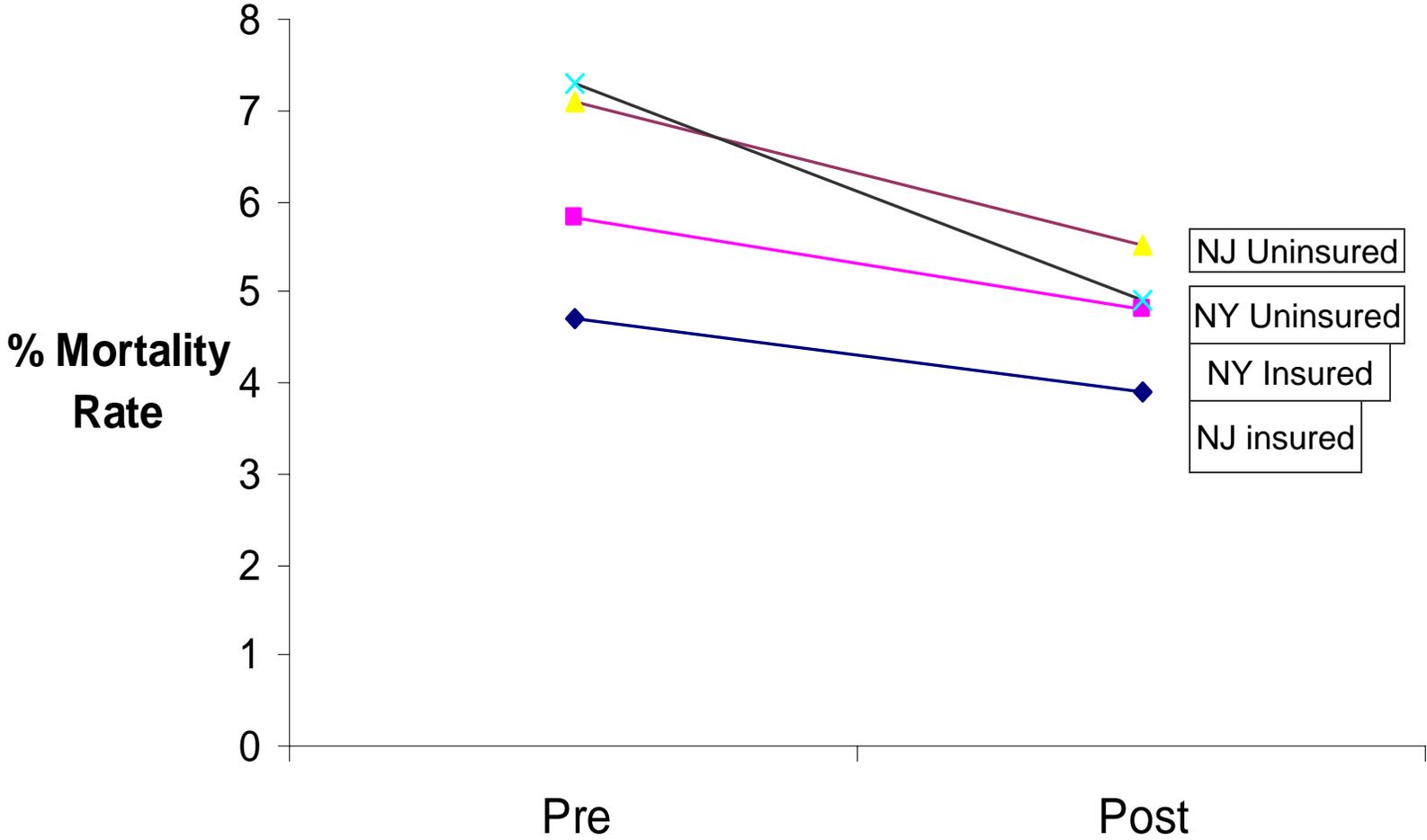
- Adjust using Linear probability model for:
 - patient characteristics
 - baseline differences in mortality between the two states
 - common intertemporal trends

Measuring market-specific changes in mortality

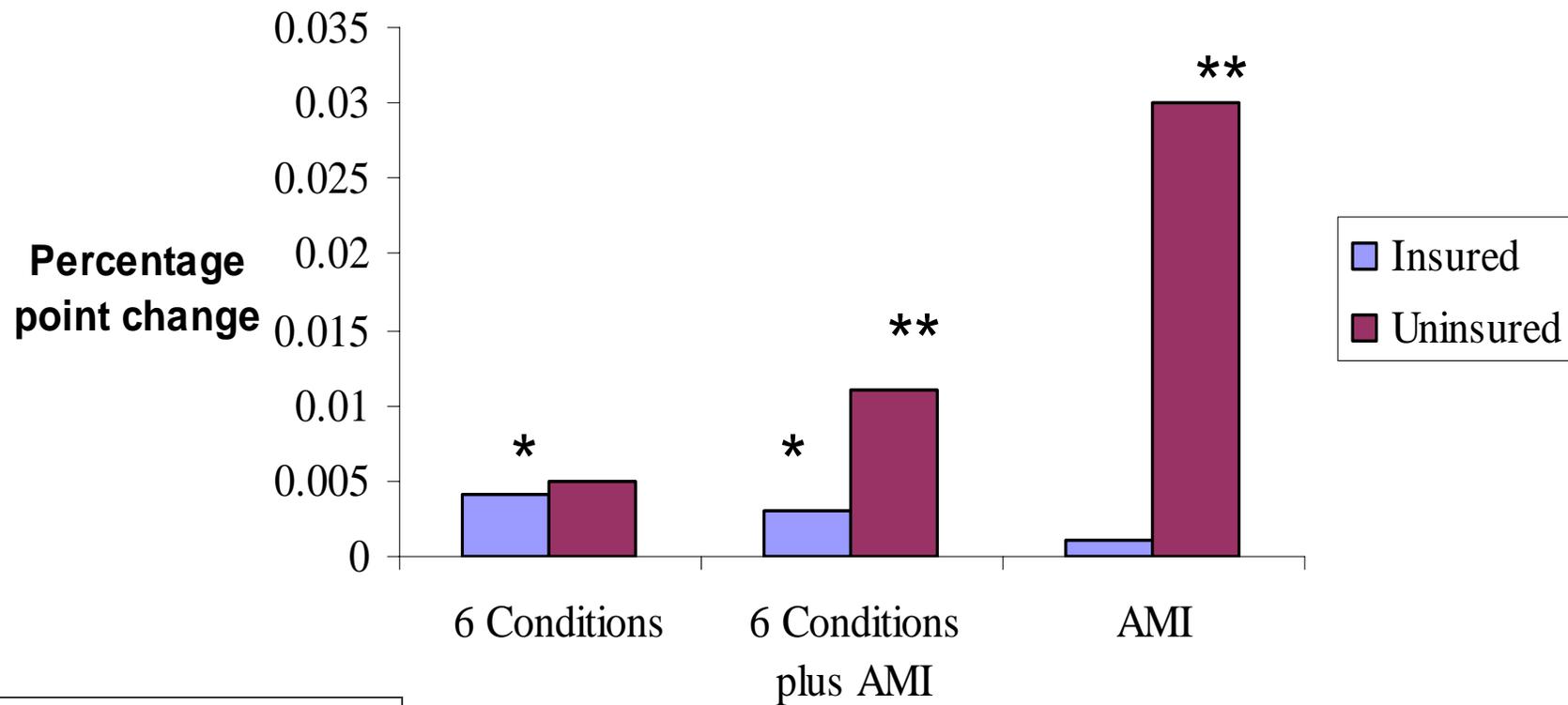
$$y_{iht} = \beta X_i + \alpha^{NJ} \delta_i^{NJ} + \sum_{time=1991}^{1996} \alpha^{time} \delta_t^{time} + \alpha^{NJ,POST} \delta_{it}^{NJ,POST} + \sum_{avg}^{high} \alpha^{COMP} \delta_h^{COMP} + \alpha^{NJ,POST,COMP} \delta_{it}^{NJ,POST,COMP}$$

- Test differences in rate of change in more competitive vs less competitive markets
- Separate analyses using different approaches to defining markets

Changes in mortality - 6 condition averages



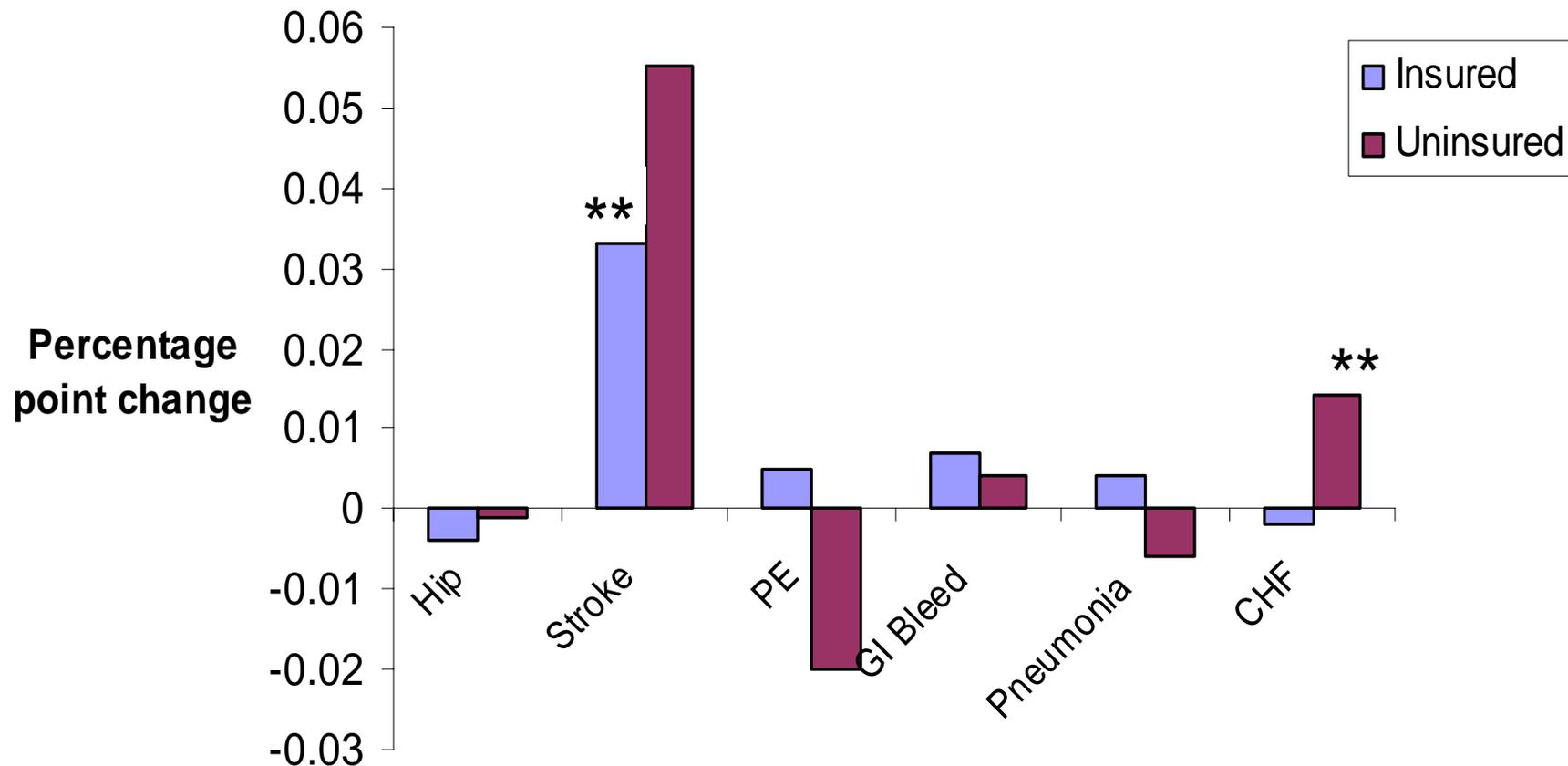
Percentage point change in mortality for all patients in New Jersey relative to New York



* $p < .10$, ** $p < .05$

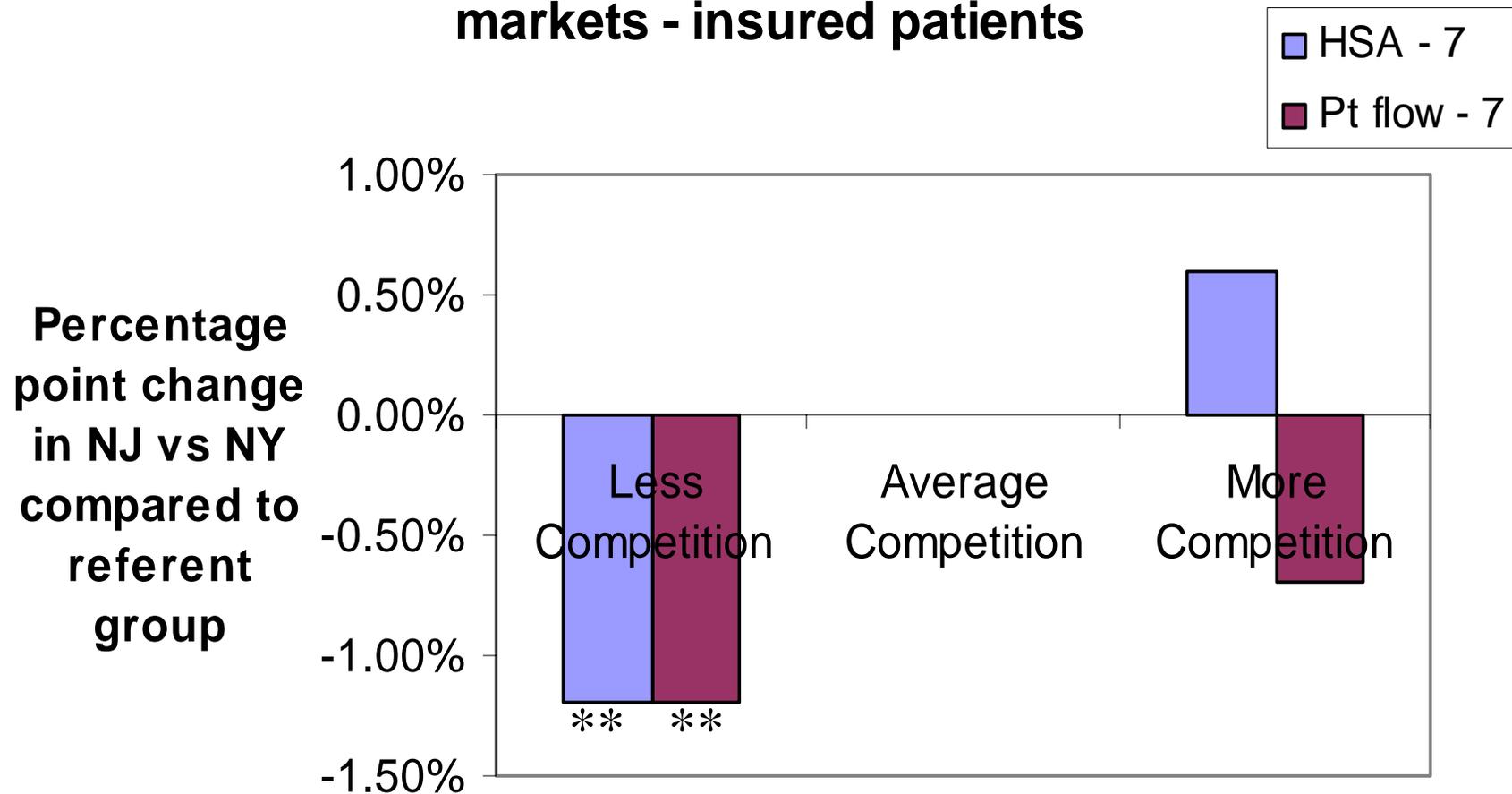
Difference between insured and uninsured only sig for AMI

Percentage point change in mortality for different conditions in NJ vs NY



* $p < .10$, ** $p < .05$

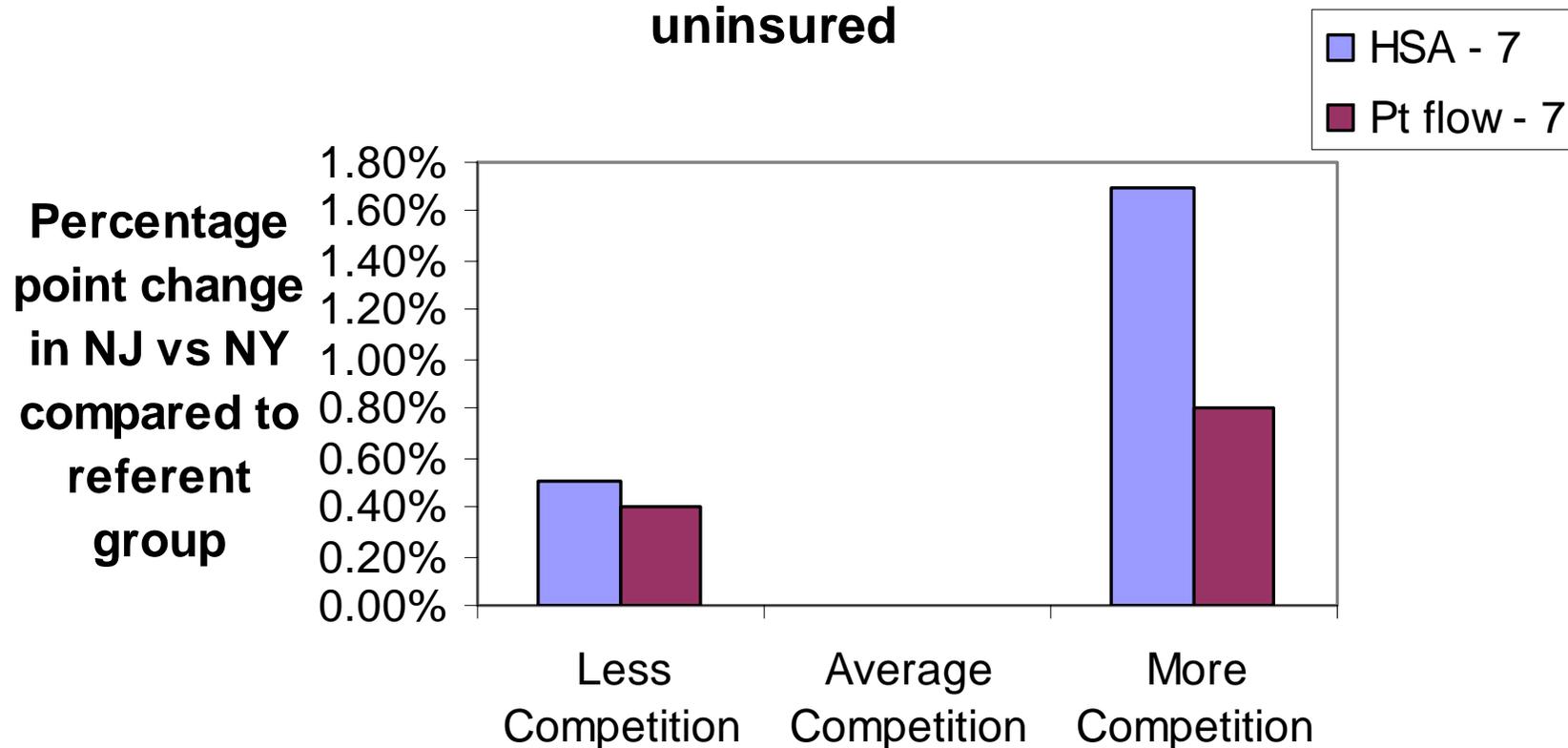
Change in mortality in NJ vs NY for different markets - insured patients



Difference between less and more competitive markets sig for HSA ($p=.004$) but not for patient flow ($p=.38$).

* $p<.10$, ** $p<.05$

Change in mortality in different markets in NJ vs NY - uninsured

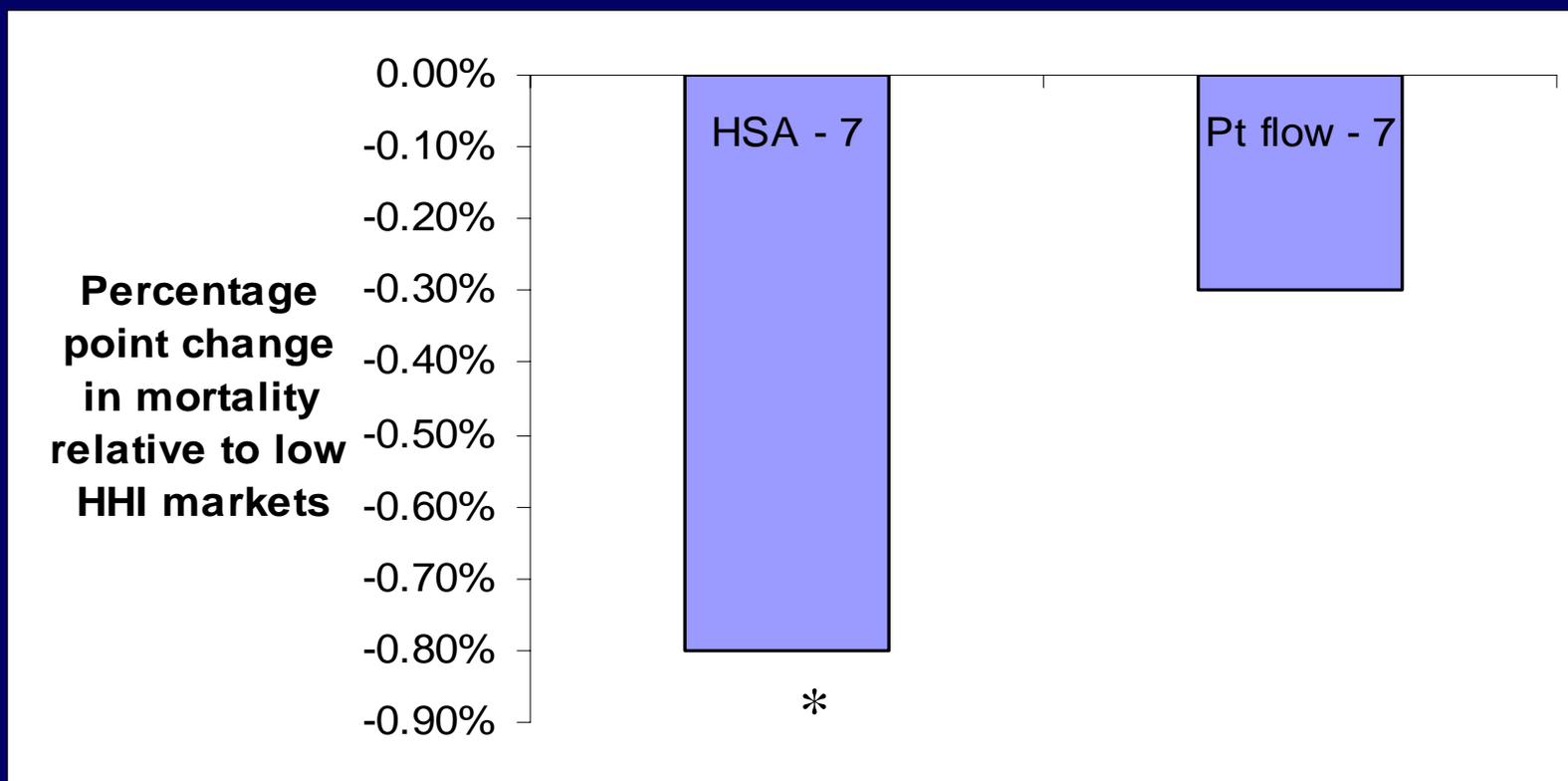


None of these effects were significantly different than zero

Are changes within hospital as opposed to due to patient movement?

- Hospital fixed effects were added to all specifications and results were qualitatively identical on all study coefficients

Change in mortality in NJ vs NY based on hospital market concentration (no HMO interaction) – insured patients



P-value for difference for HSAs is .053, for pt flow .481

Were effects greater in hospitals with bigger reductions in subsidies?

	Insured		Uninsured	
	A	B	A	B
NJ*Post	.004	.003	.009	.006
NJ*Post* less comp	-.012**	-.012**	.005	.007
NJ*Post* more comp	.006	.007	.017	.014
NJ*Post* % uninsured		.004		.003
F-test (more =less comp	8.33***	7.99***	.239	.288

Summary of results on competition

- Among insured patients:
 - No significant worsening in mortality for seven inpatient medical conditions
 - Less competitive hospital markets within NJ had smaller adverse changes in hospital outcomes
 - Degree to which mortality worsened in more competitive markets differed by hospital market definition
- Among uninsured patients:
 - In-hospital mortality worsened to a greater degree than among insured
 - Rate of change in mortality in NJ vs. NY was not significantly different across markets

Competition Results in Context

- Among insured, 0.5-1.8 percentage point smaller relative increase in mortality in less competitive markets. Baseline mortality rate is about 8%.
- Differences between our results and G+T may reflect that price competition in New Jersey was new relative to more mature markets in Southern California
- Kessler and McClellan measure the effect of changes in HHIs on AMI mortality for Medicare patients.

Limitations

- New Jersey is a relatively small state with few markets
- Generalizability: 7 conditions and mortality outcomes only
- In-hospital data only
 - LOS Decreases more in NJ than NY
- Limited Risk adjustment with administrative data
 - Diff in diff design makes this less critical

Policy implications

- The cost savings from price competition should be balanced against any potential reductions in quality
- Adverse effects on quality from reductions in uncompensated care subsidies appeared to be less than those induced by competitive effects
- Multiple approaches to measuring hospital markets may be important to quantify the magnitude of changes in outcomes