USC Schaeffer

Leonard D. Schaeffer Center
for Health Policy & Economics

USC Schaeffer
Leonard D. Schaeffer Center
for Health Policy & Economics

Productivity Growth in Health Care

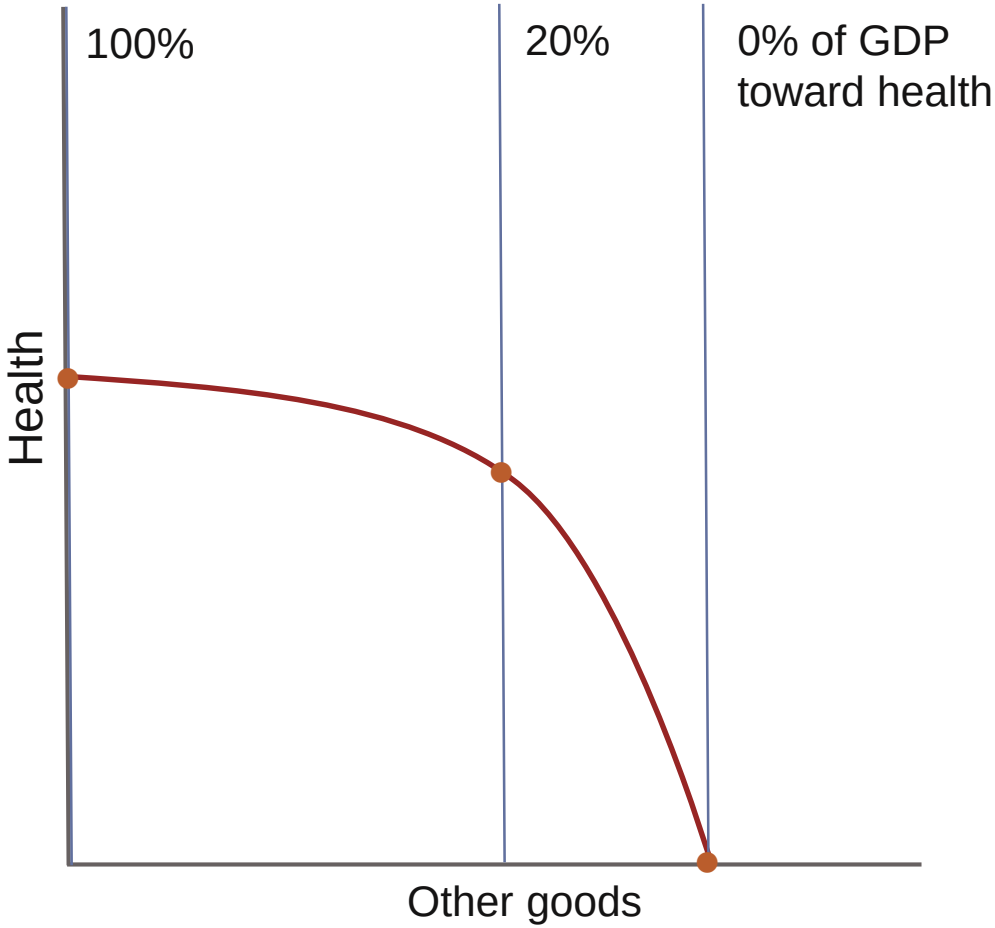
John A. Romley, PhD

Associate Professor
USC Schaeffer Center for Health Policy & Economics
USC Price School of Public Policy
USC School of Pharmacy

June 25, 2019

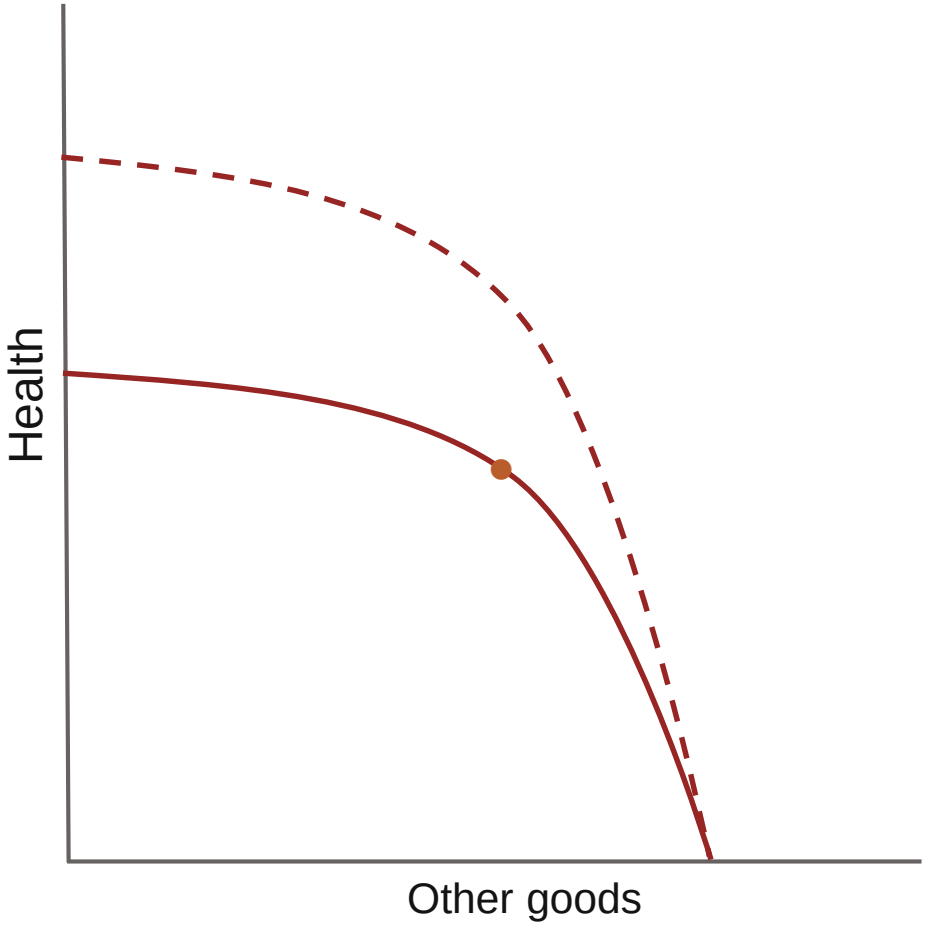
USC Schaeffer

A little health economic theory: Possible combinations of health and goods for society



USC Schaeffer

Suppose we are at point 1 and productivity increases in health care

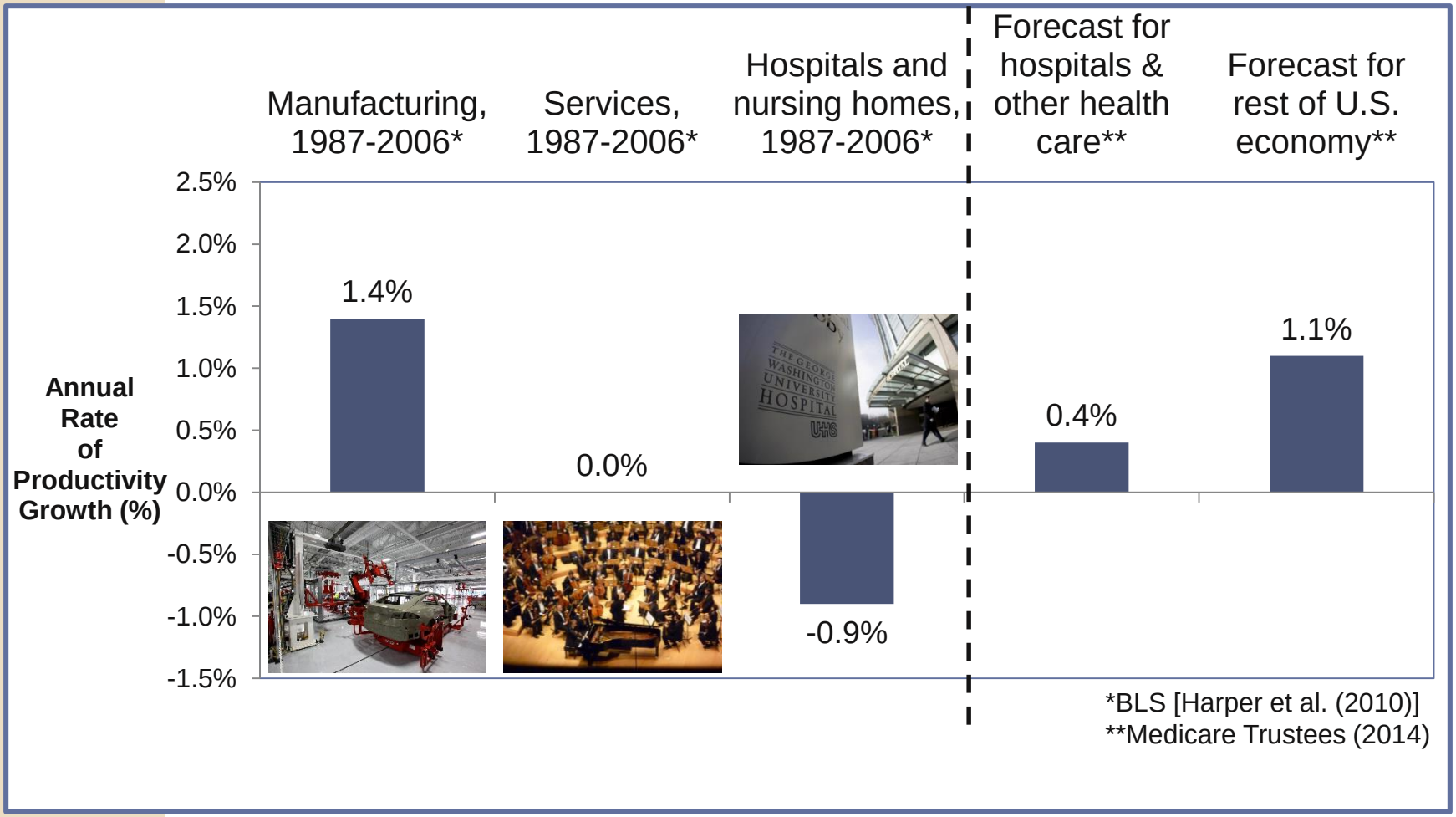


USC Schaeffer

Sweet spot for public policy: Quality (i.e. health) increases, & cost decreases

USC Schaeffer

Within the context of a larger debate, productivity growth in health care is a particular concern



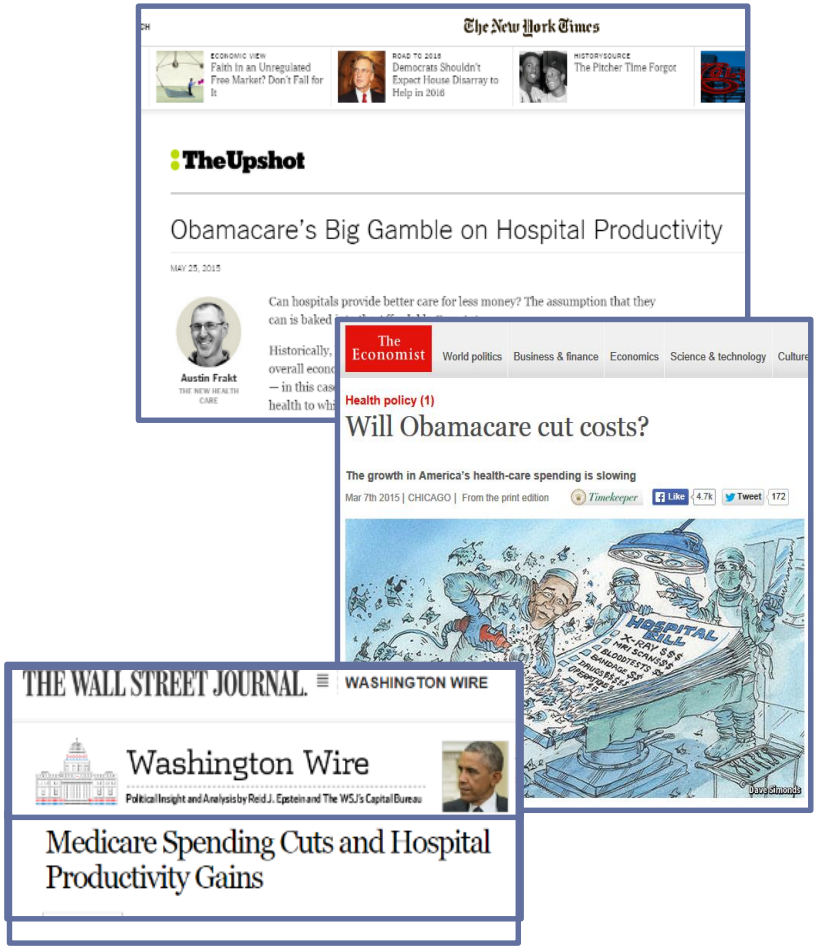
USC Schaeffer

Medicare payments to hospitals and others are tied to productivity growth

ACA reduces annual "updates" based on productivity growth in broader economy

- In FY 2019, 2.9% increase for inflation reduced by 0.8%

Adjustment has raised concern about viability of health care providers

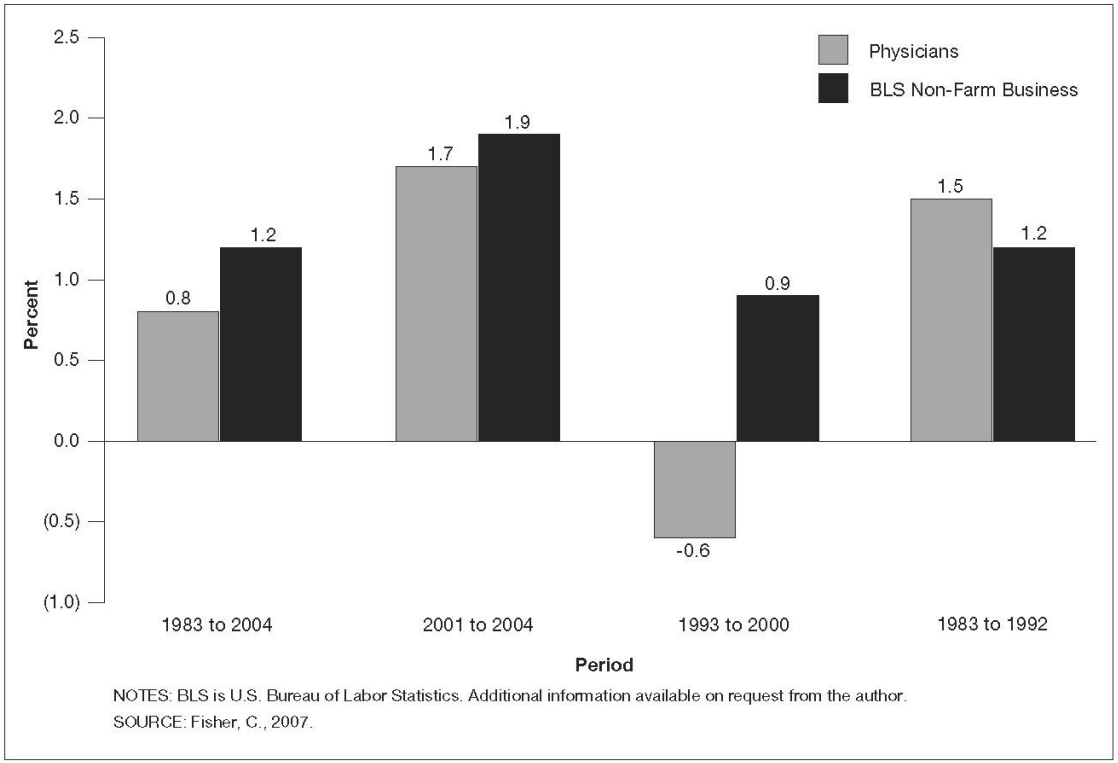


What we know: 2007 Health Care Finance Review special issue on productivity measurement

Fisher found lagging growth among physicians

Figure 1

Average Percent Changes in Physicians and Non-Farm Business Multifactor Productivity, by Selected Periods



NOTES: BLS is U.S. Bureau of Labor Statistics. Additional information available on request from the author.

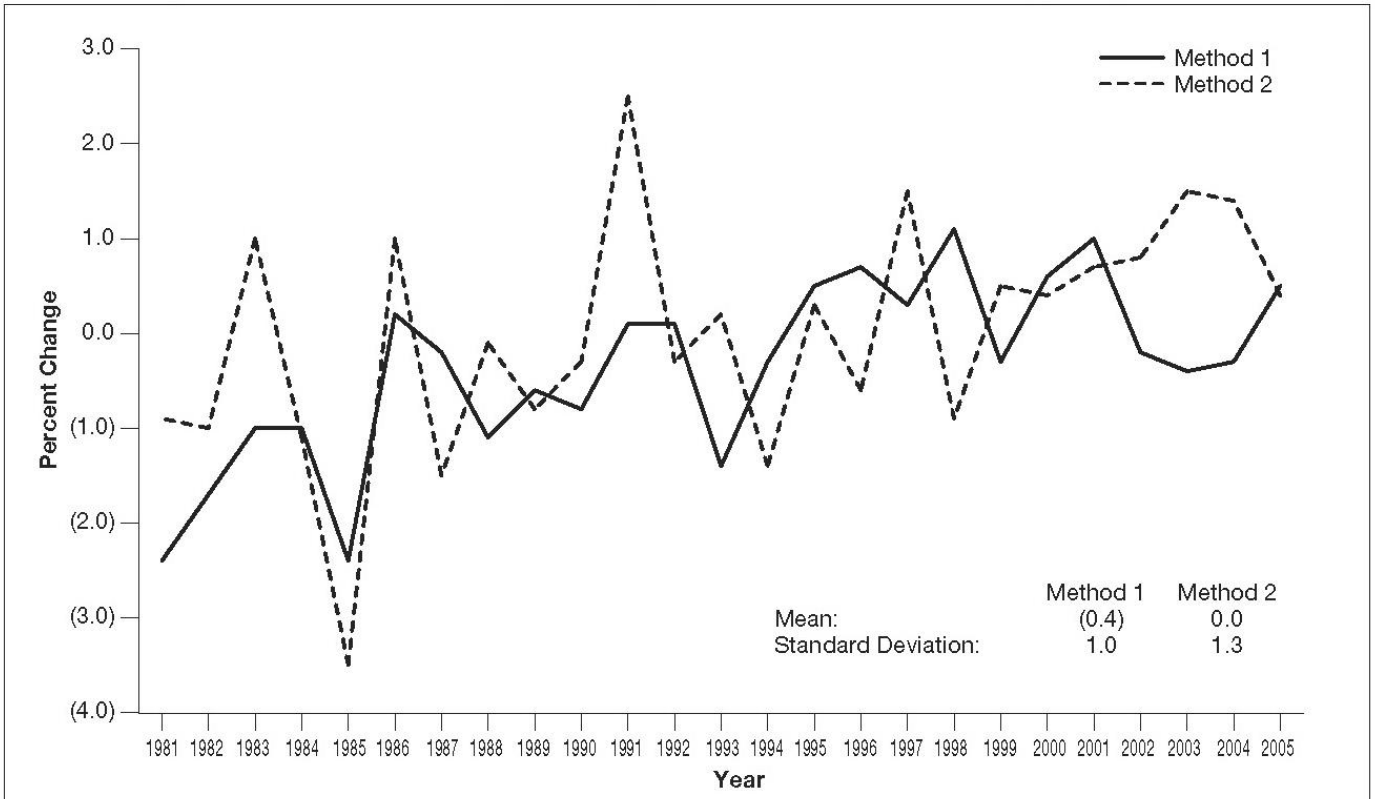
SOURCE: Fisher, C., 2007.

USC Schaeffer

Using two approaches, Cylus & Dickinsheets found no productivity growth in hospitals

Figure 1

Average Annual Percent Change in Hospital Multifactor Productivity (MFP): 1981-2005



NOTES: Method 1 derives outputs and inputs from select hospital revenues and expenses, respectively. Method 2 generally follows the approach that the U.S. Bureau of Labor Statistics has used to calculate MFP in other industries. Labor quantities are estimated by merging Current Employment Statistics data for total hospital employees with Current Population Survey data for average work weeks and average weekly hours.

SOURCE: Centers for Medicare & Medicaid Services, Office of the Actuary, 2007.

USC Schaeffer

Productivity measurement is especially challenging in health care

Health care is not cement concrete, or even automobiles

In this context, productivity can be readily confounded by trends in unmeasured aspects of

- Quality of care
- Patient severity

From this perspective, existing evidence on health care productivity had limitations

Romley, Goldman, and Sood (2015 – *Health Affairs*): Revisiting productivity growth in hospitals

WEB FIRST

By John A. Romley, Dana P. Goldman, and Neeraj Sood

US Hospitals Experienced Substantial Productivity Growth During 2002–11

DOI: 10.1377/hlthaff.2014.0587
HEALTH AFFAIRS 34,
NO. 3 (2015): –
©2015 Project HOPE—
The People-to-People Health
Foundation, Inc.

ABSTRACT **The need for better value in US health care is widely recognized. Existing evidence suggests that improvement in the productivity of American hospitals—that is, the output that hospitals produce from inputs such as labor and capital—has lagged behind that of other industries. However, previous studies have not adequately addressed quality of care or severity of patient illness. Our study, by contrast, adjusts for trends in the severity of patients' conditions and health outcomes. We studied productivity growth among US hospitals in treating Medicare patients with heart attack, heart failure, and pneumonia during 2002–11. We found that the rates of annual productivity growth were 0.78 percent for heart attack, 0.62 percent for heart failure, and 1.90 percent for pneumonia. However, unadjusted productivity growth appears to have been negative. These findings suggest that productivity growth in US health care could be better than is sometimes believed, and may help alleviate concerns about Medicare payment policy under the Affordable Care Act.**

John A. Romley (romley@healthpolicy.usc.edu) is an economist at the Leonard D. Schaeffer Center for Health Policy and Economics and a research assistant professor in the Sol Price School of Public Policy, both at the University of Southern California, in Los Angeles.

Dana P. Goldman is the Leonard D. Schaeffer Director's Chair and director of the Leonard D. Schaeffer Center for Health Policy and Economics, and a professor of public policy, pharmacy, and economics in the School of Pharmacy, Sol Price School of Public Policy, and Dornsife College of Letters, Arts, and Sciences, all at the University of Southern California.

Neeraj Sood is an associate professor of health economics and director of research at the Leonard D. Schaeffer Center for Health Policy and Economics at the University of Southern California.

Health spending in the United States has grown less rapidly in recent years, compared to its long-term trend.[1] However, the sustainability of the US health care system continues to be a serious concern.[2] Against this backdrop, the Institute of Medicine

in American manufacturing grew by 1.37 percent per year from 1987 through 2006.[4]

Some observers have noted that service industries such as health care may suffer from what has sometimes been called a "cost disease"—in which a heavy reliance on labor limits opportunities for cost efficiencies stemming from tech-

USC Schaeffer

Analyzed hospital treatment of key conditions within Medicare program

Dates: **2002 through 2011**

Population: **Older Americans in fee-for-service Medicare**

Data: **Health insurance claims, administrative records and regulatory filings**

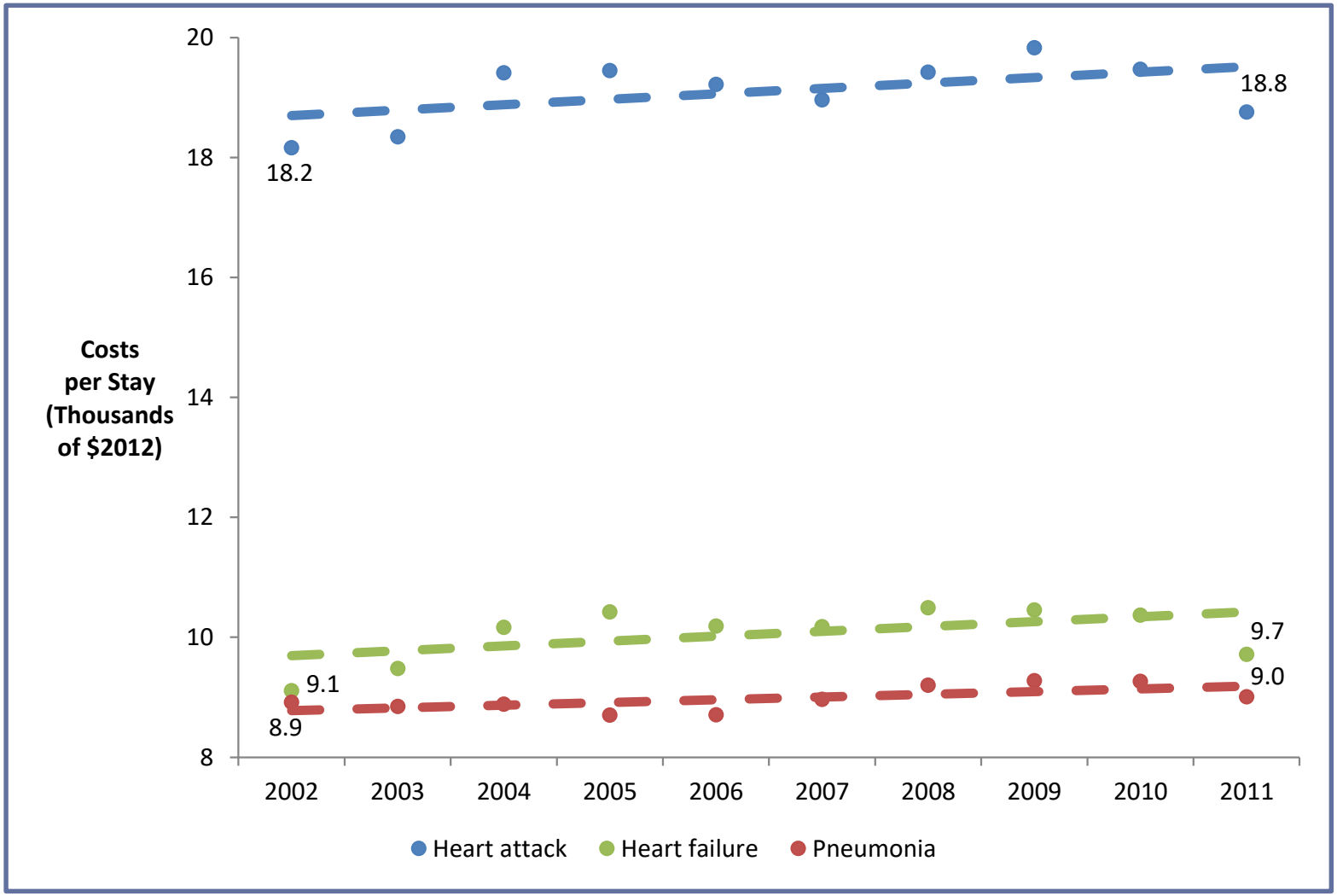
- Data provide longitudinal perspective on care and outcomes

Conditions: **Heart attack, heart failure, and pneumonia**

- Open-source risk adjustment from clinical experts was available

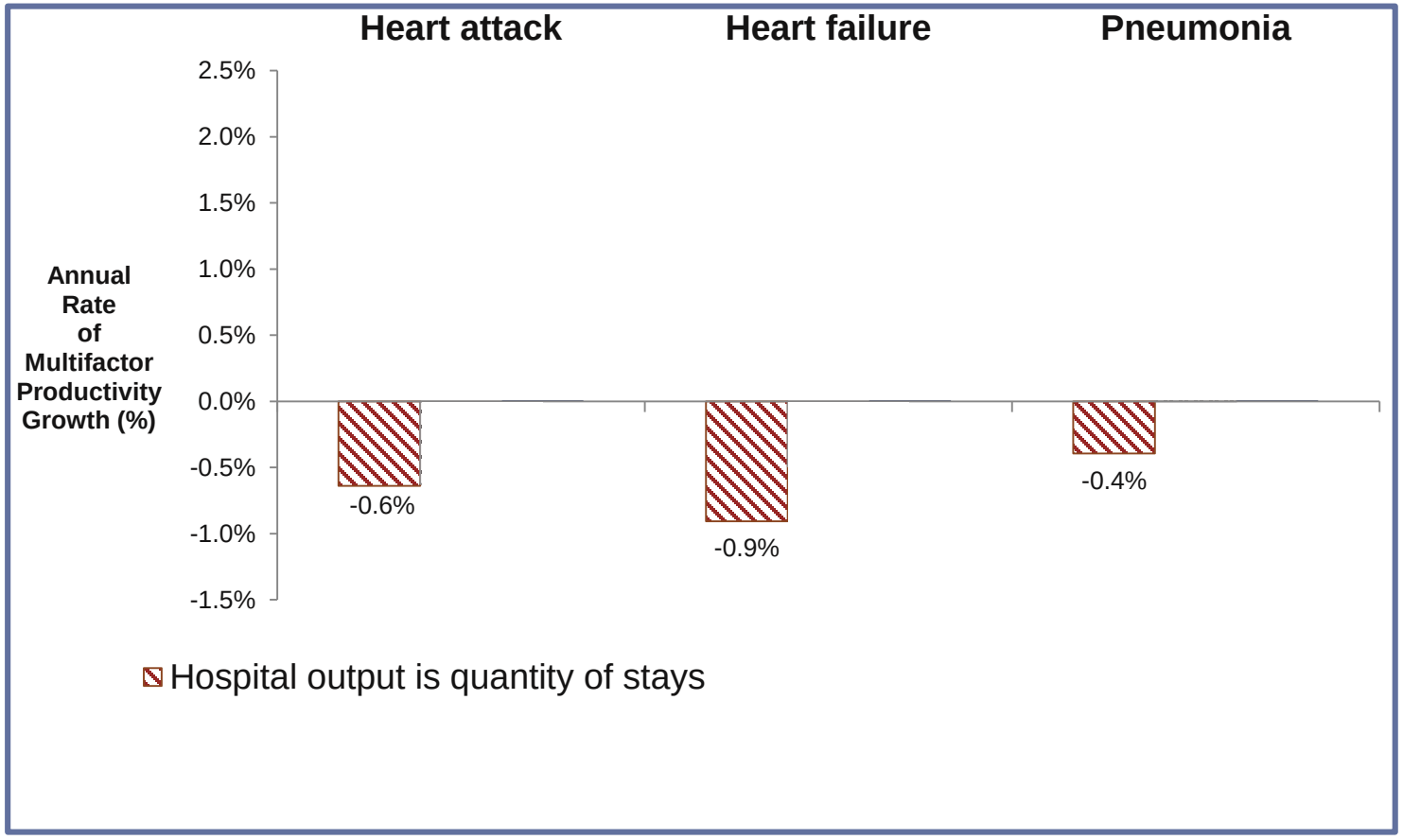
USC Schaeffer

General trend lines did not point to productivity growth

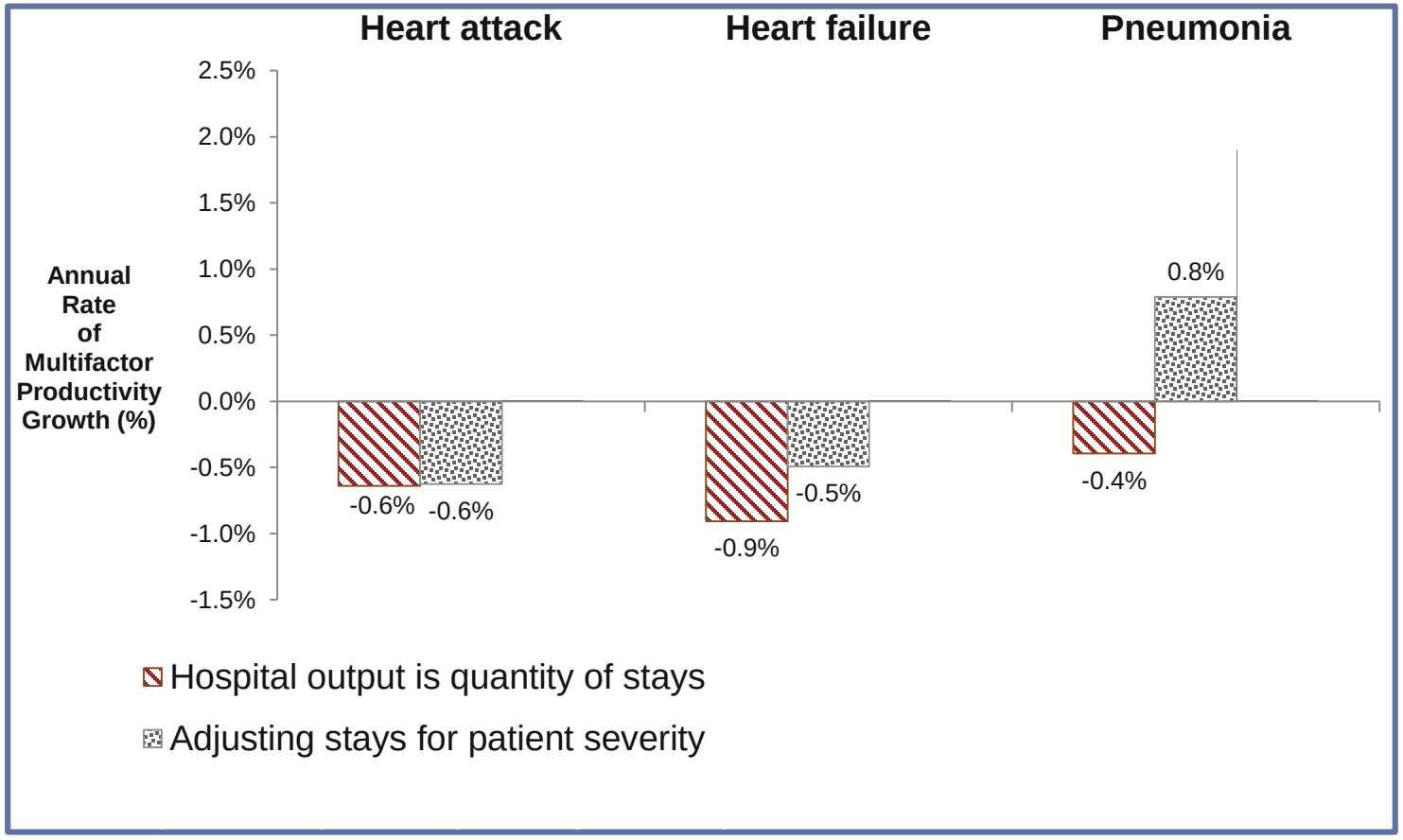


USC Schaeffer

In regression analysis, "naïve" productivity growth was negative over 2002-2011 for all conditions



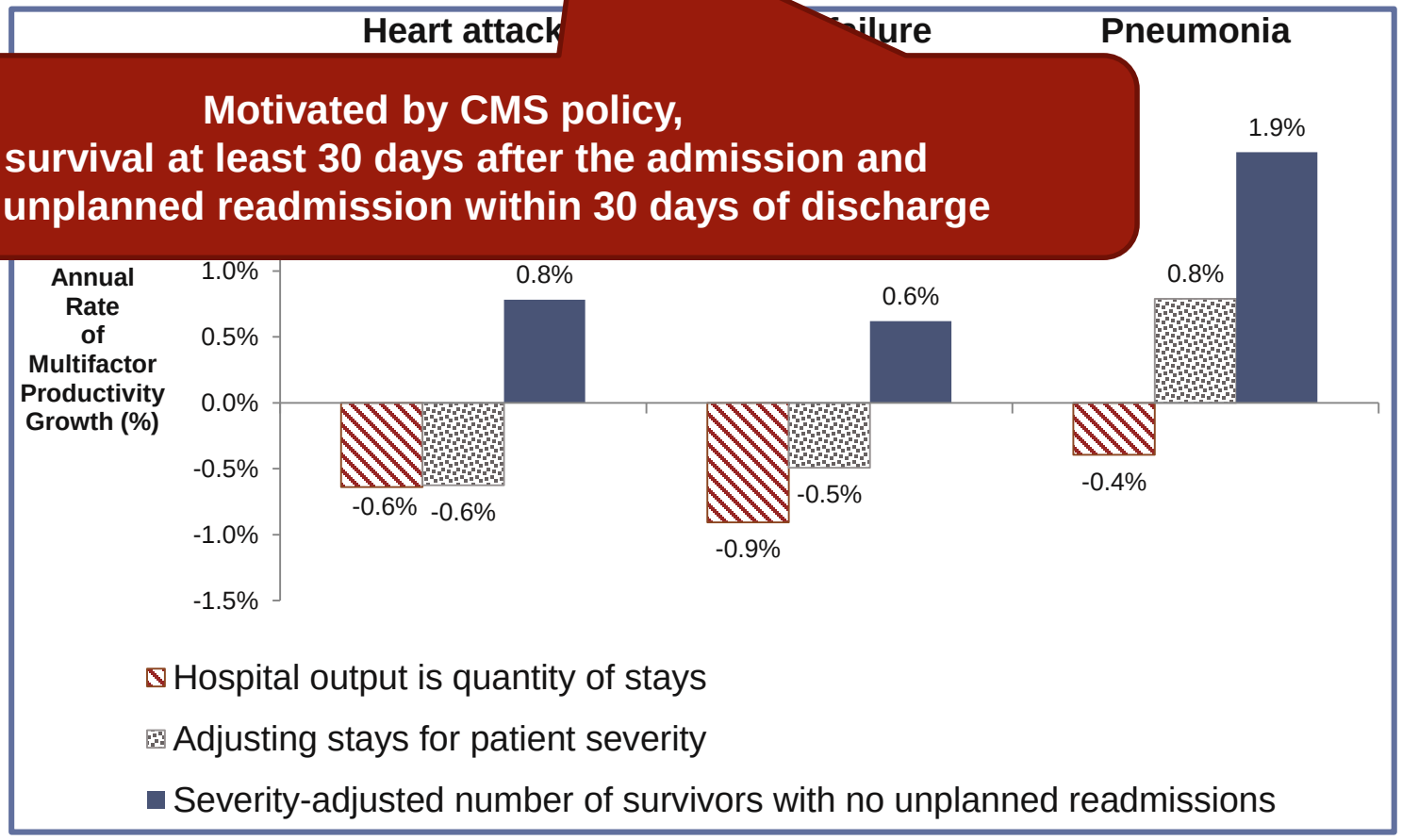
With adjustment for patient severity, measured growth improves for HF and PN



USC Schaeffer

When output is "high-quality" stays, U.S. hospitals actually performed well

Motivated by CMS policy,
1) survival at least 30 days after the admission and
2) no unplanned readmission within 30 days of discharge



Dealing with quality of health care is not a new challenge

Boskin Commission addressed CPI

- Found upward bias due to improvements in product quality

Cutler et al. analyzed heart-attack care

- Accounting for better outcomes, price of treatment *decreased*

THE
QUARTERLY JOURNAL
OF ECONOMICS

Vol. CXIII November 1998 Issue 4

ARE MEDICAL PRICES DECLINING?
EVIDENCE FROM HEART ATTACK TREATMENTS*

DAVID M. CUTLER
MARK MCCLELLAN
JOSEPH P. NEWHOUSE
DAHLIA REMLER

We address long-standing problems in measuring medical inflation by estimating two types of price indices. The first, a Service Price Index, prices specific medical services, as does the current CPI. The second, a Cost of Living Index, measures a quality-adjusted cost of treating a health problem. We apply these indices to heart attack treatment between 1983 and 1994. More frequent reweighting and accounting for price discounts lowers the measured price change for heart attacks by three percentage points annually. Accounting for quality change lowers it further; we estimate that the real Cost of Living Index fell about 1 percent annually.

I. INTRODUCTION

The difficulties of deriving accurate price indices for service industries are well-known [Griliches 1992]. In this paper we address the issue of appropriate price indices for medical care. We focus on medical care because it is a large and growing part of the

USC Schaeffer

Quality of outcomes is key factor for skilled nursing facilities too

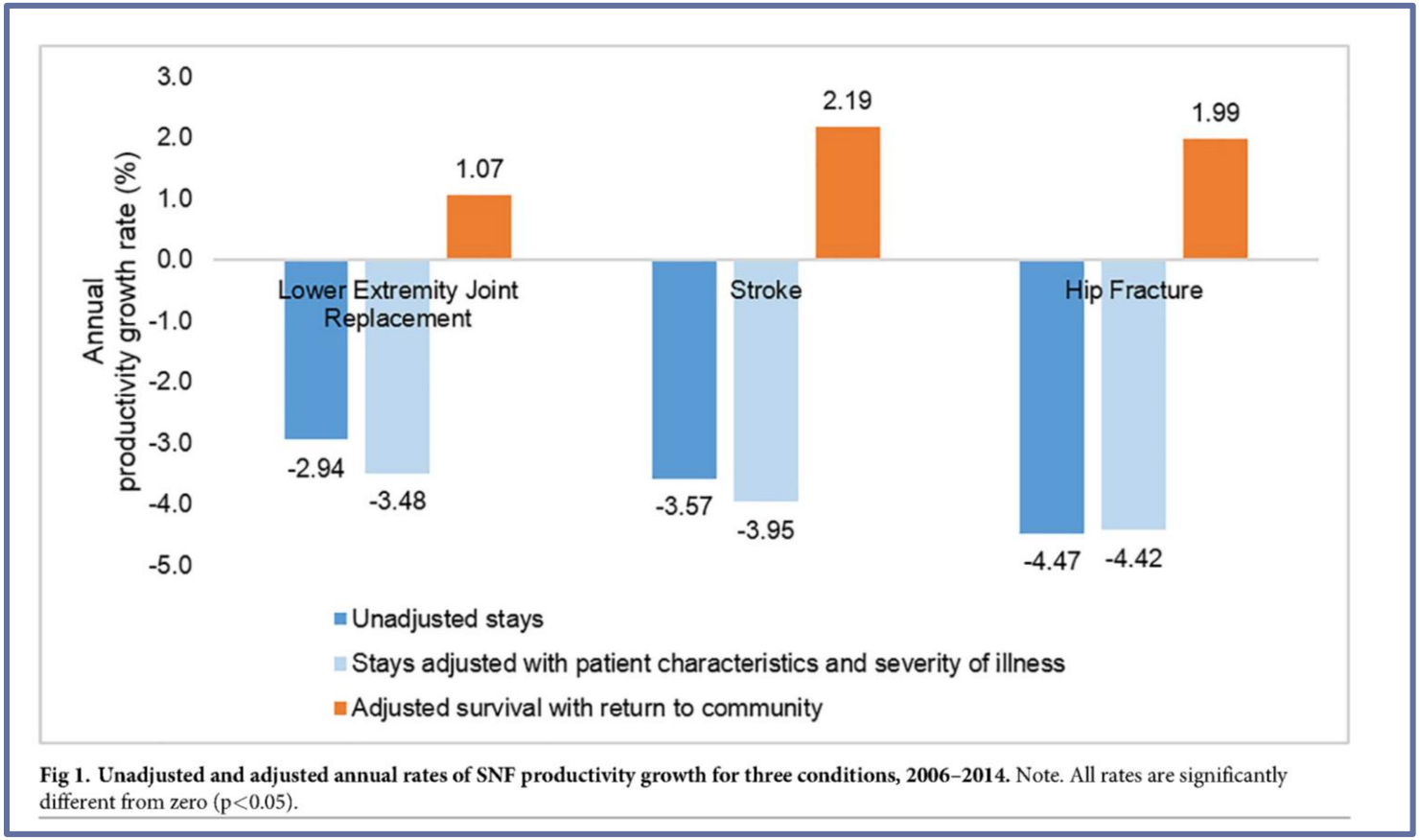


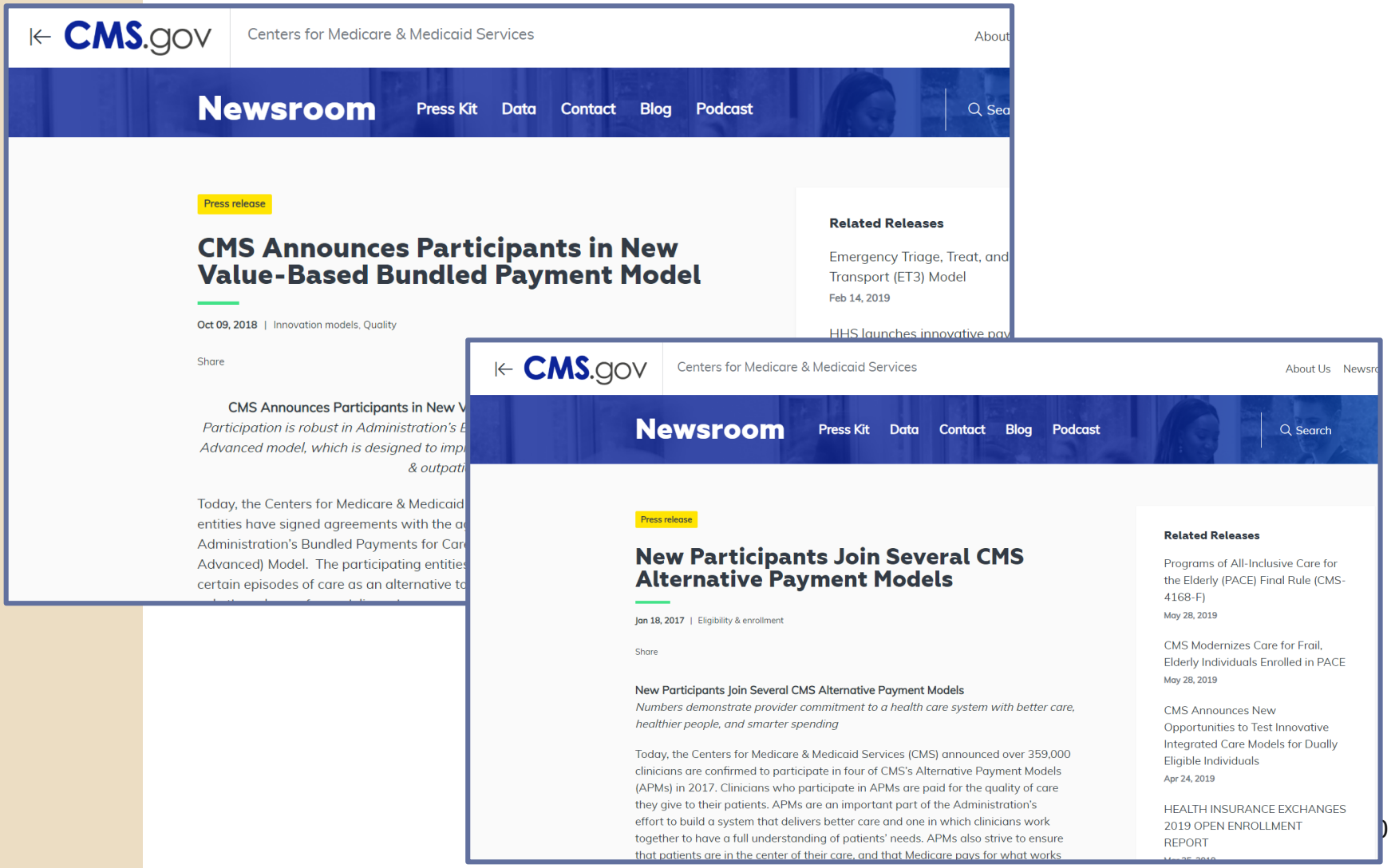
Fig 1. Unadjusted and adjusted annual rates of SNF productivity growth for three conditions, 2006–2014. Note. All rates are significantly different from zero ($p<0.05$).

Source: Gu, Dunn, Sood, and Romley (2019)

USC Schaeffer

Where do we go from here?

A comprehensive view – not limited to a particular institutional setting – is increasingly important



Where do we go from here?

Beyond encounters

- Episodes of care and population health

New populations and contexts

- Medicaid and the commercial insured
- Low-risk childbirth

Analytic issues

- “Top down” versus “bottom up”
- Multidimensionality of quality
- Tradeoff between quality and quantity

Assessing productivity drivers

- Organizational attributes
- Technical innovation
- Public policy

USC Schaeffer

Additional slides

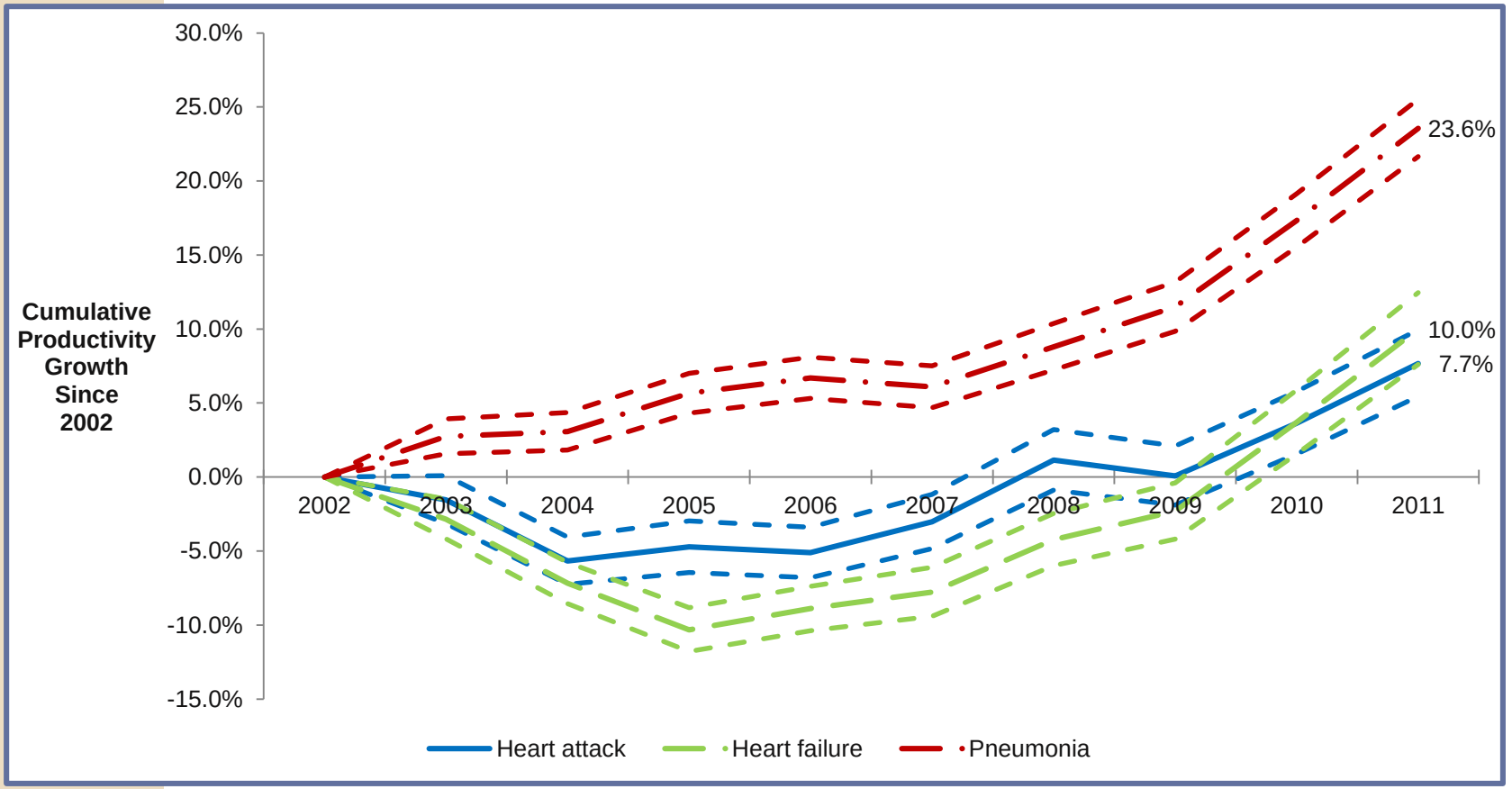
USC Schaeffer

Clinical experts for AHRQ developed model of inpatient mortality risk in administrative data sets

Table 7. Risk Adjustment Coefficients for IQI #15— AMI Mortality

Parameter	Label	DF	Estimate	Standard Error	Wald Chi-Square	Pr > Chi-Square
Intercept		1	-5.5309	0.1025	2912.8843	<.0001
Age	18 to 39	1	-0.5723	0.1438	15.8301	<.0001
Age	40 to 44	1	-0.7079	0.1302	29.5492	<.0001
Age	45 to 49	1	-0.2508	0.0847	8.777	0.0031
Age	50 to 54	1	-0.23	0.0716	10.3304	0.0013
Age	55 to 59	1	-0.1458	0.0644	5.1317	0.0235
Age	65 to 69	1	0.1264	0.0462	7.4857	0.0062
Age	80 to 84	1	0.123	0.0506	5.9012	0.0151
Age	85+	1	0.1959	0.0487	16.1528	<.0001
APR-DRG	'1611' to '1612'	1	1.1742	0.3682	10.1694	0.0014
APR-DRG	'1613' to '1614'	1	2.87	0.1589	326.1709	<.0001
APR-DRG	'1621' to '1622'	1	2.3699	0.253	87.7313	<.0001
APR-DRG	'1623'	1	3.9284	0.1762	497.1341	<.0001
APR-DRG	'1624'	1	4.6219	0.1993	537.5819	<.0001
APR-DRG	'1651' to '1652'	1	1.0558	0.1471	51.5343	<.0001
APR-DRG	'1653'	1	2.6729	0.1227	474.6562	<.0001
APR-DRG	'1654'	1	3.8062	0.1407	731.6044	<.0001
APR-DRG	'1731' to '1734'	1	3.8338	0.1753	478.5413	<.0001
APR-DRG	'1742'	1	1.4064	0.1109	160.7569	<.0001
APR-DRG	'1743'	1	3.035	0.1096	766.6736	<.0001
APR-DRG	'1744'	1	4.4992	0.1026	1922.9611	<.0001
APR-DRG	'1901'	1	1.4033	0.1255	125.084	<.0001
APR-DRG	'1902'	1	2.3416	0.1028	519.1431	<.0001
APR-DRG	'1903'	1	3.3619	0.0984	1167.0483	<.0001
APR-DRG	'1904'	1	4.9943	0.0982	2585.3541	<.0001
MDC	5	1	3.5402	0.1069	1096.7232	<.0001
TRNSFER		1	-0.2032	0.0352	33.3572	<.0001
c-statistic	0.84					

Romley et al. (2015): Year by year



USC Schaeffer

Geographic variation in productivity of inpatient heart attack treatment

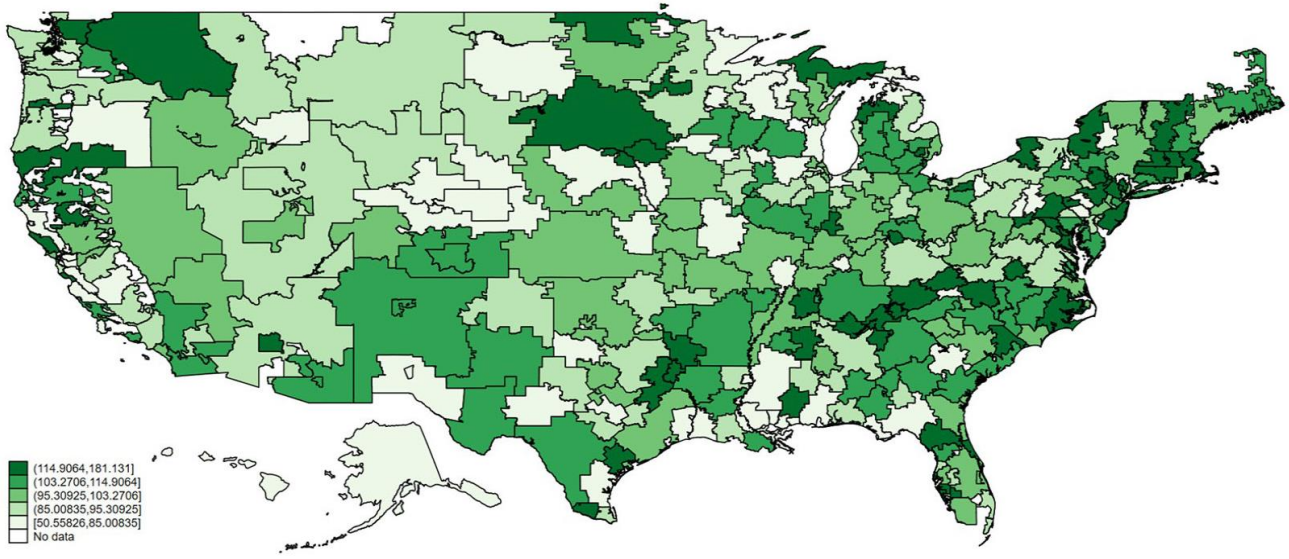


Fig 1. Value index for inpatient heart attack care in 2013, by hospital referral region grouped into quintiles. Note: Darker green indicates higher value.

Source: Romley, Trish, Goldman, Buntin, Hu and Ginsburg (2019)