Topics in Medicare

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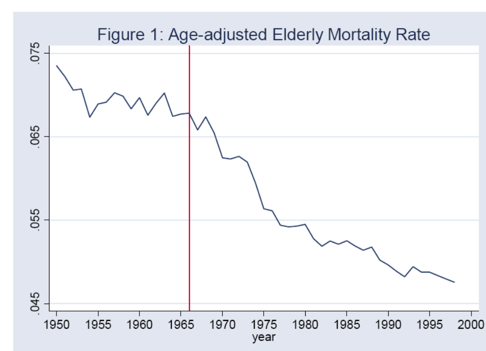
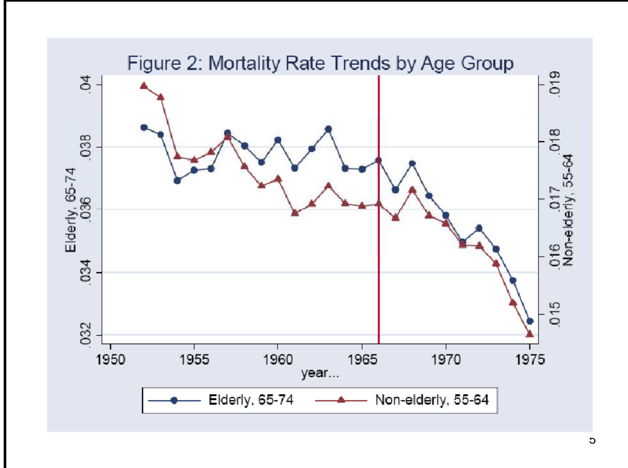
Research question

- Currently 47 million uninsured
- Efforts to expand coverage in Congress
- Will health improve because of an expansion of insurance coverage?
- Outside of Medicare, how can we answer this question in a way that provides convincing results?
  - Hint: Think of previous papers we've read

Un-insurance rates

Age Group	1963	1970	1977
45-54	28%	18%	13%
55-64	28%	25%	13%
65-74	34%	2%	1%
75+	60%	4.6%	0.2%





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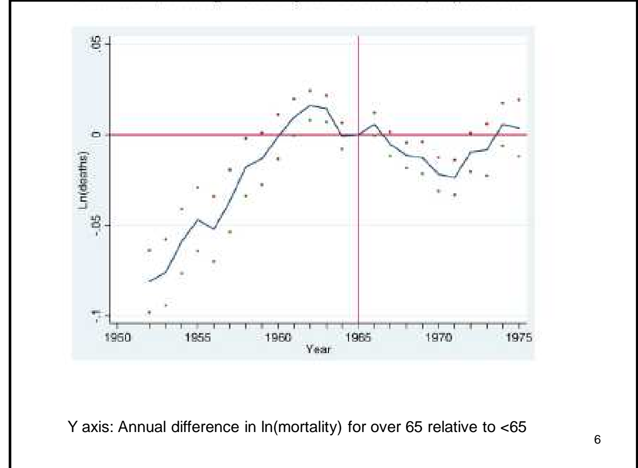

Y axis: Annual difference in ln(mortality) for over 65 relative to <65

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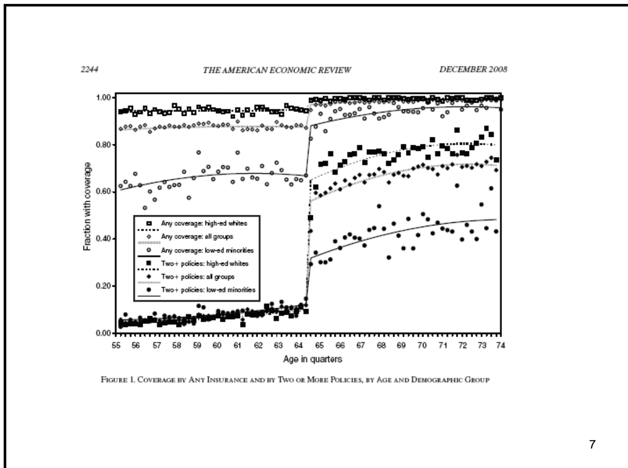

Figure 1. Coverage by Any Insurance and by Two or More Policies, by Age and Demographic Group

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Table 1—Insurance Characteristics Just before Age 65 and Estimated Discontinuities at Age 65

	On Medicare		Any insurance		Private coverage		2+ Forms coverage		Managed care	
	Age 63–4 (1)	RD at 65 (2)	Age 63–4 (3)	RD at 65 (4)	Age 63–4 (5)	RD at 65 (6)	Age 63–4 (7)	RD at 65 (8)	Age 63–4 (9)	RD at 65 (10)
Overall sample	12.3	59.7 (4.1)	87.9	9.5 (0.6)	71.8	−2.9 (1.1)	10.8	44.1 (2.8)	59.4	−28.4 (2.1)
Classified by ethnicity and education:										
White non-Hispanic:										
High school dropout	21.1	58.5 (4.6)	84.1	13.0 (2.7)	63.5	−6.2 (3.3)	15.0	44.5 (4.0)	48.1	−25.0 (4.5)
High school graduate	11.4	64.7 (5.0)	92.0	7.6 (0.7)	80.5	−1.9 (1.6)	10.1	51.8 (3.8)	58.9	−30.3 (2.6)
At least some college	6.1	68.4 (4.7)	94.6	4.4 (0.5)	85.6	−2.3 (1.8)	8.8	55.1 (4.0)	69.1	−40.1 (2.6)
Minority:										
High school dropout	19.5	44.5 (3.1)	66.8	21.5 (2.1)	33.2	−1.2 (2.5)	11.4	19.4 (1.9)	39.1	−8.3 (3.1)
High school graduate	16.7	44.6 (4.7)	85.2	8.9 (2.8)	60.9	−5.8 (5.1)	13.6	23.4 (4.8)	54.2	−15.4 (3.5)
At least some college	10.3	52.1 (4.9)	89.1	5.8 (2.0)	73.3	−5.4 (4.3)	11.1	38.4 (3.8)	66.2	−22.3 (7.2)
Classified by ethnicity only:										

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Table 3—Measures of Access to Care Just before 65 and Estimated Discontinuities at 65

	1997–2003 NHIS				1992–2003 NHIS			
	Delayed care last year		Did not get care last year		Saw doctor last year		Hospital stay last year	
	Age 63–64 (1)	RD at 65 (2)	Age 63–64 (3)	RD at 65 (4)	Age 63–64 (5)	RD at 65 (6)	Age 63–64 (7)	RD at 65 (8)
Overall sample	7.2	−1.8 (0.4)	4.9	−1.3 (0.3)	84.8	1.3 (0.7)	11.8	1.2 (0.4)
Classified by ethnicity and education:								
White non-Hispanic:								
High school dropout	11.6	−1.5 (1.1)	7.9	−0.2 (1.0)	81.7	3.1 (1.3)	14.4	1.6 (1.3)
High school graduate	7.1	0.3 (2.8)	5.5	−1.3 (2.8)	85.1	−0.4 (1.5)	12.0	0.3 (0.7)
At least some college	6.0	−1.5 (0.4)	3.7	−1.4 (0.3)	87.6	0.0 (1.3)	9.8	2.1 (0.7)
Minority:								
High school dropout	13.6	−5.3 (1.0)	11.7	−4.2 (0.9)	80.2	5.0 (2.2)	14.5	0.0 (1.4)
High school graduate	4.3	−3.8 (3.2)	1.2	1.5 (3.7)	84.8	1.9 (2.7)	11.4	1.8 (1.4)
At least some college	5.4	−0.6 (1.1)	4.8	−0.2 (0.8)	85.0	3.7 (3.9)	9.5	0.7 (2.0)

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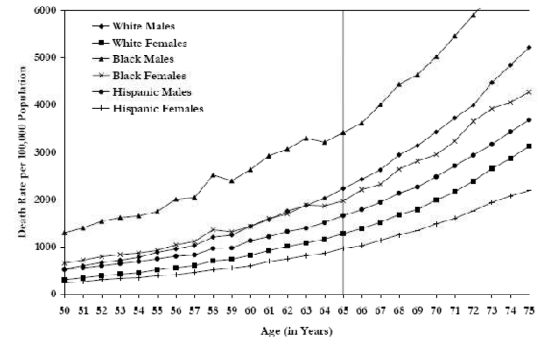
Figure 14. Age-Specific Death Rates by Sex and Race



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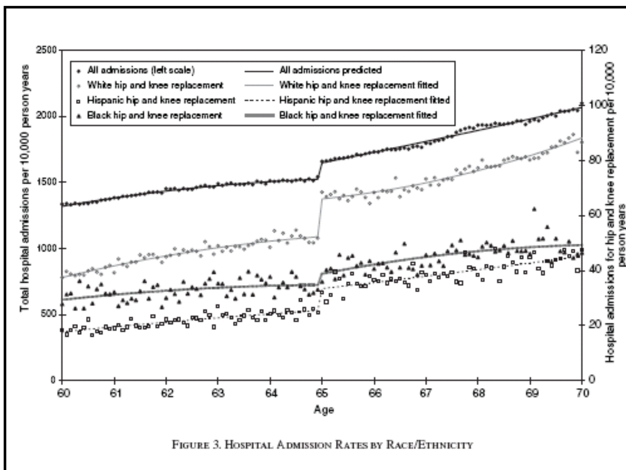

Figure 3. Hospital Admission Rates by Race/Ethnicity

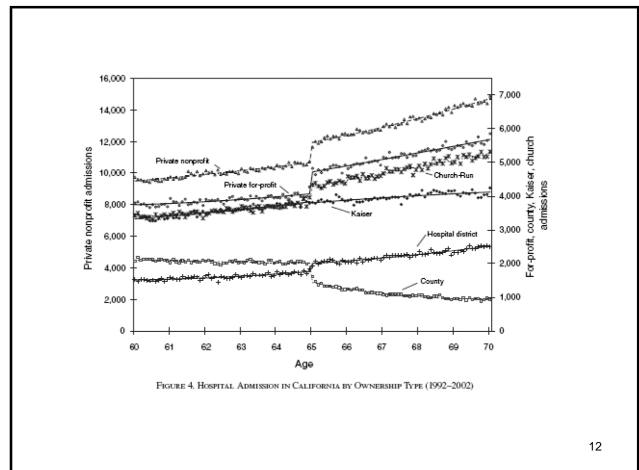

Figure 4. Hospital Admission in California by Ownership Type (1992–2002)

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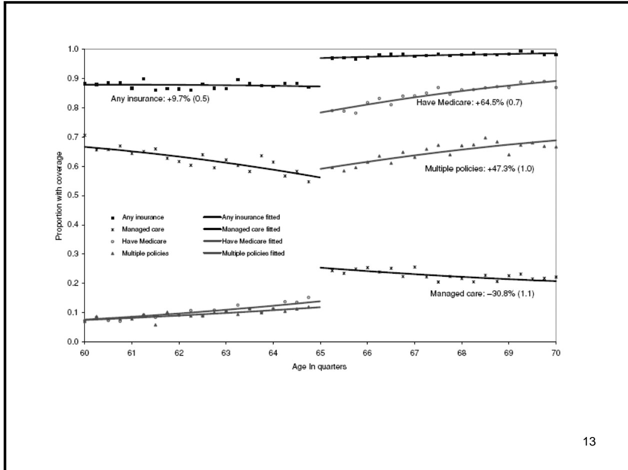

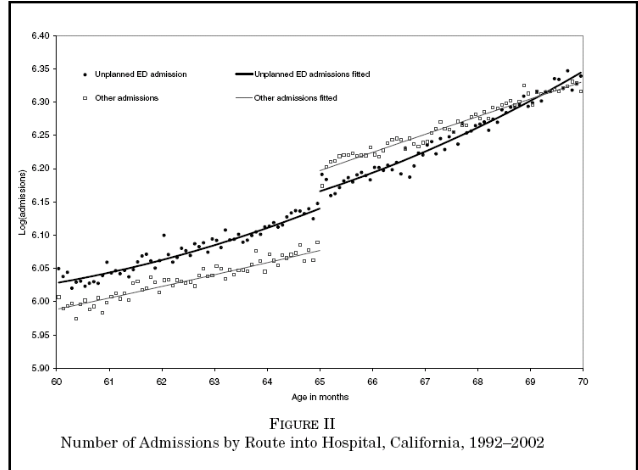

FIGURE II
Number of Admissions by Route into Hospital, California, 1992–2002

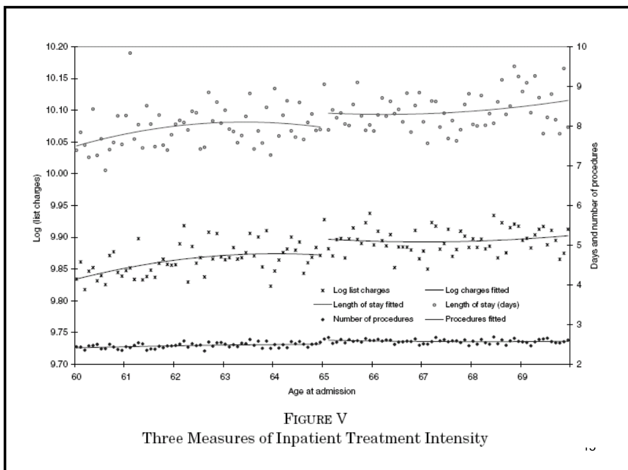

FIGURE V
Three Measures of Inpatient Treatment Intensity

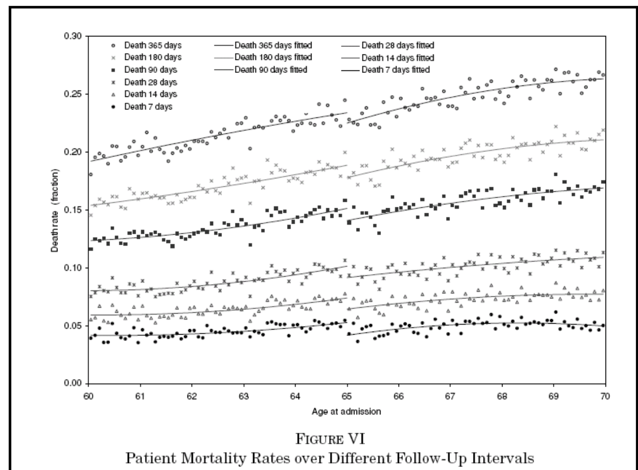

FIGURE VI
Patient Mortality Rates over Different Follow-Up Intervals

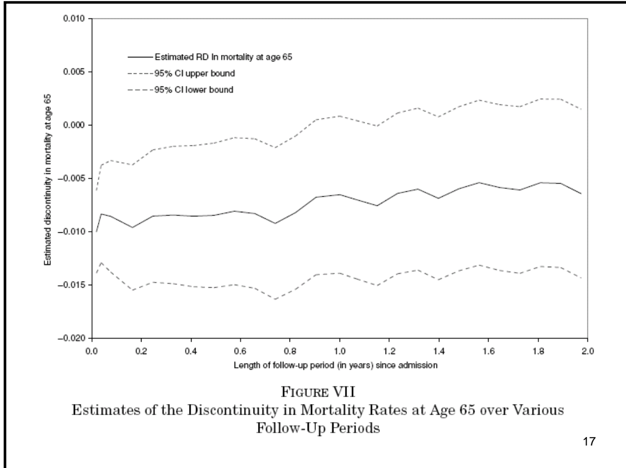

FIGURE VII
Estimates of the Discontinuity in Mortality Rates at Age 65 over Various Follow-Up Periods

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Prospective payment system

- Prior to PPS, hospital stays were reimbursed based on fee for service
  - Hospitals kept track of every procedure performed and were reimbursed for services
- Concern: asymmetric information lead to principal/agent problem
  - Hospitals had the incentive to over-provide care

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- Between 1975 and 1980, hospital expenditures increased 120%
- In response, Congress adopted PPS
- How it works
  - Based on diagnosis, patients are placed into Diagnosis related groups (DRG)
  - Over 500 categories
  - Hospitals are then given a fixed dollar amount based on the DRG

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- Reimbursement to hosp h, admission d is
- $P_{hd} = P_h(1+IME_h)(1+DSH_h)W_d$
- P_h annually adj. hospital cost factor
- IME_h adjustment for medical education
- DSH_h disproportionate share payment
  - Compensate for high fraction indigent
- W_d is the DRG weight

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DRG weights

- Generates most of the variation in cost
  - Allergic reactions (W_g=0.09)
  - Liver transplants (W_d=22.8)
- Weights recoded annually
  - Categories with rising costs are coded down
- DRG based on ‘relative valuation’ scale

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Incentives

- To NOT over-provide care
- To discharge patients as early as possible
- To “upcode”
  - Complicated cases get higher reimbursement
  - Get more if upcode the DRG
- To shift patients to outpatient – not subject to PPS

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Upcoding

- More complicated cases have higher reimbursement rates
  - CABG vs. CABG with complications
- To receive higher reimbursement, may ‘upcode’ move patient to more serious category

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Carter et al. (1990)

- Sample of inpatient charts from 1986/87
- Sent to expert coding group (SuperPRO)
- Examined whether DRG was accurate
- Found 1/3 of the increase in DRG case-mix during that period was DRG creep

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Dafney

- 473 DRG codes in 1987
- 95 “pair” coded (same condition, complicated and uncomplicated)
  - 138 arrhythmia >69 and/or complications
  - 139 arrhythmia w/out complications
- Starting in 1988, eliminated the >69 age group for complications
  - Now “pairs” were just w/ and w/out comps.

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- Immediate drop in the # of complicated conditions (those >69 were not automatically placed with that group)
- Changed relative price in comp/non-comp conditions

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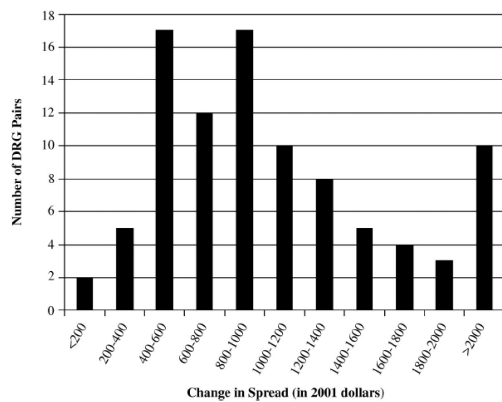

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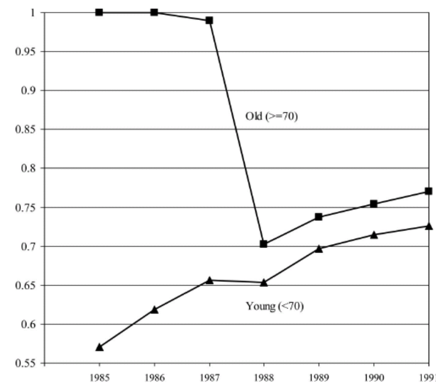

FIGURE 1. FRACTION OF ADMISSIONS IN TOP CODES BY AGE GROUP

Notes: Sample includes all admissions to DRG pairs in hospitals financed under PPS. Author's tabulations from the 20-percent MedPAR sample.

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Incentive to upcode

- For younger (<70)
  - Trend is for increased % complicated over time
  - But incentive changed in 1987 – now there is a shift in the benefit of upcoding
  - Should see an increase in upcoding for higher benefit pairs relative to lower benefit pairs

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- For older (>69)
  - Large decline in % complicated due to law change
  - The decline should be smaller in conditions with the greatest incentive to upcode

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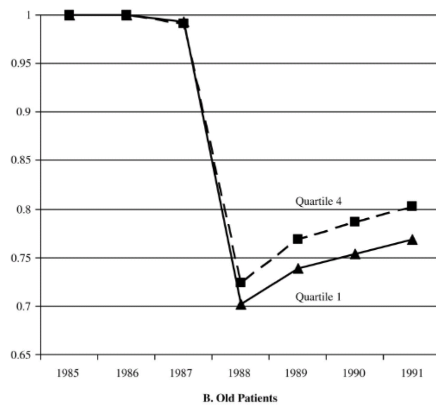

FIGURE 3. FRACTION OF ADMISSIONS IN TOP CODES BY AGE GROUP AND QUARTILE OF SPREAD CHANGE

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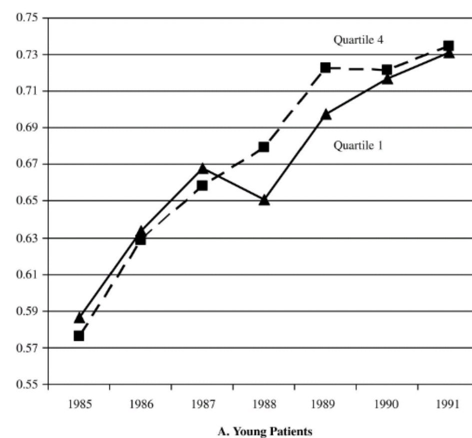

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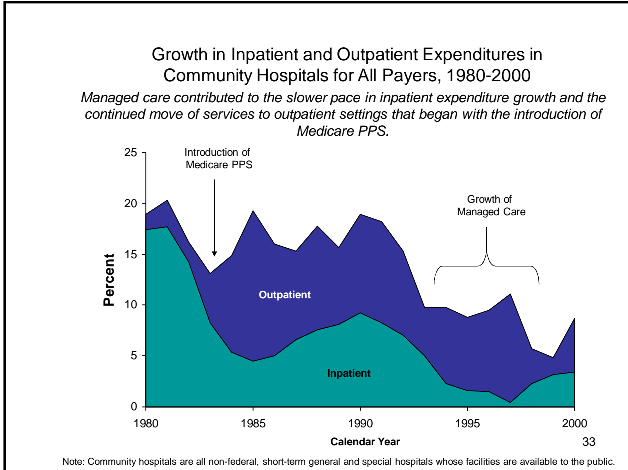

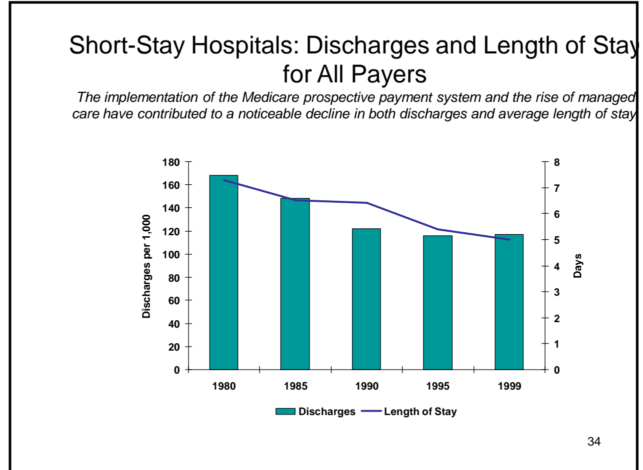

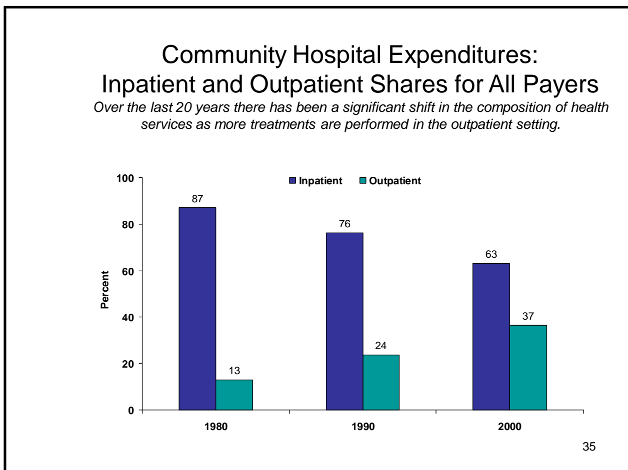

Rodgers et al.

- Considered outcomes for ≈12,500 patients
- 5 diseases (heart failure, heart attack, pneumonia, stroke, hip fracture)
- Two periods:
  - 1981/82 (Pre PPS)
  - 1985/6 (Post PPS)

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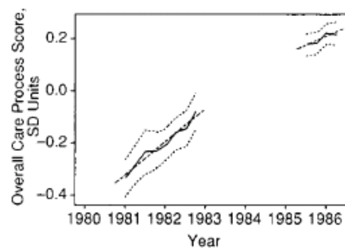

Fig 1.—In-hospital processes of care for five diseases (n = 14 012). Solid line indicates values for the sample; dotted and dashed line, trends before and after the introduction of the prospective payment system; and dotted lines, sample values ±2 SEs.

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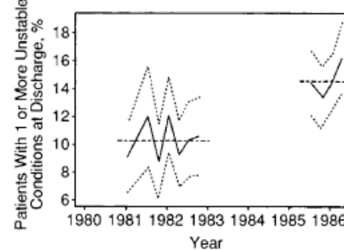

Fig 3.—Patients discharged with one or more unstable conditions for five diseases (n = 7412). Solid line indicates values for the sample; dotted and dashed line, trends before and after the introduction of the prospective payment system; and dotted lines, sample values ±2 SEs.

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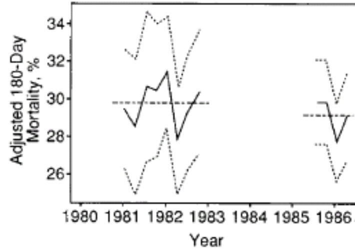

Fig 4.—Mortality rates 180 days after admission, adjusted for sickness at admission, for five diseases (n = 12 823). Solid line indicates values for the sample; dotted and dashed line, trends before and after the introduction of the prospective payment system; and dotted lines, sample values ±2 SEs.

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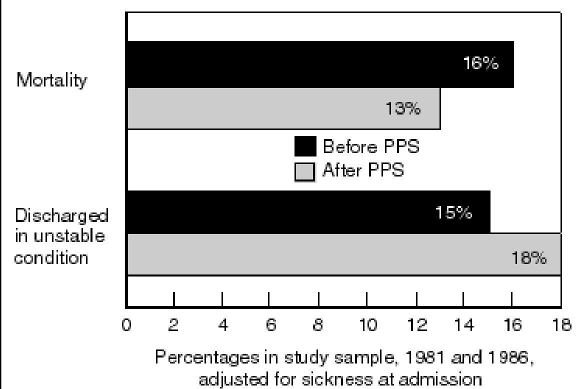

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Cutler

- Uses data on 30K recipients, 40K admissions in New England to evaluate PPS on outcomes
- Identification: MA adopted PPS later than the rest of the country

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Data

- 6 NE states including MA
- 5 adopt PPS in FY84, MA in 86
- 3 periods
  - 81-83 Pre PPS for all
  - 84-85 Fed PPS
  - 86-88, PPS in all states
- 1% random sample

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- Diagnosis were selected as being susceptible to quality of care
  - In: heart attack, pneumonia
  - Out: mental health, arthritis
- Outcomes
  - In hospital mortality, readmission to any hospital, death within a particular time
- Clean prediction: if quality of care has declined, mortality should increase

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- Readmission is less clear: people should be discharged sicker but death could prevent readmission
  - 30 day mortality 2.5x as large as readmission rate

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TABLE II
READMISSION AND MORTALITY RATES, BEFORE AND AFTER PROSPECTIVE PAYMENT

Days from [2u Discharge	Federal Prospective Payment 1981–83	Federal Post-PPS 1984–85	Federal Post-PPS 1986–88	Mass. Prospective Payment 1981–83	Mass. 1984–85	Mass. Post-PPS 1986–88
	A. Readmission Probability					
30	4.6% (0.3)	5.8% (0.3)	5.8% (0.2)	4.5% (0.3)	4.7% (0.4)	6.3% (0.3)
180	13.8 (0.4)	15.6 (0.4)	16.1 (0.4)	13.5 (0.5)	13.5 (0.6)	17.1 (0.4)
365	19.6 (0.5)	21.3 (0.5)	21.4 (0.5)	18.0 (0.6)	19.1 (0.6)	22.4 (0.6)

Experiment 1: Fed as treatment, MA as control

Experiment 2: MA as treatment, Fed as control

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TABLE II
READMISSION AND MORTALITY RATES, BEFORE AND AFTER PROSPECTIVE PAYMENT

Days from [2u Discharge	Federal Prospective Payment 1981–83	Federal Post-PPS 1984–85	Federal Post-PPS 1986–88	Mass. Prospective Payment 1981–83	Mass. 1984–85	Mass. Post-PPS 1986–88
	B. Mortality Probability					
0	9.6% (0.4)	9.1% (0.4)	10.2% (0.3)	8.9% (0.4)	11.0% (0.5)	9.6% (0.3)
30	13.4 (0.4)	12.8 (0.4)	14.1 (0.3)	12.4 (0.5)	14.1 (0.5)	13.0 (0.4)
180	21.9 (0.5)	22.5 (0.5)	24.1 (0.4)	21.8 (0.6)	23.7 (0.7)	23.2 (0.5)
365	28.5 (0.5)	29.3 (0.6)	30.7 (0.4)	28.7 (0.7)	30.8 (0.7)	30.3 (0.5)

Experiment 1: Fed as treatment, MA as control

Experiment 2: MA as treatment, Fed as control

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Mortality Effects

	Fed (control)		MA (Treat)		
Followup	Bef.	Aft.	Bef.	Aft.	D-D
0	9.1	10.2	11.0	9.6	-1.1
30	12.8	14.1	14.1	13.0	-1.3
180	22.5	24.1	23.7	23.2	-1.6
365	29.3	30.7	30.8	30.3	-1.4

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Reuslts

- Large reduction in in-hospital mortality
  - But not much change in after discharge mortality
- Large increase in after hospital discharge
  - Possibly suggesting that people were discharged in a sicker state, requiring re-admissions

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