

Induced Demand

Lather, rinse, repeat

1

Introduction

- Two key concepts we've been stressing collide in this section
 - The role of incentives
 - Asymmetric information
- Lively topic of research
- Lots of suggestive but not definitive results

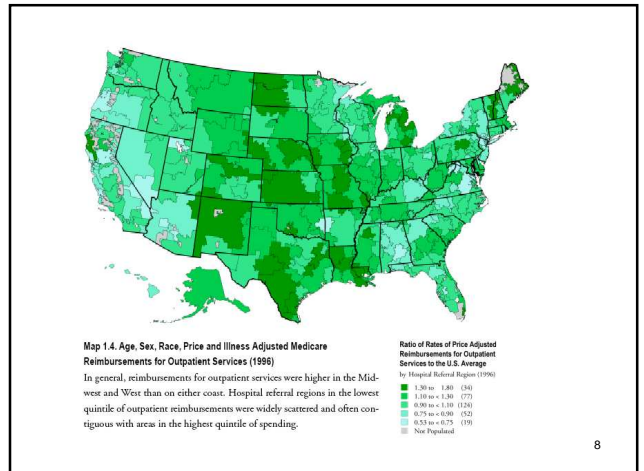
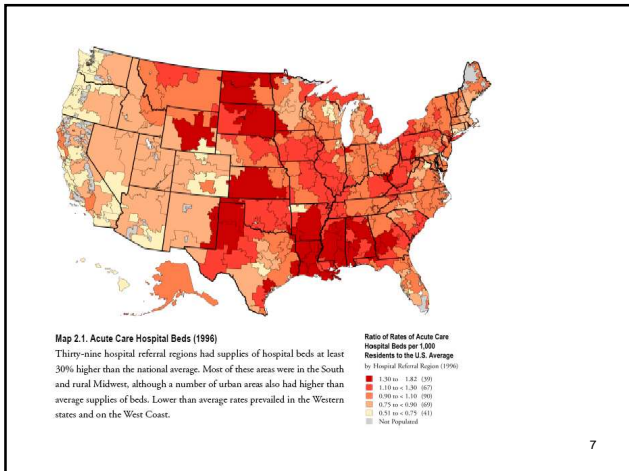
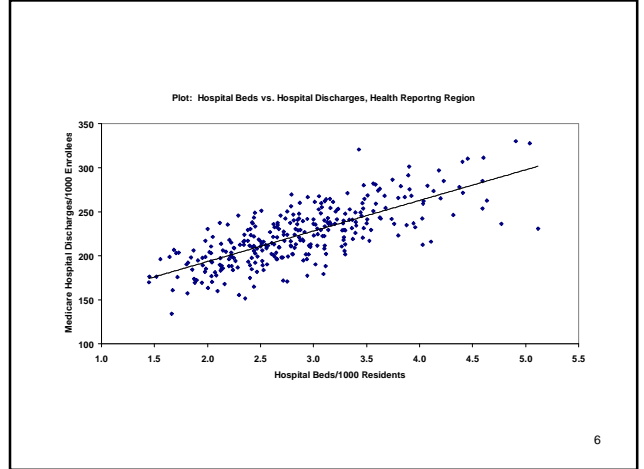
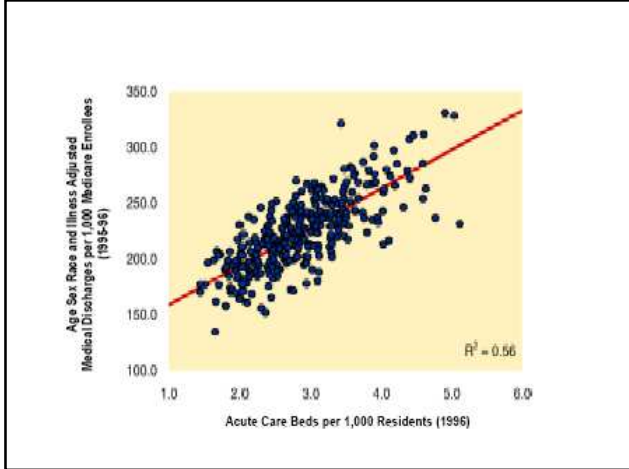
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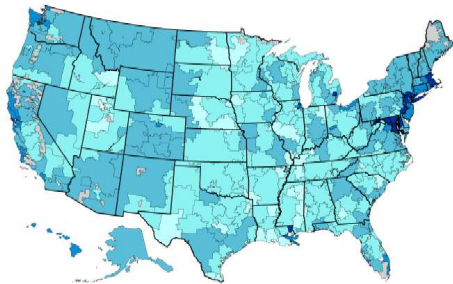
- Idea: when providers paid on a per unit basis, they have an incentive to order more procedures, whether needed or not
 - Still the case in Medicare
- Problem: patients in poor position to understand whether a procedure is needed, so they do not have the ability to monitor

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- Idea took root when people observed that areas with greater hospital beds had more higher hospitalization rates
- Why would many dismiss these results immediately as simply correlation and not causation?
- Tests have become more sophisticated over time

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Map 2.4. The Physician Workforce (1996)
 In 1996, there were higher than average numbers of physicians per 100,000 residents of the East and West Coasts, parts of the Mountain and Southwestern states, and in the Pacific Northwest. Some regions with high supplies of physicians were contiguous with areas that had much lower supplies, as in Nebraska, New Mexico, and Idaho.

Ratio of Rates of Physicians per 100,000 Residents to the U.S. Average by Hospital Referral Region (1996)

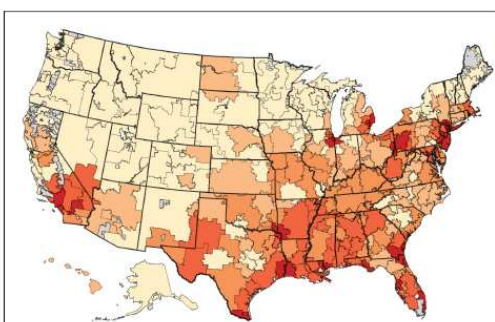
1.30 or + 1.77 (18)
1.00 or + 1.26 (27)
0.90 or + 1.10 (90)
0.75 or + 0.90 (132)
0.60 or + 0.73 (11)
Not Populated

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Some evidence against

- Dranove et al., looked at the induced demand for childbirth
- Compared frequency of childbirth with concentration of OB/GYNs
- Found that OB/GYNs 'induced' childbirth
- Tongue in cheek paper, but it drives the point home

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Attributes of U.S. HRRs in Different Quintiles of the EOL-EI*

Variable

Quintile of EOL-EI

1	2	3	4	5
(Lowest)				(Highest)

Ratio (Highest to Lowest)

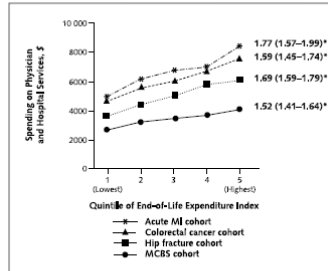
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Attributes of U.S. HRRs in Different Quintiles of the EOL-EI*

Variable	Quintile of EOL-EI					Ratio (Highest to Lowest)
	1 (Lowest)	2	3	4	5 (Highest)	
EOL-EI, \$ ¹	9074	10 636	11 559	12 598	14 644	1.61
Per capita Medicare spending, \$ ²	3922	4439	4940	5444	6304	1.61
Hospital characteristics³						
Overall supply (beds per 1000), n	2.4	2.6	2.9	2.9	3.2	1.32
Beds in teaching hospitals, %	10.2	18.1	13.8	20.8	28.1	2.76
Beds in hospitals with > 300 beds, %	31.6	37.4	38.7	43.8	57.2	1.81
Physician supply (per 10 000), n⁴	184.8	189.4	184.4	204.6	242.4	1.31
Medical specialists	26.9	28.8	28.6	34.8	44.4	1.65
General internists	21.3	23.4	22.6	28.5	37.3	1.75
Family practitioner/GP	35.9	31.3	29.6	25.9	26.5	0.74
Surgeons	43.8	45.6	46	50.3	56.4	1.29
All other specialties	56.8	60.3	57.5	65.1	77.7	1.37
Medicare enrollees in HMOs, %	12.1	6.8	7.3	7.7	15.3	1.26
Residents in metropolitan areas, %	77.5	81.9	82.3	79.2	97.4	1.26

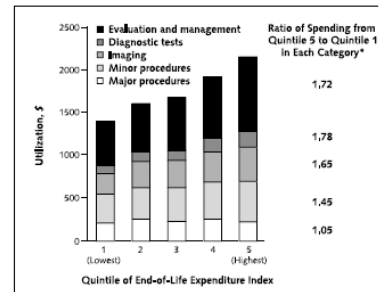
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Figure 3. Per capita utilization of hospital and physician services during follow-up by study cohorts.



MCBS = Medicare Current Beneficiary Survey; MI = myocardial infarction. The graph presents unadjusted annual per capita spending on hospital and physician services (using standardized national prices) for each cohort in each quintile of the End-of-Life Expenditure Index. Data shown for the acute myocardial infarction, colorectal cancer, and hip fracture cohorts exclude the first 6 months of follow-up. *Relative rate of utilization in quintile 5 compared with quintile 1, adjusting for baseline differences in patient characteristics. Values in parentheses are 95% CIs.

Figure 4. Utilization of physician services across quintiles of spending for the Medicare Current Beneficiary Survey cohort, 1992–1996.

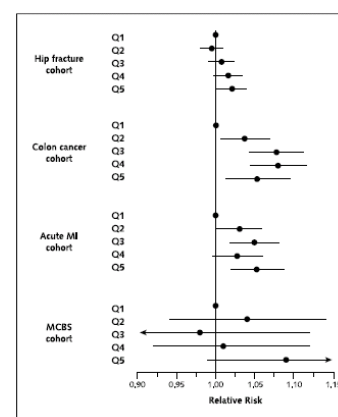


Utilization is summarized as unadjusted average annual per capita spending on physician services (using standardized national prices, as described in the Methods section). *Categories defined by using the Berenson-Eggers type of service classification scheme.

Table 5. Quality of Care according to Level of Medicare Spending in Hospital Referral Region of Residence*

Variable	Quintile of EOL-EI					Test for Trend
	1 (Lowest)	2	3	4	5 (Highest)	
Acute MI cohort†						
Received reperfusion within 12 hours	55.8	55.3	52.3	53.3	49.8	↓
Received aspirin in the hospital	87.7	87.0	84.8	85.3	83.9	↓
Received aspirin at discharge	83.5	82.5	79.8	78.5	74.8	↓
Received ACE inhibitors at discharge	62.7	60.0	56.6	58.3	58.5	↓
Received β-blockers in the hospital	61.5	61.0	54.3	61.5	63.9	↑
Received β-blockers at discharge	52.7	53.2	47.1	53.5	53.7	>0.05

Figure 1. Adjusted relative risk for death during follow-up across quintiles of Medicare spending.



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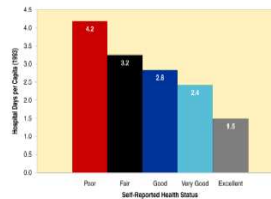


Figure 3.6a. Average Hospital Days Stratified by Self-Reported Health (1993)
The average number of hospital days corresponds to Medicare enrollees' self-reported health status; enrollees who report themselves to have better health status use fewer days of hospital care.

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Table 3.2. Actual and Predicted Days in Hospitals (1993)

Rates of hospitalizations do not reflect population health status; predicted demand, based on self-reported health status, was the same in the regions in the lowest quintile of per capita supply of hospital beds as in the region in the highest quintile — about 2.2 days per person per year.

(1) Quintile of Beds	(2) Beds/1,000 (Range)	(3) Actual Hospital Days	(4) Hospital Days as Predicted by Health Status
1 Bottom 20%	<2.9	1.8	2.2
2 Second 20%	2.9–3.2	1.8	2.1
3 Middle 20%	3.2–3.5	2.0	2.2
4 Fourth 20%	3.5–3.9	2.0	2.2
5 Highest 20%	>3.9	2.8	2.2

Data Source: Medicare Current Beneficiary Survey Atlas Data

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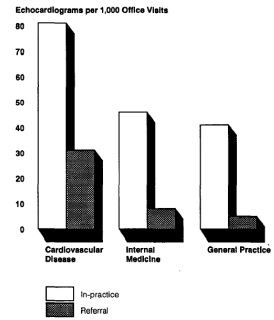
Hillman et al, 1990 (NEJM)

- Doctors can send patients to diagnostic clinics
- Sometimes, the clinics are owned by physicians, sometimes they are not
- These authors, compared rates that physicians referred patients to imaging centers based on certain conditions

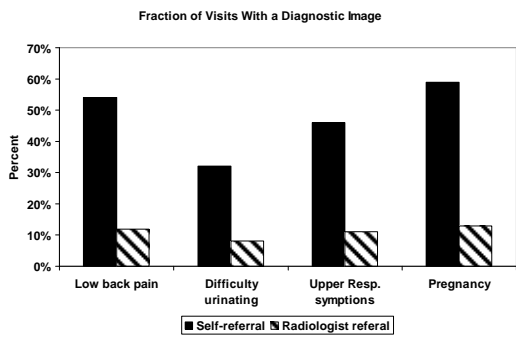
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- Compared two groups
 - Physicians that owned their own imaging centers
 - Those that did not (had to refer to radiologist)
- Using the previous model, is this a change in m or a change in Q?

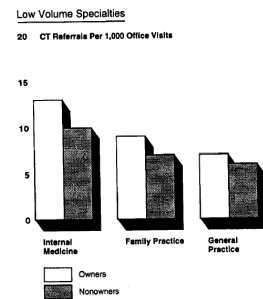
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Gruber-Owings

- Excellent example of empirical analysis of SID
- Different type of identification strategy
- Most papers rely on either
 - Cross area variation in doctors
 - Fee schedules that may induce demand

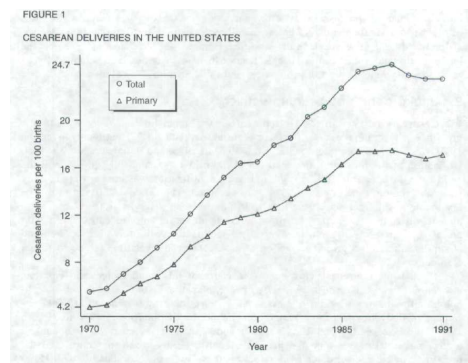
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- Exploits the fact that
 - OB/GYNs paid more if deliver by c-section
 - Between 1970-82, fertility declined 13.5%
 - C-sections were at 5.5% in 1970, rose 240% over the next decade
- Question: did doc's respond to the income 'shock' of reduced births by performing more c-sections

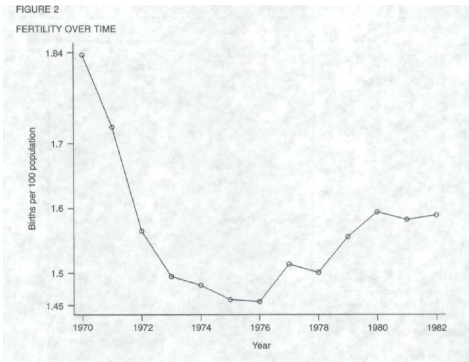
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- Some key facts
 - Tremendous variation across areas in fertility rates. Use this fact in model
 - The time, physicians made \$500 more delivering by c-section (1989\$)
 - C-section, \$2100
 - Vaginal, \$1600

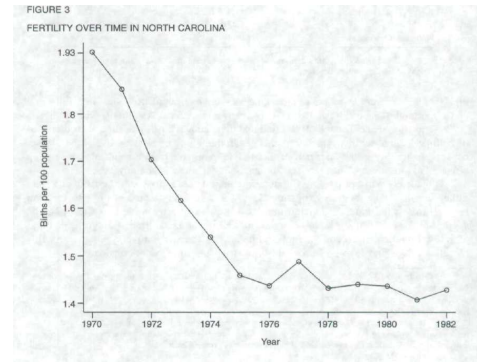
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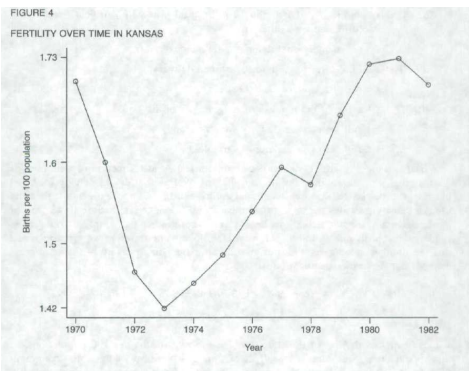
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TABLE 2 Basic Regression Results
Dependent Variable is a Dummy for Cesarean Delivery

	(1)	(2)	(3)	(4)
Log ob/gyn per 100 births	.578 (.126)			
Log fertility (births per 100 population)		-.888 (.202)	-.923 (.201)	
Log ob/gyn per 100 population		.342 (.174)		.410 (.174)
Age 20-25	.001 (.022)	.001 (.022)	.001 (.022)	.001 (.022)
Age 25-30	.081 (.023)	.081 (.023)	.082 (.023)	.082 (.023)

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Results in Gruber

- Fall in fertility can explain 16% of the rise in c-sections over the 1970-1982 period

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