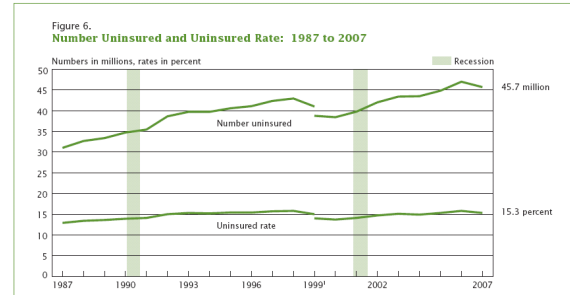


Two key issues: The uninsured and rising health care costs



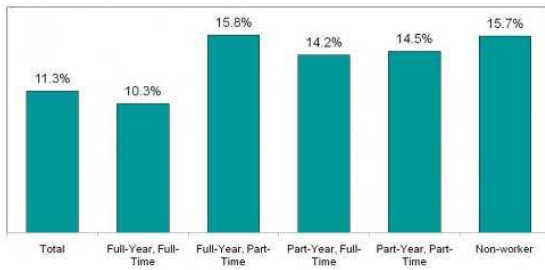
Uninsurance rates, 2007

- Overall 15.3%
- By race
 - White, NH 10.4%
 - Black 19.5%
 - Asian 16.8%
 - Hispanic 32.1%
- Nativity
 - Native 12.7%
 - Naturalized 17.6%
 - Not citizen 43.8%
- Age
 - <18 11.0%
 - 18-24 28.1%
 - 25-34 25.7%
 - 35-44 18.3%
 - 45-64 14.0%
 - 65+ 1.9%
- HH income
 - <\$25K 24.5%
 - \$25-\$50K 21.1%
 - \$50-\$75K 14.5%
 - >\$75K 7.8%

Distribution of the uninsured

- By race
 - White 45.1%
 - Black 15.4%
 - Hispanic 32.5%
 - Other 6.9%
- By citizenship
 - Not a citizen 19.1%
 - Citizen 80.9%
- Age
 - <18 20.6%
 - 18-24 16.6%
 - 25-34 21.6%
 - 35-44 16.2%
 - 45-64 23.8%
 - 65+ 1.3%

Uninsured Children by Work Status of Parent, 2007



Uninsured Non-Elderly Population by Work Status of Family Head, 2007

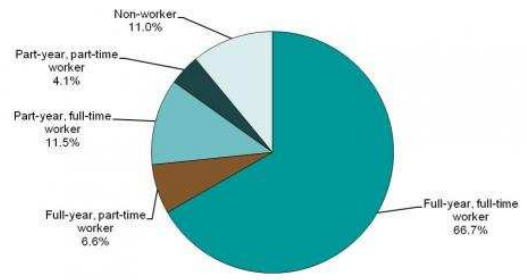
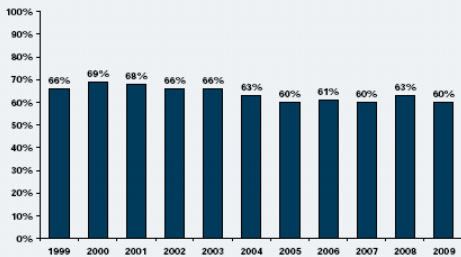


Exhibit 2.1 Percentage of Firms Offering Health Benefits, 1999–2009*



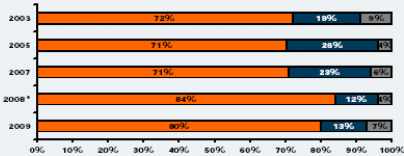
* Tests found no statistical difference from estimate for the previous year shown ($p < .05$).
 Note: As noted in the Survey Design and Methods section, estimates presented in this exhibit are based on the sample of both firms that completed the entire survey and those that answered just one question about whether they offer health benefits.
 Source: Kaiser/HRET Survey of Employer-Sponsored Health Benefits, 1999-2009.

Exhibit 2.2 Percentage of Firms Offering Health Benefits, by Firm Size, 1999-2009

FIRM SIZE	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
3-9 Workers	56%	57%	58%	58%	55%	52%	47%	48%	45%	49%	46%
10-24 Workers	74	80	77	70*	76	74	72	73	76	78	72
25-49 Workers	86	91	90	86	84	87	87	87	83	90*	87
50-199 Workers	97	97	96	95	95	92	93	92	94	94	95
All Small Firms (3-199 Workers)	65%	68%	68%	66%	65%	63%	59%	60%	59%	62%	59%
All Large Firms (200 or More Workers)	99%	99%	99%	98%	98%	99%	98%	98%	99%	99%	98%
ALL FIRMS	66%	69%	68%	66%	66%	63%	60%	61%	60%	63%	60%

* Estimate is statistically different from estimate for the previous year shown ($p < .05$).
 Note: As noted in the Survey Design and Methods section, estimates presented in this exhibit are based on the sample of both firms that completed the entire survey and those that answered just one question about whether they offer health benefits.
 Source: Kaiser/HRET Survey of Employer-Sponsored Health Benefits, 1999-2009.

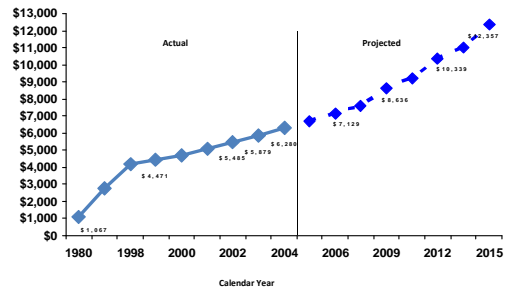
Exhibit 2.11
Among Small Firms (3-199 Workers) Not Offering Health Benefits, Employer Beliefs About Employees' Preferences for Higher Wages or Health Insurance Benefits, 2003-2009



*Distribution is statistically different from distribution for the previous year shown (p < .05).
 Note: The question asks firms whether they believe employees would rather receive an additional \$2 per hour (approximating the cost of health insurance for single coverage) in the form of higher wages or health insurance.
 Source: Kaiser/MHET Survey of Employer-Sponsored Health Benefits, 2003-2009.

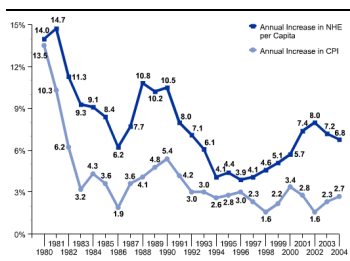
Table 1.2
National Health Expenditures Per Capita, 1980-2015

National health spending per capita is projected to increase rapidly over the next decade.



Source: CMS, Office of the Actuary, National Health Statistics Group.

% Change in NHE and CPI



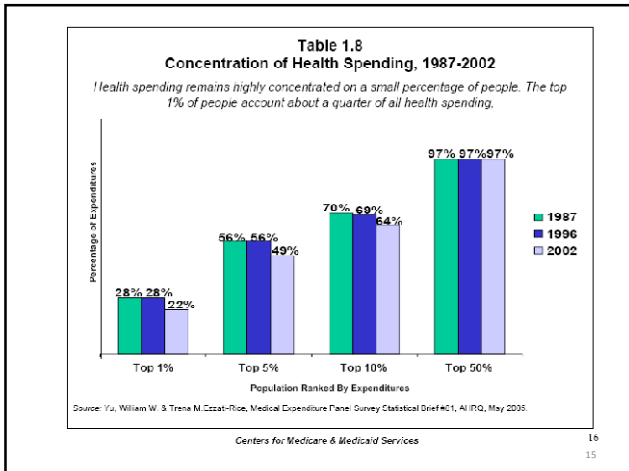
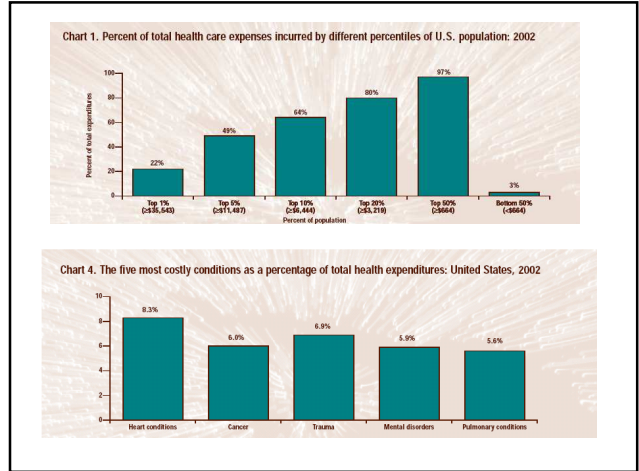
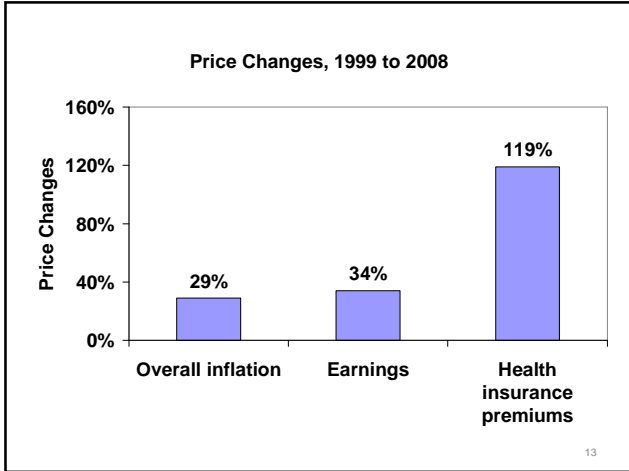


Table 1 Growth in Real Health Care Expenditure and GNP, by Decade (% per year)

Decade	Growth in real health care dollars, per capita	Growth in real GNP per capita	Health care share of GNP at end of period
1929-1940	1.4%	0.0%	4.0% ^a
1940-1950	4.0%	3.1%	4.5%
1950-1960	3.6%	1.5%	5.3%
1960-1970	6.5%	2.5%	7.3%
1970-1980	3.8%	1.7%	9.1%
1980-1990	4.4%	1.7%	12.2%

16

A couple of questions to consider?

- Are we spending too much on health care?
How would we know?

- To answer these questions ask yourself
 - Why do expenditures increase?
 - Why do prices for a product rise?
 - (Do not think of HC in particular – answer these questions for any particular product)

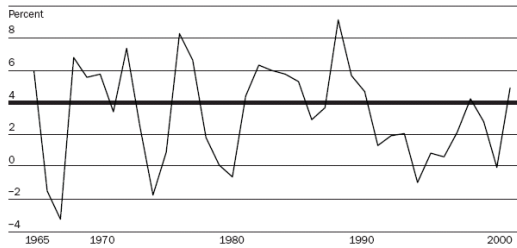
Why we should not worry

- Ebbs and flows

- Is it quality adjusted?

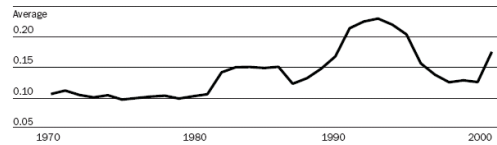
- Who is paying the cost?

EXHIBIT 1
Annual Change In Private Health Spending Per Capita, Adjusted For Inflation, 1965-2001



SOURCES: Centers for Medicare and Medicaid Services, Office of the Actuary, National Health Statistics Group; U.S. Department of Commerce, Bureau of the Census and Bureau of Economic Analysis; and U.S. Department of Labor, Bureau of Labor Statistics.

EXHIBIT 2
Five-Year Moving Average For Marginal Propensity To Spend On Medical Care, 1970-2001



SOURCES: Centers for Medicare and Medicaid Services, Office of the Actuary, National Health Statistics Group; U.S. Department of Commerce, Bureau of the Census and Bureau of Economic Analysis; and U.S. Department of Labor, Bureau of Labor Statistics.

Why we should worry

- Excess burden of taxation
- Intergeneration equality
- Excess burden of moral hazard

Newhouse

- Why have expenditures increased so rapidly in HC?
- Simple decomposition
 - Expenditures = price*quantity
 - $E=PQ$
 - $\Delta E = P\Delta Q + \Delta P Q$
 - How much due to ΔP , how much to ΔQ

22

Candidate reasons for increase in health care expenditures

- Aging of the population
- Increased insurance
- Increased income (income effects)
- Supplier induced demand
- Factor productivity in service sector
- End of life care

23

Aging

- Average age of the population has been increasing for past half century
 - Population over 65 represented 8% in 1950
 - 12 percent today
 - 20 percent by 2040
- Newhouse: hold 1950's spending constant, increase share of elderly
- Explains only 15% of the increase

24

- Let θ_i be fraction of people in group i
 – 3 groups <18, 19-64, 65+
- S_i be average spending per capita in group
- Total spending is a weighted average of spending across groups
- Hold spending per group constant but impose 1950's population weights

25

- $S^{50} = \theta_1^{50}S_1^{50} + \theta_2^{50}S_2^{50} + \theta_3^{50}S_3^{50}$
- $S^{87} = \theta_1^{87}S_1^{87} + \theta_2^{87}S_2^{87} + \theta_3^{87}S_3^{87}$
- $S^{*50} = \theta_1^{50}S_1^{87} + \theta_2^{50}S_2^{87} + \theta_3^{50}S_3^{87}$
- $(S^{87} - S^{*50})/S^{*50} = 0.15$, only 15%

26

- ### Insurance
- Over time, fraction of people with insurance increased considerably
 – 1940, 10%
 – 2000, 85%
 - Average coinsurance rate went from 67% to 27% between 1950 and 1987
 - RAND HEI:
 – Movement from 95% to 0% coinsurance increases demand by 31%

27

TABLE 3—VARIOUS MEASURES OF PREDICTED MEAN ANNUAL USE OF MEDICAL SERVICES, BY PLAN

Plan	Likelihood of Any Use (%)	One or More Admissions (%)	Medical Expenses (1984 \$)
Free	86.7 (0.67)	10.37 (0.420)	777 (32.8)
Family Pay			
25 Percent	78.8 (0.99)	8.83 (0.379)	630 (29.0)
50 Percent	74.3 (1.86)	8.31 (0.400)	583 (32.6)
95 Percent	68.0 (1.48)	7.75 (0.354)	534 (27.4)
Individual Deductible	72.6 (1.14)	9.52 (0.529)	623 (34.6)

Big change in The probability Of use, 21% decline

25% reduction In hospitalization

31% reduction In costs

28

- 95 percentage drop in price generated a 31 percent increase in use for an elasticity of demand of roughly -0.32
- 1950-1980 saw a $(27-67)/67 = -0.60$ or a 60% drop in price (coinsurance)
- Which means demand should have increased by 18% $(-0.6)(-0.3)$
- Use increased by a factor of 5, so $< 3\%$

29

- What is potentially wrong with the reasoning in the previous analysis?

30

Income effects

- 1940 and 1990, real GDP/capita increased by 180%
- Income elasticity of demand for medical care is 0.2 to 0.4
- Demand should have increased by 36% to 72%
- Actual use increased by 780% over this time period, about 10% of total

31

End of life care

- Dying have incredibly high medical costs
 - 6% of seniors die each year in Medicare
 - Represent 27.9% of all expenses in 1999
 - Average Medicare spending for person in last year of life, \$25,000 in 1999
 - about \$3,000 for survivors
- This fraction has been pretty stable over time. Was 28% in 1978

32

Technology

- All of the factors so far, probably about 25% of the increase in medical care use over time
- What explains the rest? Technology
- MRIs, open heart surgery (CABG), angioplasty, CT scans, anti-psychotropic drugs, hip-knee replacements, neo-natal intensive care All **not** available 40 years ago. Now, commonplace

33

Some evidence for Technology

- Rate of increase in medical costs similar across countries – suggests something broad based like technology
- Next table: If these other factors were important, we would see big increase in hospital admissions over time and length of stay. We don't. What we see is an increase in price/admission

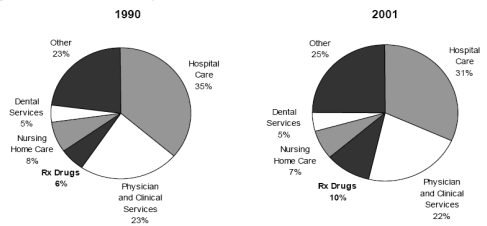
34

Table 3
Utilization of Short Stay General Hospitals

Year	Adm / 1000	Length of Stay (days)	Days / 1000	Adjusted Cost / Day (1982 dollars)
1950	110.5	8.1	895.1	n.a.
1960	128.9	7.6	980.0	\$114*
1970	144.9	8.2	1188.1	\$172
1980	160.4	7.6	1219.2	\$282
1986	135.4	7.1	961.3	\$437
1989	134.6	n.a.	n.a.	n.a.

35

Figure 1. National Health Expenditures, 1990 and 2001



Source: CMS, Office of the Actuary, National Health Statistics Group.
Note: Prescription drug sales are reported at the retail level, and include both brand and generic drugs.

36

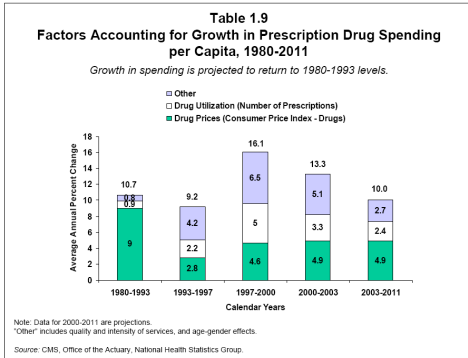
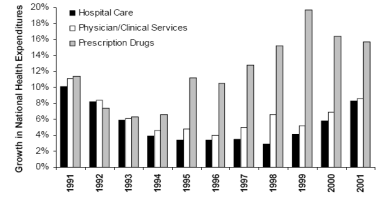


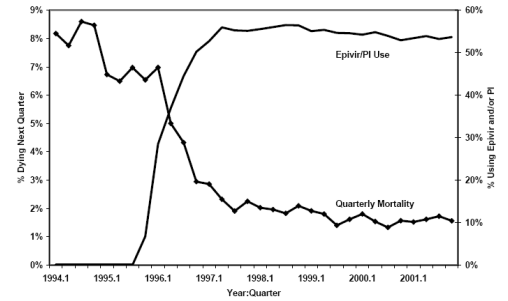
Figure 2: Growth Rate of National Health Expenditure Components

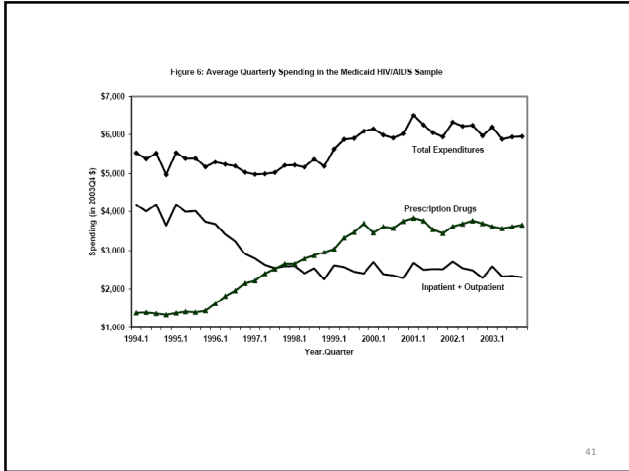


HIV/AIDS Drugs

- Early 1990s, quarterly mortality rates for patients w/ AIDS of 7.5/8%, annual rates of roughly 30%
- 1995:4, 1996:1, three new drug introduced to fight virus
 - Work by preventing the virus from replicating in the host
- Use rates increase immediately and aggregate mortality falls 70% in 18 months

Figure 5: Quarterly Mortality Rate and Use of PI/Epivir





- AIDS drugs are expensive, \$12K/year in some cases
 - AIDS patients are expensive, \$20K/year
 - ARVs extend life considerably
 - This medical advance by construction increases lifetime spending by a considerably amount
- 42

Lifetime costs of treating AIDS patient w/out ARVs

$$(6) LT_{w/o} = \sum_{t=0}^{\infty} M_0 [(1 + \rho) / (1 + r)]^t (1 - \delta)^t$$

Real price increase per quarter (points to ρ)

Discount rate (points to r)

Period mortality rate (points to δ)

Cost per period at diagnosis (points to M_0)

43

- Let $r = \rho$, so lifetime costs are now M_0 / δ
 - After ARVs, assume costs increase to M_a and period mortality rates falls to δ_A
 - Change in life expectancy is $(1 / \delta_A) - (1 / \delta)$
 - Quarterly mortality falls from 7.5 to 2.2 percent (life expectancy goes from 3.6 to 11.2 years)
 - M_0 is \$6242 and ARVs increase spending by 16% to \$7241
 - Lifetime costs increase from \$83K to \$329K
- 44

- Cost per life saved is $(\$329K-\$83K)/(11.2-3.6)$
 $=\$33K/\text{life year saved}$
- Cost effective in relative terms
- So although costs are increasing a lot, this is a cost-effective program

45

NICU

- Neonatal intensive care units
- Specialty wards of hospitals that provide “constant nursing and continuous cardiopulmonary and other support for severely ill infants”
- Developed in late 1950 early 1970s
- Growth has been rapid since

46

TABLE 1—Trends in Neonatal Intensive Care Unit (NICU) Hospitals, NICU Beds, and Neonatologists: US Metropolitan Statistical Areas, 1980–1995

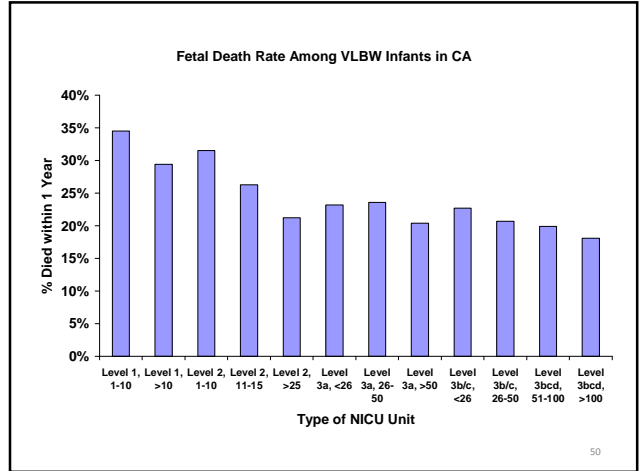
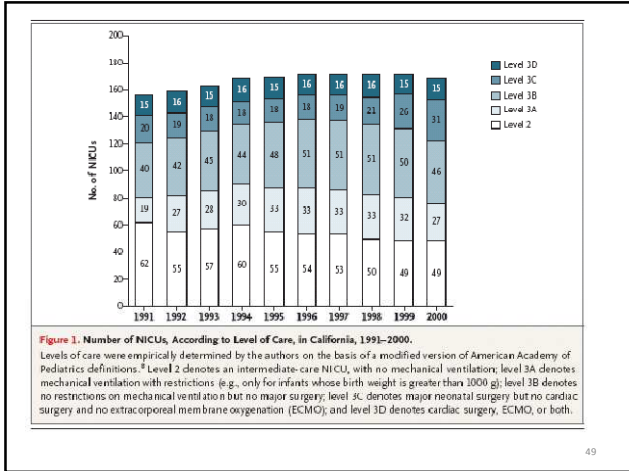
	1980	1995	% Change, 1980–1995
Births, thousands	2729	3210	+17.6
No. of hospitals with obstetric beds and children's hospitals	2135	1810	-15.2
No. of hospitals with NICU beds	351	698	+98.9
Obstetric/children's hospitals with NICUs, %	16.8	38.6	+129.8
No. of NICU beds	7021	16702	+137.9
No. of neonatologists ^a	710	2613	+268.0
NICU beds per 1000 births	2.57	5.20	+102.3
Neonatologists per 1000 births	0.26	0.81	+211.5
Occupancy rate of NICUs	76.4	78.5 ^b	+2.7

47

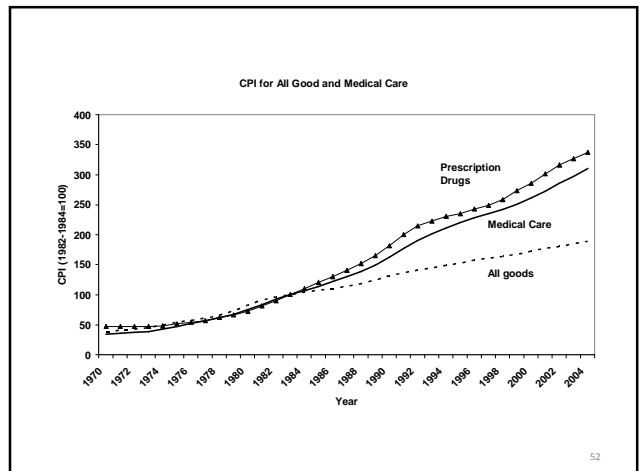
Costs, 2001 CA

- NICU discharge \$50,000
- Non-NICU, \$4,500
- In CA, 10% of births are for a NICU
- Therefore, more than half the hospital cost of childbirth are attributable to NICUs

48



- ### Problem
- Consumer prices in health care are increasing much faster than general CPI
 - In response, some have proposed price controls
 - Price indexes are designed to keep 'all else constant' but difficult to do when quality is changing rapidly (e.g., medical)
 - Boskin commission report on CPI, CPI overstates true MC growth by 3 per pts/yr



Price changes, 1983 to 2004

- All goods 89%
- Medical Care 208%
- Prescription drugs 237%

53

- Q: how much of rising expenditures reflects true improvements in quality
- Impossible to do in all aspects of medical care
- Cutler et al., construct price index for treatment of AMI (heart attack)
- CPI/PPI for services are Service Price Index
 - What is price for service provided?
 - Lack quality component
- Incorporate COL index – how much people are willing to pay for medical treatment changes over time

54

Price vector Laspayers Price Index

$$SPI_{t_0, t_1} = \frac{p(t_1) \cdot m(t_0)}{p(t_0) \cdot m(t_0)} = \alpha \cdot \frac{p(t_1)}{p(t_0)},$$

Vector or services in base period

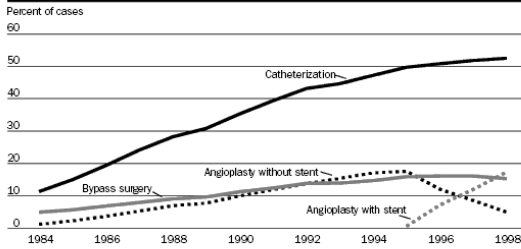
55

Problems

- What is a medical service and how to measure?
- What is price? In CPI, p(t) is OOP only but insurance raises prices
- As product quality changes, and market based in CPI does not, then price change may reflect quality
-

56

EXHIBIT 2
Changes In The Surgical Treatment Of Heart Attacks, 1984-1998



SOURCE: Authors' analysis of Medicare claims records for all elderly patients with a heart attack.
 NOTES: Procedure use is within ninety days of the initial admission for the heart attack. See references in text for more detail.

EXHIBIT 1
Accounting For The Increased Cost Of Heart Attack Treatments, 1984 And 1998

	1984	1998	Annual change
Total spending (billions)	\$3.0	\$4.8	3.4%
Number of cases	245,687	221,133	-0.8
Average spending per case	\$12,083	\$21,714	4.2

SOURCE: Authors' analysis of Medicare claims records for all elderly patients with a heart attack in 1984 and 1998.

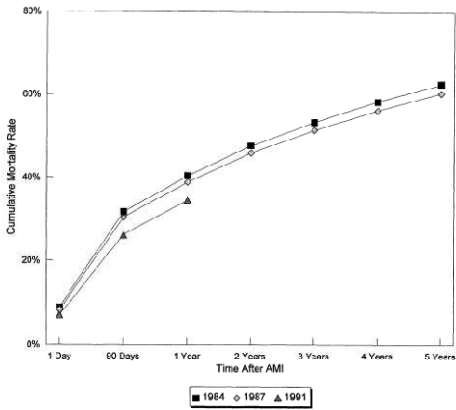


FIGURE IV
 Changes in Mortality Rates After AMI

- VSLY == value of a statistical life year
- Sum VSLY over all year for VSL
- $VSL = \sum_i VSLY / (1+r)^i$
- $VSLY = \$150,000$, $r=0.03$, 40 years $VSL = \$3.5$ million
- Cutler et al. assume \$25,000 which is pretty low

TABLE III
LIFE EXPECTANCY AND COST FOLLOWING A HEART ATTACK

Year	Life expectancy (years)	Change in value of life for net value of life-year:			Life expectancy (years)	General population Costs	AMI population net value \$25,000/year	
		AMI population						
		\$10,000/year	\$25,000/year	\$50,000/year				
1984	5 1/2	\$11,175	—	—	10 1/2	\$1,667	—	
1985	5 1/2	11,691	\$ 613	\$ 2,306	5,126	10 1/2	1,765	\$3,230
1986	5 1/2	11,998	455	2,421	5,698	10 1/2	1,779	2,163
1987	5 1/2	12,253	946	4,054	9,234	10 1/2	1,791	2,748
1988	5 1/2	12,725	1,497	6,177	13,976	10 1/2	1,865	6,460
1989	5 1/2	13,019	2,403	8,936	19,826	10 1/2	1,936	6,018
1990	5 1/2	13,623	2,897	11,079	24,716	10 1/2	1,945	6,334
1991	5 1/2	14,772	2,217	11,133	25,994	10 1/2	2,080	5,015

The sample is all elderly Medicare beneficiaries with a new heart attack. Costs are in 1991 dollars, adjusted using the GDP deflator.

61

1014 QUARTERLY JOURNAL OF ECONOMICS

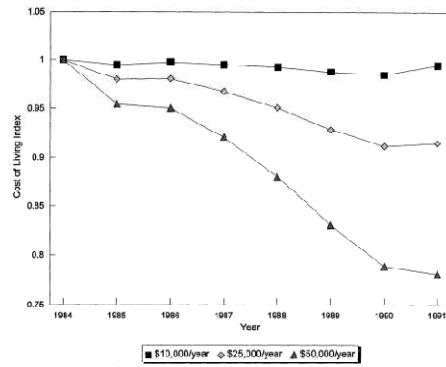


FIGURE V
Cost of Living Index

62

EXHIBIT 3
Summary Of Research On The Value Of Medical Technology Changes

Condition	Years	Change in treatment costs	Outcome		
			Change	Value	Net benefit
Heart attack ^a	1984-98	\$10,000	One-year increase in life expectancy	\$70,000	\$60,000
Low-birthweight infants ^b	1950-90	\$40,000	Two-year increase in life expectancy	\$240,000	\$200,000
Depression ^c	1991-96	\$0	Higher remission probability at some cost for those already treated More people treated, with benefits exceeding costs		
Cataracts ^d	1969-96	\$0	Substantial improvements in quality at no cost increase for those already treated More people treated, with benefits exceeding costs		
Breast cancer ^e	1985-96	\$20,000	Four-month increase in life expectancy	\$20,000	\$0

63

Thorpe et al.

- Used two major data sets on health care spending at individual level
 - NMES, 1987
 - MEPS
- Scan data for people with particular conditions
- How much of increased spending is due to these conditions?
- How much of that increase is due to
 - Increased spending per case?
 - Increased incidence rates?
 - Increased population?

EXHIBIT 2
Percentage Of Total Change In Health Care Spending Accounted For By The Fifteen Most Costly Medical Conditions, 1987-2000

Condition	Treated prevalence per 100,000		Spending (millions of dollars)		Percentage of change in total health care spending associated with the condition, 1987-2000*		
	1987	2000	1987	2000	Upper bound	Lower bound	Best-guess estimate
Heart disease	6,189	6,226	30,450.1	56,678.6	8.34	5.25	8.06
Pulmonary conditions	10,389	15,526	11,684.5	36,476.5	7.89	4.77	5.63
Mental disorders	4,373	8,575	9,935.8	34,439.1	7.79	6.51	7.40
Cancer	2,892	3,948	21,187.5	38,901.8	5.64	4.92	5.36
Hypertension	9,734	11,382	8,008.6	23,394.5	4.89	2.81	4.24
Trauma	17,866	12,338	26,527.6	41,124.2	4.64	3.79	4.64
Cerebrovascular disease	410	854	3,859.8	14,938.8	3.52	2.77	3.52
Arthritis	5,479	6,966	7,403.5	17,686.3	3.27	2.54	3.27
Diabetes	2,961	4,260	8,661.1	18,287.9	3.06	1.45	2.37
Back problems	3,400	5,092	7,964.6	17,451.0	3.02	2.11	2.99
Skin disorders	6,754	7,990	4,758.0	12,044.5	2.32	1.95	2.26
Pneumonia	1,537	1,370	5,437.6	12,841.3	2.29	1.74	2.29
Infectious disease	6,588	5,841	3,658.0	9,849.5	1.97	1.16	1.35
Endocrine	5,515	7,322	5,247.8	10,276.9	1.60	0.79	1.18
Kidney	675	908	4,938.1	8,169.5	1.03	0.87	1.03
Total	- ^b	- ^b	159,702.6	352,360.5	61.28	43.43	55.59

EXHIBIT 3
Decomposition Of Change In Nominal Health Care Spending, Fifteen Most Costly Medical Conditions, 1987-2000

Condition	Total change in spending (millions of dollars)	Percent change in spending attributable to		
		Increased cost per treated case	Rise in treated prevalence	Increased population
Heart disease	26,228.5	68.6	1.1	30.3
Pulmonary conditions	24,792.0	37.5	41.9	20.6
Mental disorders	24,503.3	21.1	59.2	19.7
Cancer	17,734.3	41.9	27.4	30.7
Hypertension	15,385.8	59.8	18.9	21.3
Trauma	14,596.6	169.1	-108.5	39.5
Cerebrovascular disease	11,078.9	20.8	60.3	18.9
Arthritis	10,282.8	44.3	31.6	24.1
Diabetes	9,626.8	23.6	49.8	26.6
Back problems	9,486.4	21.7	52.6	25.8
Skin disorders	7,286.5	54.8	22.0	23.2
Pneumonia	7,203.8	93.8	-18.4	24.6
Infectious disease	6,191.6	95.2	-17.5	22.3
Endocrine	5,029.1	28.0	43.4	28.6
Kidney	3,231.4	8.8	55.8	35.4