

Reimbursing Health Plans and Health Providers: Efficiency in Production Versus Selection

Joseph P. Newhouse,
Journal of Economic Literature, 1996

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Large Variation in Health Care Costs

Literature review on the regulation of the supply of Health Care.

- Who supplies ?
- To whom ?
- Large Variation in Health Care costs
- IO literature: Principal-Agent framework, regulator/hospital with cost heterogeneity and asymmetrical info.
- This paper reviews lit, and proposes one idea : tradeoff between efficiency in production and selection of risks.

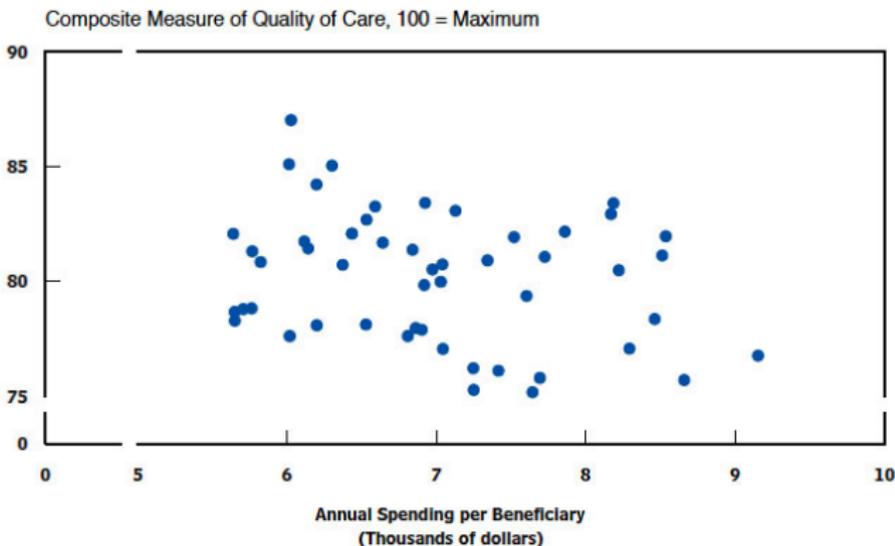
Large Variation in Health Care Costs

	UCLA Medical Center	Massachusetts General Hospital	Mayo Clinic (St. Mary's Hospital)
Biologically Targeted Interventions: Acute Inpatient Care			
CMS composite quality score	81.5	85.9	90.4
Care Delivery—and Spending—Among Medicare Patients in Last Six Months of Life			
Total Medicare spending	50,522	40,181	26,330
Hospital days	19.2	17.7	12.9
Physician visits	52.1	42.2	23.9
Ratio, medical specialist / primary care	2.9	1.0	1.1

Source: Elliot Fisher, Dartmouth Medical School.



The Relationship Between Quality of Care and Medicare Spending, by State, 2004



Arrow 1963 : A reminder

How is Medical Care different than other markets?

- 1 The nature of demand:
Demand is irregular and unpredictable, only in event of illness. It is associated with a probability of death or impairment of full functioning.
- 2 Expected Behavior of the Physician
Trust. Customer cannot test the product before consuming it. Physicians behavior is expected to be concerned by a concern of patients welfare.
Advertising and price competition virtually eliminated among doctors.
Uninterested. Advise by doctors is supposed to be completely uninterested and dictated by need, not financial considerations.
Legal Expertise. Doctors relied on as experts - for legal certifying, etc.
- 3 Product uncertainty
- 4 Supply Conditions
Restricted Entry in the profession by licensing, increasing the cost of medical care, reducing quantity. Educational institutions both subsidize and limit entry. Control of quality (strong reputation externalities).
- 5 Price Discrimination

How is Medical Care different from the competitive model ?

- 1 Strong externalities in health care. Non-marketable.
- 2 Increasing returns
- 3 Entry Restrictions
 Additional entrants could lower quality ; Subsidies in Medical schools ;
 Tuition would be deterrent because of imperfect capital markets
 Subsidy plus selection attracts highly qualified individuals. without these
 quantity would increase and quality decrease.
- 4 Price discrimination. A puzzle. Obviously not a "collective monopoly",
 but rather elasticity of demand very small, for all income levels.

Add Uncertainty :

- 1 **Risk-averse agents** want to cover against illness risk. They are willing to pay a premium over the actuarial fair policy
- 2 **Agency Problems**
Moral Hazard : insurance affects incentives. To some extent the professional relationship between physician and patient limits the hazard. The physician acts like a controlling agent on behalf of the insurance companies. But this check is far from perfect, the physicians themselves are not under any control and it may be convenient for them to please their patients and to prescribe more expensive/frequent medication/care.
- 3 Methods of Insurance Prepayment ; Indemnities according to a fixed schedule ; Insurance against costs.

Summary

Medical Care is full of market failures, and there exists a wide variety of institutional arrangements (also imperfect) to correct them. Think of substituting market failure by government failure.

No insurance in the demand side takes us away from optimality. Full insurance also far from optimal. Institutional arrangement should - perhaps - not seek corner solutions.

Newhouse '96 examines why, in the supply side, corner solutions are also far from optimal.

Health Actors in the US

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Medicare

Health insurance for the elderly (65 years or older). Created in 1965, and funded at the federal level. Has 4 parts :

- Part A. Hospital insurance : covers hospital stays.
- Part B. Medical insurance : covers physician and nursing services.
- Part C. Advantage plans : Medicare + Choice.
- Part D. Drugs prescription plans.

Medicaid

Health insurance for certain categories of the poor. Each State has its own version. Mainly covers children, pregnant women, disabled.

Jointly financed by state and Fed. Minimum standards imposed by the CMS . Has strong eligibility criteria (60% of poor are not covered).

Health Maintenance Organizations

Vertical Integration - constrained by "any willing provider" legislation. They have to pre-approve spending. Big moral hazard issue + avoid pooling.

Insurance Companies

Large variety of contracts/coverage/reimbursement options

Introduction

∃ Tradeoff in insurance between risk aversion and moral hazard: greater insurance implies less risk bearing but higher moral hazard. . .

But the widespread of insurance creates another tradeoff, between efficiency in production and selection.

Efficiency meant as least cost treatment of a patient problem, holding quality equal.

Selection meant as the breaking of pooling arrangements.

The essence of the moral hazard - risk aversion tradeoff is captured by the cost that the patient bears at the time of use (demand side).

The essence of the efficiency-selection tradeoff is captured by the cost the medical provider bears at the time of use (supply side).

The Traditional System : Selection and Production Efficiency

Traditional System: Distinction between medical care and insurance

- Medical care priced on the basis of fee-for-service; while insurance purchased through employer or provided by government (via Medicaid or Medicare).
- \exists price competition among insurers, but little price competition among providers. System minimized incentives to select against bad risks.
- Insurance weakened consumers' incentive to search. Barrier to price competition among providers.
- Result : Supply prices exceed competitive levels. Medical system produced treatment inefficiently.

The Evolving System: Vertical Integration and HMOs

- Vertical Integration of insurance and medical care services. How ? lump-sum fee by customers on one side; contract or own hospitals on the other side.
- Problem : HMO would not reimburse your costs if you went somewhere else; until "Any willing provider" legislation: HMOs forced to accept reimbursement if price matched their owns.

The Traditional System : Selection and Production Efficiency

Insurance market also changed :

- Price competition now on the costs of medical care.
- Higher incentive to produce efficiently and to select good risks.

SICK incentives :

Network physicians have contracts in which they receive bonuses (or pay penalties) if the service they order falls short (or exceeds) a target amount. If patients are poorly informed, physicians with such a contract have an agency problem that is the opposite from the traditional system. They have an incentive to avoid high costs patients.

Plan Pricing and Contract Length

Most Health insurance plans (HMO or not) do not charge a premium that equals the expected costs of an individual or family.

i.e : A plan generally receives the same premium for all single employees of a firm, even if it can discriminate between high and low risk ones.

The plan's premium is a function of the average risk in a heterogeneous group, and risk bearing plans enroll both profitable and non-profitable members.

As a result, they have an incentive to dump unprofitable patients and keep the profitable ones.

Unprofitable patients may be unable to obtain insurance because of selection.

Selection-Efficiency Tradeoff

Providers can be treated as agents for plans. This paper analyzes the selection-efficiency tradeoff at the level of plans, hospitals, and physicians.

On the demand side neither no insurance nor full insurance is likely to be optimal. A similar conclusion applies to the supply side; neither corner solution is likely to be optimal.

A Theory of Selection

Framework used : Rothschild-Stiglitz '76 ; Barr '92

Imagine 2 types of agents : low-risk and high-risk, with $p_H > p_L$. Risk-averse consumers maximize expected utility:

$$\text{Max } E(U) = (1 - p)U(W_1) + pU(W_2) \quad (1)$$

Endowment E in the absence of insurance. Agents want to smooth consumption, so as to receive the always the same income, no matter the state . They are willing to trade money from the no-accident state W_1 to the accident state W_2 .

Insurance consumption depends on its price : the rate at which an agent (p_L, p_H) can trade money in the no-accident state W_1 to receive money in the accident state w_2

A theory of selection

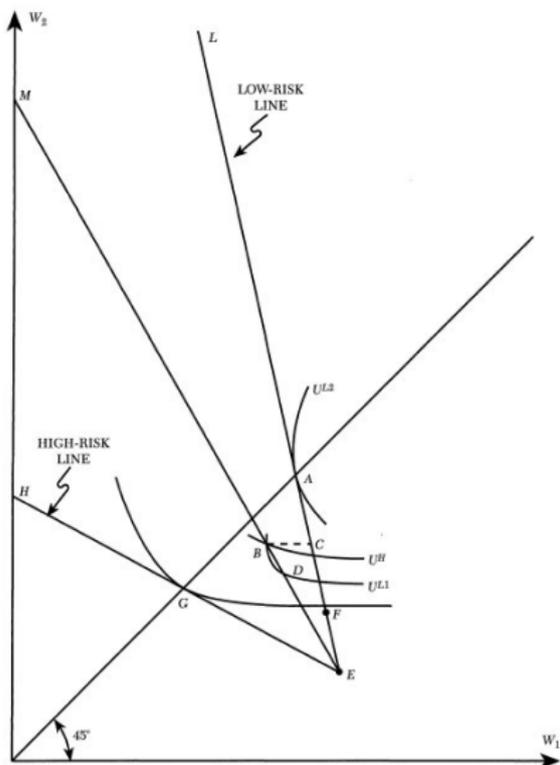


Figure 2. Separating and Pooling Equilibria

EL is the fair-odds line for low risk persons, with slope $\frac{-(1-p_L)}{p_L}$

EH is the fair-odds line for high risk persons, with slope $\frac{-(1-p_H)}{p_H}$

EM line could represent the fair-odds line for the joint population, with $\bar{p} = (1 - \lambda)p_L + \lambda p_H$ in which λ is the share of the population with a high risk.

This EM line could equally be the price-line for low risks, if insurance charges a premium.

A theory of selection

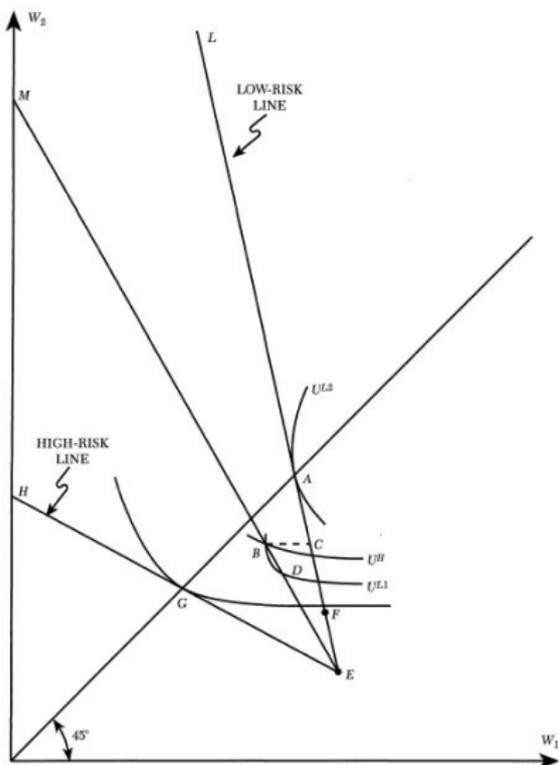


Figure 2. Separating and Pooling Equilibria

Proposition 1

If drawing a contract attracting low risks is costly enough, a pooling equilibrium might still exist.

Where would the equilibrium be ?

Has to be on EM line, but if low risk agents buy insurance on EM, they will want less than full insurance.

For the high-risk, B is a corner solution. At that price, they want full insurance, but no one offers them because low risks don't buy.

Thus, B is an equilibrium. if cost of contract if higher than distance B-C

Principal-Agent

Framework used is Principal-Agent. Many models reviewed :

- Shleifer's model of Yardstick competition (1985)
 - Laffont-Tirole (1986, 1987, 1993)
 - Ellis McGuire (1986)
 - Pope (1990)
 - Ma (1994)
-
- Hospitals are agents. Principal could be regulator (government/employer) or HMO or insurance.
 - Heterogeneity in production costs.
 - Asymmetrical information on managerial effort
 - Pure capitation vs fee-for-service

Cost Heterogeneity

Pope's (1990) Hospital cost function :

$$C_i = T_i + S_i + e_i \quad (2)$$

T_i , S_i , e_i , are respectively quality, unobserved heterogeneity across hospitals and managerial effort.

Regulator reimburses T and S ; it wants to minimize the squared error loss in payment :

$$P_i = R + \alpha C_i \quad (3)$$

$$P^d = E(T) + S_i \quad (4)$$

If $\alpha = 0 \rightarrow$ prospective payment

If $\alpha = 1; R = 0 \rightarrow$ Cost reimbursement

Laffont-Tirole relax many of Shleifer's assumption :

- 1 Cost heterogeneity : regulator does not observe costs.
- 2 Entry not possible : regulator keeps several firms - not only the low cost ones.
- 3 If regulator pays a lump-sum to all firms at the level of high-cost firm, rents arise - they have to be paid through taxes.
Regulator trades off welfare loss from taxes to welfare loss from production inefficiency of the non-full prospective payment.
- 4 Firm must break even : at the low cost extreme, firm keeps the residual, at the high cost the contract is cost-reimbursement.

Ellis-McGuire (1986) :

- Physician utility-maximizing for both hospitals and patients.
- Optimal payment scheme has to be a mixture of fee-for-service (overservicing) and pure capitation (under-servicing)

Large evidence that HMOs select against bad risks.

Medicare beneficiaries who were offered the option of enrolling in an HMO or remaining in traditional, fee-for-service Medicare. Hill and Brown studied 98 HMOs, comparing the groups who chose the HMO with those who did not.

TABLE 2
PRIOR USE OF MEDICARE SERVICES BY HMO
AND NON-HMO ENROLLEES, ADJUSTED
FOR DEMOGRAPHICS, 1985–1986

Ratio of Prior Medical Expense, HMO Enrollees to non-HMO Enrollees	Percentage of the 98 plans in interval
<0.80	56
0.80–1.00	38
1.01–1.20	6
Average ratio among all 98 plans, 0.77	

Source: Hill and Brown (1990, table III.7)

TABLE 3
POST-ENROLLMENT ADJUSTED MORTALITY RATES,
HMO AND NON-HMO ENROLLEES

Ratio of Adjusted Mortality Rates Among HMO Enrollees to Non-HMO Enrollees in the post-enrollment period	Percentage of Plans
<0.80	58
0.80–1.00	42
Overall average ratio among 83 plans, 0.75	

Source: Hill and Brown (1990, tables III.19 and III.20).

TABLE 4
COST AND ACTUARIAL VALUE OF INSURANCE POLICIES

Percentile	Individual Policy		Family Policy	
	Cost	Actuarial Value	Cost	Actuarial Value
10	\$1220	\$1740	\$2760	\$4220
25	1670	1910	3950	4600
50	2100	2100	5070	5070
75	2620	2260	6090	5459
90	3220	2440	7670	5890
Difference 90-10	164%	40%	178%	40%

Source: Cutler (1994, table 2).

Policy Implications

Mixed Payment Systems and Insurance Plan Reimbursement :

- Plans distinguish between individuals and families, but not by age, sex, number of children. No experience rating. (pooling).
- Selection causes markets to be incomplete. No supplier wants the bad risk. Some cannot acquire the desired amount of insurance, because of asymmetrical info.
- Mixed payments reduce the incentive to select ; with less incentive to produce efficiently.
- Subsidies to Insurance Plans to encourage pooling
- Health Information Technology :
Incentive to providers to adopt HIT (such as stopping the reimbursement of Medicare/Aid).
- Mixed levels of both supply and demand cost-sharing