

Bundling, risk adjustment, and provider payment systems

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Presentation based on work in progress

Outline of talk

- ♦ Motivation
 - Focus on supply side payments, not demand side cost sharing
 - Recent expansion of systems of provider payment
 - Extension of classic Ellis and McGuire (1986) model
- ♦ Four dimensions of provider payment
- ♦ Incenting doctors to coordinate care that they do not actually provide

Conventional conceptualization of provider payment

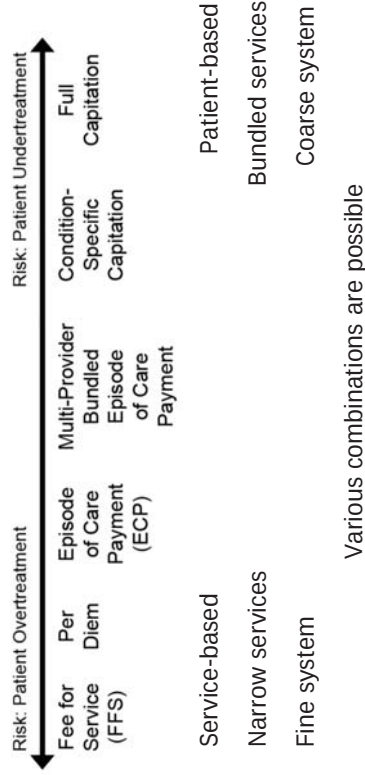
CONTINUUM OF HEALTHCARE PAYMENT METHODS



Source: NRHI (2007); Ellis (2002).

Conventional conceptualization is too simplified

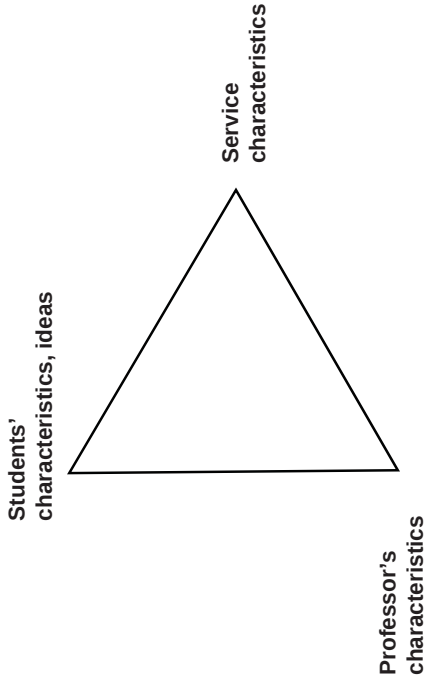
CONTINUUM OF HEALTHCARE PAYMENT METHODS



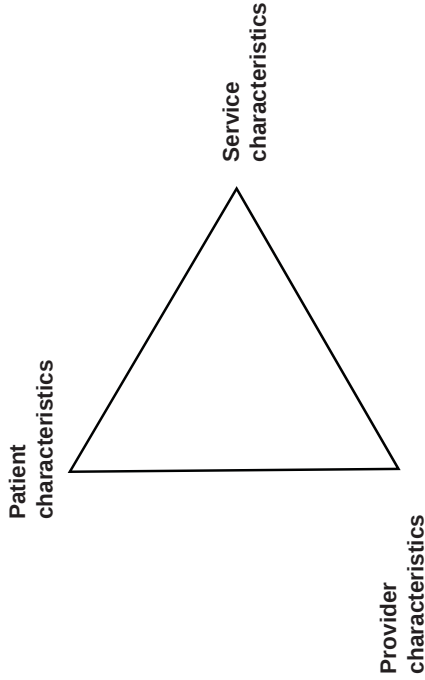
Four fundamental dimensions of provider payment

- ◆ Type of information used
 - Provider, patient, or service
- ◆ Breadth of payment
 - Narrow or Broad
- ◆ Fineness of payment
 - Fine or Course
- ◆ Generosity of payment
 - Low or high

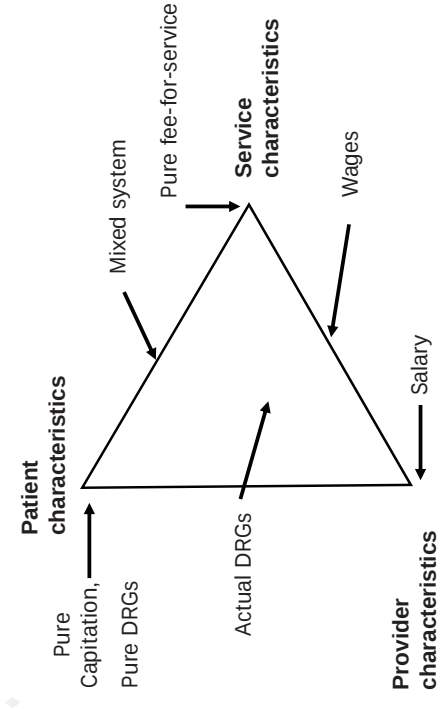
Three Types of Information Available for Paying University Professors



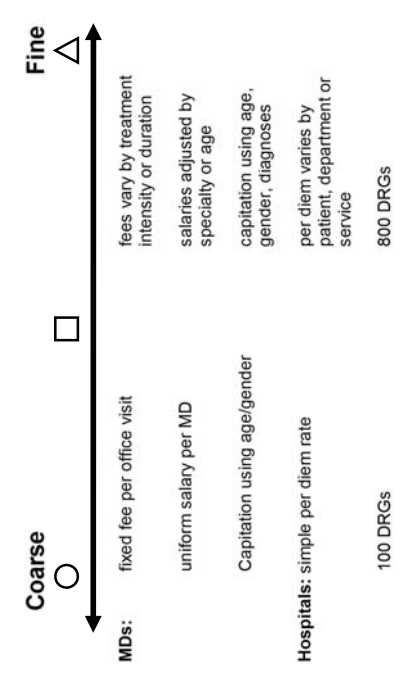
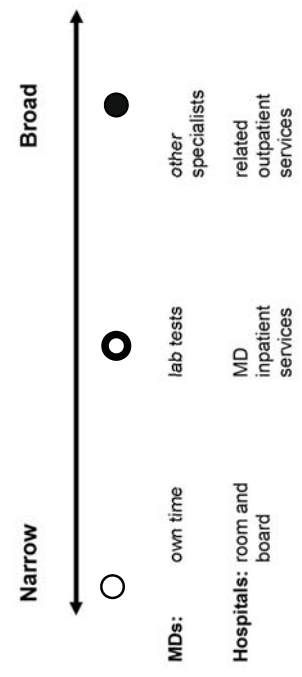
Three Types of Information Available for Provider Payment



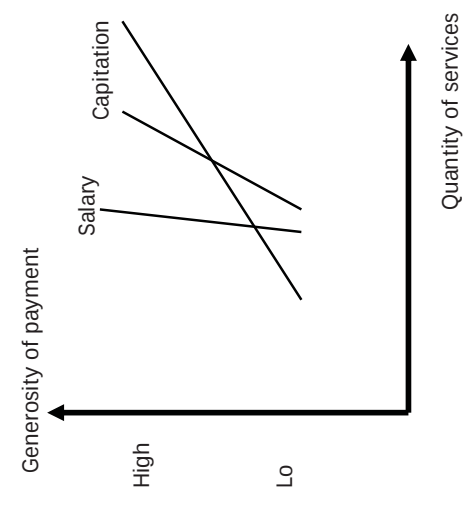
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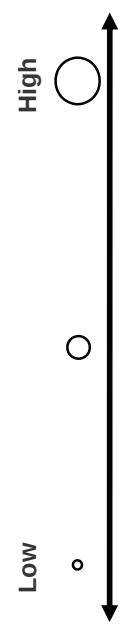
Breadth of Provider Payment (“Bundling”)



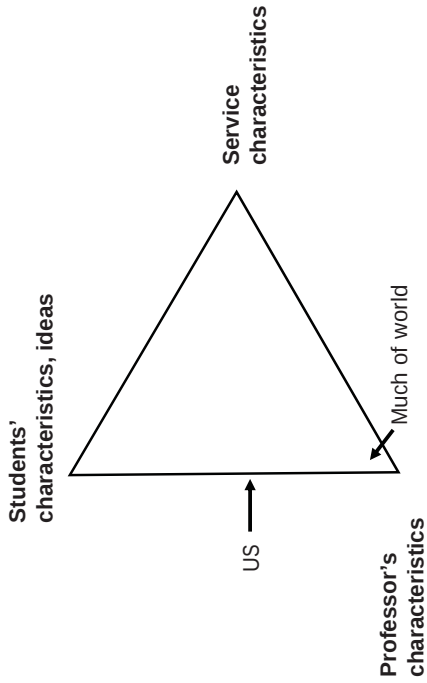
Generosity of Provider Payment: What do the supply curves look like?



Generosity of Provider Payment



Three Types of Information Available for Paying University Professors



Classic EM model of provider payment (fixed panel size)

Solutions restricted to linear reimbursement systems

Altruistic providers

$$\begin{aligned}
 U &= \text{Provider utility} = \text{Profits} + \alpha \text{ Benefits} \\
 &= \Pi(q) + \alpha B(q) \\
 &= R^0 + (r - c)q + \alpha B(q)
 \end{aligned}$$

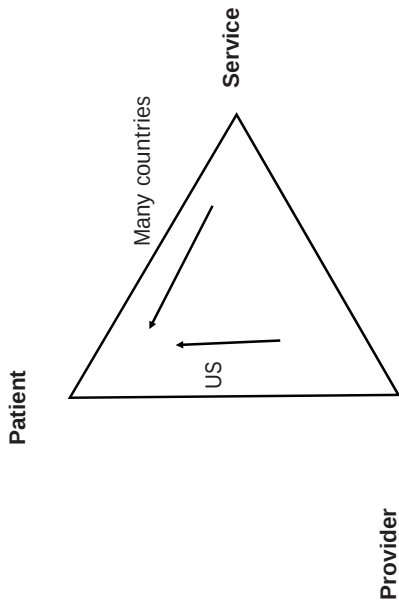
Where:

α = agency index = weight assigned to B relative to Π

q = quantity of services

R^0 = lump sum payment, r = per service payment

Trends in physician payment



Classic EM model result

Social optimum requires

$$B_q = c \quad (\text{Marginal Benefit} = \text{Marginal Cost})$$

Can be implemented by

$$r = (1 - \alpha)c$$

$$R^0 = \alpha c E(q)$$

Weaknesses of classic EM result

1. Ignores demand side cost sharing
Solution examined in Ellis and McGuire (1990)
2. Ignores the role of competition
Solution explored in Ellis (1998)
3. Optimality breaks down with patient heterogeneity if providers can distort services to attract only the lowest cost patients.

*Solution: Optimal Risk adjustment of R^0
Glazer and McGuire (2000), Ellis (2008)*

3. Model assumes that provider bears the full cost of q .

Solution: Explored in the next slides

How to solve over-provision problem?

$$\begin{aligned}
 U &= \text{Profits} + \alpha \text{ Benefits} \\
 &= \Pi(q_1, q_2) + \alpha \{B_1(q_1) + \delta B_2(q_2)\} \\
 &= R^0 + (r_1 - c_1) q_1 + r_2 q_2 + \alpha \{B_1(q_1) + \delta B_2(q_2)\} \\
 U_{q_1} &= (r_1 - c_1) + \alpha B_{q_1} = 0 \quad \rightarrow r_1 = (1 - \alpha) c_1 \\
 U_{q_2} &= r_2 + \alpha \delta B_{q_2} = 0 \quad \rightarrow r_2 = -\alpha \delta c_2 \\
 \Pi = 0 &\quad \rightarrow R^0 = \alpha c_1 E(q_1) + \alpha \delta c_2 E(q_2)
 \end{aligned}$$

Simple extension of EM model to two types of services $\{q_1, q_2\}$

Provider provides only q_1 , e.g. office visits

Provider influences but does not provide q_2 , e.g. Prescription drugs

$$\begin{aligned}
 U &= \text{Profits} + \alpha \text{ Benefits} \\
 &= \Pi(q_1) + \alpha \{B_1(q_1) + B_2(q_2)\} \\
 &= R^0 + (r_1 - c_1) q_1 + \alpha \{B_1(q_1) + B_2(q_2)\} \\
 &= R^0 + (r_1 - c_1) q_1 + \alpha \{B_1(q_1) + \delta B_2(q_2)\}
 \end{aligned}$$

Clearly if the physician controls referrals to service q_2 but does not bear any of the costs or revenue, then the fact that she has B_2 in her utility function means that too much q_2 will be recommended.

How to solve?

Recent trends

- ◆ Toward increased use of patient information for payment (capitation, DRGs, pay for performance) in US
- ◆ Toward increased bundling (broad groups of providers)
- ◆ Toward increasingly finer payment categories in US (Opposite pattern seen in Germany and some other countries)
- ◆ Toward more generous payments. (reverse?)
- ◆ Mixed payment systems being used in Denmark, Sweden and UK

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