Capitation and provider choice

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Introduction

motivation

- bigger provider networks lead to higher health care expenditure
  - cross section studies
  - AWP laws
  - US: fee-for-service; narrow networks; broader networks
- both price effect and utilization effect of selective contracting/managed care
  - Cutler et al (2000): price
  - papers by Zwanziger and co-authors (1988, 1994, 1996): utilization and cost
  - Chernew et al. (2008): utilization
  - Chernew and Newhouse (2011): overview of effects on expenditure and costs
- we focus on the effect of network size on utilization and costs

policy problem

- is it a problem that bigger networks lead to higher costs?
- often presented as a trade off between patient choice and efficiency
- but insurer should be able to resolve this efficiently?
- why should more choice lead to higher utilization?
- people worry that narrow network leads to under-treatment (NYT, July 2014; LA Times Sept. 2013)
- why should insurer want to induce under-treatment?

private contracts

- with public contracts there is no effect of network size on utilization and costs
- cannot address concerns on under-treatment
- contracts are private in reality
  - confidentiality clauses (Muir et al., 2013)
  - only insurer and provider know the terms
  - other insurers and providers do not
  - consumers do not
- details of these contracts are payoff relevant

questions

- capitation fee as supply side cost sharing
  - how is this combined with provider choice?
  - why is demand side cost sharing used?
- higher fee-for-service makes provider more willing to treat
  - how can this be signalled to insured?
  - what are effects of price transparency and AWP laws?

literature

- health economics literature on selective contracting and managed care
- papers by McGuire and co-authors (1993, 1997, 2002) on physician agency
  - with public contracts demand and supply side cost sharing separated
  - optimal to have no demand side cost sharing
- I.O. literature on private contracts
  - Hart and Tirole (1990): upstream monopolist with two downstream firms cannot earn monopoly profit with two part tariff
  - $p > c$: oversupply because downstream firms expect U to oversell to competitor
  - in our case: $p < c$: provider expects too many patients

main results

- with private contracts, supply side cost sharing decreases in network size
- strategic effect: given capitation fee, insurer sends too many patients to provider with lowest p
- needs to be compensated by higher capitation
- optimal network size trades off treatment efficiency against provider profits
- demand side cost sharing to reduce over-treatment

Model

insurers

- risk neutral
- risk averse consumers (mass 1)
- premium σ
- co-payment γ in case of treatment
- network size n of homogeneous providers
- offer providers fee-for-service $p \geq 0$, capitation t
- no other cost of insurance
- perfect competition

providers

- risk neutral
- c cost of treatment
- $v \in [0, \bar{v}]$ value of treatment, F
- efficiency: treat iff $v \geq c$
- under-treatment: patients with $v > c$ are not treated

consumers

- same exogenous probability θ that treatment is needed
- copay $\gamma > 0$ inefficient due to risk aversion: $\delta(p, \gamma)$
- gets treatment iff $v \geq v(p, \gamma)$
  - efficiency: $v(p, \gamma) = c$
  - $v(p, \gamma) > c$: under-treatment
  - number of treatments $H(p, \gamma) = \theta(1 - F(v(p, \gamma)))$
  - with $H_p \geq 0, H_\gamma \leq 0$

Public contracts

efficiency

- contract n providers
- fee-for-service: p^* with $v(p^*, 0) = c$
- assume $p^* < c$
- capitation: $t = H(p^*, 0)(c - p^*)/n$
- network size has no effect on costs/utilization
- can be an effect on distribution of rents via t

other effects

- threat to exclude
- shifting volume
- taste for variety
- heterogeneous providers or agents
- risk averse providers

Private contracts

truthful revelation

- insurer can implicitly guide patients to providers
- send patients (first) to provider i with lowest p_i
- different from explicit/contractible steering
  - exclude provider from network
  - vary γ_i with provider P_i
- even without steering:
  - number of patients treated by P_i depends on prices of other providers
  - patients not treated by P_j shop around hoping that $v(p_i, \gamma) < v < v(p_j, \gamma)$

capitation

- how many patients can P_i expect?
- insurer tells P_i that P_j has contract with $p_j = p_i - \varepsilon$
- P_i can expect to treat only $\hat{x}_i = H(p_i, \gamma) - H(p_i - \varepsilon, \gamma)$ patients
- t_i close to 0
- set of contracts p, t where x_i is truthfully revealed:

$$A_{\gamma,n} = \{(p, \hat{x}(c - p)) | \hat{x} \geq x\}$$

proposition

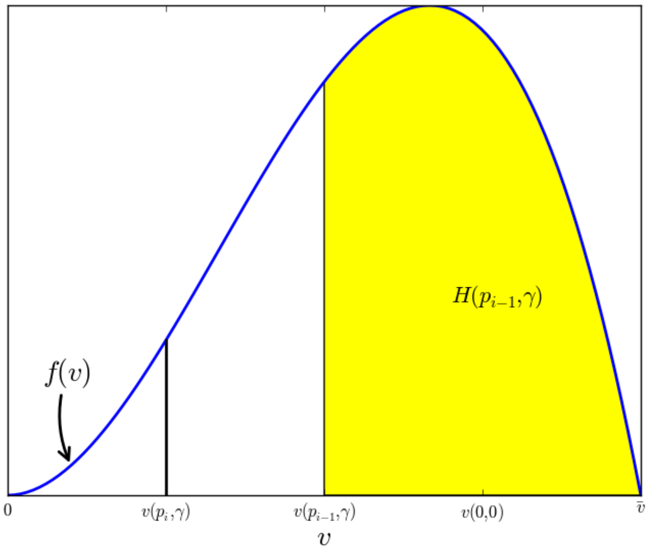
- for each $(p, t) \in A_{\gamma,n}$, we have $t \geq H(p, \gamma)(c - p)$
  - each provider gets t as if she has lowest p
  - any lower t is rejected by providers
  - intuition: provider P_i does not believe insurer's claim that there is $p_j < p_i$

profits

- if two providers get offered the same $p < c$, insurer pays $t = H(p,\gamma)(c-p)$ to each
- total cost equal

$$H(p,\gamma)p + 2H(p,\gamma)(c-p) = H(p,\gamma)c + H(p,\gamma)(c-p) > H(p,\gamma)c$$

- providers make a profit


$f(v)$
$H(p_{i-1},\gamma)$
0
$v(p_i,\gamma)$
$v(p_{i-1},\gamma)$
$v(0,0)$
$\bar{v}$
v

- reduce provider profits by raising fee-for-service p and reduce capitation t
- hence bigger networks lead to less supply side cost sharing
- and thus to higher health care utilization and costs
- with $n = 2$, set $p_1 = 0, t_1 = H(0, \gamma)c$ and

$$C(n, \gamma) = \min_{p_2} H(0, \gamma)(c - \gamma) + [H(p_2, \gamma) - H(0, \gamma)](p_2 - \gamma)$$

$$+H(p_2, \gamma)(c - p_2)$$

intuition

- as network size n increases, supply side cost sharing becomes more expensive
- with $n = 1$, reduce treatment costs by setting $p = 0, t = H(0, \gamma)c$
  - insured cannot observe p
  - premium does not depend on p
- with $n \geq 2$, this becomes too expensive, as each provider requires $t = H(0, \gamma)c$
- raise p to reduce t
- bigger network leads to more utilization and higher cost
- for n big enough, $p = c$: indemnity insurance, all providers contracted
- size of the network signals probability of treatment
  - broader networks are more generous
  - premium depends on n

results

- costs $C(n, \gamma)$ increase in n
- decrease in γ
- consumer is interested in highest price $p(n, \gamma)$
- probability that insured is treated (at all) is $H(p(n, \gamma), \gamma)$
- probability of treatment increases with n

Insurance market

value of insurance

- Bertrand competition: $\sigma = C(n, \gamma)$
- consumer does not know p_i
- but does understand that bigger network leads to higher $p(n, \gamma)$
- values insurance at

$$V^i = \theta \int_{v(p(n,\gamma),\gamma)} (v - \gamma) f(v) dv - C(n, \gamma) - \theta \delta(p(n, \gamma), \gamma)$$

efficiency

- due to competition, insurers choose n, γ to maximize V^i
- network size is trade off between number of treatments and providers' profits
- inverse U between n and profits
  - zero profits with $n = 1$
  - zero profits with n high enough that $p = c$
- if optimal n implies over-treatment, $\gamma > 0$ can be optimal
- unlike public contracts, here both demand and supply side cost sharing needed

Policy implications

AWP laws

- make it harder to exclude provider from the network
- with private contracts, providers have positive profits; want to be part of the network
- with perfect competition in insurance market, V^i is maximized
- if AWP laws lead to higher n, reduction in welfare

price transparency

- attempts by government to increase price transparency
- ensuring that insured know what prices they have to pay for treatment
  - what is price for uninsured treatment?
  - what co-payment do insured pay?
- should there be transparency about prices paid by insurers to providers?

- “do it well or not at all”
  - if everyone knows these prices: public contracts
  - implement first best: $p^* < c, \gamma = 0$
  - consumer buying insurance need to know prices for all possible treatments
  - more likely: insurers and providers know all prices but consumers do not
  - optimal to set $p = 0$: under-treatment
  - signalling value of network size disappears
  - as $p = 0$ is possible with private contracts as well, this type of price transparency reduces welfare