

Capitation and provider choice

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Introduction

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Introduction

motivation

- ▶ health care costs increase rapidly in many countries
- ▶ some countries introduced private health insurers to bargain with providers in order to
 - ▶ keep costs down
 - ▶ reward quality
- ▶ ideally insurers exclude providers that are too expensive/offer too low quality
- ▶ policy concern that insurers choose narrow networks which induce under-treatment (NYT, July 2014; LA Times Sept. 2013)

evidence

- ▶ 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

- ▶ why should more choice lead to higher utilization?
- ▶ or why would narrow network lead to under-treatment?
- ▶ why should insurer want to induce under-treatment?
- ▶ consumers are willing to pay for “proper 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
 - ▶ fee-for-service below treatment cost
 - ▶ 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 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
 - ▶ $p > c$: downstream firm expects too few customers
 - ▶ in our case: $p < c$: provider expects too many patients

main results

- ▶ with private contracts, supply side cost sharing decreases in network size
- ▶ low fee-for-service becomes too expensive as network expands
- ▶ utilization and costs increase with network size
- ▶ small networks lead to under-treatment
- ▶ optimal network size trades off treatment efficiency against provider profits

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: $\delta(p, \gamma)$
- ▶ 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

steering

- ▶ insurer can affect patient's provider choice
- ▶ 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
- ▶ what we need is:
 - ▶ 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?
- ▶ depends on p_j ; private information
- ▶ 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

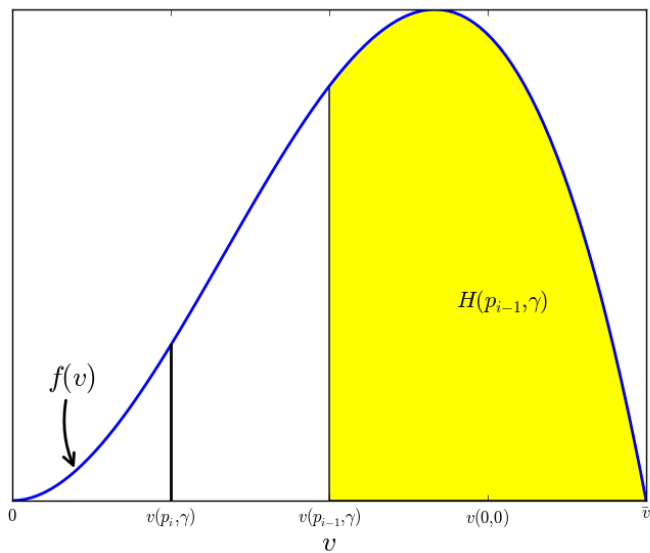
- ▶ for each $(p, t) \in A_{\gamma, n}$, we have $t \geq H(p, \gamma)(c - p)$
 - ▶ each provider gets t as if she has lowest p
 - ▶ any lower t is rejected by providers
 - ▶ intuition: provider P_i does not believe insurer's claim that there is $p_j < p_i$

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
 - ▶ they want to belong to a network
 - ▶ defend confidentiality of their contracts



- ▶ 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