31E99906 Microeconomics policy

Lecture 5: Adverse selection in health care

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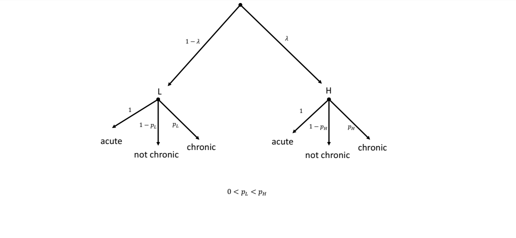
The Plan

Two readings

- First reading: Adverse selection and the health care plans. We build on the insurance market model of the previous lecture. How the premiums should be adjusted to correct for the adverse selection problems?
- Second reading: unraveling of the market and policy remedies.

First reading: optimal risk adjustments

- citizens/customers can have acute or chronic illnesses. Expenditure for acute illness is m_a and m_c for chronic. Premium is denoted by r
- firms offer plans (m_a, m_c), that is, they can compete by choosing expenditures per illness. Policy maker can only regulate payment r, not the plans directly.
- all customers have acute needs (flu), and a probability for chronic illness (cancer). Low and high type shares in the population given by λ



What is the first-best outcome?

- from plan (m_a, m_c, r), the consumer gets expected utility

$$V_a(m_a) + p_i V_c(m_c) - r, i = L, H$$

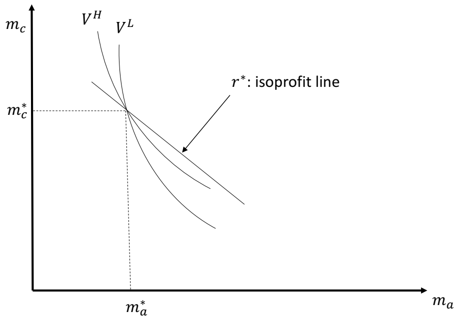
- marginal cost of expenditure is 1. Efficiency requires that there are no gains from reallocating resources from treatment to another:

$$V_a'(m_a^*) = V_c'(m_c^*) = 1$$

- if the burden is shared in evenly (fairness), all citizens pay the same premium

$$r^* = m_a^* + [\lambda p_H + (1 - \lambda) p_L] m_c^*$$

First best in Figure



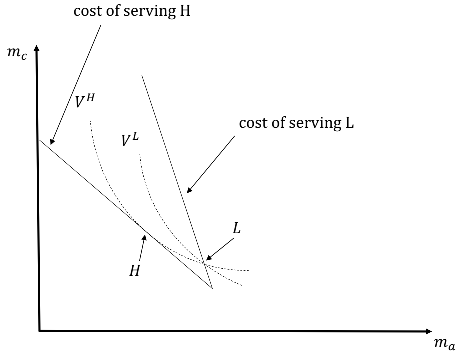
Note that this different from the insurance market first-best: both types get the same treatment (and thus the indifference curves cross)

Equilibrium when firms do not observe the consumers types: adverse selection

First case: unregulated equilibrium. Firms receive charge premium r (not allowed to discriminate), and compete with (m_a, m_c). We know from the previous lecture on insurance markets with adverse selection:

- pooling equilibrium does not exist: firms have incentives to deviate and attract the good risks by offering plans designed for them
- separating equilibrium firms provide efficient plans to high risks but not to the good risks
- signals about the health status have no impact on the equilibrium! Why?

Separating equilibrium



How to regulate: increasing the premium

Second case: regulated equilibrium. Recall efficient outcome: (m_a^*, m_c^*, r^*). How to make firms willing to offer this plan? We can regulate the premium $r^*)$, which should give enough resources for the firms to offer efficient plans (m_a^*, m_c^*). Does this work?

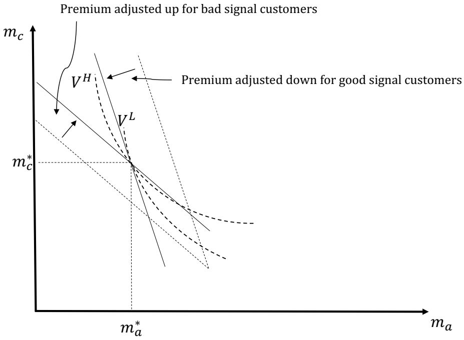
- This can improve the allocation but the separating equilibrium still follows
- Firms compete with plans, and these are not regulated.

How to regulate: risk adjusted premiums

We now allow the premiums to differ between risk types. Assume that there is some signal of the type (visit to a doctor) that provides a basis for paying more for taking high risk customers.

- Let $r_H^* = m_a^* + P_H m_c^*$ be the expected cost of efficient service to H, and similarly $r_L^* = m_a^* + P_L m_c^*$.
- After the signal, we have an improved estimate of the risk, say, probabilities (q_L, q_H),for the two types. These can be obtained through Bayes formula.
- We want the providers to offer efficient plans (m_a^*, m_c^*) by paying a different premium for those customers who have been classified H by the doctor (this is the signal). We can pay premiums (r_0, r_1) where r_0 is for customers who did not receive a signal and r_1 is for customers who did: such that $q_H r_1 + (1 - q_H) r_0 = r_H^*$, and $q_L r_0 + (1 - q_L) r_1 = r_L^*$

Risk adjusted premiums can implement the first best



Second reading: firms offer a single insurance contract that covers some probabilistic loss

Important assumptions

- firms compete in prices but do not compete on the coverage features of the insurance contract. Very different from the previous reading!
- Consumers in this market make a binary choice of whether or not to purchase this contract, and firms in this market compete only over what price to charge for the contract.
- Quantity is the fraction of insured individuals.
- Costs associated with insurance is the expected payouts on policies.
- Market demand curve: the cumulative distribution of individuals' willingness to pay for the contract.

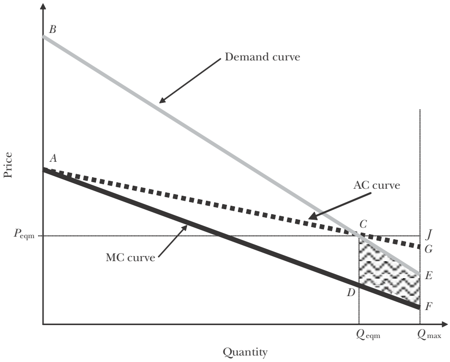
Simple formalization of the reading

- Firms offer simple contract with one price p, unit mass of consumers
- Willingness to pay (WTP) is u, distributed in $[0, \overline{u}]$ according to cumulative distribution function $F(u)$
- Buy if $u \geq p \Rightarrow Q(p) = \int_p^{\overline{u}} dF(u) = 1 - F(p)$
- Expect cost of the contract, $MC = MC(u) \geq 0$
- Average cost, $AC(p) = \frac{1}{Q(p)} \int_p^{\overline{u}} dF(u)$
- Profit $\pi(p) = Q(p)(p - AC(p))$, Consumer surplus, $CS = \int_p^{\overline{u}} (u - p) dF(u)$

In equilibrium, $\pi(p) = 0 \Rightarrow p = AC(p)$. In the first best, $W(p) = CS(p) + \pi(p)$. $W'(p) = 0 \Rightarrow p = MC(p)$.

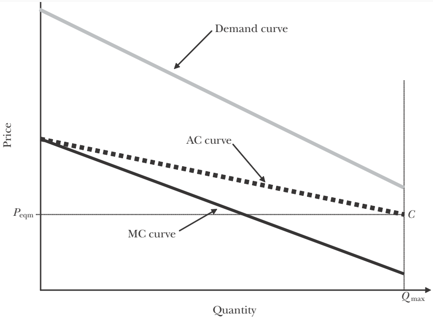
How to read this Figure?

Why is the MC curve downward sloping? Why is the gap AC-MC increasing?



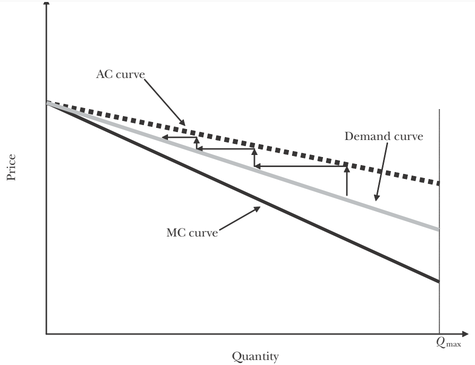
How to read this Figure?

Where is the adverse selection here?



How to read this Figure?

What happens to the market in this case?



Adverse Selection in a Dental Care Monthly Subscription Program

Master's thesis: Takala, 2018. Comparing two contracts: (1) pay for service, (2) insurance plan

	Billing per visit		
Treatment order*	Monthly subscribers	Basic customers	Difference in average billing
1	500 €	400 €	100 €
2	460 €	390 €	70 €
3	430 €	350 €	80 €
4	350 €	290 €	60 €
5	300 €	250 €	50 €
6	280 €	220 €	60 €
7	260 €	190 €	70 €
8	250 €	170 €	80 €
9	240 €	160 €	80 €
10	180 €	130 €	50 €
11	150 €	100 €	50 €
12	140 €	100 €	40 €
13	140 €	90 €	50 €
14	170 €	120 €	50 €
15	130 €	110 €	20 €

**The ordinal number of visit*