

# Imperfect Information in Health Care Markets

Exercise Session 12 - Utilization management, Supplier induced demand

## Exercise 30

Consider the following case: "I met Jane at a gas station in the outskirts of Oklahoma City where she was filling up her 8 year old Chevrolet. She was in her forties and when I asked for the way she was happy to help me out. The moment she talked it became apparent that some of her teeth were missing which impeded her speech slightly (the pronunciation of "s" was a bit off). As a result, I misunderstood her first and had to ask her to repeat. The second time I got it and apologized for my earlier misunderstanding.

'Don't worry, it happens all the time. Ever since I had the tooth thing three years ago. It hurt so bad...After two days I begged my brother to pull them out.' she said. 'I see. Did it help?' I asked politely. 'Well first he did not want to do it. But after another day he said yes. It was terrible. He did not get them first time and then it hurt even more and there was lots of blood. But, yeah, it got better when they were out.' It took me a second to follow but then it dawned on me: 'I guess your brother is not a dentist...'

## Exercise 30 (cont.)

'No, of course not,' Jane laughed, 'he did his best. I called the dentist but they said it was 500\$. I mean, who can pay that if you have no insurance, you know.'"

Discuss whether Jane should have had a dentist to treat her toothache from a welfare perspective.

## Exc. 30

Jane has no insurance and did not see a dentist. Hence, her WTP is below the cost of a dentist and it is most efficient for her not to see a dentist.

Objections:

- maybe, it is rather about ability to pay than about willingness to pay (however, she could have sold her car)
  - you could argue that some social health insurance should be paying for her treatment. In this case, we would use health insurance to redistribute wealth.
- potential disadvantage: If Jane were given 500€ cash for her treatment, she might still use it for something else.
- potential advantage: negative externalities of non-treatment can be prevented, which might be socially desirable (e.g. for infectious disease)
- higher potential future costs (follow up diseases due to insufficient previous treatment)

## Exercise 31

Assume for simplicity that a consumer needs to go to hospital exactly once per year. When he goes to hospital, a *long stay* is appropriate with probability  $1/2$  and a *short stay* is appropriate with probability  $1/2$ . The costs of a long (short) stay are  $c_l$  ( $c_s$ ) with  $c_l > c_s$ . The hospital has idle capacity and prefers if the consumer stays long. The consumer cannot judge whether a short or a long stay is more appropriate but the hospital knows this perfectly. Assume that there is perfect competition on the insurance market, i.e. insurance premia equal expected costs, that only full coverage contracts are allowed and that insurers have no administrative costs.

- a) Assume that the hospital determines the length of the stay. What is the equilibrium on this market, i.e. how long will the consumer stay and what is the insurance premium?

Exc. 31 a)

The hospital will always enforce a long stay (by assumption). This leads to a premium of  $c_2$ .

## Exercise 31 (cont.)

- b) Now assume that the insurer engages in utilization management, in particular assume that the insurer decides whether the stay is short or long. Assume that the insurer does not know which length of stay is appropriate but he has some information on this: More precisely, assume that the insurer's perception of which length of stay is appropriate is correct with probability  $\alpha > 1/2$ . What is the equilibrium insurance premium if the insurer uses his perception?
- c) Assume that the consumer has utility 1 if the length of his stay is at least as long as appropriate but 0 if he has a short stay and a long one would have been appropriate. The consumer maximizes expected utility from health minus the insurance premium. Is the consumer better off with or without utilization management? Reconsider what the equilibrium is when utilization management is possible.

## Exc. 31 b)

The premium depends on the probability of a long stay if the insurer uses his perception.

This probability is:  $\frac{1}{2} \cdot \alpha + \frac{1}{2} \cdot (1-\alpha) = \frac{1}{2}$

↙ long stay appropriate

↘ short stay appropriate

→ premium is  $p = \frac{1}{2} \cdot c_L + \frac{1}{2} \cdot c_S$

C) Expected utility of the consumer depends on who decides about the length of the stay:

• if the hospital decides:  $E_h(u) = 1 - c_L$

• if insurer decides:  $E_i(u) = \frac{1}{2} (\alpha \cdot 1 + (1-\alpha) \cdot 0) + \frac{1}{2} \cdot 1 - \left( \frac{1}{2} c_L + \frac{1}{2} c_S \right) = \frac{1}{2} (1 + \alpha - c_L - c_S)$

$(E_h(u) \geq E_i(u)) \Leftrightarrow (2 - 2c_L \geq 1 + \alpha - c_L - c_S)$

↙ long stay necessary

↙ short stay necessary

↘ consumer cannot stay too shortly

$\Leftrightarrow (1 + c_S - c_L \geq \alpha)$

Might want to recall: Inequalities, equivalence sign

→ If  $\alpha$  is sufficiently large, then UM is beneficial for the consumer.

If UM is allowed but not optimal for the consumer, then the equilibrium is that insurers do not use UM.