

GUIDANCE TO THE EXAM IN HECON 4220 (Payment systems for healthcare providers. Spring 2019)

QUESTION A (weight 25%):

Explain briefly the following concepts;

- (i) Prospective payment systems, Retrospective payment systems and Supply-side cost-sharing.
- (ii) Patient selection
- (iii) Information rent

All questions can be answered by using chapter 10 (Zweifel et al. 2009) and, to some extent, from using the lecture slides and the article by Kornai and Eggleston (2001). Good grading will be achieved by consulting Zweifel et al. (2009) at page 331 and p 337 (question i), Zweifel et al. (2009) subsection 10.3.2, page 355 (question ii) and Zweifel et al. (2009) subsection 10.2.3, page 345 (question iii).

QUESTION B (weight 25%):

Discuss factors that may explain the observed variation in medical practice

First, a relevant starting point would be to say what VIMP is all about, for example mentioning what type of variations are in mind (across regions, across hospitals and across individual physicians. Second, a classification of the types of explanations could be presented (demand-side factors, supply-side factors and other factors). Third, discuss what factors are believed to be the most important ones (the medical uncertainty hypothesis versus the clinical practice variation hypothesis). In my opinion the medical uncertainty hypothesis is not particularly relevant since due to the law of large numbers, we would not expect to see VIMP across regions.

QUESTION C (weight 25%):

Advocates of the Patient Safety Movement have proposed the implementation of several principles believed to encourage health care workers to self-report medical errors. The principles are; (i) voluntary reporting, (ii) confidentiality, and, (iii) immunity. Discuss to what extent these principles will strengthen the incentives for reporting.

A good answer would be to define each of the principles and discuss how each of them might impact the reporting incentives. A more formal approach would be to present the expressions from Grepperud (2009) that both reflect the costs of reporting and the cost of non-reporting, respectively. By comparing the two expressions and discuss how the same expressions change in response to each of the three principles, it will be possible to arrive at some definitive conclusions. Important conclusions are as follows; (i) voluntary reporting (the absence of a non-report penalty) makes non-reporting less costly, thus the reporting incentives are being weakened, (ii) Confidentiality and Immunity make self-reporting less costly (for any given non-reporting penalty), thus the reporting incentives are being strengthened. It would also be of interest to discuss how shame and guilt may influence the reporting incentives. A discussion of the role of the penalty that is to ensure the correct precautionary level would improve the quality of the answer.

QUESTION D (weight 25%):

A third-party payer (sponsor) has the following welfare function; (1) $W = B(q) - P$ where q is the quality level, $B(q)$ is the treatment benefits of a patient while P refers to the payments to the provider from the third-party payer. The objective function of the provider is as follows; (2) $U(Y) = P - C(q)$ where $C(q)$ represents the quality treatment costs. Let $\bar{U}$ be the reservation utility of the provider.

(i) Identify and explain the welfare-optimal (first-best) level of quality.

(ii) Assume that q is unobservable (non-contractible) for the third-party payer. However, the third-party may observe (contract upon) quality costs which implies that we have the following payment function; (3) $P = F + \gamma B(q)$ where F is the fixed budget and γ is a parameter that transforms patient benefits (quality) into provider payments. Derive and discuss the optimal payment scheme for this case.

The above questions can, in principle, be answered without using algebra. If so, it will be important to provide explanations to the answers provided (for example by presenting some graphs), both as concerning the first-best quality level and the optimal payment scheme. An alternative approach would be to use algebra (optimization), however, in this case, in order to produce a good answer, it is important that the findings are accompanied with explanations. Below, the mathematical solution to the questions is presented.

As concerning (i): In order to identify the first-best quality level set expression 2 equal to the reservation utility level which yields $P - C(q) = \bar{U}$ and solve this expression with respect to P which yields; (4) $P = C(q) + \bar{U}$. Now by inserting (4) into (1), we get; (5) $W = B(q) - C(q) - \bar{U}$. Now by maximizing (5) with respect to q (the first-order condition) we get the following expression that defines the first-best quality level q^* ; (6) $B'_q(q^*) - C'_q(q^*) = 0$. It would now be a good approach to provide condition (6) with some intuition. Extra merit is given to those who also discuss the needed assumptions on $B(q)$ and $C(q)$ to fulfill the first-order and the second-order condition for our problem.

As concerning (ii): To derive the optimal payment scheme start out with inserting expression (3) into (2) which yields; (7) $U(Y) = F + \gamma B(q) - C(q)$. By maximizing (7) with respect to q we get the following first-order condition; (8) $\gamma B'_q(\bar{q}) - C'_q(\bar{q}) = 0$. Expression (8) defines the following response-function for the provider; $\bar{q} = q(\gamma)$ saying that the quality level chosen by the provider will depend on the size of γ . By inserting the response-function into the welfare function (see 5), we get the following expression; (9) $W(\gamma) = B(q(\gamma)) - C(q(\gamma)) - \bar{U}$. By maximizing (9) with respect to γ we get the following first-order condition for the third-party payer; (10) $[B'_q(q(\gamma)) - C'_q(q(\gamma))]q'_\gamma(\gamma) = 0$. By comparing (10) with (8) it follows that (10) will produce q^* (see 8) if γ is equal to 1. Provide your finding with some intuitive remarks. It is also possible to discuss the consequences from various model extensions such as introducing cost-reducing effort and/or uncertainty and risk aversion.