

Exam October 12^h 2021

HECON4100 – Fundamentals of Health Economics

The requirements for a home exam will typically differ somewhat from a standard 4 hour exam since the questions, in the first case, tend to invite the candidates to undertake more discussion-like answers - to provide several arguments and discuss their relevance.

Furthermore, the answers, to the questions raised, will to a lesser extent be covered by lectures and textbooks, hence it is not always so much about correct or wrong answers. An assessor will typically look for the candidates' ability to apply the basic idea of economics and health economics into analyzing a particular topic (the degree of understanding of the discipline).

Both the presentation itself and the structure of arguments become relatively more important for home exams. This means that figures and graphs should be carefully presented and commented upon and the text should be adequately structured. Remember to provide intuition to your answers and first and foremost, make sure that you are answering the questions raised. Discussion-like answers, where it is possible is, is in demand.

Below, I will quite briefly (mainly by presenting some key words) suggest what the relevant answers could/should contain. This is done since presenting "correct" answers to each of the questions is not possible since there is much variation in how to approach most of the questions raised in the exam.

Question I: QUALITY (weight 1/6)

- A) Quality is a concept that is widely used in the literature on health and health care services.

Discuss the meaning (content) of this particular concept.

Multi-dimensional concept (see Sloan and H. page 279)

Often understood as “minimum standards”

Quality in health services are discussed, in governmental white papers (Kvalitetsmeldingen) and Grepperud (tidsskrift for Legeforeningen) – a debate on what particular dimensions are to be included in the concept of quality.

An economic definition “any increase that fully-informed consumers are willing to pay for,,,” See also Donebedian (structure, Process and outcome)

It will be OK to mention the measurement-problems (some dimensions are easily observed while others are not – reputation, search and credence).

- B) In many situations, patients must wait before they can meet with health care providers. One example is “waiting lists” - where patients are assigned a future date for meeting up with a provider. A second example is a “queue” which implies waiting in person (for example sitting physically in the waiting room waiting of a GP). Explain why waiting lists and “queues” occur.

Note that this question is about WHY

For any given price of health care services, the demand exceeds the supply.

People are insured, thus demand is high (ex-post moral hazard).

Typical in tax-based systems and public ownership = supply shortage

Two groups of patients (planned and acute) and a stochastic demand among one group (acute) – plus seasonal variations.

Is also the result of the need to prioritize among different patient groups

- C) Discuss waiting lists and “queues” in relation to the health care quality with a particular focus on the differences and similarities.

Note that this question is about CONSEQUENCES (see Sloan and H. p. 573)

Given that access (time to treatment start and treatment duration are part of the quality of services) are relevant for quality, the longer waiting time and queues are reducing the quality of care.

The opportunity cost of queues are higher than waiting on a waiting list since physical presence is needed in association with queues” – time in queues = lost leisure time and lost working time.

Typically, waiting in queues are shorter than waiting on a waiting list

Delayed treatment start (waiting lists) may also imply that the expected clinical outcome is being reduced due to a worsening of the condition.

May also be a strategy in promoting efficiency, in terms of providers being able to avoid vacancies (unused capacity) that typically arise due to stochastic demand (demand fluctuations). Some waiting might be optimal from a provider perspective

Non-complex patients drop-out (efficiency improving?)

Strong incentives for going private

Long term consequences – future voting behavior (distrust) and the future sustainability of the welfare state

- C) Explain why researchers and policy analysts are claiming that the improvement in the quality of health care services is an important causal factor of the observed increase in health care costs that has taken place the last 50 years.

Most of the innovation that has taken place in medicine is concerned with new products rather than cost-reductions. New products imply that additional needs are fulfilled thus meaning an increase in quality (the treatment standard). Innovation is the most important cost-driver and innovation often implies an increase in the quality level of healthcare services.

With rising income, there is a pressure towards raising the quality standards

Question II: QUALITY: COMPETITION AND REGULATION (weight 2/6)

- A) Discuss factors that determine the degree of market competition.

Could use the perfect-competition assumptions (entry, number of firms, the degree of product homogeneity (how products from different producers differ in the eyes of consumers), the degree and type of information being available to the consumers). Externalities are maybe less relevant.

Other factors are motivation (for-profit or not), location and type of market competition (price competition or quality competition)

Governmental interventions to strengthen competition (anti-trust)

Could also here discuss the concepts of “market power”, “downward-falling demand and elasticity of the demand function directed at given producers.

- B) In markets where prices are set freely (endogenous) by the producers, what will be the effect on the prices if the degree of competition is increasing in such markets?

The price will typically go down according to standard theory.

However, if there already is fierce competition in a market, you would not expect the prices to become lower since the price already is close to marginal costs.

In health care, the literature refer to exceptions sees Pauly and Sattertwate, the Target-income model and Supply-induced demand.

- C) Consider a market for health care services where the providers freely set the prices (the prices are not regulated by a third-party payer). Discuss what the effects on the quality of health care services will be if the degree of competition is increasing in this market.

There is mixed evidence.

Two dimensions that could be used to discuss this particular question is (i) type of motive, and, (ii) what is observable (the degree and distribution of information and provider motivation).

A higher quality of the goods and services provided will typically become higher if the consumers are able to observe quality.

Could be that observable quality dimensions become higher while non-observable becomes lower.

One possibility here would be to discuss “waiting-time” as the quality-dimension.

- D) Consider a provider of health care services being reimbursed by a third-party payer (insurance company). Discuss the quality incentives for the provider given a; (i) retrospective payment scheme, and, (ii) prospective reimbursement scheme.

Retrospective reimbursement = actual cost are covered by the tariffs charged, thus the incentives to provide higher quality is strong. Especially so, if quality has an intrinsic value for the providers. Overinvesting in quality.

Prospective reimbursement = a fixed price for a service. Given that quality is difficult to observe we would expect that the quality incentives are weaker compared with retrospective reimbursement.

Does provider motivation matter? (for-profit vs. non-profit providers)

Will a mixed-system solve the potential problems

- E) Consumers are often not well-informed about the quality of the services supplied by health care providers, consequently it can be difficult to distinguish bad performers from good performers. Discuss, to what extent, the market itself (consumers and/or producers) is able to take some type of voluntary action to reduce such informational problems (provide some examples)?

PROVIDERS

Issue warranties (may or may not be so relevant in health care; treatment guarantees, Waiting-time, single room etc.)

Become accredited

Register for “Report cards”

Professional norms /peer reviews

Publish information about own qualities public (i.e number of specialists, number of nurses per bed). How trustworthy are such initiatives?

Ownership -?

CONSUMERS

May actively search for information

Repeated purchases may provide consumers with information over time (GPs?)

- F) Governments are often intervening into health care markets (by using various regulatory measures) in order to ensure adequate quality. Provide examples of such regulatory measures.

Audits/oversight/supervision

Event-based controls

Mandatory accreditation

Licensing requirements

Tort law (malpractice law)

Patient complaint institutions (ombudsmen)

Competition - to choose among providers

Reimbursement systems

Policies directed at informing consumers

QUESTION III: INVESTING IN QUALITY (weight 1/6)

Quality can be perceived as being a capital good (stock) where the stock of quality at any given date t , Q_t is a function of the initial quality level, Q_0 (the initial investment in quality) and the depreciation rate, ∂ .

- A) Present an expression for Q_t as a function of Q_0 and ∂ .

$$Q_t = (1 - \partial)^t Q_0$$

- B) Let $V(Q_t)$ where $t = 1, \dots, T$ represent the valuation of the quality level (the willingness to pay) in any period t . Present the expression for the present value of this value stream.

$$NPV = \sum_{t=1}^T \frac{V(Q_t)}{(1+r)^{t-1}}$$

- C) The initial investment in quality is associated with some investment costs, K , in the initial period. What is the condition for this quality-investment being social desirable?

$$\sum_{t=1}^T \frac{V(Q_t)}{(1+r)^{t-1}} - K > 0$$

The above answers should not only put up the expressions but be accompanied with some explanations (intuition).

QUESTION IV: QUALITY RISK (weight 1/6)

The reduction of risk (the occurrences of bad outcomes) will typically improve the expected quality in the eyes of consumers. Consider now an individual that is confronted with a risky project (lottery) where the probability for a good outcome is q and where the good outcome is equal to Q . The probability for a bad outcome is $1-q$ and the bad outcome is equal to $Q - L$ (where L is the loss). The individual can only choose between becoming fully insured, which means a coverage, C , that is equal to L ($C = L$) or stay uninsured ($C = 0$).

- A) What is the expected value of this lottery if the individual stays uninsured?

$$EV = qQ + (1 - q)(Q - L)$$

- B) Write the expression for an “actuarially fair premium” in this case.

$$\text{actuarially fair premium} = (1 - q)L$$

May also say something about loading costs and how they affect premiums

- C) What factors will be important for the individual when choosing between becoming fully insured or staying uninsured?

$$EU = qU(Q) + (1 - q)U(Q - L)$$

Risk preferences (RISK PREMIUM AND CERTAINTY EQUIVALENT)

The premium (actuarially fair or not)

The distribution of probabilities and losses (subjective probabilities)

Wealth and income.

The above answers should not only put up the expressions but be accompanied with some explanations (intuition).

QUESTION V: OPTIMAL QUALITY LEVELS (weight 1/6)

Consider as quality-improving project where the benefits of the project, $V(Q)$, is a function of the quality level, Q , where $V'_Q > 0$ and $V''_{QQ} < 0$. The variable costs of the quality project, $K(Q)$, is a function of the quality level where $K'_Q > 0$ and $K''_{QQ} > 0$.

- A) What is the optimal quality level, Q^* , for this project.

The optimal quantity is defined by the marginal benefit being equal to the marginal cost. It would be nice here to draw a figure in which the optimal quality-level is defined and provide some intuition to the result.

- B) Assume, that for some reason, the quality-level, $\tilde{Q}$, is realized where $\tilde{Q} > Q^*$. What is the deadweight loss associated with $\tilde{Q}$.

The amount of quality that exceeds the optimal level defines the level of overinvestment in quality. For this amount of quality, the deadweight loss is represented by the area where the marginal cost is higher than the marginal benefit.

- C) Consider now the case where a planner that has to allocate a *given* amount of resources, $\bar{K}$, between two quality-improving projects (project 1 and project 2) where Q_1 is the quality-level of project 1 and where Q_2 is the quality-level of project 2. The benefit function of project 1 is $V_1(Q_1)$ and the cost function of project 1 is $K_1(Q_1)$. The benefit function of project 2 is $V_2(Q_2)$ and the cost function of project 2 is $K_2(Q_2)$. What is now the optimal allocation of resources across the two resources [note that a *given* amount of resources being available for the two projects implies that $\bar{K} = K_1(Q_1) + K_2(Q_2)$]?

A good try would be to put up and explain the following answer:

$$V'_1 - K'_1 = V'_2 - K'_2$$

The net benefit from the last unit of quality 1 produced must equal the net benefit from the last unit of quality 2 produced.

Or more formally;

Max $V_1(Q_1) + V_2(Q_2)$ **subject to** $\bar{K} = K_1(Q_1) + K_2(Q_2)$

This can be solved by using Lagrange Method or by inserting the constraint into the objective function.

The formal and correct answer is as follows;

$$\frac{V'_1(Q_1)}{K'_1(Q_1)} = \frac{V'_2(Q_2)}{K'_2(Q_2)}$$

The ratio of the marginal benefit to the marginal cost must be equal for the two projects.