Written Exam for the M.Sc. in Economics 2009-II

Health Economics

Master's course

June 4, 2009

4-hour closed book exam

Please note that the language used in your exam paper must correspond to the language of the title for which you registered during exam registration. I.e. if you registered for the English title of the course, you must write your exam paper in English. Likewise, if you registered for the Danish title of the course or if you registered for the English title which was followed by "eksamen på dansk" in brackets, you must write your exam paper in Danish.

If you are in doubt about which title you registered for, please see the print of your exam registration from the students' self-service system.

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This exam consists of three essay problems. Each problem has approximately equal weight in the final grade. A problem consists of different sub-questions that do not necessarily have equal weight. All answers must be explained.

Problem 1 (Healthcare financing) A number of lifestyle related diseases can be seen as caused by previous acts of the individual concerned. The emergence of such diseases can be seen as an *external effect* caused by consumption of particular goods (tobacco, fast-food etc.), since the population as a whole has to look at the disease-hidden person or alternatively pay for her treatment.

1.1. Explain that externalities may be remedied either by creating artificial markets or by taxes/subsidies. How should the two types of intervention be constructed in the case considered?

1.2. It is decided to avoid taxes and subsidies. Instead, it is contemplated to set up a system of *medical savings accounts* for treatment of lifestyle diseases, whereby all individuals are allowed to deduct transfers to these accounts from their income, and all treatment has to be paid from these individual accounts. Give an assessment of this system in relation to efficient financing of lifestyle related diseases.

1.3. For type 2 diabetes, it is possible to measure the progression of the disease and therefore also to give an estimate of the probability of reaching the stage where serious illness needing costly treatment occurs. It is therefore proposed to introduce a scheme where each individual pays the yearly change in expected cost of treatment if positive, or alternatively receives this amount if it is negative. Give an assessment of this scheme; which advantages does it have from the point of view of prevention, and what are the disadvantages?

Problem 2. (**QALYs**). Let a pair (Q, T) denote an outcome where a person lives for T years in health state Q. Suppose that preferences are in accordance with expected utility theory, and consider the QALY model $U(Q, T) = V(Q)T$.

2.1. Interpret the model, and describe some methods for assessment of the quality-adjustment factor $V(Q)$ in practice. For each method you describe,

discuss pros and cons and whether the method is meaningful in relation to the QALY model.

2.2. Suppose that a healthcare provider adopts a policy of maximizing the total sum of QALYs of all individuals in a given population. Discuss possible justifications and ethical objections to such a policy.

2.3. Suppose that the healthcare provider does NOT wish to adopt a policy of the type outlined in sub-question 2.2 above. That is, suppose that the healthcare provider does not wish to maximize the sum of QALYs of all people in the population (for reasons that you may have discussed in 2.2). What other objective could there be? Discuss.

Problem 3. (Health insurance) In a country where the healthcare system is under financial strain, it has been decided to separate all healthcare related to salmonella infections and their treatment and to set up a special insurance scheme for this illness. Participation is voluntary, but the insurance scheme should be such that all costs are covered by the premium payments of the participants. There is an additional cost of administrating the scheme, and due to capacity limitations unit cost of administration increases with number of participants.

3.1. At the outset, it is decided that the insurance premium must be equal for all. It is known, however, that the individuals in the country concerned have almost identical probability of becoming infected, but they differ considerably in their attitude towards risk. Give a formalized presentation of this situation and show that there may be adverse selection in the sense that some individuals who basically want insurance nevertheless choose not to participate.

3.2. Give a suggestion to what the new insurance organization could do in order to increase as much as possible the welfare of the population, given that

it may introduce other elements than the common premium in the contract. What will happen if it is decided that several insurance companies may offer this type of insurance?

3.3. Since participation in the scheme turns out to be small, so that a considerable part of the population remains uninsured, it is decided that participation shall be mandatory. It is however accepted that the insurance organization offers a contract (the same for all) which has less than full coverage and therefore also a lower premium. What will be the equilibrium in this case?