

Review questions for EC782 midterm. Prof. Ellis

Midterm exam is rescheduled for **Monday March 23, 2015 in** class 10:30-12:00, Room 546

The midterm will be for 1.5 hours and have two parts. In the first part, there will be four questions chosen from the following seven and you will be asked to answer **two**. In the second part there will be only one question, largely based on what is below, and there will be no choice. The actual wording and information requested may differ slightly from those shown here, or simplified. Short, well organized answers will be preferred to long, disorganized ones.

1. The Rand Health Insurance Experiment (HIE), conducted in the mid 1970's, remains the classic and largest controlled experiment done in the health services field. Key literatures include Manning et al (1987) and the new evaluation of the same data by Aron-Dine, Einav and Finkelstein (2013).

- a. List three research questions that motivated the HIE.
- b. Describe two reasons why a controlled experiment may be superior to using a natural experiment for answering these questions.
- c. Describe two weaknesses of a controlled experiment relative to using observational data from a natural experiment to answer these questions. In this part and the previous one, use examples from the literature if possible.
- d. Discuss one study (with the author(s), journal, and year) that we have discussed in class or is on the reading list that extends one of the three research questions from the HIE.
- e. Briefly describe a new study that YOU could imagine doing that would improve upon either this study from part (e) or the Rand HIE results. .

2. a) Why might supply side cost sharing be superior to demand side cost sharing?
b) What form of cost sharing is predominantly used in the US to control costs? What form predominates in Europe?
c) In the terminology and notation of Ellis and McGuire (EM) (1986), what is a perfect agent? What payment system can achieve the first best if hospitals are perfect agents? Briefly, explain why.
d) Briefly list three criticisms of the EM model.
e) Alice Chen and Darius Lakdawalla (2015) have recently extended the EM model of physician behavior by assuming that doctors care not only about benefits of treatment but also the consumer's out of pocket costs. (You do not need to read their paper, but it is linked on the economics department calendar on March 11, 2015.) A simplified version of their model of FFS payment (ignoring that that they also introduce a substitute good S) is the objective function

$$\max_x U(x) = (1-\alpha)[P_x \cdot x - C(x)] + \alpha[B(x) - c \cdot P_x \cdot x]$$

where they assume $C' > 0$, $C'' > 0$, $C''' > 0$, $B' > 0$, $B'' < 0$, and $B''' < 0$.

Derive the first order condition for the physician's utility maximizing choice of x , x^* .

- f) For what value of P_x and c will the physician's choice attain the social optimum?
- g) Use this foc to derive an expression for the effect of P_x and c on x^* . Can you sign this expression?

3. Managed care is pervasive in US health care markets, although relatively rare in other countries still.
 - a) What is managed care?
 - b) Speculate on why managed care is more common in the USA. What problem or problems is it designed to fix? Describe an alternative approach used in at least one other country to solve these same problem(s).
 - c) Explain carefully how selection complicates the assessment of the impact of managed care on total health care spending. Give an empirical example.
 - d) We have studied several papers that touch on managed care. (Manning et al, 1987; Burgess, Carey and Young, 2005; Shen and Melnick, 2005; and Glied, 2000, more in health seminars) Summarize briefly what this literature says about the effectiveness of managed care in controlling costs or improving quality.
 - e) What is the managed care backlash? Is it still happening today?

4. Answer the following questions, providing references from the literature where possible.
 - a) List five (or more) properties of health care expenditure models make OLS less than ideal for estimating models of health care spending.
 - b) Explain the estimation algorithm of the classic two-part log linear model used in the RAND health experiment. (Manning et al 1987, and Buntin and Zaslowsky, 2004).
 - c) Criticize this two part model.
 - d) Describe briefly one alternative **specification** for individual level spending that has been used more recently. What are its strengths and weaknesses?
 - e) What models of individual health care costs are preferred by Andrew Jones (2010) and other econometricians?

5.
 - a) There are three markets in the US that are potentially becoming more concentrated: provider markets, health plan markets, and the government as a sponsor of health plans. Is there one form of concentration that is of greater concern than others? Briefly explain your answer.
 - b) In Europe, is there more or less concentration in these three markets? Why or why not is this a concern compared to the US?
 - c) Dunn and Shapiro (2012) develop a market level model of health plan and physician decisions about pricing and quantity. What are the three stages or periods in their model and what decisions are made in each?
 - d) What is the physician's entry decision model? Describe one change or extension you would make to this model.
 - e) How do they model the market determination of price and quantity? Describe one change or extension you would make to this model.
 - f) Summarize briefly the empirical findings of their paper.

6. Using the Finkelstein and Einav budget constraint representation of health care spending in which consumer out-of-pocket spending (OOP) plus premium is a function of medical spending (M), draw the appropriate budget constraints for both of the following plans on one diagram. Assume an income of \$10,000. Be sure to label any intercepts, kinks, or intersections.
 - a) Budget constraint corresponding to full insurance at a \$3000 premium. (Plan A).
 - b) Budget constraint with the following features. (Plan B)

\$2000 premium

There is no deductible.

50% coverage until the consumer has spent \$2000 out of pocket on health care beyond the premium;

Full coverage above this point.

Redrawing this diagram three times, once for each person, draw sets of indifference curves consistent with the following three people.

- c) Carol is healthy and chooses to buy \$500 of health care in both insurance plan A or B.
- d) Donna has moderate health care needs and ex post is just indifferent between Plan A and Plan B.
- e) Erica is very sick and buys \$8000 per year of health care in both Plan A and in Plan B.
- f) Explain why you should or should not expect to observe consumers exactly spending \$2000 on health care in Plan B. Under what alternative richer models might this be observed?

7. Daniel Kahneman's book "Thinking, Fast and Slow" is a careful analysis of the insights from behavioral economics, and includes review of the concepts of
- i) Priming
 - ii) Framing
 - iii) Base rate neglect
 - iv) Cognitive ease
 - v) Anchors
 - vi) Availability bias
 - vii) Intuitive prediction
 - viii) Optimism bias
 - ix) Prospect theory
 - x) The Endowment effect
 - xi) The possibility effect
 - xii) The certainty effect
 - xiii) Overestimation and overweighting of rare events
 - xiv) Avoiding regret
 - xv) WYSIATI

(Even if you have not read the book, you can read about any of these concepts through articles on the web, including Wikipedia).

- a) Choose ONE of these topics and describe it briefly.
- b) Choose one (and only one) article from the course readings (or the BU/Harvard/MIT Health Economics Seminar) and describe the new insights from any one or more of the above topics on that paper. In short, describe the insights of behavioral economics to the article you have chosen.

Part II. This question will definitely be on the midterm exam.

8. Consider the following two frameworks for consumer and provider decisionmaking.

Exhibit 1 Two possible illness processes	
Model 1: Informed patient choice model: Model 2: uninformed, passive patient choice	
1. Consumer chooses health plan k given the status θ_t	1. Consumer reliably remains in same health plan regardless of health status
2. Provider announces price P and offered and treatment intensity Q, given k and θ_t	2. Consumer chooses provider j given plan k without knowing θ_t
3. Consumer chooses provider j knowing θ_t , k, P, Q	3. Provider tells patients their health status θ_t , and chooses Q, at price P given k

- a. Develop an analytical model that allows you to reflect and compare the difference between these two decision processes. Be explicit about your assumptions about competition between health plans and providers, states of the world, provider objectives, provider heterogeneity, and consumer demand, and or or consumer attachment to a particular provider.
- b. Identify at least two articles that help with making predictions about the difference between these two frameworks.
- c. Describe how the predictions of these two frameworks differ based on your model.
- d. Develop at least one empirical test to distinguish between these two models of behavior that you could test using claims data, and describe the specification that you would use to conduct this test. Assume that you have figured out how to calculate empirical counterparts of:

plan k generosity, summarized in the plan cost sharing c_k
health status θ_t
Provider pricing P
provider treatment intensity Q

Key constraint: Assume empirically that you know something about the providers actually visited, but not about the choice set of all providers potentially visited by the consumer.