University of Victoria
Department of Economics

Economics 318
Health Economics

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Midterm Examination II
March 10, 2014

Instructions. Answer all questions. For multiple choice questions, choose the single, best answer. For short answer questions, respond concisely, using equations or a diagram if necessary, noting that undefended answers are worth zero marks. Neither calculators nor any other electronic device, including but not limited to cell phones, are needed and you may not use any such device during the exam. Each multiple choice question is worth 2 points, for a total of 30 points. There are two short answer questions worth a total of 25 marks. Good luck!

NAME: _____

STUDENT #: _____

1 Multiple choice questions (30 marks).

Instructions. Choose the best answer for each question. **Record your answers clearly on this page.** Each question is worth 2 marks.

MULTIPLE CHOICE ANSWERS

1. (A.) B. C. D.
2. A. B. C. (D.)
3. (A.) B. C. D.
4. A. B. C. (D.)
5. A. (B.) C. D.
6. (A.) B. C. D.
7. A. (B.) C. D.
8. (A.) B. C. D.
9. (A.) B. C. D.
10. A. B. C. (D.)
11. (A.) B. C. D.
12. (A.) B. C. D.
13. A. (B.) C. D.
14. A. (B.) C. D.
15. A. B. (C.) D.

1. Supplied–induced demand for health care results from

   (a) asymmetric information between providers and patients.

   (b) asymmetric information between the government and insurers.

   (c) moral hazard beween providers and patients.

   (d) health care as a derived demand.

2. Victoria has more GPs per capita than other cities in Canada, and in Victoria the average person demands more medical care than the average Canadian. We can conclude from these observations that:

   (a) GPs in Victoria induce demand for their services.

   (b) GPs in Victoria do not induce demand demand for their services.

   (c) An increase in fees paid to physicians in Victoria would reduce demand for medical care in Victoria.

   (d) None of the above.

3. The presence of a "caring externality" implies that

   (a) the amount of health care consumed by the poor will be too small.

   (b) the amount of health care consumed by the poor will be allocatively efficient.

   (c) physicians will induce too much demand for their services.

   (d) physicians will induce too little demand for their services.

4. Suppose physicians can induce demand for their services. Then

   (a) the area under the demand curve is no longer a measure of consumer welfare.

   (b) supply and demand are not independent.

   (c) the government should increase the number of positions in medical schools and encourage more physician immigrants.

   (d) answers (a) and (b).

5. You have utility function for wealth $U(W) = W^2$. You are offered actuarially fair insurance against some risk. You

   (a) fully insure.

   (b) buy no insurance.

   (c) are indifferent to how much insurance you purchase.

   (d) there is not enough information to decide if (a), (b), or (c) is correct.

6. In the pure investment variant of Grossman's model, a person with a very elastic MEI schedule will

   (a) experience a rapid decline in health as she ages.

   (b) experience a very slow decline in health as she ages.

   (c) use more health care as she ages.

   (d) answers (b) and (c).

7. We say GPs in the Canadian health care system act as "gatekeepers" because

   (a) GPs often have large houses with impressive front gates.

   (b) GPs must be contacted first before a patient can see a specialist.

   (c) GPs prescribe most pharmaceuticals.

   (d) GPs typically administer Randomized Controlled Trials (RCTs).

8. A statistician finds evidence that small-area variations in British Columbia are very large. This result implies

   (a) there exists allocative inefficiency in health care provision in B.C.

   (b) patient characteristics differ markedly across regions within B.C.

   (c) the outcome is Pareto efficient, as implied by the Second Welfare Theorem.

   (d) patient preferences differ markedly across regions within B.C.

9. Econometric evidence demonstrates that U.S. states which have experienced relatively large declines in fertility over time have also experienced relative increases in Caesarean section rates. This is evidence that

   (a) OBGYNs induce demand for Caesareans.

   (b) OBGYNs do not induce demand for Caesareans.

   (c) The government should ban Caesarean sections.

   (d) None of the above.

10. Life expectancy in Canada is 81.2 years and Canadians spend $4,100 per capita per year on health care. Life expectancy in the U.S. is 77.8 years and Americans spend $7,400 per capita per year on health care. Therefore,

    (a) the Canadian health care system is more efficient than the U.S. system.

    (b) Americans would be better off if they spent less on health care.

    (c) Canadians have healthier lifestyles than Americans.

    (d) we cannot conclude any of (a), (b), or (c).

11. The St. Petersburg Paradox demonstrates

    (a) people are not generally willing to pay the expected value to obtain some risky outcome.

    (b) small-area variations cannot be reconciled with the premise the health care system is efficient.

    (c) private markets for health insurance cannot function due to adverse selection.

    (d) costless redistribution of income could have the perverse consequence of decreasing average health.

12. A researcher asserts, "More income redistribution would increase average health." The researcher's claim

    (a) is a positive statement.

    (b) is a normative statement.

    (c) is neither a positive nor a normative statement.

    (d) could be either a positive or a normative statement, there is not enough information to determine which.

13. Suppose the elasticity of life expectancy to health care expenditures in Canada is 0.1. Life expectancy is currently 80 years at expenditures of $5,000 per person. Increasing expenditures to $6,000 per person would cause life expectancy

    (a) to rise to 80.8 years.

    (b) to rise to 81.6 years.

    (c) to rise to 88.0 years.

    (d) to rise to 96.0 years.

14. The Second Fundamental Theorem of welfare economics asserts

    (a) a competitive market equilibrium is Pareto efficient.

    (b) any Pareto efficient outcome can be obtained as a competitive equilibrium, if endowments can be redistributed.

    (c) the Pareto set associated with the competitive outcome is upper hemi-continuous.

    (d) if indifference curves exhibit diminishing marginal rates of substitution, the market equilibrium is unique.

15. In Grossman's model, health and education are correlated because

    (a) the marginal cost of obtaining more education is assumed to be lower for healthier people.

    (b) people who discount the future heavily choose low levels of both health and education.

    (c) education is assumed to increase the efficiency of health production.

    (d) more educated people endogenously form social networks which encourage healthier behaviors.

2 Short-answer questions (25 marks).

Instructions. Answer all questions clearly and concisely. No marks will be awarded to undefended answers. **Ensure all axes and objects in graphs are clearly labeled.**

1. (10 marks) Consider the model we discussed in class in which a physician receives m per treatment she provides. If she is perfectly ethical she provides Q_0 treatments, but can choose to induce $I \geq 0$ treatments, where inducement damages patient health. Making use of a diagram illustrating income and substitution effects, argue that a physician who decreases inducement in response to an increase in m must also respond to a lump-sum increase in income by reducing inducement.

   Answer. Diagram straight from class notes showing income y on the y-axis and inducement I on the x-axis. The initial budget constraint has y-intercept mQ_0 and slope m. A second budget constraint at a higher fee (say, m', not specified in the question) should have both a higher intercept ($m'Q_0$) and a steeper slope. Correctly-shaped (upward–sloping and slope increases in I) indifference curves should be shown passing through the initial point and, optionally, the new equilibrium. The new equilibrium at should have lower inducement than the initial point, and the income and substitution effects should be clearly specified as in the class notes.

   The argument should be some variant on: geometrically (since the slope of the indifference curve passing through the initial point is higher at higher values of I and the new budget has a steeper slope), the substitution effect must be positive. Since the total effect is the sum of the income and substitution effects and the total effect is negative, it follows that the income effect must be negative, in other words, this physician would respond to a lump-sum increase in income by reducing inducement.

2. (15 marks) Jerry obtains utility $\sqrt{W}$ from wealth W. Jerry has \$100, but there is a 25% chance he will require surgery which costs \$64.

   (a) Sketch this utility function, indicating the values of Jerry's wealth if he does and if he does not need surgery.

   (b) Calculate and indicate on your graph the expected value of Jerry's wealth.

   (c) Calculate and indicate on your graph Jerry's expected utility.

   (d) Calculate and indicate on your graph the maximum amount Jerry would be willing to pay to fully insure against the cost of the surgery.

   (e) An insurance company incurs a cost of \$4 per additional contract it sells. Can the company profitably insure Jerry?

1. **Answer:**

   (a) A graph showing wealth on the x-axis and the function $\sqrt{W}$ on the y-axis should be displayed. The x-axis points \$100 and \$36 should be marked.

   (b) EV = 0.75(100) + 0.25(36) = 75 + 9 = 84, to be shown on the graph.

   (c) EU = $0.75\sqrt{100} + 0.25\sqrt{36} = 7.5 + 1.5 = 9$, to be shown on the graph (optionally, using the fact that expected utility traces out a line segment between (36, $U(36)$) and (100, $U(100)$)).

   (d) The certainty equivalent wealth W^{CE} satisfies

   $$\sqrt{W^{CE}} = EU = 9, \tag{1}$$

   so $W^{CE} = 81$. Therefore, Jerry would pay up 100-81=\$19 to fully insure. (Or any equivalent arithmetic, the concept "certainty equivalent" need not be explicitly invoked.) This can be indicated on the graph as the horizontal difference between the certainty equivalent (\$81) and the value of wealth in the good state of the world (\$100).

   (e) The expected loss is 0.25(64) = \$16. The firm incurs an additional cost of \$4 to sell the contract, so on average it costs the firm \$20 to sell a contract. Since Jerry is only willing to pay \$19, there is no way for the firm to profitably sell insurance to Jerry.

ANSWER TO SHORT-ANSWER QUESTIONS CONTINUED, OR USE AS SCRATCH SPACE.