University of Victoria
Department of Economics

Economics 317
Health Economics

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Midterm Examination I
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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. **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 and each short answer question is worth 15 points.

1 Multiple choice questions (two marks each).

1. Cost-effectiveness analysis differs from cost-benefit analysis in that
   (a) no attempt is made to monetize benefits.
   (b) geometric discounting is not imposed.
   (c) costs and benefits in the distant future are not ignored.
   (d) contingent valuation can be used as a method of measuring outcomes.
2. A researcher estimates that an increase in Canadian health care expenditures from 9% of GDP to 11% of GDP would increase life expectancy from 79 years to 81 years. The implied elasticity of health to expenditures is
   (a) 1/8.
   (b) 5/6.
   (c) 10/11.
   (d) 5/4.

3. Increases in life expectancy in Canada over the last 200 years are largely attributable to

   (a) increased government spending on health care.

   (b) improved medical technologies which decrease mortality from cancer and heart disease.

   (c) vaccination against communicable diseases such as polio .

   (d) improvements in standards of living such as nutrition and sanitation.

4. The paper we discussed by Halla and Zweimuller (2010) statistically compared the employment of workers who had been in accidents to those who had not in order to

   (a) provide evidence on the causal effect of health on employment.

   (b) provide evidence on the causal effect of employment on health.

   (c) estimate the monetary and QALY costs of workplace accidents.

   (d) provide evidence on the causal effect of workplace safety regulations.

5. Cost-effectiveness analysis (CEA) differs from cost-benefit analysis (CBA) in that

   (a) CBA does not attempt to evaluate efficacy.

   (b) CBA monetizes both costs and benefits, whereas CEA only monetizes costs.

   (c) CBA assumes geometric discounting whereas CEA allows for hyperbolic discounting.

   (d) CBA fails to consider effects on income distribution.

6. The RAND Health Insurance Experiment

   (a) randomly assigned tax rates to different insurance companies.

   (b) randomly assigned levels of health insurance coverage to people.

   (c) randomly assigned levels of health care to people.

   (d) randomly assigned health insurance public policies to different countries.

7. The evidence suggests that the elasticity of population health to health care expenditures is

   (a) large, somewhere between 2.0 and 4.0.

   (b) moderate, around 1.0.

   (c) small, around 0.1.

   (d) probably negative.

8. Evidence from changes in compulsory schooling laws tells us that

   (a) the correlation between health and education cannot be attributed to a causal effect of education on health.

   (b) at low levels of education, more education counterintuitively decreases health.

   (c) social interactions within peer groups drives most of the observed correlation between health and education.

   (d) increasing the amount of education someone gets causes their health to rise substantially.

9. Fishermen and miners have similar education and other characteristics, and fishing and mining are considered identically desirable jobs except that fishing is riskier. Fishermen face a risk of on-the-job death of 4/10,000 per year, whereas 2/10,000 miners per year are killed in workplace accidents. Fishermen earn $45,000 per year and miners earn $43,000 per year. We infer that the value of a statistical life for this population is

   (a) $2,000,000.

   (b) $4,400,000.

   (c) $10,000,000.

   (d) $100,000,000.

10. A regulation requiring asbestos removal generates costs of $10,000,000,000 and is estimated to save 50 lives. The regulation has no other effects. The regulation

    (a) is good policy, because it saved the lives of 50 people.

    (b) would not pass a CBA, because the cost per life saved is much higher than the conventional value placed on life.

    (c) would probably pass a CBA, because the cost per life saved is roughly equal to the conventional value placed on life.

    (d) easily passes a CBA, because the cost per life saved is much lower than the conventional value placed on life.

2 Short-answer questions (15 marks each).

Instructions. Answer each question clearly and concisely. No question requires more than a sentence or two and possibly an equation or a single graph. Ensure axes, curves, and points on diagrams are clearly labeled.

1. Suppose the production function for average health (H) in Canada is $H = f(C, L)$, where C is percentage of GDP devoted to health care and L is a measure of healthy lifestyle. Assume this function increases at a decreasing rate in both its arguments. Assume that the United States faces exactly the same production function.

   (a) Sketch a diagram showing the relationship between H and C in Canada, for a given level of L, $L = L_C$. Below this diagram, display the associated marginal product of health care in another diagram.

   (b) Assume that in the U.S. lifestyle takes the level $L = L_{US}$ where $L_C > L_{US}$. Draw a relationship between health and health care in the U.S. on your diagram.

   (c) Label points in your diagram consistent with the observation that Canada has higher average health but lower health care expenditures as a percentage of GDP than the U.S.

   (d) In this model under these assumptions, is health care in Canada more efficient than health care in the U.S.? Briefly explain.

2. For every person, health (h) is determined by income (y) and by a genetic factor (g) through the production function: $h = (1/2)y + 2g$.

   (a) What is the causal effect of a one unit increase in income on health in this society?

   (b) Sketch a diagram displaying production functions for health, with income on the horizontal and health on the vertical axis, for Fred who is endowed with $g = 0$, and for Bill, who is endowed with $g = 1$.

   (c) Suppose the government can costlessly redistribute income from relatively rich to relatively poor people. What effect does redistribution have on average health?

   (d) Suppose income is determined by the same genetic factors as health:

   $$y = 3 - 2g.$$

   Label the health–income outcomes for Fred and for Bill on your diagram.

   (e) Show that increases in income in this society are associated with decreases in health.

   (f) Very briefly reconcile your answers to (a) and (e).