UNIVERSITY OF VICTORIA DEPARTMENT OF ECONOMICS

ECONOMICS 317 HEALTH ECONOMICS

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Midterm Examination I February 10, 2012

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 10 points.

1 MULTIPLE CHOICE QUESTIONS.

- 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. Canadians have higher life expectancy and lower health care costs than Americans. Therefore,
 - (a) the Canadian health care system is more efficient than the U.S. system.
 - (b) the U.S. could increase health by reallocating resources from health care to education.
 - (c) Canada should increase expenditures on health care.
 - (d) none of the above.

- 3. A researcher estimates that an increase in Canadian health care expenditures from 10% of GDP to 12% of GDP would increase life expectancy from 80 years to 82 years. The implied elasticity of health to expenditures is
 - (a) 1/2.
 - (b) 1/8.
 - (c) 10/12.
 - (d) 12/10.
- 4. 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.
- 5. Murphy and Topel (2005) concluded that
 - (a) improvements to health in the U.S. since 1970 are enormously valuable, equivalent to trillions of dollars per year.
 - (b) vaccines were not primarily responsible for the historical decline in deaths due to communicable disease.
 - (c) the use of QALYs to evaluate new treatments cannot be reconciled with microeconomic theory.
 - (d) lifestyle is a more important determinant of health than access to health care.
- 6. 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.
- 7. 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.

- 8. People with more education tend to be healthier than people with less education. The evidence suggests that we observe this correlation because
 - (a) something about education causes people to be healthier.
 - (b) people in poor health tend to obtain less education.
 - (c) other variables, such as family background, lead to both more health and more education.
 - (d) (a), (b), and (c) are all true.
- 9. The McKeown Thesis holds that
 - (a) correlation does not imply causation.
 - (b) increases in health care expenditures have negligible effects on population health.
 - (c) medical interventions should be based on cost-effectiveness and not merely clinical considerations.
 - (d) improvements in population health over the last two hundred years cannot be largely attributed to medical technology.
- 10. "Social capital" refers to
 - (a) networks of friends, family and other social contacts.
 - (b) capital that impacts the elasticity of the MEI schedule.
 - (c) factors of production owned by the government.
 - (d) capital that generates substantial positive external effects.
- 11. 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.

- 12. Evidence from changes in compulsory schooling laws tells us that
 - (a) increasing the amount of education someone gets causes their health to rise substantially.
 - (b) the correlation between health and education cannot be attributed to a causal effect of education on health.
 - (c) at low levels of education, more education counterintuitively decreases health.
 - (d) social interactions within peer groups drives most of the observed correlation between health and education.
- 13. Fishermen and miners have similar education and other characteristics, and fishing and mining are considered similar jobs except that fishing is riskier. Fishermen face a risk of on-the-job death of 2/10,000 per year, whereas 1/10,000 miners per year are killed in workplace accidents. Fishermen earn \$60,000 per year and miners earn \$59,000 per year. We infer that the value of a statistical life for this population is
 - (a) \$6,000,000.
 - (b) \$5,900,000.
 - (c) \$10,000,000.
 - (d) \$100,000,000.
- 14. The average person with diabetes earns \$40,000 per year, the average person without diabetes earns \$50,000 per year. There are one million diabetics in Canada. Therefore, a new treatment which instantly cures diabetes would
 - (a) have no effect on GDP.
 - (b) increase GDP by somewhere between \$0 and \$10 billion dollars.
 - (c) increase GDP by about \$10 billion.
 - (d) we do not have enough information to calculate the effect of the treatment on GDP.
- 15. 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.

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 graphs are clearly labeled.

- 1. A pharamaceutical firm has developed a new treatment (treatment B) for bone cancer. With the existing treatment (treatment A), patients live in health state q = 0.5 for one year, then in state q = 0.4 for one year with certainty, then die. With treatment B, patients live in health state (q = 0.6) for one year, then with probability (1/3) they die and otherwise they live in health state x for one more year, then they die. Discount only the second year at rate r = (1/3). How large does x have to be for treatment B to generate more QALYs than treatment A?
- 2. For every person, health (h) is determined by income (y) and by a genetic factor (g) through the production function: h = 2y + g.
 - (a) Does income cause health in this society?
 - (b) Draw a production function for health, with income on the horizontal and health on the vertical axis, for a person with g = 2, and on the same diagram the production function for someone with g = 4.
 - (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:

$$y = 6 - \left(\frac{1}{2}\right)g.$$

Show data from this society would display zero correlation between income and health.

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