EC387 Introduction to Health Economics   Problem set 1   Due: July 12

1. (10 points) The social optimum occurs when:

   a. total benefits have been maximized.
   b. total costs have been minimized.
   c. total costs equal total benefits.
   d. marginal costs equal marginal benefits.

2. (30 points) FGS 4.2
3. (30 points) FGS 4.4
4. (30 points) FGS 4.5

5. Some suggest that a dollar value cannot be placed on life; that is, life is priceless. Explain how the dilemma to social decision created by this view might be resolved.

6. Does it matter whether a higher or lower discount rate is applied to the CBA of a social project? If so, why?

7. Discuss possible reasons why the estimates of the value of life presented in Table 4-1 differ so much.

8. How does the willingness-to-pay principle of welfare economics differ from the valuation of an extra life-year in applying QALYs?

9. Distinguish between cost-benefit analysis (CBA) and cost-effectiveness analysis (CEA). Can CEA replace CBA in all cases? If not, why not?

10. In the example of the ACE inhibitor, what decision issue is the marginal cost relevant to? The extra QALYs?

11. Consider the information provided in Box 4-1, "The Cost of Saving Lives." If a society has a fixed budget that it can devote to all interventions, formulate a prioritizing rule that would save the greatest number of years of life for a given budget.

Exercises

1. Using Figure 4-3, explain why a pollution abatement program that reduces discharge beyond Q_1 is inefficient.

2. Consider the following two projects. Both have costs of $5,000 in Year 1. Project 1 provides benefits of $2,000 in each of the first four years only. The second provides benefits of $2,000 for each of Years 6 to 10 only. Compute the net benefits using a discount rate of 6 percent. Repeat using a discount rate of 12 percent. What can you conclude from this exercise?

3. Consider the following table of costs and benefits from a governmental policy to clean the water in a local area.
   (a) What level of abatement is most efficient by general economic criteria?

Level of Abatement	Total Costs	Total Benefits
0%	$0	$0
10	10	80
20	22	150
30	40	200
40	70	240
50	105	280
60	150	320
70	210	350
80	280	375
90	350	385
100	420	390

   (b) Would a 70-percent level of abatement pass a cost-benefit test? Is it efficient?
   (c) How would you respond to those who argue for 100-percent abatement?

4. Consider a project that costs $10,000 today. It will provide benefits of $4,000 at the end of Year 1, $3,500 at the end of Year 2, and $3,500 at the end of Year 3. If the discount rate is 6 percent, will this project be approved using cost-benefit analysis? Would your answer change if the discount rate is:
   (a) 5 percent?
   (b) 4 percent?

5. Consider a hypothetical three-stage screening test for a cancer with the following rates of detection and costs:

Stage	Number of Cases Detected	Total Costs
1	100	$200,000
2	105	260,000
3	106	300,000

   (a) Calculate the average cost per cancer detected in the three stages.
   (b) Calculate the marginal cost per cancer detected in the three stages.
   (c) Suppose that the marginal benefit per treated case is $12,000 per person. What would be the optimal screening, given the costs?