

1. Discuss the magnitude of the financing problem in medical care. What are the major reasons that medical spending is absorbing an increasing share of national output?
2. What do economists mean by scarcity? Why is the concept so important in economic analysis?
3. What are the likely consequences on the US market for tobacco products of the events listed below? Does the supply curve or the demand curve shift? In which direction? State whether the equilibrium price and quantity increase, decrease, or stay the same. Show the changes using a standard supply and demand diagram.
 - a) The FDA classifies tobacco an “addictive substance,”
 - b) The Congress votes to raise the excise tax on all tobacco products.
 - c) Hurricane Fran dumps 15 inches of rain on North Carolina and destroys 80 percent of that state’s tobacco crop.
 - d) Sixteen states sue the major tobacco companies for billions of dollars because of tobacco-related costs in their Medicaid programs.
 - e) Medical evidence that more than two cups of coffee a day (considered by many to be a substitute for smoking) greatly increases the risk of stomach cancer.
4. The relationship between health care spending (E) and per capita national income (Y) was estimated using cross-section data from 24 developed countries. The resulting equation $E = 200 + 0.09Y$ relates spending and income in US dollars.
 - a) Interpret the coefficient on the national income variable.
 - b) Complete the table:

Income	Health Care Spending
\$5000	
\$10,000	
\$15,000	
\$20,000	
\$25,000	

- c) Graph the relationship (with Y on the horizontal axis).
5. What is market failure? What are the major reasons that a free, unregulated market in medical care might not be optimal?
6. Proponents of a government-run health care system argue that the market does not work well in the medical care industry. What evidence do they use to support this claim?
7. Suppose the market for anti-inflammatory drugs can be described by the following equations:

$$Q_d = 2000 - 12P$$

$$Q_s = -400 + 20P$$
 - a) Solve for the market equilibrium price and quantity. Illustrate your answer with a diagram of the market.
 - b) What are the dollar values of consumer and producer surplus?
 - c) Suppose the government imposes a price ceiling of \$40. What is the quantity demanded and quantity supplied? What type of disequilibrium exists? Recalculate consumer and producer surplus. What is the deadweight loss?
 - d) Suppose the demand curve shifts to $Q_d = 2500 - 12P$. Recalculate the equilibrium price and quantity.

8. When you receive a flu vaccination your chances of getting the flu are reduced. However, some of your friends may also reap benefits from your flu vaccinations since their chance of getting the flu is now lower. Listed below are the market demand and supply schedules for flu vaccinations as well as the marginal external benefits enjoyed by those who do not get flu shots.

Quantity of Vaccinations	Marginal Private Benefit	Marginal External Benefit	Marginal Social Benefit	Marginal Cost
400	\$18.00	\$2.00		\$12.00
500	16.00	3.00		13.00
600	14.00	4.00		14.00
700	12.00	5.00		15.00
800	10.00	6.00		16.00
900	8.00	7.00		17.00
1000	6.00	8.00		18.00
1100	4.00	9.00		19.00

- a) What output and price would the free market generate?
- b) What is the socially optimal output and price?
- c) In order to obtain the socially optimal equilibrium, what would the necessary per-vaccine subsidy given to consumers need to be? Of this subsidy, how much would vaccine providers end up capturing?
- d) Calculate the total cost of providing the subsidy from the government's point-of-view.
[Hint: total cost = (per-unit subsidy) x (quantity of vaccine consumed)]
9. How does cost-benefit analysis differ from cost-effectiveness analysis? Main difference is the way benefits are measured. Why has cost-effectiveness analysis become the method of choice for health economists around the world?
10. The following table represents the costs and benefits of four alternative clinical programs designed to treat a single disease. Benefits are measured in terms of the number of lives saved.
- | Program | Cost (\$) | Lives Saved | ICER | ACER |
|---------|-----------|-------------|------|------|
| A | 100,000 | 10 | | |
| B | 100,000 | 12 | | |
| C | 200,000 | 12 | | |
| D | 200,000 | 15 | | |
- a) Finish the table. Which is the best program? In terms of the number of lives saved? In terms of the ICER per life saved?
- b) How does the cost-effectiveness ratio defined as the average cost per life saved differ from the ICER?
- c) Which program would an economist favor? What would your argument be?
11. A controversial new device, the implantable cardiac defibrillator (ICD), was used in a clinical trial to determine if it improved survival for heart attack patients over the standard drug treatment. The trial provided the following information. Two years after the first heart attack, 85 percent of the ICD patients were still alive, compared to 70 percent of the drug treatment group. No additional data is available after the 24-month trial.
- a) What is your best guess on survival probability after the trial is over?
- b) Calculate the improvement in life expectancy during the trial. What is your best estimate of improved life expectancy after the trial?
- c) Graph the mortality function for both the ICD group and the drug therapy group.
- d) What is the difference in life expectancy between the two groups?

12. The health authorities are considering the treatment alternatives for three types of diseases: heart disease, cancer, and infectious disease. Each year there are 10,000 new cases of heart disease, 10,000 new cases of cancer, and 5,000 new cases of infectious disease. For each diagnosis there are a number of mutually independent treatment alternatives (including no treatment) as shown in the table below.

Treatment	Cost per treatment	QALYs Gained	ICER= $\Delta C/\Delta E$
Heart Disease			
A	0	0	
B	100	2	
C	300	8	
D	400	8	
E	600	12	
F	800	15	
Cancer			
G	0	0	
H	200	8	
I	400	10	
J	500	12	
K	600	9	
L	700	14	
M	800	15	
Infectious Disease			
N	0	0	
O	100	2	
P	350	4	
R	650	6	

- Identify all dominated treatment alternatives. Explain why each is dominated.
 - Calculate the incremental cost, incremental QALYs, and incremental cost-effectiveness ratios (ICERs) for all economically rational strategies (ICER = incremental cost/incremental QALYs). Why are these considered economically rational?
 - Using separate graphs for heart disease, cancer, and infectious disease, show the alternative treatment options, label the dominated options, and show the economically feasible alternatives. (Place QALYs on the vertical axis and cost per treatment on the horizontal axis.)
 - The local health district has asked your opinion on the “best” strategy from a public health perspective (disease covered, treatment strategy). What do you tell them? How much will it cost?
13. In what ways is medical care different from other commodities? In what ways is it the same?
14. According to studies undertaken by the US Department of Agriculture, the price elasticity of demand for cigarettes is between -0.3 and -0.4 and the income elasticity is about +0.5.
- Suppose the Congress, influenced by studies linking cigarette smoking to cancer, plans to raise the excise tax on cigarettes so the price rises by 10 percent. Estimate the effect the price increase will have on cigarette consumption and consumer spending on cigarettes (both in percentage terms).
 - Suppose a major brokerage firm advised its clients to buy cigarette stocks under the assumption that, if consumer incomes rise by 50 percent as expected over the next decade, cigarette sales will double. What is your reaction to this investment advice?
15. In what sense is health care an investment? In what sense is it pure consumption?

16. Visit the web site of the National Center for Health Statistics. Spend some time studying the leading causes of death for different age groups at http://www.cdc.gov/nchs/data/nvsr/nvsr52/nvsr52_13.pdf (look to page 27). What are the three leading causes of death for each age cohort listed? What are some of the policy implications?
17. When people are sick they often have very little idea of what is wrong with them or what the most promising treatment is. They may place themselves under a physician's care in the belief that the physician is better qualified to make decisions regarding the proper course of treatment. The physician acts as an agent for the patient. For many treatments the physician offers the only access to the treatment; e.g., prescription drugs and surgery.
 - a) Are there any reasons that the physician acting as agent for a patient might not choose exactly what a fully informed patient would choose?
 - b) A number of studies have gathered evidence on physician-induced demand, and most have reported rather small but statistically significant effects. Isn't it rather cynical to seriously advance the notion of physician-induced demand? What factors might control the extent of physician-induced demand?
 - c) If surgeons really increase the demand for operations, which kinds of operations do you think would be most affected? How would you decide which were unnecessary? Can you think of any examples from your own experience or reading?
18. Define the following concepts. How important are they in determining the efficient functioning of medical markets?
 - a) moral hazard
 - b) adverse selection
 - c) asymmetric information
 - d) third-party payer
 - e) cream skimming
19. What are the major reasons that health insurance policies have deductibles and coinsurance features? Are they really necessary?
20. What are the four types of medical insurance? Briefly describe the coverage available with each one.
21. One of the major issues driving the health care reform debate is the number of uninsured Americans and their limited access to medical care. Describe the typical person in the US without health insurance. Does lack of insurance mean the uninsured have no access to medical care?
22. Why do some firms self-insure?
23. What factors would you use to estimate the level of demand for medical care for the typical individual? How would your choice of variables differ if you were estimating demand for an entire country?
24. Choices in health care delivery must be made at two levels: (1) the individual physician prescribing a course of treatment for an individual patient and (2) the policy maker determining the availability of medical care to an entire group of patients or a community. One way to choose among alternative treatment regimes and community programs is by using the criterion of economic efficiency. Briefly describe the three types of economic evaluation that enter into medical decision making. Discuss the unique features of each and describe their basic strengths and weaknesses.