Econ 149: Health Economics
Problem Set I
Answer Key

1. Name three ways that the market for health care is different than, say, the market for surfboards. Explain why each characteristic is important in terms of economic thinking.

   (a) Most people would buy a surfboard with cash or a credit card, but health care in the U.S. is primarily financed either through insurance, whether it's public or private. This is important when we're thinking about incentives for consuming health care, since we don't pay the full price up front.

   (b) When you buy a surfboard, you probably can gauge its basic quality and you and the shop owner will generally have the same information about the surfboard. In health care, there are many situations when one party has more information than another (an information asymmetry). For example, the doctor can prescribe you some pills, but cannot monitor whether you take them. These asymmetries are important for the design of public policy meant to improve health.

   (c) Your demand for most types of health care is likely to be relatively more price inelastic than your demand for surfboards. If the price of heart surgery doubles and you've got a bad heart, you'll probably still get some heart surgery. If the price of surfboards doubles, most people will find a new hobby. If we all expect a certain level of health care and costs increase for that care, the share of our income dedicated to health services will likely increase.

2. What two major institutions (one private and one public) have taken a major role in the financing of health care in the U.S. over the last half century?

   Back then, most people paid for their health services in cash. Now, most working people and children are covered by private insurance. Old people and some poor people are covered by public insurance: Medicare and Medicaid, respectively.

3. Consumers are far more likely to pay for dental services out-of-pocket than for hospital care. What implications does this fact have for the growth of total spending on dental service and hospital care? Why?

   Total spending on hospital care is likely to grow faster than total spending on dental care because we don't pay the marginal cost of hospital care, and are therefore likely to overconsume it.

4. In lecture, Dr. Bitler discussed the 911 Victims' Compensation Fund and the challenge of determining the value of a victim's "statistical life". Explain why an economist might reason that the families of victims who smoked cigarettes be allotted less compensation than the families of victims who did not smoke cigarettes.

   Two variables we might use to calculate the compensation packages are the lifetime stream of income that the victim would have earned and his discount rate (i.e., how much he preferred present consumption to future consumption). An individual's decision to smoke is likely to be related to both. Smokers live shorter lives than nonsmokers, and so may have lower lifetime earnings. But more importantly, smokers may have a higher discount factor (i.e., they favor current consumption to future consumption), and this is a rationale for a smaller compensation package.

5. Suppose that patients pay cash for medical services, and that their demand for heart surgery is very price inelastic, while their demand for rhinoplasty is quite price elastic. On two graphs, draw demand curves for these two services, using slopes that characterize their price elasticities of demand. Also, draw two supply curves for these services. Now, show on the graphs and explain in words how an increase in the costs of supplying these services might affect the equilibrium price and quantity of services supplied. How are the effects different for the two services?

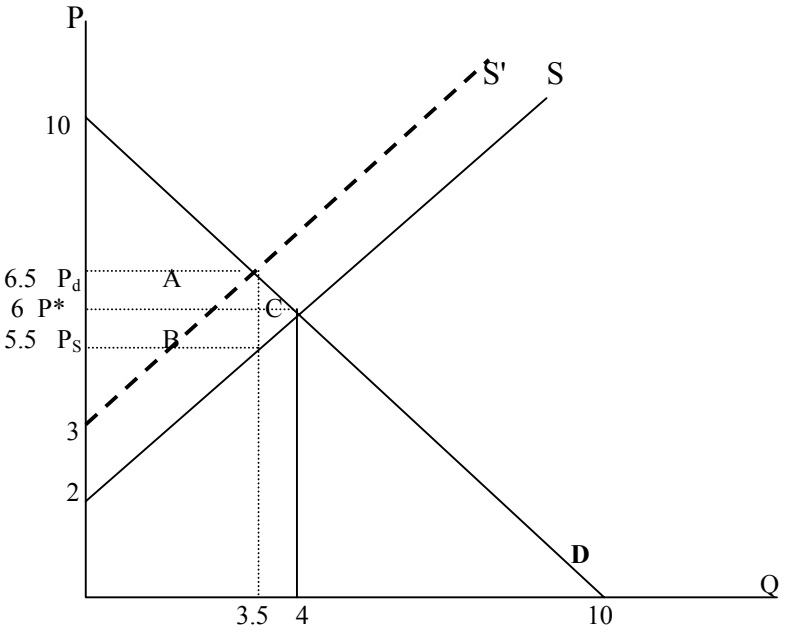
   The demand curve for heart surgery should be relatively steeper than the demand curve for rhinoplasty, although both should be downward sloping. The supply curves can be drawn in any way as long as they are upward sloping. The graphs should show that for any similar shift upward in the supply curves, the drop in equilibrium quantity traded is relatively larger for rhinoplasty than for heart surgery. In other words, consumers are less sensitive to changes in the price of heart surgery than changes in the price of rhinoplasty.

6. Suppose the market demand for cigarettes is: $Q_D = 10 - P$, and the supply of cigarettes is: $Q_S = -2 + P$, where P is the price per pack of cigarettes.

   (a) Graph the supply and demand curves.

   (b) What is the equilibrium price and quantity sold of cigarettes? Show this on the graph.

   The equilibrium without the tax is P*=6 and Q*= 4.



   If the government imposes a cigarette tax of $1 per pack,

   (c) What is the price paid by consumers?

   (d) What is the price faced by suppliers?

   The inverse original supply is $P = 2 + Q_S$, so the shifted supply is $P = 3 + Q_S$. Setting the shifted supply to be equal to the demand, $10 - P = -3 + P$, yields a price for consumers of 6.5. Plugging that price into the demand function yields $Q = 3.5$. Plugging Q into the original supply yields a price for suppliers of 5.5. Thus, the price paid by consumers is 6.5, and the price paid by suppliers is 5.5.

(e) What is the government revenue from the tax?

The tax revenue = (6.5 - 5.5)*3.5 = 3.5.

(f) How much is the consumers' tax burden?

Consumers' tax burden = (6.5- 6)*3.5 = 1.75.

(g) How much is the producers' tax burden?

Producers' tax burden = (6 -5.5)* 3.5 =1.75.

(h) What is the deadweight loss of the tax?

The deadweight loss = 1/2 *(6.5-5.5)*(4-3.5) = 0.25.

7. A monopolistic pharmaceutical company sells a pill in two countries, and resales between the countries are impossible. The demand curves in the two countries are: $P_1 = 100 - Q_1$ and $P_2 = 120 - 2Q_2$. The monopolist's marginal cost is \$30. Solve for the equilibrium price in each country. What is the equilibrium price and quantity if the monopolist decides to treat the two markets as one big market and charge a unique price? Compare the profits in these two situations.

   The monopolist is a price setter, and will maximize its profit in each market by choosing a quantity supplied such that the marginal revenue in each market is equal to its market cost. We find marginal revenue by calculating total revenue in each market (as a function of Q) and then taking the derivative of each with respect to Q.

   $MR_1 = 100 - 2Q_1 = MC = 30$, so $Q_1 = 35$ and $P_1 = 65$, and $\pi_1 = 352 = 1,225$. $MR_2 = 120 - 4Q_2 = MC = 30$, so $Q_2 = 22.5$ and $P_2 = 75$, and $\pi_2 = 452/2 = 1,012.5$.

   For the combined market, the hardest part is to figure out what the demand and the MR are if the firm decides to treat these markets as one big market and charge one price. The best way to see how to derive the market demand is to plot the two demand curves and add them as we did when we studied consumer theory. The market demand will have a kink. The expression for the market demand is the following: $P = 120 - 2Q$ if $Q < 10$ and $P = 2/3 * (160 - Q)$ if $Q > 10$. That implies that the MR is equal to: $MR = 120 - 4Q$, if $Q < 10$ and $MR = 320/3 - 4/3 * Q$, if $Q > 10$. Now, we only need to equate MR to MC = 30. When we do, $320/3 - 4/3 * Q = 30$, and get that $Q = 230/4$ and $P = 205/3$. (Why this MR segment? What is the minimum value of MR, if $Q < 10$?). The profit then is equal to $(205/3 - 30) * 230/4 = 2,204.17$. So it's more profitable to consider these two markets separately than to treat them as a one big market. When the monopolist treats the markets separately, the monopolist is able to price discriminate, and this yields higher profits.