

Answer all questions in the space provided on the exam.

Total of 60 points (and worth 44.5% of final grade).

Read each question carefully, so that you answer the question.

Multiple Choice (1 points each question)

CIRCLE ONE

1. a b c d e

2. a b c d e

3. a b c d e

4. a b c d e

5. a b c d e

6. a b c d e

7. a b c d e

8. a b c d e

9. a b c d e

10. a b c d e

11. a b c d e

12. a b c d e

13. a b c d e

14. a b c d e

15. a b c d e

16. a b c d e

17. a b c d e

18. a b c d e

Short Answer (6 points each question)

1.(a) Consider the following diagram from Pauly “The Economics of Moral Hazard: Comment”

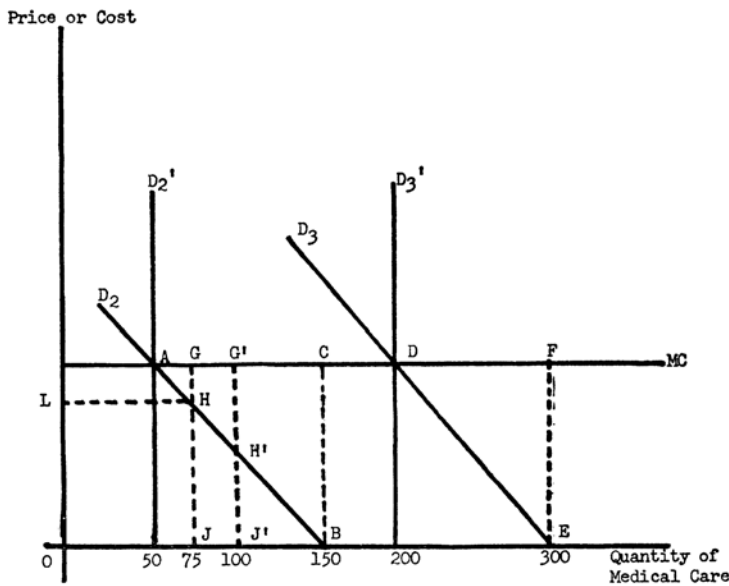


FIGURE 1

Demand is 0 with probability 0.5, D_2 with probability 0.25 and D_3 with probability 0.25. Calculate the welfare loss of complete health insurance due to moral hazard if $MC = \$10$.

(b) Consider the following data from the Manning et al. paper. “Health Insurance and ...”

TABLE 3—VARIOUS MEASURES OF PREDICTED MEAN ANNUAL USE OF MEDICAL SERVICES, BY PLAN

Plan	Likelihood of Any Use (%)	One or More Admissions (%)	Medical Expenses (1984 \$)
Free	86.7 (0.67)	10.37 (0.420)	777 (32.8)
Family Pay			
25 Percent	78.8 (0.99)	8.83 (0.379)	630 (29.0)
50 Percent	74.3 (1.86)	8.31 (0.400)	583 (32.6)
95 Percent	68.0 (1.48)	7.75 (0.354)	534 (27.4)

Calculate the arc price elasticity of demand for health care based on movement from the 50 percent plan to the free plan.

(c) Did the Manning et al. paper confirm the concerns raised in the article by Pauly? Explain.

2.(a) Consider the following screening test for cancer applied to 100,000 people of whom 1,000 have cancer. Each test costs \$5, picks up 80% of cancer cases, and additionally 10% of the time falsely diagnoses cancer. Detection of cancer (rightly or wrongly) leads to a further exact diagnostic test that costs \$100. Correct early detection of cancer by the test is valued at \$10,000. Is the first test worthwhile?

(b)(i) Define cost-benefit analysis and cost-effectiveness analysis.

(ii) Which of cost-benefit analysis and cost-effectiveness analysis is more commonly used in health care? Why?

(c) The pap smear test rate is estimated to be 0.50 with standard error 0.02 for the Acme HMO and is estimated to be 0.45 with standard error 0.02 for the Xanadu PPO.

Is the difference statistically significant at significance level 5 percent? Explain your answer [Note: $T = [m_1 - m_2] / s$ where m_1 and m_2 are sample means and s equals the square root of $(s_1^2 + s_2^2)$. The critical value for a two-sided test is 1.96.]

3.(a) On an appropriate diagram show the impact on individual consumer choice of a major illness. For your diagram state the effect on individual well-being and level of health.

(i) On an appropriate diagram show the impact of licensure on price and quantity of medical services (assuming licensing of doctors does not change people's preferences to see doctors).

(ii) On the same diagram show the welfare loss or welfare gain due to licensure.

(c)(i) Explain how an open HMO typically compensates a pediatrician.

(ii) Explain how Medicare typically compensates hospital care providers for a routine problem such as a tonsillectomy or appendicitis.

4. Circle True or False to each of the following statements [One point each.]

- (a) **True** **False** Over 20 percent of the U.S. population is without health insurance.
- (b) **True** **False** The movement to manage care led to both a one-time decrease in health expenditures and a decrease in subsequent growth rates in expenditures.
- (c) **True** **False** A patient bed day costs (in real \$) more than 10 times what it cost in 1950.
- (d) **True** **False** Medicare is unusual for U.S. insurance in being mostly fee-for-service.
- (e) **True** **False** The economic costs of obesity in the U.S. are measured to exceed \$300 billion per year.
- (f) **True** **False** Life expectancy in 2009 is a forecast of average life expectancy for someone born in 2009 allowing for forecast future increases in longevity.

5.(a) On an appropriate diagram show that in a market economy without government intervention too few people will be immunized against an infectious disease, even if people are fully informed about the potential risks of the infection and the costs of the immunization.

(b) Consider testing of chemicals for potential carcinogens. To properly test each chemical costs \$10 million. If Q chemicals are tested a typical household places value $\$(1 - 0.02 \times Q)$ on each chemical tested. There are 100 million households in the U.S. What is the socially optimal number of chemical tests that should be sponsored by the National Institutes for Health.

(c) For each of the following organizations state what health care, if any, they provide to people over the age of 65.

(i) Medicare:

(ii) Medicaid:

6.(a) Consider the article by Roland Sturm, “The Effects Of Obesity, Smoking, And Drinking On Medical Problems And Costs”.

What was the essential conclusion of this article?

(b) Consider the following table from Chou et al. “An Economic Analysis of Adult Obesity” where, from Table 2 mean BMI is 26 and mean number of restaurants per 10,000 persons is 13.

Table 3
Body mass index and obese regressions, persons 18 years of age and older

Independent variable	Dependent variable: BMI
Black	1.638 (57.58)
Hispanic	0.737 (26.09)
Other race	-0.406 (-7.14)
Male	0.890 (54.41)
Some high school	-0.110 (-3.50)
High school graduate	-0.503 (-17.21)
Some college	-0.572 (-19.17)
College graduate	-1.150 (-35.68)
Married	0.187 (11.99)
Divorced	-0.411 (-19.86)
Widowed	0.262 (10.00)
Household income	-0.035 (-32.95)
Household income squared	0.0002 (23.18)
Age	0.346 (165.73)
Age squared	-0.003 (-153.92)
Restaurants (full-service + fast-food)	0.631 (9.41)
Restaurants squared	-0.011 (-5.17)

Provide a numerical estimate of the effect of more restaurants on obesity. Explain whether or not this is a large effect.

(c) Consider the following from the article by Cutler and McClellan “Is Technological Change in Medicine Worth It.”

EXHIBIT 3

Summary Of Research On The Value Of Medical Technology Changes

Condition	Years	Change in treatment costs	Outcome		
			Change	Value	Net benefit
Heart attack ^a	1984-98	\$10,000	One-year increase in life expectancy	\$70,000	\$60,000
Low-birthweight infants ^b	1950-90	\$40,000	Twelve-year increase in life expectancy	\$240,000	\$200,000

Explain why the net benefit (in \$) for low-birthweight infants is only 3-4 times as much as that for heart attack, even though life expectancy increases by 12 times as much.

7.(a) Briefly contrast health care in the United States with that in the major western European countries on the basis of:

(i) Health insurance (of any sort):

(ii) Health outcomes:

(b) Briefly contrast health care in the United States with that in China and India on the basis of

(i) Health insurance (of any sort):

(ii) Health outcomes:

(c) State three major health policy issues that you expect will receive a lot of attention in the U.S. in the next few years. (One point if give two issues and 0 points if give only one issue).

Multiple Choice (1 points each) Note: You should spend 30% of time on these!

1. U.S. health spending in 2007 was
 - a. less than \$1,000,000,000,000
 - b. between \$1,000,000,000,000 and \$2,000,000,000,000
 - c. between \$2,000,000,000,000 and \$3,000,000,000,000
 - d. more than \$3,000,000,000,000

2. For a risk-averse consumer
 - a. the expected utility of wealth exceeds the utility of expected wealth
 - b. the utility of expected wealth exceeds the expected utility of wealth
 - c. wither a. or b. is possible

3. If a company insures 100 identical consumers who each have expected health expenses of \$6,000 with a standard deviation of \$4,000, then an insurance company will expect that with probability 0.95 that the average of claims of the 100 insured will be
 - a. between \$2,000 and \$10,000
 - b. between \$5,200 and \$6,800
 - c. between \$5,600 and \$6,400
 - d. none of the above.

4. The article by Miller and Luft on Managed Care
 - a. strongly supported the view that HMO's increase quality of care
 - b. strongly supported the view that HMO's uniformly lead to worse quality of care
 - c. neither a. nor b. though it did look at these issues
 - d. did not consider these issues

5. The article by Neuhauser and Lewicki, "What Do We Gain from the Sixth Stool Guaiac?" determined that
 - a. It was better to do no tests at all than to do six tests
 - b. The optimal number of tests was much less than six tests
 - c. both a. and b.
 - d. neither a. nor b.

6. For a pharmaceutical company selling a patented drug in different countries we expect
 - a. a higher price in countries with more price elastic demand
 - b. a higher price in countries with less price elastic demand
 - c. similar price across countries (assuming similar MC across countries)
 - d. any of the above is likely.

7. Doctor's pay in the U.S. is high due to

- a. high training costs
- b. high return on training
- c. both a. and b.
- d. neither a. nor b.

8. The economic rationale for patent protection for prescription drugs is

- a. creation of a monopoly that will maximize consumer surplus
- b. redistribution of income to wealthy corporations
- c. privatization of a public good to make it excludable
- d. internalization of a positive externality

9. The economic rationale for Medicare is

- a. avoid private monopoly in the market for health insurance for elderly
- b. avoid failure of the market for health insurance for elderly
- c. avoid negative externalities from disease transmission

10. Medicare Part B (physician and outpatient) is provided

- a. free to those eligible
- b. at heavily subsidized insurance rates to those eligible
- c. at actuarially fair insurance rates to those eligible

11. Medicaid is funded

- a. by the federal government
- b. by state governments
- c. neither a. nor b.
- d. both a. and b.

12. For Medicare Part D for Yolo County

- a. there are many plans to choose from and one of them is clearly the best
- b. there are many plans to choose from and it is very unclear as to which is best
- c. there are few plans to choose from and one of them is clearly the best
- d. there are few plans to choose from and it is nonetheless unclear as to which is best

- 13.** In the study by Cutler and McClellan on Technology
- a.** all examples were clearly worthwhile
 - b.** all examples but improved treatment of breast cancer were clearly worthwhile
 - c.** all examples but improved treatment of depression were clearly worthwhile
 - d.** none of the above.
- 14.** Life expectancy (averaged across the world) in 1850 was
- a.** less than 20 years
 - b.** between 20 and 40 years
 - c.** between 40 and 60 years
 - d.** more than 60 years
- 15.** The article by Chao et al. on restaurants impact on obesity
- a.** established a causal link as it also controlled for time trends
 - b.** established a causal link as it did not control for time trends
 - c.** did not establish a causal link as it also controlled for time trends
 - d.** did not establish a causal link as it did not control for time trends
- 16.** In the U.S.
- a.** roughly one-third of adults are obese and an additional one-third are overweight
 - b.** obesity rates have increased appreciably since 1980
 - c.** both a. and b.
 - d.** neither a. nor b.
- 17.** The major gains in life expectancy due to increased health spending per capita occur
- a.** at low levels of spending
 - b.** at moderate levels of spending
 - c.** at high levels of spending
- 18.** Compared to OECD countries
- a.** the U.S. spends more on health per capita
 - b.** the U.S. has more doctor visits and hospital days per capita
 - c.** both a. and b.
 - d.** neither a. nor b.