Cameron ECON 132 (Health Economics): FINAL EXAM (A) Fall 17

Answer all questions in the space provided on the exam.
Total of 60 points (and worth 45% 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 moving from no health insurance to partial health insurance cover. On an appropriate diagram show the change in health expenditures and in overall society welfare.

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

TABLE 2—SAMPLE MEANS FOR ANNUAL USE OF MEDICAL SERVICES PER CAPITA

Plan	Face-to-Face Visits	Outpatient Expenses (1984 $)	Admissions	Inpatient Dollars (1984 $)	Prob. Any Medical (%)	Prob. Any Inpatient (%)	Total Expenses (1984 $)
Free	4.55	340	.128	409	86.8	10.3	749
	(.168)	(10.9)	(.0070)	(32.0)	(.817)	(.45)	(39)
25 Percent	3.33	260	.105	373	78.8	8.4	634
	(.190)	(14.70)	(.0090)	(43.1)	(1.38)	(0.61)	(53)
50 Percent	3.03	224	.092	450	77.2	7.2	674
	(.221)	(16.8)	(.0116)	(139)	(2.26)	(0.77)	(144)
95 Percent	2.73	203	.099	315	67.7	7.9	518
	(.177)	(12.0)	(.0078)	(36.7)	(1.76)	(0.55)	(44.8)

(i) Calculate the arc price elasticity of demand for outpatient expenses based on movement from the 50 percent plan to the free plan. (In calculations you use the coinsurance rate given in the table, rather than the effective coinsurance rate).

(ii) Was dental care more or less price responsive than inpatient care in the Rand experiment? A simple answer of more, less or similar will do. There is no need for explanation.

(c) Suppose Susan has the following utility of income function

Income	50	60	70	80	90	100	110	120	130	140	150
Utility	88	102	116	128	139	150	160	168	176	182	188

Without insurance Susan receives income of 50 with probability one-half or 150 with probability one-half. With insurance Susan receives income of 80 (factoring in the cost of the insurance policy). Should Susan purchase the insurance? Explain your answer.

2.(a) Consider insurance under Obamacare (Affordable care Act) health markets.

(i) Explain how Obamacare has a managed competition component.

(ii) Explain how Obamacare limits the adverse selection problem.

(b) Consider the market for used cars as presented in class and in the course notes.
Let X = value of the car.
Sellers know the value of the car they sell and their utility is U(X) = X.
Buyers only know that car value is uniformly distributed on (50,150) and their utility is 1.5×X.
Suppose the posted price for used cars is 110. Will consumers buy a car at this price?
Explain your answer.

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

(a) True False U.S. health expenditures per capita exceed $7,500.

(b) True False Prescription drugs are the second biggest category of health expenditures in the U.S.

(c) True False Roughly half of medical expenditures in the U.S. are paid by government.

(d) True False The most common form of health insurance in the U.S. is employer-provided.

(e) True False An essential component of the Grossman model is that increased medical inputs on average lead to increased level of health

(f) True False Life expectancy in 2015 is a forecast of average life expectancy for someone born in 2015 allowing for forecast future increases in longevity.

4.(a) The pill Truvada drastically reduces the risk of contracting AIDS when taking daily. The Brazilian Health Ministry is paying Gilead Sciences, the American manufacturer of the drug, $23 for a month's supply. By contrast a month's supply in the U.S. sells for upward of $1,600. Using appropriate diagrams show why such a pricing strategy might arise.

(b) Suppose that a person with terminal cancer has the following options:

- Do nothing: spend nothing and live two more years with each year worth 0.4 of a year in perfect health.
- Passive treatment: spend $40,000, live four more years with each year worth 0.5 of a year in perfect health.
- Aggressive treatment: spend $200,000, live ten more years with each year worth 0.6 of a year in perfect health.

With adjustment for quality of life, which treatment – passive or aggressive – is most preferred to no treatment on cost-effectiveness grounds? Explain your answer. For simplicity there is no need to discount.

(c) 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 the level of health.

5.(a)(i) What is the economic advantage of paying healthcare providers using a prospective payment system?

(ii) Explain physician-induced demand and its likely consequences.

(b) 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.

(c)(i) State the main negative aspect for health care of government laws providing patent protection.

(ii) State the main positive aspect for health care of government laws providing patent protection.

6.(a) Provide a plot of life expectancy (across countries) against country income per capita, paying attention to both the slope and curvature of the plot.
On the same diagram show where the U.S. lies in relation to this curve.

(b) Consider the following from Exhibit 1on Cost of Heart Attack Treatment in the article by Cutler and McClellan "Is Technological Change in Medicine Worth It."

	1984	1998	Annual change
Total spending (billions)	$3.0	$4.8	3.4%
Number of cases	245,687	221,133	−0.8
Average spending per case	$12,083	$21,714	4.2

SOURCE: Authors' analysis of Medicare claims records for all elderly patients with a heart attack in 1984 and 1998.

(i) What do we learn from this exhibit?

(ii) This exhibit considers only costs. What, if anything, did the article say about the benefits?

(c) 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:

7. The data are for 498 people in the fifth year of the Rand Health Insurance Experiment in either the free plan or the 25% plan. The sample is only of people in the 0% and 25% coinsurance plans.

out_infl = outpatient medical spending in 2011 dollars
lnout = ln(out_infl + 1)
fam_income = Family annual income in 1984 dollars
lnincome = ln(fam_income)
coins0 = 1 if have 0% coinsurance and = 0 otherwise
coins25 = 1 if have 25% coinsurance and = 0 otherwise

```
. sum out_infl lnout coins0 coins25 fam_inc lnincome
    Variable |        Obs        Mean    Std. Dev.       Min        Max
    out_infl |        498    1543.365    2596.798          0   28519.19
       lnout |        498    6.135355     2.20115          0   10.25837
      coins0 |        498    .5763052    .4946401          0          1
     coins25 |        498    .4236948    .4946401          0          1
  fam_income |        498    11537.71    5822.957          0      26000
    lnincome |        498    9.074336    1.204742          0   10.16589

. regress out_infl coins0, vce(robust)
             |               Robust
    out_infl |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
      coins0 |   701.8745   217.9603     3.22   0.001     273.6351    1130.114
       _cons |   1138.871    126.772     8.98   0.000     889.7951    1387.948
```

You can answer the following in the simplest possible way. If there is not enough information provided to answer the question parts (a)-(e) then state this.

(i) Give average outpatient spending in the 25% coinsurance plan.

(ii) Give a 95% confidence interval for the difference in mean spending across the two plans.

(iii) What is estimated by the Stata command **regress out_infl** ?.

(iv) Suppose you wanted to calculate the percentage increase in spending due to aging one year, controlling for whether on the 0% or 25% plan. What Stata command would enable you to get this estimate? You need to give both the command and the names of any variables. If you need to create a new variable do so and define the variable.

(v)-(vi) Two points and separate from the preceding.

Consider a policy change that came into effect in 2010. We have data for 2005 and 2015. The outcome variable in 2015 was 11 in communities affected by the policy and 12 in communities not affected by the policy. The outcome variable in 2005 was 5 in communities affected by the policy and 10 in communities not affected by the policy.

Give the difference in differences estimate of the effect of the policy. **Show computations.**

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

1. John obtains a major medical and hospital policy that covers all costs, aside from a $1,000 annual deductible and a 20% coinsurance rate. If John actually incurs annual health charges of $4,000, by how much will his health insurance company reimburse him?

a. less than $1,000
b. between $1,000 and $1,999
c. between $2,000 and $2,999
d. more than $3,000**.**

2. A risk-averse person's expected health expenses equals the actuarially fair premium for the policy. Then

a. they will definitely buy the insurance policy
b. they will definitely not buy the insurance policy
c. they are indifferent between buying and not buying the policy
d. it's unclear given the information - they may either buy or not buy the policy.

3. If a company insures 10,000 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 10,000 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 lead uniformly to worse quality of care
c. neither a. nor b. though it did look at these issues
d. did not consider these issues

5. In forming policy on health interventions that can save a life, the need to place a value on a year of life is the greatest limitation for studies that use

a. cost-benefit analysis
b. cost-effectiveness analysis
c. it is a limitation for neither
d. it is a comparable limitation for both

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

a. high training costs
b. high rate of return on the training costs
c. neither a. nor b.
d. both a. and b.

7. According to the data from the article Howard et al. "Pricing in the Market for Anticancer Drugs", in the period studied drug prices per life year gained

a. decreased

b. were roughly constant

c. increased roughly 10 percent a year

d. increased by much more than 10 per cent per year.

8. Phase III drug trials to show a drug is safe and effective are required for

a. the original developer of the drug

b. manufacturers of a generic version of the drug after it comes off patent

c. both a. and b.

d. neither a. nor b.

9. The main rationale for Medicare on grounds of economic efficiency is

a. avoid failure of the market for health insurance for elderly

b. avoid private monopoly in the market for health insurance for elderly

c. avoid negative externalities from disease transmission

d. none of the above.

10. In deciding on the optimal provision of a nonexcludable public good the major challenge for government policy-makers is

a. determining social marginal cost

b. determining social marginal benefit

c. neither of these is relevant

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

a. internalization of a positive externality

b. privatization of a public good to make it excludable

c. redistribution of income to wealthy corporations

d. creation of a monopoly that will maximize consumer surplus

12. For Medicaid

a. most of those with Medicaid insurance are the young and able-bodied

b. most Medicaid expenditures are on the old and disabled

c. both a. and b.

d. neither a. nor b.

13. In the study by Cutler and McClellan on Technology

a. A specific value was placed on a year of life

b. A specific value was placed on the discount rate

c. neither a nor b

d. both a and b

14. Life expectancy (averaged across the world) before 1800 was

a. less than 30 years

b. between 30 and 50 years

c. between 50 and 70 years

d. more than 70 years

15. The marked increase in average life expectancy in the world really began

a. 10,000 years ago

b. 2,000 years ago

c. 1,500 years ago

d. 200 years ago.

16. Very large variation from region to region in the U.S. of the use of C-sections (rather than vaginal delivery) for child birth is viewed as a sign of

a. overuse of medical technology

b. underuse of medical technology

c. neither of the above.

17. The major gains in life expectancy due to increased health spending per capita occur

a. at low levels of spending per capita

b. at moderate levels of spending per capita

c. at high levels of spending per capita

d. roughly uniformly at all levels of spending per capita.

18. Compared to China and India

a. the U.S. spends more on health per capita

b. the U.S. spends a greater share of GDP on health care

c. both a. and b.

d. neither a. nor b.