

**Cameron ECON 132 (Health Economics): FIRST MIDTERM EXAM (A) Fall 18**

Answer all questions in the space provided on the exam.

Total of 36 points (and worth 22.5% of final grade).

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

**Short Answer (6 points each question)**

**1.(a)** Consider FFS, PPO and HMO health insurance.

**(i)** Which of these gives the greatest power to a gatekeeper?

**(ii)** Which of these is likely to have the lowest insurance premium?

**(b)(i)** Define an annual health insurance deductible.

**(ii)** Define an actuarially fair premium.

**(c)(i)** If the purpose of health insurance is to reduce an individual's exposure to risk, why do most health insurance policies have coinsurance rates of more than zero percent?

**(ii)** Provide an economic definition of a person who is risk averse.

2. Circle True or False to each of the following statements about the U.S. health market in 2017.

[One point each.]

- (a) **True False** Annual health care expenditures in the U.S. exceed \$10,000 per person.
- (b) **True False** Health expenditures per person are higher and health outcomes are better in the U.S. than in other major developed countries.
- (c) **True False** The biggest use of health funds in the U.S. is pharmaceutical drugs.
- (d) **True False** It is possible for a person to have both Medicare and Medicaid insurance.
- (e) **True False** A limitation of the Rand experiment is that people chose their health insurance policy, rather than being randomly assigned a policy.
- (f) **True False** Obamacare has led to substantial reduction in the fraction uninsured.

3. Use the following results from the Rand Health Insurance Experiment to answer the following.

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)
Individual			
Deductible	72.6 (1.14)	9.52 (0.529)	623 (34.6)

- (a) Give a 95% confidence interval for mean health spending in the 25 percent plan.
  
- (b) Calculate the price elasticity of demand based on the difference between mean spending in the 25 percent plan (with average coinsurance rate 16%) and health spending in the free plan.
  
- (c) Test whether the difference in mean health spending in the 95 percent plan and that in the free plan is statistically significantly different at level 0.05.

4.(a)(i) Suppose an individual faces the following possible health losses:

$X = 20$  with probability 0.8 and  $X = 70$  with probability 0.2.

Calculate the expected loss and standard deviation of the loss.

(ii) Suppose an insurance company insures 400 such individuals, each independent of the other.

Calculate the expected average claim and loss and standard deviation of the average claim.

(b) Suppose John is risk-averse and faces a gain of \$100 with probability 0.5 and a gain of \$200 with probability of 0.5.

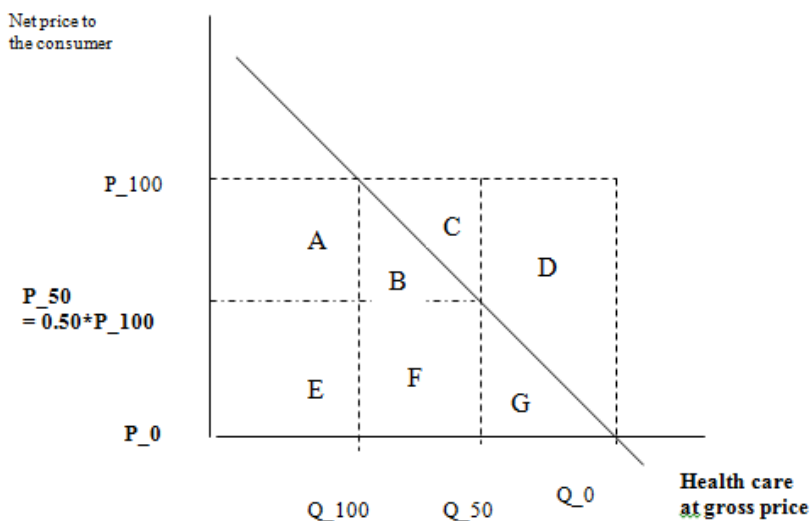
(i) On an appropriate diagram show John's expected utility.

(ii) On the same diagram show John's utility if he could instead receive with certainty an amount equal to his expected gain.

(c) Compare a health insurance policy with 50% coinsurance to one with free health care.

(i) The change in total medical expenditures due to increased insurance cover is given by which combinations of areas A, B, C, D, E, F and G?

(ii) The welfare loss due to moral hazard is given by which combinations of areas A, B, C, D, E, and G?



5. Consider Stata output for people who have insurance with either 0% coinsurance (coins95==0) or 95% coinsurance (coins95==1).

. mean out\_infl if coins95==1

Mean estimation                                      Number of obs      =              806

	Mean	Std. Err.	[95% Conf. Interval]	
out_infl	783.2636	56.04307	673.2558	893.2714

. regress out\_infl coins95, vce(robust)

Linear regression                                      Number of obs      =              2,308  
 F(1, 2306)    =              41.56  
 Prob > F    =              0.0000  
 R-squared    =              0.0162  
 Root MSE    =              1767.1

out_infl	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
coins95	-475.0367	73.68932	-6.45	0.000	-619.541	-330.5324
_cons	1258.3	47.85882	26.29	0.000	1164.449	1352.151

**For each of the following, if there is not enough information to answer the question, then say so. If there is enough information to answer, include an explanation in your answer.**

- (i) Give the average difference in spending between the two plans.
  
- (ii) Give a 95% confidence interval for the mean difference in spending between the two plans.
  
- (iii) Give the average spending under the 0% coinsurance plan.
  
- (iv) Give the average spending under the 95% coinsurance plan.
  
- (v) Suppose we gave the command **regress out\_infl if coins95==1**. What value will the resulting t-statistic take?
  
- (vi) Suppose we give the command **ttest out\_infl, by(coins95) unequal**. What value will the resulting t-statistic take?

**Multiple Choice (1 point each) Note: You should spend 15-20 % of time on these!**

1. Comparing the Blue Shield Bronze 60 PPO plan to the Kaiser Permanente Bronze 60 HMO
  - a. the plans have similar deductibles and coinsurance rates for in-network care
  - b. the plans have similar flexibility regarding ability to receive health care, such as an MRI
  - c. both a. and b.
  - d. neither a. nor b.
  
2. Major changes in health care in the U.S. since 1930 include
  - a. increased government spending on health care as a fraction of GDP
  - b. increased private spending on health care as a fraction of GDP
  - c. both a. and b.
  - d. neither a. nor b.
  
3. Features of health insurance policies under the Affordable Care Act (Obamacare) include:
  - a. no exclusion due to pre-existing conditions
  - b. subsidy given to people with low income (but not so low as to qualify for Medicaid)
  - c. both a. and b.
  - d. neither a. nor b.
  
4. The Miller and Luft study, "Does Managed Care Lead to Better or Worse Quality of Care?", summarized in the course pack and discussed in class compared FFS with HMO
  - a. for various forms of health care in a particular city
  - b. for one particular form of health care across a range of cities
  - c. both a. and b.
  - d. neither a. nor b.
  
5. Under managed competition
  - a. private health insurance companies compete with government-provided insurance
  - b. doctors and hospitals compete for patients on the basis of prices for standardized health care
  - c. insurance companies compete for business on the basis of prices for standardized insurance policies
  - d. none of the above.
  
6. A risk-averse person is more likely to purchase insurance
  - a. the greater their degree of risk-aversion
  - b. the smaller the variance of their expected losses
  - c. both a. and b.
  - d. neither a. nor b.