**Cameron**      **ECON 132 (Health Economics): FIRST MIDTERM EXAM (A)**      **Winter 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)(i)** A consumer faces a choice between a gold plan with lower coinsurance rate and higher premium, and a bronze plan with higher coinsurance rate and lower premium. Otherwise the plans are the same. If the consumer is risk averse, and rational, will the consumer choose the gold plan, the bronze plan, or is either possible? **Explain your answer.**

**(ii)** Give the name of the California website used to find the various insurance plans offered under the Affordable care Act (Obamacare).

**(b)(i)** Carna obtains a major medical and hospital policy that covers all costs, aside from a $5,000 annual deductible and a 20% coinsurance rate. If Carna actually incurs annual health charges of $8,000, by how much will her health insurance company reimburse her?

**(ii)** What name is given to the type of insurance policy in the preceding question.

**(c)** Suppose the immunization rates of HMO and FFS plans are, respectively, 0.72 and 0.90, with standard errors of, respectively, 0.06 and 0.08. Is the difference between the population mean immunization rates of the HMO and FFS plans statistically significant at 5 percent?
[Hint: $t = (m_1 - m_2) / \text{sqrt}(s_1^2 + s_2^2)$ where m denotes sample mean and s denotes standard error]

**2.** Circle True or False to each of the following statements about the U.S. health market in 2007.

[One point each.]

**(a) True False** Life expectancy in the U.S. has increased greatly over the past forty years.

**(b) True False** Compared to other major developed countries, and controlling for health spending, the U.S. has better than expected health outcomes.

**(c) True False** The main uses of health funds in the U.S. are in order: hospital, pharmaceutical and physician.

**(d) True False** Medicare is a federal health insurance program primarily funded by a payroll tax.

**(e) True False** A high-deductible health insurance plan is necessarily fee-for-service.

**(f) True False** The average premium on a family health insurance policy in the U.S. exceeds $10,000 per year.

**3.(a)** Suppose an individual faces the following possible health losses:
X = 10 with probability 0.8 and X = 60 with probability 0.2.
Suppose an insurance company insures 100 such individuals.
Give a 95% confidence interval for the average claim (averaged over the 100 individuals).

**(b)** Suppose going from no insurance to insurance with an effective coinsurance rate of 50% leads to health expenditures changing from $2,000 to $3,000. Calculate the arc price elasticity of demand.

**(c)** Suppose George 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 George's well-being.

**(ii)** On the same diagram show George's well-being if he could instead receive with certainty an amount equal to his expected gain.

**4.(a)** Compare no health insurance to a health insurance policy with 50% coinsurance.
**(i)** The change in total medical expenditures due to insurance is given by which combinations of areas A, B, C, D E, F and G?

**(ii)** Compare no health insurance to a health insurance policy with 50% coinsurance.

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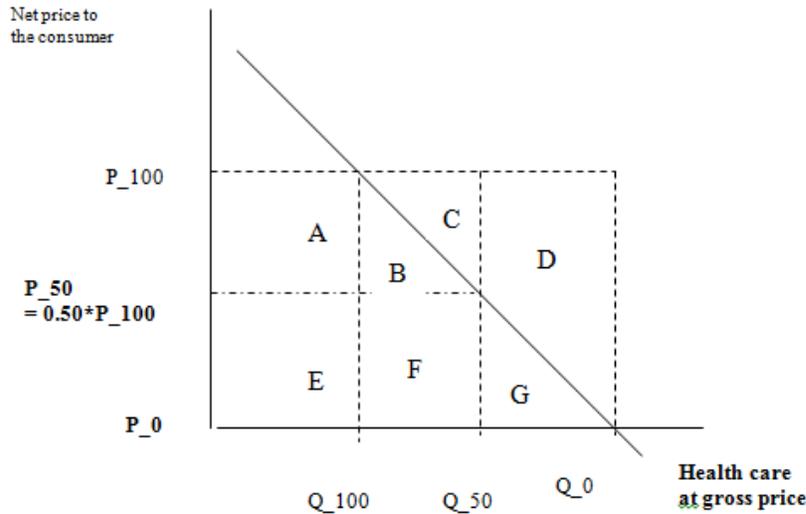


**(b)** For the Rand study (summarized in the article by Manning et al.).
**(i)** How did the study ensure that sicker people were not concentrated in the most generous health insurance plan?

**(ii)** Which plan had higher outpatient expenses: the 25% plan or the 95% plan?

**(c)** Given our discussion in class and the course notes, Paully in the article "The Economics of Moral Hazard: Comment", it is reasonable to believe that Paully asserted that:

Circle True or False

**(i) True   False**     The smaller the price elasticity of demand for health care, the less will be the effect of coinsurance on usage.

**(ii) True   False**     An earlier influential article by Ken Arrow was wrong to state that "the welfare case for insurance of all sorts is overwhelming. It follows that the government should undertake insurance where the market, for whatever reason, has failed to emerge."

**5.** Consider Stata output for people who have insurance with either 0% coinsurance or 95% coinsurance.

```
. describe out_infl coins95

              storage   display    value
variable name   type    format     label        variable label
─────────────────────────────────────────────────────────────────────
out_infl        double  %9.0g                    outpatient medical spending in 2011 dollars
coins95         float   %9.0g                    = 1 if 95% coinsurance and = 0 otherwise

. ttest out_infl, by(coins95)

Two-sample t test with equal variances
```

| Group | Obs | Mean | Std. Err. | Std. Dev. | [95% Conf. Interval] | |
|-------|-----|------|-----------|-----------|----------|----------|
| 0 | 1,547 | 1364.559 | 56.38554 | 2217.752 | 1253.959 | 1475.16 |
| 1 | 817 | 711.8274 | 48.75557 | 1393.591 | 616.1262 | 807.5285 |
| combined | 2,364 | 1138.975 | 41.05701 | 1996.232 | 1058.463 | 1219.486 |
| diff | | 652.7319 | 85.30078 | | 485.4598 | 820.0041 |

```
    diff = mean(0) - mean(1)                              t =    7.6521
Ho: diff = 0                             degrees of freedom =      2362

    Ha: diff < 0              Ha: diff != 0                Ha: diff > 0
 Pr(T < t) = 1.0000      Pr(|T| > |t|) = 0.0000       Pr(T > t) = 0.0000
```

**(i)** Give a confidence interval for spending in the 95% coinsurance plan.

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

**(iii)** Does a test at significance level one percent reject the null hypothesis that mean spending is the same in the two plans? **Explain your answer.**

**(iv)** Suppose we give the command **regress out_infl coins95**
Give the intercept and slope coefficient from this regression.

**(v)** Is it possible given the above information to obtain an estimate of average spending for people who are in either the 95% plan or the 0% plan? If no, say so. If yes, provide an estimate.

**(vi)** Suppose we give the command **hist out_infl**.
Do you expect the resulting histogram to be symmetrically distributed?
A simple YES or NO will do.

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

**1.** U.S. health spending in 2017 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.** Major changes in health care in the U.S. since 1930 include
**a.** decreased health insurance coverage
**b.** increased health spending 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 coursepack and discussed in class, made comparisons on the basis of
**a.** quality of care
**b.** quantity of care
**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 managed health plan that allows patients to choose any physician, but pays for care more generously if patients choose from a panel of participating physicians is called
**a.** a health maintenance organization
**b.** a preferred provider organization
**c.** an exclusive provider organization
**d.** a Canadian-style plan