# Practice Quiz 5

Statistics 1000
Dr. Nancy Pfenning

1. (3 pts.) This table classifies 2000 Americans with respect to age group and having health insurance or not.

| | College-Aged | Other | Total |
|---|---|---|---|
| Insured | 140 | 1560 | 1700 |
| Uninsured | 60 | 240 | 300 |
| Total | 200 | 1800 | 2000 |

   (a) The explanatory variable is and this table displays it along the (i) rows (ii) columns

   (b) What is the conditional probability of being uninsured, given that someone is college-aged?

   (c) What is the conditional probability of being uninsured, given that someone is non-college-aged?

   (d) Does there appear to be a substantial relationship between being college-aged or not and having health insurance or not? Explain.

   (e) Notice that altogether, 300 of those 2000 were uninsured. If equal proportions were uninsured, then _____of the 200 college-aged individuals would be uninsured, and _____of the 1800 others would be uninsured.

2. (3 pts.) A survey in 2001-2002 found the following probability distribution for American's number $X$ of visits to the emergency room in the preceding year:

| $X$ | 0 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| Probability | .78 | .14 | .04 | .02 | .01 | .01 |

   (a) Find the mean number of visits per person.

   (b) Keeping in mind that standard deviation $\sigma$ measures the typical distance of values of $X$ from their mean, which of these is the only reasonable guess for standard deviation? (No calculations necessary.) (i) .09 (ii) .90 (iii) 9.0 (iv) 90

   (c) A histogram of the distribution would show
   (i) some left skewness (ii) some right skewness (iii) perfect symmetry

   (d) Will the 68-95-99.7 Rule do a fairly good job of estimating probability of being more than two standard deviations above the mean?

3. (4 pts.) Researchers at Harvard Medical School reported in 2005 that the proportion of all bankruptcies in the U.S. that were due to medical bills was .50.

   (a) In random samples of 20 bankruptcies, the distribution of sample proportion due to medical bills has mean _____.

   (b) The standard deviation for samples of 20 bankruptcies is .11. If sample size were increased, the standard deviation would be (i) smaller (ii) larger (iii) the same

   (c) Since $20(.5) = 10$ and $20(1 - .5) = 10$, the shape of the distribution of sample proportion is
   (i) not at all normal (ii) just roughly normal (iii) almost perfectly normal

   (d) Suppose 11 in a sample of 20 bankruptcies are due to medical bills. Identify each of the following: (i) $X$ _____(ii) $n$ _____(iii) $p$ _____(iv) $\hat{p}$ _____