Bayes' Rule (and More Probability) Handout – STAT 509 – Fall 2011

For all these problems, show fully how you got your answers!

1. Among people without health insurance, the proportion of them who are senior citizens is 0.006. Also note that senior citizens make up 17 percent of the population, and note that 13.8 percent of all people lack health insurance. Finally, 19.6 percent of all people who do have health insurance are senior citizens.

(a) If we choose a person at random, verify *mathematically* that the event that the person is a senior citizen and the event that the person lacks health insurance are **not** independent events.

(b) If we choose a person at random, find the probability that the person is a senior citizen and does not have health insurance.

(c) If we choose a person at random, find the probability that the person is a senior citizen or that the person does not have health insurance.

(d) Given that a randomly chosen person is a senior citizen, use Bayes' Rule to find the probability that this person has no health insurance.

(e) In part (a), you found that two events were not independent. Are those two events mutually exclusive? Why or why not?

Selected Answers: (1) b) .000828 c) .30717 d) .004877 e) No