(1) Does a nicotine patch help a person to quit smoking? 150 people have joined a clinical trial that is testing the effectiveness of a nicotine patch on a person's ability to quit smoking. The 150 subjects were divided into two groups, one given the nicotine patch and the other a placebo. After 12 weeks, the number of people who had quit smoking was recorded:

	Still Smoking	Quit Smoking	Total
Patch	58	22	80
No Patch	57	13	70
Total	115	35	150

(a) Find the conditional probability of someone quitting smoking if they are on the nicotine patch.

(b) Find the conditional probability of someone quitting smoking if they are *not* on the nicotine patch.

(c) Is smoking status independent of the treatment received?

(d) Construct a 95% confidence interval for the difference in the proportion of people who quit smoking on the nicotine patch compared with a placebo. Does this appear to be a significant difference? Why or why not?

(e) At the 5% level of significance, test the claim that the nicotine patch is effective at helping people to quit smoking.

(f) Determine the odds ratio of still smoking while on the nicotine patch. Interpret as: estimated odds were $z\%$ higher or the odds are z times the odds for the other group

(2) Suppose that at any given time, approximately 1% of people in Worcester have the flu. Suppose that the typical flu test that you take at your doctor's office has 60% sensitivity and 90% specificity. Given that your flu test came back positive, what is the probability that you actually have the flu? Note: This is called the positive predictive value of the test.

Does this result surprise you? How can the PPV be so low given the relatively high sensitivity and specificity?