1. A study was conducted to investigate the relationship between the smoking habits and divorce history of 1,669 people (all subjects had been married at some point).   The results are shown in the following table.

| Smoking Status | Ever Divorced? | | |
	No	Yes	*Total*
Nonsmoker	810	374	1184
Smoker	247	238	485
Total	**1057**	**612**	**1669**

a. Find the risk of divorce for smokers.

238/485 = 0.49

b. Find the risk of divorce for nonsmokers.

374/1184 = 0.316

c. Find and interpret the relative risk ratio.

RR = .49/.316 = 1.55. Those who smoke are 1.55 times as likely to divorce as those who don't smoke. Alternatively, you could say that smoking is associated with a 55% increase in the risk of divorce.

d. Find the odds of divorce for smokers.

238/247

e. Find the odds of divorce for nonsmokers.

374/810

f. Find and interpret the odds ratio.

(238/247)/ (374/810) = 2.09. The odds of divorce are about twice as large for smokers as for nonsmokers. Alternatively, you could say that smoking is associated with a 109% increase in the odds of divorce.

g. Suppose a journalist writes a story summarizing the results of this study and uses the following headline: "Study Shows that Smoking More than Doubles the Risk of Divorce." This headline is inappropriate for two (statistical) reasons. Identify both of these reasons.

First, this headline incorrectly interprets the odds ratio. We can say that the *odds* of divorce for smokers are approximately double the *odds* of divorce for nonsmokers, but when talking about the *risk* (i.e., probability) of divorce, we can say only that the *risk* of divorce is about 1.5 times as large for smokers as for nonsmokers (this isn't exactly double!). Second, the headline implies that smoking *causes* the divorce. This study was an observational study because subjects were not randomly assigned to smoke or not; thus, we can establish only that an association exists between smoking and divorce.