

Homework 3, due 14 Oct 2009

1. These data come from Appleton, D.R. French, J.M. and Vanderpump, M.P (1996, *American Statistician*, 50, 340-341). Here are tables showing the twenty-year survival status for smokers and non-smokers in a certain cohort, stratified by age.

	Age 55-64		Age 65-74		
	Dead	Alive	Dead	Alive	
Smokers	51	64	Smokers	29	7
Non-smokers	40	81	Non-smokers	101	28

- a. Calculate the p -value for the test of association between smoking and survival. Consider two-sided alternatives, and report results from both Fisher’s exact test, and the naive Pearson chi-square test. Ignore the effect of age.
- b. Describe the set of tables whose probabilities are summed to give the answer to part (a).
- c. List one table that contributes to the p -value for the test, considered as two binomials, but does not contribute to the p -value for Fisher’s exact test.

2. Falsey *et. al.* (2000) report on a study of the effectiveness of handwashing in reducing respiratory infections among participants at adult day care centers. The following table contains results on 145 subjects participating in these centers in December of 1992 and December 1993. Each participant was classified as having had or not had an illness in each of these months.

	Ill December 1992		Ill December 1993	
	No	Yes	No	Yes
No	110	13		
Yes	21	1		

- a. Was December 1993 more healthy, less healthy, or about the same as December 1992? Do a hypothesis test.
- b. Describe a model for association between year and sickness, and estimate the association between year and sickness. Give a 95% confidence interval.
- c. Very few people were sick both years. Why do you think this might be so?