Exercise 6B.1

In a study of low birthweight and maternal smoking, the birth outcomes of 74 women who smoked during pregnancy were compared to the birth outcomes of 115 women who did not smoke during pregnancy. Of the 74 smokers, 30 had babies with low birthweight, and of the 115 non-smokers, 29 had babies with low birthweight.

(a) Construct a 2x2 contingency table for these data.

(b) What is the estimated probability that a baby is born with low birthweight among women who smoke? Among women who do not smoke?

(c) Calculate the expected counts for each cell in the table.

(d) Calculate the chi-square test statistic using the expected counts you calculated in (c).

(e) Test whether there is a significant difference in the probability of a low birthweight baby for women who smoke during pregnancy and women who do not smoke using a chi-square test. Make sure to write all steps of the hypothesis test and state a conclusion.

Exercise 6B.2

A study was done to compare the rate of chronic kidney disease (CKD) among diabetics and non-diabetics. The data from Stata are below. We are interested in whether the probability of CKD is the same for diabetics and non-diabetics.

```
. tabulate group ckd

               |          CKD
         group |       yes          no |     Total
---------------+----------------------+----------
     diabetics |        30          80 |       110
non-diabetics |        35         190 |       225
---------------+----------------------+----------
         Total |        65         270 |       335
```

(a) What is the estimated probability of CKD in each group (diabetics, non-diabetics)?

(b) Use a two-sample z-test to test whether the probability of CKD is different for diabetics and non-diabetics in the population.

(c) Perform a chi-square test to test the same hypothesis. Confirm that the conclusion is the same.