This week’s prelive assignment is very simple and will just piggy back off of Unit 10.

Below is some sas code utilizing a data set involving two fictional colleges. For our purposes, 4000 students from CRANE and EAGLE college had a friendly competition to see who had the better science knowledge from their respective student bodies.  The 4000 students were randomly selected and then administered a science exam of which they were given a pass/fail score.   Does a student’s overall science knowledge differ between the two schools?

Pre Live Questions to address

* What is the response and what is the explanatory variable?

Exam Status is the response variable and Exposure is explanatory variable

* What type of sampling scheme/ study design is this?

The study is prospective

* From the SAS output provided by the code below. Find the Fisher’s exact table and make note of the test result? What is the decision and conclusion of the test?

Let the null hypothesis be that the proportion of passing students on the science exam for CRANE is the equal for EAGLE.

The Fischer’s exact test table gave p-value=0.0268. Based on the p-value we can say that there is enough evidence to suggest that the proportion of passing students on the science exam for CRANE is not equal to the EAGLE and rejecting the null hypothesis with p-value=0.0268 from Fischer’s exact test.

* Output is provided for CI’s for proportions as well as odds ratios and relative risk. Make note of the odds ratio value and CI. Can you interpret it?

Based on the odds ratio and CI from the output, we can say that Eagle students are 1.0499 times likely to pass the science test than Crane Students. We are 95% confident that the true relative risk (relative to Crane Students) of passing the exam is between 1.006 to 1.096.

* Take a look at the second set of SAS code. It turns out that the students who participated were sitting in either a math or physics class. The second analysis takes into account this additional factor as a covariate. Compare the ODDS ratio result of the first model with that of the second. What is this saying? Provide some thoughts and explore based on what you got from the videos on the Mantel-Haenszel test. Look at the summary statistics.

Since the study is prospective the odds ratio and relative risk are acceptable measures. Looking at the summary table of MH test, we reject the null hypothesis that the odds for CRANE (pass: fail ratio) is the same as the EAGLE after adjusting for the class(math/physics)

proc format;

value ExpFmt 1='Crane C.'

0='Eagle C.’;

value RspFmt 1='Pass'

0='Fail’;

run;

data CH19\_9;

   input Exposure Response Count;

   label Response='Exam Status';

   datalines;

0 0  1900

0 1  2100

1 0  2000

1 1  2000

;

proc sort data=CH19\_9;

   by descending Exposure descending Response;

run;

proc freq data=CH19\_9 order=data;

   format Exposure ExpFmt. Response RspFmt.;

   tables Exposure\*Response / chisq  riskdiff(equal var=null) relrisk;

   exact pchi or fisher;

   weight Count;

   title ' Prospective Study ';

run;

data CH19\_92;

   input Exposure Response Count Subject $;

   label Response='Exam Status';

   datalines;

0 0 1600  Math

0 1 2000  Math

1 0 600  Math

1 1 1200  Math

0 0 300  Physics

0 1 100  Physics

1 0 1400  Physics

1 1 800  Physics

;

proc sort data=CH19\_92;

   by descending Exposure descending Response;

run;

proc freq data=CH19\_92 order=data;

   format Exposure ExpFmt. Response RspFmt.;

   tables Subject\*Exposure\*Response / CMH chisq  riskdiff(equal var=null) relrisk;

   exact pchi or fisher;

   weight Count;

   title ' Prospective Study ';

run;