**Week 11, Day 1**

**Multiple Logistic Regression: Debriefing of activity**

* What model did you choose?
* Comparing misclassification rates

**Binary predictor, binary response**

* Options for analysis:
  + 2-sample proportion test

vs.

* + Chi-sq test for association/independence/homogeneity

vs.

* + Logistic regression
* Activity: ChisqVSLogistic, Part I

**Categorical predictor, binary response**

* Options for analysis:
  + Chi-sq test

vs.

* + Logistic regression
* Activity: ChisqVSLogistic, Part II

**Binary/Categorical predictor, Categorical response**

* Options for analysis:
  + Chi-sq test

vs.

* + Ordinal Logistic regression (if response is ordinal)

Or Multinomial Logistic regression (if response is categorical)

**Pros & Cons of each method: Is one better than the other?**

* When can they each be used?
  + Each have conditions
* One-sided vs. 2-sided alternative
* Binary X case: CI for the difference between the 2 groups
  + - 2-sample prop (CI for pi1 – pi2)
    - Logistic regression (CI for beta1/OR)
    - Chi-sq: no CI
* Categorical X case: CI for the difference between ***any*** groups:
  + - Logistic regression (CI for betas/OR)
    - Chi-sq: no CI

Moral of the story:

* Logistic reg allows you to summarize the entire relationship in a single equation
* Logistic reg allows you to say which factors (if any) were statistically significant and how different they are, while Chi-sq test just tells you whether there is an association between the two variables. (Contribution to the chi-sq is useful, but doesn’t tell you exactly what’s significant.)