BIOS 6312 - Modern Regression Analysis
Spring 2021
Lab #7

Objective: Using the `mri` data, examine the association between cerebrovascular event prior to MRI and common lifestyle risk factors.

Data pre-processing:

1. Load the `mri` data set into Stata.

2. Using the levels from the `mri` data dictionary, relabel the race variable: 1 = White, 2 = Black, 3 = Asian, 4 = Other.

3. Using the following levels, create an ordinal variable for global brain atrophy: 1 = 0 - 25, 2 = 26 - 50, 3 = 51 - 75, and 4 = 76 - 100.

4. Relabel this new atrophy variable with the following labels: 1 = Level 1, 2 = Level 2, 3 = Level 3, and 4 = Level 4.

Primary data analysis:

1. Fit a multinomial regression model to quantify the association between prior cerebrovascular event (outcome) and smoking history (exposure), controlling for age, gender, and race and using robust standard errors. (Hint: did you remember to add i. before the name of the categorical race variable?). Use the `mlogit` function and the `nolog`, `robust`, and `rrr` options.

   Interpret both of the smoking history coefficients.

2. Test for the overall association between smoking history and prior cerebrovascular event.

3. Repeat #1, and replace smoking history with average alcohol intake for the two weeks prior to MRI.

   Interpret both of the alcohol intake coefficients.

4. Repeat #1, and replace smoking history with diabetes status prior to MRI.

   Interpret both of the diabetes coefficients.

5. Fit a proportional odds regression model to quantify the association between the ordinal variable we created for global brain atrophy (outcome) and smoking history (exposure), controlling for age, gender, and race and using robust standard errors. (Hint: did you remember to add i. before the name of the categorical race variable?). Use the `ologit` function and the `nolog`, `robust`, and `or` options.

   Interpret the smoking history coefficient.

List of useful Stata commands:

- `import delimited`
- `replace`
- `group`
- `label define`

- `label values`
- `generate`/ `egenerate`
- `mlogit, robust`
- `ologit`

- `nolog`
- `rrr`/ `or`
- `testparm`