Pubhlth 740  
Assignment 1

1.1 (from KKMN p489, example 18.1). An intervention that was designed to improve perception of health is to be evaluated in a clinic among hypertensive patients. Since perception of health may depend to some extent on age and gender, groups of patients were formed, with subjects in each group having the same age and gender. A random sample of 15 groups was selected, and one subject in each group was assigned to the intervention, with the other assigned to control. The investigators are interested in whether or not the intervention increases the scores of self-perception. Write a brief (1 page or less) report that analyzes these data and summarizes results. (see Resources for data).

1.2. Create a SAS data set from the Vitamin D questionnaire data (see Resources). Label the variables and the data set. Write a short descriptive report of the data that summarizes each variable.

1.3. For the intervention described in problem 1.1, answer the following questions:

a. Define a finite population that might correspond to the problem. Assume there is no measurement error. For a group, write a non-stochastic model that includes group and treatment effects (using deviations from means parameterizations for each). Define all parameters, including parameters for the variance of group means, and the residual variance.

b. Suppose that a random sample of blocks is selected. Write a stochastic model that accounts for the sampling, including fixed and random effects.

c. Consider the pair of responses for a block in the sample. Write an expression for the expected value and variance of the pair.

d. Use the expression in c to derive the variance of the difference in sample means between the treatments. Use the results of the SAS output for the variance parameters to form an estimate of the variance, and show that the square root is equal to the standard error given for the estimate of a treatment effect.