**Preparation for first Biostatistics Exam**

This review sheet defines the scope of the exam. Exam questions will be clearly associated with one or more of the questions below. The format of the exam may contain a variety of questions, including problem solving, multiple guess, short answer, labeling drawings, making drawings, matching, and others.

You should be able to:

1. Understand and be able to explain the types of variables, and the types of statistical tests
2. Understand, be able to identify, and be able to explain randomness and randomly generated sets of information
3. Describe, explain, formulate and identify null hypotheses
4. Understand what a frequency distribution is and how they are used in statistics
5. Create and interpret a frequency distribution
6. Understand and explain what probability is
7. Distinguish between theoretical and observed distributions, and their role in statistics
8. Explain the relationships among statistics, probability, and hypothesis testing
9. Explain measures of central tendency and measures of dispersion
10. Given a set of data, be able to calculate and interpret basic descriptive statistics (sample size, mean, median, mode, range, quartiles, variance, standard deviation, degrees of freedom, z-scores)
11. Understand, describe and identify the relationships among sample distributions, sample size, and standard deviations
12. Understand and be able to identify and explain the concepts of independent, response and dependent variables
13. Explain the Let's Make a Deal Paradox
14. Calculate the probability of an event
15. Create, interpret, and understand the role of metadata in the curation of data files
16. Explain the characteristics, purposes and functions of source data files and analysis files
17. Explain, understand, create and interpret z-scores and their relationship to distributions
18. Explain the central limit theorem
19. Be able to apply any p-value to make the best decision about null hypotheses
20. Explain what alpha is, and how it is used in statistics
21. Understand, explain and identify the errors in hypothesis rejection/non-rejection based on statistical tests
22. Describe and know how to identify how to reduce the each of these errors
23. Be able to repeat any specific task that you did in homework or in class