

Statistical Concepts and Tests:

A basic reference guide for COMD students

Statistics- A set of tools for collecting, organizing, representing, and analyzing numerical facts or observations.

Descriptive Statistics - Basic statistics used to summarize and describe the data. Usually, mean, median, mode and measures of variation are included.

Inferential Statistics – Procedures employed to arrive at broader generalizations of inferences from sample data to populations

Null Hypothesis – H_0 – Statement of no effect – we seek to negate this in science

Alpha Level - The probability that a statistical test will find significant differences among groups. It is usually .05, .01 or .001 for most research studies.

P-value: Probability, assuming H_0 is true, that test statistic wd be more extreme; Thus, smaller P value is greater evidence against H_0 .

Confidence Interval – interval within which we may consider a hypothesis tenable. Common CIs are 90%, 95% and 99%.

Type I and II error – Type I – rejection of H_0 when it is actually true. Type II - acceptance of H_0 when it is actually false.

T-test - A statistical test used to compare the means of two samples. Lower case t is the statistic

Paired t-test - Usually used to determine before and after effects of an intervention. The lower case t is the statistic.

One Way Analysis of Variance (ANOVA) - A statistical test that determines whether the means of two or more groups are statistically different. There is one dependent and one independent variable.

Two Way ANOVA - The statistical test to study the effect of two categorical independent variables on a continuous variable or dependent variable. F is the statistic.

Correlation - the degree to which two variables are associated. The correlation coefficient is the measure of degree to which two variables are related and can range from 0 to +1 of positively correlated and 0 to -1 if negatively correlated. Lower case r = correlation coefficient.

Discriminant Analysis - A grouping method that identifies characteristics that distinguish among groups.

Linear Regression - A statistical technique used to find a linear relationship between one or more continuous independent variables and a continuous outcome or dependent variable. Multiple R is the statistic.