Variable(s) of Interest	Parameter of Interest	Statistic of Interest	Descriptive Method(s)	Inferential Method(s)	Assumption(s) for Inferential Methods
Single Categorical Variable	True Population Proportion (π)	Sample Proportion ($\hat{\pi}$)	▪ Report $\hat{\pi}$ ▪ Bar chart ▪ Pie chart ▪ Mosaic plot	▪ Binomial test ▪ CI for π	Check the four conditions for the binomial
Two Categorical Variables (each with 2 levels)	True Difference in Population Proportions ($\pi_1 - \pi_2$) OR Relative Risk/Odds Ratio of the Population	Difference in Sample Proportions ($\hat{\pi}_1$ - $\hat{\pi}_2$) OR Sample Relative Risk/Odds Ratio	▪ Report sample proportions ▪ Report difference in proportions, relative risk, or odds ratio ▪ Contingency table ▪ Mosaic plot	▪ Fisher's exact test ▪ Chi-square test ▪ CI for difference in proportions, relative risk, or odds ratio	▪ Each observation can be classified into only one cell of the contingency table ▪ Observations are independent ▪ Most EXPECTED counts should be greater than 5 for the chi-square test to work well
Two Categorical Variables (in general)	True Population Proportions	Sample Proportions	▪ Report sample proportions ▪ Contingency table ▪ Mosaic plot	▪ Chi-square test	▪ Each observation can be classified into only one cell of the contingency table ▪ Observations are independent ▪ Most EXPECTED counts should be greater than 5 for the chi-square test to work well

Variables of Interest	Parameter of Interest	Statistic of Interest	Descriptive Methods	Inferential Methods	Assumptions for Inferential Methods
Single Numerical Variable	True Population Mean (μ)	Sample Mean ($\bar{x}$)	▪ Report measures of center and variation ▪ Dotplot, boxplot, histogram, etc.	▪ One-sample t-test ▪ CI for population mean	▪ Either the sample size is fairly large or the data reasonably follow a normal distribution
Comparing Numerical Variable across Two Categories of a Categorical Variable (DEPENDENT samples)	True Mean Difference ($\mu_{difference}$)	Sample Mean Difference ($\bar{x}_{difference}$)	▪ Report measures of center and variation for the differences ▪ Dotplot, boxplot, histogram, etc.	▪ paired t-test ▪ CI for population mean difference	▪ Either the number of pairs is fairly large or the differences reasonably follow a normal distribution
Comparing Numerical Variable across Two Categories of a Categorical Variable (INDEPENDENT samples)	Difference in True Population Means (μ_1 - μ_2)	Difference in Sample Means ($\bar{x}_1$ - $\bar{x}_2$)	▪ Report $\bar{x}_1$, $\bar{x}_2$, and s_1, s_2 ▪ Side-by-side boxplots, etc.	▪ Two-sample t-test ▪ CI for μ_1 - μ_2	▪ Observations are independent ▪ Either both sample sizes are fairly large or the data from each group reasonably follow a normal distribution
Comparing Numerical Variable across 2 or more categories of a Categorical Variable			▪ Group means, standard dev. ▪ Side-by-side boxplots	Analysis of Variance (ANOVA)	▪ Independence ▪ Equal variances ▪ Normality
Comparing Two Numerical Variables			▪ Correlation ▪ Scatterplot ▪ Regression line	Regression Analysis	▪ Linearity ▪ Independence ▪ Constant variance ▪ Normality