Variables of Interest	Parameter of Interest	Statistic of Interest	Descriptive Methods	Inferential Methods	Assumptions for Inferential Methods
Two Categorical Variables (in general)	True Conditional Population Proportions $(\pi_{1\|G1}, \pi_{1\|G2}, ...)$	Sample Proportions $(\hat{p}_{1\|G1}, \hat{p}_{1\|G2} \dots)$	▪ Report sample proportions ▪ Contingency table Stacked/Dodged/Filled Bar Plot	Chi-square test	▪ Observations are independent EXPECTED counts should be greater than 5
Single Numerical Variable	True Population Mean (μ)	Sample Mean $(\bar{x})$	▪ Report measures of center and variation ▪ Dotplot, boxplot, histogram, etc. ▪ Describe shape + outliers	▪ 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 (INDEPENDENT samples)	Difference in True Population Means $(\mu_1 - \mu_2)$	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, facet histograms, etc.	▪ Two-sample t-test ▪ CI for $\mu_1 - \mu_2$	▪ 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 Two Categories of a Categorical Variable (DEPENDENT samples)	True Mean Difference (μ_d)	Sample Mean Difference ($\bar{x}_d$)	▪ 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